



TotalEnergies EP South Africa B.V.

**ENVIRONMENTAL AND SOCIAL IMPACT  
ASSESSMENT (ESIA) FOR THE OFFSHORE  
PRODUCTION RIGHT AND ENVIRONMENTAL  
AUTHORISATION APPLICATIONS FOR BLOCK  
11B/12B - REF NO: 12/4/13 PR**

Draft Environmental and Social Impact  
Assessment Report



# EXECUTIVE SUMMARY



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Draft Environmental and Social Impact Assessment Report

**PUBLIC**

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**WSP**





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# QUALITY CONTROL

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# CONTENTS

<b>1 INTRODUCTION AND SCOPE OF REPORT</b>	<b>1</b>
<b>1.1 PROJECT BACKGROUND AND LOCATION</b>	<b>1</b>
<b>1.2 SUMMARY OF AUTHORISATION REQUIREMENTS</b>	<b>6</b>
<b>1.3 PURPOSE OF REPORT</b>	<b>6</b>
<b>1.4 OPPORTUNITY TO COMMENT</b>	<b>7</b>
<b>1.5 STRUCTURE OF REPORT</b>	<b>8</b>
<b>2 ADMINISTRATIVE AND LEGAL FRAMEWORK</b>	<b>10</b>
<b>2.1 SOUTH AFRICAN ADMINISTRATIVE AND INSTITUTIONAL FRAMEWORK</b>	<b>10</b>
2.1.1 DEPARTMENT OF MINERAL RESOURCES AND ENERGY	10
2.1.2 PETROLEUM AGENCY OF SOUTH AFRICA	10
2.1.3 DEPARTMENT OF FORESTRY, FISHERIES AND THE ENVIRONMENT	11
2.1.4 SOUTH AFRICAN HERITAGE RESOURCES AGENCY	11
2.1.5 GARDEN ROUTE DISTRICT MUNICIPALITY	12
<b>2.2 SOUTH AFRICAN LEGISLATIVE FRAMEWORK</b>	<b>13</b>
2.2.1 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002)	13
2.2.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 OF 1998)	13
2.2.3 NATIONAL HERITAGE RESOURCES ACT, 1999 (ACT 25 OF 1999)	17
2.2.4 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT 59 OF 2008)	18
2.2.5 NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT, 2004 (ACT 39 OF 2004)	19
2.2.6 NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT, 2003 (ACT 57 OF 2003)	21
2.2.7 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 2004 (ACT 10 OF 2004)	21
2.2.8 NATIONAL ENVIRONMENTAL MANAGEMENT: INTEGRATED COASTAL MANAGEMENT ACT, 2008 (ACT 24 OF 2008)	22
<b>2.3 OTHER SOUTH AFRICAN LAWS, POLICIES, PLANS AND FRAMEWORKS</b>	<b>25</b>



<b>2.4 INTERNATIONAL REGULATIONS, CONVENTIONS AND BEST PRACTICE GUIDELINES</b>	<b>36</b>
<b>2.5 TEEPSA'S STANDARDS AND HEALTH, SAFETY AND ENVIRONMENTAL POLICIES</b>	<b>42</b>
2.5.1 TOTALENERGIES' SUSTAINABILITY APPROACH	42
2.5.2 STANDARDS FOR PROJECT DESIGN AND EXPLORATION AND PRODUCTION ACTIVITIES	44
2.5.3 GENERAL STANDARDS FOR ESIA	45
2.5.4 HEALTH, SAFETY AND ENVIRONMENTAL STANDARDS	45
2.5.5 TOTALENERGIES SUSTAINABLE PERFORMANCE	48
<b>3 ESIA APPROACH AND PROCESS</b>	<b>50</b>
<b>3.1 DETAILS OF THE ESIA TEAM</b>	<b>50</b>
<b>3.2 ESIA PROCESS</b>	<b>50</b>
3.2.1 SCOPING PHASE	52
3.2.2 EIA PHASE	52
<b>3.3 ESIA ASSUMPTIONS AND LIMITATIONS</b>	<b>53</b>
<b>4 PUBLIC PARTICIPATION</b>	<b>55</b>
<b>4.1 GUIDING PRINCIPLES AND OBJECTIVES</b>	<b>55</b>
<b>4.2 PRE-SCOPING CONSULTATION ACTIVITIES</b>	<b>58</b>
4.2.1 COMPETENT AUTHORITY PRE-APPLICATION MEETING	58
4.2.2 IDENTIFICATION OF POTENTIAL I&APS	58
4.2.3 PUBLIC CONSULTATION TIMEFRAME	61
<b>4.3 SCOPING PHASE CONSULTATION ACTIVITIES</b>	<b>62</b>
4.3.1 STAKEHOLDER NOTIFICATION	62
4.3.2 MANDATORY MEDIA ADVERTISEMENTS	65
4.3.3 SITE NOTICES, DRAFT SCOPING REPORT AND NON-TECHNICAL SUMMARY	67
4.3.4 STAKEHOLDER ENGAGEMENT: INTRODUCTORY MEETINGS	73
4.3.5 FOCUS GROUP MEETINGS	76
4.3.6 PUBLIC MEETINGS	79
4.3.7 COMMENT AND RESPONSE REGISTER	84



4.3.8	SUMMARY OF KEY ISSUES	84
4.3.9	TEEPSA COMMUNITY NOTIFICATION	87
<b>4.4</b>	<b>IMPACT ASSESSMENT PHASE CONSULTATION ACTIVITIES</b>	<b>88</b>
4.4.1	UPDATING OF STAKEHOLDER DATABASE	88
4.4.2	NOTIFICATION PROCESS	88
4.4.3	PUBLIC COMMENT PERIOD	91
4.4.4	IN-PERSON AND ONLINE MEETINGS	92
4.4.5	COMMENT AND RESPONSE REGISTER	94
4.4.6	FINAL REPORT SUBMISSION	95
<b>4.5</b>	<b>NOTIFICATION OF COMPETENT AUTHORITY DECISION</b>	<b>95</b>
<b>5</b>	<b>PROJECT NEED AND DESIRABILITY</b>	<b>96</b>
<b>5.1</b>	<b>CONSISTENCY WITH NEMA PRINCIPLES</b>	<b>96</b>
5.1.1	TIME AND PLACE	97
5.1.2	NATURE, SCALE AND LOCATION	97
<b>5.2</b>	<b>POLICY, PLANS AND GUIDELINES</b>	<b>98</b>
5.2.1	NATIONAL DEVELOPMENT PLAN 2030, 2012	98
5.2.2	SOUTH AFRICA INTEGRATED RESOURCE PLAN (IRP) 2019	99
5.2.3	OPERATION PHAKISA (SOUTH AFRICA'S OCEAN ECONOMY), 2014	99
5.2.4	GAS MASTERPLAN BASE CASE REPORT (2021)	99
5.2.5	INTEGRATED ENERGY PLAN, 2016	100
5.2.6	SOUTH AFRICA INTEGRATED RESOURCE PLAN (IRP) 2019	101
5.2.7	SOUTH AFRICAN ECONOMIC RECONSTRUCTION AND RECOVERY PLAN (2020)	101
5.2.8	WESTERN CAPE PROVINCIAL STRATEGIC PLAN (2019-2024)	101
5.2.9	NET ZERO BY 2050: A ROADMAP FOR THE GLOBAL ENERGY SECTOR, 2021	102
5.2.10	FIRST NATIONALLY DETERMINED CONTRIBUTION (2021)	102
5.2.11	WESTERN CAPE CLIMATE CHANGE RESPONSE STRATEGY (2021)	103
<b>5.3</b>	<b>POWER GENERATION</b>	<b>104</b>
5.3.1	FUTURE ENERGY MIX DEMAND AND SUPPLY	105
<b>5.4</b>	<b>PROJECT RISKS AND OPPORTUNITIES</b>	<b>110</b>



5.4.1	ENVIRONMENTAL RISKS AND OPPORTUNITIES	110
5.4.2	SOCIO-ECONOMIC RISKS AND OPPORTUNITIES	112
5.4.3	SPILL AND PIPELINE LEAK	113

## **6 PROJECT DESCRIPTION** **115**

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<b>6.1</b>	<b>BLOCK 11B/12B PRODUCTION RIGHT APPLICATION DETAILS</b>	<b>115</b>
<b>6.2</b>	<b>PREVIOUS EXPLORATION ACTIVITIES IN BLOCK 11B/12B</b>	<b>116</b>
<b>6.3</b>	<b>PROPOSED PROJECT OVERVIEW</b>	<b>116</b>
<b>6.4</b>	<b>RESOURCE ESTIMATES AND PRODUCTION TIMEFRAME</b>	<b>119</b>
<b>6.5</b>	<b>PROJECT COMPONENTS AND ACTIVITIES</b>	<b>119</b>
6.5.1	EXPLORATION AND APPRAISAL WELL DRILLING COMPONENTS AND ACTIVITIES	120
6.5.2	SURVEY AND DATA COLLECTION ACTIVITIES	128
6.5.3	PRODUCTION COMPONENTS AND ACTIVITIES	131
6.5.4	SUPPORT ACTIVITIES AND COMPONENTS	139
<b>6.6</b>	<b>PROJECT TIMEFRAMES</b>	<b>140</b>
<b>6.7</b>	<b>PERSONNEL REQUIREMENTS</b>	<b>141</b>
<b>6.8</b>	<b>RESOURCE REQUIREMENTS</b>	<b>142</b>
6.8.1	WELL DRILLING	142
6.8.2	CONSTRUCTION	143
6.8.3	PRODUCTION	143
6.8.4	DECOMMISSIONING	143
<b>6.9</b>	<b>CHEMICALS AND HAZARDOUS MATERIALS</b>	<b>143</b>
6.9.1	WELL DRILLING	143
6.9.2	CONSTRUCTION	144
6.9.3	PRODUCTION	144
6.9.4	DECOMMISSIONING	144
<b>6.10</b>	<b>AIR EMISSIONS</b>	<b>144</b>
6.10.1	GREENHOUSE GASES	146
6.10.2	OTHER POLLUTANTS	148
<b>6.11</b>	<b>EFFLUENT DISCHARGES</b>	<b>150</b>
6.11.1	WELL DRILLING	150

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6.11.2	CONSTRUCTION	155
6.11.3	PRODUCTION	156
6.11.4	DECOMMISSIONING	156
<b>6.12</b>	<b>SOLID WASTE</b>	<b>157</b>
6.12.1	WELL DRILLING	157
6.12.2	CONSTRUCTION	158
6.12.3	OPERATION	158
6.12.4	DECOMMISSIONING	158
<b>6.13</b>	<b>LIGHT AND NOISE EMISSIONS</b>	<b>158</b>
6.13.1	AIRBORNE SOUND	158
6.13.2	UNDERWATER SOUND	159
6.13.3	LIGHT EMISSIONS	160
<b>6.14</b>	<b>SAFETY ZONES AND NAVIGATION</b>	<b>160</b>
<b>6.15</b>	<b>EMERGENCY RESPONSE</b>	<b>161</b>
<b>6.16</b>	<b>FINANCIAL PROVISION AND TEEPSA INSURANCES</b>	<b>162</b>
<b>6.17</b>	<b>PROJECT ALTERNATIVES</b>	<b>163</b>
<b>7</b>	<b>RECEIVING ENVIRONMENT</b>	<b>167</b>
<hr/>		
<b>7.1</b>	<b>INTRODUCTION</b>	<b>167</b>
<b>7.2</b>	<b>AREA OF INFLUENCE</b>	<b>167</b>
7.2.1	DIRECT AREA OF INFLUENCE	167
7.2.2	INDIRECT AREA OF INFLUENCE	168
<b>7.3</b>	<b>PHYSICAL ENVIRONMENT</b>	<b>168</b>
7.3.1	METOCEAN DATA	168
7.3.2	CLIMATE	171
7.3.3	BATHYMETRY	171
7.3.4	NOISE	172
7.3.5	AIR QUALITY	172
<b>7.4</b>	<b>ECOLOGY AND BIODIVERSITY</b>	<b>177</b>
7.4.1	OCEANOGRAPHY	177
7.4.2	BIOGEOGRAPHY	180





7.4.3	BENTHIC HABITATS	180
7.4.4	BENTHIC INVERTEBRATE COMMUNITIES	185
7.4.5	PLANKTON	189
7.4.6	FISH AND SQUID	189
7.4.7	SEA TURTLES	196
7.4.8	BIRDS	196
7.4.9	MARINE MAMMALS	198
7.4.10	NEAR ENVIRONMENT	205
7.4.11	RED LIST SPECIES	208
7.4.12	MARINE PROTECTED AREAS AND OTHER VULNERABLE AREAS	209
<b>7.5</b>	<b>SOCIAL CONDITIONS</b>	<b>214</b>
7.5.1	DELINEATION OF THE STUDY AREA	214
7.5.2	DESCRIPTION OF THE SOCIO-ECONOMIC BASELINE	216
7.5.3	VULNERABLE GROUPS	228
7.5.4	HUMAN RIGHTS	231
7.5.5	SOCIAL SUSTAINABLE DEVELOPMENT GOALS	232
<b>7.6</b>	<b>ECONOMIC CONDITIONS</b>	<b>234</b>
7.6.1	AREA OF INFLUENCE	234
7.6.2	ECONOMICS	234
7.6.3	ECONOMIC INDUSTRIES AND ACTIVITIES RELEVANT TO THE PROJECT	240
<b>7.7</b>	<b>FISHERIES</b>	<b>243</b>
7.7.1	DEMERSAL HAKE TRAWL	243
7.7.2	DEMERSAL HAKE LONGLINE	246
7.7.3	MID-WATER TRAWL	247
7.7.4	LARGE PELAGIC LONGLINE	247
7.7.5	TRADITIONAL/COMMERCIAL LINE FISHERY	248
7.7.6	SMALL PELAGIC PURSE-SEINE	250
7.7.7	SOUTH COAST ROCK LOBSTER	251
7.7.8	CHOKKA SQUID JIG	252
7.7.9	SMALL SCALE AND RECREATIONAL FISHERIES	254
7.7.10	MARICULTURE	257



<b>7.8 COASTAL TOURISM AND RECREATIONAL ACTIVITES</b>	<b>258</b>
7.8.1 CRUISE VESSEL TOURISM	259
<b>7.9 OFFSHORE MARINE AND COASTAL INFRASTRUCTURE AND ACTIVITIES</b>	<b>259</b>
7.9.1 PETROLEUM EXPLORATION AND PRODUCTION	259
7.9.2 PROSPECTING AND MINING OF OTHER MINERALS	260
7.9.3 SUBMARINE CABLES	262
7.9.4 PORT INFRASTRUCTURE	262
<b>7.10 INTANGIBLE CULTURAL HERITAGE</b>	<b>263</b>
<b>7.11 PALAEONTOLOGY</b>	<b>264</b>
<b>7.12 MARITIME ARCHAEOLOGICAL HERITAGE SITES</b>	<b>267</b>
7.12.1 MARITIME HERITAGE OF BLOCK 11B/12B	267
7.12.2 ARCHAEOLOGICAL RESOURCES	268
<b>8 ENVIRONMENTAL AND SOCIAL SCREENING OF POTENTIAL IMPACTS</b>	<b>271</b>
<b>8.1 ENVIRONMENTAL AND SOCIAL INTERACTION MATRIX</b>	<b>272</b>
<b>8.2 ASPECTS AND IMPACTS REGISTERS</b>	<b>279</b>
<b>8.3 SCREENING OUT OF INSIGNIFICANT IMPACTS</b>	<b>283</b>
<b>9 IMPACT ASSESSMENT – NORMAL OPERATIONS</b>	<b>285</b>
<b>9.1 EXPLORATION</b>	<b>285</b>
9.1.1 AIR EMISSIONS	285
9.1.2 UNDERWATER NOISE	289
9.1.3 AMBIENT AIR NOISE LEVELS	293
9.1.4 LIGHT EMISSIONS	297
9.1.5 PRODUCED WATER DISCHARGE	300
9.1.6 DISCHARGE OF DRILLING FLUID AND CUTTINGS	302
9.1.7 PHYSICAL DISTURBANCE OF SEAFLOOR SEDIMENTS	333
9.1.8 MARITIME SAFETY ZONES	335
9.1.9 SPENDING ON LOCAL GOODS, SERVICES AND LABOUR	337
<b>9.2 OFFSHORE SURVEYS</b>	<b>343</b>
9.2.1 PHYSICAL DISTURBANCE OF SEAFLOOR SEDIMENT	343



9.2.2	UNDERWATER NOISE	344
9.2.3	MARITIME SAFETY ZONES	345
<b>9.3</b>	<b>CONSTRUCTION</b>	<b>346</b>
9.3.1	AIR EMISSIONS	346
9.3.2	UNDERWATER NOISE	348
9.3.3	AMBIENT AIR NOISE LEVELS	354
9.3.4	LIGHT EMISSIONS	359
9.3.5	PRODUCED WATER DISCHARGE	360
9.3.6	DISCHARGE OF DRILLING FLUIDS AND CUTTINGS	360
9.3.7	PHYSICAL DISTURBANCE OF SEAFLOOR SEDIMENTS	364
9.3.8	MARITIME SAFETY ZONES	368
9.3.9	SPENDING ON LOCAL GOODS, SERVICES AND LABOUR	370
<b>9.4</b>	<b>PRODUCTION OPERATIONS</b>	<b>376</b>
9.4.1	AIR EMISSIONS	376
9.4.2	PRESENCE OF SEA FLOOR INFRASTRUCTURE	378
9.4.3	MARITIME SAFETY ZONES	380
9.4.4	SPENDING ON LOCAL GOODS, SERVICES AND LABOUR	381
<b>9.5</b>	<b>DECOMMISSIONING AND CLOSURE</b>	<b>388</b>
9.5.1	AIR EMISSIONS	388
9.5.2	UNDERWATER NOISE	390
9.5.3	AMBIENT AIR NOISE LEVELS	390
9.5.4	LIGHT EMISSIONS	390
9.5.5	MARITIME SAFETY ZONES	391
9.5.6	SPENDING ON LOCAL GOODS, SERVICES AND LABOUR	392
<b>9.6</b>	<b>ALL PHASES</b>	<b>396</b>
9.6.1	ROUTINE DISCHARGES TO SEA	396
9.6.2	DISCHARGE OF BALLAST WATER	398
9.6.3	PRESENCE OF ABOVE WATER INFRASTRUCTURE	400
9.6.4	IMPACT ON INTANGIBLE CULTURAL HERITAGE	401
9.6.5	IMPACT ON COMMUNITY HEALTH, SAFETY AND SECURITY	403
9.6.6	IMPACT ON HOUSEHOLD LIVELIHOOD	405



9.6.7	IMPACT ON LIVELIHOOD OF FISHERS	407
<b>9.7</b>	<b>IMPACT ASSESSMENT SUMMARY</b>	<b>411</b>
<b>9.8</b>	<b>IMPLICATIONS OF THE NO-GO ALTERNATIVE</b>	<b>430</b>
<b>10</b>	<b>IMPACT ASSESSMENT – UNPLANNED EVENTS</b>	<b>431</b>
<hr/>		
<b>10.1</b>	<b>INTRODUCTION</b>	<b>431</b>
<b>10.2</b>	<b>IMPACT ASSESSMENT</b>	<b>432</b>
10.2.1	WELL BLOWOUT AND PRODUCTION PIPELINE RUPTURE	432
10.2.2	ACCIDENTAL HYDROCARBON SPILLS DURING REFUELLING OR DUE TO VESSEL COLLISIONS	507
10.2.3	ACCIDENTAL VESSEL COLLISION OR SUBSEA PRODUCTION SYSTEM AND TRAWLING GEAR ACCIDENT	509
10.2.4	FAUNAL STRIKES	510
10.2.5	LOSS OF EQUIPMENT AT SEA	512
<b>10.3</b>	<b>IMPACT ASSESSMENT SUMMARY</b>	<b>514</b>
<b>11</b>	<b>CUMULATIVE IMPACT ASSESSMENT</b>	<b>519</b>
<hr/>		
<b>11.1</b>	<b>HISTORIC OIL AND GAS ACTIVITIES</b>	<b>519</b>
<b>11.2</b>	<b>EXISTING AND APPROVED INFRASTRUCTURE</b>	<b>520</b>
<b>11.3</b>	<b>PROPOSED PROJECTS</b>	<b>522</b>
<b>11.4</b>	<b>CUMULATIVE IMPACT ASSESSMENT</b>	<b>525</b>
<b>12</b>	<b>ENVIRONMENTAL MANAGEMENT PROGRAMME</b>	<b>527</b>
<hr/>		
<b>12.1</b>	<b>INTRODUCTION</b>	<b>527</b>
12.1.1	OBJECTIVES	527
12.1.2	ENVIRONMENTAL MANAGEMENT PROGRAMME STRUCTURE	527
<b>12.2</b>	<b>SUMMARY OF KEY ENVIRONMENTAL AND SOCIAL SENSITIVITIES</b>	<b>528</b>
<b>12.3</b>	<b>SUPPORTING DOCUMENTATION</b>	<b>531</b>
<b>12.4</b>	<b>ROLES AND RESPONSIBILITIES</b>	<b>535</b>
12.4.1	MANAGEMENT STRUCTURE	535
12.4.2	COMPETENT AUTHORITY – PETROLEUM AGENCY OF SOUTH AFRICA	535



12.4.3	COMPETENT AUTHORITY – DEPARTMENT OF MINERAL RESOURCES AND ENERGY	535
12.4.4	COMPETENT AUTHORITY – SOUTH AFRICAN MARITIME AUTHORITY	537
12.4.5	COMPETENT AUTHORITY – GARDEN ROUTE DISTRICT MUNICIPALITY	537
12.4.6	COMPETENT AUTHORITY – SOUTH AFRICAN HERITAGE RESOURCES AGENCY	537
12.4.7	APPLICANT – TEEPSA	537
12.4.8	F-A PLATFORM AND BLOCK 11B/12B WELL FIELD OPERATOR – PETROSA	538
12.4.9	GAS OFFTAKER	538
12.4.10	SITE LIAISON OFFICER – TEEPSA	538
12.4.11	CONTRACTORS	538
12.4.12	ENVIRONMENTAL CONTROL OFFICER	538
12.4.13	MARINE MAMMAL OBSERVER	538
12.4.14	PAM OPERATOR	539
12.4.15	FISHING LIAISON OFFICER	539
<b>12.5</b>	<b>TRAINING, AWARENESS AND COMPETENCY</b>	<b>539</b>
<b>12.6</b>	<b>COMPLIANCE VERIFICATION AND CORRECTIVE ACTIONS</b>	<b>540</b>
12.6.1	MONITORING PROCEDURES	540
12.6.2	AUDITING PROCEDURES	542
<b>12.7</b>	<b>MANAGEMENT OF CHANGE</b>	<b>542</b>
<b>12.8</b>	<b>COMMUNICATION</b>	<b>542</b>
<b>12.9</b>	<b>DOCUMENT CONTROL AND REPORTING</b>	<b>542</b>
<b>12.10</b>	<b>ENVIRONMENTAL AND SOCIAL MITIGATION MANAGEMENT COMMITMENT REGISTER</b>	<b>543</b>
<b>13</b>	<b>CONCLUSIONS AND RECOMMENDATIONS</b>	<b>570</b>
<b>13.1</b>	<b>IMPACT ASSESSMENT</b>	<b>570</b>
13.1.1	NORMAL OPERATIONS	570
13.1.2	UNPLANNED EVENTS	575
<b>13.2</b>	<b>CUMULATIVE IMPACT ASSESSMENT</b>	<b>578</b>
<b>13.3</b>	<b>COMPARATIVE ASSESSMENT OF PROJECT ALTERNATIVES</b>	<b>578</b>



13.3.1 PRODUCTION PIPELINE CORRIDOR	578
<b>13.4 ENVIRONMENTAL IMPACT STATEMENT</b>	<b>579</b>
<b>14 REFERENCES</b>	<b>581</b>

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## **TABLES**

Table 1-1 – Block 11B/12B Application Area Co-ordinates	5
Table 1-2 – Project Development Area Co-ordinates	5
Table 1-3 – Co-ordinates for Exploratory Priority Area	5
Table 1-4 – Locations of placements of printed copies of ESIA report, NTS and Comment Forms	7
Table 1-5 – ESIA Report Structure	8
Table 2-1 - Listing activities Applicable to the proposed Project	15
Table 2-2 - NEM: ICMA Requirements	22
Table 2-3 – Other South African Laws, Policies, Plans and Frameworks applicable to the Project	25
Table 2-4 – International Regulations, Conventions and Best Practice Guideline applicable to the Proposed Project	36
Table 3-1 - Details of the EAP	50
Table 4-1 – Public Participation Guiding Principles and Objectives	55
Table 4-2. List of Key Challenges	60
Table 4-3 - Commenting Authorities	64
Table 4-4 – Project and ESIA Process Newspaper Advertisement (December 2022)	65
Table 4-5 – Project and ESIA Process Radio Announcements (December 2022)	66
Table 4-6 - Newspaper Advertisements of Public Meetings (January 2023)	67
Table 4-7 - Radio Announcements of Public Meetings (January 2023)	67
Table 4-8 - Local Authorities Contacted for Consultation Meetings	73
Table 4-9. Introductory Meetings with Local Authorities	74
Table 4-10 - Online focus Group Meetings (Scoping Phase)	76
Table 4-11 - Scoping Phase Public Meetings	80
Table 4-12 - In-person Scoping Phase Public Meetings - Photographs	82

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Table 4-13 - Summary of Key Issues	85
Table 4-14 – Media Advertisements – IA Phase	89
Table 4-15 - Radio Stations – IA Phase	90
Table 4-16 – Public Places – IA Phase	91
Table 4-17 – Public and Focus Group Meeting Itinerary	92
Table 5-1 – Offshore Oil & Gas Development Milestones	107
Table 6-1 –PR Application Information	115
Table 6-2 – Structure of Licence Holding and Shareholding of Block 11B/12B	116
Table 6-3 –Previous Exploration Right Information	116
Table 6-4 –Details of Proposed Project Activities	117
Table 6-5 – Preliminary Well Design	122
Table 6-6 - Typical Cement Plug Formation	126
Table 6-7 – Summary of Sonar Surveys	128
Table 6-8 – Seafloor Sampling Activities	129
Table 6-9 – Preliminary production well design	133
Table 6-10 – Co-ordinates for Production Pipeline	136
Table 6-11 – Closure Components and Actions	139
Table 6-12 - Summary of Support Vessel Requirements	140
Table 6-13 – Project activities timeframes	141
Table 6-14 - Marine fuel and kerosene consumption	146
Table 6-15 – Block 11B/12B and associated facility GHG emissions sources	147
Table 6-16 - Offshore Emissions over Life of Project (Scope 1 emissions)	147
Table 6-17 - Offshore Emissions over Life of Project (Scope 3 emissions)	148
Table 6-18 - Emission rates for offshore operations	148
Table 6-19 – Emission rates for port operations	150
Table 6-20 – Notional well design and estimated drilling discharges: Exploration	152
Table 6-21 – Notional well design and estimated drilling discharges: Production Wells	153
Table 6-22 – Typical waste types	157
Table 6-23 – Summary of Project alternatives	163
Table 7-1 - Minimum and maximum sea temperatures within Block 11B/12B	171



Table 7-2 - Important demersal and pelagic linefish species landed by commercial and recreational boat fishers and shore anglers along the South Coast [(CCA &CMS 2001, Pisces 2018 and DFFE unpublished data) in (Anchor Environmental, 2023)]	193
Table 7-3 - Important large migratory pelagic fish likely to occur in the offshore regions of the South Coast [(IUCN 2023, adapted from Pisces, 2018, 2019) in (Anchor Environmental, 2023)]	194
Table 7-4 – Breeding resident seabirds present along the South Coast and their Conservation Status	197
Table 7-5 - Cetacean occurrence off the South Coast of South Africa, their distribution, seasonality, hearing frequency, and IUCN Red List conservation status [(Southall et al. 2019), (IUCN 2023), (*Penry et al. 2016), (**Barendse & Carvalho 2016) in (Anchor Environmental, 2023)]	199
Table 7-6 – Total GVA and GVA per capita in the area of influence	234
Table 7-7 – Sectoral GVA contribution, 2021 (Urban-Econ, 2023)	236
Table 7-8 – Sectoral employment composition, 2021 (Urban-Econ, 2023)	238
Table 7-9 – Employment growth per skill level, 2017 – 2021 (Urban-Econ, 2023)	239
Table 8-1-- Environmental and Social Impact Matrix	272
Table 8-2 – Aspect and Impact Register: Normal Operations	279
Table 8-3 – Aspect and Impact Register: Unplanned Events	282
Table 8-4 – Screening out of insignificant impacts	283
Table 9-1-- Modelled drilling discharge environmental scenarios for the western Project Development Area	305
Table 9-2-- Modelled drilling discharge environmental scenarios for the eastern Exploratory Priority Area	306
Table 9-3-- Summary of upper and lower water column EIF results for Discharge Points 4 and 5.	313
Table 9-4-- Upper and lower water column maximum cumulative extent of impact and overlap with the Southwest Indian Seamounts MPA for Discharge Points 4 and 5 across all seasons	315
Table 9-5 - Summary of sediment EIF results for Discharge Points 4 and 5 across the four modelled seasons	318
Table 9-6-- Summary of water column EIF results for Discharge Points 1 and 2	320
Table 9-7-- Summary of sediment EIF results for Discharge Points 1 and 2 across the five modelled scenarios	326
Table 9-8 – Exploration period impact on production and GDP	338





Table 9-9 – Exploration period impact on employment	340
Table 9-10 – Exploration period impact on household income	341
Table 9-11 – Construction period impact on economic output and GDP	370
Table 9-12 – Construction period impact on production and GDP distribution	371
Table 9-13 – Construction period impact on employment	373
Table 9-14 – Construction period impact on income	375
Table 9-15 – Operational period impact on production and GDP (per annum)	382
Table 9-16 – Operation period impact on employment	385
Table 9-17 – Operational period impact on income	386
Table 9-18 – Decommissioning period impact on economic output and GDP	392
Table 9-19 – Decommissioning period impact on employment	394
Table 9-20 – Decommissioning period impact on income	395
Table 9-21 – Impact Summary Table: Normal operations	411
Table 10-1 - General characteristics of modelled spill scenarios for the western Project Development Area wells	434
Table 10-2 - General characteristics of modelled spill scenarios for the eastern Priority Exploratory Area wells	436
Table 10-3 - Thresholds applied to results of the modelled spill scenarios	436
Table 10-4 – Scenario 1: Well blowout model (Discharge Point 5) results summary across all seasons. RP = Release Point	441
Table 10-5 – Scenario 2: Pipeline rupture model results summary across all seasons. RP = Release Point	446
Table 10-6 – Discharge Point 1 blowout model results summary across all seasons. RP = Release Point	448
Table 10-7 – Discharge Point 2 blowout model results summary across all seasons. RP = Release Point	454
Table 10-8 – Area* of overlap between the fishing grounds of relevant South African commercial fisheries, recreational, and mariculture fisheries and modelled uncontrolled condensate spill results for western Project Development Area	477
Table 10-9 – Area* of overlap between the fishing grounds of relevant South African commercial fisheries (and small-scale and recreational fisheries and mariculture activities) and modelled uncontrolled oil spill results (worst case scenario), for Discharge Point 1 and 2 in the Exploratory Priority Area in the east	487



Table 10-10 - Estimated overlap of modelled well blowout and pipeline rupture oil spill in the western Project Development Area, with commercial industry areas and the economic impact thereof (Urban Econ, 2023)	496
Table 10-11 - Estimated overlap of modelled well blowout oil spill in the eastern Exploratory Priority Area, with commercial industry areas and the economic impact thereof (Urban Econ, 2023)	497
Table 10-12 – Impact Summary Table: Unplanned events	514
Table 11-1 – Existing and Approved Infrastructure Within Reasonable Proximity to the Project	521
Table 11-2 – Proposed Project Within Reasonable Proximity to the Project	523
Table 12-1 – EMPr Structure	527
Table 12-2 – Key environmental and social sensitivities identified within Block 11B/12B	528
Table 12-3 – Monitoring Requirements	541
Table 12-4 – Environmental and Social Mitigation Management Commitment Register – Normal Operations	544
Table 12-5 – Environmental and Social Mitigation Management Commitment Register – Unplanned Events	565

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## **FIGURES**

Figure 1-1 - Localities of Project Development Area, Exploratory Priority Area and Pipeline Corridors	3
Figure 1-2 – Co-ordinate map of the Production Right Application Area, Project Development Area, Exploratory Priority Area and Pipeline Corridors	4
Figure 2-1 - Axes of TotalEnergies CSR strategy	44
Figure 2-2 - TEEPSA HSE policy	47
Figure 3-1 - ESIA Process	51
Figure 4-1 - Western Cape Site Notice Locations	69
Figure 4-2 - Eastern Cape Site Notice Locations	70
Figure 4-3 - Western Cape Locations of Document Deposits	71
Figure 4-4 - Eastern Cape Locations of Document Deposits	72
Figure 4-5 - ESIA Process Schematic Diagram	79
Figure 5-1 – PetroSA F-A Platform and Schematic Diagram of Block 9 Layout	109
Figure 6-1 - Example of semi-submersible drilling unit	120

Figure 6-2 – Schematic of a typical well testing apparatus	124
Figure 6-3 – Sea Emerald burner heads: 99.993% efficiency under a wide range of conditions	125
Figure 6-4 – Schematic of typical VSP arrangement	125
Figure 6-5 - Diagrammatic Example of Typical Well Plug and Abandon Measures (Vralstad, 2019)	127
Figure 6-6 - Example of Over-trawlable Cap to be Installed on Wellhead on Sea Floor (image provided by TEEPSA)	128
Figure 6-7 – Examples of sea floor sediment sampling tools	130
Figure 6-8 – Typical Metocean Buoy System with Weather Station Buoy (Source: Metocean Services, in SLR, 2020)	131
Figure 6-9 - Project Development Area cross-section	132
Figure 6-10 – Vertical well	134
Figure 6-11 – Options for deviated wells	134
Figure 6-12 - Subsea infrastructure typical layout	135
Figure 6-13 – dB Reduction vs. Height (Helicopter Association International; Fly Neighborly Committee, Undated)	159
Figure 6-14 – Relationship Between Sound Level and Weight (Helicopter Association International; Fly Neighborly Committee, Undated) (SEL = sound exposure level)	159
Figure 7-1 - Locations of Discharge Points 4 and 5, and condensate Pipe Leak	169
Figure 7-2 - Average annual current and wind speed roses at Discharge 5 for 2012-2016	170
Figure 7-3 - Existing vessel traffic in 2021 in the vicinity of the project. ( <a href="https://www.marinetraffic.com/">https://www.marinetraffic.com/</a> )	172
Figure 7-4 - Location, bathymetry (500 m countour line) and seabed features of the South Coast	174
Figure 7-5 - Mossel Bay Port location and nearby high sensitive receptors	176
Figure 7-6 - Major current streams around South Africa. The warm Agulhas Current (orange) flows down the east coast, and cold upwelling plumes (light blue) can be observed along the west coast.	178
Figure 7-7 - The major circulatory elements along the South Coast in relation to the Block 11B/12B PR Application Area (blue polygon) [(Lutjeharms 2006 and Pisces 2014a in Anchor Environmental, 2023)].	179
Figure 7-8 - Inshore and offshore Ecoregions in South Africa	181

Figure 7-9 - The ecosystem classification of benthos [(SANBI, 2018) in (Anchor Environmental Consultants, 2023)]. The drop camera sites of the 2022 Bourbon Evolution 807 benthic epifaunal assessment of the Block 11B/12B PR Application Area are indicated as yellow points	182
Figure 7-10 - The substrate type in the vicinity of the PR Application Area [(SANBI, 2018) in (Anchor Environmental Consultants, 2023)].	183
Figure 7-11 - Heat map of the number of taxa, according to phyla, based on preliminary data from the 2022 Bourbon Evolution 807 environmental survey ROV campaign (Anchor Environmental, 2023)	188
Figure 7-12 - Block 11B/12B (blue polygon) in relation to important seamounts, pelagic and demersal fish and squid spawning areas (Anchor Environmental, 2023)	190
Figure 7-13 - The spawning area in the Atlantic Ocean (blue, to the west) is numerically dominated by cool-temperate sardines, and the spawning area in the Indian Ocean (orange, to the east and south) is dominated by warm-temperate sardines. Source: [Teske et al. (2021) in: Anchor Environmental, 2023]	191
Figure 7-14 – South Coast estuaries in proximity to Block 11B/12 (Anchor Environmental, 2023)	207
Figure 7-15-- Designated MPAs, EBSAs and Proposed CBAs in the Project Area	210
Figure 7-16-17 – Ecosystem types categorised as “Critically Endangered” (CE), “Endangered” (E), “Vulnerable” (V), “Near Threatened” (NT) or “Least Concern” (LC) as per the NBA (Sink et al. 2019) within and around Block 11B/12B (Anchor Environmental, 2023)	211
Figure 7-18 – Delineation of the Study Area	215
Figure 7-19 - GVA for the period 2012 to 2021 in the areas of influence	235
Figure 7-20 – Izol employment changes, 2017 – 2021	237
Figure 7-21 – Employment growth across all study areas, 2017 – 2021	237
Figure 7-22 – Formal employment skills profile, 2021	239
Figure 7-23 – Contribution of the Fishing Sector to Agriculture, Forestry and Fishing, 2021 (Urban-Econ, 2023)	240
Figure 7-23 – Fishing Subsector Labour Contribution to Agriculture, Forestry and Fishing, 2021 (Urban-Econ, 2023)	241
Figure 7-24 – Trawl gear typically used by demersal trawlers targeting hake ( <a href="http://www.afma.gov.au/fisheries-management/methods-and-gear">www.afma.gov.au/fisheries-management/methods-and-gear</a> )	244
Figure 7-26 – ‘Footprint’ of the large pelagic longline of South Africa (‘south coast’ selection only). The footprint is scaled (by colour) in terms of frequency of trips being a proxy measure for relative fishing effort. Dark blue areas = most effort [(Sink et al., 2019) in Anchor Environmental, 2023]	249

Figure 7-27--“Footprin” of the Chokka squid fishery of South Africa (‘south coast’ selection only). The footprint is scaled (by colour) in terms of frequency of trips being a proxy measure for relative fishing effort. Dark blue areas = most effort. Figure uses catch and effort data from DFFE for the period 2012-2019	253
Figure 7-27-- Petroleum Exploration and Production Activities in South Africa ( <a href="https://www.petroileumagencysa.com/images/pdfs/Hubmap0523">https://www.petroileumagencysa.com/images/pdfs/Hubmap0523</a> )	261
Figure 7-29-- Geological map for the Palaeo-Agulhas Plain	266
Figure 7-30-- Indication of the number of recorded shipwrecks between Still Bay in the west and Cape Recife in the east (ACO Associates cc, 2023)	270
Figure 9-1-- Sketch of processes in the DREAM model. In the water column the model accounts for attached chemicals which might dissolve into the water column as well as stress from particles during the simulation period. At the end of the simulation period, the sediment module computes processes in the sediment compartment (HES 2021c, d; Sintef, 2023)	303
Figure 9-2-- Locations of the drilling discharges modelling points in Block 11B/12B (Discharges Points 4 and 5 in the western Project Development Area, and Discharge Points 1 and 2 in the eastern Exploratory Priority Area). Pipe leak location was used for oil spill modelling – see Section 10 for details.	307
Figure 9-3-- Primary sediment discharges resulting from deep-water drilling activities. These effects are nearly identical whether a semi-submersible rig (as shown) or a drillship is used for drilling and are similar for both exploratory and production drilling (Cordes et al. 2016)	309
Figure 9-4-- Maximum instantaneous (i.e., time instance snapshot) EIF for the upper water column between 0-100 m for all modelled seasons. The snapshot occurs ~25 days after start, when the discharge is released from the rig. The vertical cross section shows the PEC/PNEC ratio in the water column along the grey arrow (Sintef, 2023)	311
Figure 9-5-- Maximum instantaneous (i.e., time instance snapshot) EIF for the lower water column between 1100-1300 m for Discharge Point 4, and 1750-1850 m for Discharge Point 5 for all modelled seasons (Sintef, 2023)	312
Figure 9-6-- Time series development of the EIF for the upper water column, for Discharge Point 5 season 4 (Spring) (Sintef, 2023)	314
Figure 9-7-- Maximum cumulative risk of drilling operations throughout the water column during winter for Discharge Point 4 and spring for Discharge Point 5 (Sintef, 2023)	317
Figure 9-8-- Maximum cumulative risk of drilling operations throughout the water column at any time for Discharge Point 1 across all modelled scenarios/seasons (HES, 2021c)	322
Figure 9-9-- Maximum cumulative risk of drilling operations throughout the water column at any time for Discharge Point 2 across all modelled scenarios/seasons (HES, 2021d)	323

Figure 9-10-- Maximum cumulative risk of drilling operations throughout the water column at any time for (left) Discharge Point 1 and (right) Discharge Point 2 for Scenario 5 (HES, 2021c, d)	324
Figure 9-11-- Maximum cumulative risk of drilling operations throughout the water column for Discharge Points 1 and 2 in summer, indicating potential overlap with the Southwest Port Elizabeth Corals MPA (dark blue) and the Kingklip Corals EBSA (light blue) (HES, 2021c, d). Red = > 1 PNEC	325
Figure 9-12-- The fate of drill cuttings (adapted from Neff, 2005, in Anchor Environmental, 2023)	330
Figure 9-13-- Noise modelling study predicted zone impact on cetaceans by proposed drilling activities (worst-case, 24-hour exposure)	351
Figure 9-14-- Noise modelling study predicted zone impact of proposed drilling activities on penguins / diving birds	352
Figure 9-15-- Area of potential flight paths (within dashed white lines) from George Airport to the western Project Development Area	356
Figure 9-16-- Social Cost of Carbon	383
Figure 10-1 - Modelling Discharge Point Locations	435
Figure 10-2 - Worst-case, all seasons, Scenario 1 model mass balance (i.e., all the processes that influence the fate of the total oil spilled, and the relative proportion thereof assuming conservation of mass). Note how most of the total oil released (medium blue line) evaporates over time (grey line) (DHI 2023)	437
Figure 10-3 - Surface oil presence probability: Scenario 1 (well blow out) model results statistics for all simulations that start in summer, autumn, winter and spring. Note: these maps are an amalgamation of 400 spill simulations under different metocean conditions, not representative of a single spill event (DHI, 2023)	439
Figure 10-4 - Worst-case coastal surface oil presence probability: Scenario 1 (well blow out) model results statistics for all simulations that start in winter. This map is an amalgamation of 400 spill simulations under different metocean conditions, not representative of a single spill event (DHI, 2023)	440
Figure 10-5 - Surface oil presence probability: Scenario 2 (pipeline rupture) model results statistics for all simulations that start in summer, autumn, winter and spring. Note that these maps are an amalgamation of 400 spill simulations under different metocean conditions, not representative of a single spill event (DHI, 2023)	444
Figure 10-6 - Worst-case coastal surface oil presence probability: Scenario 2 (pipeline rupture) model results statistics for all simulations that start in winter. Note that these maps are an amalgamation of 400 spill simulations under different metocean conditions, not representative of a single spill event (DHI, 2023)	445

Figure 10-7 - Surface oil presence probability: Discharge Point 1 blowout model results statistics for all simulations in summer, autumn, winter and spring. Note: these maps are an amalgamation of 90 spill simulations under different metocean conditions, not representative of a single spill event (HES, 2021a) 450

Figure 10-8 - Worst-case shoreline oiling probability above threshold (>10 g/m<sup>2</sup>): Discharge Point 1 blowout model results statistics for all simulations in summer, autumn, winter and spring. Note: these results do not represent a single spill but the combination of statistical results of the 90 individual trajectories composing the various Stochastic scenarios (seasons) (HES, 2021a) 451

Figure 10-9 - Worst- case surface oil presence probability: Discharge Point 1 blowout model results statistics for all winter, focussing on coastal MPAs. Note: these maps are an amalgamation of 90 spill simulations under different metocean conditions, not representative of a single spill event. Marine Protected Areas are overlaid (HES, 2021a) 452

Figure 10-10 - Surface oil presence probability: Discharge Point 2 blowout model results statistics for all simulations in summer, autumn, winter and spring. Note that these maps are an amalgamation of 90 spill simulations under different metocean conditions, not representative of a single spill event (HES, 2021b) 455

Figure 10-11 - Worst-case shoreline oiling probability above threshold (>10 g/m<sup>2</sup>): Discharge Point 2 blowout model results statistics for all simulations in summer, autumn, winter and spring. Note that these results do not represent a single spill but the combination of statistical results of the 90 individual trajectories composing the various Stochastic scenarios (seasons) (HES, 2021b) 456

Figure 10-12 - Worst- case surface oil presence probability: Discharge Point 2 blowout model results statistics for all winter, focussing on coastal MPAs. Note: these maps are an amalgamation of 90 spill simulations under different metocean conditions, not representative of a single spill event (HES, 2020d). Marine Protected Areas are overlaid 457

Figure 10-13 – Spill contingency planning process overview (source: TEEPSA) 463

Figure 10-14 - (Left) Weathering processes acting on oil at sea. (Right) Relative importance of weathering processes on a crude oil spill with time; the width of each band indicates the importance of each process. Source: ITOPF, from Biccard et al. (2018) 468

Figure 10-15 - Surface condensate presence probability well blow out model results for all simulations across the full simulation period with commercial fishing activity for each affected fishery overlaid (purple gradients). Fisheries shown are inshore hake trawl (top left), offshore demersal trawl (top right), hake longline (bottom left) and linefishing (bottom right) 479

Figure 10-16 - Surface condensate presence probability well blow out model results for all simulations across the full simulation period with commercial fishing activity for each affected fishery overlaid (purple gradients). Fisheries shown are pelagic longline (top left),

midwater trawl (top right), small pelagic purse seine (bottom left) and squid jig (bottom right) 480

Figure 10-17 - Surface condensate presence probability well blow out model results (red gradients) for all simulations across the full simulation period with fishing activity for each affected fishery overlaid (blue gradients). Fisheries shown are south coast rock lobster (left), recreational shore angling (right), and mariculture (bottom) 481

Figure 10-18 - Surface condensate presence probability pipeline rupture model results for all simulations across the full simulation period with fishing activity for each affected fishery overlaid (purple gradients). Fisheries shown are inshore hake trawl (top left), offshore demersal trawl (top right), hake longline (bottom left) and linefishing (bottom right) 482

Figure 10-19 - Surface condensate presence probability pipeline rupture model results (red gradients) for all simulations across the full simulation period with commercial fishing activity for each affected fishery overlaid (purple gradients). Fisheries shown are pelagic longline (top left), midwater trawl (top right), small pelagic purse seine (bottom left) and squid jig (bottom right) 483

Figure 10-20 - Surface condensate presence probability pipeline rupture model results for all simulations across the full simulation period with fishing activity for each affected fishery overlaid (purple gradients). Fisheries shown are south coast rock lobster (left), recreational shore angling (right) and mariculture (bottom) 484

Figure 10-21 - Crude oil surface presence probability model results for worst case scenario (Summer) for Discharge Point 1, with commercial fishing activity for each affected fishery overlaid (purple gradients). Fisheries shown are inshore hake trawl (top left), offshore demersal trawl (top right), hake longline (bottom left) and linefishing (bottom right) 488

Figure 10-22 - Crude oil surface presence probability model results for worst case scenario (Summer) for Discharge Point 1, with commercial fishing activity for each affected fishery overlaid (purple gradients). Fisheries shown are inshore pelagic longline (top left), midwater trawl (top right), small pelagic purse seine (bottom left) and squid jigging (bottom right) 489

Figure 10-23 - Crude oil surface presence probability model results for worst case scenario (Summer) for Discharge Point 1, with commercial fishing activity for each affected fishery overlaid (purple gradients). Fisheries shown are south coast rock lobster (left), recreational fisheries (right) and mariculture (bottom) 490

Figure 10-24 - Crude oil surface presence probability model results for worst case scenario (Summer) for Discharge Point 2, with commercial fishing activity for each affected fishery overlaid (purple gradients). Fisheries shown are inshore hake trawl (top left), offshore trawling (top right), hake longline (bottom left), commercial longline (bottom right) 491

Figure 10-25 - Crude oil surface presence probability model results for worst case scenario (Summer) for Discharge Point 2, with commercial fishing activity for each affected fishery overlaid (purple gradients). Fisheries shown are inshore pelagic longline (top left), midwater trawl (top right), small pelagic purse seine (bottom left) and squid jigging (bottom right) 492





Figure 10-26 - Crude oil surface presence probability model results for worst case scenario (Summer) for Discharge Point 2, with commercial fishing activity for each affected fishery overlaid (purple gradients). Fisheries shown are south coast rock lobster (left), recreational fishing (right) and mariculture (bottom)	493
Figure 11-1 - Location of Exploration, Appraisal and Production Well Activities in South Africa	520
Figure 11-2 - Overlap of the Block 11B/12B and CGG application areas	524
Figure 12-1 - Project Management Structure	536

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## **APPENDICES**

### APPENDIX 1

#### EAP UNDERTAKING

### APPENDIX 2

#### CURRICULA VITAE OF THE PROJECT TEAM

### APPENDIX 3

#### ACCEPTANCE OF FINAL SCOPING REPORT AND CORRESPONDENCE

### APPENDIX 4

#### METHOD FOR ASSESSING IMPACT SIGNIFICANCE

### APPENDIX 5

#### PPP DOCUMENTATION

##### APPENDIX 5.1

#### SCOPING PHASE PPP DOCUMENTATION

##### APPENDIX 5.2

#### I&AP DATABASE

##### APPENDIX 5.3

#### NOTICE TO I&APS

### APPENDIX 6

#### OIL SPILL MODELLING

##### APPENDIX 6A

#### OIL SPILL MODELLING IN THE WESTERN PROJECT DEVELOPMENT AREA, INCLUDING PEER REVIEW

##### APPENDIX 6B

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OIL SPILL MODELLING IN THE EASTERN EXPLORATORY PRIORITY AREA,  
INCLUDING PEER REVIEW

APPENDIX 7

DRILL DISCHARGE MODELLING, INCLUDING PEER REVIEW

APPENDIX 7A

DRILL DISCHARGE MODELLING IN THE WESTERN PROJECT DEVELOPMENT AREA,  
INCLUDING PEER REVIEW

APPENDIX 7B

DRILL DISCHARGE MODELLING IN THE EASTERN EXPLORATORY PRIORITY AREA,  
INCLUDING PEER REVIEW

APPENDIX 8

UNDERWATER NOISE MODELLING

APPENDIX 9

CLIMATE CHANGE IMPACT ASSESSMENT

APPENDIX 10

AIR QUALITY IMPACT ASSESSMENT (AQIA)

APPENDIX 11

MARINE ECOLOGY AND FISHERIES IMPACT ASSESSMENT

APPENDIX 12

CULTURAL HERITAGE IMPACT ASSESSMENT (CHIA)

APPENDIX 13

SOCIAL IMPACT ASSESSMENT (SIA)

APPENDIX 14

MARITIME HERITAGE IMPACT ASSESSMENT

APPENDIX 15

ECONOMIC IMPACT ASSESSMENT

APPENDIX 16

CLOSURE PLAN



# EXECUTIVE SUMMARY

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## INTRODUCTION

This is the Executive Summary of the Draft Environmental and Social Impact Assessment Report (ESIA) prepared as part of the ESIA Process for the Production Right (PR) and Environmental Authorisation (EA) applications for Block 11B/12B offshore of the southern cape coast of South Africa (hereafter referred to as the “Project”). A locality map is provided in Figure E1.

## PROJECT BACKGROUND

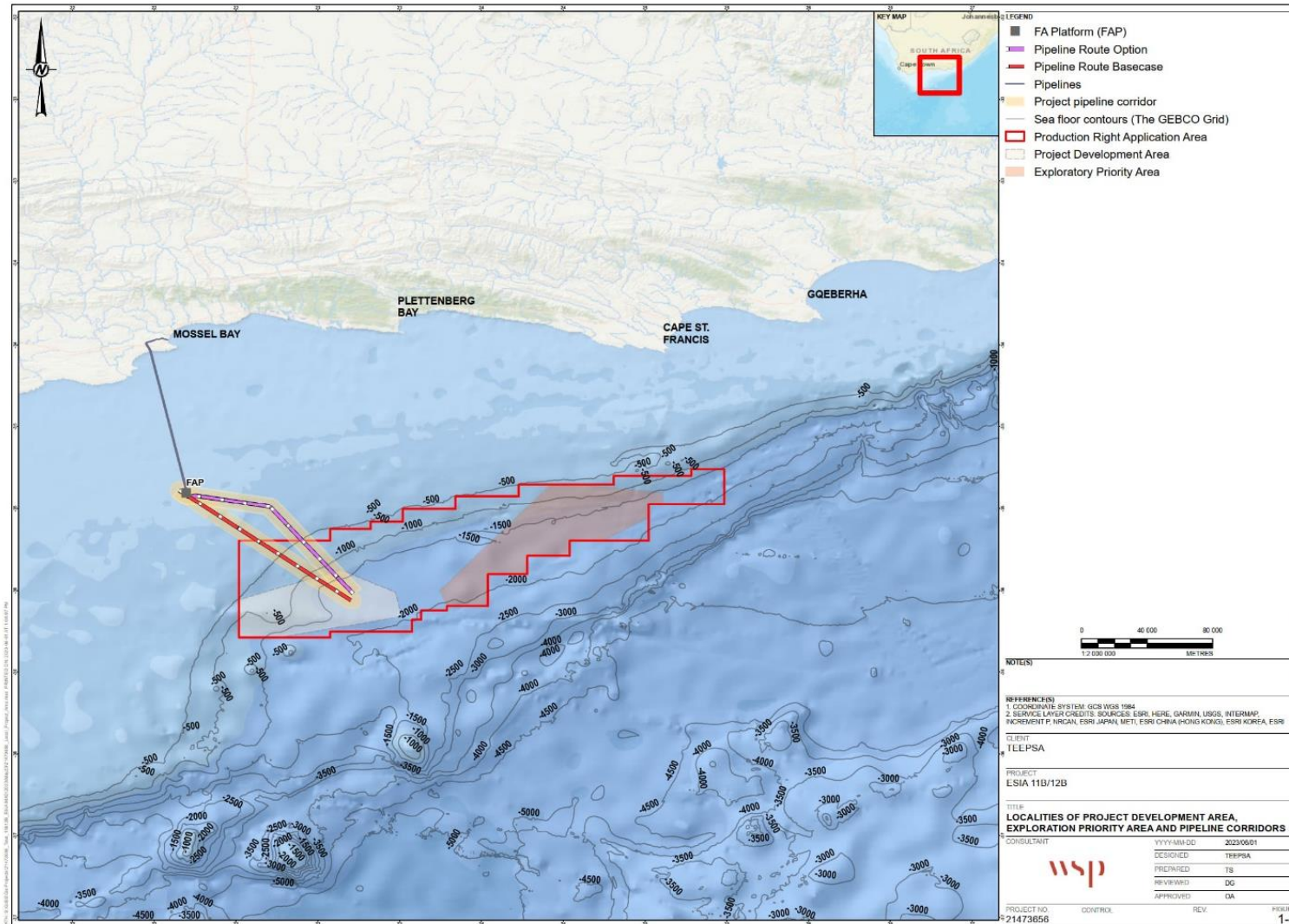
TotalEnergies EP South Africa B.V. (TEEPSA), together with its joint venture partners, QatarEnergy International E&P LLC (previously Qatar Petroleum International Upstream LLC), Canadian Natural Resources International South Africa Limited, and a South African consortium, MainStreet 1549, held an Exploration Right (Exploration Right Ref. No.: 12/3/067) over Block 11B/12B. Exploration activities in Block 11B/12B commenced in 2012 and ended in 2020. The activities entailed drilling of wells in the south-west section of the Block (known as the Project Development Area) in 2019 and 2020, as well as 3D seismic surveys. TEEPSA’s Exploration Right expired on 6 September 2022. The exploration programme led to an important gas discovery, and after further completion of technical and feasibility studies, the viability of the gas and associated condensates resources was confirmed.

## PROJECT OVERVIEW

TEEPSA is now planning to develop Block 11B/12B if a PR is granted and a commercial agreement for the sale of the gas to the domestic market can be achieved. TEEPSA submitted a PR application in terms of Section 83 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA), as amended, to the Department of Mineral Resources and Energy (DMRE), as the Competent Authority (CA). The CA acknowledged receipt of the application on 19 September 2022.

The development of Block 11B/12B will involve the drilling of five production and appraisal wells, with the option of drilling a sixth well, in the Project Development Area, located in the south-western portion of Block 11B/12B. The wells will be connected via subsea infrastructure to a pipeline carrying both gas and associated condensates to the existing F-A Platform, which is located approximately 40 km northwest of Block 11B/12B.

While the primary objective of the Project is gas and condensate production, further exploration and appraisal activity will be conducted in the Exploratory Priority Area in the central and eastern section of Block 11B/12B. The objective of the exploration drilling campaign is to further understand the extent and characteristics of hydrocarbon resources. The Project’s activities also include undertaking surveys in specific areas in Block 11B/12B, to refine the understanding of the physical and biological characteristics of the Block. The Project offshore activities will require onshore support in terms of delivery of plant and equipment, materials and supplies from ports such as Mossel Bay, Gqeberha and/or Cape Town. Helicopters will operate from George Airport to support offshore activities, as required. Logistics, laydown areas and support will be undertaken from Mossel Bay port using existing infrastructure and facilities.



**Figure E1 – Localities of Project Development Area, Exploratory Priority Area and Pipeline Corridors**



## SUMMARY OF AUTHORISATION REQUIREMENTS

In terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (Government Notice Regulation [GNR] 982 of 2014) (EIA Regulations, 2014), as amended, promulgated under the National Environmental Management Act, 1998 (Act 107 of 1998), as amended, (NEMA), the Project requires EA as it triggers the following Listed Activities:

- Activities 17 and 19A included in Listing Notice 1 (GNR 983 of 2014) (LN 1).
- Activities 4, 6, 7, 14 and 20 included in Listing Notice 2 (GNR 984 of 2014) (LN 2).

In accordance with the regulatory requirements, the undertaking of a Scoping and EIA (S&EIA) Process in support of its EA application is required for the Project.

WSP Group Africa (Pty) Ltd (WSP) has been appointed as the Environmental Assessment Practitioner (EAP) to undertake the required S&EIA Process.

In addition, the Project also requires a PR in terms of the MPRDA. The PR application process entails the submission of a PR application to the CA, DMRE. The PR application should be accompanied by a Production Works Programme (PWP), detailing the proposed activities and technical development plan in detail, as well as a Social and Labour Plan (SLP), describing the commitments proposed by TEEPSA to develop human resources, to invest in communities and to further procurement opportunities, among others. The PR application process will only be considered for decision-making once the EA is received.

## PURPOSE OF THE REPORT

This ESIA Report has been compiled in accordance with Appendix 3 of the EIA Regulations, 2014, as amended, and details the outcomes of the EIA, including specialist study findings, as well as the recommended Environmental Management Programme (EMPr). This ESIA Report has been prepared in accordance with the Plan of Study presented in the Final Scoping Report (FSR) accepted by the CA on 18 May 2023.

## OPPORTUNITY FOR COMMENT

This ESIA Report, including the EMPr, will be distributed for a public review and comment period from 22 September to 25 October 2023, in order to provide Interested and Affected Parties (I&APs) with an opportunity to comment on any aspect of the S&EIA process and the Project. Hard copies of the ESIA Report, Non-Technical Summary (NTS) and comment forms will be placed at various public places. The ESIA Report, NTS and comment forms will also be placed on the WSP website at <https://www.wsp.com/en-za/services/public-documents#esia> and the WSP data-free website at <https://wsp-engage.com/Total-11B12B>.

I&APs are also invited to attend information sharing meetings where comments, queries and concerns will also be recorded. Information sharing meetings, in the form of an open house, will be undertaken in various towns between 27 September and 13 October 2023. In addition, online public meetings and focus groups will be undertaken between 16 and 18 October 2023.



Any comments on the Draft ESIA Report and EMPr should be submitted to WSP using any of the following platforms:

- **Email:** teepsaEIA@WSP.com.
- **Post:** PO Box 6001, Halfway House, 1685.
- **Telephone:** +27 11 254 4800.
- **WhatsApp:** +27 76 694 3842.

For comments to be considered during the remainder of the S&EIA process, they should reach WSP **by no later than 25 October 2023.**

## ESIA PROCESS

The S&EIA process is being undertaken in accordance with the EIA Regulations, 2014, as amended, promulgated under NEMA. The S&EIA process consists of two phases, namely the Scoping and EIA phases; the key steps and tasks undertaken are detailed below.

### SCOPING PHASE

The Scoping Phase undertaken for the Project included the following key stages:

- Attendance of a pre-application meeting with the CA, the DMRE.
- Compilation of the National Screening Tool Report using the Department of Forestry, Fisheries and the Environment's (DFFE) National Screening Tool.
- Compilation of a Public Participation Plan (PP Plan) detailing the proposed Public Participation Process (PPP) that will be followed during the Scoping Phase.
- Compilation of the EA application form and submission to the CA, the DMRE. The Screening Tool Report and PP Plan were submitted along with the application form.
- Undertaking a gap analysis of existing information against the project compliance criteria.
- Review of applicable compliance criteria inclusive of South African legal and administrative requirements.
- Carrying out a desktop assessment to review the existing baseline conditions of the environment that could be affected by the Project.
- Inputs to the identification of sea uses and screening of the alternatives from an environmental and socio-economic impact perspective.
- Identification of key impacts and issues and outlining the Plan of Study.
- Compilation of the Draft Scoping Report (DSR) in accordance with Appendix 2 of the EIA Regulations, 2014, as amended.
- Undertaking of a PPP as required in terms of the EIA Regulations, 2014, as amended, including circulation of the DSR to I&APs.
- Updating and finalisation of the DSR, which incorporates the comments received from I&AP's during the PPP.
- Submission of the FSR to the CA, the DMRE, for consideration in terms of Section 22 of the EIA Regulations, 2014, as amended.

### ENVIRONMENTAL IMPACT ASSESSMENT PHASE

The EIA Phase activities undertaken for the Project to date include:

- Conducting Specialist Assessments in accordance with Appendix 4 of the EIA Regulations, 2014, as amended, including:
  - Oil Spill Modelling, including Peer Review.



- Drill Discharge Modelling, including Peer Review.
- Underwater Noise Modelling.
- Climate Change Impact Assessment.
- Air Quality Impact Assessment (AQIA).
- Marine Ecology and Fisheries Impact Assessment.
- Cultural Heritage Impact Assessment.
- Social Impact Assessment (SIA).
- Maritime, Archaeological and Palaeontological Heritage Impact Assessment.
- Economic Impact Assessment.
- Preparation of a Closure Plan in accordance with Appendix 5 of the EIA Regulations 2014, as amended.
- Preparation of the Draft ESIA Report, including the EMPr, in accordance with Appendix 3 and Appendix 4 of the EIA Regulations, 2014 as amended, respectively.
- Conducting the assessment of impacts of the proposed activities as required by the EIA Regulations 2014, as amended.
- Circulation of the Draft ESIA Report into the public domain for review and comment.

The remainder of the EIA phase for the Project will include the following key stages:

- Developing a Comments and Responses Report (CRR) that will incorporate all issues and comments from the PPP. Responses to the issues and comments will form part of the Final version of this Report.
- Updating the Draft ESIA Report and EMPr, taking comments received during the PPP into consideration.
- Submission of the Final ESIA Report and EMPr to the CA, for a decision on whether the project may proceed, and if so, under what conditions.
- Notification of all I&APs of the decision by the CA, and how and by when the decision may be appealed.

## PROJECT NEED AND DESIRABILITY

The need and desirability of the Project is discussed in terms of the location of Block 11B/12B an area where historic oil and gas exploration activity has occurred; together with oil and gas production clustered around the F-A Platform to provide feedstock to the facility over the last three decades.

The 2016 Integrated Energy Plan (IEP) acknowledges the importance of renewable energy resources to reduce greenhouse emissions. The diversification of energy mix is considered necessary to improve the security of energy supply in the country. Natural gas has been identified in the IEP as having the most significant potential in the energy mix in South Africa, due to the use of natural gas in combined cycle gas turbines in the electricity sector, gas to liquid plants in the liquid fuel sector, as well as for direct thermal application in the industrial and residential sectors.

The Gas Master Plan: Base Case Report (2016) reported that South Africa currently consumes approximately 0.15 tcf natural gas per annum. This is approximately three percent of the country's primary energy demand and most demand is met through imports from Mozambique. The exploration of local coastal gas is encouraged, in line with required legislation and regulations. Saldanha Bay is promoted in Operation Phakisa as a dedicated oil and gas servicing hub and this facility will support the Block 11B/12B Project, specifically in the location in Saldanha Bay of the



capping stack that will be used in responding to an unplanned event. The 2019 Integrated Resource Plan (First Nationally Determined Contribution Under the Paris Agreement, 2021) updated emission targets identify annual GHG emissions in a range from 398-510 Mt CO<sub>2</sub>-eq by 2025 and annual GHG emissions in a range from 350-420 Mt CO<sub>2</sub>-eq by 2030. The Project average annual greenhouse gas emissions are forecast to increase the national greenhouse gas inventory by 0.016%.

Given that, at the time of writing, no off-take agreement has been reached between TEEPSA and potential purchasers of the Block 11B/12B gas and condensate, the need and desirability of the Project is based on possible end-user scenarios, namely:

- Scenario 1 - Gas is sent to either the Eskom Gourikwa Power Plant, which could be transformed into a combined cycle power plant, or to a new combined cycle power plant that could be built.
- Scenario 2 - Gas and condensates are sent to the existing PetroSA GTL plant for further processing into synthetic fuels and industrial products.

The options are not necessarily mutually exclusive. PetroSA may take the condensate but not gas in an off-take agreement; discussion are ongoing.

The key environmental, social and economic risks and opportunities have been identified and assessed in several technical reports and findings are summarised in the sections below. Of these, the following are highlighted as key issues:

- Conflict with marine planning and protected areas.
- Overlap with commercial and small-scale fishing grounds and temporary and permanent restrictions on access due to safety zones.
- The emission of greenhouse gas.
- Opportunities for safeguarding employment and skills.
- The Project local and regional economic contribution.
- Disruption to marine tourism.
- Impacts on intangible cultural heritage.





## PROJECT DESCRIPTION

### PROJECT APPLICATION DETAILS AND LOCATION

Details of the Project application and area are provided in Table E1.

**Table E1 – Project Application Details**

Aspect	Description
Licence Block No.	11B/12B
Licence Holding and Shareholding of Licence Block	<ul style="list-style-type: none"> <li>▪ TEEPSA – 45%</li> <li>▪ Canadian Natural Resources International (South Africa) Limited – 20%</li> <li>▪ QatarEnergy International E&amp;P LLC (previously Qatar Petroleum International Upstream LLC), – 25%</li> <li>▪ Main Street 1549 – 10%</li> </ul>
PR Application No.	Ref. No. 12/4/13 PR
Size of Area of Interest/Application Area	12 000 km <sup>2</sup>
Water Depth Range	Water depth range of area of interest: 500 to 2 300 m
Distance Offshore	75 km to 120 km
Closest Towns	<ul style="list-style-type: none"> <li>▪ The north-east corner of Block 11B/12B is approximately 75 km offshore from Cape St. Francis</li> <li>▪ The north-west corner is approximately 120 km offshore from Mossel Bay</li> </ul>

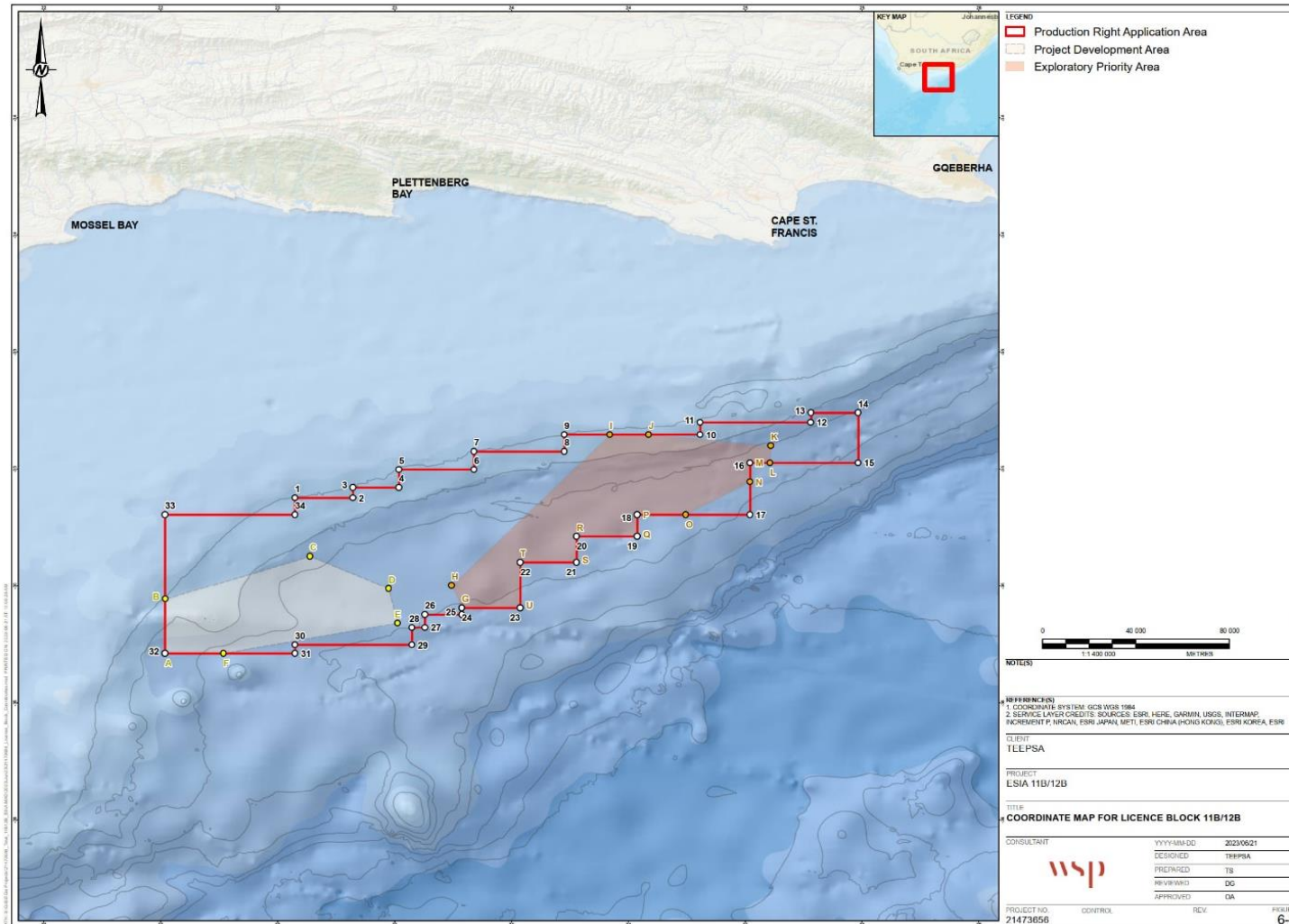
A co-ordinate map is provided in Figure E2, with the co-ordinates of Block 11B/12B included in Table E2.

**Table E2 – Block 11B/12B Co-Ordinates**

No.	Longitude (°) (E)	Latitude (°) (S)	No.	Longitude (°) (E)	Latitude (°) (S)
1	22° 59' 58.345" E	35° 11' 7.153" S	18	24° 18' 58.377" E	35° 15' 0.234" S
2	23° 13' 19.258" E	35° 11' 7.153" S	19	24° 18' 58.366" E	35° 20' 0.231" S
3	23° 13' 19.258" E	35° 8' 43.165" S	20	24° 4' 58.308" E	35° 20' 0.261" S
4	23° 23' 56.914" E	35° 8' 43.165" S	21	24° 4' 58.300" E	35° 26' 0.227" S
5	23° 23' 56.914" E	35° 4' 35.136" S	22	23° 51' 58.246" E	35° 26' 0.211" S
6	23° 41' 18.761" E	35° 4' 35.136" S	23	23° 51' 58.270" E	35° 36' 30.158" S
7	23° 41' 18.761" E	35° 0' 23.268" S	24	23° 38' 28.284" E	35° 36' 30.139" S
8	24° 2' 7.072" E	35° 0' 23.268" S	25	23° 38' 28.292" E	35° 38' 0.136" S
9	24° 2' 7.072" E	34° 56' 30.663" S	26	23° 29' 58.307" E	35° 38' 0.143" S
10	24° 33' 29.791" E	34° 56' 30.663" S	27	23° 29' 58.314" E	35° 41' 0.145" S
11	24° 33' 29.791" E	34° 53' 39.513" S	28	23° 26' 58.313" E	35° 41' 0.148" S
12	24° 59' 2.233" E	34° 53' 39.513" S	29	23° 26' 58.313" E	35° 45' 0.147" S
13	24° 59' 3.896" E	34° 51' 28.391" S	30	22° 59' 58.293" E	35° 45' 0.199" S
14	25° 9' 58.403" E	34° 51' 28.391" S	31	22° 59' 58.290" E	35° 47' 0.192" S



No.	Longitude (°) (E)	Latitude (°) (S)	No.	Longitude (°) (E)	Latitude (°) (S)
15	25° 9' 58.403" E	35° 3' 0.239" S	32	22° 29' 58.216" E	35° 47' 0.292" S
16	24° 44' 58.378" E	35° 3' 0.260" S	33	22° 29' 58.109" E	35° 15' 0.334" S
17	24° 44' 58.381" E	35° 15' 0.209" S	34	22° 59' 58.359" E	35° 15' 0.324" S



**Figure E2 - Co-Ordinate Map for Block 11B/12B**



## OVERVIEW OF KEY PROJECT ACTIVITIES

The key activities associated with the Project are detailed in Table E3.

**Table E3 – Key Project Activities**

<b>Activity</b>	<b>Details</b>
<b>Exploration and appraisal drilling (eastern portions of Block, Exploratory Priority Area)</b>	<ul style="list-style-type: none"> <li>▪ Mobilisation of drill unit to site.</li> <li>▪ Drilling of up to four exploration and appraisal wells.</li> <li>▪ Possible well flow testing, vertical seismic profiling (VSP), well logging for each well drilled.</li> <li>▪ Plugging and abandonment of each well.</li> <li>▪ Demobilisation of drill unit from site.</li> <li>▪ Onshore support.</li> </ul>
<b>Offshore surveys (Whole Block)</b>	<ul style="list-style-type: none"> <li>▪ Mobilisation of specialised vessels for survey work.</li> <li>▪ Bathymetry and sonar surveys.</li> <li>▪ Seafloor sampling surveys.</li> <li>▪ Metocean surveys.</li> <li>▪ Demobilisation of survey vessels.</li> <li>▪ Onshore support.</li> </ul>
<b>Development and production activities (Western Portion of Block, Project Development Area)</b>	
Construction Phase	Offshore
	<ul style="list-style-type: none"> <li>▪ Mobilisation of drill unit to site.</li> <li>▪ Drilling of up to six<sup>1</sup> production and appraisal wells and testing.</li> <li>▪ Installation of well-heads and Christmas-Trees (XMT).</li> <li>▪ Laying of deep-water subsea production manifolds and jumpers connecting the wells.</li> <li>▪ Installation of subsea production pipeline (“flowline”).</li> <li>▪ Connection of manifolds to the F-A Platform via the production pipeline, riser and umbilical.</li> <li>▪ Demobilisation of drill unit from site.</li> <li>▪ Demobilisation of pipeline installation and support vessels.</li> </ul>
	Onshore
	<ul style="list-style-type: none"> <li>▪ Establishment of logistics base, including a material and equipment laydown area within the Mossel Bay port.</li> <li>▪ Support vessels transport of equipment, bulk materials and general supplies from shore to drill unit, survey and pipeline laying vessels.</li> <li>▪ Helicopter flights for ship/shore personnel movement and in emergency events.</li> <li>▪ Periodic bulk delivery (equipment) from Gqeberha and/or Cape Town port.</li> <li>▪ Engineering manufacturing and maintenance work.</li> </ul>
	Offshore

<sup>1</sup> At this stage of the engineering design, five production wells will be drilled in the Project Development Area with the option for a sixth well, should it be required.

Activity	Details
Production Operations Phase	<ul style="list-style-type: none"> <li>Operation of gas field, including subsea infrastructure to supply the F-A Platform.</li> <li>Operation of F-A Platform and associated infrastructure.</li> <li>Vessel movements for maintenance and inspections of subsea infrastructure and flowlines pigging.</li> </ul>
	<p>Onshore</p> <ul style="list-style-type: none"> <li>Movement of support vessels from shore to F-A Platform for transportation of equipment, bulk materials and general supplies.</li> <li>Helicopter flights for ship/shore personnel rotation and in emergency events.</li> <li>Periodic bulk delivery (equipment) from Gqeberha and/or Cape Town port.</li> </ul>
Decommissioning Phase	<p>Offshore</p> <ul style="list-style-type: none"> <li>Mobilisation of drill unit to site.</li> <li>Mobilisation of specialised vessel for survey/remote operated vehicle (ROV) work.</li> <li>Movement of support vessels from shore to drill unit for transportation of equipment, bulk materials and general supplies.</li> <li>Helicopter flights for ship/shore personnel movement and in emergency events.</li> <li>Decommissioning of production manifold, flowlines, umbilical and riser.</li> <li>Decommissioning of subsea distribution units and power cable(s).</li> <li>Retrieval of shallow water infrastructure, such as production risers and umbilicals.</li> <li>Pigging of production flowline including subsea tie-in.</li> <li>Abandonment of wells.</li> <li>Demobilisation of drill unit and support vessels from site.</li> </ul>
	<p>Onshore</p>
	<ul style="list-style-type: none"> <li>Movement of support vessels from shore to drill unit for transportation of equipment, bulk materials and general supplies.</li> <li>Helicopter flights for ship/shore transport.</li> <li>Salvage of retrieved equipment and shipping to Gqeberha and/or Cape Town port.</li> </ul>

## PROJECT TIMEFRAMES

A summary of the timeframes associated with the Project activities is provided in Table E4.

**Table E4 – Project activities timeframes**

Activity	Phase	Timeframe	Duration of Activities	No. of wells
Exploration and appraisal drilling (eastern portions of Block, Exploratory Priority Area)	Mobilisation	<ul style="list-style-type: none"> <li>To be determined</li> </ul>	<ul style="list-style-type: none"> <li>120 days per well</li> </ul>	-
	Operations, including plugging and abandonment			<ul style="list-style-type: none"> <li>Up to four</li> </ul>
	De-mobilisation			-
Offshore surveys (Whole Block)	Operations	<ul style="list-style-type: none"> <li>To be determined</li> </ul>	<ul style="list-style-type: none"> <li>Sonar: 15 – 30 days for 1 survey</li> <li>Seafloor sampling: 15 – 30 days for 1 survey</li> <li>Metocean Buoy: 7 – 15 days for deployment, 2</li> </ul>	-

Activity	Phase	Timeframe	Duration of Activities	No. of wells
			services and 1 retrieval for 1 year monitoring	
Development and production activities (Western Portion of Block, Project Development Area)	Final well site selection, pipeline alignment selection	<ul style="list-style-type: none"> <li>To be determined</li> </ul>	<ul style="list-style-type: none"> <li>To be determined</li> </ul>	-
	Construction (including mobilisation)	<ul style="list-style-type: none"> <li>Year 0</li> </ul>	<ul style="list-style-type: none"> <li>120 days per well</li> </ul>	<ul style="list-style-type: none"> <li>Two</li> </ul>
		<ul style="list-style-type: none"> <li>Year 1</li> </ul>	<ul style="list-style-type: none"> <li>120 days per well</li> </ul>	<ul style="list-style-type: none"> <li>One</li> </ul>
		<ul style="list-style-type: none"> <li>Year 10</li> </ul>	<ul style="list-style-type: none"> <li>120 days per well</li> </ul>	<ul style="list-style-type: none"> <li>Two</li> </ul>
	Production	<ul style="list-style-type: none"> <li>Year 1 to Year 25</li> </ul>	-	<ul style="list-style-type: none"> <li>Year 1 to 10 – three wells</li> <li>Year 11 to 25 – five wells</li> </ul>
Decommissioning (including plugging and abandonment, and demobilisation)	<ul style="list-style-type: none"> <li>Year 26</li> </ul>	-	<ul style="list-style-type: none"> <li>Five</li> </ul>	

## PROJECT ALTERNATIVES

Two corridors have been identified and assessed for the alignment of the production pipeline:

- The base case is a direct route of approximately 109 km from the Project Development Area to the F-A platform; and
- The alternative is approximately 115 km, routing slightly northeast from the base case, overlapping an Ecologically or Biologically Significant Area (EBSA), with a bend to reach the F-A Platform.

The following key considerations have informed the assessment of the corridors:

- Both pipeline corridor options go through an area of high sensitivity associated with rich epifaunal community and rare fossils. However, the shorter base case corridor avoids overlap with an EBSA and has a smaller footprint on the proposed<sup>2</sup> marine Critical Biodiversity Area (CBA) that it traverses.
- The base case corridor follows an area already disturbed by previous oil and gas activities.
- The shorter base case corridor reduces the risk of palaeontological impacts by reducing the physical footprint of the pipeline on the seabed.

Based on the above, the base case pipeline corridor is the preferred corridor for the production pipeline. The final pipeline alignment within the corridor will however still need to be confirmed pending the outcomes of:

- Final positions of the production well(s); and

<sup>2</sup> SANBI 2017, Proposed Approach to Spatial Development and Management for South Africa's Marine Planning Areas 2019, and the Draft marine sector plan for the Biodiversity Sector 2023



- Further, supplementary bathymetry, geotechnical, benthic and ROV surveys, which will possibly be used to confirm the absence of seafloor obstacles or stability issues as well as any sensitive features prior to finalising the route.

The No-Go Alternative has also been assessed as part of the S&EIA Process.

## **FINANCIAL PROVISION AND INSURANCE**

In accordance with the Regulations Pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations, 2015 (GNR 1147 of 2015) (Financial Provisioning Regulations, 2015), as amended, as well as the amendment to the transitional arrangements in GNR2087 of 2022 promulgated under NEMA, TEEPSA will put in place the required financial provision for the Project.

The estimated cost for management and rehabilitation of potential negative environmental impacts that might be incurred during the Project activities has been calculated as part of this S&EIA Process.

## **BASELINE ENVIRONMENTAL AND SOCIAL CONDITIONS**

The environmental and social context within Block 11B/12B is described in the sections below. The receiving environment is defined as the physical (metocean data, noise and air quality), biophysical (ecology and biodiversity) and the socio-economic environment (demographic characteristics, economic conditions, tangible and intangible cultural heritage resources, palaeontological resources and fisheries activities).

### **PHYSICAL ENVIRONMENT**

Prevailing winds in Block 11B/12B are from the west-southwest and west-northwest (approximately 36% of the time) and east-northeast and east-southeast (approximately 28% of the time). Wind speeds are mostly in the 5 to 20 m/s range. Prevailing surface current direction within Block 11B/12B is towards the southwest and west-southwest. The prevailing current direction at the seabed within Block 11B/12B is west-southwest and southwest direction for approximately 80% of the time.

Tides are typically semi-diurnal along the south coast of South Africa, with two high tides and two low tides during a tidal day. Tidal influence will be minimal in Block 11B/12B. Wave direction along the south coast of South Africa is generally from the south-west. Wave heights, particularly during winter and spring, exceed 6 m and can reach heights of 10 m. Giant waves, higher than 20 m, are encountered within the Agulhas current during the summer months when seas are driven by an easterly wind, causing the southerly flowing Agulhas current to collide with the south-westerly swells. Water depths in Block 11B/12B range from approximately 110 to 1 800 m below sea level.

Mean annual precipitation in Block 11B/12B is approximately 1 242.7 mm. The average air temperature within Block 11B/12B is 19.3°C. Monthly mean temperatures are high in February, at 21.5°C, and low in August, at 16.1°C. Water temperatures at the surface and along the seabed (1 684 m depth) range between 16 - 28°C and 1.7 – 4°C, respectively.

Ambient offshore air quality is primarily affected by the long-range transboundary transportation of pollutants through large-scale weather systems and, more locally, by emissions from merchant shipping. During the production phase, emission concentrations are low, resulting in negligible onshore impacts.



Airborne pollutant levels are elevated the Mossel Bay area, due to existing industrial activity, traffic emissions, wind-blown dust and biomass burning. The primary onshore Project activities that contribute to pollution includes vessel emissions due to manoeuvring within the port and using boilers or generators for power while at the quayside. The modelling of emissions to air due to Project activities indicated that emissions associated with port activities remain low, well below their respective National Ambient Air Quality Standards (NAAQS) for all pollutants, with little to no impact on neighbouring sensitive receptors.

Underwater noise levels are influenced by marine vessel movements, as well as wind, waves and vocalisations of marine mammals. Low frequencies are generally impacted by human influences, such as marine shipping, while higher frequencies may be impacted by natural, physical or bioacoustics sources such as surface waves, precipitation or marine fauna. Marine vessel movements are; however, the largest contributor to underwater noise levels in the application area.

## BIOPHYSICAL ENVIRONMENT

The oceanographic conditions of Block 11B/12B is influenced by both the strong-flowing Agulhas current that moves down the east coast of South Africa, as well as by localised oceanographic processes. The interaction of the warm Agulhas current with cooler temperate waters is the principal reason for the diverse range of coastal and marine flora and fauna for which South Africa is famous. The thermal structure of Agulhas Bank is complex and is influenced by Agulhas current water intrusions at the surface and subsurface, upwelling and solar heating of surface waters. The warm, tropical water carried by the Agulhas current cools as it moves southwards and supports a changing array of species.

Block 11B/12B falls within the Southwestern Indian Ecoregion and the Southwestern Indian upper and lower bathyal ecozones. Communities within this marine habitat are largely ubiquitous throughout the southern African South Coast region, being particular only to substrate type or depth zone. The biological communities occurring in Block 11B/12B consist of many hundreds of species, often displaying considerable temporal and spatial variability. Block 11B/12B falls within the Outeniqua Basin, on the Agulhas Bank, southwards of the 200 m isobath and down to approximately 2 000 m depth.

The diverse benthic habitats of the Block 11B/12B area fall within the Agulhas sub-photic biozone (from 30 m depth to the shelf edge) and the continental slope biozone (beyond to the lower slope). The benthic habitat types in Block 11B/12B include the Southwest Indian Lower Slopes, Southwest Indian Mid Slope, Southwest Indian Upper Slope, with intersection with Agulhas Rocky Shelf Edge, Eastern Agulhas Outer Shelf Mosaic and Agulhas Blues in the vicinity of the pipeline routing. Most of Block 11B/12B is a mosaic of both rocky reef and areas with sparse sediment cover, with the northern area characterised by hard sediment, meaning that a narrow layer of unconsolidated sand sits atop a denser clay layer.

A range of marine fauna is likely to be encountered in Block 11B/12B, including commercially important linefish pelagic species, large migratory pelagic species, turtles, various seabird species and cetaceans. Some of these species are listed in the Red List of Threatened Species. Species having a conservation status of Endangered or Critically Endangered that are likely to be encountered in Block 11B/12B include:

- Endangered:
  - Turtles - green turtle (*Chelonia mydas*)





- Seabirds - african penguin (*Spheniscus demersus*), Cape gannet (*Morus capensis*), bank cormorant (*Phalacrocorax neglectus*), Cape cormorant (*Phalacrocorax capensis*), Indian yellow-nosed albatross (*Thalassarche carteri*), Atlantic yellow-nosed albatross (*Thalassarche chlororhynchos*)
- Cetaceans - Indian Ocean humpback dolphin (*Sousa plumbea*), sei whale (*Balaenoptera borealis*)
- Pelagic Fish - southern bluefin tuna (*Thunnus maccoyii*), pelagic thresher shark (*Alopias pelagicus*), great hammerhead shark (*Sphyrna mokarran*), dusky shark (*Carcharhinus obscurus*), shortfin mako shark (*Isurus oxyrinchus*), longfin mako shark (*Isurus paucus*), whale shark (*Rhincodon typus*)
- Critically Endangered
  - Cetaceans - blue whale (*Balaenoptera musculus ssp. Intermedia*), oceanic whitetip shark (*Carcharhinus longimanus*)

The benthic communities in Block 11B/12B are known to exhibit high levels of endemism and, as such, the coastal area in the vicinity of Mossel Bay has been recognised as one of seven areas in the biozone in need of additional protection which has been granted in the form of these offshore Marine Protected Area (MPA) designations. Offshore MPAs near Block 11B/12B include the Southwest Indian Seamounts MPA to the southwest of Block, and the Port Elizabeth Corals MPA to the northeast.

No proposed CBAs are located within Block 11B/12B; however, the proposed pipeline route passes through a proposed CBA Natural Area. The Kingklip Corals and the Shackleton Seamount Complex EBSAs are located along the northern border and towards the southwest of Block 11B/12B, respectively. Block 11B/12B intersects with the Southern Coastal and Shelf Waters Important Marine Mammal Area. These sensitive habitats are shown in Figure E3.

In terms of the Draft Proposed Approach to Spatial Development and Management for South Africa's Marine Planning Areas 2019, and the Draft marine sector plan for the Biodiversity Sector 2023 (SANBI 2017), the Critical Biodiversity Areas have yet to be given legal status.

## **SOCIO-ECONOMIC ENVIRONMENT**

The towns of Mossel Bay and George are the coastal towns most likely affected by the Project. They are located within the Garden Route District Municipality (GRDM). The GRDM extends across 23 331 km<sup>2</sup> and has approximately 627,917 residents. Approximately 80% of the district's population lives in urban areas along the coast. The largest ethnic group in the GRDM is Coloured (52%), followed by Black/African (30%) citizens. 33% of GRDM's population live below the poverty line. The 2021 unemployment rate in Mossel Bay was 20.7%, with evidence that the job losses from PetroSA exacerbated this scenario. Escalating unemployment, particularly among women, youth, and vulnerable people, is challenging.

The Mossel Bay Port mainly caters for the import and export of petroleum products. Mossel Bay is the only port in South Africa with two offshore berths within the port's limits and can accommodate passengers and Project ships. Mossel Bay is a popular cruise destination.

Fishing and tourism sectors are important components of the local economy in the GRDM and many people rely on these industries for income. Offshore, there is some overlap of fishing grounds with the Block 11B/12B Application Area. The large pelagic longline fishing sector has the greatest spatial overlap with and pipeline routing corridors, with a small overlap with offshore demersal trawl fishery and the Chokka squid fishery effort to the north and northeast of the Block, respectively.



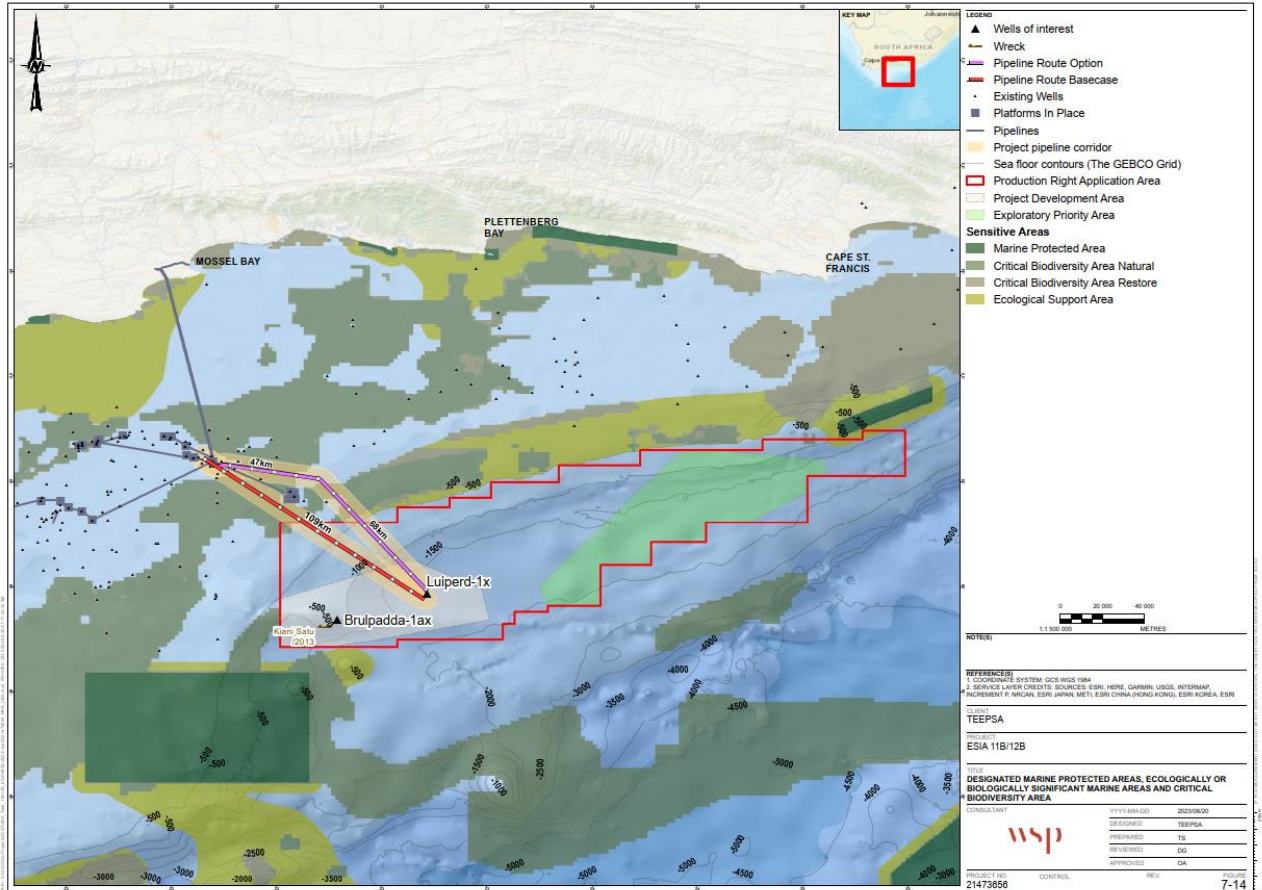
The coastal areas of the IZol has a rich history in terms of cultural heritage, which includes the history of the Khoi-San, ships that had foundered along the coastline and the colonial history of Mossel Bay and surrounding areas. Research on rock shelters and sea caves in the IZol have interested several archaeologists and professionals over the past years. It has been indicated that Mossel Bay was recently placed on the international map as a critical research area. Pinnacle Point is a proposed World Heritage Site.

The seabed within Block 11B/12B would not have been occupied by early humans and no archaeological sites or material can be expected within the Block. According to available records, there are no known historical ship wrecks within Block 11B/12B; however, research indicates that a wreck (Kiani Satu that sank in 2013) may be located within the Production Development Area of the Block. There is a high possibility that important fossils occur within Block 11B/12B. This has been demonstrated by the recovery of fossilised whalebone during a scientific demersal trawl in Block 11B/12B in 1993, and by the recent finds of apparently fossilised whalebone and possible fossilised wood made during the TEEPSA environmental baseline surveys in late 2022.

Any site that is coastal or where people make use of the sea has spiritual significance. The waters along the coast are considered as 'living' waters. These waterways are believed to play a critical role in spiritual and health management in indigenous and Nguni groups specifically.

Vulnerable groups within the IZol are the poor, the unemployed, women, youth (substance abuse among young people was mentioned as a specific concern in the public participation meetings), indigenous peoples (Khoi-San and Nguni peoples), and small-scale fishers. Gender-based violence has been reported as a big concern in the Project area, one that does not receive adequate attention. Victims of gender-based violence can therefore also be seen as a vulnerable group.

The rights of vulnerable populations such as indigenous groups, including the Gourikwas and the Koi-San group (who claims coastal areas) and the rights and impacts on small-scale fishers are of relevance to this ESIA. For these groups, it is important to provide the opportunity for them to express their views about the Project.



**Figure E3 - Designated MPAs, EBSAs and Proposed CBAs in close Proximity to Block 11B/12B**

## IMPACT ASSESSMENT SUMMARY

### NORMAL OPERATIONS

Potential impacts were assessed for each of the Project phases, namely exploration, offshore surveys, construction (which includes well drilling and installation of subsea infrastructure), production and closure. For each of these phases, the potential impact/s on receptors for the following aspects were assessed: air emissions, underwater noise, ambient air noise levels, light emissions, discharges to sea (produced water, drilling fluids and cuttings, ballast water and routine discharges), physical disturbance of seafloor sediments, presence of sea floor infrastructure, presence of above water infrastructure, maritime safety zones, impact on intangible cultural heritage, impact on household livelihood, impact on fisheries, and the economic effect of spend on local goods, services and labour.

Of these, the most significant potential negative impacts are:

- The impact of drill cuttings discharges on turbidity in the water column and suspended sediment concentrations on epifaunal communities (unmitigated=high; mitigated=medium).
- The potential impact related to the introduction of alien invasive marine species due to discharges of ballast water from the drill rig and vessels (unmitigated=high; mitigated=medium).

- Direct loss of epifauna living on hard substrata on the seabed along the production pipeline route or in the areas where concrete is placed (unmitigated=high; mitigated=low).
- Impact on various aspects which make up people's intangible cultural heritage, which include ancestry / spirituality and sense of place (unmitigated=medium to high; mitigated=very low to medium).
- The contribution of the Project to greenhouse gasses and climate change during exploration, construction and production (unmitigated=medium; mitigated=negligible).
- The impact on squid fishery, small-scale fishers and large pelagic fishery as a result of maritime safety zones in the eastern Exploratory Priority Area in particular (unmitigated=medium; mitigated=medium).
- The impact on commercial and small-scale fisheries as a result of disturbances to marine habitat in the western Project Development Area in particular (unmitigated=medium; mitigated=low to negligible).
- The potential impact on health, safety and security resulting from Project workers spending leisure time in local communities and impacts on air quality as a result of emissions from support and supply vessels (unmitigated=medium; mitigated=low).

The most significant potential positive impacts are:

- Impact on economic output and GDP, jobs, household income and household livelihood as a result of spending on local goods, services and labour during the construction phase (high+).
- Impact on economic output and GDP, and on government, during production operations phase (medium+).
- Impact on jobs, household income and household livelihood as a result of spending on local goods, services and labour during the production operations phase (medium+).

Impact significance of the remainder of the potential impacts range from negligible to low. A summary of the significance of potential impacts before and after mitigation during normal operations are included in Table E5 below.

Impact significance of the remainder of the potential impacts range from negligible to low. This includes underwater acoustics that has been modelled to identify the thresholds at which marine life is affected by Project activities, particularly, drilling, Vertical Seismic Profiling and sonar surveys.

The significant potential impacts are further described below.

## **GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE**

GHG emissions from Project activities will result from possible well flow testing (non-routine flaring), and the mobile GHG emissions generated by the drill unit, helicopters, supply vessels and tugs. The key GHGs for the Project include CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O. It is anticipated that the direct GHG emissions resulting from Project activities are calculated at a total of 1,5 MtCO<sub>2e</sub>. The GHG emissions from the re-commissioning of the F-A platform will total 4 MtCO<sub>2e</sub> over the Project life span.

Within the context of the national GHG inventory and targets, this contribution of GHG emissions is considered to be medium, before mitigation, and negligible, with mitigation. Key mitigation measures include the use of a high-efficiency burner for flaring during well flow testing, and for TEEPSA to continue to engage with PetroSA regarding the use of good international industry practices in the operation and maintenance of the F-A Platform.



## **DISCHARGE OF DRILLING FLUID AND CUTTINGS**

The installation of exploration, appraisal and production wells in Block 11B/12B is expected to result in a discharge of drill cuttings. Drilling materials can impact both water and sediment quality through the introduction of toxic compounds, decreased oxygen levels, deposition of particle matter on the sea floor and changes in sediment grain structure. Discharge directly onto the seafloor adjacent to the wellbore would also smother sedentary benthic species. Furthermore, discharge of excess cement around the wellbore and leaching of cement additives into the surrounding water column can be toxic to marine life.

Water Based Muds (WBM) are anticipated to be used in the initial stages of well drilling (riserless stage) and the riser stage of drilling. The main ingredient of WBM is freshwater or seawater, making up to 85-90% of the total volume of the WBM. The impacts of discharged WBMs toxicity levels and potential for anoxia is therefore considered to be low. However, the impact significance of increased turbidity in the water column and elevated suspended sediment concentrations on epifaunal communities has been assessed as high, without mitigation.

Drill discharge modelling results show that, depending on the well location, potential impacts can extend beyond the confines of the 11B/12B Application Area, with the worst-case upper water column impacts' intersecting with the Southwest Indian Seamounts Marine Protected Area (MPA) to the southwest of Block 11B/12B. The area where cumulative environmental risks are expected within the modelled plume covers approximately 5 to 10% of the surface water area of the MPA, and approximately 2.5% of the bottom water area of the MPA.

The key mitigation measure recommended is to undertake supplementary baseline surveys within Block 11B/12B, to inform placement of wells, with the aim of preventing disturbances to declared / proclaimed sensitive areas and habitats, such as the Southwest Indian Seamounts MPA to the southwest of the Block.

## **DISCHARGE OF BALLAST WATER**

Ballast water will be used and discharged by, for example, support vessels and the drilling unit (rig) when the pontoons are partially ballasted with seawater for stability. Ballast water and infrastructure associated with oil and gas production will, over time, develop a fouling community of marine epifauna which may consist of alien invasive species. The potential impact related to the introduction of alien invasive marine species is considered to be high.

However, due to the highly dynamic, wave-exposed coastline of South Africa, which contributes to minimising the establishment of alien invasive species this impact is unlikely. The key mitigation measures is to thoroughly clean infrastructure (e.g. wellheads, BOPs and guide bases) used in other locations before deployment. With this mitigation, impact significance can be reduced to medium.

## **PHYSICAL DISTURBANCE OF SEAFLOOR SEDIMENTS**

Anchoring and laying of infrastructure over hard ground or boulder fields will result in physical damage to rock outcrops or the inversion of boulders on the seabed. Construction of pipelines (for either routing option) across subtidal reefs will require permanently attaching the structure to the substratum in a manner that is sufficiently strong to resist the action of the sea. The use of concrete to cement pipelines in place is the most feasible option. This would result in the direct loss of epifauna living on these hard substrata along the pipeline path or in the areas where concrete is



placed. This impact has been assessed to be of high significance, before mitigation, mostly since recovery of disturbed deep-sea coral communities can take up to 30 years, or longer.

The key mitigation will be to ensure that infrastructure is not located within one km of any sensitive communities, habitats or structures. If this is not possible, an out-of-kind offset or compensatory mechanism needs to be developed as part of a Biodiversity Action Plan (BAP), if required.

## **SPENDING ON LOCAL GOODS AND SERVICES AND LABOUR**

Procuring goods and services in South Africa for the various Project phases will result in an increase in local economic activities, resulting in GDP growth, and will positively impact jobs, either by sustaining existing jobs or creating new jobs. These economic opportunities could have a positive impact by creating and/or enhancing household income, whether direct, indirect or induced, thereby contributing to the local communities.

The positive impact on household income will also positively impact the government in terms of household income (personal and corporate) tax generation. Furthermore, given the nature of the Project, the national government will benefit from the Mineral and Petroleum Resource Royalty (MPRR) taxes as well as a carbon tax.

Economic modelling results indicate that the total local spend on goods and services during the Project's construction period would contribute R27 billion to economic output, of which R13.9 billion will be a direct impact. This will increase GDP by R8.2 billion. In addition, the re-commissioning and refurbishing or modifying of the F-A Platform is expected to add a further R25 billion if it is able to achieve a high local content that can be sourced within South Africa.

The Project construction phase, excluding the F-A Platform upgrade, is expected to support 634 direct jobs. The Project is expected to support approximately 7 300 employment opportunities throughout the Project lifetime. For the scenario that included the re-commissioning of the F-A Platform and refurbishment and modifications, the modelling indicated that the construction phase could support 5 547 direct jobs, the majority of which will be created by PetroSA. The main sectors most likely to benefit from employment during construction include manufacturing, trade and accommodation, and general government and community services.

The drilling of the production, appraisal and exploration wells, installation of the production pipeline and subsea production system, and subsequent closure phase, will create fewer local, direct jobs, given the specialised nature of the work to be done.

The production phase will increase economic output by R3.0 billion per annum, of which R1.4 billion will be directly related to the Project. The GDP impact due to the increase in economic output is an estimated R1.4 billion per annum. The main sectors estimated to benefit from production and GDP during the operation phase include mining, transport and storage, real estate and business, and manufacturing. In conjunction with the economic benefits linked to Project activities, there will be investment into local economic development initiatives through the Social and Labour Plan (SLP) prepared as a requirement of the PR application. For all the Project phases, the increase in economic output is estimated at R3.58 billion.

The positive impacts linked to spending on local goods, services and labour have been assessed as low(+) to high(+), depending on the relevant Project phase. One of the key measures that could enhance the economic benefits of the Project would be for TEEPSEA to investigate options for local procurement for the production pipeline construction.



## IMPACT ON INTANGIBLE CULTURAL HERITAGE

Any impact on the integrity of the coastal and marine ecosystem through disturbance, pollution, noise impacts from the various Project phases could negatively affect aspects which make up the intangible cultural heritage of communities situated in the coastal zone. These aspects include ancestry, spirituality and sense of place. Because the majority of Project activities will take place offshore, and exploration, construction and decommissioning activities will take place over the short to medium term, the impact of the Project on intangible cultural heritage for these phases has been assessed as medium. For the longer production phase, the impact has been assessed as high.

Engaging with relevant communities to undertake a ritual event/s that supports communities' engagement with ancestral spirits and with living communities/indigenous people to allow for the usage of the sea, is recommended. This aspect will be included in a Project-specific stakeholder engagement plan.

## IMPACT ON THE LIVELIHOOD OF FISHERS

There is no overlap between Block 11B/12B and fishing grounds for inshore hake trawling, demersal longline fishing, mid-water trawl fishing, traditional/commercial line fishing, small pelagic purse seine fishing and south coast rock lobster fishing.

There is an overlap of Block 11B/12B with established fishing grounds for deep-sea hake trawling but this is outside of the Project Development Area and the overlap with the Exploratory Priority Area is limited to a small area along the northern boundary. There is an overlap with large pelagic longline fishing grounds and Block 11B/12B; however, the assessment indicated that this area is fished 38.5% of the time, on average, per annum. There is also limited overlap in the north-east corner of Block 11B/12B with squid jig fishing, and the intensity of fishing is described as 'high' in this area.

The establishment of temporary and permanent safety zones within areas of Block 11B/2B is limited to a 500 m radius around the specific locations where Project activities take place. During the exploration, construction and closure phases and while survey work is undertaken, TEESPA will notify SAMSA who will issue a Notice to Mariners regarding the establishment of temporary safety zones for the duration of activities, prior to the commencement of works.

The permanent safety zone around the production wells, subsea infrastructure installation and pipeline will possibly prevent large pelagic longline fishing and squid jig fishing in certain areas of Block 11B/12B.

The reduction in fish catch due to disruption to the abundance of valuable fish species will increase the effort required by fishers to fill quotas. This may result in fishers abandoning the fishing ground altogether or fishers having to leave the industry due to fewer fishing licenses being issued due a reduction in the total allowable catch.

The impact significance of safety zones on commercial, recreational, small-scale fisheries and mariculture fisheries is assessed as very low to negligible. However, the impact significance of reduction in fish habitat is assessed as medium.

A key mitigation measure for this impact is for TEESPA to conduct pre-screening surveys to identify the most appropriate location for well drilling and installation of subsea infrastructure and the pipeline to minimise disturbance to benthic habitat.



## COMMUNITY HEALTH, SAFETY AND SECURITY

The potential for anti-social behaviour within communities, including an increase in communicable diseases resulting from Project workers spending leisure time in local communities, even if the opportunity for interaction with the local community is limited. Local communities are aware that security and safety issues are linked to the lack of work opportunities for unskilled or low-skilled job seekers and the anti-social behaviour of criminal activity and substance abuse are linked to the lack of constructive alternatives.

A lack of understanding of local culture and traditions may result in tensions between Project personnel who are newcomers to the community and established community members. The potential for this is limited by the low number of local personnel required for most Project phases. However, the production phase over a 25-year period has the greatest potential for community health, safety and security issues to arise as newcomers seek opportunities associated with the Project.

The emissions from support and supply vessels while they are in port and utilise diesel-powered on-board generators for power supply will potentially increase emissions in the local airshed. There are insufficient data to confirm the anecdotal attribution of poor health to exceedances of ambient air quality limits, but communities are concerned that Project activities may result in a decrease of ambient air quality with consequent health effects.

These impacts in the absence of mitigation measures are considered to be medium. It has been recommended that TEEPSA engage with communities, government agencies, and other stakeholders throughout the Project process to understand community concerns regarding health, safety and security issues. TEEPSA should also ensure that Project personnel are made aware of local customs and traditions and the need to respect cultural norms.

## UNDERWATER ACOUSTICS

For drilling activities, temporary threshold shifts (i.e., a temporary loss of hearing sensitivity - TTS) and permanent threshold shifts (i.e., a permanent increase in the hearing threshold, that has behavioural consequences - PTS) for the 30-minute exposure scenarios modelled the maximum temporary threshold shift distance as 790 m for very high-frequency cetaceans, and 380 m for high frequency cetaceans, while the maximum 30-minute exposure distance for permanent threshold shift was modelled as 20 m for low frequency cetaceans and very high-frequency cetaceans.

For fish with a swim bladder, drilling noise TTS impacts is predicted to occur only very close to the drilling activity (within 160 m), and 30 m for a recoverable injury. The maximum distance from the drilling source for PTS was modelled to be 66 km for marine mammals in all hearing groups, 11.8 km for penguins and diving birds, and 10 m for turtles.

For Vertical Seismic Profiling (VSP) and sonar exploration activities, the noise modelling results showed that the permanent threshold shifts were 2 km for marine mammals in all hearing groups, 350 m for turtles, and 19.2 km for penguins and diving birds.

Model results show that cumulative impacts (for the estimated 250 pulses over a 24-hour period) had a greater extent of impact, with temporary damage occurring at up to 2.2 km for baleen whales and at 170 m for turtles, with permanent damage predicted at a distance of 200 m for baleen whales. For fish, cumulative impacts of 250 pulses over 24-hours predicted temporary damage to





fish both with and without swim bladders at a distance of 370-400 m, and mortality and potential mortal injury of both fish, fish eggs and larvae at 10-30 m.

Given the sensitivity of the Block 11B/12B area, the recorded occurrence of a number of sensitive species within the site, and the uncertainty surrounding the implication of behavioural impacts over the long term, the significance of the impact on marine fauna as result of drilling related noise is considered to be very low to low.

A key mitigation measure that has been recommended is to undertake supplementary baseline surveys, to inform placement of wells (and hence where VSP will be undertaken), with the aim of preventing disturbances to sensitive and significant VME epifaunal communities, vulnerable habitats (e.g., hard grounds), and structural features (e.g., rocky outcrops).

**Table E5 - Impact Summary – Normal Operations**

Phase	Aspect	Impacts on Main Receptors	Pre-Mitigation Significance	Residual Significance
Exploration	Air Emissions	Impacts on air quality	Negligible (offshore) Very low (offshore)	Negligible (offshore) Very Low (onshore)
Exploration	Air emissions	Impacts on GHG emissions and climate change	Medium	Negligible
Exploration	Underwater noise from drill rig and support vessels	Physical injury or disturbance to marine fauna	Low	Low
Exploration	Underwater noise from vertical seismic profiling	Physical injury or disturbance to marine fauna	Low	Low
Exploration	Ambient air noise from helicopters	Physical injury or disturbance to marine fauna	Low	Low
Exploration	Ambient air noise from support vessels	Physical injury or disturbance to marine fauna	Low	Very Low
Exploration	Light from drill rig and support vessels	Impact on marine fauna	Low	Very Low
Exploration	Light from well flow testing	Impact on marine fauna	Very Low	Very Low
Exploration	Produced water discharge	Impact on water quality	Very Low	Very Low

Phase	Aspect	Impacts on Main Receptors	Pre-Mitigation Significance	Residual Significance
Exploration	Discharge of drilling fluid and cuttings (cement and WBMs)	Biochemical and toxicity water column and benthic impacts	Low	Low
Exploration	Discharge of drilling fluid and cuttings	Turbidity and smothering impacts on marine environment	Low (infauna communities) Very Low (pelagic communities) High (epifauna communities)	Low (infauna communities) Very Low (pelagic communities) Medium (epifauna communities)
Exploration	Discharge of drilling fluid and cuttings	Impact on livelihood of small-scale fishers	Low	Low
Exploration	Physical disturbance of seafloor sediments	Impact on maritime heritage and palaeontology	Low	Low
Exploration	Maritime safety zones	Impact on fisheries	Low (demersal trawl fishery) Medium (squid fishery, SSF's and large pelagic fishery)	Very Low (demersal trawl fishery) Medium (squid fishery, SSF's and large pelagic fishery)
Exploration	Spending on local goods, services and labour	Impact on economic output and GDP	Very Low (+)	Very Low (+)
Exploration	Spending on local goods, services and labour	Impact on jobs	Very Low (+)	Very Low (+)
Exploration	Spending on local goods, services and labour	Impact on household income	Very Low (+)	Very Low (+)
Exploration	Spending on local goods, services and labour	Impact on household livelihood	Negligible (+)	Very Low (+)
Offshore surveys	Physical disturbance of seafloor sediment	Disturbance to benthic communities	Low	Very Low

Phase	Aspect	Impacts on Main Receptors	Pre-Mitigation Significance	Residual Significance
Offshore surveys	Noise from sonar profiling	Physical injury or disturbance to marine fauna	Low	Low
Offshore surveys	Maritime safety zones	Impact on fisheries	Low (demersal trawl fishery) Medium (squid fishery, SSF's and large pelagic fishery)	Low (demersal trawl fishery) Medium (squid fishery, SSF's and large pelagic fishery)
Construction	Air emissions	Impact on air quality	Negligible (offshore) Very Low (onshore)	Negligible (offshore) Very Low (onshore)
Construction	Air emissions	Impact on GHG emissions and climate change	Medium	Negligible
Construction	Underwater noise from drill rig and support/construction vessels	Physical injury or disturbance to marine fauna	Low	Low
Construction	Underwater noise from vertical seismic profiling	Physical injury or disturbance to marine fauna	Low	Low
Construction	Ambient air noise from helicopters	Physical injury or disturbance to marine fauna	Low	Low
Construction	Ambient air noise from construction vessels	Physical injury or disturbance to marine fauna	Low	Very Low
Construction	Light from drill rig and support vessels	Impact on marine fauna	Low	Very Low
Construction	Light from well flow testing	Impact on marine fauna	Very Low	Very Low
Construction	Produced water discharge	Impact on marine fauna	Very Low	Very Low
Construction	Discharge of drilling fluid and cuttings (cement and WBMs)	Biochemical and toxicity water column and benthic impacts	Low	Low

Phase	Aspect	Impacts on Main Receptors	Pre-Mitigation Significance	Residual Significance
Construction	Discharge of drilling fluid and cuttings	Turbidity and smothering impacts on marine environment	Low (infauna communities) Very Low (pelagic communities) High (epifauna communities)	Low (infauna communities) Very Low (pelagic communities) Medium (epifauna communities)
Construction	Discharge of drilling fluid and cuttings	Impact on livelihood of small-scale fishers	Low	Low
Construction	Physical disturbance of seafloor sediments	Loss of benthic habitat and impact on benthic infauna	Low	Very Low
Construction	Physical disturbance of seafloor sediments	Loss of benthic habitat and impact on benthic epifauna	High	Low
Construction	Physical disturbance of seafloor sediments	Impact on maritime heritage and palaeontology	Low	Low
Construction	Maritime Safety Zones	Impact on Fisheries	Very Low (hake demersal trawl) and Low (large pelagic fisheries)	Very Low (hake demersal trawl) and Low (large pelagic fisheries)
Construction	Spending on local goods, services and labour	Impact on economic output and GDP	Very Low (+) (TEEPSA activities) High (+) (PetroSA F-A Platform activities)	Medium (+) (TEEPSA activities) High (+) (PetroSA F-A Platform activities)
Construction	Spending on local goods, services and labour	Impact on jobs	Very Low (+) (TEEPSA activities) High (+) (PetroSA F-A Platform activities)	Medium (+) (TEEPSA activities) High (+) (PetroSA F-A Platform activities)

Phase	Aspect	Impacts on Main Receptors	Pre-Mitigation Significance	Residual Significance
Construction	Spending on local goods, services and labour	Impact on household income	Very Low (+) (TEEPSA activities)  High (+) (PetroSA F-A Platform activities)	Very Low (+) (TEEPSA activities)  High (+) (PetroSA F-A Platform activities)
Construction	Spending on local goods, services and labour	Impact on household livelihood	High (+)	High (+)
Production	Air emissions	Impact on air quality	Negligible (TEEPSA & PetroSA F-A Platform activities, offshore)  Very Low (TEEPSA & PetroSA F-A Platform activities, onshore)	Negligible (TEEPSA & PetroSA F-A Platform activities, offshore)  Very Low (TEEPSA & PetroSA F-A Platform activities, onshore)
Production	Air emissions	Impact on GHG emissions and climate change	Medium (TEEPSA activities)  Very High (PetroSA F-A Platform activities)	Negligible (TEEPSA activities)  Medium (PetroSA F-A Platform activities)
Production	Light emissions	Impact on marine fauna	Medium	Low
Production	Presence of seafloor infrastructure	Impact on local benthic environment	Low (pipeline not buried)  Negligible (pipeline buried)	Low (pipeline not buried)  Negligible (pipeline buried)
Production	Maritime safety zones	Impact on fisheries	Very Low (hake demersal trawl) and Low (large pelagic fisheries)	Very Low (hake demersal trawl) and Low (large pelagic fisheries)



Phase	Aspect	Impacts on Main Receptors	Pre-Mitigation Significance	Residual Significance
Production	Spending on local goods, services and labour	Impact on economic output and GDP	Medium (+)	Medium (+)
Production	Spending on local goods, services and labour	Impact on jobs	Medium (+)	Medium (+)
Production	Spending on local goods, services and labour	Impact on household income	Medium (+)	Medium (+)
Production	Spending on local goods, services and labour	Impact on government	High (+)	High (+)
Production	Spending on local goods, services and labour	Impact on household livelihood	Medium (+)	High (+)
Decommissioning	Air emissions	Impact on air quality	Negligible (offshore) Very Low (onshore)	Negligible (offshore) Very Low (onshore)
Decommissioning	Air emissions	Impact on GHG emissions and climate change	Negligible	Negligible
Decommissioning	Underwater noise from drill rig and support/decommissioning vessels	Physical injury or disturbance to marine fauna	Low	Low
Decommissioning	Ambient air noise from helicopters	Physical injury or disturbance to marine fauna	Low	Low
Decommissioning	Ambient air noise from construction vessels	Physical injury or disturbance to marine fauna	Low	Very Low
Decommissioning	Light emissions from drill rig and support/decommissioning vessels	Impact on marine fauna	Low	Very Low
Decommissioning	Maritime safety zones	Impact on fisheries	Very Low (hake demersal trawl) and Low	Very Low (hake demersal trawl) and Low (large pelagic fisheries)

Phase	Aspect	Impacts on Main Receptors	Pre-Mitigation Significance	Residual Significance
			(large pelagic fisheries)	
Decommissioning	Spending on local goods, services and labour	Impact on economic output and GDP	Low (+)	Low (+)
Decommissioning	Spending on local goods, services and labour	Impact on jobs	Low (+)	Low (+)
Decommissioning	Spending on local goods, services and labour	Impact on household income	Low (+)	Low (+)
Decommissioning	Spending on local goods, services and labour	Impact on household livelihood	Negligible (+)	Very Low (+)
All phases	Routine discharges to sea	Impact on water quality	Low	Low
All phases	Discharge of ballast water	Impact on water quality	High	Medium
All phases	Presence of Above Water Infrastructure	Impact on avifauna	Low	Low
All phases	All Project activities	Impact on intangible cultural	High	Very Low (for the exploration, construction and decommissioning phases) Medium (for the production operations phase)
All phases	All Project activities	Impact on community health, safety and security	Medium	Low
All phases	Maritime safety zones	Impact on livelihood of fisheries	Negligible (commercial, recreational or mariculture fisheries) Low (small-scale fisheries)	Negligible (commercial, recreational and mariculture fisheries) Very Low (small-scale fisheries for the well drilling,

Phase	Aspect	Impacts on Main Receptors	Pre-Mitigation Significance	Residual Significance
				construction, closure and survey phases) Low (small-scale fisheries for the production phase)
All phases	Disturbance of marine habitat and reduction in fish catch	Impact on livelihood of fisheries	Medium (commercial, recreational, small-scale and mariculture fisheries)	Negligible (commercial, recreational and mariculture fisheries) Low (small-scale fisheries)

## UNPLANNED EVENTS

Unplanned events or accidents linked to the Project that could have the greatest environmental impact is a major spill of hydrocarbons from a subsea well blowout or rupture of the production pipeline. It is noted that the probability of a well blowout occurring is extremely low. To date, offshore South Africa, 358 wells have been drilled and no well blowouts have been recorded.

The impact of a blowout on the marine environment is largely dependent on the quantity and physical state of the hydrocarbons released. A blowout would result in a jet release rising through the water column of two-phase material (gas and liquids). Gaseous components would be released to the atmosphere, while liquid components will form a slick on the sea surface. Some oil would, however, be dispersed and dissolved into the water column. A seabed blowout would form a crater because of the escape of high-pressure gas. Escaping hydrocarbons would form a plume of bubbles, liquids and re-suspended sediments as the gas and liquids are ejected through the water column. The potential hazards to the marine ecosystem are associated with the toxicity of the hydrocarbons, damage to the benthic community, the effects of increased turbidity generated by the rising gas and sediment-loaded plume and impacts associated with hydrocarbons in the water column and a slick on the sea surface.

A well blowout and pipeline rupture has the potential to affect various marine ecological receptors, including phytoplankton, zooplankton and microbes; benthic fauna; fish; seabirds; turtles and other marine mammals; the coastal environment; as well as fishery and mariculture activities. In addition, impacts on these aspects have the potential for knock-on effects on other receptors and aspects, including tourism, household livelihoods, community health, safety and security and intangible cultural heritage; the full extent of the impact will be dependent on prevailing seasonal meteorological and oceanographic conditions at the time of the spill, the duration of the spill and extent and trajectory of the plume.

In addition to the above, other unplanned events that would also have environmental impacts include accidental hydrocarbon spills during refuelling, vessel collisions, vessel strikes on marine megafauna, vessel-on-vessel collision or trawling vessel snagging fishing gear with the subsea production infrastructure with subsequent loss of equipment.



A summary of the significance of potential impacts before and after mitigation during unplanned events is included in Table E6.

**Table E6 - Impact Summary – Unplanned Events**

Phase	Aspect	Impact on Main Receptor	Pre-Mitigation Significance	Residual Significance
Well drilling & production operations	Pollution generated from production well blowout and pipeline rupture	Negative impact on seabirds, turtles, marine mammals, and coastal environment	Very high	High
Production well drilling & production operations	Pollution generated from production well blowout and pipeline rupture	Negative impact on plankton, benthic infauna, benthic epifauna, fish	High	Medium
Exploration well drilling	Pollution generated from exploration well blowout	Negative impact on seabirds, turtles, and coastal environment	Very high	High
Exploration well drilling	Pollution generated from exploration well blowout	Negative impact on plankton, benthic fauna, marine mammals	Very high	High
Production well drilling & production operations	Pollution generated from production well blowout and pipeline rupture	Negative impact on fisheries and mariculture	High	Medium
Exploration well drilling	Pollution generated from exploration well blowout	Negative impact on fisheries and mariculture	Very high	High
All phases	Pollution generated through fuel leaks, refuelling (bunkering), or vessel collision	Negative impact on marine environment	Medium	Low
Production well drilling & production operations	Well blowout or pipeline rupture	Negative economic impact on commercial fishing industry	High	Medium
Production well drilling & production operations	Well blowout or pipeline rupture	Negative economic impact on fishing activities	Medium	Low
Exploration well drilling	Well blowout	Negative economic impact on fishing activities	Very High	High
Production well drilling & production operations	Well blowout or pipeline rupture	Negative economic impact on coastal tourism	Negligible	Negligible
Exploration well drilling	Well blowout	Negative economic impact on coastal tourism	Very High	High

Phase	Aspect	Impact on Main Receptor	Pre-Mitigation Significance	Residual Significance
Production well drilling & production operations	Well blowout or pipeline rupture	Negative impact on household livelihood	High	Medium
Exploration well drilling	Well blowout	Negative impact on household livelihood	Very High	High
Exploration well drilling	Well blowout	Negative impact on community health, safety and security	High	Low
Production, appraisal and exploration well drilling Production operations	Well blowout or pipeline rupture	Negative impact on community health, safety and security	Very Low	Very Low
Production, appraisal and exploration well drilling & production operations	Well blowout or pipeline rupture	Negative impact on intangible cultural heritage	Very High	High
All phases	Vessel collisions or SPS and trawling gear accident	Negative impact on fisheries	Low	Very Low
All phases	Faunal strikes	Negative impact on cetaceans	Low	Very Low
All phases	Loss of equipment at sea	Negative impact on benthic substrate and biota	Low	Low

## OIL SPILL CONTINGENCY PLAN

A “multi-barrier” approach will be implemented to deal with the risk of oil spills, including Avoidance, Technical Barriers and Mitigation Measures. The first step, and most important, in applying the mitigation hierarchy to manage the risk of an oil spill is Avoidance (or prevention). If these preventative technical and control barriers fail or are not effective under certain conditions, then control and response capabilities (Mitigation Measure) will be in place. Key steps in the approach include the following:

- Avoidance (or Prevention):** Identify constraints that may impact the operational integrity of the drilling operation and optimise well design to ensure most stringent pressure profiles can be withstood.
- Technical Barriers:** Design well casings to withstand a variety of forces.
- Blowout Control and Oil Spill Response:** Implement the Blowout Contingency Plan, Emergency Response Plan and Oil Spill Contingency Plan, that has been prepared and approved in consultation with PASA, the DFFE and the South African Maritime Authority.
- Oil Spill/Slick Monitoring:** Predict the movement of an oil spill/slick and sample and analyse spill to determine the behaviour and toxicity levels.
- Offshore Oil Response:** Deploy adequately trained resources and dispersants.



6. **Shoreline Response:** Conduct a coastal sensitivity assessment and mapping exercise to identify coastal sensitivities in order to prioritise coastal response strategies.
7. **Compensation and Insurance:** Determine the economic effects of the oil spill/slick and financially manage the consequence through compensation to affected parties.

## CUMULATIVE IMPACT ASSESSMENT

Potential cumulative impacts occur when impacts arising from activities undertaken in Block 11B/12B coincide with impacts that have the same effect on the receiving environment, to enhance the severity or duration or extend the area or time over which the impact occurs. The cumulative nature of the impact arises from the activities overlapping due to them occurring in proximity to Block 11B/12B or from activities being undertaken within the same or similar timeframes.

Of all the developments that have been identified as proposed or authorised, the following have potential for cumulative impacts to occur with Block 11B/12B:

- The proposed CGG 3D seismic survey covering an area of up to 9 000 km<sup>2</sup> in a 12 750 km<sup>2</sup> area of interest located offshore between Gqeberha in the east and a point approximately 120 km southeast of Plettenberg Bay in the west. A portion of the area of interest overlaps with the eastern section of Block 11B/12B and there is potential for cumulative impacts in terms of underwater noise generated by the seismic survey activities coinciding with the exploration well drilling activities undertaken in the Exploratory Priority Area of Block 11B/12B.
- The PetroSA F-A Platform – if the Platform is re-commissioned, the timing of these activities may coincide with the activities of the Block 11B/12B drilling and construction phases. Although Block 11B/12B is approximately 40 km to the south of the F-A Platform, there is potential for cumulative impacts due to a decrease in air quality and a simultaneous increase in carbon emissions resulting from the greater number of vessels manoeuvring within and around the Project Development Area and the F-A Platform; and
- Karpowership Gas to Power Powership Project – with the commencement of the 450MW Gas to Power Powership Project at the Port of Ngqura, within the Coega Special Economic Zone in the Eastern Cape, the potential exists for cumulative impacts such as a decrease in air quality and a simultaneous increase in carbon emissions due to the Block 11B/12B 25-year production phase coinciding with the proposed 20-year contract for electricity generation from the Gas to Power Powership Project.

## ENVIRONMENTAL IMPACT STATEMENT

The S&EIA Process for the Project has been undertaken in accordance with the EIA Regulations, 2014, as amended, promulgated under NEMA. The Scoping Phase of the S&EIA Process undertaken for the Project identified several potential impacts associated with the Project activities to be considered for assessment in the EIA Phase. In accordance with the key objectives of the EIA Phase, the ESIA Report presents an assessment of the potential environmental and social impacts identified for the Project and alternatives; identifies measures to avoid, minimise or otherwise



manage identified impacts; and presents a monitoring programme to assess performance of implemented measures.

To adequately assess potential impacts arising from the Project, the EIA Phase entailed the undertaking of Specialist Assessments, all of which have been prepared in accordance with Appendix 6 of the EIA Regulations, 2014, as amended.

In this regard, WSP, as the appointed EAP for the Project, is of the opinion that the ESIA Report prepared for the Project presents an appropriate level of information related to the anticipated environmental and social impacts associated with the Project. In addition, WSP is of the opinion that given the implementation of the identified mitigation and enhancement measures as detailed in the EMPr included in this Report, there is no reason for the Project not to proceed.

The recommendation is based on all the mitigation measures contained in the EMPr to be implemented, with the following specific measures to be included as conditions in the EA:

- Pre-drilling baseline surveys must be undertaken to supplement baseline information obtained in previous environmental baseline surveys for Block 11B/12B, to inform placement of wells, with the aim of preventing disturbances to declared / proclaimed sensitive areas and habitats.
- If complete avoidance mitigation is not possible, an out-of-kind offset or compensatory mechanism needs to be developed as part of a Biodiversity Action Plan (BAP), if required.
- Establish a stakeholder engagement forum to facilitate ongoing engagement with indigenous people, coastal communities and fisheries associations / organisations, while carrying out its business in the IZol. Encourage communities to document and report any adverse health effects, incidents, or concerns related to the Project operations.



## Acronyms and Abbreviations

Abbreviation	Explanation
ACP	Advanced Command Post
AEL	Atmospheric Emissions Licence
ANC	African National Congress
AQIA	Air Quality Impact Assessment
B&B	Bed and Breakfast
B-BBEE	Broad-Based Black Economic Empowerment
BA	Basic Assessment
BAP	Biodiversity Action Plan
BAR	Basic Assessment Report
BAT	Best Available Techniques
BCC	Benguela Current Commission
BML	Below the Mud Line
BOCP	Blow-Out Contingency Plan
BOD	Biological Oxygen Demand
BOP	Blow-Out Preventer
CA	Competent Authority
CBA	Critical Biodiversity Area
CBD	Convention on Biological Diversity
CBO	Community Based Organisation
CCGT	Close Cycle Gas Turbine
CE	Critically Endangered
CGG	CGG Services SAS
CGR	Condensate Gas Ratio
CHIA	Cultural Heritage Impact Assessment
CITES	Convention on International Trade in Endangered Species
CPI	Consumer Price Index
CPUE	Catch per Unit Effort
CR	Critically Endangered
CRR	Comment and Response Report
CSR	Corporate Social Responsibility
CSO	Civil Society Organisation
DA	Democratic Alliance
DAFF	Department of Agriculture, Forestry and Fisheries



<b>Abbreviation</b>	<b>Explanation</b>
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DEDAT	Department of Economic Development and Tourism
DFFE	Department of Forestry, Fisheries and the Environment
DHI	Danish Hydraulic Institute
DMRE	Department of Mineral Resources and Energy
DSI	Department of Science and Innovation
DWOB	Deep Water Orange Basin
E	Endangered
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EBSA	Ecologically or Biologically Significant Area
EEZ	Exclusive Economic Zone
EFZ	Estuarine Functional Zone
EIA	Environmental Impact Assessment
EIA Regulations, 2014	Environmental Impact Assessment Regulations, 2014 (GNR 982 of 2014)
EIF	Environmental Impact Factor
EIFDD	Environmental Impact Factors for Drilling Discharge
EIFPW	Environmental Impact Factors for Produced Water
EMPr	Environmental Management Programme
EN	Endangered
ERP	Emergency Response Plan
ESA	Ecological Support Area
ESIA	Environmental and Social Impact Assessment
EU-TGD	European Commissions' Technical Guidance Document
FGM	Focus Group Meeting
FIT	Formation Integrity Test
Financial Provision Regulations, 2015	Regulations Pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations, 2015 (GNR 1147 of 2015)
FLET	Flow Line End Termination
FLO	Fisheries Liaison Officer
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System



<b>Abbreviation</b>	<b>Explanation</b>
GLM	George Local Municipality
GNR	Government Notice Regulation
GRDM	Garden Route District Municipality
GTL	Gas-to-Liquid
GTP	Gas-to-Power
GVA	Gross Value Added
HC	Hydrocarbon
HDI	Human Development Index
HDP	Historically Disadvantaged Person
HFO	Heavy Fuel Oil
HSE	Health, Safety and Environmental
HSE-MS	Health, Safety and Environmental Management System
HSSE	Health, Safety, Security and Environment
HYCOM	Hybrid Coordinate Ocean Model
I&APs	Interested and Affected Parties
IA	Impact Assessment
IAP2	International Association for Public Participation
ICP	Incident Command Post
IEA	International Energy Agency
IEM	Integrated Environmental Management
IEP	Integrated Energy Plan
iGAS	South African Gas Development Company
ILO	International Labour Organisation
IMMA	Important Marine Mammal Area
IMO	International Maritime Organisation
IPCC	Intergovernmental Panel on Climate Change
IPF	Impact Producing Factor
IRP	Integrated Resource Plan
ISPPC	International Sewage Pollution Prevention Certificate
IUCN	International Union for Conservation of Nature
IWC	International Whaling Commission
IZoI	Immediate Zone of Influence
JET IP	Just Energy Transition Investment Plan
JV	Joint Venture
KLM	Knysna Local Municipality



Abbreviation	Explanation
LC	Least Concern
LED	Local Economic Development
LN 1	Listing Notice 1 (GNR 983 of 2014)
LN 2	Listing Notice 2 (GNR 984 of 2014)
LN 3	Listing Notice 3 (GNR 985 of 2014)
LNG	Liquefied Natural Gas
LOC	Loss of Containment
LWD	Logging While Drilling
MARPOL 73/78	International Convention for the Prevention of Pollution from Ships, 1973/1978
MBLM	Mossel Bay Local Municipality
MEG	Methyl Ethylene Glycol
MERO	Municipal Economic Review and Outlook
MFO	Marine Fuel Oil
MGO	Marine Gas Oil
MLRA	Marine Living Resources Act, 1998 (Act 18 of 1998)
MMO	Marine Mammal Observer
MoU	Memorandum of Understanding
MPA	Marine Protected Area
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
MPRR	Mineral and Petroleum Resource Royalty
MSC	Marine Stewardship Council
MSL	Mean Sea Level
MUCH	Marine Underwater Cultural Heritage
NAAQS	National Ambient Air Quality Standards
NADFs	Non-Aqueous Drilling Fluid
NAEIS	National Atmospheric Emissions Inventory System
National Appeal Regulations, 2014	National Appeal Regulations, 2014 (GNR 995 of 2014)
NBA	National Biodiversity Assessment
NBI	National Business Initiative
NDC	Nationally Determined Contributions
NDP	National Development Plan
NEM: AQA	National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)
NEM: BA	National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)





Abbreviation	Explanation
NEM: ICMA	National Environmental Management: Integrated Coastal Management Act, 2008 (Act 24 of 2008)
NEM: PAA	National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003)
NEM: WA	National Environmental Management: Waste Act, 2008 (Act 59 of 2008)
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NGO	Non-Governmental Organisation
NHRA	National Heritage Resources Act, 1999 (Act 25 of 1999)
NIKSO	National Indigenous Knowledge Systems Office
NOEC	No Observed Effect Concentration
NOSCP	National Oil Spill Contingency Plan
NPO	Non-Profit Organisation
NT	Near Threatened
NTS	Non-Technical Summary
OCGT	Open Cycle Gas Turbine
OEC	Original Equipment Manufacturer
OECD	Organisation for Economic Co-operation and Development
OEE	Operator Extra Expense
OOC	Oil on Cutting
OPRC Convention	International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990
OSCAR	Oil Spill Contingency and Response
OSCP	Oil Spill Contingency Plan
P&A	Plugging and Abandonment
PAM	Passive Acoustic Monitoring
PASA	Petroleum Agency of South Africa
PEC	Predicted Environmental Concentration
PetroSA	Petroleum Oil and Gas Corporation of South Africa
PM	Particulate Matter
PNEC	Predicted No Effect Concentration
POPIA	Protection of Personal Information Act, 2013 (Act 4 of 2013)
PPP	Public Participation Process
PR	Production Right
PTS	Permanent Threshold Shift
PV	Photovoltaic
PWP	Production Work Programme



Abbreviation	Explanation
RFP	Request for Proposal
ROV	Remotely Operated Vehicle
RP	Release Point
S&EIA	Scoping and Environmental Impact Assessment
SAELIP	South African Atmospheric Emission Licensing and Inventory Portal
SAGERS	South African Greenhouse Gas Emissions Reporting System
SAHRA	South African Heritage Resources Agency
SAMSA	South African Maritime Safety Authority
SANBI	South African National Biodiversity Institute
SANCCOB	South African Foundation for the Conservation of Coastal Birds
SANParks	South African National Parks
SAT3/SAFE	South Atlantic Telecommunications cable No.3 / South Africa Far East
SCC	Social Cost of Carbon
SDG	Sustainable Development Goal
SDU	Subsea Distribution Units
SEEMP	Ship Energy Efficiency Management Plan
SEL	Sound Exposure Level
SEP	Stakeholder Engagement Plan
SETA	Sector Education and Training Authority
SEZ	Special Economic Zone
SHAZ	Shallow Hazard
SHEQ	Safety, Health, Environmental Management and Quality Control
SIA	Social Impact Assessment
SLO	Site Liaison Officer
SLP	Social and Labour Plan
SOLAS	Safety of Life at Sea
SOPEP	Shipboard Oil Pollution Emergency Plan
SPM	Single-Point Mooring
SPS	Subsea Production System
SSDI	Subsea Dispersant Injection
SSF	Small-Scale Fisher
StatsSA	Statistics South Africa
TAC	Total Allowable Catch
TAE	Total Allowable Effort
TBC	To Be Confirmed



<b>Abbreviation</b>	<b>Explanation</b>
TPL	Third-Party Liability
TTS	Temporary Threshold Shift
TSS	Temporary Threshold Shift
UN	United Nations
UNCLOS	United Nations Convention on Law of the Sea, 1982
UNESCO	United Nations Educational, Scientific and Cultural Organisation
TEEPSA	TotalEnergies Exploration and Production South Africa B.V.
US	United States
UV	Ultraviolet
V	Vulnerable
VME	Vulnerable Marine Ecosystem
VOC	Volatile Organic Compound
VSP	Vertical Seismic Profiling
VU	Vulnerable
WB	World Bank
WD	Water Depth
WBM	Water Based Mud
WML	Waste Management Licence
WMO	World Meteorological Organisation
WSP	WSP Group Africa (Pty) Ltd
XMT	Christmas Trees



## Units of Measure

Unit	Explanation
\$	Dollar
°C	Degree Centigrade
"	Inch = 2.54 cm
Bbl/d	Barrels per Day
CO <sub>2</sub> e	Carbon Dioxide Equivalent
CUI	Cubic Inch
dB	Decibel
dB(A)	Decibel average weighted
Dwt	Dead-Weight Tonnage
ft	Feet = 0.305 m
g/m <sup>2</sup>	Grams per Square Metre
GW	Gigawatt
ha	Hectare
Hz	Hertz
kg	Kilogram
km	Kilometre
km <sup>2</sup>	Square Kilometre
m	Metre
m <sup>3</sup>	Cubic Metre
m/s	Meters per Second
mamsl	Metres above mean sea level
mg	Milligrams
mg/l	Milligrams per Litre
mg/m <sup>2</sup> /day	Milligrams per square metre per day
ml/l	Milliliters per Liter
mm	Millimetre
MMstb	Millions of Standard Tank Barrels
MMscfd	Million Standard Cubic Feet per Day
Mt CO <sub>2</sub> -eq	Metric Tons of Carbon Dioxide Equivalent
MVA	Megavolt Amperes
MW	Megawatt
nm	Nautical Miles
ppm	Parts per Million
psi	Parts per Inch



Unit	Explanation
R	Rand
Sm <sup>3</sup> /d	Standard Cubic Meter per Day
t	Tons
t/a	Tons per Annum
t/month	Tons per Month
Tcf	Trillion Cubic Feet
TCO <sub>2e</sub>	Tonnes Of Carbon Dioxide Equivalent
%	Percentage
µg	Microgram
µg/m <sup>3</sup>	Micrograms per cubic metre
µm	Micrometre