

**PROPOSED EXPLORATION DRILLING IN
THE ORANGE BASIN DEEP WATER LICENCE
AREA OFF THE WEST COAST OF
SOUTH AFRICA**

PLAN OF STUDY FOR EIA

Prepared for:
Department of Environmental Affairs

On behalf of:
Shell South Africa Upstream B.V.

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1. INTRODUCTION

This Plan of Study for EIA is submitted in accordance with the requirements of Section 28(n) of the Environmental Impact Assessment (EIA) Regulations 2010, which states that the Scoping Report must include a Plan of Study for EIA which sets out the proposed approach to the environmental impact assessment of the application.

2. DESCRIPTION OF TASKS TO BE UNDERTAKEN IN THE EIA PHASE

If the Final Scoping Report (FSR) is accepted by the Department of Environmental Affairs (DEA), specialist studies will be undertaken at the commencement of the EIA Phase. Once the specialist studies have been completed they will be integrated into a Draft Environmental Impact Report (EIR). These tasks are discussed in more detail below and summarised in Figure 1.

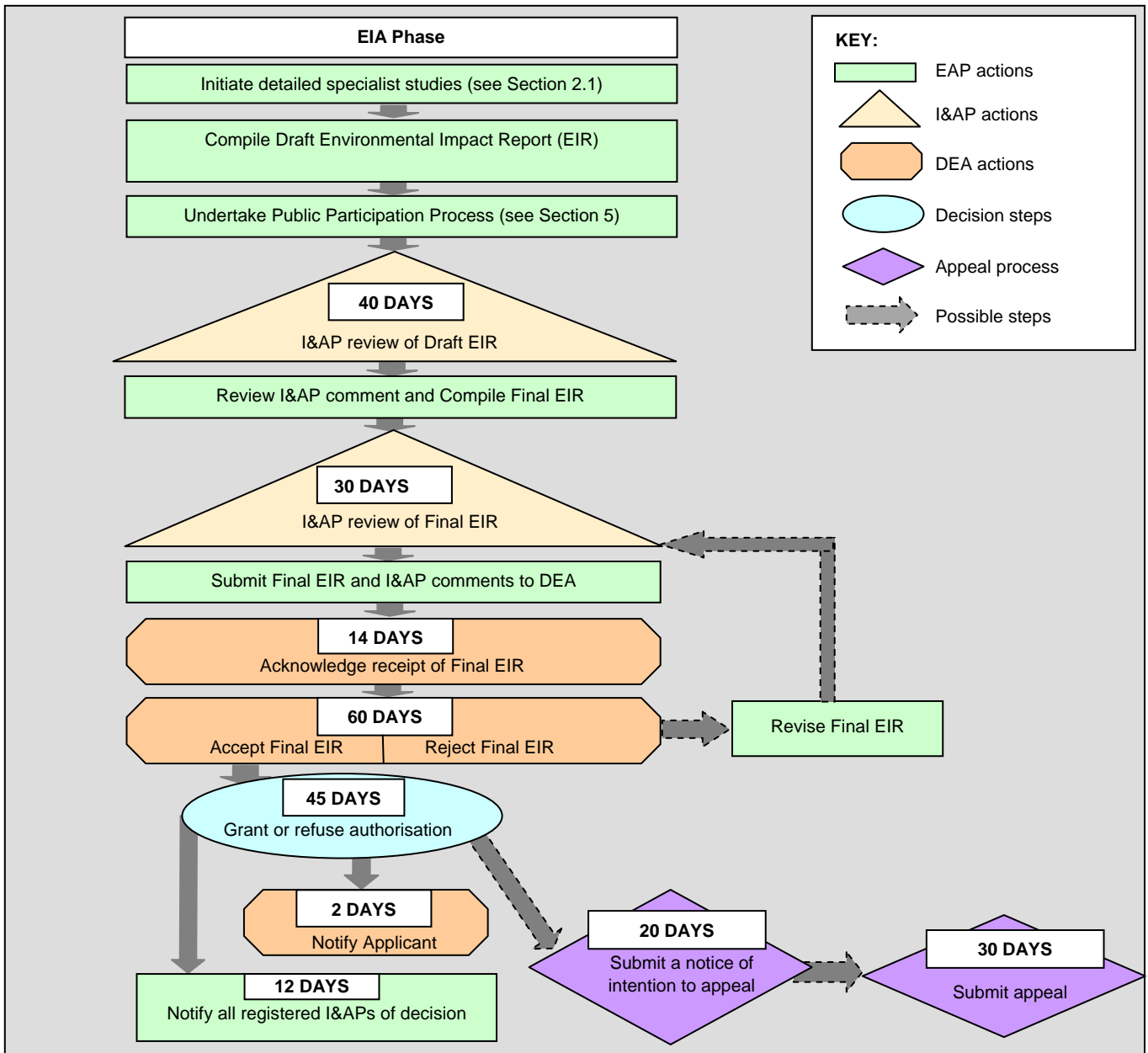


Figure 1: Tasks of the EIA phase.

2.1 SPECIALIST STUDIES

Three specialist studies will be undertaken to address key issues that require further investigation and detailed assessment. The specialist studies to be undertaken and the specialist details are presented in Table 1. The specialist Terms of Reference for these studies are presented in Sections 2.1.1 to 2.1.4.

Specialists would gather data that is relevant to identifying and assessing environmental impacts that may occur as a result of the proposed project. These impacts would be assessed according to pre-defined rating scales (see Section 3). Specialists would also recommend appropriate mitigation or control measures to minimise potential impacts or enhance potential benefits.

Table 1: List of specialist studies and specialists.

No.	Specialist study	Specialist/s	Qualifications	Company
1	Drill cuttings and oil spill modelling	Mr Stephen Luger	MSc (Engineering), University of Cape Town	Prestedge Retief Dresner Wijnberg (Pty) Ltd
2	Fishing	Mr Dave Japp	MSc (Ichthyology and Fisheries Science), Rhodes University	CapFish SA (Pty) Ltd
		Ms Sarah Wilkinson	BSc (Hons) (Botany), University of Cape Town	
3	Marine fauna	Dr Andrea Pulfrich	PhD (Fisheries Biology), Christian-Albrechts University, Kiel, Germany	Pisces Environmental Services (Pty) Ltd

2.1.1 GENERAL TERMS OF REFERENCE FOR THE SPECIALIST STUDIES

The following general terms of reference will apply, where applicable, to the specialist studies:

- Describe the baseline conditions that exist in the study area and identify any sensitive areas that would need special consideration;
- Review the Issues and Responses Trail to ensure that all relevant issues and concerns relevant to fields of expertise are addressed;
- Identify and assess potential impacts of the proposed operations;
- Identify areas where issues could combine or interact with issues likely to be covered by other specialists, resulting in aggravated or enhanced impacts;
- Indicate the reliability of information utilised in the assessment of impacts as well as any constraints to which the assessment is subject (e.g. any areas of insufficient information or uncertainty);
- Where necessary consider the precautionary principle in the assessment of impacts;
- Identify feasible ways in which impacts could be mitigated and benefits enhanced giving an indication of the likely effectiveness of such mitigation and how these could be implemented in the management of the proposed operation;
- To ensure that specialists use a common standard, the determination of the significance of the assessed impacts will be undertaken in accordance with a common Convention (see Section 3);
- Comply with DEA guidelines as well as any other relevant guidelines on specialist study requirements for EIAs;
- Include specialist expertise and a signed statement of independence; and
- Comply with Sections 17 and 32 of the EIA Regulations 2010, which specifies requirements for all specialist reports.

2.1.2 DRILL CUTTINGS AND OIL SPILL MODELLING

The specific terms of reference for the drill cuttings and oil spill modelling are as follows:

- Provide a description of the metocean conditions, such as winds and ocean currents in the licence area;
- Model the transport, dispersion and bottom deposition of drill cuttings discharged during drilling operations;
- Model the trajectory and fate of hydraulic fluid and diesel due to a small operational spill on the water surface at the drilling unit; and
- Model the trajectory and fate of crude oil due to a large blow-out spill at the wellhead on the seafloor.

2.1.3 MARINE FAUNAL ASSESSMENT

The specific terms of reference for the marine faunal assessment are as follows:

- Provide a general description of the local marine fauna and benthic biodiversity in the Orange Basin Deep Water Licence Area based on current available literature.
- Identify, describe and assess the significance of potential impacts of normal drilling operations and upset conditions (small accidental spills and large blow-out) on the local marine fauna. Impacts of normal drilling operations should focus particularly on the benthic environment, but including generic effects on cetaceans, turtles, seals, fish and pelagic invertebrates;
- Identify practicable mitigation measures to reduce the significance of any negative impacts and indicate how these can be implemented in the start-up and management of the proposed project.

2.1.4 FISHING INDUSTRY ASSESSMENT

The specific terms of reference for the fishing industry assessment are as follows:

- Provide a description of the fisheries sectors operating off the West Coast of South Africa;
- Undertake a spatial and temporal assessment of recent and historical fishing effort and catch in the proposed drilling area. Provide detailed maps delineating fishing grounds relative to the offshore Orange Basin Deep Water Block and proposed drilling site(s);
- Assess the risk of impact of the drilling activities on specific commercial fish species and the consequential implications for fish catch by the different fishing sectors;
- Assess the potential impacts of normal drilling operations (namely the proposed safety zones around the drilling unit) and upset conditions (small accidental spills and large blow-out) on the fishing activities in terms of estimated catch and effort loss; and
- Identify practicable mitigation measures to reduce any negative impacts on the fishing industry.

2.2 INTEGRATION AND ASSESSMENT

The specialist information and other relevant information will be integrated into a Draft EIR. The Draft EIR will be presented in a clear and understandable format, suitable for easy interpretation by Interested and Affected Parties (I&APs) and authorities. The specialist studies will be included as appendices to this report. The Draft EIR will be published for a 40-day I&AP comment period. The comment period will be advertised and all I&APs on the project database will be notified once the draft report is available for comment.

After closure of the comment period, the report will be updated into a Final EIR. Comments received on the Draft EIR will be incorporated into an Issues and Responses Trail that will be appended to the Final EIR. The Final EIR will be released for a further 30-day comment period. All I&APs on the project database will

be notified once the Final EIR is available for comment. After closure of the comment period, the Final EIR, including any comments received from I&APs on the Final EIR, will be submitted to DEA for consideration and decision-making.

The decision taken by DEA will be distributed to all I&APs on the project database as part of the statutory appeal period.

3. METHOD OF ASSESSING THE ENVIRONMENTAL ISSUES AND ALTERNATIVES

The marine faunal and fishing specialists will consider seven rating scales when assessing potential impacts. These include:

- Extent of impact;
- Duration of impact;
- Intensity of impact;
- Significance of impact;
- Status of impact;
- Probability of impact occurring; and
- Degree of confidence of assessment.

In assigning significance ratings to potential impacts before and after mitigation, specialists are instructed to follow the approach presented below:

- The core criteria for determining significance ratings are “extent” (Section 3.1), “duration” (Section 3.2) and “intensity” (Section 3.3). The preliminary significance ratings for combinations of these three criteria are given in Section 3.4.
- The status of an impact is used to describe whether the impact would have a negative, positive or zero effect of the surrounding environment. An impact may therefore be negative, positive (or referred to as a benefit) or neutral.
- Describe the impact in terms of the probability of the impact occurring (Section 3.5) and the degree of confidence in the impact predictions, based on the availability of information and specialist knowledge (Section 3.6).
- Additional criteria to be considered, which could “increase” the significance rating if deemed justified by the specialist, with motivation, are the following:
 - > Permanent / irreversible impacts (as distinct from long-term, reversible impacts);
 - > Potentially substantial cumulative effects; and
 - > High level of risk or uncertainty, with potentially substantial negative consequences.
- Additional criteria to be considered, which could “decrease” the significance rating if deemed justified by the specialist, with motivation, are the following:
 - > Improbable impact, where confidence level in prediction is high.
- When assigning significance ratings to impacts *after mitigation*, the specialist needs to:
 - > First, consider probable changes in intensity, extent and duration of the impact after mitigation, assuming effective implementation of mitigation measures, leading to a revised significance rating; and
 - > Then moderate the significance rating after taking into account the likelihood of proposed mitigation measures being effectively implemented. Consider:
 - Any potentially significant risks or uncertainties associated with the effectiveness of mitigation measures;

- The technical and financial ability of the proponent to implement the measure; and
- The commitment of the proponent to implementing the measure, or guarantee over time that the measures would be implemented.

The fundamental question in the assessment of impacts is “to whom are the impacts significant”. The significance ratings are based on professional scientific judgement criteria and inform decision-making from a scientific perspective. There may be instances, for particular impacts, where the significance ratings assigned by the specialists are deemed to be “low” or “very low”, but in the opinion and perspective of an individual are unacceptable and of high significance. To resolve potential differences in perspective, the importance which I&APs attach to impacts must be taken into consideration.

The relationship between the significance ratings after mitigation and decision-making can be broadly defined as follows:

Significance rating	Effect on decision-making
Very Low; Low	Would not have an influence on the decision to proceed with the proposed project, provided that recommended measures to mitigate negative impacts are implemented.
Medium	Should influence the decision to proceed with the proposed project, provided that recommended measures to mitigate negative impacts are implemented.
High; Very High	Would strongly influence the decision to proceed with the proposed project.

3.1 EXTENT

“Extent” defines the physical extent or spatial scale of the impact.

Rating	Description
LOCAL	Extending only as far as the activity, limited to the site and its immediate surroundings. Specialist studies to specify extent.
REGIONAL	West Coast. Specialist studies to specify extent.
NATIONAL	South Africa
INTERNATIONAL	

3.2 DURATION

“Duration” gives an indication of how long the impact would occur.

Rating	Description
SHORT TERM	0 - 5 years
MEDIUM TERM	6 - 15 years
LONG TERM	Where the impact would cease after the operational life of the activity, either because of natural process or human intervention.
PERMANENT	Where mitigation either by natural processes or by human intervention would not occur in such a way or in such time span that the impact can be considered transient.

3.3 INTENSITY

“Intensity” establishes whether the impact would be destructive or benign.

Rating	Description
ZERO TO VERY LOW	Where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.
LOW	Where the impact affects the environment in such a way that natural, cultural and social functions and processes continue, albeit in a slightly modified way.
MEDIUM	Where the affected environment is altered, but natural, cultural and social functions and processes continue, albeit in a modified way.
HIGH	Where natural, cultural and social functions or processes are altered to the extent that it will temporarily or permanently cease.

3.4 SIGNIFICANCE

“Significance” attempts to evaluate the importance of a particular impact, and in doing so incorporates the above three scales (i.e. extent, duration and intensity).

Rating	Description
VERY HIGH	Impacts could be EITHER: of high intensity at a regional level and endure in the long term ¹ ; OR of high intensity at a national level in the medium term ; OR of medium intensity at a national level in the long term .
HIGH	Impacts could be EITHER: of high intensity at a regional level and endure in the medium term ; OR of high intensity at a national level in the short term ; OR of medium intensity at a national level in the medium term ; OR of low intensity at a national level in the long term ; OR of high intensity at a local level in the long term ; OR of medium intensity at a regional level in the long term .
MEDIUM	Impacts could be EITHER: of high intensity at a local level and endure in the medium term ; OR of medium intensity at a regional level in the medium term ; OR of high intensity at a regional level in the short term ; OR of medium intensity at a national level in the short term ; OR of medium intensity at a local level in the long term ; OR of low intensity at a national level in the medium term ; OR of low intensity at a regional level in the long term .
LOW	Impacts could be EITHER of low intensity at a regional level and endure in the medium term ; OR of low intensity at a national level in the short term ; OR of high intensity at a local level and endure in the short term ; OR of medium intensity at a regional level in the short term ; OR of low intensity at a local level in the long term ; OR of medium intensity at a local level and endure in the medium term .
VERY LOW	Impacts could be EITHER of low intensity at a local level and endure in the medium term ; OR of low intensity at a regional level and endure in the short term ; OR of low to medium intensity at a local level and endure in the short term .

¹ For any impact that is considered to be “Permanent” apply the “Long-Term” rating.

Rating	Description
INSIGNIFICANT	Impacts with: Zero to very low intensity with any combination of extent and duration.
UNKNOWN	In certain cases it may not be possible to determine the significance of an impact.

3.5 STATUS OF IMPACT

The status of an impact is used to describe whether the impact would have a negative, positive or zero effect on the affected environment. An impact may therefore be negative, positive (or referred to as a benefit) or neutral.

3.6 PROBABILITY

“Probability” describes the likelihood of the impact occurring.

Rating	Description
IMPROBABLE	Where the possibility of the impact to materialise is very low either because of design or historic experience.
PROBABLE	Where there is a distinct possibility that the impact would occur.
HIGHLY PROBABLE	Where it is most likely that the impact would occur.
DEFINITE	Where the impact would occur regardless of any prevention measures.

3.7 DEGREE OF CONFIDENCE

This indicates the degree of confidence in the impact predictions, based on the availability of information and specialist knowledge.

Rating	Description
HIGH	Greater than 70% sure of impact prediction.
MEDIUM	Between 35% and 70% sure of impact prediction.
LOW	Less than 35% sure of impact prediction.

4. COMPETENT AUTHORITY CONSULTATION

DEA will be consulted at the following stages / steps during the EIA Phase:

- DEA will be notified of the release of the Draft EIR for review and comment*; and
- The Final EIR, together with any comments received on the Final EIR, will be submitted to DEA for consideration and decision-making*.

* Note: Two hard copies and two electronic copies (CD) of the Draft and Final EIR will be submitted to DEA for consideration.

5. PUBLIC PARTICIPATION PROCESS

Tasks that will be undertaken to ensure adequate public consultation during the EIA Phase includes the following:

- The Draft EIR will be published for a 40-day review / comment period. The following tasks will be undertaken in order to notify I&APs of the release of the Draft EIR:
 - > A notification letter (with an Executive Summary of the Draft EIR) will be sent to all I&APs on the project database to inform them of the release of the Draft EIR and where the full report can be reviewed.
 - > Copies of the Draft EIR will be made available on the CCA website and at the following venues:

Location	Name of Facility
Cape Town	Cape Town Central Library
Vredenburg	Vredenburg Library
Saldanha Bay	Saldanha Library
Lamberts Bay	Lamberts Bay Public Library
Kleinzee	Kleinzee Tourism Information Centre
Springbok	Matjieskloof Library
Springbok	Moberg Library
Springbok	Springbok Library
Port Nolloth	AJ Bekeur Library

- > The Draft EIR comment period will be advertised in the following newspapers:

Newspapers	Languages
Sunday Times	English and Xhosa
Rapport	Afrikaans
Cape Times	English and Xhosa
Die Burger	Afrikaans
Ons Kontrei	English, Afrikaans and Xhosa
Weslander	English, Afrikaans and Xhosa
Die Namakwalander	English, Afrikaans and Xhosa
Die Plattelander	English, Afrikaans and Xhosa

- > Posters indicating the availability of the Draft EIR and associated comment period will be erected at public libraries / municipal offices in Saldanha, Vredenburg, Lamberts Bay, Kleinzee, Port Nolloth and Springbok.
- Two open day and information-feedback meetings will be held in Cape Town and Saldanha Bay during the Draft EIR comment period.
- Feedback meetings will be held in the Northern Cape with local and district authorities in Springbok and potentially the Northern Cape Provincial Coastal Committee.
- The Final EIR will be released for a further 30-day review and comment period. Distribution and notification of the Final EIR (incl. letters and posters) would be as per the Draft EIR, except that no advertising would be undertaken.
- The decision taken by DEA will be advertised in the newspapers indicated above and distributed to all I&APs registered on the project database as part of the statutory appeal period.