

3 Impact Assessment Methodology

Table of Contents

3.1	Introduction.....	3-2
3.2	ESIA Process	3-2
3.2.1	Screening and Scoping.....	3-3
3.2.2	Impact Significance Assessment	3-3
3.2.3	Environmental Impacts.....	3-4
3.2.4	Socio- Economic Impacts.....	3-7
3.2.5	Environmental and Socio-Economic Impact Significance.....	3-8
3.3	Accidental, Transboundary and Cumulative Impacts.....	3-9
3.4	Mitigation and Monitoring	3-9

Table of Figures

Figure 3.1:	The ESIA Process.....	3-2
-------------	-----------------------	-----

Table of Tables

Table 3.1:	Event Magnitude Rankings	3-5
Table 3.2:	Receptor Sensitivity Rankings	3-7
Table 3.3:	Event Magnitude Rankings	3-7
Table 3.4:	Receptor Sensitivity Ranking	3-8
Table 3.5:	Impact Significance	3-8

3.1 Introduction

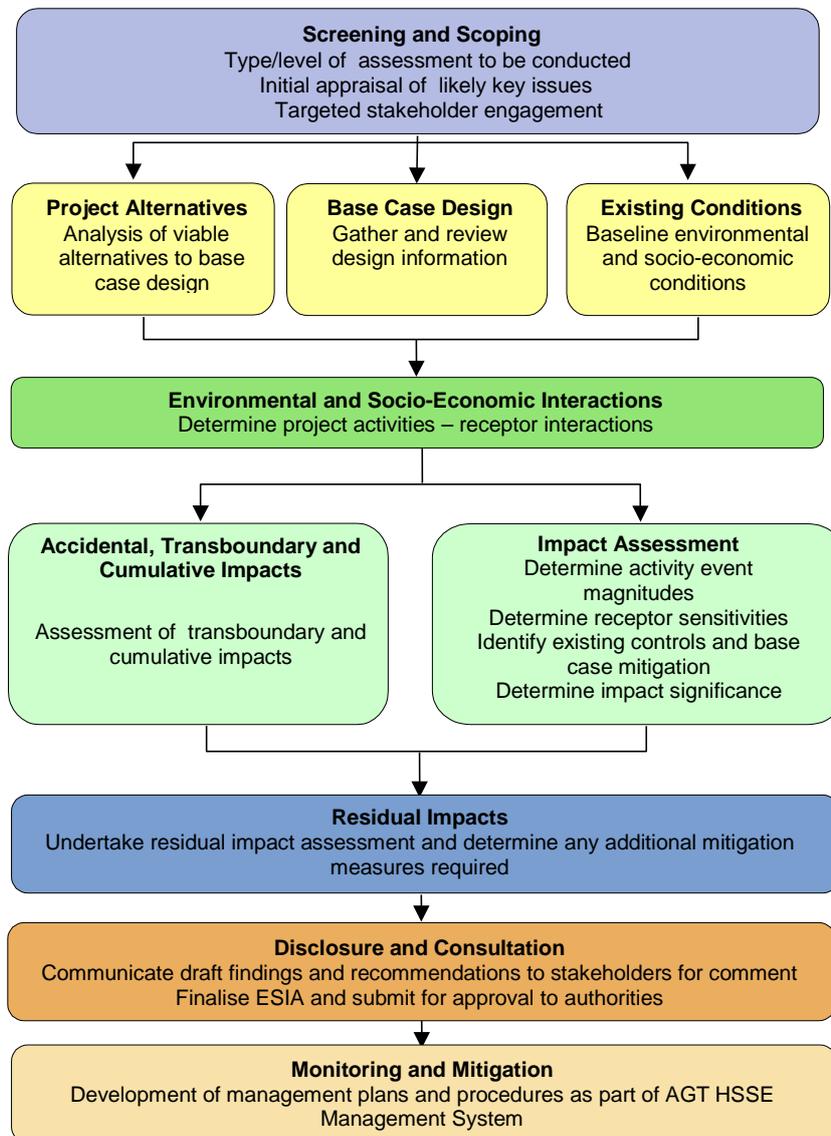
This Chapter of the Environmental and Socio-Economic Impact Assessment (ESIA) sets out the ESIA process adopted for the Shallow Water Absheron Peninsula (SWAP) 3D Seismic Survey and the methodology used to assess impact significance.

3.2 ESIA Process

The ESIA process constitutes a systematic approach to the evaluation of a project and its associated activities throughout the project lifecycle. The process (refer to Figure 3.1) includes:

- Screening and Scoping;
- Project Alternatives and Base Case Design;
- Existing Environmental and Socio-Economic Conditions;
- Impact Assessment;
- Residual Impact Identification;
- Disclosure and Stakeholder Consultation; and
- Monitoring and Mitigation.

Figure 3.1: The ESIA Process



3.2.1 Screening and Scoping

Screening is the first step in the assessment process. It confirms the need (or otherwise) for an ESIA by appraising the type of project and its associated activities throughout the project lifecycle in the context of its biophysical, socio-economic, policy and regulatory environments.

Given the location, scale and planned activities associated with the SWAP 3D Seismic Survey, and in line with the SWAP PSA and national legislation the requirement to complete an ESIA for the SWAP 3D Seismic Survey was identified. This is consistent with the approach taken for similar seismic surveys completed in the Azeri Chirag Gunashli (ACG), Shah Deniz (SD) and Shafag-Asiman Contract Areas, which are all operated by BP and located in the Azerbaijani sector of the Caspian Sea. The scope of the ESIA was agreed with the Ministry of Ecology and Natural Resources (MENR) at a scoping meeting held in August 2015 (refer to Chapter 7 for further details).

Scoping is a high level assessment of anticipated **interactions** between **project activities** and **environmental and socio-economic receptors**¹. Its purpose is to focus the assessment on key issues and eliminate certain activities from the full impact assessment process based on their limited potential to result in discernible impacts. To arrive at a conclusion to 'scope out' an activity/event, a mixture of expert scientific judgement based on prior experience of similar activities and events and, in some instances, scoping level quantification/numerical analysis (e.g. emission and discharge modelling) is used.

The SWAP 3D Seismic Survey Scoping process has included:

- Review of available environmental and socio-economic data and reports relevant to the area potentially affected by the SWAP 3D Seismic Survey activities;
- Primary and secondary environmental and social baseline data collected during the SWAP 3D Seismic Survey Project ESIA process; and
- Liaison with the SWAP 3D Seismic Survey Project Team to gather data and to formulate an understanding of project activities.

Based on the findings of the review and data gathering, the SWAP 3D Seismic Survey ESIA Team identified potential project related environmental and socio-economic impacts based on likely interactions between seismic survey activities and environmental/socio-economic receptors. In addition the Team identified gaps where the extent, depth and/or quality of available environmental, socio-economic and/or technical data at the scoping stage was insufficient for the SWAP 3D Seismic Survey Project ESIA process. This allowed the scope of the work required to complete the ESIA to be confirmed. Further information on data collection and consultation undertaken during the ESIA preparation is provided within Chapter 7 of this ESIA.

3.2.2 Impact Significance Assessment

An **impact**, as defined by the international standard ISO14001:2015 is:

"Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects".

Where an **environmental aspect** is defined as:

"Element of an organisation's activities or products or services that can interact with the environment".

An impact is defined where an interaction occurs between a project activity and an environmental receptor. The ESIA process ranks impacts according to their **significance** determined by considering project activity **event magnitude** and **receptor sensitivity**. Determining event magnitude requires the identification and quantification (as far as practical) of the sources of potential environmental and socio-economic effects from routine and non-routine project activities. Determining receptor sensitivity requires an understanding of the biophysical and human environment.

¹ For the purpose of this assessment, a receptor is considered an aspect of the existing biophysical and social environment (i.e. air, water, land, sediments, habitats, communities, etc.) that is affected by or interacts with the project activities.

The approach to evaluating the significance of potential environmental and socio-economic impacts is set out in the sections below. It should be noted that impact significance is assessed taking into account existing control measures that are incorporated into the project design.

Impacts can be positive or negative depending on whether they result in a beneficial or adverse change when compared to baseline conditions.

3.2.3 Environmental Impacts

3.2.3.1 Method for Determining Event Magnitude

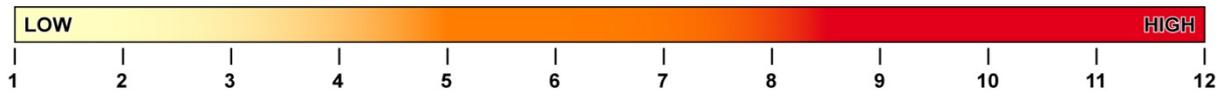
Event magnitude is determined based on the following parameters, which are equally weighted and are each assigned a rating of 1, 2, or 3:

- **Extent / Scale:** Events range from those where the effect extends across an area:
 - 1 – Near to the source² (in the range tens to hundreds of metres); to
 - 2 – At intermediate distance from the source (in the range hundreds to thousands of metres); to
 - 3 – At far distance from the source (in the range thousands of metres and above) .
- **Frequency:** Events range from those occurring:
 - 1 – Once or twice; to
 - 2 - Repeatedly but intermittently; to
 - 3 – Frequently and persistently.
- **Duration:** Events range from those where effects occur over :
 - 1 – Instantaneous/short term (i.e. hours to days); to
 - 2 - Medium term (between a week and 3 months); to
 - 3 - Long term (more than 3 months to permanent).
- **Intensity:** Concentration³ of an emission or discharge with respect to standards of acceptability that include applicable legislation and international guidance, its toxicity or potential for bioaccumulation, and its likely persistence in the environment. And degree/permanence of disturbance or physical impact (e.g. disturbance to species, loss of habitat or damage to cultural heritage). Ranges from:
 - 1 - A low intensity event; to
 - 2 - A moderate intensity event; to
 - 3 - A high intensity event.

² For the purpose of this assessment, it is understood as source the origin place for operational emissions and discharges, including underwater sound (seismic array), vibrations (seismic source), atmospheric emissions and light emissions (vehicles and vessels) and marine discharges (vessels).

³ In the case of underwater sound this parameter relates to peak sound pressure level or sound energy level depending on the criteria selected

Overall, event magnitude is scored from low (1) to high (12) by adding the individual parameter scores:



Resulting individual ratings are summed to give the overall event magnitude ranking. Table 3.1 presents the score ranges for magnitude rankings of Low, Medium and High.

Table 3.1: Event Magnitude Rankings

Event Magnitude	Score (Summed Parameter Rankings)
Low	4
Medium	5-8
High	9-12

3.2.3.2 Method for Determining Receptor Sensitivity

Receptor sensitivity considers the type of receptor (namely, biological/ecological, human and physical receptor/feature); and is determined based on the following parameters, which are equally weighted and are each assigned a rating of 1, 2, or 3:

- Biological/Ecological Receptors:

Presence ranges from:

3 – Internationally threatened species⁴/protected area within the area impacted by the project activities during period of high sensitivity (e.g. during breeding, spawning or nesting) and during routine or reliably predictable peak presence; to

2 - Internationally threatened species⁴/protected area within the area impacted by the project activities outside of period of high sensitivity or during routine or reliably predictable peak presence.

Internationally near threatened species⁵ within the area impacted by the project activities during period of high sensitivity (e.g. during breeding, spawning or nesting) and/or during routine or reliably predictable peak presence.

Nationally protected species and/or species which are of importance to the local and regional ecosystem within the area impacted by the project activities.

1 - Presence of species which is none of the above.

Resilience (to the identified stressor) ranges from:

3 - Species and/or population which has little or no capacity to absorb or adapt to change (i.e. little or no capacity to move away from or adapt to the project impact), leading to potential for substantial change of character and/or loss of ecological functionality.

⁴ IUCN Red List Classification of Critically Endangered, Endangered or Vulnerable

⁵ IUCN Red List Classification of Near Threatened

2 - Species and/or population which has moderate capacity to absorb or adapt to change (i.e. has capacity to move away from or adapt to the project impact), leading to potential temporary but sustainable effect which does not substantially alter character or result in significant loss of ecological functionality.

1 - Species and/or population has high capacity to absorb or adapt to change (i.e. has capacity to move away from or adapt to the project impact), and is potentially unaffected or marginally affected.

- Human Receptors:

Presence ranges from:

3 - People being permanently present (e.g. residential property) in the geographical area of anticipated impact; to

2 - People being present some of the time (e.g. commercial property); to

1 - People being uncommon in the geographical area of anticipated impact.

Resilience (to the identified stressor) ranges from:

3 - Most vulnerable groups (i.e. ambient conditions such as air quality are at or above adopted standards); to

2 - People being vulnerable to change or disturbance (i.e. ambient conditions such as air quality are below adopted standards); to

1 - People being least vulnerable to change or disturbance (i.e. ambient conditions such as air quality are well below applicable legislation and international guidance).

- Physical Receptors/Features:

Presence (to the identified stressor) ranges from:

3 - Presence of feature which has, in reverse order, national or international value (e.g. state protected monument); to

2 – Feature with local or regional value and is sensitive to disturbance; to

1 - Feature which is none of the above.

Resilience (to the identified stressor) ranges from:

3 – Highly vulnerable (i.e. potential for substantial damage or loss of physical integrity);

2 – Undergoes moderate but sustainable change which stabilises under constant presence of impact source, with physical integrity maintained; and

1 – Feature/receptor is unaffected or marginally affected (i.e. resilient to change);

Overall, receptor sensitivity is then scored on a scale from low (1) to high (6) by adding the individual parameter scores:



Table 3.2 presents the score ranges for sensitivity rankings of Low, Medium and High.

Table 3.2: Receptor Sensitivity Rankings

Receptor Sensitivity	Score (Summed Parameter Rankings)
Low	2
Medium	3-4
High	5-6

3.2.4 Socio- Economic Impacts

The socio-economic impact assessment uses a semi-qualitative assessment approach to describe and evaluate potential impacts based on the event magnitude and receptor sensitivity rankings set out in Tables 3.3 and 3.4 respectively. Indirect socio-economic impacts (i.e. induced effects) will also be assessed using a similar approach.

Table 3.3: Event Magnitude Rankings

Magnitude	Criteria
Low	<p>Changes in social, economic or cultural dynamics with slight and temporary effect on any given sector performance and/ or population wellbeing. These impacts are unlikely to result in concerns being raised by governmental bodies or stakeholders.</p> <p>Events may include:</p> <ul style="list-style-type: none"> • Minor disruption to livelihoods or living conditions resulting in a localised, reversible and temporary nuisance. • Temporary disruption to businesses that does not result in a loss of revenue or any reputational damage. • No change in the health status of local communities. • Temporary disruption to public infrastructure (such as a road closure) that results in minor inconveniences to affected communities.
Medium	<p>Changes in social, economic or cultural dynamics with moderate and noticeable adverse effect on any given sector performance and/or population wellbeing. Such impact may result in concerns being raised by governmental bodies or stakeholders.</p> <p>Events may include:</p> <ul style="list-style-type: none"> • Negative change in livelihood status, household assets/income or living conditions. • Temporary disruption to businesses resulting in a small drop in business revenue. • Increased risk to public health that can be controlled using detailed mitigation measures. • Disruption to public infrastructure (such as a road closure, or failure of a sewer) that results in an inconvenience to other users.
High	<p>Changes in social, economic or cultural dynamics with major adverse effect on any given sector performance and/or population wellbeing. Such impacts may result in immediate intervention by governmental bodies and stakeholders.</p> <p>Events may include:</p> <ul style="list-style-type: none"> • Negative change in livelihood status, household income/assets or living conditions affecting a high proportion of people resulting in economic loss and protests against the project. • Reputational damage and/or drop in business revenue that threatens the future viability of the economic activity. • Increased risk to public health leading to a fatality or injury to a member of a community. • Damage to public infrastructure (such as a sewer, regional water pipeline, etc.) leading to environmental or socio-economic impacts to other users.

Table 3.4: Receptor Sensitivity Ranking

Sensitivity	Criteria
Low	<p>Receptor sensitivity is considered low when there is a moderate to high capacity and means to adapt to a given change and maintain / improve quality of life.</p> <p>Receptors of low sensitivity may include:</p> <ul style="list-style-type: none"> • Individuals who are able to quickly adapt to temporary disruption in their living conditions, livelihood status or a change in the status of public infrastructure (such as a road closure). • Businesses with a robust economic model that are able to adapt easily to any restrictions placed upon their activities, or who are able to gain economically from such changes.
Medium	<p>Receptor sensitivity is considered medium when there is limited capacity and means to adapt to a given change and maintain / improve quality of life.</p> <p>Receptors of medium sensitivity may include:</p> <ul style="list-style-type: none"> • Individuals who rely heavily on their livelihood to maintain their socio-economic status and have a limited ability to adapt to change. • Businesses that have a limited ability to adapt to change and are sensitive to any reduction in economic revenue or reputation.
High	<p>Receptor sensitivity is considered high in the case of vulnerable receptors, who have little capacity and means to adapt to a given change and maintain / improve quality of life (e.g. homeless people, Internally Displaced Persons community in temporary accommodation, people with low access to recourse (e.g. no land titles), people with no or low representation (e.g. migrants, seasonal herders with no permanent assets in the area).</p> <p>Receptors of high sensitivity may include:</p> <ul style="list-style-type: none"> • Individuals with a marginal livelihood, low socio-economic income or poor quality living conditions. • Individuals who are vulnerable due to their age, disability or other reason and who may require special assistance during engagement activities associated with the 3D seismic survey. • Businesses with a marginal economic existence which are not able to easily adapt to change.

3.2.5 Environmental and Socio-Economic Impact Significance

For both Environmental and Socio-Economic Impacts, impact significance, as a function of event magnitude and receptor sensitivity, is ranked as **Negligible**, **Minor**, **Moderate** or **Major** as presented in Table 3.5.

Table 3.5: Impact Significance

		Receptor Sensitivity		
		Low	Medium	High
Event Magnitude	Low	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	High	Moderate	Major	Major

Any impact classified as **Major** is considered to be significant and, where the impact is **negative**, requires additional mitigation. Impacts of **Negligible**, **Minor** or **Moderate** significance are considered as being mitigated as far as practicable and necessary, and therefore, do not require further mitigation.

3.3 Accidental, Transboundary and Cumulative Impacts

In addition to assessing impacts associated with the routine SWAP 3D Seismic Survey activities the following will also be assessed:

- **Impacts from Accidental Events:** Impacts that arise as a result of a technical failure, human error or as a result of natural phenomena such as a seismic event.
- **Transboundary Impacts:** Defined as impacts that occur outside the jurisdictional borders of a project's host country.
- **Cumulative Impacts:** While an impact may be relatively small when considering the project or activity on its own, it may be magnified in combination with impacts from other projects and activities; these combined effects are known as 'cumulative' impacts.

Cumulative impacts may arise from the following:

1. **Interactions between separate project-related residual impacts** this could include the effect of multiple project environmental interactions (e.g. underwater sound, discharges, physical disturbance from vessel movements) on a single receptor or habitat with the resultant effect being greater than each individual impact in isolation; and
2. **Interactions between project-related residual impacts in combination with impacts from other projects and their associated activities within the same area of influence** This effect can occur as a result of the combined impacts of a number of projects, which individually might not be significant, but when considered together could create a significant cumulative effect on a single receptor or habitat.

The steps taken to undertake the cumulative impact assessment presented in Chapter 10 comprise the following:

- Identify other known projects and activities within the vicinity of the SWAP 3D Seismic Survey where there is potential for cumulative impacts;
- Define the spatial (i.e. impacts are so close in space that their effects overlap) and temporal (i.e. impacts are so close in time that the effect of one is not dissipated before the next one occurs) scope of the assessment;
- Assess potential cumulative impacts to the environmental and socio-economic receptors potentially affected by the SWAP 3D Seismic Survey and the cumulative projects identified; and
- Where required, define measures to avoid, reduce, or mitigate any potentially significant cumulative impacts to the extent possible.

The significance of accidental, transboundary and cumulative impacts are assessed using a qualitative analysis of impacts.

3.4 Mitigation and Monitoring

The iterative and integrated nature of the ESIA and project planning processes means that the majority of proposed additional mitigation measures and strategies have been incorporated into the project and integrated into the design of the 3D Seismic. These measures / strategies have included mitigation measures and ongoing commitments as previously adopted by other projects (including other seismic surveys) in the AGT Region.

The ESIA will be submitted for review and comment to the MENR who will have an opportunity to make comments on the findings (refer to Chapter 7, Section 7.6), including suggestions for additional mitigation measures to those already committed to in this ESIA associated with project activities. If deemed appropriate, such mitigation measures will be added to the 3D Seismic Survey design and/or management programme.