ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT (ESIA) FOR PRINOS OFFSHORE DEVELOPMENT PROJECT

Chapter 9 Environmental and Social Scoping

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ABBREVIATIONS

EBRD	European Bank for Reconstruction and Development
EC	European Commission
EIA	Environmental Impact Assessment
ENERGEAN	Energean Oil & Gas S.A.
ESIA	Environmental & Social Impact Assessment
EU	European Union
GHG	Green House Gas
MARPOL	Marine Pollution
MD	Ministerial Decision
PR	Performance Requirements
SEP	Stakeholder Engagement Plan
SIP	Self Installing Platfrom

9 ENVIRONMENTAL AND SOCIAL SCOPING

9.1 INTRODUCTION

The overall objective of carrying out the scoping exercise is to determine the key parameters, which may require additional attention during the preparation of the ESIA. The purposes include

- To identify the key environmental issues and potential impacts associated with each of the project phases;
- To share this information along with project specifics, with the relevant identified stakeholders, in order to make sure the identified issues are reflecting the true nature of issues on the ground and in case there are any further to be included in the assessment conducted in the framework of the ESIA.

While carrying out scoping for the ESIA is not obligatory in the Greek legislative system, nothing precludes this step being undertaken (as it has in this assessment).

The current Greek legislative framework prescribes analytical both the screening process and the scoping stages by:

- Classifying all projects and activities as per the type / capacity / population served / etc (screening process), with MD 1958/2012 and
- Setting out analytical specifications for all categories / classes of projects and activities, with MD 170225/2014.
- Specialising particular requirements in the cases that project falls within protected areas or fall within particular Directives (IPPC, Offshore Directive, etc) and defining the baseline studies required to be performed within the framework of the ESIA.

It is noted, that the Greek legislative framework, is fully harmonised with all relevant EU Directives and therefore the provisions set out by the aforementioned legislative acts, are fully in line with the EU policies. In particular, with regards to the provisions of Article 5(2) of Directive 97/11/EC, which requires the Member State (MS) to implement a procedure whereby, at a minimum, developers can ask competent authorities for advice on the information to be submitted under the EIA procedure. This procedure has been defined by Article 2 of L.4014/2011, where the scoping report (in particular Preliminary Determination of Environmental Requirements), is foreseen as part of a **voluntary procedure**. Moreover the specifications of the scoping report, of have been defined in Annex 1 of the MD 170225/2014 for the cases that the project developer, wishes to follow this.

Although, the voluntary procedure of the scoping stage was chosen not to be followed, Energean has decided to perform a scoping exercise in order to

- Be in line with international best practices and EBRD's PRs;

- Identify environmental and social impacts potentially associated with the Project which should be considered in the ESIA,
- Inform and consult with stakeholders discuss with them:
  - ⇨ The baseline information (including the existing facilities environmental and social issues) and the story of the company in the area over the last three decades;
  - ⇨ The company plans for further development;
  - ⇨ The relevant legislative requirements as those arise from national, EU and EBRD standards;
  - ⇨ The methodology of the ESIA assessment;
  - ⇨ The specialist studies to be conducted in the framework of the ESIA as well as the overall designing of the new planned developments

Scoping activities involved meetings key institutional stakeholders identified during the development of the Stakeholder Engagement Plan (SEP) and are described in more detail in the SEP.

In the following chapters, the main environmental and social impacts are considered in terms of their significance and mitigation measures required to avoid, reduce, offset or compensate the impacts

9.2 IDENTIFICATION OF KEY ENVIRONMENTAL AND SOCIAL IMPACTS

In the following chapter, a primary environmental scoping exercise was done, for both routine and unplanned events.

The methodology used, included the following steps:

- Identification of the distinct project activities, for each phase of the project, that could potentially cause an interaction with the physical, biological or social environment;
- Identification of the potential receptors types present in the project area. Receptors were identified for the physical, biological, and social environment, considering both marine and terrestrial receptor types.
- The preparation of a matrix, which lists the project activities against the potential affected receptor types;
- A workshop with the ESIA team and Energean where each project activity was systematically evaluated for potential interactions with receptors. Any potential interactions were classified as ‘positive’, ‘scoped out’ or ‘Scoped in’.
- For those interactions that were ‘scoped out’ from further assessment, the supporting rationale is provided in this Chapter.
- For any positive impacts or ‘scoped in’ interactions, a detailed assessment of potential impacts is provided in Chapter 11.

- Discussion of a similar (simplified) matrix with stakeholders to make sure they are also involved in the process (as further described in the SEP, Annex 11).

The developed matrix is presented in the following tables, whereas the justification of the scoping out of particular activities is further given below as per environmental parameter.

Table 9-1: Scoping – interaction table during construction phase

Activity		Marine											Terrestrial								Social									
		Physical				Biological							Physical					Biological												
Construction phase																														
		Water quality	Sediment quality	Seabed features	Underwater noise	Benthic habitats	Coastal marine habitat	Plankton	Fish ecology	Marine mammals	Sea-coastal birds	Protected areas	Soils & landscape	Surface & groundwater	Air quality	Global climate	Airborne noise	Flora species	Fauna species	Protected areas	Fisheries (commercial / subsistence)	Tourism	Other livelihoods	Marine traffic	Cultural heritage	Workforce	Community health & safety	Infrastructure & services	Community cohesion
Routine activities	Transport of components and final SIP assembly at a deep-water quay																													
	Onshore fabrication of pipeline (including possible changes to breakwater, levelling and bringing to sea																													
	Transport SIP to site																													
	Installation of permanent mooring																													
	Leg lowering and suction anchor installation																													
	Topside jack-up																													
	Installation of pipelines and umbillicals																													
	Burial of pipelines and umbilicals																													
	Operation of support vessels																													
	Establishment and enforcement of safety exclusion zone including the placement of marker buoys																													
	Maintenance of an offshore workforce																													
	Modification to Delta (new risers / J-tubes)																													

Activity		Marine											Terrestrial								Social										
		Physical				Biological							Physical					Biological													
Construction phase																														
		Water quality	Sediment quality	Seabed features	Underwater noise	Benthic habitats	Coastal marine habitat	Plankton	Fish ecology	Marine mammals	Sea-coastal birds	Protected areas	Soils & landscape	Surface & groundwater	Air quality	Global climate	Airborne noise	Flora species	Fauna species	Protected areas	Fisheries (commercial / subsistence)	Tourism	Other livelihoods	Marine traffic	Cultural heritage	Workforce	Community health & safety	Infrastructure & services	Community cohesion
Unplanned	Worst case unplanned event (damage to Delta platform leading to large oil spill)																													

LEGEND:

No interaction	
Scoped out – possible low level interaction	
Scoped in – definite interaction, potentially significant	
Positive interaction	

Table 9-2: Scoping – interaction table during operation phase

Activity		Marine											Terrestrial								Social									
		Physical				Biological							Physical					Biological												
Operation phase																														
		Water quality	Sediment quality	Seabed features	Underwater noise	Benthic habitats	Coastal marine habitat	Plankton	Fish ecology	Marine mammals	Sea-coastal birds	Protected areas	Soils & landscape	Surface & groundwater	Air quality	Global climate	Airborne noise	Flora species	Fauna species	Protected areas	Fisheries (commercial / subsistence)	Tourism	Other livelihoods	Marine traffic	Cultural heritage	Workforce	Community health & safety	Infrastructure & services	Community cohesion
Routine activities	Maintenance of exclusion zones																													
	Mooring of Energean Force																													
	Installation of conductors (new wells only)																													
	Spuding and drilling of wells, including cementing of initial casings																													
	Seabed cuttings disposal (0-400m)																													
	Cuttings treatment and disposal (400-3,150m)																													
	Construction of flow lines																													
	Water injection																													
	Gas lift																													
	Injection of chemicals																													
	Use and handling of hazardous materials																													
	Maintenance flaring																													
	Disposal of produced water to sea at Delta																													
	Stormwater discharge to sea																													
	Natural resource usage (indirect form grid use)																													

Activity		Marine											Terrestrial								Social									
		Physical				Biological							Physical					Biological												
Operation phase																														
		Water quality	Sediment quality	Seabed features	Underwater noise	Benthic habitats	Coastal marine habitat	Plankton	Fish ecology	Marine mammals	Sea-coastal birds	Protected areas	Soils & landscape	Surface & groundwater	Air quality	Global climate	Airborne noise	Flora species	Fauna species	Protected areas	Fisheries (commercial / subsistence)	Tourism	Other livelihoods	Marine traffic	Cultural heritage	Workforce	Community health & safety	Infrastructure & services	Community cohesion
	Any ballasting / deballasting																									+			
	Maintenance of an offshore workforce																									+			
	Operation of Energean Force																									+			
	Operation of support vessels																									+			
Unplanned	Worst case unplanned event (loss of well control with large oil spill, leak from pipeline or spill from loading point)																									+			

LEGEND:

No interaction	
Scoped out – possible low level interaction	
Scoped in – definite interaction, potentially significant	
Positive interaction	

Table 9-3: Scoping – interaction table during abandonment phase

Activity		Marine											Terrestrial								Social									
		Physical				Biological							Physical					Biological												
Abandonment phase																														
		Water quality	Sediment quality	Seabed features	Underwater noise	Benthic habitats	Coastal marine habitat	Plankton	Fish ecology	Marine mammals	Sea-coastal birds	Protected areas	Soils & landscape	Surface & groundwater	Air quality	Global climate	Airborne noise	Flora species	Fauna species	Protected areas	Fisheries (commercial / subsistence)	Tourism	Other livelihoods	Marine traffic	Cultural heritage	Workforce	Community health & safety	Infrastructure & services	Community cohesion
Routine activities	Mobilize light work over rig to sites																													
	Plug wells																													
	Sever conductors																													
	Operation of support vessels																													
	Maintenance of an offshore workforce																													
	Clean and leave pipelines in situ																													
	Disposal of pipeline rinse water to sea at Delta																													
	Anchoring of support vessels / barge																													
	Existing platforms																													
	Dispersal of drill cuttings from piles																													
	Removal of topside																													
	Cut piles																													
	Remove jacket																													
	Onshore deconstruction																													
	New platforms																													
	Removal of SIP																													
	Reuse																													

Activity		Marine											Terrestrial								Social									
		Physical				Biological							Physical					Biological												
Abandonment phase																													
		Water quality	Sediment quality	Seabed features	Underwater noise	Benthic habitats	Coastal marine habitat	Plankton	Fish ecology	Marine mammals	Sea-coastal birds	Protected areas	Soils & landscape	Surface & groundwater	Air quality	Global climate	Airborne noise	Flora species	Fauna species	Protected areas	Fisheries (commercial / subsistence)	Tourism	Other livelihoods	Marine traffic	Cultural heritage	Workforce	Community health & safety	Infrastructure & services	Community cohesion
Unplanned	Worst unplanned event (localised spill)																												

LEGEND:

No interaction	
Scoped out – possible low level interaction	
Scoped in – definite interaction, potentially significant	
Positive interaction	

9.2.1 Routine activities

9.2.1.1 Climate & bioclimate characteristics

Following the aforementioned scoping exercise, it was identified that no interaction or serious concern has been identified from the activities that could potentially adversely impact the climatic and bioclmatic characteristics.

The justification of the scoping in / out is provided below per project phase.

Construction phase

- Transport of components and final SIP assembly at a deep-water quay was scoped out since although emissions of GHGs will be generated from vessel operation, it is expected that those will be small and thus will not significantly contribute to any climate change. GHG emissions from the project have been quantified for all phases of the project to support this.
- Onshore fabrication of pipelines (including possible changes to breakwater, levelling and bringing to sea) was scoped out since although some combustion emissions (e.g. CO_2) from equipment and vehicles are expected to be produced during this activity, they are expected to be rather small and dispersion will be localized. Given the limited duration, extent and scale, potential impacts to climate change are considered negligible
- Operation of support vessels was also scoped out since although emissions of GHGs will be generated from vessel operation, it is expected that those will be small and thus will not significantly contribute to any climate change. GHG emissions from the project have been quantified for all phases of the project to support this.

Operation phase

- Activities including the operation of Energean Force are scoped out since the rig is not self-propelled and therefore does not emit combustion emissions.
- Operation of support vessels was also scoped out since although emissions of GHGs will be generated from vessel operation, it is expected that those will be small and thus will not significantly contribute to any climate change. GHG emissions from the project have been quantified for all phases of the project to support this.

Abandonment phase

- Activities to mobilise work over rig to sites were scoped out since although emissions of GHGs will be generated from vessel operation, it is expected that those will be small and thus will not significantly contribute to any climate change. GHG emissions from the project have been quantified for all phases of the project to support this.
- Operation of support vessels was also scoped out since although emissions of GHGs will be generated from vessel operation, it is expected that those will be small and thus will not significantly contribute to any climate change. GHG emissions from the project have been quantified for all phases of the project to support this.

9.2.1.2 Morphological and topological characteristics

Following the aforementioned scoping exercise, it was identified that no interaction or serious concern has been identified from the activities that could potentially adversely impact the morphological and topological characteristics.

Construction phase

- Activities related the onshore fabrication of pipeline (including possible changes to breakwater, levelling and bringing to sea), were scoped out since the levelling activities are expected to be small scale and not significantly altering the landscape.

Operation phase

- Installation of conductors (for new wells only), was scoped out since although the activity is expected to change seabed features in the area immediately surrounding the conductors, the extend will be very localized and thus this is not considered to be a significant impact.

Abandonment phase

- Sever conductors, was scoped out since although the activity is expected to change seabed features in the area immediately surrounding the conductors, the extend will be very localized and thus this is not considered to be a significant impact.
- Anchoring of support vessels / barge was scoped out since although the activity is expected to change seabed features in the area where anchors will be dropped, the extend will be very localized and thus this is not considered to be a significant impact.
- Cutting piles on the existing platforms was scoped out since although the activity is expected to change seabed features in the area surrounding the piles, the extend will be very localized and thus this is not considered to be a significant impact.

9.2.1.3 Geological, tectonic and pedological characteristics

Following the aforementioned scoping exercise, it was identified that no interaction or serious concern has been identified from the activities that could potentially adversely impact the geological, tectonic and pedological characteristics.

The justification of the scoping in / out is provided below per project phase.

Construction phase

- Leg lowering and suction anchor installation was scoped out, since although it is expected to cause temporary disruption to the seabed/sediment in the vicinity of the platform through mixing with the water column, in practice the overall nature of the sediment is not expected to change and no impacts are therefore predicted to sediment quality.
- Installation of pipelines and umbillicals were scoped out since although it they are expected to cause temporary disruption to the seabed/sediment in the vicinity of the

pipeline and umbilicals through localized mixing with the water column, the overall nature of the sediment is not expected to change and no impacts are therefore predicted to sediment quality.

- Burial of pipelines and umbillicals was scoped out since although it is expected to cause temporary disruption to the seabed/sediment in the vicinity of the pipeline and umbilicals through localized mixing with the water column, overall nature of the sediment is not expected to change and no impacts are therefore predicted to sediment quality.
- Modifications activities to Delta (new rises / J-tube) were scoped out, since although they are expected to cause temporary disruption to the seabed/sediment in the vicinity of the platform through localized mixing with the water column, the overall nature of the sediment is not expected to change and no impacts are therefore predicted to sediment quality.

Operation phase

- Activities related to the installation of conductors (new wells only) were scoped out, since although they are expected to cause temporary disruption to the seabed/sediment in the vicinity of the platform(s) through localized mixing with the water column, the overall nature of the sediment is not expected to and no impacts are therefore predicted to sediment quality.

Abandonment phase

- Activities relating to plugging wells were scoped out, since although they are expected to cause temporary disruption to the seabed/sediment in the immediate vicinity of the wells through the introduction of cement at the well, the only sediment affected by this activity will be that in the immediate vicinity of the well. Given this very limited extent, the physical change in sediment quality at the wells sites is not considered to be a significant impact.
- Sever conductors was scoped out, since although it is expected to cause temporary disruption to the seabed/sediment in the vicinity of the platform(s) through localized mixing with the water column, the overall nature of the sediment will not be changed and no impacts are therefore predicted to sediment quality.
- Disposal of pipeline rinse water to sea at Delta was scoped out, since this will be routed to the existing treatment system at Delta platform. Following treatment, water will be discharged at the seabed near Delta platform. Because the existing treatment system is monitored prior to any discharge to meet Greek water quality standards (as per current environmental Permit), and because this additional volume of water for treatment is within the existing treatment systems' design capacity, this discharge is assumed to not contain pollutants in quantities enough to significantly impact sediment quality.
- Anchoring of support vessel/barge is scoped out. It is anticipated that by lowering the anchor to the seabed, some sediment may temporarily be disturbed in the vicinity of the anchor. However, the overall nature of the sediment will not be changed by this activity and no impacts are therefore predicted to sediment quality.

- Dispersal of drill cuttings from piles is scoped out. By dispersing drill cutting piles from existing platforms, some sediment may temporarily be disturbed in the vicinity of the platform. However, because these cuttings will have become part of the seabed over time, dispersing this material will not change the overall nature of the sediment and no impacts are therefore predicted to sediment quality.
- Cutting piles from existing platforms is scoped out since although it is expected to cause temporary disruption to the seabed/sediment in the vicinity of the platform(s) through mixing with the water column, the overall nature of the sediment will not change by this activity and no impacts are therefore predicted to sediment quality.
- Removal of SIPs (new platforms) is scoped out since although it is expected to cause temporary disruption to the seabed/sediment in the vicinity of the platform(s) through mixing with the water column, the overall nature of the sediment will not change by this activity and no impacts are therefore predicted to sediment quality.

9.2.1.4 Water environment

Following the aforementioned scoping exercise, it was identified that no interaction or serious concern has been identified from the activities that could potentially adversely impact the water environment.

Construction phase

- Activities associated with the onshore fabrication of pipelines (including changes to breakwater, leveling and bringing to sea) were scoped out. In particular in order to support moving the fabricated pipes from onshore location to the sea, some minor reconstruction may be required of the breakwater in the existing port. This activity may result in extremely localised increases in turbidity near the breakwater, however given the limited extent and the low sensitivity of the area, due to its existing industrial nature, this activity is assumed to result in no significant impacts.
- Installation of permanent mooring was scoped out. By lowering the mooring to the seabed, some sediment may temporarily be disturbed causing increased turbidity in the immediate vicinity of the mooring; however, given the limited extent and the short duration of any such disturbance, no significant impacts on water quality are anticipated
- Operation of support vessels in the project area was scoped out. This may result in small-scale discharges to the sea (e.g. stormwater runoff); however all vessels operated for the Project will be compliant with MARPOL requirements governing discharges to the sea. For this reason, no significant impacts are predicted.

Operation phase

- Installation of conductors (new wells only) was scoped out. The installation of the conductors into the seabed will cause some sediment to temporarily be disturbed causing increased turbidity in the immediate vicinity of the conductors; however, given the limited extent and the short duration of any such disturbance, no significant impacts on water quality are anticipated.

- Disposal of produced water to sea at Delta. All produced water will be routed to the existing treatment system at Delta platform. Following treatment, water will be discharged at the seabed near Delta platform. Because the existing treatment system is monitored prior to any discharge to meet Greek water quality standards, and because this additional volume of water for treatment is within the existing treatment systems' design capacity, no significant impacts to water quality are anticipated from this activity.
- Stormwater from areas of the platform where oil/hazardous chemicals are not present is discharged directly to the sea. For areas where oil or hazardous chemicals are present, a closed drain system collects and routines any stormwater to the water treatment system at Delta platform. As the stormwater discharged directly to sea is not expected to have any contaminants in it, no significant impacts to water quality are expected.
- Activity of operation of the Energean Force. Operating the Energean Force in the project area may result in small-scale discharges to the sea (e.g. stormwater runoff); however the vessel is compliant with MARPOL requirements governing discharges to the sea. For this reason, no significant impacts are predicted.
- Support vessels operating in the project area may result in small-scale discharges to the sea (e.g. stormwater runoff); however the vessel will be compliant with MARPOL requirements governing discharges to the sea. For this reason, no significant impacts are predicted.

Abandonment phase

- Activity of mobilize light work over rig to sites was scoped out. Operating the light work over rig vessel may result in small-scale discharges to the sea (e.g. stormwater runoff); however all vessels operated for the Project will be compliant with MARPOL requirements governing discharges to the sea. For this reason, no significant impacts are predicted.
- Plugging wells by pouring cement into the wells. This may result in a small amount of cement mixing with the water column in the immediate vicinity of the sea; however, as the cement will contain no hazardous compounds, no impacts to water quality are anticipated from this activity.
- Sever conductors. Severing the conductors at the seabed will cause some sediment to temporarily be disturbed causing increased turbidity in the immediate vicinity of the conductors; however, given the limited extent and the short duration of any such disturbance, no significant impacts on water quality are anticipated.
- Support vessels operating in the project area may result in small-scale discharges to the sea (e.g. stormwater runoff); however all vessels operated for the Project will be compliant with MARPOL requirements governing discharges to the sea. For this reason, no significant impacts are predicted.
- Activity of disposal of pipeline rinse water to sea at Delta. The pipeline rinse water will be routed to the existing treatment system at Delta platform. Following treatment, water will be discharged at the seabed near Delta platform. Because the existing treatment

system is monitored prior to any discharge to meet Greek water quality standards, and because this additional volume of water for treatment is within the existing treatment systems' design capacity, no significant impacts to water quality are anticipated from this activity.

- Anchoring of support vessels / barge was scoped out. By lowering the anchor to the seabed, some sediment may temporarily be disturbed causing increased turbidity in the vicinity of the anchor; however, given the limited extent and the short duration of any such disturbance, no significant impacts on water quality are anticipated.

9.2.1.5 Air quality

Following the aforementioned scoping exercise, it was identified that no interaction or serious concern has been identified from the activities that could potentially adversely impact the air quality.

Construction phase

- Activities relating with the transport of components and final SIP assembly at a deep-water quay were scoped out from further assessment. Emissions to air are expected to be generated from vessel operation; however, these emissions will be temporary in nature and no sensitive receptors (i.e. human populations or terrestrial ecology) are expected to be present in the immediate vicinity of the vessel. All vessels will be operated to meet MARPOL requirements pertaining to emissions to air.
- Activities including the onshore fabrication of pipeline (including possible changes to breakwater, levelling and bringing to sea). Some dust emissions, and combustion emissions from equipment and vehicles will be produced during this activity; however, these emissions will be relatively small and dispersion will be localized. Given the limited duration, extent and scale, potential impacts to air quality are considered negligible.
- Operation of support vessels is expected to generate emissions to air; however, these emissions will be temporary in nature and no sensitive receptors (i.e. human populations or terrestrial ecology) are expected to be present in the immediate vicinity of the vessel. All vessels will be operated to meet MARPOL requirements pertaining to emissions to air.

Operation phase

- Activity of maintenance flaring was scoped out, since no flaring will occur for the new platforms.
- Activity of operation of the Energean Force was scoped out, since Energean Force rig is not self-propelled and therefore does not emit combustion emissions.
- Activity of operation of support vessels was scoped out. Although emissions to air are expected from vessel operation these emissions will be temporary in nature and no sensitive receptors (i.e. human populations or terrestrial ecology) are expected to be present in the immediate vicinity of the vessel. All vessels will be operated to meet MARPOL requirements pertaining to emissions to air.

Abandonment phase

- Activity to mobilize light work over rig to sites. Emissions to air will be generated from vessel operation; however, these emissions will be temporary in nature and no sensitive receptors (i.e. human populations or terrestrial ecology) are expected to be present in the immediate vicinity of the vessel. All vessels will be operated to meet MARPOL requirements pertaining to emissions to air.
- Activity of operation of support vessels. Emissions to air will be generated from vessel operation; however, these emissions will be temporary in nature and no sensitive receptors (i.e. human populations or terrestrial ecology) are expected to be present in the immediate vicinity of the vessel. All vessels will be operated to meet MARPOL requirements pertaining to emissions to air.

9.2.1.6 Acoustic environment

Following the aforementioned scoping exercise, it was identified that no interaction or serious concern has been identified from the activities that could potentially adversely impact the acoustic (airborne – underwater) environment.

9.2.1.6.1 Airborne noise

Construction phase

- Activities of transport of components and final SIP and assembly at a deep-water quay are expected to generate airborne emissions, however since there are no sensitive receptors in the vicinity, this activity is scoped out from further assessment.
- Activities in relation with the onshore fabrication of pipeline (including possible changes to breakwater, levelling and bringing to sea) is expected to generate some very localized airborne noise emissions associated with operation of construction equipment; however, given the short duration of activities and expected noise levels, any impacts to surrounding communities are expected to be negligible.
- Operation of support vessels is expected to generate airborne noise emissions, however since there are no sensitive receptors in the vicinity, this activity is scoped out.

Operation phase

- The operation of the Energean Force is expected to generate airborne noise emissions, however since there are no sensitive receptors in the vicinity, this activity is scoped out.
- The operation of support vessels is expected to generate airborne noise emissions, however since there are no sensitive receptors in the vicinity, this activity is scoped out.

Abandonment phase

- The activity including the mobilization of light work over rig to sites is expected to generate airborne noise emissions, however since there are no sensitive receptors in the vicinity, this activity is scoped out.
- The activity of operation of support vessels is expected to generate airborne noise

emissions, however since there are no sensitive receptors in the vicinity, this activity is scoped out.

9.2.1.6.2 Underwater noise

All underwater noise related impacts have been assessed in terms of their interactions against specific receptors (i.e. fish species, marine mammals). The activities that were assessed and assessed as been scoped out are the following:

Construction phase

- Transport of components and final SIP assembly at a deep-water quay
- Transport SIP to site
- Installation of pipelines and umbillicals
- Operation of support vessels
- Modification activities to Delta (new risers/J tubes)

Operation phase

- Operation of the Energean Force
- Operation of support vessels

Abandonment phase

- Activity to mobilize light work over rig to sites
- Plugging wells
- Operation of support vessels

9.2.1.7 Biotic environment

Following the aforementioned scoping exercise, it was identified that no interaction or serious concern has been identified from the activities that could potentially adversely impact the biotic environment.

This is broken down to the types of biotic assessed, i.e. plankton, benthic communities, fish species, marine mammals, avifauna

9.2.1.7.1 Plankton

Construction phase

- Transport of components and final SIP assembly at a deep-water quay causing physical disturbance to plankton is assumed to be negligible given that an existing commercial port will be used, which would mean the project's activities will not significantly alter the physical environment of the port and therefore this is scoped out.
- Activities related to onshore fabrication of pipeline (including possible changes to breakwater, levelling and bringing to sea). To support moving the fabricated pipes from onshore location to the sea, some minor reconstruction may be required of the

breakwater in the existing port. This activity may result in extremely localised increases in turbidity near the breakwater which could impact existing plankton present, however given the limited extent and the low sensitivity of the area, due to its existing industrial nature, this activity is assumed to result in no significant impacts.

- Transport SIP to site. Vessel propulsion results in interaction with plankton in the project area; however, this interaction is expected to be very localized (i.e. the direct route followed by vessels) and will not result in any adverse effects.
- Leg lowering and suction anchor installation. Leg lowering and the use of suction anchoring will temporarily disturb the water column. Any plankton present at this time would be disturbed; however, this would be temporary and no lasting harm to plankton should occur.
- Installation of pipelines and umbillicals is expected to temporarily disturb the water column. Any plankton present at this time would be disturbed. Any disturbance would be temporary and no lasting harm to plankton should occur.
- Operation of support vessels. Vessel propulsion is likely to result in an interaction with plankton in the project area; however, this interaction will be very localized (i.e. the direct route followed by vessels) and will not result in any adverse effects.
- Modifications activities to Delta (new risers/J tubes) are expected to temporarily disturb the water column. Any plankton present at this time would be disturbed. Any disturbance would be temporary and no lasting harm to plankton is expected occur.

Operation phase

- Installation of conductors (new wells only) is expected to temporarily disturb the water column. Any plankton present at this time would be disturbed. Any disturbance would be temporary and no lasting harm to plankton should occur.
- Spudding and drilling of wells, including cementing of initial casings is expected to temporarily disturb the water column. Any plankton present at this time would be disturbed. Any disturbance would be temporary and no lasting harm to plankton should occur.
- Disposal of produced water to sea at Delta. The produced water will be routed to the existing treatment system at Delta platform. Following treatment, water will be discharged at the seabed near Delta platform. Because the existing treatment system is monitored prior to any discharge to meet Greek water quality standards (as per the environmental permit), and because this additional volume of water for treatment is within the existing treatment systems' design capacity, no significant impacts to water quality, or dependent receptors such as plankton, are anticipated from this activity.
- Stormwater from of the platform where oil/hazardous chemicals are not present areas is discharge directly to sea. For areas where oil or hazardous chemicals are present, a closed drain system collects and routines any stormwater to the water treatment system at Delta platform. As the stormwater discharged directly to sea is not expected to have any contaminants in it, no significant impacts to water quality, or dependent receptors such as plankton, are expected.

- Operation of support vessels. Vessel propulsion is expected to result in an interaction with plankton in the project area; however, this interaction will be very localized (i.e. the direct route followed by vessels) and will not result in any adverse effects.

Abandonment phase

- Sever conductors at the seabed is expected to cause some sediment to temporarily be disturbed causing increased turbidity in the immediate vicinity of the conductors; however, given the limited extent and the short duration of any such disturbance, no significant impacts on water quality, nor dependent receptors such as plankton, are anticipated.
- Disposal of pipeline rinse water to sea at Delta. This will be routed to the existing treatment system at Delta platform. Following treatment, water will be discharged at the seabed near Delta platform. Because the existing treatment system is monitored prior to any discharge to meet Greek water quality standards (and as per current environmental permit), and because this additional volume of water for treatment is within the existing treatment systems' design capacity, no significant impacts to water quality, or dependent receptors such as plankton, are anticipated from this activity.
- Anchoring of support vessels/barge. By lowering the anchor to the seabed, some sediment may temporarily be disturbed causing increased turbidity in the vicinity of the anchor; however, given the limited extent and the short duration of any such disturbance, no significant impacts on water quality, or dependent receptor such as plankton, are anticipated.
- Activities relating to the dispersal of drill cuttings from piles at the existing platforms are expected to temporarily disturb the water column. Any plankton present at this time would be disturbed. Any disturbance would be temporary and no lasting harm to plankton should occur.
- Cutting piles at existing platforms is expected to temporarily disturb the water column. Any plankton present at this time would be disturbed. Any disturbance would be temporary and no lasting harm to plankton should occur.

9.2.1.7.2 Benthic communities and habitats

Construction phase

- Installation of conductors (new wells only) is expected to only affect a very small area of the seabed (conductor area). Based on this limited area affected, any impacts on the benthic community are assumed to be negligible.

Operation phase

- Disposal of produced water to sea at Delta. The produced water will be routed to the existing treatment system at Delta platform. Following treatment, water will be discharged at the seabed near Delta platform. Because the existing treatment system is

monitored prior to any discharge to meet Greek water quality standards (as the facilities' environmental permit), and because this additional volume of water for treatment is within the existing treatment systems' design capacity, no significant impacts to water quality, or dependent receptors such as the benthic community, are anticipated from this activity.

- Activity of stormwater from areas of the platform where oil/hazardous chemicals are not present is discharged directly to the sea. For areas where oil or hazardous chemicals are present, a closed drain system collects and routines any stormwater to the water treatment system at Delta platform. As the stormwater discharged directly to sea is not expected to have any contaminants in it, no significant impacts to water quality, or dependent receptors such as the benthic community, are expected.

Abandonment phase

- Sever conductors is expected to affect a very small area of the seabed (immediately near conductors). Based on this limited area affected, any impacts on the benthic community are assumed to be negligible.
- Disposal of pipeline rinse water to sea at Delta. The pipeline rinse water will be routed to the existing treatment system at Delta platform. Following treatment, water will be discharged at the seabed near Delta platform. Because the existing treatment system is monitored prior to any discharge to meet Greek water quality standards (as per the facilities' environmental permit), and because this additional volume of water for treatment is within the existing treatment systems' design capacity, no significant impacts to water quality, or dependent receptors such as the benthic community, are anticipated from this activity.
- Anchoring of support vessels/barge is expected to affect a very small area of the seabed (direct anchor site(s)). Based on this limited area affected, any impacts on the benthic community are assumed to be negligible.

9.2.1.7.3 Coastal marine habitat

Construction phase

- Onshore fabrication of pipeline (including possible changes to breakwater, levelling and bringing to the sea. While this activity will interact with the coast (i.e. bringing the pipes from onshore to offshore), the sites being considered are not located in areas with sensitive coastal marine environments.

9.2.1.7.4 Fish species

Construction phase

- Transport of components and final SIP assembly at a deep-water quay. Some noise will be generated from vessel operation; however this will be within an existing port and therefore represents negligible change in baseline conditions.

Physical disturbance to fish from this activity is also assumed to be negligible given that an existing commercial port will be used, which would mean the project's activities will not significantly alter the physical environment of the port.

- Onshore fabrication of pipeline (including possible changes to breakwater, levelling and bringing to sea). To support moving the fabricated pipes from onshore location to the sea, some minor reconstruction may be required of the breakwater in the existing port. This activity may result in extremely localised increases in turbidity near the breakwater which could impact existing fish present, however given the limited extent and the low sensitivity of the area, due to its existing industrial nature, this activity is assumed to result in no significant impacts.
- Transport SIP to site is expected to generate some noise from vessel operation; however, this will be constant low-level noise to which fish are not particularly sensitive.
- Leg lowering and suction anchor installation is expected to temporarily disturb the water column. Any fish present at this time would be disturbed; however, this would be temporary and no lasting harm to fish should occur.
- Installation of pipelines and umbillicals is expected to temporarily disturb the water column. Any fish present at this time would be disturbed; however, it is expected that fish would demonstrate avoidance behaviour. Any disturbance would be temporary and no lasting harm to fish should occur.
- Operation of support vessels is likely to generate some noise; however, this will be constant low-level noise to which fish are not particularly sensitive.
- Modifications to Delta (new risers/J tubes) are expected to temporarily disturb the water column. Any fish present at this time would be disturbed; however, it is expected that fish would demonstrate avoidance behaviour. Any disturbance would be temporary and no lasting harm to fish should occur.

Operation phase

- Disposal of produced water to sea at Delta. The produced water will be routed to the existing treatment system at Delta platform. Following treatment, water will be discharged at the seabed near Delta platform. Because the existing treatment system is monitored prior to any discharge to meet Greek water quality standards (as per the facilities' environmental permit), and because this additional volume of water for treatment is within the existing treatment systems' design capacity, no significant impacts to water quality, or dependent receptors such as fish, are anticipated from this activity.
- Stormwater from areas of the platform where oil/hazardous chemicals are not present is discharged directly to the sea. For areas where oil or hazardous chemicals are present, a closed drain system collects and routines any stormwater to the water treatment system at Delta platform. As the stormwater discharged directly to sea is not expected to have any contaminants in it, no significant impacts to water quality, or dependent receptors such as s fish, are expected.
- Operation of support vessels is expected to generate some noise; however, this will be

constant low-level noise to which fish are not particularly sensitive.

Abandonment phase

- Operation of support vessels is expected to generate some noise; however, this will be constant low-level noise to which fish are not particularly sensitive.
- Disposal of pipeline rinse water to sea at Delta routed to the existing treatment system following treatment, water will be discharged at the seabed near Delta platform. Because the existing treatment system is monitored prior to any discharge to meet Greek water quality standards (as per the facilities' environmental permit), and because this additional volume of water for treatment is within the existing treatment systems' design capacity, no significant impacts to water quality, or dependent receptors such as fish, are anticipated from this activity.
- Dispersal of drill cuttings from piles at the existing platforms is expected to temporarily disturb the water column. Any fish present at this time would be disturbed; however, it is expected that fish would demonstrate avoidance behaviour. Any disturbance would be temporary and no lasting harm to fish should occur.

9.2.1.7.5 Marine mammals

Construction phase

- Activities of transport of components and final SIP assembly at a deep-water quay are expected to generate some noise from associated vessel operation; however this will be within an existing port and therefore represents negligible change in baseline conditions. Physical disturbance to fish from this activity is also assumed to be negligible given that an existing commercial port will be used, which would mean the project's activities will not significantly alter the physical environment of the port.
- Transport SIP to site is likely to generate some from associated vessel operation; however, this will be a single trip and will be at constant low-level noise to which marine mammals are not particularly sensitive.
- Leg lowering and the use of suction anchoring are expected to temporarily disturb the water column. Any marine mammals present at this time would be disturbed; however, this would be temporary and no lasting harm to marine mammals should occur.
- Installation of pipelines and umbilicals will temporarily disturb the water column near the seabed. It is unlikely that many marine mammals would be present in the area affected; however, it is expected that any marine mammals present would demonstrate avoidance behaviour. Any disturbance would be temporary and no lasting harm to marine mammals should occur.
- Modifications activities to Delta (new risers/J tubes) are expected to temporarily disturb the water column near the seabed. It is unlikely that many marine mammals would be present in the area affected; however, it is expected that any marine mammals present would demonstrate avoidance behaviour. Any disturbance would be temporary and no lasting harm to marine mammals should occur.

Operation phase

- Disposal of produced water to sea at Delta. The produced water will be routed to the existing treatment system at Delta platform. Following treatment, water will be discharged at the seabed near Delta platform. Because the existing treatment system is monitored prior to any discharge to meet Greek water quality standards (as per the facilities' environmental permit), and because this additional volume of water for treatment is within the existing treatment systems' design capacity, no significant impacts to water quality, or dependent receptors such as marine mammals, are anticipated from this activity.
- Stormwater from areas of the platform where oil/hazardous chemicals are not present is discharged directly to the sea. For areas where oil or hazardous chemicals are present, a closed drain system collects and routines any stormwater to the water treatment system at Delta platform. As the stormwater discharged directly to sea is not expected to have any contaminants in it, no significant impacts to water quality, or dependent receptors such as marine mammals, are expected in Abandonment phase.
- Mobilize light work over rig to sites is expected to generate some noise from associated vessel operation; however, this will be a single trip and will be at constant low-level noise to which marine mammals are not particularly sensitive.
- Plug wells by pouring cement into the wells may result in a small amount of cement mixing with the water column in the immediate vicinity of the sea; however, as the cement will contain no hazardous compounds, no impacts to water quality, or dependent receptors such as marine mammals, are anticipated from this activity.
- Disposal of produced water to sea at Delta. The produced water will be routed to the existing treatment system at Delta platform. Following treatment, water will be discharged at the seabed near Delta platform. Because the existing treatment system is monitored prior to any discharge to meet Greek water quality standards (as per the facilities' environmental permit), and because this additional volume of water for treatment is within the existing treatment systems' design capacity, no significant impacts to water quality, or dependent receptors such as marine mammals, are anticipated from this activity.
- Dispersal of drill cuttings from piles activities at the existing platforms is expected to temporarily disturb the water column. Any marine mammals present at this time would be disturbed; however, it is expected that marine mammals would demonstrate avoidance behaviour. Any disturbance would be temporary and no lasting harm to marine mammals should occur.

9.2.1.7.6 Avifauna

Birds are potentially affected by a number of activities through their reliance on fish as a food source. As impacts on fish have been scoped out, so are impacts on birds.

The activities that were assessed to be of relevance are the following:

Operation phase

- Disposal of produced water to sea at Delta. Birds are potentially affected by this activity through their reliance on fish as a food source. As impacts on fish have been scoped out, so are impacts on birds.
- Stormwater discharge to sea

Abandonment phase

- Disposal of pipeline rinse water to sea at Delta

9.2.1.8 Manmade environment

Following the aforementioned scoping exercise, it was identified that no interaction or serious concern has been identified from the activities that could potentially adversely impact the manmade environment.

9.2.1.8.1 Community cohesion

Construction phase

- Maintenance of an offshore workforce. Interactions between a project's workforce and community members can lead to conflict; however, in this case, the construction workforce will be the workforce already employed for existing operations, plus supplemental local support. Given the low percentage of expat/non-local workers, it has been assumed that the project's workforce will not be significantly different from the surrounding area, and as such, the risk of reduced social cohesion and increased conflict is low.

Operation phase

- Maintenance of an offshore workforce. Interactions between a project's workforce and community members can lead to conflict; however, in this case, the operations workforce will be the workforce already employed for existing operations. Given the low percentage of expat/non-local workers, it has been assumed that the project's workforce will not be significantly different from the surrounding area, and as such, the risk of reduced social cohesion and increased conflict is low.

Abandonment phase

- Maintenance of an offshore workforce. Interactions between a project's workforce and community members can lead to conflict; however, in this case, the abandonment workforce will be the workforce already employed for existing operations, plus supplemental local support. Given the low percentage of expat/non-local workers, it has been assumed that the project's workforce will not be significantly different from the surrounding area, and as such, the risk of reduced social cohesion and increased conflict is low.

9.2.1.8.2 Community health & safety

As any community health and safety impacts from routine operations would be related to emissions to air, because air quality impacts have been scoped out for this activity, impacts to community health and safety are also considered to be negligible. The following activities present the activities which could potential interact with the community H&S parameter.

Construction phase

- Transport of components and final SIP assembly at a deep-water quay
- Onshore fabrication of pipeline (including possible changes to breakwater, levelling and bringing to sea)
- Operation of support vessels

Operation phase

- Maintenance Flaring
- Operation of the Energean Force
- Operation of support vessels

Abandonment phase

- Mobilize light work over rig to sites
- Operation of support vessels

9.2.1.8.3 Marine traffic

Construction phase

- Transport of components and final SIP assembly at a deep-water quay. An existing quay is planned to be used within a commercial port. As this will not constitute a change in use from existing conditions, no significant impacts to marine traffic are assumed.
- Transport SIP to site. This will be a single event, that will occur for a short duration (<1 day). Based on this, minimal interaction with exiting marine traffic is expected.
- Establishment and enforcement of safety exclusion zone including placement of marker buoys. Marker buoys will be placed around the exclusion one to clearly demark the area so that any other marine traffic will be aware of the restrictions. The location of the exclusion zones does not overlap with any existing navigation channels used for ferries, and avoiding the exclusion zones should not add any significant hardship to marine traffic given the availability of alternative routing.

Operation phase

- Maintenance of exclusion zones. The location of the exclusion zones does not overlap with any existing navigation channels used for ferries, and avoiding the exclusion zones should not add any significant hardship to marine traffic given the availability of alternative routing.
- Operation of support vessels. Limited vessel movements will occur during operation. These movements will not significantly change the number or composition of marine traffic in the region.

Abandonment phase

- Operation of support vessels. Limited vessel movements will occur during operation. These movements will not significantly change the number or composition of marine traffic in the region.

9.2.1.9 Socioeconomic environment

Following the aforementioned scoping exercise, it was identified that no interaction or serious concern has been identified from the activities that could potentially adversely impact the socioeconomic environment.

9.2.1.9.1 Fisheries

Any impacts to fisheries from this activity would be related to the broader impacts on fish. As impacts to fish have been scoped out, impacts to fishing have also been scoped out. Moreover, a further interaction relates with the activity of setting and maintaining an exclusion zone during the operation phase.

Construction phase

- Transport of components and final SIP assembly at a deep-water quay
- Transport SIP to site
- Installation of pipelines and umbillicals
- Operation of support vessels
- Establishment and enforcement of safety exclusion zone including placement of marker buoys

Operation phase

- Maintenance of exclusion zones. An exclusion zone of 500 m around each of the new platforms will be maintained (subject to designation by the naval authorities). While this will reduce the area that can be fished by 157 hectares, this is a small portion of the overall area of the sea that is fished. Moreover, the positive benefit to fish by creating a marine habitat where fishing is not present may increase local fish populations (as has been seen at the existing platforms), thereby increasing the fish stocks in the sea. In consideration of these two factors, any negative impacts to fishing from maintenance of the exclusion zones are considered negligible.
- Operation of support vessels

Abandonment phase

- Operation of support vessels

9.2.1.9.2 Tourism

Operation phase

- Maintenance of exclusion zones. An exclusion zone of 500 m around each of the new

platforms will be maintained (subject to designation by the naval authorities). While this will reduce the area that can be used for tourism by 157 hectares, this is a small portion of the overall area of the sea and an area that is not current used for tourism activities (e.g. diving). Based on this, negligible adverse impacts are predicted to tourism from this limitation of access.

9.2.1.10 Technical infrastructure

Following the aforementioned scoping exercise, it was identified that no interaction or serious concern has been identified from the activities that could potentially adversely impact the technical infrastructure of the broader area. Some small-scale wastes will be generated by these activities that may be disposed of at existing waste facilities in Greece. Given the small volumes to be generated, these waste streams are not expected to significantly contribute to any strain on capacity of existing waste sites.

The activities that are expected to interact with those are the following:

Construction phase

- Transport of components and final SIP assembly at a deep-water quay
- Onshore fabrication of pipeline (including possible changes to breakwater, levelling and bringing to sea)
- Operation of support vessels

Operation phase

- Operation of the Energean Force
- Operation of support vessels

Abandonment phase

- Mobilize light work over rig to sites
- Operation of support vessels

9.2.2 Unplanned events

Because of the extent and potential magnitude of any unplanned oil spill, numerous receptor types have the potential to be significantly affected in the event of such a release. Additionally, due to the scale, any interactions are considered to be potentially significant. For this reason all potentially affected receptors will be evaluated in the detailed assessment of impacts from an unplanned oil spill.

However, it is important to note that as presented in the scoping tables the main interactions are with the marine and coastal environment and not with the terrestrial environmental (both in terms of biotic and abiotic).

Also in order to capture the most severe cases, the impacts are considered for the cases of reaching the coasts and not necessarily within the timeframes of the already existing and in

place emergency response plans. So, the scenarios modelled to show the time the spill within the first 3 hrs have in essence been scoped out not because they are insignificant but because they are not the worst cases and the assume that the emergency response will contain the spill within this timeframe.