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

Chapter 12 Mitigation and Management Measures

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ABBREVIATIONS

ALARP	As Low As Reasonable Practicable
BOP	Blow Out Preventor
DNV	Det Norske Veritas
ENERGEAN	Energean Oil & Gas S.A.
ERP	Emergency Response Plan
ESIA	Environmental and Social Impact Assessment
ESMMP	Environmental and Social Management and Monitoring Plan
F&G	Fire and Gas
GG	Government Gazette
HAZID	Hazard Identification
HAZOP	Hazard and Operability Study
HSE	Health Safety and Environment
MARPOL	Marine Pollution
MMO	Marine Mammal Observer
OHS	Occupational Health and Safety
PD	Presidential Decree
QRA	Quantitative Risk Assessment
TRA	Toolbox Risk Assessments
YPEN	Ministry of Environment & Energy

12 MANAGING ENVIRONMENTAL AND SOCIAL IMPACTS

12.1 INTRODUCTION

The existing offshore facilities in the Gulf of Kavala have been in operation for more than 35 years. During this period Energean has developed and implemented appropriate management systems to ensure that routine and unplanned impacts to the environment are mitigated to a level that is as low as reasonably practicable (ALARP).

Routine impacts are subject to an Environmental Management Plan that forms part of the existing Environmental Impact Assessment approved by the Greek government. The effectiveness of these systems and procedures are routinely audited by local and state authorities.

As discussed in preceeding sections, unplanned events, particularly the accidental release of oil to the sea, have significantly more potential for impacting the environment than routine emissions and discharges. These events can occur due to a failure in the hydrocarbon containment envelope (loss of Technical Integrity) or a failure of the established preventative systems (fixed/equipment related and/or procedural). Technical Integrity of the existing facilities, including pipelines, is checked and verified by Det Norske Veritas (DNV) every 5 years. DNV renews the Company's Operating Certificate based upon a successful audit and issues this to the Greek authorities. Any deficiencies are noted and a remedial action plan agreed. This includes target dates for rectification of any significant issues. On a 2-yearly basis DNV performs a separate audit of safety equipment. Whilst the primary focus of safety equipment is protection of staff, clearly they are also critical with regard to prevention of failures escalating so that they could also have a major impact on the environment.

When planning the development of the described new facilities (the new satellite platforms and interconnecting submarine pipelines) Energean's intent was to embed safety and environmental risk mitigation measures in the design wherever possible. Clearly risk is better mitigated by removing hazards via appropriate conceptual design work than attempting to mitigate identified hazards by controls or barriers in the construction, operational or abandonment phases.

All hazards cannot of course be completely removed. Oil and gas are in their essence hazardous materials and their production, and the development of the facilities to allow them to be produced, entails a degree of residual risk no matter what design approach is adopted. In preparing this Environmental and Social Impact Assessment (ESIA) Energean has examined whether the existing mitigation measures applied to its new facilities can be expanded to effectively mitigate residual risks associated with the introduction of the new facilities. In general

it has concluded that these existing measures are appropriate. The new facilities add little complexity and introduce no new risks, hence in general existing mitigations are appropriate. A number of new activities (largely related to construction work) are introduced. In these cases Energean considers it prudent to introduce a number of new mitigation measures. These will be added to its existing management system as described below.

In the following sub-sections mitigation measures will be presented in the order described below, namely:

- Current mitigation measures in place for the existing facilities as included in:
  - ⇨ Environmental and Operational permits;
  - ⇨ Operational and Maintenance Procedures;
  - ⇨ Safety, pollution prevention and emergency response plans;
  - ⇨ Environmental management plans; and
  - ⇨ Environmental monitoring procedures
- Mitigation measures embedded in the design of the planned (and potential) new facilities and the modifications to be applied to the existing facilities where necessary
- Additional mitigation measures proposed as a result of the assessment of environmental and social impacts as described in the previous chapter.

Energean's overarching approach to environment, social and health and safety impact and risk management is described in detail the overarching Environmental and Social Management and Monitoring Plan (ESMMP) following up in Chapter 13. Mitigation and management controls as well as monitoring provisions are expanded upon in a series of issue specific management plans that are attached to this ESIA. These management plans are framework plans, fall below the ESMMP, and will be developed into full plans and integrated into the existing environmental and health and safety management system prior to construction works and operations where relevant. Many of these plans draw on existing robust mitigation and management measures that have already been implemented by Energean and will be applied to the Project, will limited revision where necessary.

12.2 CURRENT MITIGATION MEASURES IN PLACE

Environmental and social impacts associated with the existing facilities have been managed successfully over the last 35 years through a system of controls that the company implements.

This system is in line with:

- The environmental permit that the offshore facilities currently have (80994/7.2.2002 Ministry of Environment, Spatial Planning and Public works), which was recently renewed (46781/1283/12.8.2013 Ministry of Environment, Energy and Climate Change);
- The operation permit for the offshore and onshore facilities (26556/F6.5/19.8.1985 Ministry of Industry, Energy and Technology) which was renewed in 2003 (D3/B/11591/15.9.2003 Ministry of Development);

- Pollution prevention certificate, renewed on 18.06.2015 by the Ministry of Marine, according to Marpol 73/78;
- The permit for the Greenhouse Gases emissions (135368/28.12.2004 Ministry of Environment, Spatial Planning and Public works) which was renewed in 2012 (214104/31.12.2012 Ministry of Environment, Energy and Climate Change)
- The Common Ministerial Decision 13588/725/2006 regarding waste management and annual reporting;
- The Directive 166/2006/EC regarding the European Pollutant Release and Transfer Registry annual reporting on CO_2, NO_X and SO_2 emissions;
- The Presidential Decree No. 546 regarding the code for life saving and fire fighting appliances and training practices on units for the exploration or exploitation of hydrocarbons, issued on 31.10.1985 by the Ministry of Merchant Navy;
- The rules of DNV-GL that certifies the safe operation of all offshore and onshore installations.

In Chapter 8, an assessment of the current environmental baseline (physical and social) was made. Links between the current environmental conditions and the operation of the existing facilities were made, where applicable. No significant negative impacts were identified. This would imply that the current environmental management and monitoring systems applied to routine discharges and emissions have been largely effective. Key controls are:

- Produced water, deck-washing and rain-water treatment systems at the Prinos complex and Kappa platforms in accordance with the provisions of L.1269/1982 (Government Gazette 89/A721.7.82) "International Convention for the Prevention of Pollution from Ships (MARPOL)" and PD 479/84 (GG 169 A71.11.84).
- Management of the flare system to minimize routine fugitive emissions and avoid release of liquid hydrocarbons via this open system
- Maintenance of a regularly tested Oil Spill Response system and associated Oil Spill Response Plan to eliminate or minimize the adverse effects of unexpected sea and coast oil pollution incidents, so as to:
  - ⇨ Protect the environment;
  - ⇨ Protect the interests of the local community;
  - ⇨ Enhance employees' safety;
  - ⇨ Accelerate return to normal operation of the facilities;

  These goals are met by:

  - ⇨ Minimizing the spread of the oil spill by having sufficient booms to contain the largest spill 3 hours after its formation;
  - ⇨ Recovering oil from the sea into a barge with capacity for the largest spill possible;
  - ⇨ Protecting the most critical coastlines by deployment of additional booms/dispersants as appropriate;
  - ⇨ Decontamination of the shoreline of any residual oil not removed whilst the spill is offshore;

The operational readiness of the oil spill response mechanism is ensured by the training of personnel, the use of special equipment and the means to combat pollution and is maintained through regular exercises in readiness based on hypothetical accident scenarios.

The Plan is authorized by decision of the Kavala Harbour Master and then is communicated to all recipients of the Facilities' Contingency Plan.

- Maintenance of installed Fire & Gas (F&G) detection systems consisting of detectors, to identify and alarm in the case of hydrocarbon leaks (including hydrogen sulphide) and subsequent fire (if the release is ignited). Emergency Shut Down systems are activated by the fixed F&G systems to prevent escalation.
- Provision of appropriate lifesaving and firefighting equipment at the Prinos complex and the Kappa satellite platform
- Implementation of a rigorous and structured Health, Safety and Environment (HSE) management system that defines the HSE policies, standards and procedures to be applied by all employees to all current and future facilities and activities.
- Execution, and regular updates, of an HSE plan that provides a schedule for implementing the HSE management system including all necessary guidelines to employees, HSE targets, responsibilities and effective regulations, standards and rules, training schedules and emergency drills to ensure personnel effective response in case of emergency.
- Execution, and regular updates, of a Risk Management Plan (RMP) as part of an ongoing process that continues through the life of a project and defines daily operations. It includes processes for hazards identification, analysis, risk management planning, monitoring, control and reporting. Many of these processes are updated throughout the project life cycle as new risks can be identified at any time. It's the objective of risk management to decrease the probability and impact of events adverse to the project. On the other hand, any event that could have a positive impact is exploited.

  Hazards are identified using various techniques; HAZID (Hazard Identification), HAZOP (Hazard and Operability Study), TRA (Toolbox Risk Assessments) and related risk is continuously assessed and evaluated leading to mitigation measures for either eliminating hazards or substituting with different, less hazardous approaches. Barriers forming functional grouping of safeguards and controls selected to prevent the realization of a hazard are identified to reduce the risk to ALARP (As Low As Reasonably Practicable). Hard controls are engineered solutions or physical barriers. Soft controls are procedures and work instructions. The effectiveness of all controls depends on the actions of personnel. Residual risks caused by potential failure of these controls are managed by identification of a set of HSE critical activities. These activities mainly describe the verification actions required to ensure that controls are maintained and identify the SPR (Single Point Responsible) person for the activity.

  As project activities are conducted and completed, risk factors and events are monitored to determine if in fact trigger events have occurred that would indicate the risk is now a

reality. Based on these trigger events that have been documented during the risk analysis and mitigation processes, the operations / project team or operations / project managers have the authority to enact contingency plans as deemed appropriate.

- Implementation, and regular updates, of an Emergency Response Plan (ERP). Energean's ERP covers the organization and actions to be taken during emergencies at the facilities. Emergencies are defined as:
  - ⇨ Injuries or more serious incidents;
  - ⇨ Pollution or;
  - ⇨ Damage to facilities.

  It is the responsibility of the company to do everything possible to provide a safe working environment for its employees and minimize the possibility of causing damage or injuries to third parties. It is also the responsibility of every employee of the company to perform his / her assigned duties so as not to expose himself, other persons, or the property of the company or others to potential danger.

  Despite this, it is recognized that the possibility of unplanned incidents exists and the company has developed a series of action plans to handle and control contingencies within its sphere of operations.

  The ERP outlines a course of actions for the mobilization of personnel and equipment that may be required to handle a serious emergency. The system may result in some cases in over reaction, but this must be accepted.

  Energean's ERP is regularly discussed with the Oil and Gas Division in the Ministry of Environment & Energy (YPEN). This is critical as during major emergencies collaboration with regional and national authorities could be required. The Ministry is responsible for ensuring Regional authorities are familiar with the Plan and are supplied with equipment and competent staff to support Energean's own staff.
- Implementation, and regular updates, of an H_2S emergency response plan. H_2S is a major hazard during drilling and production and a special H_2S plan is designed and implemented to avoid abnormal H_2S conditions. The plan covers all necessary general procedures and working guidelines and communications that will lead to a safe response. Furthermore, it describes alarm conditions and appropriate actions for essential and non-essential personnel. Specific H_2S procedures are applied during drilling operations, while tripping and during well control operations. These procedures define safe drilling activities and the evacuation provisions by the stand-by vessel.
- Implementation, and regular updates, of Well Management and Well Control plans. Energean uses established Good Oil Field Practice as the basis of its drilling and well management systems. The drilling of new wells is one of the most hazardous activities undertaken in the oil industry and as such a significant number of controls are required. These include:
  - ⇨ Mandatory use of API standards during drilling especially while isolating potential flow zones;
  - ⇨ Selection of the casing and the cement design appropriate to expected wellbore

conditions;

- ⇨ Provision of a specific number of barriers between the reservoir and surface and the regular testing of these;
- ⇨ Provision of a blowout prevention system (BOP) and the regular testing of its functionality. Provision of redundancy in the BOP system such as two sets of independent blind sheer rams;
- ⇨ Making sure all rig personnel are trained, familiar with all well equipment employed as well as practices to be followed. Demonstration of this via a formal Competence Assessment and Assurance system;
- ⇨ By implementing an effective communication system on the drilling rig unit and between drilling rig and coastal based staff;
- ⇨ By employing quality contractors and requiring these contractors to have the same level of attention to HSE management as the Company.

Whilst preparing the ESIA these existing control systems have been assessed to determine whether they are sufficient to manage the increased complexity as well as any new hazards introduced by the planned and potential extensions. Due to the relative simplicity of the new facilities compared with the existing facilities and the fact that no new hazards are introduced, it has been determined that the existing mitigation and management measures are sufficient to manage risks during the operational phase of the project at a level considered to be ALARP. This has been formerly demonstrated for health and safety risks (via QRA studies) and for environmental and social impacts (through the ESIA). The complexity of the new facilities was deliberately minimised by careful design selection as discussed in Chapter 7 and summarised below. The existing operational systems, plans and procedures will be updated to reflect the new offshore facilities.

12.3 MITIGATION MEASURES EBMEDDED IN PROJECT DESIGN OF THE PLANNED FACILITIES

Energean has consciously built into the design of the planned facilities specific features that minimise complexity and help mitigate risks across the full life cycle of the project. These are further detailed below for construction, operation and abandonment phases. It is noted that since the exact method of abandonment for the existing facilities is not yet decided, further mitigation measures may be added in the future to the outlined methodology. For the planned facilities abandonment impacts was a key consideration when selecting the chosen design.

- The following measures have been embedded in the design to minimize environmental and social impacts during the construction phase
  - ⇨ A novel sub-structure design has been adopted. This allows the total platform to be assembled onshore in a location designed for such industrial activities. As a result the installation time offshore is reduced from 6 - 8 weeks to a matter of days.

- ⇨ The size of the installation fleet is similarly reduced. The need for permanent offshore manning is avoided. Environmental and social risk during construction is partly driven by the extent of the marine fleet required.
- ⇨ Another benefit of the selected design is the significant reduction in offshore noise. Energean has selected to use suction piles rather than conventionally driven piles to hold the new structure in place. This avoids weeks of pile driving activities and the associated underwater noise.

- The following measures have been embedded in the design to minimize impacts during the operational phase.
  - ⇨ The topside facilities and sub-marine pipelines have all been designed to withstand the maximum closed in pressure of the wells. This means that when operating at normal conditions the corrosion allowance available is significantly increased. This reduces the calculated frequency of losses of integrity and hence introduction of hydrocarbons into the environment.
  - ⇨ In addition this conservative approach has also removed the need for a permanently lit flare on the new platforms. Flares clearly introduce significant environmental impacts. They are a source of continuous emissions and light pollution. They also represent a significant leak path to introduce liquid hydrocarbons into the environment if process systems fail. The planned and potential new facilities do not need a flare due to the conservative approach taken to rating of process pipework and the avoidance of vessels.
  - ⇨ Energean has also elected to link the new facilities to the Delta complex by submarine power cables rather than equip them with diesel-powered generators. The selected approach increases initial capex but reduces emissions by allowing efficiently generated power from the national network to be employed rather than lower efficiency locally generated electricity. This approach also reduces noise and local emissions and avoids the need to transfer diesel onto the satellites.
  - ⇨ The new facilities have been designed to be unmanned, with control achieved from Delta. Visits will be limited to 2 per week, rather than 3 per day as at the existing facilities. This reduces marine traffic and hence associated environmental impacts as well as occupational health and safety (OHS) risks.

The analysis performed in the ESIA has demonstrated that the routine risks associated with the new facilities can be managed at a level that is as low as reasonably practical (ALARP). The most significant risk associated with the new facilities is that associated with potential accidental releases.

- The following measures are embedded in the design with the objective of minimising the likelihood of unplanned (failure) events. The only credible source of a significant spill associated with the new facilities is from a blowout when the new wells are being constructed. The frequency or consequence of other typical leak types has been mitigated, for example:
  - ⇨ Carry over from the flare knock-out drum: no flare is required by design

- ⇨ Rupture of topside equipment/vessels or mal operation: no vessels are included in the main process system; topside hydrocarbon inventory is limited to 6 m^3 by design. All surface equipment is rated to 235 bar – 215 bar higher than normal operational pressures
- ⇨ Rupture of the multiphase export lines from Lamda and Omicron to Delta: line is rated to 235 bar and buried to avoid external impacts; system has been designed to allow internal inspection; liquid volume in export line limited to approximately 50 m^3 by use of small diameter and by multiphasing with produced gas

- The following measures have been embedded in the design to minimize environmental impacts during the abandonment phase:
  - ⇨ The new satellite facilities have been designed so that they can be re-floated and used elsewhere. This requires only a modest fleet of vessels to implement and hence generates a much lower impact due to noise and seabed disturbance.
  - ⇨ All pipelines are piggable to ensure effective removal of contaminants prior to abandonment.

12.4 ADDITIONAL MITIGATION MEASURES PROPOSED

Apart from the existing mitigation measures and controls in place as well as the mitigations embedded in the project's design, the impact assessment has identified the need to have a number of additional mitigation measures that are further detailed in the paragraphs below.

In the previous chapters 09 and 11, the project activities that could potentially lead to an adverse impact, were investigated in terms of their interaction to a number of environmental and social parameters. In Chapter 09, the ones that show little or non-significant interaction were scoped out from further assessment, whereas the remaining were further assessed in Chapter 11.

Further below, the mitigation measures are provided for the assessed impacts that were found to be minor, moderate or high as applicable. Impacts assessed as negligible were not included for additional mitigation measures.

12.4.1 Climate and bioclimate characteristics

As presented in Chapters 9.2.1.1 and 11.2.1 the Project impacts on the climate and bioclimate characteristics in the project area have been scoped out of the ESIA, since they have been assessed to be insignificant and no additional mitigation is required.

12.4.2 Morphological and topological characteristics

In Chapter 9.2.1.2 some project effects on the morphological and topological characteristics of the project area have been scoped out of the ESIA, since they have been assessed to be

insignificant and no additional mitigation is required.

Some project impacts, however, were assessed in Chapter 11.2.2 to be either negligible or minor. In particular during construction phase, the activity of burial of the pipelines and umbillicals was found to have a minor impact to the seabed. During the operation phase, the activity of the seabed cuttings (0-400m) is expected to have a minor impact to the benthic communities. Finally in the abandonment phase, the activities of the dispersal of seabed cutting from piles (from existing platforms) and the removal of SIPs (new platforms), is expected to also have a minor impact.

A key mitigation measure to further reduce these already minor impacts is to minimise the project footprint on the seabed as much as possible through design. This can be applied specifically to the pipelines.

Mitigation measure: The technical feasibility of bundling the three pipelines (so that they are installed together) will be investigated by Energean since through this method, the area of the seabed impacted will be smaller.

12.4.3 Geological and tectonic characteristics

During construction phase, the installation of permanent mooring was found to have a minor impact on seabed conditions. This footprint has been minimised as much as possible through design.

During drilling of the initial sections of each weel, the Project will deposit uncontaminated drill cuttings on the seabed. This will be minimised through the use of conductors to limit the volume of cuttings and impact area.

Mitigation measure: During drilling and with respect to seabed cuttings, conductor of 30" will be used instead of 36" in order to minimize volume of cuttings.

12.4.4 Water environment

A number of project impacts on the water column were assessed in Chapter 11.2.4 to be either negligible or minor. In particular during construction phase, the activity of burial of the pipelines and umbillicals, was found to have a minor impact on the water column through a temporary increase in turbidity.

In the abandonment phase, the activities of the dispersal of seabed cutting from piles (from existing platforms) and the removal of SIPs (new platforms), is expected to also have a minor impact on the water column through a temporary increase in turbidity

Mitigation measures: All burial techniques will impact the seabed to some degree and cause sediment to be disturbed and enter the water column. Jetting has been selected as it is less disruptive than trenching and back filling. In case that the pipelines are bundled together, this will further reduce the impact as only one pass with the jetter is required.

Hence less area is disrupted and less sand enters the water column. The only way to totally remove the impact is to leave them unburried but this would present a risk of external damage.

During abandonment and the resulting dispersion of cuttings from jacket before piles are cut and jacket removed, the feasibility of trial lifting the cuttings to surface will be investigated. This will minimize the cuttings that are disposed on the seabed and that may cause increases in turbidity in the water column.

Accidental spills will be avoided through the use of good practice codes, collision avoidance and fuel handling and transfer procedures. Management controls will be in place to avoid and minimise accidental events. In addition all staff and contractors will be required to undertake training and maintain good housekeeping standards.

12.4.5 Air environment

As presented in Chapters 9.2.1.5 and 11.2.5 all project impacts on air quality in the project area have been scoped out, since they have been assessed as insignificant following the Project design.

12.4.6 Acoustic environment

As presented in Chapters 9.2.1.6 and 11.2.6 most noise related impacts have been scoped out of the ESIA as they have been assessed as insignificant. However, specific measures are required to minimise noise related impacts to marine receptors such as fish and marine mammals. These are presented under 12.4.7.

12.4.7 Biotic environment

12.4.7.1 Plankton

As presented in Chapters 9.2.1.7.1 and 11.2.7.1 impacts on plankton have been assessed as insignificant and no further mitigation is required other than what forms part of the existing design.

12.4.7.2 Benthic communities and habitats

During the construction phase, the following activities were found to have a minor impact to the benthic communities:

- Installation of permanent mooring;
- Installation of pipelines and umbilicals; and
- Burial of pipelines and umbilicals.

During operation phase, the activity of seabed cuttings (0-400m) has a minor impact to the benthic communities.

Finally in the abandonment phase, the activities of the dispersal of seabed cutting from piles (from existing platforms) and the removal of SIPs (new platforms), is expected to also have a minor impact to the benthic communities and habitats.

Mitigation measures: Measures outlined in Sections 12.3.2 and 12.3.4 will be adopted to reduce and/or eliminate the impacts on water quality and the footprint of the development on the seabed will also mitigate the potential impacts on the benthic community. These are not repeated here but are listed in the previous sections.

12.4.7.3 Coastal marine habitats

As presented in Chapter 9.2.1.7.3 impacts on coastal marine habitats have been assessed to be low and insignificant even in the event of an unplanned spil due to the design measures in place and the Company's existing oil spill response and emergency response measures.

12.4.7.4 Fish ecology

During the operational and abandonment phases, the impacts significance on the fish ecology is assessed as minor. However, because the reversibility is high, the final impact significance is negligible. It is noted that reversibility refers to the ability of an ecosystem or receptor a) to reverse into a pre-impact state by using its own resilience mechanisms, or b) maintain its biological integrity even if an impact has occurred. Based on the above, no specific mitigation measures for fish ecology are presented other that built into the project design such as no piling activities.

12.4.7.5 Marine mammals

During the construction phase, the following activities were found to have a minor and moderate potential impact to the marine mammals:

- Operation of support vessels (moderate);
- Modifications to Delta (new risers / J-tubes) (minor)

Collisions of marine mammals with vessels usually occur at speeds exceeding 20 knots. Therefore a speed limitation of 20 knots will be defined in all boat movements under the responsibility of Energean and, thus, the possibility of a collision with a marine mammal is rather minimal.

Construction project activities with the potential to generate significant noise are quite limited and short in duration (for instance installation of mooring bays). In terms of the additional marine traffic this is against baseline conditions with the study area around subject to a moderate level of marine traffic. Marine currently using the study area will have habituated against the background and it is probable that the marginal increase in traffic will have no impact.

During operation phase the following activities were found to have a positive and minor impact:

- Maintenance of exclusion zones (positive);
- Installation of conductors (new wells) (minor);
- Spudding and drilling of wells, including cementing initial casings (minor);
- Operation of support vessels (moderate).

During abandonment phase, sever conductors activity is likely to have a moderate impact to marine mammals, cutting piles from existing platforms, a major impact whereas removing existing platforms jackets and removal SIPs (new platforms) is expected to have minor impacts to marine mammals. Finally operation of support vessels is also expected to have a moderate impact.

Mitigation measures: Energean will examine the possibility to install conductors with vibropile equipment rather than hammers (to be determined through a soil sample analysis). Vibropile equipment produces low noise levels.

Use cold cutting equipment during abandonment rather than explosives for removal of platforms as this method produces low noise levels.

Collisions of marine mammals with vessels usually occur at speeds exceeding 20 knots. Therefore a speed limitation of 20 knots will be defined in all boat movements under the responsibility of Energean and, thus, the possibility of a collision with a marine mammal is rather minimal.

Support vessel will have at least one experienced marine mammal observer (MMO) onboard and will have two if 24 hour operations are expected. Construction will not commence during periods of darkness or poor visibility (such as fog) unless MMOs are equipped with night vision binoculars. A pre-construction search will be conducted by the MMO. Construction (including conductor driving) will not commence if marine mammals detected within 500m of the activity or until 20 minutes after the last visual detection.

12.4.7.6 Avifauna

As presented in Chapters 9.2.1.7.6, project impacts on avifauna have been assessed as insignificant. Impacts may occur during a spill but existing design and oil spill response equipment reduces the likelihood of such event occurring and the impact area. Flaring is limited and the proposed structures would complement the existing offshore facilities.

12.4.8 Manmade environment

As presented in Chapters 9.2.1.8 and 11.2.8 significant impacts on the manmade environment were not identified. No additional mitigation other than existing controls is required.

12.4.9 Socio-economic environment

Implementation of the newly developed Stakeholder Engagement Plan is a key mitigation measure aimed at managing the relationships with potentially impacted and interested stakeholders. This will help manage actual and/or perceived environmental *and* social impacts, especially if any unplanned events occur.

The Company will ensure that good and services are procured locally where possible

12.4.10 Technical infrastructures

During the operation phase, treatment and disposal of drilling cuttings (from 400 – 3,150 m) is expected to add additional burden to the region's waste management infrastructure, which has been assessed in Chapter 11.2.10.2 as minor impact.

As mentioned in the above chapter, Energean will audit the waste facility to make sure it has the required capacity before it sends the waste for further management / treatment.

During the abandonment phase a number of waste streams in various quantities are expected, which again will need to be managed by licenced contractors / facilities, adding an additional burden to their operations. Since there are a number of alternative facilities to receive, the impact is minor and there is no need to specific mitigation measures.