

19 Summary of Mitigation and Monitoring Measures

19.1 Introduction

This chapter provides a summary of the proposed mitigation and monitoring measures associated with the proposed development (as identified in **Chapters 6 to 17**).

A number of safeguards and management measures have been identified in order to mitigate negative environmental effects during construction and operation. It should be noted that the project already includes any inherent measures and elements that have been incorporated in the design. Further, any environmental management measures during construction that have been identified and are associated with construction activity and methodology are documented in the ***Construction Environmental Management Plan*** (CEMP) which is available as **Appendix 5.1 in Volume 3** of this EIAR.

19.2 Construction Mitigation and Monitoring Measures (Assessment Chapters)

19.2.1 Population and Human Health

Construction phase mitigation measures relating to those factors under which population and human health effects might occur have been addressed elsewhere in this EIAR, under the environmental factors for traffic and transportation, air quality and noise and vibration. Other than the mitigation measures outlined in **Section 19.2.2 Traffic and Transportation, Section 19.2.3 Air Quality, Section 19.2.5 Noise and Vibration, Section 19.2.9 Land and Soils, Section 19.2.10 Water and Section 19.2.12 Major Accidents and Disasters** below, no further mitigation measures are proposed with respect to population and human health.

19.2.2 Traffic and Transportation

Construction hours will be from 07:00-19:00. This will result in construction personnel arriving on site before 07:00 and departing after 19:00, thereby avoiding the peak hours on the local road network.

Furthermore, HGV traffic associated with the construction of Phases 1 and 2 will not be permitted to route through Duleek Village.

A Construction Traffic Management Plan (CTMP) will also be in place for the duration of the construction phases of the proposed development (see Section 9 of the ***Construction Environmental Management Plan*** in **Appendix 5.1 of Volume 3** of this EIAR). This will be agreed with Meath County Council in advance of commencement of construction, and the overall goal of the CTMP will be to

minimise insofar as possible the potential impacts arising from the construction phase of the development on the local road network.

19.2.3 Air Quality

Construction activities are likely to generate some dust emissions. The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with environmental factors including levels of rainfall, wind speeds and wind direction.

The potential for impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. The majority of any dust produced will be deposited close to the potential source and any impacts from dust deposition will typically be within 200m of the construction area. The measures to be implemented will include:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction will be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.
- Hoarding or screens shall be erected around works areas to reduce visual impact. This will also have an added benefit of preventing larger particles of dust from travelling off-site and impacting receptors.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

19.2.4 Climate

As impacts to climate are imperceptible no mitigation is proposed.

19.2.5 Noise and Vibration

The impact assessment has determined that construction activities can comply with the construction noise and vibration criteria included in **Section 10.5.2.1** of **Chapter 10 Noise and Vibration** of this EIAR at the closest noise sensitive locations. Notwithstanding this, best practice control measures from BS5228-Parts 1 and 2 are included. BS5228 offers detailed guidance on the control of noise and vibration from demolition and construction activities that will be complied with during the construction phase. Various mitigation measures should be considered and applied during the construction phase and specific examples of such measures are:

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise;
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations;
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;
- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;
- Any plant, such as generators or pumps that is required to operate outside of normal permitted working hours will be surrounded by an acoustic enclosure or portable screen.

BS 5228 -1:2009+A1 2014 includes guidance on several aspects of construction site practices, which include, but are not limited to selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise monitoring.

The **Construction Environmental Management Plan** (CEMP) prepared as part of this EIAR (see **Appendix 5.1**) summarises the overall environmental management strategy that will be adopted and implemented during the construction phase of proposed development. The CEMP is a working document and will be finalised by the Contractor following appointment and prior to commencing works on site. For the control of noise, the contractor will be required to conduct construction noise predictions prior to works taking place and put in place the most appropriate noise control measures depending on the level of noise reduction required at any one location.

Further comment is offered on these items in the following paragraphs, however specific control measures will be chosen depending on the works involved and the noise reduction required.

19.2.5.1 Selection of Quiet Plant

The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item of plant will be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action will be to identify whether or not said item can be replaced with a quieter alternative.

For static plant such as compressors and generators used at work areas such as construction compounds etc., the units will be supplied with manufacturers' proprietary acoustic enclosures where possible.

19.2.5.2 General Comments on Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control "at source". This refers to the modification of an item of plant, or the application of improved sound reduction methods in consultation with the supplier or the best practice use of equipment and materials handling to reduce noise.

- For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. Mobile plant will be switched off when not in use and not left idling.
- For piling plant, steady continuous noise such as that generated by diesel engines, it is possible to reduce the noise emitted by fitting a more effective exhaust silencer system or utilising an acoustic canopy to replace the normal engine cover.
- For all materials handling, the contractor will ensure that best practice site noise control measures are implemented including ensuring that materials are not dropped from excessive heights and drop chutes/dump trucks are lined with resilient materials, where relevant.
- Where compressors, generators and pumps are located in areas in close proximity to noise sensitive properties/ areas and have potential to exceed noise criterion, these will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.
- Resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can be controlled by fixing resilient materials in between the surfaces in contact.
- All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

19.2.5.3 Screening

Screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to other forms of noise

control. The effectiveness of a noise screen will depend on the height and length of the screen, its mass, and its position relative to both the source and receiver.

In addition, careful planning of the site layout will also be considered. The placement of temporary site buildings such as offices and stores between the site and sensitive locations can provide a good level of noise screening during the phasing of works.

19.2.5.4 Hours of Work

Construction noise impacts will be controlled through strict working hours. Construction activity will take place during daytime hours Monday to Friday and Saturdays. It may be necessary to work outside of these hours for example for the consideration of safety, weather or sub-contractor availability.

Consideration will be given to the scheduling of activities in a manner that reflects the location of the site and the nature of neighbouring properties. Each potentially noisy event/activity will be considered on its individual merits and scheduled according to its noise level, proximity to sensitive locations and possible options for noise control.

19.2.5.5 Liaison with the Public

Clear forms of communication will be established between the contractor and noise sensitive areas in proximity so that residents or building occupants are aware of the likely duration of activities likely to generate higher noise or vibration.

19.2.5.6 Monitoring

During the construction phase of the proposed project, spot check noise monitoring will be undertaken at the nearest sensitive locations to ensure construction noise limits are not exceeded. Noise monitoring will be conducted in accordance with the International Standard ISO 1996: *Acoustics – Description, measurement and assessment of environmental noise* Part 1 (2016) and Part 2 (2017).

19.2.6 Biodiversity

The following mitigation measures will be implemented:

19.2.6.1 Protection of Habitats

- There will be a defined working area which will be fenced off to prevent inadvertent damage to adjoining habitats.
- To prevent incidental damage by machinery or by the deposition of spoil during site works, any habitats earmarked for retention nearby will be securely fenced or sign posted early in the construction phase. These will be clearly visible to machine operators.

- Habitats that are damaged and disturbed will be left to regenerate naturally or will be rehabilitated and landscaped, as appropriate, once construction is complete. Disturbed areas will be seeded or planted using appropriate native grass or species native to the areas where necessary.
- Any woodland habitat disturbed during construction will be replanted using a suitable mix of native species.
- Tree root systems can be damaged during site clearance and groundworks. No materials will be stored within the root protection area of semi-mature trees. Materials, especially soil and stones, can prevent air and water circulating to the roots. Retention of the existing woodland areas will provide natural screening and help to maintain biodiversity.

19.2.6.2 Protection of Water Quality and Surface Water Management

Detailed mitigation and monitoring measures in relation to water quality and preventing effects on aquatic habitats, in particular when working adjacent to or in the vicinity of ditches or streams are specified in **Section 15.5.3** and **15.6.2** of **Chapter 15 Water** and in **Section 14.8.1** and **14.8.2** of **Chapter 14 Land and Soils**.

The surface water discharge will continue to be monitored prior to discharge and if an out of specification reading is detected all contaminated runoff will be contained within the storage tank system. No change from the current situation is required.

A **Construction Environmental Management Plan** (CEMP) is included as **Appendix 5.1**. It will be maintained by the Contractor for the duration of the construction phase. The CEMP will cover all potentially polluting activities and include an emergency response procedure. All personnel working on the site will be trained in the implementation of the procedures.

The employment of good construction management practices will minimise the risk of pollution of storm water run-off, and any deterioration in the quality or quantity of surface water. In particular, the measures detailed in **Section 15.5.3** and **15.6.2** of **Chapter 15 Water** and in **Section 14.8.1** and **14.8.2** of **Chapter 14 Land and Soils** will be implemented when working adjacent to or in the vicinity of ditches or streams to prevent uncontrolled runoff from the site into the watercourses. In particular, the contractor will maintain an incident and emergency response action plan which will cover all foreseeable risks, i.e. fire, flood, collapse etc. An Incident Response Plan (IRP) is located in Section 8 of the CEMP in **Appendix 5.1**.

19.2.6.3 Noise and Vibration

Mitigation measures in relation to noise and vibration are addressed in **Section 19.2.5** above of this chapter and **Chapter 10 Noise and Vibration** of this EIAR.

19.2.6.4 General Ecology Protection

The Wildlife Act 1976, as amended, provides that it is an offence to cut, grub, burn or destroy any vegetation on uncultivated land, or any such growing in any hedge or ditch from the 1st of March to the 31st of August. Exemptions include the clearance of vegetation in the course of road or other construction works or in the development or preparation of sites on which any building or other structure is intended to be provided. Nonetheless, it is recommended that vegetation is removed outside of the breeding season.

Retention of the native treelines, hedgerows and woodland along the site boundaries will reduce the loss of breeding and nesting habitat for birds. NRA guidelines on the protection of trees and hedges prior to and during construction should be followed (NRA, 2006b).

19.2.7 Archaeology, Architecture and Cultural Heritage

There will be no impact on the archaeological, architectural and cultural heritage environment for the bulk of the development on the site in areas 3-12 and 14-18 (refer to **Figure 4.4**). Hence, no archaeological mitigation measures are required for these development areas.

During construction archaeological monitoring will be carried out on areas of ground disturbance under the berm in Areas 1 and 2 and under the overhead powerline in Area 13. In the event of archaeological material being uncovered such material will be preserved *in situ*, where possible or preserved by record. Preservation *in situ* will require the relocation of the element of the development beyond the area of archaeological sensitivity.

Preservation by record will require the excavation of the archaeological material and such material will be fully resolved to professional standards of archaeological practice (Policy Guidelines on Archaeological Excavation¹ – Department of Arts, Heritage, Gaeltacht and the Islands, 1999). This work will be funded by the developer.

19.2.8 Landscape and Visual

Mitigation measures proposed during the construction stage of the development, revolve primarily around the implementation of appropriate site management procedures during the construction works – such as the storage of materials, placement of compounds, control of vehicular access, and effective dust and dirt control measures, etc. These are outlined in the **Construction Environmental Management Plan** prepared by Indaver, which accompanies the submission (**Appendix 5.1**).

¹ Department of Arts, Heritage, Gaeltacht and the Islands (1999) Policy Guidelines on Archaeological Excavation,

<https://www.archaeology.ie/sites/default/files/media/publications/excavation-policy-and-guidelines.pdf>

19.2.9 Land and Soils

The mitigation measures detailed below are also relevant for the protection of surface water and are hence cross referred to in **Section 19.2.10 Water** below. Also, **Section 19.2.10** outlines additional measures which will be implemented when working adjacent to or in the vicinity of ditches or streams to prevent uncontrolled runoff from the site into watercourses. Refer to **Section 19.2.10** for further details.

As outlined in **Appendix 5.1 Construction Environmental Management Plan** (CEMP) of **Volume 3**, the adopted construction techniques will be completed in accordance with industry best practice guidance:

- TII's Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan and Construction Industry Research; and
- Information Association (CIRIA) in the UK, Environmental Good Practice on Site Guide, 4th Edition (CIRIA 2015).

Mitigation measures regarding land and soils will be implemented to minimise the impact on land and soils (including groundwater). These mitigation measures are designed to contain any areas within the site boundary at risk to contaminated runoff.

19.2.9.1 Excavation Works

- Where possible, excavated materials will be reused on site for backfilling purposes, re-grading and landscaping.
- All earthworks will be monitored by suitably qualified and experienced geotechnical personnel.
- Earthworks will be programmed so as not to be carried out during extreme weather events.
- There is no evidence that contaminated soil should be encountered during the site works, however if any is encountered it will be disposed of as required to a suitable authorised waste facility.

19.2.9.2 Storm water and foul water management

- In general, storm water generated on site (e.g. from excavations) will be channelled away from the watercourse and infiltrated to ground via silt traps and managed soakaways.
- Drainage from the bunded and designated storage areas will be diverted for collection and safe disposal.
- All construction foul effluent will be stored in the temporary holding tank and will be regularly disposed of off-site.
- Laydown areas will be suitably drained.

- Temporary interceptors (soak pits lined with geotextile) will be constructed as necessary during the early stages of construction mitigating against silt laden run off to the existing drainage network.

19.2.9.3 Material Storage

- Storage tanks/drums of fuel, oil, chemicals and all other materials that pose a risk to waters if spilled, will be stored in designated storage areas which will be locked when not in use.
- Bunded pallets will be used for storage of drums.
- Storage areas will be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded areas.
- Secure valves will be provided on oil and fuel storage facilities.
- Filling and draw-off points will be located entirely within the bunded areas.
- Any areas which will involve the storage of fuel and refuelling will be paved and bunded and hydrocarbon interceptors will be installed to ensure that no spillages will get into the surface water or groundwater.
- Appropriate staff will be trained in environmental issues and spill response procedures.
- The contractor will maintain an incident and emergency response action plan which will cover all foreseeable risks, i.e. fire, flood, collapse etc. An Incident Response Plan (IRP) is located in Section 8 of the CEMP in **Appendix 5.1 of Volume 3**.

19.2.9.4 Site Hygiene

Vehicles exiting the site from excavation areas will be required to pass through wheel wash facilities to remove mud and organic material before entering main site or public roads. The discharge from the wheel wash (equipped with a filtering system) will be directed to a temporary storage tank on site and will be collected periodically for off-site treatment.

19.2.9.5 Waste Management

All waste produced on site will be transported to licensed waste disposal facilities to avoid potential soil contamination. Refer to the Construction Waste Management Plan in Section 7 of the CEMP in **Appendix 5.1 of Volume 3**.

19.2.9.6 Monitoring

- Visual monitoring will be undertaken as part of the regular site audits during the construction of the proposed development to ensure existing surface water runoff is draining from the site and is not exposed to any contaminants.
- The contractor will be required to monitor the weather forecasts to inform the programming of earthworks and stockpiling of materials.

- Any excavation shall be monitored during earthworks to ensure the stability of side slopes and to ensure that the material excavated for disposal or re-use is consistent with the descriptions and classifications according to the waste acceptance criteria testing carried out as part of the site investigations.
- Movement monitoring shall be carried out during any activities which may result in ground movements. It is anticipated that the works will be monitored by a Resident Engineer.
- In relation to potential contamination, a suitably experienced environmental consultant will be required to oversee the excavation works for the proposed development so that potential contamination can be segregated, classified and suitably disposed.

Refer also to **Section 19.2.10** below for specific monitoring measures required for the protection of (surface) water quality.

19.2.10 Water

A **Construction Environmental Management Plan** (CEMP) is contained in **Appendix 5.1** in **Volume 3** of this EIAR. It will be maintained by the Contractor for the duration of the construction phase. The CEMP will cover all potentially polluting activities and include an emergency response procedure. All personnel working on the site will be trained in the implementation of the procedures.

The contractor will maintain an incident and emergency response action plan which will cover all foreseeable risks, i.e. fire, flood, collapse etc. An Incident Response Plan (IRP) is located in **Section 8** of the CEMP in **Appendix 5.1 of Volume 3**.

The employment of good construction management practices will minimise the risk of pollution of storm water run-off, and any deterioration in the quality or quantity of surface water.

Section 19.2.9 above (and also replicated in **Section 14.7.1 of Chapter 14 Land and Soils**) sets out a number of mitigation measures and monitoring measures to minimise the risk of effects on land and soils (including groundwater) during construction. These mitigation measures address excavation works; storm water and foul water management; material storage (including fuel, oil and other potentially contaminating materials); site hygiene; and waste management. These measures also apply to the protection of surface water and are therefore relevant for this chapter. Refer to **Section 19.2.9** above for further details.

In addition, the following measures shall also be implemented when working adjacent to or in the vicinity of ditches or streams to prevent uncontrolled runoff from the site into the watercourses:

- The perimeter of the construction area adjacent to the watercourse will be bermed to create a physical barrier between the site and the watercourse. Where there is insufficient space for a berm, a barrier will be created using trench sheeting along the boundary with the watercourse.

- Where cast-in-place concrete is required, all work must be carried out in the dry and effectively isolated from any flowing water (or water that may enter streams and rivers) for a period sufficient to ensure no leachate from the concrete.
- Waterproofing and other chemical treatment to structures in close proximity to watercourses shall be applied by hand.

Monitoring

The same monitoring measures will apply in relation to water protection as those detailed in **Section 19.2.9** above (and also replicated in **Section 14.7.1** of **Chapter 14 Land and Soils**) to protect soils and groundwater. In addition, the following monitoring measures for the protection of (surface) water quality are required:

- Where surface water run-off from the site construction works areas will be discharged to surface waters, monitoring will be carried out to ensure the concentration of suspended solids (SS) does not exceed 30 mg/litre.
- The contractor will be required to ensure that the sanitary facilities for the site personnel are maintained and effluent storage is regularly emptied and disposed of.
- The contractor will be required to ensure that the water supply to the site is maintained and free of contaminants.

19.2.11 Material Assets

The proposed development will be constructed and operated in accordance with good practice in energy and resource conservation, and efficiency.

A **Construction Environmental Management Plan** (CEMP) has been prepared, refer to **Appendix 5.1**, and summarises the overall environmental management strategy that will be adopted and implemented during the construction phase including the responsible and efficient management of material assets including water and waste.

Under the CEMP, the contractor will appoint a Construction Waste Co-ordinator who will be responsible for implementing the construction waste management plan (CWMP). Refer to Section 7 of the CEMP in **Appendix 5.1** of this EIAR for details of the CWMP.

19.2.12 Major Accidents and Disasters

None of the hazards identified in this report arise during the construction phase of the development. The new accident scenarios associated with the new plant will only arise during the operational phase of this plant. However, the construction activities could present a risk of acting as an initiator to an accident scenario at the existing plant.

A **Construction Environmental Management Plan** (CEMP) will be in place to ensure that the construction is carried out in a safe manner with regard to safeguarding the environment from potential incidents on site.

The CEMP also sets out the Construction Traffic Management Plan which will be finalised and implemented by the Contractor. The CEMP is described in **Appendix 5.1 of Chapter 5 Construction Activities.**

Risk assessment is an integral part of the CEMP. Furthermore, the appointed PSCS (Project Supervisor Construction Stage) will ensure that the interaction of different activities at the site is managed safely so as not to present any unacceptable risks. The CEMP will also incorporate the development of an Incident Response Plan (IRP) to ensure that, in the unlikely event of an incident, response efforts are prompt, efficient, and appropriate. The objectives of the IRP will be to:

- Ensure the health and safety of workers and visitors along the site.
- Minimise any impacts to the environment and ensure protection of the water quality and the aquatic species dependent on it.
- Minimise any impacts on properties, services etc.
- Establish procedures that enable personnel to respond to incidents with an integrated multi-departmental effort (including a link to the existing on-site Emergency Plan) and in a manner that minimises the possibility of loss and reduces the potential for affecting health, property, and the environment.
- The CEMP also sets out provisions for traffic management during the carrying out of the construction works.

The CEMP will include provision for continuous inspections, auditing and monitoring of the construction works. The Site Environmental Manager (SEM) will draw up a schedule of monitoring, which will set out roles and responsibilities for monitoring and reporting the works. In the event that the monitoring results indicate that the works are not being carried out in accordance with the contractual requirements, the SEM is responsible for initiating and reporting on the corrective actions to be implemented.

The SEM and the Construction Manager will also carry out quarterly audits to ensure that the Contractor engaged in carrying out the works is successfully meeting all environmental commitments / requirements under the CEMP.

The effective implementation of the CEMP will help to reduce the risks associated with the construction phase of the project in terms of the environmental effects. The PSCS (Project Supervisor Construction Stage) will monitor performance against the CEMP to ensure that it is adhered to throughout the process.

19.3 Operational Mitigation and Monitoring Measures (Assessment Chapters)

19.3.1 Population and Human Health

Operational phase mitigation measures relating to those factors under which population and human health effects might occur have been addressed elsewhere

in this EIAR, under the environmental factors for traffic and transportation, noise and vibration and major accidents and disasters. Other than the mitigation measures outlined in **Section 19.3.2 Traffic & Transportation**, **Section 19.3.5 Noise and Vibration** and **Section 19.3.12 Major Accidents and Disasters** below, no further mitigation measures are proposed with respect to population.

As there will be no significant change in emissions in the operational phase, no further mitigation is proposed regarding human health.

19.3.2 Traffic and Transportation

19.3.2.1 Staff Operational Hours

Arrival and departure times for the additional 20 personnel to be employed on site following completion of Phases 1 and 2 of the proposed development will result in all new personnel arriving on site before 08:00 and departing the site before 17:00, thereby avoiding the morning and evening peak periods on the local road network (08:15-09:15 and 17:00-18:00, respectively).

19.3.2.2 HGV Arrival and Departure Profiles

The arrival profile of HGVs to the site is distributed across the working day. This is as a result of specific deliveries to the site being co-ordinated by the Indaver planner, and also a result of the current operators and deliveries to the site settling into an established pattern since the existing facility became operational. It is expected that this will continue for the proposed development.

Furthermore, it is Indaver policy to instruct those companies that use the existing facility to ensure that HGV traffic does not route through Duleek Village, although some localised routing is sometimes necessary for specific cases.

19.3.3 Air Quality

Impacts to air quality during operation are not significant therefore no mitigation is proposed. The site will continue to operate within the EPA licence conditions set for the plant, which will ensure no significant impacts to air quality occur.

19.3.4 Climate

There are no significant impacts to climate predicted as part of the operational phase of the proposed development therefore no mitigation is proposed.

19.3.5 Noise and Vibration

19.3.5.1 On-site Noise Sources

The results of the assessment have confirmed that once noise emission levels associated with the new plant items do not exceed the equipment noise limit applied at the site, discussed **Section 10.5.4 of Chapter 10 Noise & Vibration**,

the facilities noise emission limit values will not be exceeded. The following best practice measures will be applied to the proposed development to ensure noise levels are controlled to the surrounding environment and to comply with the facilities IE licensed noise emission limits:

- Roller shutter doors within the Bottom Ash Storage building will be maintained closed at all times, except for access/egress during activities, and;
- Vehicles parked at the truck parking bay will be required to switch engines off when parked on site.

In addition to the measures outlined above, the following best practice measures which form the basis of ongoing noise management at the site will be applied to the proposed development to ensure operational plant noise levels are kept to a minimum:

- All new items of external plant will be limited to a sound pressure noise level of 82dB at 1m;
- Plant will be sited as far away from noise-sensitive locations as is practicable;
- External plant items (pump, motors, fans) will be switched off when not required, particularly during night-time periods;
- The use of acoustic attenuators/ enclosures etc., will be employed to any items of external plant in order to ensure this limit value is complied with.
- Duct mounted attenuators will be installed on the atmosphere side of all air moving plant, where required;
- Splitter attenuators will be installed providing free ventilation to internal plant areas, where required, and;
- Anti-vibration mounts will be installed on all reciprocating plant, where required.

19.3.5.2 Additional Vehicles on Public Roads

The noise effect assessment outlined above has demonstrated that mitigation measures are not required.

Monitoring

The facility is licensed by the EPA under an Industrial Emissions (IE) licence. As part of the IE licence, annual noise monitoring is undertaken at the nearest noise sensitive locations to compare against the operational Emission Limit Values (ELV's).

Monitoring results will be submitted to the EPA for review and will also be included within the facilities Annual Environmental Report (AER) issued to the EPA.

19.3.6 Biodiversity

No specific mitigation measures are required for biodiversity at operational stage.

19.3.7 Archaeology, Architecture and Cultural Heritage

Mitigation measures are not required for operational stage.

19.3.8 Landscape and Visual

Specific mitigation measures are not required for the operational phase.

The design of the proposed buildings and their scale, massing and heights are entirely in keeping with the existing buildings and the existing site operations. Their proposed locations adjacent to existing buildings and behind the existing tree planted berms, assist further in screening them from the identified key viewpoints along the R152 road from Drogheda to Duleek. Extensions in height and length of some of the berm planted areas is proposed under the scheme proposals. The finishes of the proposed buildings, in matching with the existing main building finishes, will assist in assimilating the proposed buildings and should to an extent, reduce any visual impact.

19.3.9 Land and Soils

As the significance of the ‘likely significant environmental impact’ on the site during operation of the proposed development is ‘imperceptible’ no mitigation measures have been proposed with respect to effects from operation of the proposed development.

Monitoring

Regular on-going monitoring of groundwater quality is already carried out at the existing Indaver facility as part of the EPA licence (W0167-03) requirement and this monitoring will continue, refer to **Section 14.3.3.5 of Chapter 14 Land & Soils**. No additional monitoring is necessary.

19.3.10 Water

No specific mitigation measures are required to protect water quality or minimise any flood risk for the operation of the proposed development.

Monitoring

No additional water monitoring is proposed. The current monitoring carried out on site is sufficient. As described in **Section 4.9 of Chapter 4 Description of the Proposed Development** of the EIAR, there are a number of existing monitoring measures on site to prevent any accidental emissions or spills and ensure fire water retention to minimise the risk to water quality.

Under the current EPA IE licence (W0167-03) surface water monitoring is carried out, as outlined in **Section 15.3.2.2 of Chapter 15 Water**, and this monitoring will continue with the proposed development.

19.3.11 Material Assets

During operation of the proposed development, energy efficient power systems will be employed, water conservation measures will be implemented, and wastes will be avoided, minimised or recycled where economically feasible.

Wastes arising on site, for example from the administration building and maintenance activities, will be sent off site to be recycled where practical, and treated in the Waste-to-Energy facility if not. A beneficial reuse will be sought for the bottom ash. Metals will be recovered from the bottom ash.

The additional boiler ash and flue gas residues accepted and produced at the site will be pre-treated for recovery off-site.

19.3.12 Major Accidents and Disasters

In assessing the risks presented at each installation at the site (both existing and proposed installations), the HAZID&RA in **Appendix 17.1** of this EIAR noted a range of measures that are in place, or will be put in place for the new development, to mitigate the risks associated with the accident scenarios that were identified.

Details of the measures that will be put in place to reduce and mitigate the risks associated with the key scenarios associated with the proposed development are discussed in the following sub-sections:

19.3.12.1 Risk Reduction and Mitigation Measures at New Aqueous Waste Tank Farm

- Tanks will be fully bunded, in accordance with the 110% rule and 25% rule (i.e. bund is large enough to retain at least 110% of the volume of the largest tank and 25% of the total inventory stored at the bund).
- Tanks will be fitted with shielding to protect against the risk of a release outside of the bund due to tank failure.
- Tanks will operate with a nitrogen blanket on the vapour space, to protect against the potential for evolution of flammable vapours from the liquid surface.
- Welded pipelines to minimise the use of flanged connections.
- Preventative maintenance regime to ensure integrity.
- Design to incorporate measure to protect against siphoning of the tank contents in the event of line failure.
- Permit to work system to control potentially invasive works on site.
- Impact protection at tank farm and at tanker loading area.
- Deliveries will be manned activities carried out by trained operators.

- Hoses will be inspected prior to transfers taking place.
- Visual inspection of tankers prior to acceptance on site.
- Overfill protection system on tanks (level gauges, level switches).
- Personnel protective equipment (PPE) for operators involved in carrying out deliveries, as required.
- Contents of the aqueous waste tank are dilute (>90% water), thereby reducing the fire hazard.

19.3.12.2 Risk Reduction and Mitigation Measures at New Hydrogen Plant

- Interlocks on system, to enable a leaking section of line to be isolated, reducing the potential quantity released to atmosphere.
- Pressure reduction at connection for vehicle fuelling.
- Siting of facility and separation distances to other plant, equipment, buildings, etc. in accordance with NFPA 55.
- Preventative maintenance system on plant and equipment, to ensure integrity and fitness for purpose.
- Forced ventilation at indoor area of plant, to prevent risk of hydrogen accumulation at ceiling level.
- Impact protection on hydrogen plant.
- Speed limit in place on site.
- Road tanker movements supervised by trained Indaver operator.
- Visual inspection of road tankers prior to acceptance on site.
- Transfer hoses inspected prior to use.
- ATEX zoning, with control of ignition sources.

These include measures to reduce the probability of an accident scenario developing (risk prevention) and measures to reduce the consequences if an accident did occur (risk mitigation). The measures protect against the conditions arising under which an accident could occur, they enable rapid detection and response and protect against the risk of environmental contamination.

With these measures in place, the HAZID&RA found that Indaver would have all necessary measures in place at the bunker, throughout all phases of the operation. As such the risks associated with this scenario were considered to be ALARP (as low as reasonably practicable).