Methodology

The following tables in this section assess the potential risk to receptors from the following hazards, taking into account the measures proposed to reduce those risks.

The method relies on a scoring system that is based on the frequency or probability of the event occurring and the resulting consequence or potential effect of the event on the environment.

Controls or mitigation are also identified in the assessment, which consist of measures or actions that can be carried out to limit the potential for impacts.

The probability of exposure is the likelihood of the receptors being exposed to the hazard, and is defined as low, medium or high. These terms are qualified as follows:

- Low: exposure is unlikely, barriers in place to mitigate against exposure;
- Medium: exposure is fairly probable, barriers to exposure less controllable; and
- High: exposure is probable, direct exposure likely with few barriers.

The aim is it to reduce the risk of fugitive emissions from the facility or the impact of the emissions on the environment, through specific mitigation measures identified for each specific risk.

Control and mitigation measures have been identified for all risks identified in the assessment, based on the Best Available Techniques (BAT) measures set out in the guidelines and on operational experience. The measures specific to each risk are described in the assessment. The mitigation measures will be incorporated into the Site management processes and Site operatives will be made aware of these measures during training.

More general mitigation measures to avoid emissions, in line with indicative BAT standards, are also set out in the relevant sections of the Main Supporting Document.

Figure 3: Risk Assessment Matrix

Consequence	Exposure probability		
	Low	Medium	High
Low	Low Risk	Low Risk	Medium Risk
Medium	Low Risk	Medium Risk	High Risk
High	Medium Risk	High Risk	High Risk

Table 3.1: Severity Index

Severity of harm	Severity Index
Impact to people or designated receptor	High
Impact to non-designated receptor	Medium
All other impacts	Low

Table 3.2: Probability Index

Likelihood of harm occurring	Probability Index
Harm is near certain or very likely to occur	High
Harm is likely to occur	Medium
Harm is unlikely	Low

Table 3.3: Magnitude of risk

Magnitude of risk	Probability index		
Severity index	**Low**	**Medium**	**High**
Low	Low	Low	Medium
Medium	Low	Medium	High
High	Medium	High	High

Figure 3: Climate Change Risk Assessment Matrix

Risk Assessment	Definition	Score Range
Frequency (or probability)	Describes the likelihood of the event occurring.	1 (least frequent) – 6 (most frequent)
Consequence	Describes the potential effect of the event on the environment.	1 (least consequent) – 6 (most consequent)
Risk	Risk is frequency multiplied by consequence.	1 – 36 (36 greatest risk)

Table 1-1 Emissions to air

Hazard	Receptor	Pathway	Risk reduction measures	Exposure probability	Potential consequences	Exposure rating	Consequence rating	Overall risk
Emissions to air from Post Carbon Capture (PCC) plant	Local residents and businesses beyond the boundary of the Installation. See human and ecological receptors listed in Main Supporting Document Table 7.1 and 7.2	Air	Under normal operating conditions, the Combined Cycle Gas Turbine (CCGT) will send flue gas to the PCC plant and therefore the emissions will comprise combustion emissions from the CCGT and emissions resulting from the carbon capture process from the PCC absorber stack (Emission Point A1). Emissions from A1 will include: - Nitrogen oxides (NOx) and carbon monoxide (CO) from combustion. - Ammonia (NH_3) from the Selective Catalytic Reduction (SCR) unit. - Amines and other degradation products from the PCC plant, including nitrosamines and nitramines (N-amines) from the PCC process. Sulphur dioxide (SO_2) and particulate matter (PM_{10} and $PM_{2.5}$) from natural gas-fired plants occur at levels so low relative to Air Quality Standards (AQS) objectives that they are considered negligible. Consequently, these pollutants were not included in the assessment. The assessment concluded: - No significant effects on human receptors under normal operating conditions for any pollutants assessed. - No significant effects on ecological receptors for any pollutants assessed, based on critical levels (CL) and acid critical loads (CLd).	Medium due to design and operational measures in place.	Low due to findings of the Air Impact Assessment	Medium	Low	Low

Emissions to air from HRSG Stack	Local residents and businesses beyond the boundary of the Installation. See human and ecological receptors listed in Main Supporting Document Table 7.1 and 7.2	Air	If the CCGT operates without the PCC plant, emissions will be released from the HRSG stack (Emission Point A2). These emissions will include: - NOx and CO from combustion. - NH_3 from the SCR unit. Operation in this mode is expected to be infrequent and short-term, occurring only when the CO_2 transport and storage network is unavailable. Detailed air dispersion modelling was carried out for short-term averaging periods only, and results are provided in Appendix E of the Main Supporting Document. The assessment findings are as follows: - Human receptors: No significant effects for any pollutants. - Ecological receptors: One exceedance of the daily NOx CL (75 µg/m³) at Teesmouth and Cleveland Coast. However, IAQM guidance for Nature Conservation allows a less stringent CL of 200 µg/m³ in areas where SO_2 and ozone concentrations are likely to be low. When applying this threshold, there are no exceedances of the CL and therefore the effects are not significant.	Medium due to design and operational measures in place.	Low due to findings of the Air Impact Assessment	Medium	Low	Low

Emissions to air of nutrient nitrogen and acidification	Cotahm dunes sand dunes receptor (part of the Teeesmouth and Cleveland SSSI)	Air	Impacts of nitrogen deposition on the sensitive sand dune receptor were assessed as part of the Air Impact Assessment (Appendix E of the Main Supporting Document). The sources of nitrogen from the Installation which contribute to nitrogen and acid deposition include NOx emissions from the CCGT, NH_3 from ammonia slip of the SCR, amines from the PCC plant and N-amines from the PCC process. Two scenarios were considered: - An extreme worst case normal operation. - A likely worst case normal operation. Air quality modelling results show that nutrient nitrogen deposition impacts could not be screened as insignificant under the extreme worst case normal operating scenario at the Teesmouth and Cleveland Coast SSSI receptor. The predicted impacts are up to 1.7% of the lower CLd applied and therefore over the 1% to demonstrate insignificance, in an area where the background concentrations are already predicted to be exceeding the lower CLd. Under the likely worst case normal operational scenario, predicted impacts are much lower, at 0.9% of the CLd. Actual impacts are therefore considered likely to be insignificant. For acid deposition, predicted process contributions under an extreme worst case normal operatign scenario are below the CLd, and no exceedances are expected at any ecological receptor assessed. Acid deposition impacts are therefore considered insignificant.	Medium due to design and operational measures in place.	Low due to findings of the Air Impact Assessment	Medium	Low	Low

Emissions to air from emergency diesel generators	Local residents and businesses beyond the boundary of the Installation. See human and ecological receptors listed in Main Supporting Document Table 7.1 and 7.2	Air	There will be a total of 6 emergency diesel generators (EDG) at the Installation. The purpose of the EDGs is to provide provide electricity during a power cut to critical systems. However, under normal operating conditions the EDGs will require testing. It is anticipated that each EDG will operate for a maximum of 12 hours per year for testing (i.e. 72 hours in total for the six proposed EDGs), however in accordance with the permit, only one EDG will be tested at a time. A screening assessment on impacts of the air emissions (oxides of nitrogen only) from the operation of an EDG for 72 hours using the Simple Calculation of Atmospheric Impact Limits (SCAIL) assessment tool has been undertaken. In addition, an emergency scenario has been modelled whereby all 6 EDGs would be operating concurrently for 72 hours. The results of the assessment are presented in the Air Impact Assessment (Appendix E of the Main Supporting Document). The results show that for the impacts on human receptors, during testing (up to 72 hours per year across the 6 EDGs), the predicted annual mean NO_2 contribution was less than 1% of the air quality standard, and short-term (hourly) contributions were 0.1% of the limit. These impacts are considered insignificant. In an emergency scenario (up to 72 hours with all EDGs operating), the hourly NO_2 contribution was 0.2% of the limit, which is also insignificant. For the closest ecological receptor, annual mean NOx contributions during testing were 0.3% of the critical level, and nitrogen deposition was 0.3% of the critical load. Acid These are well below thresholds (1%) and considered insignificant. Emergency operation was not assessed against annual criteria because it is a short-term event, but given the very low predicted contributions, impacts are expected to remain insignificant.	Low due to frequency of operation	Low due to findings of the Air Impact Assessment	Low	Low	Low

Table 1 - 2 Emissions to water

Hazard	Receptor	Pathway	Risk reduction measures	Exposure probability	Potential consequences	Exposure rating	Consequence rating	Overall risk
Emissions to water (Tees Bay) via W1	Tees Bay	Water	The existing Environmental Permit contains two Emission Points to water, W1 and W2. Emission Point W1 represents the final discharge point for all waters collected in the onsite Effluent Pond, which will discharge via a pump into Tees Bay via a new outfall to be constructed for the Installation, discharging approximately 1.1 km from the shore. Waters collected in the Effluent Pond will comprise surface waters from areas of the Site with no potential for contamination (Clean Surface Water (CSW)) and Reverse Osmosis (RO) concentrate from the water demineralisation plant. Surface water from process areas, and therefore could potentially be contaminated (PCSW), will pass through an oil/water interceptor before before transferred to an attenuation pond where it would be be tested to ensure that it is suitable for release before being transferred to the Effluent Pond. If required, the effluent will be neutralised before release to the Effluent Pond. There will also be process effluents which will be treated in the WwTP, before being reused within the cooling water circuit. Cooling tower and HRSG blow down will be monitored at Emission Point W2 before being released into the Effluent Pond for discharge via Emission Point W1. A H1 screening assessment has been undertaken to determine the potential for impacts from the emissions to water (see Appendix G of Main Supporting Document). The findings of the H1 screening assessment confirm that all the parameters potentially released from the Installation will not have any adverse impact on the quality of the receiving waters. It is therefore considered that further detailed modelling is not required to support the Environmental Permit variation application.	Medium due to design and operational measures in place.	Low due to findings of the H1 screening assessment	Medium	Low	Low

Table 1 - 3 Fugitive emissions

Hazard	Receptor	Pathway	Risk reduction measures	Exposure probabi	Potential consequ	Exposure rating	Consequence rating	Overall risk
Release of natural gas through leakage and valves	On-site staff and local residents and businesses beyond the boundary of the Installation. See human and ecological receptors listed in Main Supporting Document Table 7.1 and 7.2	Gas carried on wind leading to the development of flammable atmospheres	There are no on-site gas storage facilities, minimising the likelihood of a large gas release and the development of an explosive atmosphere on site. An emergency shutdown valve will be in place. The valve shall be quick acting and hard-wired and be able to be activated from the central control room and shall meet the IGEM standards for ESDV and also in accordance with IEC 61508 and IEC 61511. All pressure relief, safety relief valves and vents, shall be provided with independent discharge piping routed to a safe location. Each vent shall have a capped connection downstream to allow sampling of the vents. The site will be fitted with fire & gas detection which will be connected to the control system. All pipework will be constructed and maintained in accordance with the relevant safety standards. Safety mechanisms, such as safety valves, and pressure relief valves shall be integrated to protect against overpressure and overheating. Regular inspection of the site infrastructure will be undertaken by suitably trained employees.	Low exposure probability due to implementation of risk reduction measures to prevent a gas leak	Medium potential consequence on human health and ecological receptors in surrounding area.	Low	Medium	Low

Spillage of diesel to surface water or groundwater during	Local surface water and groundwater	Flow path is determined by surface topography and drainage systems	Site drains are designed in accordance with industry best practice and appropriate safety standards including CIRIA Guidance 736. The diesel will be stored in accordance with Oil Storage Regulations. Diesel will be delivered by an approved contractor. Appropriate site training/ induction will be in place and appropriate monitoring points and audio/ visual alarms will be present during any bulk chemical transfers to minimise chance of leaks/ overfill. EDGs and tankered areas will be paved and kerbed/ bunded to prevent contamination and will be stored in an appropriately bunded container which will be regularly inspected. Spill kits designed to deal with the stored material will be in the proximity of storage areas and fill points in the event of a spill. The EMS will comprise procedures for controlling raw material delivery including for oil transfer operations, and spill response procedures. All relevant personnel will be trained on how to handle a spill incident.	Low exposure probability due to implementation of risk reduction measures to prevent escape of diesel.	Medium potential consequence on human health and ecological receptors in surrounding area.	Low	Medium	Low

Leak of amines from amine storage	On-site staff and local residents and businesses beyond the boundary of the Installation. See human and ecological receptors listed in Main Supporting Document Table 7.1 and 7.2, soil and groundwater receptors		The amines will be stored within a closed loop system and topped up when required. The PPC Plant area will be paved and kerbed/ bunded with controlled discharges to avoid uncontrolled surface run-off and contain spillage and leakages from equipment. Amine contaminated water will not be discharged to any open drain systems or to the outfall to Tees Bay. It will be taken off-site by tanker to be treated at a licensed waste site.	Low exposure probability due to implementation of risk reduction measures to prevent escape of amines.	High potential consequence on human health and ecological receptors in surrounding area.	Low	High	Medium

Storage of ammonia	On-site staff and local residents and businesses beyond the boundary of the Installation. See human and ecological receptors listed in Main Supporting Document Table 7.1 and 7.2, soil and groundwater receptors.	Air, land and surface water (dependent on the state of ammonia)	Liquid ammonia for the Selective Catalytic Reduction (SCR) system will be stored in atmospheric pressure fixed roof tank, sized tank designed to relevant industry codes (API 650) and standards (BSEN 14015). The tank will be nitrogen blanketed and will have vapour balancing for unloading operations. For details on odour management, see 'Table 1 - 6 Odour'. The ammonia storage tank will be bunded with a secondary containment capacity of either 110% or the capacity of the largest tank wihtin the bund or 25% of the total capacity, in accordance CIRIA c736. The bund will also be constructed of impermeable materials on impermeable ground and all pipework will be routed over the bund and not through it. Gases emisisons of ammonia will be minimised as the storage tanks will be fitted with carbon filters to prevent ammonia emissions. NH_3 gas detectors will be provided and located in the bund area and close to pumps handling aqueous Ammonia due to the toxicity of this product.	Low exposure due to containment measures in place	Medium potential consequence on human health and ecological receptors in surrounding area due to toxicity.	Low	Medium	Low

Spillage/ escape of other raw materials including water treament chemicals	Local surface water and groundwater	Flow path is determined by surface topography and drainage systems	Chemicals will be stored in self bunded leak proof containers or in a secure impermeable bunded area. Bunding will have a minimum capacity of either 110% of the capacity of the largest tank or 25% of the total capacity of all the tanks within the bund, whichever is the greater. Storage tanks will be designed to reelvant industry codes and standards. Installation of the storage tanks within a secondary containment system (bund) designed in accordance with CIRIA C736 guidance. All process equipment and pipework where leakages could occur will be provided with drip pans which will collect and direct escaped fluids to a closed drainage system and prevent it from spilling to the environment.	Low due to site design and management procedures.	Medium potential consequence on human health and ecological receptors in surrounding area.	Low	Medium	Low

Table 1 - 4 Nuisances

Hazard	Receptor	Pathway	Risk reduction measures	Exposure proba	Potential consequ	Exposure rating	Consequence rating	Overall risk
Mud/ litter carried onto highway	Land and water	Public	All internal roads, storage and processing areas will be hard-surfaced with concrete or tarmac and swept when required	Low due site design and management procedures	Low adverse impacts on local receptors	Low	Low	Low
Pest, vermin and scavengers	Land and water	Staff and public	Due to the nature of the proposed activity, pest/ vermin/ scavengers are unlikely to be an issue.	Low due to nature of the site.	Low adverse impacts on local receptors	Low	Low	Low

Waste generation	Land and water	Staff and public	All solid waste will be stored in a dedicated waste management area located within the Installation. Waste will be temporarily stored and collected for offsite treatment or disposal from this location. The waste storage area will also be designed in accordance with the following: - The area will be designated and located away from any watercourses and sensitive boundaries (e.g. those with public access), - The area will have signs and notices and be clearly marked-out for waste segregation, and all containers and packages will be clearly labelled, - The area will have appropriate kerbing and bunding and be lined, - The maximum storage capacity of the area will be defined and not exceeded, and the maximum storage period for containers will be specified and adhered to, - Appropriate storage facilities will be provided for waste substances with specific requirements (e.g. flammable, sensitive to heat or light), - All waste containers will be stored with lids, caps and valves secured and in place, - All waste containers, drums and small packages will be regularly inspected, - Spill response procedures will be in place to deal with damaged or leaking waste, - For liquid wastes stored in the waste management area, the container will be bunded with at least 110% of the largest storage container, or 25% of the total storage capacity (whichever is greater).	Low exposure probability due to implementation of waste management measures	Low adverse impacts on local receptors	Low	Low	Low

Table 1 - 5 Noise

Hazard	Receptor	Pathway	Risk reduction measures	Exposure proba	Potential consequ	Exposure rating	Consequence rating	Overall risk
Noise and vibration from the operation of the Installation	Local residents and businesses beyond the boundary of the Installation. See human and ecological receptors listed in Main Supporting Document Table 7.1 and 7.2	Air/ wind	Pre-operational measure PO4 of the existing Environmental Permit requires the Noise Impact Assessment that was presented with the original Environmental Permit application to be updated 6 months prior to the commencement of commissioning. As the noise controls for the final plant design are not yet finalised, the updated assessment has not been presented as part of this Environmental Permit variation, and will be provided in line with the requirements of PO4. It is considered that the noise impacts of the Installation will be controlled to ensure that there will be no residual impacts to receptors.	Low due site design and management procedures	Low adverse impacts on local receptors	Low	Low	Low

Table 1 - 6 Odour

Hazard	Receptor	Pathway	Risk reduction measures	Exposure proba	Potential consequ	Exposure rating	Consequence rating	Overall risk
Odour resulting from operation of the plant or from escape of stored chemicals	Local residents and businesses beyond the boundary of the Installation. See human and ecological receptors listed in Main Supporting Document Table 7.1 and 7.2	Air/ wind	Due to the nature of the materials used onsite and the containment measures, the proposed plant is unlikely to generate significant odour. The CCGT plant will use natural gas as a fuel, it is expected that odour from the proposed CCGT operations will not be a significant issue. Carbon dioxide is odourless and therefore not considered to be a risk. Odour may arise from the use of the solvent in the carbon capture process, however this is dependent on the volatility. CANSOLV DC-103 has a low volatility (boiling point is 105°C, i.e. higher than water, and it has a very low vapour pressure of <0.013 kPa at 20°C, which is only just over 0.01 kPa, which is used for the definition of a VOC in the IED). It is considered that due its low volatility there is minimal potential for odour issues from its use and therefore no specific controls on storage tanks are considered necessary. In addition the carbon capture unit shall use good engineering design practice, along with appropriate techniques or methods during maintenance activities, to ensure that site activities shall be free from odour at levels likely to cause annoyance outside the site boundary. The Selective Catalytic Reduction (SCR) system will produce ammonia emissions which have an odour. The ammonia storage tank will be nitrogen blanketed and will also have vapour balancing for unloading operations. In addition the associated vent to atmosphere will be fitted with carbon filters to prevent ammona emissions and therefore the potential for odour issues. Gas monitors will be in place to detect levels of ammonia.	Low due to the nature of the facility, site design and management procedures.	Low adverse odour impact on local receptors.	Low	Low	Low

Global warming potential

Hazard	Receptor	Pathway	Risk reduction measures	Exposure probability	Potential consequences	Overall risk
Generation of greenhouse gas emissions	National and global climate	Air	The Power Station will operate with a PCC plant to capture the CO2 produced during the combustion of natural gas. The PCC plant will be designed for a minimum CO2 capture efficiency of 95% . As such the generation and release of greenhouses gases during operation is expected to be low.	Low due to carbon capture process.	Low adverse impact on the environment	Table 1 - 7 Low

Table 1 - 8 Accidental release

Hazard	Receptor	Pathway	Risk reduction measures	Exposure proba	Potential consequ	Exposure rating	Consequence rating	Overall risk
Fire	On-site staff and local residents and businesses beyond the boundary of the Installation. See human and ecological receptors listed in Main Supporting Document Table 7-1 and 7-2	Emission of smoke to the air, transported by the wind. Emission of firewater and foam to drainage systems, water and land.	Fire/smoke detection and alarm will be present around the installation. The CCGT and carbon capture plant will be fitted with a water mist system. A deluge system is to be confirmed. Pressurised fire water will be provided throughout the plant to supply all water based fire fighting systems. A dedicated fire water reserve will be provided within the treated raw water tank. The fire water reserve shall be sized to supply, for two hours, all fixed fire water suppression system demands, that could reasonably be expected to operate simultaneously during a single fire event, plus hose stream allowance. Local fire extinguishers and outdoor hydrants will also be present on site. The design of Building structures will comply with BS 9999 and the Buildings Fire Strategy. The Installation will be design to ensure safe separation distances plant items. Fire rated-walls and fire-rated structural elements will be employed where protection of personnel and equipment cannot be achieved by spatial separation. Any fire water likely to arise from any area in case of a fire event shall be contained within the site. Fire water will be collected from the storage area and disposed of offsite	Medium due to fire risk reduction measures	Medium adverse impact on local ecological receptors	Medium	Medium	Medium

Flooding	On-site staff and local residents and businesses beyond the boundary of the Installation. See human and ecological receptors listed in Main Supporting Document Table 7.1 and 7.2	Flow path is determined by topography and drainage systems	The EA 'Flood map for planning' indicates that the whole of the Installation is located within Flood Zone 1 that is defined as, "land having a less than 1 in 1,000 (less than 0.1%) annual probability of river or sea flooding." The Installation site is not located within any Groundwater Source Protection Zone. However due to the important nature of the site following mitigation measures have been considered to protect the Installation from flood, in accordance with the legislative and regulatory authority requirements: - Flood resilience measures; - Flood Emergency Response Plans; - Flood Warnings and Alerts; - Emergency access and egress; and - Design capacity exceedance.	Low due to proposed potential flood mitigation options being considered.	Low adverse impact on local ecological receptors	Low	Low	Low

Security and vandalism	Local residents and businesses beyond the boundary of the Installation. See human and ecological receptors listed in Main Supporting Document Table 7.1 and 7.2	Pathway of emissions could be land, air or water. Emissions could potentially occur due to failure/ reduced performance of equipment and infrastructure	The site will be located with a security fence with CCTV present around the site perimeter. 24/7 security personnel will be present at the installation. The entrance to the site will be gated and manned.	Low due to extensive security measures.	Medium due to potential impact if a security breach were to occur.	Low	Medium	Low

Table 1 - 9 Climate change risk assessment

Potential change	Impact	Likelihood	Severity	Risk	Mitigation	Likelihood (after mitigation)	Severity (after mitigation)	Residual Risk
1) Summer daily maximum temperature may be around 7°C warmer than average summer temperatures now.	Reduced efficiency of CCGT	2	2	4	The power plant is designed to operate over a large range of ambient conditions. Temperature changes would not have a noticeable impact on plant efficiency.	1	2	2
2) Winter daily maximum temperature could be 4°C more than the current average, with the potential for more extreme temperatures, both warmer and colder than present.	Increases in temperature may cause a drop in efficiency, but a lower risk than in summer.	2	2	4	The power plant is designed to operate over a large range of ambient conditions. Temperature changes would not have a noticeable impact on plant efficiency.	1	2	2

3) Daily rainfall intensity could increase by up to 20% on today's values resulting in flooding on the Site.	Surface water flooding and standing water. Increased soil moisture levels leading to deterioration of structure or foundations. Damage to infrastructure through storm surge and river flooding.	1	3	3	The EA 'Flood map for planning' indicates that the whole of the Installation is located within Flood Zone 1 that is defined as, "land having a less than 1 in 1,000 (less than 0.1%) annual probability of river or sea flooding." A Flood Risk Assessment (FRA) was completed for the associated Development Consent Order (DCO) for the Installation. As part of the FRA a conceptual drainage strategy was completed for surface water management which included a precautionary 40% increase in peak rainfall intensities. As a result, surface water runoff increasing over the lifetime of the development as a result of climate change is expected to be managed and not increase flood risk to the Installation or elsewhere. The Installation will implement a Maintenance and Inspection Strategy which will encompass all aspects of maintaining the integrity and reliability of the facilities to ensure the Installation is fit for continued service and safe operation by using the combined best practice of operations, maintenance and inspection.	1	2	2

4) Average winter rainfall may increase by over 40% on today's averages resulting in potential increased risk of Site surface flooding and could impact Site wide drainage capacity	- Flash flooding on Site - Surface water run-off systems need to be cleared and account for increased flows to prevent them being overwhelmed - Potential for increased Site Surface water flooding	1	3	3	As part of the FRA a conceptual drainage strategy was completed for surface water management which included a precautionary 40% increase in peak rainfall intensities. As a result, surface water runoff increasing over the lifetime of the development as a result of climate change is expected to be managed and not increase flood risk to the Installation or elsewhere. To satisfy Pre-operational Condition PO7 a copy of the Drainage Plan is presented in Figure 6 in Appendix A of Main Supporting Document.	1	2	2
5) Sea level rise which could be as much as 0.6m higher compared to today's level.	Fluvial flooding on the Site. Site surface water systems and effluent treatment plant may become overwhelmed and unable to discharge for prolonged periods due to backing up.	1	3	3	The EA 'Flood map for planning' indicates that the whole of the Installation is located within Flood Zone 1 that is defined as, "land having a less than 1 in 1,000 (less than 0.1%) annual probability of river or sea flooding." The FRA included an assessment of the worse case scenario of a peak flood event during a 0.1% Annual Exceedance Probability (AEP) (1 in 1000 chance) climate change flood scenario (fluvial/tidal) up to year 2100. It was calculated to be 6.23 mAOD would be reached. As part of the construction of the site the site levels have been raised to no lower than 7.5 mAOD. The FRA concluded that with levels no lower than 7.5 mAOD the Installation would remain at a low risk of flooding from the 1% Annual Exceedance Probability (AEP) with 25% allowance for climate change flood event.	1	2	2

6) Drier summers which could see potentially up to 40% less rain than now.	Reduction in availability of water consumption on Site.	1	2	2	Based on the abstraction licence agreement, this is not expected to be a issue. No further mitigation required.	1	2	2
7) Flows in river could be 50% more than now at its peak and 80% less than now at its lowest	Fluvial flooding	1	2	2	The EA 'Flood map for planning' indicates that the whole of the Installation is located within Flood Zone 1 that is defined as, "land having a less than 1 in 1,000 (less than 0.1%) annual probability of river or sea flooding." The FRA included an assessment of the worse case scenario of a peak flood event during a 0.1% Annual Exceedance Probability (AEP) (1 in 1000 chance) climate change flood scenario (fluvial/tidal) up to year 2100. It was calculated to be 6.23 mAOD would be reached. As part of the construction of the site the site levels have been raised to no lower than 7.5 mAOD. The FRA concluded that with levels no lower than 7.5 mAOD the Installation would remain at a low risk of flooding from the 1% Annual Exceedance Probability (AEP) with 25% allowance for climate change flood event.	1	2	2

	Surface flooding	1	3	3	As part of the FRA a conceptual drainage strategy was completed for surface water management which included a precautionary 40% increase in peak rainfall intensities. As a result, surface water runoff increasing over the lifetime of the development as a result of climate change is expected to be managed and not increase flood risk to the Installation or elsewhere. To satisfy Pre-operational Condition PO7 a copy of the Drainage Plan is presented in Figure 6 in Appendix A of Main Supporting Document.	1	2	2
8) Storms	Storms could see a change in frequency and intensity. The unique combination of increased wind speeds, increased rainfall, and lightning during these events provides the potential for more extreme storm impacts. .	1	2	2	As part of the FRA a conceptual drainage strategy was completed for surface water management which included a precautionary 40% increase in peak rainfall intensities. As a result, surface water runoff increasing over the lifetime of the development as a result of climate change is expected to be managed and not increase flood risk to the Installation or elsewhere. The Installation will be designed, constructed and operated in accordance with the relevant building standards ensuring structural integrity. Following a significant storm event the Installation will be inspected and any signs of damages will be addressed accordingly.	1	2	2