

1. Abbreviations and Definitions

Definitions for the Environmental Risk Assessment	
Activity / Event	The specific operation being undertaken relating to the proposed hazard and risk.
Hazard	The hazards category i.e. type of emission.
Source	The pollutants from the activity taking place such as flaring.
Pathway	The pathway the pollutant is taking such as air or unsaturated zones.
Receptor	Those who it may have an adverse effect on i.e. surrounding residents, wildlife and habitats, designated sites.
Exposure Probability	The chance of the hazard occurring without taking into account mitigation measures.
Impact Severity	The impact of the hazard should it occur without taking into account mitigation measures.
Risk Magnitude	A hazard that has been assessed and has been given a risk rating level pre-mitigation measures.
Risk Management	Mitigation measures that will be put in place to control the risks so far as reasonably practicable.
Residual Risk	A hazard that has been assessed and has been given a risk rating level post mitigation measures.
Not Significant	The severity, together with the likelihood of the risk is not expected to cause any harm to the environment.
Low	The severity, together with the likelihood of the risk has low potential to cause harm to the environment.
Medium	The severity, together with the likelihood of the risk has moderate potential to cause harm to the environment.
High	The severity, together with the likelihood of the risk has a high potential to cause harm to the environment.

Table 1: Definitions

2. Methodology and Scope

The structure of the Environmental Risk Assessment follows the Environment Agency guidance and uses a model known as the 'Source-Pathway-Receptor' model. The Environmental Risk Assessment shall:

- identify the risk from the site;
- assess risks and checking they are acceptable;
- justify appropriate measures to control the risk (if needed); and
- present the findings of the risk assessment.

The Environmental Risk Assessment has included the following categories which have been reviewed for applicability within the proposed operations.

- Accidents.
- Air Emissions.
- Fugitive Emissions.
- Global Warming Potential.
- Noise.
- Odour.
- Releases to Water.
- Visible Emissions.

3. Scoring Criteria

In order to establish a risk rating for each Source-Pathway-Receptor (S-P-R) linkage both the Likelihood (Exposure Probability) and Consequence (Impact Severity) have been issued with a score using Table 2 and Table 3 respectively. The score is used in conjunction with Table 4 to provide an overall risk rating of the activity. All scores and risk ratings are provided on the basis that the mitigation measure are not in place.

The Residual Risk uses the same scoring system but does consider the proposed mitigation measures.

Likelihood	Descriptor
Very Low	Rarely encountered, never reported or highly unlikely.
Low	Infrequent occurrences.
Medium	Can be expected to occur several times per year.
High	Repeated Occurrences.

Table 2: Scoring System Likelihood

Consequence	Descriptor
Very Low	Slight environmental effect that does not exceed a regulatory standard.
Low	Minor environmental effect, may breach a regulatory standard, localised to the point of release with no significant impact.
Medium	Moderate, localised effect on people and the environment in the vicinity of the incident.
High	A major environmental incident resulting in significant damage to the environment and harm to human health.

Table 3: Scoring System Consequence

The risk matrix presented in Table 4 provides a risk rating for each S-P-R linkage identified within this Environmental Risk Assessment.

Risk Rating		Consequence			
		Very Low	Low	Medium	High
Likelihood	Very Low	Not Significant	Not Significant	Low	Low
	Low	Not Significant	Low	Medium	Medium
	Medium	Low	Medium	Medium	High
	High	Low	Medium	High	High

Table 4: Risk Matrix

Environmental risks are assigned a Not Significant, Low, Medium or High risk rating and coded using a colour coded system. A description of each risk rating is presented in Table 5 below.

Consequence	Acceptable	Descriptor
Not Significant	Acceptable	Near-certain that an incident will not occur, or the consequences would not be significant.
Low	Acceptable	Unlikely an incident will occur, or the consequences would be minor confined to the immediate area.
Medium	Tolerable	Activity can only take place provided that impacts are localised and risk remediation is readily
High	Unacceptable	The risk must be further reduced before the activity can commence.

Table 5: Risk Rating Definition

Receptors	Search Radius (km)	Name	Distance (km)	Direction from Site	Grid Reference (Edge)
RAMSAR	10	No Receptor Identified	-	-	-
Special Areas of Conservation (SAC)	10	No Receptor Identified	-	-	-
Special Protection Areas (SPA)	10	No Receptor Identified	-	-	-
Marine Protection Areas (MPA)	10	No Receptor Identified	-	-	-
Sites of Special Scientific Interest (SSSI)	2	No Receptor Identified	-	-	-
Scheduled Ancient Monuments (SAM)	2	Harpswell Hall	1.93	Northeast	SK 93052 89693
National Nature Reserves (NNR)	2	No Receptor Identified	-	-	-
Local Nature Reserves (LNR)	2	No Receptor Identified	-	-	-
Local Wildlife Sites (LWS)	2	No Receptor Identified	-	-	-
Water Features (Closest in All Directions)	2	Field Drain 1	0.00	South	SK 91986 87859
		Field Drain 2	0.30	North	SK 91799 88258
		Field Drain 3	0.52	East	SK 92608 88091
		Field Drain 4	0.55	West	SK 91379 87621
		Field Drain 5	0.62	North	SK 91972 88636
Sensitive Receptors: Households / Businesses	2	Westlands Farm	0.50	Southwest	SK 91724 87361
		Low Farm	0.61	South	SK 92046 87237
		Orchard House	0.63	South	SK 92001 87162
		Grange Court	0.73	South	SK 92342 87209
		Billyards Farm	0.82	Northwest	SK 91154 88348
		Grange Cottages	0.83	Southeast	SK 92608 87225
		Hermitage Low Farm House	0.87	North	SK 92113 88900
		Northlands Cottage	1.49	East	SK 93553 88299
		Low Field Farm	1.49	West	SK 90494 87316
		Lowfield Farmhouse	1.67	Southwest	SK 90555 86936
		Manor Farm	1.81	West	SK 90133 88373
		Heapham Cliff Farm	1.92	West	SK 89967 88275
Heapham Cliff Farmhouse	1.96	West	SK 89952 88378		

Table 6: Sensitive Receptors

Activity / Event Leading to Emission	Hazard	S-P-R Linkage			Exposure Probability	Impact Severity	Risk Magnitude	Risk Management	Residual Risk
		Source	Pathway	Receptor					
Construction Works (Well Cellar etc.)	Air Emissions	Diesel Generator and Vehicle Exhausts	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Air Quality impact Assessment concludes no significant impact. Equipment installed, serviced and maintained by competent and qualified contractors. Generators assessed for compliance with Emission Limit Values. Records kept of complaints and subsequent mitigation imposed if necessary. Regular maintenance and inspections conducted as directed by written procedures. Sensitive Receptors in excess of 500 metres away from the development. Trained persons to operate vehicles and site plant. Vehicles and plant serviced and maintained in line with manufacturer requirements. Vehicles and plant switched off when not in use.	Not Significant
	Visible Emissions (Smoke / Plume)	Diesel Generator and Vehicle Exhausts	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Air Quality Impact Assessment concludes no significant impact. Equipment installed, serviced and maintained by competent and qualified contractors. Generators assessed for compliance with Emission Limit Values. Sensitive Receptors in excess of 500 metres away from the development.	Not Significant
	Odour Emissions	Use of Low Volume Odourous Products	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Competent personnel only to store / use chemicals. Containers checked on delivery, pre-use and periodically for signs of damage/leaks. Drip trays used for the transfer or decanting of fuel/small volume liquids such as engine oil. Equipment installed, serviced and maintained by competent and qualified contractors. Odour Management Plan implemented for the site, if required. Odourless products used ahead of those which give rise to odour where practicable. Products kept within their dedicated storage area when not in use. Quantities of odourous products to be kept to a minimum. Records kept of complaints and subsequent mitigation imposed if necessary. Sensitive Receptors in excess of 500 metres away from the development. Working personnel subject to a site induction covering odour management.	Not Significant
		Storage of General Waste and Sewage	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Odour Management Plan implemented for the site, if required. Records kept of complaints and subsequent mitigation imposed if necessary. Sensitive Receptors in excess of 500 metres away from the development. Skips clearly marked to ensure waste segregation and avoid cross contamination. Skips monitored daily and emptied as required. Skips self-contained / enclosed to prevent emissions. Tanks monitored and emptied as required. Tanks self-contained / enclosed where necessary to limit emissions to air. Working personnel subject to a site induction covering odour management.	Not Significant
	Noise and Vibration Emissions	Diesel Generators and Vehicle Movements	Atmosphere and ground vibrations	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Low	Low	Low	Compliance with planning authority noise limits. Installation of acoustic barrier where required. Loading/unloading operations planned for day light hours where possible. Noise monitoring imposed if required. Records kept of complaints and subsequent mitigation imposed if necessary. Regular maintenance and inspections conducted as directed by written procedures. Sensitive Receptors in excess of 500 metres away from the development. Trained operators to load / unload vehicles using MHE plant equipment. Vehicles and plant serviced and maintained in line with manufacturer requirements. Vehicles and plant switched off when not in use. White noise reversing alarms fitted to site vehicles if required.	Not Significant
	Discharge Emissions	No Source	Percolation to ground	Surface Water and Groundwater Features	Not Applicable	Not Applicable	Not Applicable	No discharge activities are being proposed.	Not Applicable

Activity / Event Leading to Emission	Hazard	S-P-R Linkage			Exposure Probability	Impact Severity	Risk Magnitude	Risk Management	Residual Risk
		Source	Pathway	Receptor					
Drilling Operations	Air Emissions	Diesel Generator and Vehicle Exhausts including Rig Engine.	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Low	Low	Low	Air Quality Impact Assessment concludes no significant impact. Equipment installed, serviced and maintained by competent and qualified contractors. Generators assessed for compliance with Emission Limit Values. Records kept of complaints and subsequent mitigation imposed if necessary. Regular maintenance and inspections conducted as directed by written procedures. Sensitive Receptors in excess of 500 metres away from the development. Trained persons to operate vehicles and site plant. Vehicles and plant serviced and maintained in line with manufacturer requirements. Vehicles and plant switched off when not in use.	Not Significant
		Operation of Safety Flare	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Combustion temperature managed to ensure efficient (>98%) combustion efficiency. Dedicated scrubbers in place to remove H2S from natural gas, if necessary. Drilling mud provides over balanced weight to prevent gas to surface. Regular maintenance and inspections conducted as directed by written procedures. Safety flare installed to incinerate unexpected gas whilst drilling. Sensitive Receptors in excess of 500 metres away from the development.	Not Significant
	Visible Emissions (Smoke / Plume)	Diesel Generator and Vehicle Exhausts	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Air Quality Impact Assessment concludes no significant impact. Equipment installed, serviced and maintained by competent and qualified contractors. Generators assessed for compliance with Emission Limit Values. Sensitive Receptors in excess of 500 metres away from the development.	Not Significant
		Operation of Safety Flare	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Combustion temperature managed to ensure efficient (>98%) combustion efficiency. Dedicated scrubbers in place to remove H2S from natural gas, if necessary. Drilling mud provides over balanced weight to prevent gas to surface. Regular maintenance and inspections conducted as directed by written procedures. Safety flare installed to incinerate unexpected gas whilst drilling. Sensitive Receptors in excess of 500 metres away from the development.	Not Significant
	Odour Emissions	Use of Low Volume Odourous Products.	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Chemicals segregated, stored correctly and sealed when not in use. Cleaning and purging where possible prior to pulling out of hole. Containers checked on delivery, pre-use and periodically for signs of damage/leaks. Equipment cleaned / purged where possible prior to breaking containment. Odour Management Plan implemented for the site, if required. Odourless products used ahead of those which give rise to odour where practicable. Plant, tanks and pipework tested for leaks prior to first use to confirm integrity. Plant, tanks and pipework capped / plugged after breaking containment. Products kept within their dedicated storage area when not in use. Quantities of odourous products to be kept to a minimum. Records kept of complaints and subsequent mitigation imposed if necessary. Regular maintenance and inspections conducted as directed by written procedures. Sensitive Receptors in excess of 500 metres away from the development. Tanks monitored and emptied as required. Tanks self-contained / enclosed where necessary to limit emissions to air. Working personnel subject to a site induction covering odour management.	Not Significant
		Entrained Vapours from Drilling Mud and Wellbore Fluids from: <ul style="list-style-type: none"> Breaking Containment. Surface of Wellbore Equipment. 	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Breaking containment of tanks and pipework systems shall minimised. Cleaning and purging where possible prior to pulling out of hole. Equipment cleaned / purged where possible prior to breaking containment. Equipment installed, serviced and maintained by competent and qualified contractors. Odour Management Plan implemented for the site, if required. Plant, tanks and pipework tested for leaks prior to first use to confirm integrity. Plant, tanks and pipework cleaned / purged where possible prior to breaking containment. Quantities of odourous products to be kept to a minimum. Records kept of complaints and subsequent mitigation imposed if necessary. Sensitive Receptors in excess of 500 metres away from the development. Working personnel subject to a site induction covering odour management.	Not Significant
		Operation of Safety Flare.	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Combustion temperature managed to ensure efficient (>98%) combustion efficiency. Dedicated scrubbers in place to remove H2S from natural gas, if necessary. Drilling mud provides over balanced weight to prevent gas to surface. Odour Management Plan implemented for the site, if required. Regular maintenance and inspections conducted as directed by written procedures. Safety flare installed to incinerate unexpected gas whilst drilling. Sensitive Receptors in excess of 500 metres away from the development. Working personnel subject to a site induction covering odour management.	Not Significant

Activity / Event Leading to Emission	Hazard	S-P-R Linkage			Exposure Probability	Impact Severity	Risk Magnitude	Risk Management	Residual Risk
		Source	Pathway	Receptor					
Drilling Operations	Noise and Vibration Emissions	Diesel Generators and Vehicle Movements	Atmosphere and ground vibrations	<ul style="list-style-type: none"> • SAM • Sensitive Receptors 	Low	Low	Low	Compliance with planning authority noise limits. Loading/unloading operations planned for day light hours where possible. Noise monitoring imposed if required. Records kept of complaints and subsequent mitigation imposed if necessary. Regular maintenance and inspections conducted as directed by written procedures. Sensitive Receptors in excess of 500 metres away from the development. Trained operators to load / unload vehicles using MHE plant equipment. Vehicles and plant serviced and maintained in line with manufacturer requirements. Vehicles and plant switched off when not in use. White noise reversing alarms fitted to site vehicles if required.	Not Significant
		Operation of Safety Flare.	Atmosphere and ground vibrations	<ul style="list-style-type: none"> • SAM • Sensitive Receptors 	Very Low	Low	Not Significant	Compliance with planning authority noise limits. Records kept of complaints and subsequent mitigation imposed if necessary. Regular maintenance and inspections conducted as directed by written procedures. Safety flare installed to incinerate unexpected gas whilst drilling. Sensitive Receptors in excess of 500 metres away from the development.	Not Significant
	Discharge Emissions	No Source.	Percolation to ground	Surface Water and Groundwater Features	Not Applicable	Not Applicable	Not Applicable	No discharge activities are being proposed.	Not Applicable

Activity / Event Leading to Emission	Hazard	S-P-R Linkage			Exposure Probability	Impact Severity	Risk Magnitude	Risk Management	Residual Risk
		Source	Pathway	Receptor					
Well Testing Operations	Air Emissions	Diesel Generator and Vehicle Exhausts including Rig Engine.	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Low	Low	Low	Air Quality impact Assessment concludes no significant impact. Equipment installed, serviced and maintained by competent and qualified contractors. Generators assessed for compliance with Emission Limit Values. Records kept of complaints and subsequent mitigation imposed if necessary. Regular maintenance and inspections conducted as directed by written procedures. Sensitive Receptors in excess of 500 metres away from the development. Trained persons to operate vehicles and site plant. Vehicles and plant serviced and maintained in line with manufacturer requirements. Vehicles and plant switched off when not in use.	Not Significant
		Operation of Flare	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Air Quality Impact Assessment concludes no significant impact. Combustion temperature managed to ensure efficient (>98%) combustion efficiency. Combustion unit subject to approval by the EA. Dedicated scrubbers in place to remove H2S from natural gas, if necessary. Equipment installed, serviced and maintained by competent and qualified contractors. Flare monitoring (to be) in place with results reported in accordance with EA permit. Sensitive Receptors in excess of 500 metres away from the development. Trained persons to operate vehicles and site plant.	Not Significant
	Visible Emissions (Smoke / Plume)	Diesel Generator and Vehicle Exhausts	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Air Quality Impact Assessment concludes no significant impact. Equipment installed, serviced and maintained by competent and qualified contractors. Generators assessed for compliance with Emission Limit Values. Sensitive Receptors in excess of 500 metres away from the development.	Not Significant
		Operation of Flare	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Air Quality Impact Assessment concludes no significant impact. Combustion temperature managed to ensure efficient (>98%) combustion efficiency. Combustion unit subject to approval by the EA. Dedicated scrubbers in place to remove H2S from natural gas, if necessary. Equipment installed, serviced and maintained by competent and qualified contractors. Flare monitoring (to be) in place with results reported in accordance with EA permit. Sensitive Receptors in excess of 500 metres away from the development. Trained persons to operate vehicles and site plant.	Not Significant
	Odour Emissions	Use of Low Volume Odourous Products.	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Chemicals segregated, stored correctly and sealed when not in use. Cleaning and purging where possible prior to pulling out of hole. Containers checked on delivery, pre-use and periodically for signs of damage/leaks. Equipment cleaned / purged where possible prior to breaking containment. Odour Management Plan implemented for the site, if required. Odourless products used ahead of those which give rise to odour where practicable. Plant, tanks and pipework tested for leaks prior to first use to confirm integrity. Plant, tanks and pipework capped / plugged after breaking containment. Products kept within their dedicated storage area when not in use. Quantities of odourous products to be kept to a minimum. Records kept of complaints and subsequent mitigation imposed if necessary. Regular maintenance and inspections conducted as directed by written procedures. Sensitive Receptors in excess of 500 metres away from the development. Tanks monitored and emptied as required. Tanks self-contained / enclosed where necessary to limit emissions to air. Working personnel subject to a site induction covering odour management.	Not Significant
		Operation of Flare.	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Air Quality Impact Assessment concludes no significant impact. Combustion temperature managed to ensure efficient (>98%) combustion efficiency. Combustion unit subject to approval by the EA. Dedicated scrubbers in place to remove H2S from natural gas, if necessary. Equipment installed, serviced and maintained by competent and qualified contractors. Flare monitoring (to be) in place with results reported in accordance with EA permit. Odour Management Plan implemented for the site, if required. Odourless products used ahead of those which give rise to odour where practicable. Records kept of complaints and subsequent mitigation imposed if necessary. Regular maintenance and inspections conducted as directed by written procedures. Sensitive Receptors in excess of 500 metres away from the development. Trained persons to operate vehicles and site plant. Working personnel subject to a site induction covering odour management.	Not Significant

Activity / Event Leading to Emission	Hazard	S-P-R Linkage			Exposure Probability	Impact Severity	Risk Magnitude	Risk Management	Residual Risk
		Source	Pathway	Receptor					
Well Testing Operations	Noise and Vibration Emissions	Diesel Generators and Vehicle Movements	Atmosphere and ground vibrations	<ul style="list-style-type: none"> • SAM • Sensitive Receptors 	Low	Low	Low	Compliance with planning authority noise limits. Loading/unloading operations planned for day light hours where possible. Noise monitoring imposed if required. Records kept of complaints and subsequent mitigation imposed if necessary. Regular maintenance and inspections conducted as directed by written procedures. Sensitive Receptors in excess of 500 metres away from the development. Trained operators to load / unload vehicles using MHE plant equipment. Vehicles and plant serviced and maintained in line with manufacturer requirements. Vehicles and plant switched off when not in use. White noise reversing alarms fitted to site vehicles if required.	Not Significant
		Operation of Flare.	Atmosphere and ground vibrations	<ul style="list-style-type: none"> • SAM • Sensitive Receptors 	Very Low	Low	Not Significant	Compliance with planning authority noise limits. Installation of acoustic barrier where required. Noise monitoring imposed if required. Records kept of complaints and subsequent mitigation imposed if necessary. Regular maintenance and inspections conducted as directed by written procedures. Sensitive Receptors in excess of 500 metres away from the development.	Not Significant
	Discharge Emissions	No Source.	Percolation to ground	Surface Water and Groundwater Features	Not Applicable	Not Applicable	Not Applicable	No discharge activities are being proposed.	Not Applicable

Activity / Event Leading to Emission	Hazard	S-P-R Linkage			Exposure Probability	Impact Severity	Risk Magnitude	Risk Management	Residual Risk
		Source	Pathway	Receptor					
Accidents (Including Vandalism)	Air Emissions	Explosion / Fire breakout.	Carried on wind.	<ul style="list-style-type: none"> • SAM • Sensitive Receptors 	Very Low	High	Low	<p>Chemicals segregated, stored correctly and sealed when not in use.</p> <p>Emergency Response Plan for the site.</p> <p>Fire awareness training / site induction for personnel.</p> <p>Fire points, extinguishers and a fire water tank located around the site.</p> <p>Local Fire & Rescue Service notified of operations.</p> <p>Permit to work system implemented to authorise specific works i.e. hot/cold works.</p> <p>Qualified and competent site supervisor appointed.</p> <p>Security measures implemented at site.</p> <p>Site based fire risk assessment in place and detailing the mitigation measures.</p> <p>Spillage response procedure for the site established.</p> <p>Suitable spillage kits available on site / transport vehicles.</p> <p>Trained persons to operate vehicles and site plant.</p> <p>Vehicles and plant serviced and maintained in line with manufacturer requirements.</p>	Not Significant
	Visible Emissions (Smoke / Plume) Odour Emissions	Fumes resulting from unwanted or runaway chemical reactions.	Carried on wind.	<ul style="list-style-type: none"> • SAM • Sensitive Receptors 	Very Low	High	Low	<p>Chemicals segregated, stored correctly and sealed when not in use.</p> <p>Competent personnel only to store / use chemicals.</p> <p>COSHH Assessments and SDS sheets in place for hazardous substances.</p> <p>COSHH Items stored appropriately in accordance with SDS and regulations.</p> <p>Drip trays used for the transfer or decanting of fuel/small volume liquids such as engine oil.</p> <p>Emergency Response Plan for the site.</p> <p>Leak Detection and Repair Plan for the site.</p> <p>Local Fire & Rescue Service notified of operations.</p> <p>Operations planned / designed to minimise transport and handling operations.</p> <p>Permit to work system implemented to authorise specific works i.e. hot/cold works.</p> <p>Plant, tanks and pipework tested for leaks prior to first use to confirm integrity.</p> <p>Qualified and competent site supervisor appointed.</p> <p>Security measures implemented at site.</p> <p>Site based fire risk assessment in place and detailing the mitigation measures.</p> <p>Spillage response procedure for the site established.</p> <p>Suitable spillage kits available on site / transport vehicles.</p>	Not Significant
	Noise and Vibration Emissions	Explosion / Fire breakout.	Carried on wind.	<ul style="list-style-type: none"> • SAM • Sensitive Receptors 	Very Low	Medium	Low	<p>Chemicals segregated, stored correctly and sealed when not in use.</p> <p>Emergency Response Plan for the site.</p> <p>Fire awareness training / site induction for personnel.</p> <p>Fire points, extinguishers and a fire water tank located around the site.</p> <p>Local Fire & Rescue Service notified of operations.</p> <p>Permit to work system implemented to authorise specific works i.e. hot/cold works.</p> <p>Qualified and competent site supervisor appointed.</p> <p>Security measures implemented at site.</p> <p>Site based fire risk assessment in place and detailing the mitigation measures.</p> <p>Spillage response procedure for the site established.</p> <p>Suitable spillage kits available on site / transport vehicles.</p> <p>Trained persons to operate vehicles and site plant.</p> <p>Vehicles and plant serviced and maintained in line with manufacturer requirements.</p>	Not Significant
	Discharge Emissions	Spillages, Leaks, Overfilling and Poor Connection.	Percolation through near surface and deeper formation to groundwater bodies.	Surface Water and Groundwater Features	Very Low	Medium	Low	<p>Breaking containment of tanks and pipework systems shall be minimised.</p> <p>Chemicals segregated, stored correctly and sealed when not in use.</p> <p>Competent personnel only to store / use chemicals.</p> <p>COSHH Assessments and SDS sheets in place for hazardous substances.</p> <p>COSHH Items stored appropriately in accordance with SDS and regulations.</p> <p>Drip trays used for the transfer or decanting of fuel/small volume liquids such as engine oil.</p> <p>Emergency Response Plan for the site.</p> <p>Leak Detection and Repair Plan for the site.</p> <p>Local Fire & Rescue Service notified of operations.</p> <p>Permit to work system implemented to authorise specific works i.e. hot/cold works.</p> <p>Plant, tanks and pipework tested for leaks prior to first use to confirm integrity.</p> <p>Qualified and competent site supervisor appointed.</p> <p>Regular maintenance and inspections conducted as directed by written procedures.</p> <p>Security measures implemented at site.</p> <p>Sensitive Receptors in excess of 750 metres away from the development.</p> <p>Site based fire risk assessment in place and detailing the mitigation measures.</p> <p>Spillage response procedure for the site established.</p> <p>Suitable spillage kits available on site / transport vehicles.</p> <p>Temporary containment system (HDPE) in place.</p> <p>Trained persons to operate vehicles and site plant.</p> <p>Vehicles and plant serviced and maintained in line with manufacturer requirements.</p>	Not Significant

Activity / Event Leading to Emission	Hazard	S-P-R Linkage			Exposure Probability	Impact Severity	Risk Magnitude	Risk Management	Residual Risk	
		Source	Pathway	Receptor						
Accidents (Including Vandalism)	Discharge Emissions	Use of Fire Water	Percolation through near surface and deeper formation to groundwater bodies.	Surface Water and Groundwater Features	Very Low	Medium	Low	Chemicals segregated, stored correctly and sealed when not in use. Competent personnel only to store / use chemicals. COSHH Assessments and SDS sheets in place for hazardous substances. COSHH Items stored appropriately in accordance with SDS and regulations. Drip trays used for the transfer or decanting of fuel/small volume liquids such as engine oil. Emergency Response Plan for the site. Fire awareness training / site induction for personnel. Leak Detection and Repair Plan for the site. Local Fire & Rescue Service notified of operations. Operations planned / designed to minimise transport and handling operations. Permit to work system implemented to authorise specific works i.e. hot/cold works. Plant, tanks and pipework tested for leaks prior to first use to confirm integrity. Qualified and competent site supervisor appointed. Regular maintenance and inspections conducted as directed by written procedures. Routine visual check on the containment ditch by operatives. Site based fire risk assessment in place and detailing the mitigation measures. Temporary containment system (HDPE) in place.	Not Significant	
		Flooding	Percolation through near surface and deeper formation to groundwater bodies.	Surface Water and Groundwater Features	Very Low	Medium	Low	Site located within Flood Zone 1 (<1 in 1,000 annual probability of flooding).	Not Significant	
Fugitive Releases	Air Emissions	Cold Venting of Gas	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Medium	Low	Dedicated scrubbers in place to remove H2S from natural gas, if necessary. Drilling mud provides over balanced weight to prevent gas to surface. Emergency Response Plan for the site. Gas detectors deployed with an alarm trigger of 5ppm / 7mg.m3 (EH40 WELs). H2S is not anticipated at a level above 5.7 mg/Nm3 as stated within the EA permit. Local Fire & Rescue Service notified of operations. Plant, tanks and pipework tested for leaks prior to first use to confirm integrity. Plant, tanks and pipework capped / plugged after breaking containment. Plant, tanks and pipework cleaned / purged where possible prior to breaking containment. Qualified and competent site supervisor appointed. Receptors in excess of 750 metres away from the development. Records kept of complaints and subsequent mitigation imposed if necessary. Regular maintenance and inspections conducted as directed by written procedures. Safety flare installed to incinerate unexpected gas whilst drilling. Sensitive Receptors in excess of 750 metres away from the development.	Not Significant	
	Visible Emissions (Smoke / Plume)	Odour Emissions	Dust generated from site surface and moving vehicles.	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Low	Medium	Medium	Avoid activities that present dust if high winds occur. Operations planned / designed to minimise transport and handling operations. Qualified and competent site supervisor appointed. Records kept of complaints and subsequent mitigation imposed if necessary. Sensitive Receptors in excess of 750 metres away from the development. Trained persons to operate vehicles and site plant. Vehicles and plant serviced and maintained in line with manufacturer requirements.	Not Significant
	Litter		Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Records kept of complaints and subsequent mitigation imposed if necessary. Sensitive Receptors in excess of 750 metres away from the development. Skips clearly marked to ensure waste segregation and avoid cross contamination. Skips monitored daily and emptied as required. Skips self-contained / enclosed to prevent emissions.	Not Significant	
	<ul style="list-style-type: none"> Pests at site. Flies; Rats / mice; Wasps. 	Carried on wind.	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Very Low	Low	Not Significant	Litter cleared routinely as part of working day. Provision of adequate refuse receptacles for both inside and outside working areas. Records kept of complaints and subsequent mitigation imposed if necessary. Skips monitored daily and emptied as required. Skips self-contained / enclosed to prevent emissions.	Not Significant		
	Noise and Vibration Emissions	No Source	Atmosphere and ground vibrations	<ul style="list-style-type: none"> SAM Sensitive Receptors 	Not Applicable	Not Applicable	Not Applicable	Fugitive release of noise has not been identified.	Not Applicable	
	Discharge Emissions	<ul style="list-style-type: none"> Borehole fluids: Drilling Mud Suspension Brine 	Percolation through near surface and deeper formation to groundwater bodies.	Surface Water and Groundwater Features	Low	Medium	Medium	Borehole(s) design approved by the EA under the WR11 Process. Borehole(s) design reviewed by an independent well examiner and the HSE. Borehole(s) designed and constructed to industry standards. Emergency Response Plan for the site. Loss circulation material available within drilling fluid for drilling activities. Qualified and competent site supervisor appointed. Regular maintenance and inspections conducted as directed by written procedures. Water based drilling fluid used whilst drilling through near surface (<400m) aquifers. Surface water monitoring (to be) in place with results reported in accordance with EA permit.	Not Significant	

GLOBAL WARMING POTENTIAL - Annual Release								
Year	Activity	Substance	Formula	Atmospheric Lifetime (Years)	Global Warming Potential (GWP)	Direct / Indirect Releases	Released Mass (Tonnes)	Global Warming Potential of Emissions (Released Mass x GWP)
01	Operation of Drilling Rig and Associated Equipment (based on a 70 day drilling campaign 24/7) (Indicative Only)	Carbon Dioxide	CO2	Variable	1	Direct	4692	4692
		Methane	CH4	12.3	21		5.38	112.98
		Nitrous Oxide	N2O	120	310		0.132	40.92
02	Operation of Well Testing Equipment (based on a 365 day well testing campaign 24/7) (Indicative Only)	Carbon Dioxide	CO2	Variable	1	Direct	0	0
		Methane	CH4	12.3	21		0	0
		Nitrous Oxide	N2O	120	310		0	0
Total GWP of Emissions								4845.9

ENERGY SOURCES, CONVERSION EFFICIENCY AND EMISSIONS FACTORS				
ID	Energy Source	Location of Emission	Delivered to Primary Conversion Factor	CO2 Factor (t/mwh, Primary)
001	Electricity	Indirect	2.4	0.166
002	Gas Oil	Direct	1	0.25
003	Natural Gas	Direct	1	0.19

ENERGY EMISSIONS FACTORS					
ID	Energy Source	MWh	Delivered to Primary Conversion Factor	CO2 Factor (t/mwh, Primary)	CO2 Emissions (Tonnes)
001	Electricity	115.00	2.4	0.166	45.82
002	Gas Oil	0.00	1	0.25	0.00
003	Natural Gas	0.00	1	0.19	0.00
Total CO₂ Emissions (Tonnes)					45.82