ENVIRONMENTAL RISK ASSESSMENT

Whitwick Manor, Herefordshire

STL Energy Limited

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1 <u>Introduction</u>

- 1.1 This Environmental Risk Assessment (ERA) considers the potential and actual risks associated with the use of the site at Whitwick Manor, Herefordshire.
- The site will be operated by STL Energy Limited in accordance with a fully comprehensive Environmental Management System (EMS) and Bespoke Installation Environmental Permit (EP). The site is to be operated as a non-hazardous waste installation for biological treatment.
- 1.3 An operational layout of the facility is shown on Drawing Nos. 2102-006-02 and 01113-00-E in Appendix I of this ERA.
- 1.4 All environmental risks identified in this document should be acted upon accordingly by site management to ensure all environmental risks can be appropriately managed/controlled.
- 1.5 This document primarily considers environmental risks associated with the site. This does not aim to provide detailed Health and Safety risk assessments as required separately through the necessary legislation.

Sensitive Receptors

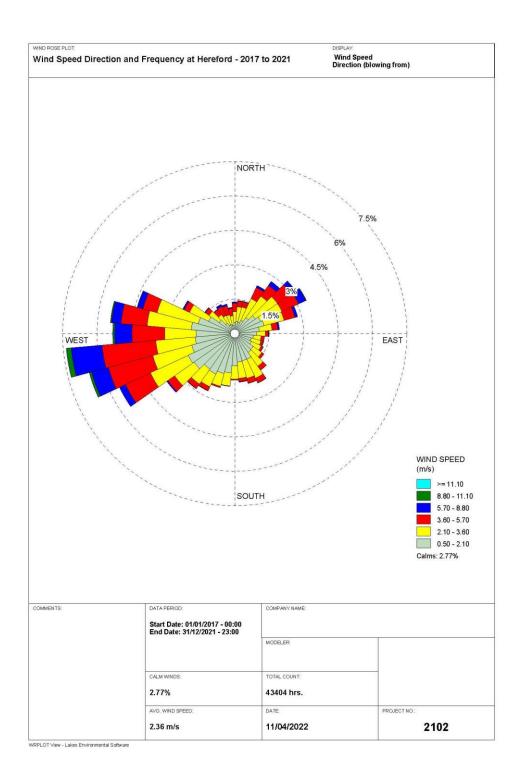
2.1 Key receptors within 1 km of the site are outlined within the table below.

Table 2.1 – Sensitive Receptors Within 1km of the Site

Receptor name	Туре	Distance and Direction from Nearest Part of Site Boundary
Residential properties within Whitwick Manor Estate	Residential	50m South-East 80m North-East
Residential properties	Residential	400m, West-North-West/North
Ancient Woodland areas	Ecological	10m, North 250m, South-West
Local Wildlife Sites	Ecological	10m, North 250m, South-West
Footpath	Short term recreational	320m, East-North-East
Local watercourses which lead to River Wye and River Lugg	Ecological	Adjacent, North-East

3 <u>Meteorological Conditions</u>

- 3.1 The nearest representative meteorological station to the site is Hereford Credenhill, situated approximately 16km to the West-South-West of the site. Below is a wind rose which shows the prevailing wind speed and direction at the site, based on observations Hereford. Given the proximity and nature of this observing station, it is considered that it provides a representative indication of wind speed and direction frequency at the site.
- 3.2 As is indicated, the predominant wind direction is between South and West, with much less frequent winds arising from other directions. This is generally the norm for most parts of the UK.



4 Environmental Risk Assessment Model

4.1 **Fundamental considerations**

- 4.1.1 **Source/Hazard:** A property or situation that in particular circumstances could lead to harm.
- 4.1.2 **Consequences:** The adverse effects or harm as the result of realising a hazard which causes the quality of human health or the environment to be impaired in the short or long term.
- 4.1.3 **Risk:** A combination of the probability of occurrence of a defined hazard and the magnitude of the consequences of the occurrence.

4.2 **Pathway**

- 4.2.1 Important in the assessment of a particular risk(s) and to inform the subsequent management of the risk(s) is the identification of the pathway(s) through which the risk may affect the identified receptor(s). The following are examples of pathways:
 - Air
 - Ground
 - Water
 - Direct contact / exposure

4.3 **Consequences**

4.3.1 The following table highlights the consequences of the hazard(s) identified and the abbreviations for each as used in the Risk Assessment Table in Section 3:

Abbreviation	Consequences
Α	Minor Injury
В	Major Injury
С	Death
D	Air Pollution
E	Water Pollution
F	Pollution of Land

4.4 **Effects of consequences**

4.4.1 In order to quantify the level of risk and identify the appropriate management procedures, the potential effects must be considered, as outlined in the table below:

Abbreviation	Consequences	Management Requirements
S	SEVERE	In all cases
Мо	MODERATE	In most cases
Mi	MILD	Occasionally
N	NEGLIGIBLE	No

4.4.2 Note: "Management" is the action required to reduce the risk of a hazard causing a problem on site. Contingency measures are procedures which are in place to reduce the consequences of a hazard.

4.5 Risk estimation and evaluation (probability/frequency of occurring hazard)

4.5.1 The following table allows the likelihood of an occurrence of an identified risk to be assessed:

Abbreviation	Probability	Evaluation
1	Very likely	Could occur during any working day
2	Likely	Could occur regularly
3	Possible	Event possible
4	Unlikely	Event very unlikely

4.6 Risk assessment outcome (combination of probability & consequence)

4.6.1 The following table shows the resultant risk of an identified hazard or potential situation. This uses the hierarchy of both probability and consequence to assess the level of risk. The level of risk determines what level of management would be required in order to reduce the risk of occurrence and/or scale.

		Consequence								
		S	Мо	Mi	N					
ity	1	High	High	Medium	Low					
bility	2	High	Medium	Low	Near-Zero					
robak	3	Medium	Low	Near-Zero	N/A					
Pr	4	Low	Near-Zero	N/A	N/A					

4.6.2 Where the risk assessment outcome is high, first-level management of the risk is essential, i.e. removal of hazard, implementation of major infrastructure/structural design measures to contain the risk/hazard and company policy changes to incorporate the management of the risk. All risk management measures must be supplemented with detailed induction training, spot training and tool-box talks to ensure all site staff and users are made fully aware of the risk/hazard, all potential consequences and necessary management and contingency procedures.

- 4.6.3 Where the risk assessment outcome is medium, the management of the risk should be tackled by management or delegates. If removal of the hazard is not possible, management will normally be met through implementing minor structural design measures or by imposing procedures for the prevention of occurrences which will be conveyed to all site staff through the appropriate training, including any contingency measures/procedures.
- 4.6.4 Where the risk assessment outcome is low, the management of the risk can be done wholly through appropriate training to site staff including any contingency measures/procedures.
- 4.6.5 Where the risk assessment outcome is near-zero, site staff should be made aware of the possibility of an occurrence and contingency measures should be readily available to all staff should they be required.

Risk Assessment Table

- The following pages contain the site-specific risk assessment for the site with appropriate remedial actions, recommendations and comments included for each identified hazard, potential contaminant or situation.
- The table also contains references to the appropriate section(s) of the site's EMS for additional management procedures.
- As discussed in Section 3.6 above, all situations which identify a risk from Low –High should be incorporated into the staff/visitor training schedule, where appropriate and acted on as required.

SEE TABLES OVERLEAF

Hazard / Potential Contaminant or Situation	Source	Pathway	Receptor(s)	Consequences	Effect	Probability	Assessment Outcome	Remedial Action/ Recommendations/ Comments	Outcome after remediation
DUST / PARTICULATES	SITE SURFACES (DRY AND WINDY WEATHER)	AIR	SITE PERSONNEL / VISITORS FLORA & FAUNA (ECOLOGY) HIGHWAY NETWORK PROTECED SPECIES (FISH & NON-FISH) RESIDENTIAL RECEPTORS WILDLIFE SITES NEARBY SURFACE WATERS	A, B, D, E	Mi to Mo	3	Low to Near-Zero	THE SITE SURFACE WILL BE IMPERMEABLE CONCRETE THEREFORE REDUCING THE RISK OF DUST ARISING FROM UNSURFACED AREAS ALL LOADS WILL BE SHEETED/CONTAINED ON ARRIVAL AND EGRESS FROM THE SITE DROP HEIGHTS WILL BE KEPT TO A MINIMUM CONTINUOUS MONITORING REGIME TO BE IN PLACE TO IDENTIFY ANY POTENTIAL FOR DUST LEAVING SITE BOUNDARY. COMPLAINTS PROCEDURE IN EMS TO BE IN PLACE CLEANING OF ANY SPILLAGES USING WET CLEANING METHODS ACCEPTED WASTE TYPES WILL NOT COMPRISE 'DUSTY	Near Zero
ODOUR	STORED WASTE PROCESSING AND TREATMENT OPERATIONS SPILLGAES OF FLUIDS CRACKS IN CONCRETE LEADING TO TRAPPED WASTE CONTINUOUS WARM/ HOT WETAHER CONDITIONS EXCEEDING 72 HOURS	AIR	SITE PERSONNEL / VISITORS RESIDENTIAL RECEPTORS	A, D	Mi to Mo	3	Low to Near-Zero	REFERENCE SHOULD BE MADE TO THE OPERATOR'S ODOUR MANAGEMENT PLAN STRICT WASTE ACCEPTANCE PROCEDURES TO IDENTIFY POTENTIALLY ODOROUS WASTES AND THEIR CONTAINMENT REJECTED WASTES OR SPILLAGES ARE TO BE QUARANTINED PRIOR TO REMOVAL OFF SITE FOLLOWING DAILY INSPECTIONS DAILY OLFACTORY MONITORING PROCEDURES COMPLAINTS PROCEDURE TO BE IN PLACE ANY ODOROUS WASTE RESULTING IN COMPLAINTS WILL BE REMOVED FROM THE WITHIN 48 HOURS WASTES WILL NOT BE STORED ON SITE FOR LONGER THAN <7 DAYS	Near Zero

Hazard / Potential Contaminant or Situation	Source	Pathway	Receptor(s)	Consequences	Effect	Probability	Assessment Outcome	Remedial Action/ Recommendations/ Comments	Outcome after remediation
LITTER	POOR HOUSEKEEPING	AIR	SITE PERSONNEL / VISITORS FLORA & FAUNA (ECOLOGY) HIGHWAY NETWORK PROTECED SPECIES (FISH & NON-FISH) RESIDENTIAL RECEPTORS WILDLIFE SITES NEARBY SURFACE WATERS	A to C E,F	Mi	3	Near-Zero	DAILY INSPECTIONS OF THE SITE AND AREAS IN THE IMMEDIATE VICINITY OF THE SITE BOUNDARY FOR LITTER WASTE ACCEPTED AND STORED WILL GENERALLY NOT CONTAIN 'LITTER'	Near Zero
NOISE/VIBRATION	ALL ACTIVITES INVOLVING THE ACCEPTANCE, STORAGE AND PROCESSING OF WASTE REPAIRS / MAINTENANCE FAULTY MOBILE / FIXED PLANT	AIR OR GROUND BY VIBRATION	SITE PERSONNEL / VISITORS FLORA & FAUNA (ECOLOGY) PROTECED SPECIES NON-FISH WILDLIFE SITES RESIDENTIAL RECEPTORS	A, D	Mi to Mo	3	Low to Near Zero	REFERENCE SHOULD BE MADE TO THE OPERATOR'S NOISE & VIBRATION MANAGEMENT PLAN	Near-Zero
VERMIN (LEPTOSPIROSIS etc.)	STORED PUTRESCIBLE/ BIODEGRADABLE WASTES	WATER, DIRECT CONTACT WITH WASTE	SITE PERSONNEL / VISITORS RESIDENTIAL RECEPTORS	A to C	Mi to Mo	3	Low to Near Zero	WEAR PPE - GLOVES AND MASKS AS APPROPRIATE SITE INSPECTIONS DAILY ANY WASTES CONSIDERED UNSUITABLE AFTER DEPOSIT WILL BE ASSIGNED TO THE QUARANTINE AREA PEST CONTROLLER CALLED IN THE EVENT OF PESTS BEING PRESENT AT THE SITE OR COMPLAINTS RECEIVED FROM RECEPTORS	Near Zero

Hazard / Potential Contaminant or Situation	Source	Pathway	Receptor(s)	Consequences	Effect	Probability	Assessment Outcome	Remedial Action/ Recommendations/ Comments	Outcome after remediation
PESTS	STORED PUTRESCIBLE/ BIODEGRADABLE WASTES	DIRECT	SITE PERSONNEL / VISITORS RESIDENTIAL RECEPTORS	A, D	Mi to Mo	3	Low to Near Zero	STRICT WASTE ACCEPTANCE PROCEDURES AND ANY WASTES WITH PEST ISSUES WILL BE REJECTED REJECTED WASTES OR SPILLAGES WILL BE QUARANTINED PRIOR TO REMOVAL OFF SITE FOLLOWING DAILY INSPECTIONS COMPLAINTS PROCEDURE TO BE IN PLACE PEST CONTROLLER CALLED TO RECTIFY ISSUE IF MULTIPLES COMPLAINTS ARE RECEIVED LIQUID WASTES WILL BE DELIVERED IN SEALED TANKERS AND INTRODUCED SRAIGHT TO THE PROCESS VIA ENCLOSED LINE	Near Zero
FIRE/ SMOKE / PARTICULATES	STORED FLAMMABLE / COMBUSTIBLE WASTE AND MATERIALS MALFUNCTION OF FIXED AND MOBILE PLANT ARSON	AIR, DIRECT CONTACT	SITE PERSONNEL / VISITORS FLORA & FAUNA (ECOLOGY) HIGHWAY NETWORK PROTECED SPECIES (FISH & NON-FISH) RESIDENTIAL RECEPTORS WILDLIFE SITES NEARBY SURFACE WATERS	A to F	Mi to S	3	Medium to Near-Zero	ALL WASTES WILL BE AT LEAST 50% MOISTURE AND STORAGE TIME MINIMISED WHERE POSSIBLE SITE SECURITY ARRANGEMENTS TO BE IN PLACE	Near Zero

Hazard / Potential Contaminant or Situation	Source	Pathway	Receptor(s)	Consequences	Effect	Probability	Assessment Outcome	Remedial Action/ Recommendations/ Comments	Outcome after remediation
VEHICLE COLLISION/ ACCIDENT	MUD ON ROADS FROM WASTE STORAGE & VEHICLE BODIES POOR VISIBILITY SPILLAGES OF OILS/FLUIDS CAUSING VEHCILES TO SKID LACK OF PPE WORN BY STAFF	DIRECT CONTACT	SITE PERSONNEL / VISITORS VEHICLE USERS PEDESTRIANS	A to F	Mi to S	3	Medium to Near-Zero	GOOD HOUSEKEEPING/ VEHICLE MANAGEMENT STOCKPILE MANAGEMENT I.E. FEEDSTOCKS CONTAINED WITHIN DESIGNATED STORAGE BAYS AN ACCIDENT LOGBOOK SHOULD BE KEPT FOR ALL INCIDENTS ENCOURAGEMENT FOR STAFF FOR GREATER NUMBER OF "ACCIDENT-FREE DAYS" TO ENCOURAGE A SAFER WORKING ENVIRONMENT NEAR MISSES TO BE REPORTED AND REMEDIAL ACTIONS ACTED UPON HSE COMPLIANT RISK ASSESSMENTS FOR ALL SITE ACTIVITIES TO IDENTIFY SITUATIONS WHICH MAY LEAD TO HARM FOR SITE USERS, EMPLOYEES, VISITORS AND MANAGEMENT APPRORIATE SIGNAGE THROUGHOUT THE SITE ALL STAFF TO USE HORNS / ALARMS ON EQUIPMENT TO ALERT OF THEIR PRESENCE THE SITE WILL HAVE TRAINED STAFF WHO CONTROL VEHICLE MOVEMENTS THROUGHOUT THE SITE BARRIER TO BE INSTALLED AROUND PROPANE TANKS TO PROTECT TANKS AGAINST COLLISION RISK SEGREGATION OF PERSONNEL AND VEHICLE PATHWAYS AND SPEED LIMIT TO BE ENFORCED	Low – Near- Zero
LEACHATE	STORED WASTES	GROUND	SURFACE WATERS FLORA & FAUNA (ECOLOGY) PROTECED SPECIES (FISH & NON-FISH) WILDLIFE SITES NEARBY WATERCOURSES	E, F	Mi to Mo	3	Low to Near-Zero	ALL WASTE STORED AT THE SITE IS TO BE ON AN IMPERMEABLE CONCRETE SURFACE WITH A SEALED DRAINAGE SYSTEM ALL WASTES WHICH ARE LIABLE TO GIVE RISE TO CONTAMINATION WILL BE REMOVED FROM SITE IF THE SITE IS NOT SECURE OR OPERATIONS AT THE SITE ARE SUSPENDED. REGULAR (MINIMUM DAILY) CHECKS OF SITE SURFACE INFRASTRUCTURE FOR CRACKS AND AREA CORDONED OFF UNTIL REPAIRS HAVE TAKEN PLACE	Near-Zero

Hazard / Potential Contaminant or Situation	Source	Pathway	Receptor(s)	Consequences	Effect	Probability	Assessment Outcome	Remedial Action/ Recommendations/ Comments	Outcome after remediation
								ANY SPILLAGES IDENTIFIED WILL BE DEALT WITH IN ACCORDANCE WITH SPILLAGE PROCEDURES AND SPILL KITS WILL BE MADE AVAILABLE AT THE SITE	
IMPACT/INJURY	COLLAPSE OF STORED MATERIALS/ FALLING MATERIALS	DIRECT CONTACT	SITE PERSONNEL/ VISITORS	A to C	Mi to S	4	Low – Near- Zero	STORAGE HEIGHTS WILL BE KEPT TO A MINIMUM AND WILL BE IN LINE WITH EA GUIDELINES DROP HEIGHTS WILL ALWAYS BE KEPT TO A MINIMUM	Near Zero
								APPROPRIATE PPE ISSUED TO ALL SITE STAFF AND AVAILABLE IN THE MAIN SITE OFFICE STAFF TRAINING AND HANDLING PROCEDURES TO BE IN PLACE	
HYDROCARBONS	UNBUNDED FUEL TANKS	GROUND - DIRECT CONTACT,	SURFACE WATERS FLORA & FAUNA	A, B, D, E, F	Mi to S	3	Medium to Near-Zero	ANY FUEL TANKS (AND PIPEWORK) TO BE STORED WITHIN A BUNDED AREA AND LOCKED WHEN NOT IN USE.	Near Zero
	DRIPS WHEN REFUELLING	INGESTION INHALATION	(ECOLOGY) PROTECED SPECIES					SPILL KITS TO BE KEPT CLOSE TO SOURCE(S) OF HAZARDS PREVENTATIVE MAINTENANCE SCHEDULE FOR	
	DURING DELIVERY LEAKAGE FROM	(OF VOLATILES)	(FISH & NON-FISH)					PLANT/MACHINERY	
	STORED DRUMS		WILDLIFE SITES					ANY SPILLAGES IDENTIFIED WILL BE DEALT WITH IN ACCORDANCE WITH SPILLAGE PROCEDURES IN THE EMS	
	PLANT FAILURE		NEARBY WATERCOURSES					CONCRETE SURFACED YARD AND SEALED DRAINAGE SYSTEM WILL REDUCE THE IMPACTS OF ANY SPILLS ENTERING SURFACE WATERS OR PROTECTED SITES	
								REGULAR (MINIMUM DAILY) CHECKS OF SITE SURFACE INFRASTRUCTURE FOR CRACKS AND AREA CORDONED OFF UNTIL REPAIRS HAVE TAKEN PLACE	
								BARRIER TO BE INSTALLED AROUND PROPANE TANKS TO PROTECT TANKS AGAINST COLLISION RISK	

Hazard / Potential Contaminant or Situation	Source	Pathway	Receptor(s)	Consequences	Effect	Probability	Assessment Outcome	Remedial Action/ Recommendations/ Comments	Outcome after remediation
RELEASE OF GASES/FUMES/ VAPOURS/ VOLATILES	MIXING OF WASTE/ CHEMICALS SPILLAGE OF CHEMICALS OVERTURNED VEHICLE/PLANT FAILURE REACTION BETWEEN STORED WASTES	AIR GROUND WATER CONFINED SPACES	SITE PERSONNEL / VISITORS SURFACE WATERS FLORA & FAUNA (ECOLOGY) PROTECED SPECIES (FISH & NON-FISH) ADJACENT RESIDENTIAL RECEPTORS WILDLIFE SITES NEARBY WATERCOURSES	A to F	Mi to S	3	Medium to Near-Zero	ENSURE ANY STORAGE OF HAZARDOUS SUBSTANCES IN PROPERLY DESIGNATED AREAS IN ACCORDANCE WITH LEGISLATIVE GUIDANCE PREVENTATIVE MAINTENANCE SCHEDULE FOR PLANT/MACHINERY QUARANTINE OF REJECTED (I.E. POTENTIALLY HAZARDOUS) WASTES	Near Zero
POINT SOURCE EMISSIONS TO AIR	CHP UNITS BACKUP BOILERS SAFETY FLARE GAS UPGRADE UNIT VENTS ON TANKS AND VESSELS	AIR DEPOSITION TO LAND	RESIDENTIAL AREAS WILDLIFE SITES SITE PERSONNEL / VISITORS	D,F	Mi to Mo	2	Low to Medium	REFERENCE SHOULD BE MADE TO EMISSIONS MODELLING REPORT FOR ASSESSMENT OF POTENTIAL IMPACTS AS A RESULT OF RESDUAL EMISSIONS FROM SAFETY FLARE BACKUP BOILERS AND CHP UNITS DEMONSTRATING NEGLIGIBLE IMPACT ELEVATED FLUES TO BE INSTALLED TO DILUTE AND DISPERSE RESIDUAL EMISSIONS SAFETY FLARE, BACKUP BOILERS AND CHP UNITS REQUIRED TO COMPLY WITH EMISSION LIMITS ABATEMENT USED TO REMOVE CONTAMINANTS IN BIOGAS IN UPGRADING UNIT TANKS AND VESSELS TO BE FITTED WITH PRESSURE RELIEF VALUES — ONLY OCCASIONAL PASSIVE VENTING LIKELY THE FLARE PROVIDED IS DESIGNED TO ENSURE HIGH TEMPERATURE DESTRUCTION OF BIOGAS INCLUDING ANY CONTAMINANTS TO AVOID EMISSIONS FROM PRESSURE RELIEF VALVES	Near Zero

Hazard / Potential Contaminant or Situation	Source	Pathway	Receptor(s)	Consequences	Effect	Probability	Assessment Outcome	Remedial Action/ Recommendations/ Comments	Outcome after remediation
BIOAEROSOL EMISSIONS	LIQUID AND SOLID FEEDSTOCKS SAFETY FLARE VENTS ON TANKS AND VESSELS GAS UPGRADE UNIT PRESSURE RELEASE VALVES	AIR	RESIDENTIAL AREAS WILDLIFE SITES SITE PERSONNEL / VISITORS	A to D	Mi to Mo	3	Low to Near-Zero	ELEVATED FLUES ARE TO BE INSTALLED TO DILUTE AND DISPERSE RESIDUAL EMISSIONS THE AD PLANT IS AN ENCLOSED OPERATION WHICH WILL CONTAIN ANY BIOAERSOL EMISSIONS. ABATEMENT USED TO REMOVE CONTAMINANTS IN BIOGAS IN UPGRADING UNIT TANKS AND VESSELS THAT ARE FITTED WITH PRESSURE RELIEF WILL ONLY HAVE OCCASIONAL AND INFREQUENT SHORT TERM VENTING AS THEY WOULD ONLY OCCUR IN AN EMERGENCY SITUATION. THEREFORE, THE RISK OF IMPACT FROM THESE EMISSIONS IS NOT CONSIDERED TO BE SIGNIFICANT LIQUID WASTES ARE TO BE LOADED DIRECTLY INTO AN ENCLOSED FILLING SYSTEM. ANY AIR WHICH MAY BE DISPLACED DURING FILLING WILL BE IN SHORT BURSTS AND WILL VENT DIRECTLY TO THE GAS LINE AND THEREFORE BIOAEROSOL RELEASE IS EXPECTED TO BE NEGLIGIBLE SOLID WASTES TO BE STORED IN RECEPTION BAYS WITH WALLS TO PREVENT WIND WHIPPING OF MATERIALS.	Near Zero

Appendix I

Drawings

