Foyle - Gloucester

Environmental Permit Application

EPR Ref: UP3700PX/A001

H1 Environmental Risk Assessment

Document Ref: Attachment B.2.5.A

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1.0 INTRODUCTION

Foyle Food Group operates a slaughtering facility on a 13,000 M^2 site located at Forest Vale Road, Forest Vale Industrial Estate, Cinderford, Gloucester, GL14 2PH, United Kingdom. Activities at the site include the slaughter of cattle and the dressing, chilling and quartering of beef carcasses, the cutting of beef and the harvesting of offal, cod fat and bones, the packing of beef, beef offal, cod fat and bones into vacuum pouches and lined cardboard boxes.

The east of the site is bounded by the B4227 main road. The south of the site is bounded by a car breakers yard, while the north is bounded by an industrial facility. The west boundary of the site is made up of a mixture of trees, hedgerows and the Cinderford Brook, beyond which is the Severn Trent municipal plant.

The Cinderford Brook watercourse also runs adjacent to the western boundary of the site. Regionally, the site is positioned in an industrial estate on the outskirts of the town of Cinderford which itself is located on the eastern fringe of the Forest of Dean in Gloucestershire. The Forest of Dean is characterised by more than 110 km^2 of mixed woodland.

The facility has a carcass production capacity of more than 50 tonnes per day, which equates to 300 head of cattle. The actual tonnage of finished product produced in 2018 was 20,712 tonnes.

The site at Gloucester was acquired from the family run business, Ensor's Ltd at the end of 2013. Major investment (> £3 million) has allowed upgrade of complete premises to a high standard. The site is a single species, beef slaughter and cutting plant. The site has approval from many of the major retailers in UK and Europe, but retail packing from the site is limited to the packing of primal joints for a single retailer on a seasonal basis. The site exports to Europe, Africa, Asia, South America and North America.

The site employs approximately 230 staff and is approximately 13,000 M^2 in size, with a weekly slaughter in excess of 1500 cattle from which carcase beef is processed.

The plant operates production shifts on a five-day basis between 07:00-18:00, while cleaning occurs between 19:00 – 01:00. Weekend work may occur at peak production times and the engineering team provide 24/7 cover.

The sites effluent treatment plants discharge volume for 2018 was 21,318 M^3, which equates to an average discharge of 58 M^3 per day. The 2019 annualized discharge volume, based on the first 24-week of the year, was calculated to be 28,043 M^3, which equates to an average discharge of 77 M^3 per day. The rate of treated effluent discharge is limit to 100 M^3 per day as per the site discharge licence.

All waste is segregated on site for removal to either recycling or incineration facilities as appropriate.

Under the 2016 Environmental Permitting Regulations for England and Wales, the site is required to submit a H1 Environmental Risk Assessment in support of its application for a Bespoke Environmental Permit.

2.0 BRIEF FOR CONSULTANCY

In order to satisfy its obligations under the 2016 Environmental Permitting Regulations for England and Wales, Panther Environmental Solutions Ltd were contracted by Foyle – Gloucester to carry out this H1 Environmental Risk Assessment in support of their application for a Bespoke Environmental Permit.

The risk assessment covers current and previous site operations and management. The risk assessment involved discussions with the main environmental and operational managers in a facilitated workshop in the identification and quantification of risks.

2.1 H1 Environmental Risk Assessment Objectives

The objectives of this assessment are to:

- Identify all potential environmental risks posed by operations at the Foyle facility;
- Identify all potentially significant environmental risks, including environmental risks arising from unexpected events, posed by operations at the facility;
- Assess potentially significant risks in more detail by way of assigning a significance value to the potentially significant environmental risks;
- Present the risk assessment: and outline the implementation of the appropriate control or mitigation measures for the significant risks.

3.0 SUMMARY OF SITE OPERATIONS

This section gives a summary account of the manufacturing process and supporting operations at Foyle - Gloucester to allow potential environmental risks to be conceptualised in detail. An in-depth description of site operations and the manufacturing process can be found in Attachment B.3.8 – Site Operations.

3.1 MANUFACTURING PROCESS

The manufacturing process is divided into the following stages:

Lairage
Cattle scheduled for slaughter are delivered to the site by road. The animals are placed in livestock holding pens in the lairage.

Slaughter Lines
Cattle are stunned and hung by their back legs on an overhead rail system. The cattle then have the main arteries in their throats cut by trained slaughter operatives.

Blood from slaughtered animals is collected by means of a dedicated collection system. Blood is then transferred from the blood trough to the blood storage tank.

Head, Horn and Hoof Removal
Heads, horns and hooves are manually removed from cattle carcass using hydraulically operated cropping shears and are sent to Specified Risk Material (SRM) skips for staining with blue dye.

Hide Removal
After bleeding, cattle have the mask and ears manually removed. After removal, the mask, which is classed as SRM, is stored in dedicated storage areas and stained with blue dye before disposal.

Trimming and Evisceration
Green offal (lungs, trachea and paunches) are collected and taken for further processing as at an off-site facilities. Gut (paunch) contents is also removed at this stage and stored for collection by a contractor for land-spreading.

The respiratory, pulmonary and digestive organs are then removed and sent for disposal or further processing as required. Red offal (heart, liver and kidneys) are removed and sent to the Red Offal processing area.

Red Offal Further Processing
Further to being initially chilled, red offal is trimmed, packed, labelled and weighed and sent to the chill for storage.

Carcass Quartering
The cattle carcasses are split along the spine using purpose designed electric saws. The spinal cord is then removed from the carcass using a vacuum suction system. Each side is cut, resulting in beef quarters.

Chilling
The beef quarters are placed in chilled storage prior to deboning.

De-boning
Beef quarters are de-boned, with bones directed to the designated bones trailer. The product would then be weighed and inspected, before being packaged and palletised.

Dispatch
An off-site contract cold storage facility is used, which is approved at group level, and BRC certificated.

Cleaning
Procedures ensure that residual material is removed from floors, water is used efficiently and employees are trained.

3.2 SUPPORTING SERVICES

3.2.1 Boilers

Process steam is supplied by two CFB model 4VT Steam Boilers. These are located in the Maintenance Workshop, which is to the south of the main building and operates on natural gas.

To the rear of these boilers is a heat exchanger system, which supply hot water for the central heating system, domestic sinks and for cleaning.

Further details on boiler specifications can be found in Attachment C.3.2 – Emission to Atmosphere.

3.2.2 Refrigeration

All cooling is achieved by the following plant:

Make.	Model	Location	Gas	Compressor Quantity
Searle	LSR123-44-6D-EL	Chill 1	R407A	3
Searle	LSR123-44-6D-EL	Chill 2	R407A	3
Searle	LSR123-44-6D-EL	Chill 3	R407A	3
Searle	LSR123-44-6D-EL	Chill 4	R407A	2
Searle	LSR123-44-6D-EL	Chill 5	R407A	4
Searle	LSR123-44-6D-EL	Chill 6	R407A	4
Searle	KM80-4-AX-3PH	Boning Hall	R407A	3
Searle	KME 140-4L 1PH	Despatch	R407A	4
Searle	KME 80-4L 1PH	Loading	R407A	2
Searle	KEC55-4 1 PH	Packing Room	R407A	1
Searle	DSR 68-4L-DH	Offal Room	R407A	1
Searle	DSR 68-4L-DH	Offal Chiller	R407A	1
Searle	KME 140-6L 1PH	Freezer	R407A	2

Refrigerant is used in a number of appliances and systems to provide refrigeration, ice-making and conditioning.

There is a relatively small volume of refrigerant gas within the system, between 650kg to 750 kgs. The table above detail the refrigerant used on-site.

3.2.3 Offices

The site's main offices are located on the first floor of the main building and typically have 18 people employed to work there at any one time.

3.2.4 Effluent Treatment Plant

The ETP is located to the west of the main process building and is used to treat all process water prior to discharge from the site to the Severn Trent Water sewer at the final effluent

discharge point S-1. The system comprises the following modules, which perform the tasks outlined in Table 3.1 below.

Environmental aspects associated with the operation of the ETP at the site are summarised in Table 3.2 below. Full information on the ETP can be found in Attachment C.3.4 – Emission to Sewer.

Table 3.1: Modules contained in ETP system

Module	Construction	Source of Water	Function	Controls
Effluent Inlet Sump	Underground sealed concrete tank	Boning Hall, Packing Area, Killing Line, Tripe-Wash, By-Product Handling Area, Lorry-Wash, Dirty yard.	Holding sump and pumping station	Level probe. Effluent plant control panel
Balancing Tank	Over-ground SS tank with fibre-glass lining	Effluent sump	Primary treatment - Balancing	Level probe. Effluent plant control panel
DAF unit	Stainless steel	Balancing Tank	Primary Treatment	Level & pH probe, effluent plant control panel
Lairage/Sludge Holding Sump	Underground sealed concrete tank	Feed from DAF units	Sludge storage and mixing	Level probe, effluent plant control panel
Final Discharge Point	Stainless Steel Piping	DAF	Connection to main sewer	Flow and pH monitoring

Table 3.2: Environmental Aspects Associated with the Effluent Treatment Plant

Outputs	Comments
Trade Effluent Volume	77 M^3/day (2019 Average)
Lairage Sump and Sludge Volume	28 M^3/day (Average)
Screen Waste	2,000 Kgs / week
Chemical usage	827 Kgs / week
Odour Emissions	Low odour - no complaints
Noise Emissions	No noise complaints
Sludge transport	Potential odour
Sludge transport spillage	None reported to date
Sludge transport odour issues	None reported to date

4.0 INITIAL SCREENING AND OPERATIONAL RISK ASSESSMENT

The initial step involved in categorising the likely environmental risks associated with a facility is to undertake a high-level screening of the site based on its complexity, environmental sensitivity and record of compliance with environmental legislation.

All aspects of the previous operation and current site operation that pose a plausible threat to the environment are covered in this H1 Risk Assessment.

This H1 Environmental Risk Assessment is based on the Environmental Agency's H1 Guidance Document, last updated December 2014, and the associated annexes therein applicable to a facility of this nature, namely:

- H1 Annex A – Amenity & accident risk from installations and waste activities
- H1 Annex D – Discharges to surface waters
- H1 Annex E – Surface Water Discharges (complex)
- H1 Annex F – Air Emissions
- H1 Annex G – Disposal or recovery of waste produced on site
- H1 Annex H – Global warming potential
- H1 Annex J – Groundwater
- H1 Annex K – Cost benefit analysis

Upon satisfactory addressing of the company's activities under each of these annexes, it can be demonstrated that the facility would not pose an unacceptable risk to the environment throughout its life cycle.

For each of the above environmental aspects, the approach to the assessment has followed the following four stage processes:

1. Identify the risks;
2. Assess the risks (assuming those control measures proposed are in place);
3. Choose appropriate further measures to control these (if required); and
4. Present the assessment.

5.0 RISK IDENTIFICATION

5.1 Methodology

Risk identification was initially undertaken during the Risk Management Workshop in April 2019 with the sites SHE Coordinator. The risk identification process involved:

- The identification of potential environmental receptors at the site.
- The identification of production processes that posed potential hazards to the environment.
- The identification of any other site operations that posed potential hazards to the environment.
- The identification and quantification of the risks using a Failure Mode Effect Analysis (FMEA) worksheet.

5.2 Operator Performance

Assessing operator performance is crucial when seeking to assess the environmental risks posed by the Gloucester site. As detailed above, the large-scale slaughtering of cattle, processing of packaging is being carried out, along with the application of cleaning chemicals, the operation refrigeration plant, boiler plant, and an ETP.

Poor operator performance can pose a significant risk to the environment. The implementation of industry best practices and BAT for all processes in the facility significantly minimises environmental risk factors. The operation of all equipment and plant should have a Standard Operating Procedure and a Contingency Operating Procedure where necessary – i.e. EMS OP03 - Energy Management Procedure.

Foyle Food Group Ltd acquired the Gloucester site in 2013. Since then the site has seen heavy investment and has achieved both ISO14001:2015 and BRC accreditation.

There have been no noise complaints in relation to the facility.

In the first half of 2019, the site has received two complaints with regards to odour.

Extensive improvements and upgrades were carried out at the site's effluent treatment plant between Q3 2017 and Q1 2018 in response to a final effluent discharge non-compliance notification by Severn Trent Water Ltd.

On Thursday 17th January 2019, the site was informed by the Environment Agency of a potential surface water contamination issue at Cinderford Brook, in the vicinity of the sites surface water discharge point.

5.3 Identification of Environmental Receptors

The term 'environmental receptor' describes those parts of the surroundings likely to be affected by the processes that are on-going at the site. The significant environmental receptors are listed below. These receptors are used as a starting point to ensure that all significant risks are identified and all major aspects of the environment are taken into account.

Environmental Receptors:

- Groundwater
- Surface water
- Human Beings
- Air Quality

5.3.1 Groundwater

The closest waterbody to the site is the Cinderford Brook, approx 25m west, which is a tributary/ source of confluence of the Blackpool Brook. The Severn Vale CAMS covers just less than 1,000 square kilometres. It spans a large part of Gloucestershire and smaller areas of Herefordshire and Worcestershire and includes the urban centres of Cheltenham and Stroud.

The solifluction and gelifluction deposits, on which the site is located is classified as an aquifer which is a 'Secondary A' superficial deposit. Secondary A consists of permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

The term 'groundwater vulnerability' refers to the intrinsic properties of the groundwater system that depend on the sensitivity of the material in permitting the degradation of the saturated zone by pollutant substances originating from human activities. The site has been designated predominately as a Minor Aquifer of High Permeability and partially as a Minor Aquifer of Low Permeability.

The site is not located on a groundwater source protection zone, the closest of which is approximately 400m to the east.

A drinking water safeguard zone is a catchment area designated as it has been deemed to influence the water quality at drinking water abstractions, which are at risk of failing the drinking water protection objectives.

The Foyle - Gloucester site is not within a Groundwater Drinking Water Safeguard Zones, the closest of which is located 35.5Km to the east-north-east at Charlton Abbots (GWSGZ0200), which is designation At Risk from Ammoniacal Nitrogen.

The site does not have a groundwater abstraction point, and all process water is taken from the town water supply.

5.3.2 Surface Water

The closest waterbody to the site is the Cinderford Brook, approx 25m west, which is a tributary/ source of confluence of the Blackpool Brook and has a catchment area of 27.636 km^2 and a length of 15.586km.

The ecological quality of the Cinderford Brook is classified as 'Moderate' by the Water Framework Directive River Basin Management Plan.

The Foyle – Gloucester site is not within a Surfacewater Drinking Water Safeguard Zones, the closest of which is 1.7 Km to the north-west at Birch Wood (SWSGZ2104), which is designated 'At Risk' from Metaldehyde.

The site is not within an area designated as a Surfacewater Nitrate Vulnerable Zones. The closest being the Walford Bk - source to conf R Wye NVZ (NVZ ID: S605 NVZ), located 4.0 km to the north.

See Attachment B.3.3: Emissions to Surface Water for further information.

Process Wastewater
All internal drainage from the production factory goes directly to the on-site effluent treatment plant where it is treated and discharged at S–1. Monitoring of final effluent emissions is carried out as per the site's Effluent Discharge License from Severn Trent Water Ltd (see Attachment B.3.5).

Foul water from toilets and canteen go directly to the Severn Trent Water public sewer via discharge point S-2.

Storm-water
The majority of site surface-water is collected by a network of drains and discharges to the Cinderford Brook, after passing through an interceptor.

Roof water is stored in a Grey-Water tank for us in the site truck-wash.

Surface water from a small area of *dirty yard* is collected by the ETP inlet sump and treated in the sites ETP.

5.3.3 Soil

Soil can be seen as a sensitive environmental receptor as pollution is often both challenging to quantify and expensive to remediate. Soil contamination typically arises from accidents such as chemicals spillages, vehicles collisions, burst pipes and contaminated firewater. The site has a Spillage Procedure (EMS OP12) and a Bund Inspection Procedure (EMS OP09), while the environmental checklist includes the checking of spill kits. A Bunding Integrity Assessment has been carried out and is included as Attachment C.3.

There are no green areas or areas of exposed soil within the site, which is surrounded by a raised kerbing, designed to minimises the potential for contamination in the event of a spill or from firewater. Chemicals are stored in the secured areas, accessible to authorised personnel only.

5.3.4 Air Quality

The site is located within Lydney District, which is designated as an Air Quality Management Zone for nitrogen dioxide - NO_X (AS NO_2).

The site's two boilers are serviced twice annually and as required in order to ensure good efficiency. More than 80% efficiency is usually taken as acceptable. These natural gas-fuelled boilers emit CO_2 and H_2O along with small levels of NO_x and SO_x. Attachment B.3.2 contains location and description of all point and fugitive sources of emissions to atmosphere.

There are several potential odour emission points on the site. These are primarily the waste storage and the treatment areas (including the ETP). The results of the Odour Impact Assessment carried out in support of this application and an Odour Management Plan can be seen in Attachment B.3.10.

See Attachment B.3.2 – Emissions to Atmosphere for further information.

5.3.5 Human Beings

Foyle Food Group operates a slaughtering facility on a 13,000 M^2 site located at Forest Vale Road, Forest Vale Industrial Estate, Cinderford, Gloucester, GL14 2PH, United Kingdom.

The nearest residential receptors to the site boundary are located on the Foxes Bridge Road to the north-east. The shortest distance between site operations and residential dwellings is 135m.

The east of the site is bounded by the B4227 main road. The south of the site is bounded by a car breakers yard, while the north is bounded by an industrial facility. The west boundary of the site is made up of a mixture of trees and hedgerows.

An Odour Impact Assessment has been conducted as part of site application for an Environmental Permit. This report and the accompanying Odour Management Plan can be seen in Attachments B.3.10.1 & B.3.10.2.

An Environmental Noise Survey has been conducted as part of the site application for an Environmental Permit. See Attachment B.3.11.

A catastrophic event such as a major fire, a gas leak leading to an explosion or a major chemical spillage also has the potential to pose a risk to surrounding residents.

Identification of Risks

A facilitated workshop was undertaken on site to systematically identify the major risks at the site. A total of 26 risks were identified which are summarised in Tables 5.1 and ranked in order in Table 6.3.

Table 5.1: Project Risk Register

RISK	AREA/ISSUE	POTENTIAL FAILURE MODE / RISK	PRINCIPLE IMPACTED RECEPTORS
Site Wide			
1	Pests	Risks from increased pest populations	Human beings
2	Litter	Risk of raw materials, waste and waste packaging litter in yard	Human beings
3	Vandalism	Risk of illegal trespass	Site plant and personnel
4	Flooding	Risk of site flooding (extreme rain event and river flooding)	Surface water / Groundwater / Human Beings
5	Factory – Major Fire	Fumes from fire & potential firewater contamination of groundwater	Air Quality / Surface water/ Human Beings
Production Facility			
6	Water-lines - Manifold connections	Major water spillages to ETP	Surface water, via on-site ETP
7	Production floor	Spillage of cleaning chemicals	Surface water, via on-site ETP
8	Chilled Storage	Potential refrigerant leak	Air Quality /Human beings
9	Boiler emissions	Emissions of NOx or particulate matter	Air Quality /Human beings
10	Energy Usage	Emission of greenhouse gasses	Global Warming
11	Gas lines	Gas leakage	Air Quality /Human beings
12	Refrigeration Plants	Noise emissions	Human beings
Drainage lines			
13	Process & foul line integrity	Potential leaks	Groundwater/ soils
14	Storm drains	Potential leaks	Groundwater/ soils
External Areas			
15	Blood storage	Risks from leaking of blood to yard	Surface water / Groundwater
16	Delivery of chemicals – fuels and chemicals	Potential spillage during delivery and operation	Surface water / Groundwater

RISK	AREA/ISSUE	POTENTIAL FAILURE MODE / RISK	PRINCIPLE IMPACTED RECEPTORS
17	Bunding arrangements	Risk of integrity loss and overtopping	Surface water / Groundwater
Waste (General)			
18	Waste engineering oil storage	Potential for spillages/leaks	Groundwater/ soils
19	Transport of waste	Potential for spillages/leaks during transport	Groundwater/ soils
20	By-product waste storage	Potential for spillages/leaks	Groundwater/ soils
21	General waste storage	Potential for odours	Human Beings
Effluent Treatment Plant			
22	ETP underground sump	Potential leakage from sumps	Groundwater/ soils
23	ETP tanks	Potential leakage to surface water	Surfacewater/ soils
24	ETP operations	Potential odour – if insufficient oxygen available in tanks	Air Quality /Human beings
25	Transport of sludge	Potential for spillages/leaks during transport	Groundwater/ soils
26	ETP effluent discharge	Exceedances of ELV's	Surface water

5.4 SUMMARY OF RISKS IDENTIFIED ON-SITE

The risks identified in Table 5.1 are to be taken as a general overview of the potential risks within each area of the site. Both the severity and likelihood of the occurrence of each depends greatly upon the control measures put in place for each during the site's operation.

As a general overview of the facilities activities and control measures in place, many of the risks identified are not considered significant risks due to the safeguards already in place at the facility.

The most significant environmental risk posed is the ETP effluent discharge which recorded several breaches of consent levels in 2017, as described in Attachment B.3.4 of this application.

The ETP is therefore considered the 'weakest link' in the risk chain, posing the highest potential risks to the environment and has been given the highest priority for this assessment.

A number of the risks identified relate to potential spillages/leaks and risks to ground and water contamination. These potential risks rely heavily on the integrity of the various bunds, storage tanks, ETP tanks and process drains.

All underground pipes/lines and tanks similarly are automatically at a higher risk due to the potential for undetected leaks occurring from these structures containing potentially contaminated substances.

The criteria scoring methodology and risk scores are included in the following section.

6.0 ASSESSMENT OF RISKS

6.1 Methodology

The risks identified during the workshop in Table 5.1 were assessed against the risk classification tables (RCT) in Tables 6.1 and 6.2. The risk classification tables were designed to reflect the levels of risk appropriate to the facility.

Ratings taken from a risk classification table were applied to the consequence and likelihood of occurrence of each risk. A risk score was calculated for each risk using the ratings. The risks were then ranked and compared based on the risk scores.

The risks were placed in a risk matrix to illustrate the ranking of each risk, and to allow the risks to be quantified and visually prioritised. The risk matrix is a particularly useful tool for tracking changes in risk levels over time.

Risk management measures were identified for selected risks during the workshop and included in the worksheets. These measures are presented in Section 6.0.

6.2 Risk Classification Table

The Risk Classification Tables (RCT) has been designed to reflect the critical levels of risk appropriate to the Foyle- Gloucester site. The RCT provides likelihood of occurrence and environmental consequence for the ranking of risks. These are included in Table 6.3 below.

Table 6.1: Risk Classification Table (Likelihood)

Rating	Likelihood	
	Category	**Description**
1	Very low	Very low chance (0-5%) of hazard occurring in 30 yr period
2	Low	Low chance (5-10%) of hazard occurring in 30 yr period
3	Medium	Medium chance (10-20%) of hazard occurring in 30 yr period
4	High	High chance (20-50%) of hazard occurring in 30 yr period
5	Very High	Very high chance (>50%) of hazard occurring in 30 yr period

Table 6.2: Risk Classification Table (Consequence)

Rating	Consequence	
	Category	**Description**
1	Very low	No impact or negligible change to the environment
2	Low	Minor / localised impact or nuisance
3	Medium	Moderate impact to the environment
4	High	Severe impact to the environment
5	Very High	Massive impact to a large area, irreversible in the medium term

The risks are identified in Table 6.3 below and a description of each heading of the table is given below:

- Risk ID – Provides a unique identifier for each risk.
- Processes carried out on site – Lists the sites process which gives rise to the potential risk.
- Potential failure mode / risk – Identifies the potential failure mode that could result in the risk occurring.
- Potential causes – Identifies what events could cause the potential failure mode to occur.
- Current Controls – Identifies the current controls in place to prevent the risk event from occurring.
- Consequence – Rates the environmental impact and potential costs due to the hazard event occurring given the current controls. The consequence is ranked against the Risk Classification Table (RCT) as provided in Table 6.2.
- Basis for consequence rating – Identifies the basis for the selected consequence rating.
- Likelihood – Rates the probability of the potential hazard occurring given the current controls. The likelihood rating is ranked against the Risk Classification Table (RCT) as provided in Table 6.1.
- Basis for likelihood rating – Identifies the basis for the selected likelihood rating.
- Risk Score – Provides a risk score to allow the ranking of each risk. The risk score is based on the product of the consequence rating and the likelihood rating.

Table 6.3: Project Risk Register – Classified by Risk Score

RISK ID	PROCESS	POTENTIAL HAZARDS	LIKELIHOOD RATING	BASIS OF LIKELIHOOD	CONSEQUENCE	BASIS OF CONSEQUENCE	RISK SCORE
1	General Management – Pest Control	Increased pest populations.	1	Low likelihood of increased pest populations as good housekeeping and pest control measures onsite. Rodent bating locations in place to control pest numbers onsite. Contract with Pest Control company in place to control pest population. Regular environmental checks are carried out (ER04 - Daily Environmental Check and Weekly Department audits).	4	Potentially large consequence on amenity and public health.	4
2	General Management – Litter Control	Potential raw materials, waste and waste packaging litter in yard	2	Low potential as all deliveries are supervised to ensure no spills occur (OP08 Receipt of Bulk Liquids) Segregated waste bins are provided at relevant process points in order to ensure correct disposal of wastes (OP04 Disposal Of Waste) Regular site inspections (ER04 - Daily Environmental Check) ensure good housekeeping in place and prompt action taken if an issue is identified.	2	Low to moderate nuisance impact on local residents and local businesses	4

RISK ID	PROCESS	POTENTIAL HAZARDS	LIKELIHOOD RATING	BASIS OF LIKELIHOOD	CONSEQUENCE	BASIS OF CONSEQUENCE	RISK SCORE
3	Site Security	Illegal trespass and vandalism.	1	Low potential, there are good security measures in place. Perimeter fence, CCTV security surveillance, 24 hour security personnel presence on-site. Contractors and visitors must sign in at security. No high-risk substances on site. Cleaning chemicals and effluent treatment tanks not accessible to unauthorised people.	5	Potentially large consequence on site personnel, on-site plant and the environment.	5
4	Whole site	Potential site flooding due to extreme weather or local river overtopping.	1	Low potential for flooding onsite as the site is located in Flood Zone 1 (Attachment B.2.3 - Site Condition Report) Surface water drainage is designed to accommodate extreme weather events. Bunds checked weekly and emptied of rainwater as required OP09 Bund Inspection Procedure	3	Potential consequence on the environment would be moderate due to good housekeeping and correct storage of potentially polluting materials.	3
5	Factory – Major fire	Fumes from fire and potential firewater contamination of groundwater	1	Low potential as comprehensive emergency response procedures in place.	5	Consequences would be large as potential impact on local community could be severe. Costs of new building would be significant	5

RISK ID	PROCESS	POTENTIAL HAZARDS	LIKELIHOOD RATING	BASIS OF LIKELIHOOD	CONSEQUENCE	BASIS OF CONSEQUENCE	RISK SCORE
6	Water-lines - Manifold connections	Major water spillages to ETP	3	Connections from Manifolds part of daily processes, leaks likely to occur on a high frequency.	1	Spillages caught in floor drains of building and into contained treatment system. Balancing tank is typically operated at 50% level, which provides adequate capacity if a shock load (volume or Kgs BOD) is received into the plant. No major cost for fix & clean-up.	3
7	Production floor	Spillage of cleaning chemicals and raw materials	3	Minor spillages would occur during normal operation and cleaning chemical spillage would be likely to occur during non-routine operations. Manual intervention. Spill containment procedure in place (OP12 Spillage Procedure) Process lines and operations that reduce excessive spillage of material onto the floor are in place and are continually reviewed. Dry cleaning in place, ensuring all food waste is diverted from drains.	1	All spillages flow into process drains, and in to ETP where any spillage will be diluted in balancing tank and treated.	3
8	Chilled Storage	Potential refrigerant leak, including manifold connections.	3	There is a high chance of this occurring in a 30 yr period. Leaks are usually due to manifold breaks in the chill or refrigeration rooms.	3	Impact would be localized and short-lived.	9

RISK ID	PROCESS	POTENTIAL HAZARDS	LIKELIHOOD RATING	BASIS OF LIKELIHOOD	CONSEQUENCE	BASIS OF CONSEQUENCE	RISK SCORE
				Preventative maintenance and leak test plan in place. Log Book in place to record quantity of refrigerant and oil added, leakage testing results and details of leakage incidents.			
9	Boiler emissions	Emissions of SOx, NOx or particulate matter	4	Monitoring of emission values on an a bi-annual basis during maintenance. NOx, SOx and particulate matter levels are low due to boilers fuelled by natural gas. Combustion plant is relatively small with a combined thermal input of 1.19MW.	1	Minor due to low concentrations in combustion products from natural gas. Any exceedance would be minor and short lived.	4
10	Energy Usage	Emission of greenhouse gasses	2	Low potential for emission of greenhouse gasses. Site uses natural gas for the fuelling of boilers and internal forklifts are electric. Gas and electricity metering recorded weekly. OP03 - Energy Management Procedure	3	Site is a minor producer of greenhouse gasses in the national context. Impact from the site would not be significant.	6
11	Gas lines	Potential leakage	1	Has not occurred to date. Gas lines are secure. Use of system safety and environmental controls include	4	Minor / localised impact or nuisance. Any exceedance would be minor and short lived.	4

RISK ID	PROCESS	POTENTIAL HAZARDS	LIKELIHOOD RATING	BASIS OF LIKELIHOOD	CONSEQUENCE	BASIS OF CONSEQUENCE	RISK SCORE
				automatic lock out of fresh feed if any of control parameters are exceeded.			
12	Refrigeration Plants	Noise emissions	3	Noise monitoring has shown this to be a high noise source. The site has not received a noise complaint since operations began. The site has an established complaints procedure.	2	Potential minor nuisance impact on local community as area is significantly influenced by road traffic at all times.	6
13	Process & foul line integrity	Potential leaks	2	Drainage pipes are cleaned regularly by external contractor. Manholes inspected regularly on site.	4	Leakages in lines may result in major costs due to high reliance on investigations as a control measure. Undetected leaking to ground can lead to high clean-up costs and ground investigation costs.	8
14	Storm drains	Potential leaks	5	Previous contamination issues in early 2019 CCTV Integrity Survey Carried out in 2016. Drainage map updated in 2019. Valve installing on surface water discharge which can be closed in case of emergency. Concrete underground pipes, likelihood of leaking over 30 year	3	Large dilution washed down drain from rainwater and dilution of any spills. Storm pipe normally carries rainwater, therefore any leak would have low contamination.	15

RISK ID	PROCESS	POTENTIAL HAZARDS	LIKELIHOOD RATING	BASIS OF LIKELIHOOD	CONSEQUENCE	BASIS OF CONSEQUENCE	RISK SCORE
				period is minimal.			
15	Blood storage	Risks from overfilling and leaking onto yard	3	Potential for tank leakage over 30 year life span, also potential for leaks in connection. Local yard drainage is directed to by inlet sump within the ETP. OP12-Spillage Response and tanks are bunded. Personnel are trained in all emergency procedures.	2	Bunds checked weekly and emptied of rainwater as required as per OP09-Bunds Inspection Procedure. Bund Assessment carried out as per attachment D.3.	6
16	Delivery of chemicals – fuels and cleaning chemicals	Potential spillage during delivery and operation	3	Can occur on a small scale on a regular basis during normal operation. Spill kits and a Spillage Procedure (OP12) are also in place. Bulk cleaning chemicals are bunded and bund inspection carried out. Storage area accessible by authorised personal only. Accident traffic management controls speed limits on site, low congestion on site. No incident in sites history to date.	3	All spillages could potentially flow into surfacewater drains in yard. Potential large clean-up costs.	9

RISK ID	PROCESS	POTENTIAL HAZARDS	LIKELIHOOD RATING	BASIS OF LIKELIHOOD	CONSEQUENCE	BASIS OF CONSEQUENCE	RISK SCORE
17	Bunding Arrangements	Risks from integrity loss and overtopping	4	Potential for tank leakage over 30 year life span, also potential for leaks in connection. Bund Assessment carried out as per permit application D.3. Bunds checked weekly and emptied of rainwater as required as per OP08-Bunds Inspection	3	Any liquids in contained bunds would be pumped to ETP for treatment	12
18	Waste engineering oil storage	Potential for spillages/leaks	1	Potential for tank leakage over 30 year life span. Waste oil contained in 205 litre drums on sufficient bunding. OP08- Bunds Inspection Procedure in place. Spill kits and Spillage Procedure (OP12) are also in place.	3	Stored in bunded tank in yard. Potential problem flowing into storm water, clean-up costs may be high.	3
19	Transport of waste	Potential for spillages/leaks during transport	2	Potential for accidents on haul route. Containers are covered and sealed to prevent any spillages occurring. Licenced waste contractors are used for the transport of waste. No incidents have occurred to date.	3	Potential large severity if accident occurred; cost high. Potential impact on human beings, soils, surface water and groundwater.	6

RISK ID	PROCESS	POTENTIAL HAZARDS	LIKELIHOOD RATING	BASIS OF LIKELIHOOD	CONSEQUENCE	BASIS OF CONSEQUENCE	RISK SCORE
20	By-product Waste storage	Potential for spillages/leaks and container overflowing	2	Low Potential for over-flowing. Containers are covered and sealed to prevent any spillages occurring. Regular environmental checks are carried out and Procedure in place. OP12-Spillage procedure. Personnel are trained in all emergency procedures.	4	All spillages could potentially flow into surfacewater drains in yard. Potential large clean-up costs	8
21	General Waste Storage	Potential odours	2	Low likelihood as all potentially odorous wastes is stored in sealed bins. New waste compactor is enclosed. Odour Management Plan in place as per permit attachment D.3. Complaints Procedure in place.	3	Residents within 200m of the site therefore possibility of odour complaint is moderate.	6
22	ETP underground sump	Potential leakage to underground	2	Leak is possible over a 30 yr period. Tank is solid concrete. Sub-contractors required to repair if required.	4	Underground tanks leaking may go undetected and lead to high investigation and clean-up costs. Sumps are continuously pumped out as per level probes.	8
23	ETP tanks	Potential leakage to underground	3	Leak is possible over a 30 yr period. Tanks are visually inspected as overground. ETP regularly visually inspected	4	Any large leaks would be immediately detected as overground. Leak would be collected by drains and fed back into ETP sump.	12

RISK ID	PROCESS	POTENTIAL HAZARDS	LIKELIHOOD RATING	BASIS OF LIKELIHOOD	CONSEQUENCE	BASIS OF CONSEQUENCE	RISK SCORE
				by operator.			
24	ETP – Operations	Potential odour – if insufficient oxygen available in tanks	5	A number of odour complaints received during 2019. Potential of odour when cleaning out DAF units, if balancing tank mixer malfunctions or if operators do not receive appropriate training. Balancing Tank is continuously mixed to avoid odours. Balancing Tank is capped. Sludge is removed on a daily basis. Balance tank is emptied and cleaned quarterly. Odour Management Plan in place.	3	Consequences would be small as potential odour impact on local community would be small and short-lived	15
25	Transport of sludge material	Potential for spillages/leaks during transport	2	Potential for accidents on haul route. Sealed tanker is used to prevent any spillages occurring. Sludge removed daily under supervision. Licenced waste contractors are used for the transport of waste. No incidents have occurred to date.	3	Potential large severity with high cost if accident occurred. Potential impact on human beings, soils, surface water and groundwater.	6

RISK ID	PROCESS	POTENTIAL HAZARDS	LIKELIHOOD RATING	BASIS OF LIKELIHOOD	CONSEQUENCE	BASIS OF CONSEQUENCE	RISK SCORE
26	ETP effluent discharge	Exceedences of ELV's	5	Chemical dosing failure can lead to poor effluent, as can aerator failure in the DAF units. Level probe in effluent plant sump and balance tank, which regulates pump flow from this sump. Balancing Tank has capacity which is 1 day retention time. Chemical storage and the ETP are locked at all times. Procedure for monitoring of effluent quality: OP11 Daily DAF Plant Checks. Analysis of COD, SS, ammonia and pH carried out daily. Daily visual and operational checks on effluent plant. Spillage kits and procedures in place. ETP discharges to Severn Trent sewer.	4	Potential large impact on local municipal plant.	20

6.3 Risk Matrix

The Risk Matrix has been developed to allow the risks to be easily displayed and prioritised. The consequence and likelihood ratings are used in the matrix; with the level of consequence forming the x-axis and the likelihood forming the y-axis. This matrix provides a visual tool for regular risk reviews and the success of mitigation can be easily identified. The risk matrix is displayed in Table 6.3.1. The risks have been colour coded in the matrix to provide a broad indication of the critical nature of each risk. The colour code is as follows:

- Red – These are considered to be high-level risks requiring priority attention. These risks have the potential to be catastrophic and as such should be addressed as a priority.

- Amber – Yellow – These are medium to high-level risks requiring action, but are not as critical as a red coded risk.

- Green – These are lowest-level risks and indicate a need for continuing awareness and monitoring on a regular basis. Whilst they are currently low or minor risks, some have the potential to increase to medium or even high-level risks and must therefore be regularly monitored. If cost effective mitigation can be carried out to reduce/mitigate the risk even further this should be pursued.

Table 6.3.1: Risk Matrix – Current Risk Status

Likelihood	V. High	5			**14, 24**	**26**	
	High	4	**9**		**17**		
	Medium	3	**6, 7**	**12, 15**	**8, 16**	**23**	
	Low	2		**2**	**10, 19, 21, 25**	**13, 20, 22**	
	V. Low	1			**4, 11, 18**	**1**	**3, 5**
			Trivial	Minor	Moderate	Major	Massive
			1	2	3	4	5
			Consequence				

The risk matrix indicates that there are three risks in the red zone requiring priority attention.

Six risks fall into the yellow zone indicating that these risks require mitigation or management action. All remaining risks are located in the green zones indicating a need for continuing awareness and monitoring on a regular basis.

However, assessment of the green zone risks during the preparation of the workshop has indicated that many of these risks can be reduced through the implementation of mitigation measures. These measures should be adopted where considered cost-effective to further reduce the risks.

6.4 Discussion of Risk Levels

Overall the facility was found to be well managed in terms of environmental controls, thus resulting in a minor number of risks with both high likelihood of occurrence and high consequence.

In cases where risks were identified as occurring on a regular basis, the consequence of environmental damage and remedial cost was generally found to be minor as a result of control measures integrated into daily operations, site design and risk management on site.

The risks identified as high severity in terms of environmental damage and cost were effluent discharge exceedances, refrigerant leaks and chemical bunding, with mitigation and management actions currently being implemented.

An action plan should also address the risks identified in the yellow zone.

All remaining risks lie in the green zone. These risks require continuing awareness and monitoring on a regular basis. Risk management measures should be put in place to manage them at their current levels, or preferably to reduce these further.

During the Risk Management Workshop, recommended mitigation measures were identified for selected risks which can be implemented as part of the overall site management.

7.0 IDENTIFICATION AND ASSESSMENT OF MITIGATION ACTIONS

7.1 Identification Of Mitigation Actions

The risk assessment and categorisation phase identified that one of the risk, Risks 14, 24 and 26 lay in the red zone of the matrix (see Table 6.3.1);

Risk 14 – Storm Drains
Risk 24 – ETP – Operations (odour)
Risk 26 – Effluent discharge licence exceedances

The risk assessment and categorisation phase identified that seven of the risks lie in the yellow zone of the matrix (see Table 6.3.1).

Management measures should be identified and implemented for these risks as a matter of priority whilst all other risks require monitoring on a regular basis. However, the green zone risks may have the potential to increase to yellow or red zone risks, and where additional risk management measures are available to manage them at their current levels or reduce them further, these should be implemented if considered cost-effective. Additional management measures were identified for all green zone risks.

The recommended risk mitigation measures identified are provided in Table 7.1. This table provides the following information:

- Risk ID – Designated ID number for each risk.
- Processes carried out on site – Lists the process which gives rise to the potential risk.
- Potential hazards/risks – Identifies the potential failure mode that could result in the risk occurring.
- Current controls in place on site as a means of preventing or reducing the risk.
- Recommended mitigation measures – Describes the mitigation actions which could be taken to reduce the likelihood of occurrence and consequence of the risk, and hence the risk score.
- Current Score – provides a risk score to allow the ranking of each risk. The risk score is based on the product of the likelihood rating and the consequence rating.
- Revised risk score – This is a revised risk score after the mitigation actions have been implemented based on the product of revised likelihood and consequence, where applicable. The revised risk score is also illustrated on a revised colour matrix as per Table 7.2.

Table 7.1: Recommended Risk Mitigation Measures and Revised Risk Scores

RISK ID	PROCESS	POTENTIAL HAZARDS	CURRENT CONTROLS	RECOMMENDED MITIGATION MEASURES	CURRENT RISK SCORE	REVISED RISK SCORE
1	General Management – Pest Control	Increased pest populations.	Rodent bating locations in place to control pest numbers onsite. Regular environmental checks are carried out. Pest Management Plan is in place.	Continue to ensure raw materials and by-product wastes are stored internally.	4 (1x4)	4 (1x4)
2	General Management – Litter Control	Potential raw materials, waste and waste packaging litter in yard	All deliveries are supervised to ensure no spills occur. Segregated waste bins are provided at relevant process points in order to ensure correct disposal of wastes (OP04 Disposal of Waste Procedure) Regular site inspections ensure good housekeeping in place and prompt action taken if an issue is identified.	Control measures are considered adequate.	4 (2x2)	4 (2x2)
3	Site Security	Illegal trespass and vandalism.	Perimeter fence, CCTV security surveillance, 24 hour security personnel presence on-site. Contractors and visitors must sign in at security. No high-risk substances on site. Cleaning chemicals and effluent treatment tanks not accessible to unauthorised people.	Control measures are considered adequate.	5 (1x5)	5 (1x5)
4	Whole site	Potential site flooding due to extreme weather or local river overtopping.	Low potential for flooding onsite as the site is located in Flood Zone 1 (Attachment B.2.3 - Site Condition Report) Surface water drainage is designed to accommodate extreme weather events. Bunds checked weekly and emptied of	Control measures are considered adequate.	3 (1x3)	3 (1x3)

RISK ID	PROCESS	POTENTIAL HAZARDS	CURRENT CONTROLS	RECOMMENDED MITIGATION MEASURES	CURRENT RISK SCORE	REVISED RISK SCORE
			rainwater as required OP09 Bund Inspection Procedure			
5	Factory – Major fire	Fumes from fire & potential firewater contamination of groundwater	Good fire prevention and protection measures in place. Fire detection system through-out factory Full fire alarm (addressable).	Control measures are considered adequate.	5 (1x5)	5 (1x5)
6	Water-lines – Manifold connections	Major water spillages to ETP	Spillages caught in floor drains of building and into contained treatment system. Balancing tank is typically operated at 50% level, which provides 1 day capacity if a shock-load (volume or Kgs BOD) is received into the plant. No major cost for fix & clean-up. Training of staff for spillage containment	Continued periodic training of staff for spillage containment, Conduct regular floor inspections for leaks and spills as opposed to remote monitoring.	3 (3x1)	3 (3x1)
7	Production Floor	Spillage of cleaning chemicals and raw materials	All spillages flow into floor drain, drains washed down in event of spillages. Spill containment procedure in place (OP12 Spillage Procedure) Process lines and operations that reduce excessive spillage of material onto the floor are in place and are continually reviewed. Dry cleaning in place, ensuring all food waste is diverted from drains. Training of staff for spillage containment	Continued periodic training of staff for chemical handlings and spillage containment measures in the event of a spillage.	3 (3x1)	3 (3x1)
8	Chill and Cold Store	Potential refrigerant leak, including manifold connections	Preventative maintenance and leak test plan in place, as per agreement with external contractor.	Continue with quarterly maintenance visits on all relevant equipment.	9 (3x3)	6 (2x3)

RISK ID	PROCESS	POTENTIAL HAZARDS	CURRENT CONTROLS	RECOMMENDED MITIGATION MEASURES	CURRENT RISK SCORE	REVISED RISK SCORE
			Accessible shut off valves are in place so that the refrigeration plant can be isolated. These double shut-off valves have being certified. OP12-Spillage Procedure in place Leak detection system in place.			
9	Boiler Emissions	Exceedances in ELV's of SO_x, NO_x or particulate matter	The boilers are serviced annually by CFB Boilers bi-annually. An efficiency of more than 80% is usually taken to be acceptable so the boiler's efficiency is above acceptable limits. Monitoring of emission values on an annual basis during maintenance. NOx, SOx and particulate matter levels will be low due to boiler fuelled by natural gas. All water is softened before use in boilers.	Carry out annual maintenance by external contractor on all boilers and heaters, measuring stack emissions as part of the service. Current Planned Preventative Maintenance should be updating to include boilers. Consider implementing boiler specific check-sheets.	4 (4x1)	2 (2x1)
10	Energy Usage	Emission of greenhouse gasses	Low potential for emission of greenhouse gasses. OP03 - Energy Management Procedure Site uses natural gas for the fuelling of boilers only. Site-wide measures to improve resource use and energy efficiency are specified in Attachment C.9 Resource Use and Energy Efficiency.	Control measures are considered adequate. Continue to implement new ways of increasing energy efficiency, as per EMS20 - Continual Improvement	6 (2x3)	4 (2x2)

RISK ID	PROCESS	POTENTIAL HAZARDS	CURRENT CONTROLS	RECOMMENDED MITIGATION MEASURES	CURRENT RISK SCORE	REVISED RISK SCORE
11	Gas Lines	Potential Leakage	Use of system safety and environmental controls include automatic lock out of fresh feed if any of control parameters are exceeded.	Control measures are considered adequate.	4 (1x4)	4 (1x4)
12	Refrigeration Plants	Noise Emissions	Noise monitoring has shown this to be a high noise source, due to the compressors. Maintenance checksheet in place. The site has not received a noise complaint since operations began. The site has an established complaints procedure.	1. Train out Noise Management to relevant personnel. 2. Maintain a closed-door policy for the vac-pack compressor room.	6 (3x2)	4 (2x2)
13	Process & foul line integrity	Potential leaks	Drainage pipes are cleaned regularly by external contractor. Manholes inspected on site.	1. Ensure testing is undertaken every 3 years for integrity. 2. Paint all foul manhole and drain cover red for identification purposes.	8 (2x4)	6 (2x3)
14	Storm Drains	Potential Leaks	Concrete underground pipes, cleaned and inspected annually. Storm pipe normally carries rainwater; therefore any potential leak would have low contamination. Multiple mitigation measure put in place as a result of the previous contamination issues in early 2019. Valve installed on surface water discharge which can be closed in case of emergency. Likelihood of leaking over 30 year period is minimal.	1. Ensure bund and pipeline testing is undertaken every 3 years for integrity. 2. Paint all storm water manhole and drain cover blue for identification purposes	15 (5x3)	6 (3x2)

RISK ID	PROCESS	POTENTIAL HAZARDS	CURRENT CONTROLS	RECOMMENDED MITIGATION MEASURES	CURRENT RISK SCORE	REVISED RISK SCORE
15	Blood storage	Risks from leaking into yard	Local yard drainage is directed to by inlet sump within the ETP. OP12-Spillage Response and tanks are bunded. Personnel are trained in spillage procedures. Bunds checked weekly and emptied of rainwater as required as part of site inspection procedure. Bund Assessment carried out as per permit application D.3.	Consider installing level probe and high-level alarm in waste oil tank.	6 (3x2)	4 (2x2)
16	Delivery of chemicals, fuels & cleaning chemicals	Potential spillage during delivery	Spill kits and a Spillage Procedure (OP12) are also in place. Bulk cleaning chemicals are bunded and bund inspection carried out. Storage area accessible by authorised personal only. Accident traffic management controls speed limits on site, low congestion on site.	Retraining of relevant staff to OP08 - Receipt of Bulk Liquids	9 (3x3)	6 (2x3)
17	Bunding Arrangements	Risks from integrity loss and overtopping	All chemicals are bunded on-site. Bund Assessment carried out as per permit application D.3. Bunds checked weekly and emptied of rainwater as required as per OP08 - Bund Inspection Procedure	1. Implement recommendations as per bund assessment, attachment D.5, section 6. 2. All bunds should be re-assessed in April 2022, as per guidance.	12 (4x3)	9 (3x3)

RISK ID	PROCESS	POTENTIAL HAZARDS	CURRENT CONTROLS	RECOMMENDED MITIGATION MEASURES	CURRENT RISK SCORE	REVISED RISK SCORE
18	Waste engineering oil storage	Potential for spillages/leaks	Waste oil contained in sealed 206 litre drums, upon adequately sized bunds. OP08- Bunds Inspection Procedure in place. Spill kits and Spillage Procedure (OP12) are also in place.	Control measures are considered adequate.	3 (1x3)	3 (1x3)
19	Transport of waste	Potential for spillages/leaks during transport	Containers are covered and sealed to prevent any spillages occurring. Licenced waste contractors are used for the transport of food waste.	Control measures are considered adequate.	6 (2x3)	6 (2x3)
20	By-product Waste storage	Potential for spillages/leaks and skip overflowing	Containers are covered and sealed to prevent any spillages occurring Regular environmental checks are carried out OP12-Spillage procedure Personnel are trained in all emergency procedures	Control measures are considered adequate.	8 (2x4)	8 (2x4)
21	General Waste Storage	Potential for odours	New waste compactor is enclosed. Odour Management Plan in place as per permit attachment D.3. Complaints Procedure in place.	Train out Odour Management Plan to relevant personnel	6 (2x3)	6 (2x3)
22	ETP underground sumps	Potential leakage to underground	Sump is solid concrete. Sub-contractors required to repair if required.	Sumps should be tested for integrity as part of the 3-year bunds and tanks integrity test requirement.	8 (2x4)	4 (1x4)
23	ETP tanks	Potential leakage to underground	Tanks are visually assessed on a daily basis and any leaks would be immediately detected. ETP regularly visually inspected by operator.	Tanks should be tested for integrity as part of the 3-year bunds and tanks integrity test requirement.	12 (3x4)	6 (2x3)

RISK ID	PROCESS	POTENTIAL HAZARDS	CURRENT CONTROLS	RECOMMENDED MITIGATION MEASURES	CURRENT RISK SCORE	REVISED RISK SCORE
24	ETP – Operations	Potential odour – if insufficient oxygen available in tanks	Balancing Tank is continuously mixed to avoid odours. Sludge is removed on a daily basis. Balancing Tank is capped. Balancing tank is emptied and cleaned on a quarterly basis. Odour Management Plan in place. The site has an established an Environmental Complaints Procedure.	1. Train out Odour Management Procedure to relevant personnel 2. Ensure stand-by critical equipment is in stock. 3. Carry out weekly odour checks in order to establish potential odour sources.	15 (5x3)	4 (3x2)
25	Transport of sludge	Potential for spillages/leaks during transport	Sealed tanker is used to prevent any spillages occurring. Sludge removed daily under supervision. Licenced waste contractors are used for the transport of waste. No incidents have occurred to date.	Control measures are considered adequate.	6 (2x3)	6 (2x3)
26	ETP effluent discharge	Exceedances of discharge licence ELV's	Good primary treatment plant in place. Level probe in effluent plant sump and balance tank, which regulates pump flow. Balancing Tank has a capacity which is 1 day retention time. Analysis of COD, SS, ammonia and pH carried out daily. Monitoring and measurement procedures and	Use sampling procedure employed by Severn Trent Water when taking effluent samples. Measure temperature and sulphates going forward. Continue to inspect output visually on a daily basis for clarity and adjust chemical dosage settings as necessary. Ensure stand-by critical equipment is in	20 (5x4)	9 (3x3)

RISK ID	PROCESS	POTENTIAL HAZARDS	CURRENT CONTROLS	RECOMMENDED MITIGATION MEASURES	CURRENT RISK SCORE	REVISED RISK SCORE
			responsibilities detailed in the ISO 14001 manual. Daily visual and operational checks on effluent plant. Spillage kits and procedures in place. Cleaning chemicals with a low phosphorus concentration are now being used. All cleaning chemicals used are standard within the food industry.	stock. Formulate procedure for effluent discharge non-compliance and train out to relevant personnel. Send Hach meter off-site for calibration bi-annually. Develop an emergency preparedness plan and include effluent plant failure and other scenarios. Odours should be recorded regularly going forward, and this should include sludge, balancing tank and DAF unit Procedures for all of the above should be implemented and trained out to the relevant personnel.		

Table 7.2: Revised Risk Matrix

Likelihood							
	V. High	5					
	High	4					
	Medium	3	**6, 7**	**14, 24**	**17, 26**		
	Low	2	**9**	**2, 10, 12, 15**	**8, 19, 13, 16, 21, 23, 25**	**20,**	
	V. Low	1			**4, 11, 18**	**1, 22**	**3, 5**
			Trivial	Minor	Moderate	Major	Massive
			1	2	3	4	5
			Consequence				

7.2 Overall Status after Mitigation

The revised matrix developed as per Table 7.2 can be compared to the matrix pre mitigation.

Table 7.3: Overall Status after Mitigation

Pre-mitigation Risk Matrix

Likelihood							
	V. High	5			**14, 24**	**26**	
	High	4	**9**		**17**		
	Medium	3	**6, 7,**	**12, 15**	**8, 16**	**23**	
	Low	2		**2**	**10, 19, 21, 25**	**13, 20, 22**	
	V. Low	1			**4, 11, 18**	**1**	**3, 5**
			V. Low	Low	Medium	High	V. High
			1	2	3	4	5
			Consequence				

Revised Risk Matrix

Likelihood							
	V. High	5					
	High	4					
	Medium	3	**6, 7**	**14, 24**	**17, 26**		
	Low	2	**9**	**2, 10, 12, 15**	**8, 19, 13, 16, 21, 23, 25**	**20,**	
	V. Low	1			**4, 11, 18**	**1, 22**	**3, 5**
			V. Low	Low	Moderate	High	V. High
			1	2	3	4	5
			Consequence				

Comparison of the two matrices shows an improvement to the perceived risks at the site.

Risk 26 has moved from a high risk to medium risk, with the works recommended in Table 7.1 implemented.

Risks 14 and 24 has moved from a high risk to low risk, with the works recommended in Table 7.1 implemented.

Risk ID's 8, 13, 16, 22 and 23 have moved from a medium risk to low risk, with the works recommended in Table 7.1 implemented.

Similarly, the risks originally placed in the dark green zone may be further reduced to lower risk through the recommended actions, which would result in a reduction in environmental liability cover.

8.0 RISK MANAGEMENT PROGRAM

8.1 General

Every risk requires a certain amount of management in order to reduce the risk or manage the risk at an acceptable level. The identified mitigation measures (and particularly risk ID's 14, 24, & 26) have been agreed by management and an improvement plan is currently being put in place.

Where identified risks were considered to have satisfactory controls in place, additional mitigation measures were not identified. In this instance, personnel involved in the management of identified risks are required to ensure that the current levels of controls are maintained and that the level of risk does not increase.

8.2 Risk Management Review

Risk management at Foyle – Gloucester is a dynamic process. This assessment and report provides a baseline assessment of the main potential risks on the site for 2019, and provides recommendations for risk mitigation and management.

Although the operation of the facility is unlikely to see any major changes in operation and controls, there is potential for processes and conditions to change. This assessment should therefore be considered to be a live document and be reviewed at least annually to ensure that all risks are identified and managed.

It is recommended that the management, environmental and safety operators review risk management at the facility on a regular basis and update the risk register and risk management programme as appropriate.

9.0 CONCLUSION

This H1 Risk Assessment has identified and assessed the operational environmental risks from unplanned and unexpected events, and has recommended risk mitigation measures.

For the most likely and severe risks identified at Foyle - Gloucester, a series of mitigation measures have been proposed in order to reduce those perceived risks at the facility. The risk matrices provide a visual and benchmarking tool against which any future risk assessments can be directly compared.

10.0 REFERENCES

Horizontal Guidance Note H1 Overview Document

- H1 Annex A – Amenity & accident risk from installations and waste activities
- H1 Annex D – Discharges to surface waters
- H1 Annex E - Surface Water Discharges (complex)
- H1 Annex F – Air Emissions
- H1 Annex G – Disposal or recovery of waste produced on site
- H1 Annex H – Global warming potential
- H1 Annex J – Groundwater
- H1 Annex K – Cost benefit analysis

Guidance on Environmental Liability Risk Assessment, Residuals Management Plan and Financial Provisions – Environmental Protection Agency 2006.