Cawingredients H1 Risk Assessment
March 2020

H1 Overview

The H1 risk assessment has been produced using regulatory guidance and the H1 software tool to assess the emissions to air, sewer, raw materials, energy consumption and waste impact for the installation. Risks to the environment and human health from accidents, odour, noise, and fugitive emissions that may be associated with the processing of soft drinks and directly associated activities have been assessed.

The following four step approach has been used:
1) Identify the risks from the activity
2) Assess the risks using the relevant modules provided in H1
3) Justify appropriate measures to mitigate the risks
4) Present the assessment

The first stage is a screening exercise to identify the potential risks and decide which of the following modules need to be considered:

- Amenity and accidents
- Surface water
- Emissions to air
- Waste produced on site
- Global warming potential
- Risk to groundwater
- Cost benefit analysis (where, applicable)

Where risks are identified a more detailed assessment will be carried out for risk using the modules given above.

Site Setting

Sensitive Receptors

Table 1 below shows sensitive receptors within 500m of the site boundary that could be potentially affected from activities carried out at the site. The closest residential properties are 55m South of the site boundary.

Table 1 Sensitive Receptors

Receptor	Distance from Site Boundary	Direction
Industrial units (unknown)	10m	East
Tertiary river leading to Bedale Beck	40m	South West
Culvert leading to tertiary river	50m	South
Residential properties	55m	South
Culvert	60m	South West
Tertiary river	83m	West
Leeming Bar meat processing unit	100m	East
Leeming Bar ice-cream factory	135m	East
Residential properties	154m	North West
Leeming Bar HWRC	246m	North
S Smith	250m	North

Residential Properties	308m	West
South Shepherd Homes	315m	South
Leeming Bar CA site	437m	East

Site of Scientific Interest

There are no SSSIs within 2km of the site. The closest SSSIs are 6.8km and 8.7km from the site boundary:

- Newton le Willows Meadow 4.25 hectares – 6.8km West
- Swales Lakes North 42.86 hectares – 8.7km North

European Designated Sites

There are no European designated sites within 10km of the site.

Table 2: Other Ecological Receptors within 1km

Receptor	Description
Protected species	Brown trout salmo trutta European eel anguilla Anguilla migratory route Bullhead cottus gobio Unidentified lamprey petromyzontidae
Local Wildlife site	IngsLane, Crakehall
Scheduled Ancient monument	Medieval market cross

Surface Waters
Bedale beck is located approximately 630m South of the site with a number of tertiary rivers entering the beck.

Flood zones
The site is not within a designated flood zone. The nearest flood zone is 615m south of the site boundary.

H1 Screening Assessment - Part 1

Amenity and accidents
As the majority of emissions from this site are considered fugitive a detailed assessment relating to amenity and accidents will be carried out and results will be presented in Part 2.

The following will be assessed:

Amenity risks
- Odour
- Noise
- Fugitive emissions

Accidents
- Leaks and spillages
- Failure of equipment,
- Fire

Surface water
We do not consider a risk to surface water from the activities carried out on site as all storage of raw materials and manufacturing of carbonated soft drinks takes place on an impermeable surface within a building. All storage of waste capable of producing leachate, produced as part of the manufacturing process is under cover or in enclosed containers. Drainage for the areas designated for waste baling/compacting runs to the effluent treatment plant. There is no contaminated effluent that can escape to surface water or land and the site is not located in a flood risk zone.

The effluent treatment plant storage vessels are bunded.

All waste water produced as part of the process is treated by the effluent treatment plant on site before it is released to the soakaway. Daily monitoring of the effluent is undertaken and additional externally verified sampling takes place weekly.

No waters from site enter a watercourse.

The only risk to surface water would be from any accidental leaks or spillages, which is addressed as part of the amenity and accident risk assessment in Part 2.

Emissions to Air
Source emissions to air are identified from the existing boiler stack (GR SE 2816 9003) and a proposed boiler stack which is due for installation prior to October 2020 (GR SE 2822 8988), which can be seen on site plan ref. Caw Site Plan 2020. The existing boiler is used to generate steam as part of the manufacturing process and the second boiler will provide additional capacity.

The H1 RA software tool has screened out the emissions (CO^2, CO and NO_x) from the two boilers and therefore further modelling of the source point emission to air is not required. We have included the specifications of both boilers ref: Caw Boiler Specifications and a site plan of air source emissions, Cawingredients – Source Emission Points (Air).

All other emissions to air are considered to be fugitive.
Waste produced on site

The manufacturing of soft drinks and directly associated activities produce waste as part of the process, so it is therefore necessary to consider whether reuse, recovery or disposal is the appropriate method.

The assessment using the H1 software tool shows that all waste produced as part of the production process is diverted from landfill (with the exception of hazardous ‘materials unsuitable for consumption or processing’ and inert ‘soil and stones’).

The risks associated with waste storage have been considered and are addressed in Part 2.

Global warming potential
The process involves a large consumption of water, gas and electricity, which has been assessed using the H1 software tool Part 2. Energy use will be considered in Part 2; we will look at control measures that balance environmental risk against energy use.

Groundwater
The process involves the production of trade effluent which is treated at the onsite effluent treatment plant. This risk cannot be assessed using the H1 software, however a separate groundwater risk assessment has been completed.

Cost benefit analysis
This part of the assessment is not considered relevant as there are certain parts of the process that cannot be altered due to health and safety implications and the negative impact on product quality.

H1 Screening Assessment - Part 2

Amenity Risks

Table 1 Odour

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the Overall risk?
What has the potential to harm?	*What is at risk?*	*How can the hazard get to the receptor?*	*What measures will you take to reduce the risk?* *If it occurs – who is responsible?*	*How likely is this contact?*	*What is the harm that can be caused?*	*What is the risk that still remains?*
Odour from wastes produced as part of production process	Residential properties identified in Part 1.	Air transmission Windy conditions Warm weather	The majority of wastes produced from the process are dry recyclables such as plastic, aluminium, wood, cardboard and packaging and are unlikely to produce any odour. All wastes are kept within containers or within a building so any odour would be mitigated. Any odorous waste detected on site will be removed immediately to an appropriate licensed facility by a registered waste carrier.	Low	Odour nuisance to local residents in adverse weather conditions.	Low risk due to composition of wastes produced.
Odour from Effluent Treatment Plant (ETP)	Residential properties identified in Part 1.	Air transmission Windy conditions Warm weather	If odour is identified carry out odour monitoring if necessary. Consider abatement technologies to mitigate the odour. Containment lids on all effluent treatment plant tanks.	Medium	Odour nuisance to local residents in adverse weather conditions.	Low risk due to the location of the site situated on an industrial estate next to a motorway.

Odour from possible spillage.	Residential properties identified in Part 1.	Air Windy conditions Warm weather	See table 4 which addresses accidents.	Low	Odour nuisance to local residents in adverse weather conditions.	Low risk due to the location of the site situated on an industrial estate next to a motorway.

Table 2 Noise and vibration

Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**What is the Overall risk?**
What has the potential to harm?	*What is at risk?*	*How can the hazard get to the receptor?*	*What measures will you take to reduce the risk? If it occurs – who is responsible?*	*How likely is this contact?*	*What is the harm that can be caused?*	*What is the risk that still remains?*
Noise and vibration from the loading and unloading of raw material and finished product from vehicles.	Residential properties identified in Part 1.	Air transmission for noise, through ground for vibration.	All vehicles are to be serviced regularly & kept in good working order. Site is located next to a motorway on an industrial estate away from private dwellings. Majority of unloading is carried out at designated loading bays, with closable doors. Loading bays located on west aspect of site adjacent to A1M.	Low	Noise nuisance to local residents	Low majority of operations take place within the building or at designated loading bays.
Noise from manufacturing process	Residential properties identified in Part 1.	Air transmission for noise, through ground for vibration.	The manufacturing of soft drinks takes place within a building so unlikely to be any level of noise beyond site boundary given the containment of the process and distance of sensitive receptors.	Low	Noise nuisance to local residents	Low majority of operations take place within the building.

			Noise levels will be monitored as part of the sites management system.			
Noise from boiler and compressor house	Site operatives and site visitors	Air	Compressor house door will be kept closed at all times. This is only an issue for site operatives working within the building. Ear protection must be worn and noise warning signs to be displayed at building entrance. Visitors will be provided with ear protection and relevant PPE.	High within the buildings but noise pollution unlikely outside the building	Harm to human health.	Low - unlikely to be noise outside of the site boundary. Correct PPE to be worn by operatives/visitors when inside boiler / compressor house.
Faulty machinery/ machinery operating 24 hours	Residential properties identified in Part 1.	Air	Machine maintained regularly as part of site management system and building doors kept closed. Limited delivery of raw product/materials during twilight hours.	Low operations take place within the building.	Noise nuisance	Low - unlikely to be noise outside of the site boundary.
Mobile noise from reversing alarms on vehicles.	Residential properties identified in Part 1.	Air	Use of vehicles kept to a practical minimum. Majority of unloading is carried out at designated loading bays, with closable doors. Loading bays located on west aspect of site adjacent to A1M.	Low Site is located on an industrial estate away from private dwellings.	Noise nuisance.	Low - unlikely to be noise outside of the site boundary.

Table 3 Fugitive Emissions

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the Overall risk?
What has the potential to harm?	*What is at risk?*	*How can the hazard get to the receptor?*	*What measures will you take to reduce the risk? If it occurs – who is responsible?*	*How likely is this contact?*	*What is the harm that can be caused?*	*What is the risk that still remains?*
Fugitive Emissions to Air						
Release of dusts, fibres and particulates.	People, property, natural and physical environment.	Air dispersion followed by inhalation.	All processing, bottling and packaging of carbonated soft drinks is carried out inside a building with closed doors, on an impermeable surface. Site is kept clean by manual sweeping and inspections regularly carried out. Raw materials delivered to the site are within enclosed HGV's and unloaded indoors, to minimize dust emissions. All waste produced from manufacturing process is stored inside a building or sealed containers.	Low Nature of activity is unlikely to cause such emissions to receptors.	Potential exposure may cause irritation and nuisance.	Low overall risk. Control and processing procedures designed to reduce such emissions.
Odour from effluent treatment plant	Residential properties identified in Part 1.	Air	No complaints received re. odour. See table 1 above.			

Litter from waste produced as part of process.	People, property, natural and physical environment.	Air/ground	All waste produced stored in containers or within a building. Litter blown from vehicles shall be collected. The site is surrounded by walls and fencing. Site entrance and areas surrounding the site are inspected routinely. Operations maintained indoors to minimise such emissions.	Low all wastes contained	Escape from the site boundary.	Low site inspected daily.
Carbon Dioxide lost to atmosphere from the carbonisation process	Atmosphere, human population.	Air	Regular maintenance and inspection. Monitoring takes place during filling process. Equipment designed to reduce loss. ISO 14001:2015 EMS Objective – Measure and reduce CO2 losses in the production of drinks where opportunities are identified.	High A percentage of CO_2 lost during in the process to atmosphere.	Harm to atmosphere and human health.	Medium if control measures and monitoring are implemented and HSE guidance followed.
Loss of nitrogen gas from nitrogen storage.	Atmosphere, human population.	Air	Regular maintenance and inspection by qualified/competent site engineer. Monitoring of fugitive emissions to be carried out for nitrogen loss.	High A percentage of nitrogen lost during in the process to atmosphere	Harm to atmosphere and human health.	Medium if control measures and monitoring are implemented and HSE guidance followed.

Release of emissions from boiler CO, CO_2, Particulates, NOx.	Atmosphere CO_2 contributes to global warming, NOx contributes to acidification.	Air	Boilers are natural gas fired so reduced emissions. Regular service and monitoring of emissions. Trained and competent engineers. Every 6 months efficiency and emissions check by Byworth Boilers. Annual emission monitoring undertaken by external contractor Point source emission from boilers deemed insignificant following H1 assessment. Low nitrogen dioxide specification.	Low	Low	Low this is a point source emission and is screened out following H1 assessment.
Fugitive Emissions to Water						
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**What is the Overall risk?**
Cleaning and sanitisation – release of effluent with high levels of COD/BOD to soakaway lagoon.	Soakaway Lagoon, Groundwater	Drainage systems	Remove as much residual material as possible from vessels and equipment before cleaning. Dry clean up methods rather than hosing. Product scheduling to minimise the number of product changes	High	Release of high COD/BOD effluent – consent limits exceeded.	Medium due to process controls in place to reduce the amount and strength of effluent entering the lagoon.

			and subsequent cleaning between product lines. Cleaning in place used to reduce effluent. Automatic dosing of chemicals. Ensure Staff and contractors are trained in the handling of solutions where manual dosing is used to avoid high concentration effluent.			
Run off from waste stockpiles	Soakaway Lagoon, Groundwater	Drainage system	All waste stored in containers in dedicated storage area away from surface water drains. Spill kits on site and training provided to staff on their use.	Low	Pollution of groundwater.	Low due to containment of wastes and the composition of waste being non putrescible.
Potential spillage	Soakaway Lagoon, Groundwater	Drainage system	All raw materials are kept within dedicated containers within buildings. Any waste produced is stored on an impermeable surface. Spill kits on site and training provided to staff on their use.	Medium	Pollution of groundwater.	Low due to dedicated storage facilities for raw materials and product.
Pump failure of effluent discharge	Soakaway Lagoon, Groundwater	Drainage system	Maintenance of all equipment as part of the management system. Ensure pump and standby pump are working at all times through regular inspection and maintenance.	Low	Pollution of groundwater.	Low due to high maintenance, inspection and back up procedures.

			When there is a problem with the ETP effluent is diverted to an emergency holding tank.			
Pests and Hygiene						
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**What is the Overall risk?**
Mud and Debris.	Local Human population and wider environment.	Direct deposition of mud / debris from vehicles entering and leaving site.	No mud or debris generated from the manufacture of carbonated soft drinks. Site will be kept clean by manual sweeping and road sweepers as required. Ensure that all vehicles are cleaned up effectively and hosed down if necessary.	Low Nature of processing unlikely to cause such emissions. Impermeable surfaces no generation of mud from site activities.	Low Potential exposure may cause nuisance and safety risks if found on public highways, for example.	Low overall risk.
Pests – Vermin / flies / insects / scavenging animals & birds.	Local Human population and wider environment.	Transportation over land (and via air also).	Routine pest control monitoring visits are undertaken monthly.	Low. Not likely to attract vermin etc due to waste produced from process non odorous and non putrescent.	Low. Potential exposure may cause harm to human health, nuisance and loss of amenity.	Low overall risk.

Table 4 Accidents

Accidents: Leaks and Spillages				
Hazard	**Receptor**	**Pathway**	**Risk Management**	**What to do if it happens?**
Spillages during the delivery, unloading, storage and loading of raw materials and chemicals.	Land, drains, groundwater and soakaway lagoon.	Via drainage system	Inspect and validate the security of all deliveries. Ensure that transfer pipelines are secure and that raw materials, products and wastes are stored properly. The buildings and surrounding areas are checked regularly for any spillages of raw materials or chemicals. All manufacturing of soft drinks, bottling and packaging takes place within a building on an impermeable concrete surface. All storage of flavourings, concentrates and chemicals is within a secure building with an impermeable surface. Daily checking of tanks and vessels to check integrity and available containment capacity is documented. Appropriate primary and secondary containment e.g. bunds and building containment. Consult product data sheets COSHH and Hazardous Waste Regulations for all handling and storage requirements. Maintain an inventory of substances that would harm the environment if they were to escape.	Spillages will be dealt with in accordance with the sites written spillage procedure. Spill kits shall be available on site and staff trained on their use and the correct spill procedures to follow. COSHH data sheets will be followed and appropriate disposal routes will be assessed. Such measures include sand or absorbent materials, drain covers, land booms and sand bagging, to prevent contamination. Drains are fitted with catchpots, penstocks or drain blockers. Contaminated absorbent materials shall be placed within a sealed container and transferred to a relevant licensed site by a licensed waste carrier. Any spillages shall be assessed and relevant Agencies notified. Record accident in site diary and the relevant incident/accident form contained in management system.

			All drainage within delivery areas lead to the effluent treatment plant.	
Spillage of fuel, oils and other liquids from vehicles, tanks, vessels and pipework during refuelling of plant and equipment	Land, drains, groundwater and soakaway lagoon.	Via drainage system	Supervise all fuel deliveries and ensure that transfer pipelines are secure. Train the staff. Plant and equipment is refuelled in designated area with impermeable surface and drip trays and spill materials are used as required. Any fuels/oils stored on site are contained in a double skinned tank and other contaminated liquids shall be stored in enclosed containers with secondary containment, both on an impermeable surface, with a sealed drainage system. Identify all sub-surface sumps and storage vessels engineer systems to minimise leakages from pipes and ensure swift detection if they do occur, particularly where hazardous substances or non-hazardous pollutants (as defined by the Groundwater Directive) are involved. Interceptors are installed on site to capture any oils which enter the surface water drainage system.	Spillage procedures given above will be followed in the event of an accident. Regular inspection of containment to ensure integrity.

Failure of chemical store containment	Drains, groundwater and soakaway lagoon.	Uncontrolled release to drainage system, ground and atmosphere.	Regular inspection of containment area. Concrete impermeable surface within a bunded area.	Clean up spillage and transfer materials into appropriate containment for off site recovery, treatment or disposal. Specialist contractors to be used.
Overfilling tanks/ vessels during delivery	Drains, groundwater and soakaway lagoon.	Via the drainage system	Stock level control checks are carried out and all deliveries are supervised. Tanks/ vessels have high-level/hydrostatic level sensors to give a physical reading of stock levels and to prevent overfilling. Bulk storage tanks for high risk products are bunded.	Spillage procedures given above will be followed in the event of an accident.
Contamination of soakaway lagoon and groundwater due to failure of site drainage system e.g. bund or overfilled drainage sump.	Drains, groundwater and soakaway lagoon.	Via the drainage system	If there is a spillage/accident this will be diverted to a holding tank.	Spillage procedures given above will be followed in the event of an accident.
Overflow due to failure of pumping systems and/or failure of sensors	Drains, groundwater and soakaway lagoon.	Via the drainage system	All tanks/vessels will be fitted with automatic sensors to detect fill level in order to prevent overflow.	Spillage procedures given above will be followed in the event of an accident.
Spillage of raw materials, chemicals and fuel due to collision.	Land, drains, groundwater and soakaway lagoon.	Via the ground or drainage system	Tanks/vessels and pipe work shall be protected by a containment barrier to avoid collision during delivery, transfer and despatch.	Spillage procedures given above will be followed in the event of an accident.
Accidents: Vehicle Movements				
Hazard	**Receptor**	**Pathway**	**Risk Management**	**What to do if it happens?**

Vehicle movements on site causing accident	Site employees and visitors	Land	All site employees are equipped with the appropriate personal protective equipment (PPE). Only trained employees are permitted to use vehicles on site. Site visitors will need to sign in at reception and will be given any relevant Health & Safety inductions and be provided with the correct PPE. They shall be supervised at all times. The Company should follow its Health & Safety procedures for all employees. Competent staff to manage and operate activities to ensure no pollution caused.	Emergency Procedures will be followed. Emergency services informed.
Accidents: Vandalism causing spillage, injury etc				
Hazard	**Receptor**	**Pathway**	**Risk Management**	**What to do if it happens?**
Unauthorised entry and tampering or malicious damage to property, plant and equipment.	Land, drains, groundwater and soakaway lagoon.	Via the ground or drainage system	Resulting in polluting liquids been released from tanks, vessels or drums. Strict regulation of visitors on site, with sign in procedures and training of staff to intercept unauthorised visitors. Key fobbed doors are installed across the site. Supervision of people entering the site during normal working hours. Out of hours security staff.	Spillage procedures and emergency procedures to be followed.

			Secure automated gate locked at all times and large wall around the parameter of the site. Tanks and valves locked when not in use out of hours. Plant and equipment locked in secure storage out of hours. Security systems installed including camera and recording facilities to minimise the risk of unauthorised access. Signs warning people not to enter the site.	
Accidents: Failure of Plant Equipment				
Hazard	**Receptor**	**Pathway**	**Risk Management**	**What to do if it happens?**
Puncture of vessels – pipes, drums, gas cylinders etc. due to impact.	Land, drains, groundwater and soakaway lagoon.	Escape to air, land and water.	All drums / vessels / containers etc. that are at risk of puncture /damage are stored safely away from any areas of operation where machinery is used, to reduce risk. Movement of drums and containers done using safe techniques. Tanks and vessels in secondary containment facilities. Storage locations of drums and non-permanent vessels protected by use of barriers or fencing. All staff trained to use equipment and on-going maintenance reviews. Procedures and training are up to date and relevant. Site rules will be made visible and high visibility PPE to be worn.	Spillage procedures and emergency procedures to be followed. Program of Planned Preventative Maintenance (PPM) in place and relevant Incident Response Plan, Spill Procedures and Accident Management Plan to be followed. Relevant spill and accident response plans in place to minimise risk.
Leakages due to faulty pipe work, valves, over-	Contamination of land, drains,	Land Air Water	Program of Planned Preventative Maintenance (PPM), where all maintenance	Advise manager/responsible person, keep a record of any failures.

pressure of vessels and pipework, blocked drains, power or pump failures, corrosion, severe weather, ground movement, electrical faults and damaged cables causing fire etc.	groundwater and soakaway lagoon.		and inspection schedules are followed to manufacturer's specification. Daily visual checks and weekly checklist record. Relevant contingency plan in place minimising impact on environment, in case of breakdown/enforced shutdown. Any underground pipes and tanks will be tested for integrity. Insulation and protection of pipework in effluent treatment plant performance will be checked regularly.	Emergency Plan to include fire fighting procedures to be followed. Spillage response procedures to be followed.
Accidents: Failure of Services				
Hazard	**Receptor**	**Pathway**	**Risk Management**	**What to do if it happens?**
Due to failure of supply; water, electricity, gas supply and of sewerage system.	Flooding, explosion with subsequent contamination of land, drainage system, groundwater and soakaway lagoon.	Land Air Water	Provision of standby facilities i.e. generator. Maintenance of up to date plans showing location of utility services. Procedure for contractors to work on site, including induction training and permit to work.	Follow Utility supply failure procedure such as manual shut down of process valves, start up of emergency generator, use of standby materials etc. Follow flood and fire procedures as described above. Emergency plans followed.
Accidents: Fire				
Hazard	**Receptor**	**Pathway**	**Risk Management**	**What to do if it happens?**

Fire.	Airborne toxic smoke plumes, liquid effluent causing long and short term effects on public health and the environment	Air Land Water	Keep a record of all substances/raw materials stored, location, quantities and a site plan indicating these. Undertake a Fire Risk Assessment to identify links between receptors, sources and pathways etc. Minimise stockpiles of combustible materials. Staff are trained on fire procedures and emergency drills. Separation of incompatible materials, combustible materials and ignition sources. Minimise stock piles of combustible material. Incorporation of fire breaks wide enough to fit emergency vehicles through (at least 4 metres) into site layout and containment of fire water. No materials shall be stored against the site boundary. No smoking policy outside of designated smoking areas and maintain a tidy site.	Emergency plans and fire procedures will be followed and all emergency services and relevant authorities contacted. Fire procedures will include details re. fire alarms, evacuations, exit routes, muster points, responsible personnel (fire warden) and the location and use of emergency fire equipment such as extinguishers, hoses, sand bags and drain covers. Fire alarm systems installed and maintained. Logging of incidents. Relevant pollution systems shall be made available.
Fire.	Airborne toxic smoke plumes, liquid effluent causing long and short term effects on public health and the environment	Air Land Water	Guidelines within the (Regulatory Reform (Fire Safety) Order 2005 shall be followed and a detailed Fire Risk Assessment produced. Implement methods to reduce the amount of fire water run-off, e.g. sprays, foam, controlled burn, recycled water. This is to be agreed with Fire & Rescue Service as to	Emergency plans and fire procedures will be followed and all emergency services and relevant authorities contacted. Fire procedures will include details re. fire alarms, evacuations, exit routes, muster points, responsible personnel (fire warden) and the location and use of emergency fire equipment such as extinguishers, hoses, sand bags and drain covers.

			what is best suited to the site and individual incident, should one occur.	Fire alarm systems installed and maintained. Logging of incidents. Relevant pollution systems shall be made available.
Accidents: Cross contamination				
Hazard	**Receptor**	**Pathway**	**Risk Management**	**What to do if it happens?**
Cross contamination of materials due to transferring and mixing of incompatible materials, making wrong connections in the drains or other systems.	Transportation of pollutants into drainage systems, groundwater and soil; threatening water supplies, public health and wildlife.	Land, drains, groundwater and soakaway lagoon. Explosion, smoke and pollution of air	Maintenance of an up to date drainage plan and inventory of substances kept on site with material property details. Check contents of bunds and other containers before disposal. Establish and record the routing of all installation drains and subsurface pipework. Check raw materials for compatibility with other substances with which they may come into contact. The Pollution Incident Response Plan shall detail location of all relevant equipment / materials and their correct usage. E.g. the use of sand bags to block drains and redirect flow of firewater to a predetermined collection point. It is important to locate all water supplies, drains and potential over flow areas for run-off, such as car parks. Also note where the	Fire procedure procedures will be followed and all emergency services contacted. Correct disposal of any run-off and contaminated materials should be dealt with ASAP and where possible it should be taken to an off-site licensed disposal site.

			nearest sensitive receptors are and notify the relevant agencies if necessary. Procedure for contractors to work on site including induction training and permit to work. Fail safe filling systems.	
Accidents: Dangerous substances				
Hazard	**Receptor**	**Pathway**	**Risk Management**	**What to do if it happens?**
Dangerous substances that may be detected on site.	Workers, general public, local habitats, local businesses	Air Land Water	Any substances found to be unauthorised and of a dangerous nature shall be identified and isolated. All details shall be logged, origin, type etc. It shall be risk assessed and all relevant parties i.e. Fire Service and the EA shall be notified. Appropriate action shall be taken to remove and dispose of safely, by an authorised person. All operations shall cease if necessary and staff fully trained.	As per Risk Management
Accidents: Failure of Containment				
Hazard	**Receptor**	**Pathway**	**Risk Management**	**What to do if it happens?**
Failure of containment facilities due to land movement, impact, corrosion etc.	Land, drain, groundwater and soakaway lagoon	Land and water	Provision of secondary containment for hazardous liquids. Inspection and maintenance of primary and secondary containment facilities. Integrity testing of tanks and bunds and pressure loss alarms. Barriers to prevent vehicles on site from damaging equipment or storage vessels.	Follow spill response procedures.
Accidents: Severe Weather Conditions				
Hazard	**Receptor**	**Pathway**	**Risk Management**	**What to do if it happens?**
Severe Weather leading to overflow of storage facilities	Transportation of pollutants into drainage	Land Water Groundwater	Reduce contents of tanks to a safe level in line with emergency management plan procedures.	Spillage and emergency procedures shall be followed.

	systems, soakaway lagoon, groundwater and soil; threatening water supplies, public health and wildlife.		All waste materials stored outside shall be brought within the building or fully covered in a container/skip.	The relevant authorities/bodies will be informed.
Accidents: Flood				
Hazard	**Receptor**	**Pathway**	**Risk Management**	**What to do if it happens?**
Ingress of water from watercourse floodwater, blocked drains, burst water main, use of fire water	Contamination of raw materials, buildings, land, drainage system and groundwater with fire and flood water.	Land, water, drainage and groundwater	Maintenance of drains. Safe location for storage of hazardous materials. Temporarily stop processing to limit increase in waste and effluent produced. The site does not lie within a designated flood plain.	Flood procedure describing what to do in the event of flood warning such as installation of barge boards, use of sand bags, movement or protection of sensitive materials. Inform the Environment Agency.

Table 5 Waste Produced on Site

Type of waste	Nature of waste	Hazard rating	Recovery or disposal (R or D) method you'll use	D or R code	R or D method impact score	Tonnes per year	Impact Score	Specific Risk Management
Sludges from on-site effluent treatment	Biodegradeable non hazardous	4	Landspreading	R10	4	830	13280	Landspreading carried out under deployment license.

								Annual compliance checks by broker and Cawingredients.
Plastic packaging	Other non-hazardous	2	Other Recycling	R3: R4: R5: R11 and R12	3	302	1812	Compliance with Packaging Regulations
Paper and cardboard packaging	Biodegradable non-hazardous	4	Other Recycling	R3: R4: R5: R11 and R12	3	107	1284	Compliance with Packaging Regulations
Wooden packaging	Biodegradable non-hazardous	4	Use of waste as fuel	R1	6	34	816	Compliance with Packaging Regulations
Metallic packaging	Other non-hazardous	2	Chemical recovery	R2 to R9	4	65	656	Compliance with Packaging Regulations
Mixed municipal waste	Other non-hazardous	2	Use of waste as fuel	R1	6	26	312	
Mixed construction and demolition wastes	Other non-hazardous	2	Use of waste as fuel	R1	6	14	168	
Soil and stones	Inert	1	Landfill	D5	30	1	30	
Waste glass other than those mentioned in 10 11 11	Inert	1	Other Recycling	R3: R4: R5: R11 and R12	3	1	3	
Materials unsuitable for consumption or processing	Hazardous	10	Landfill	D5	30	<1	0	
Sodium and potassium hydroxide	Hazardous	10	Other Recycling	R3: R4: R5: R11 and R12	3	<1	0	
Waste adhesives and sealants other than those mentioned in 08 04 09	Other non-hazardous	2	Use of waste as fuel	R1	6	<1	0	
Other engine, gear and lubricating oils	Hazardous	10	Chemical recovery	R2 to R9	4	<1	0	
Other solvents and solvent mixtures	Hazardous	10	Chemical recovery	R2 to R9	4	<1	0	
Absorbents, filter materials	Hazardous	10	Use of waste as fuel	R1	6	<1	0	

Antifreeze fluids containing hazardous substances	Hazardous	10	Chemical recovery	R2 to R9	4	<1	0	
Inorganic wastes containing hazardous substances	Hazardous	10	Chemical recovery	R2 to R9	4	<1	0	
Laboratory chemicals, consisting of or containing hazardous substances	Hazardous	10	Chemical recovery	R2 to R9	4	<1	0	
Discarded chemicals other than those mentioned	Other non-hazardous	2	Use of waste as fuel	R1	6	<1	0	
Aqueous liquid wastes containing hazardous substances	Hazardous	10	Chemical recovery	R2 to R9	4	<1	0	
Flourescent tubes	Hazardous	10	Other Recycling	R3: R4: R5: R11 and R12	3	<1	0	
Discarded electrical and electronic equipment	Other non-hazardous	2	Other Recycling	R3: R4: R5: R11 and R12	3	<1	0	

General Waste Risk Management:

- Strict adherence to the waste hierarchy:
  1. Prevention of waste through planning, training, purchasing
  2. Re-use of materials wherever possible: request returnable packaging from suppliers and reuse of pallets / containers on site when possible
  3. Recycling: aim for zero to landfill in 2018, continual monitoring of waste disposal routes, compliance monitoring of waste broker and carriers, auditing of disposal sites
  4. Recovery: general waste and non-recyclables are sent to energy from waste, general waste volumes reduced through training and awareness campaigns
  5. Disposal: landfill avoided whenever possible, unless waste is not possible to process higher up the hierarchy
- Regular compliance checks on waste paperwork, broker and carrier licenses
- Monitoring of waste weights, disposal methods

- Environmental and waste training to all Cawingredients staff
- Use of a dedicated waste broker to ensure all wastes are disposed of as sustainably as possible
- All waste stored and processed on impermeable surfaces with captured drainage leading to the effluent treatment plant
- All wastes contained within closed skips / buildings / trailers
- Regular cleaning and litter collection of escaped waste

Table 6 Global Warming Potential (taken from H1 Risk Assessment)

Substance	Source	Annual Rate MWh/yr	QWP Value per tonne	Annual GWP
CO_2 Energy: direct	Direct Emissions	8341	1	1,724
CO_2 Energy: indirect	Indirect Emissions	14,743	1	5,873

Table 6.1 Breakdown of delivered and primary energy consumption (from Cawingredients – Energy1_1 Jan 2019 – 31 Dec 2019)

Energy Source	Delivered MWh/yr	Primary MWh/yr*	CO_2 Factor	CO_2 tonne/yr
Electricity from public supply	14743	35384	0.17	6015
Natural gas	8109	8109	0.19	1540
Diesel	232	232	0.25	58

**Electricity is supplied by the National Grid and therefore delivered energy is multiplied by 2.4 to obtain primary energy consumption.*

Energy for the site is derived from the mains gas and mains electricity. The site operates a Byworth Yorkshireman 9MW steam boiler. As per variation application EPR/UP3937/FW/V006, a second 9MW boiler is to be installed prior to Oct 2020. Gas is used on site to power the boiler and electricity is used to power the process line and air compressors etc.

Details of energy management can be found in 'Cawingredients Technical Standards and BAT'.

Groundwater Risk
Please see Hafren Water Groundwater Risk Assessment