West Lay – Permit Application Supporting Document

Prepared by: Arthian Ltd

For: West Lay Ltd

Site: Aspall Engineered Wetland

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Quality Assurance

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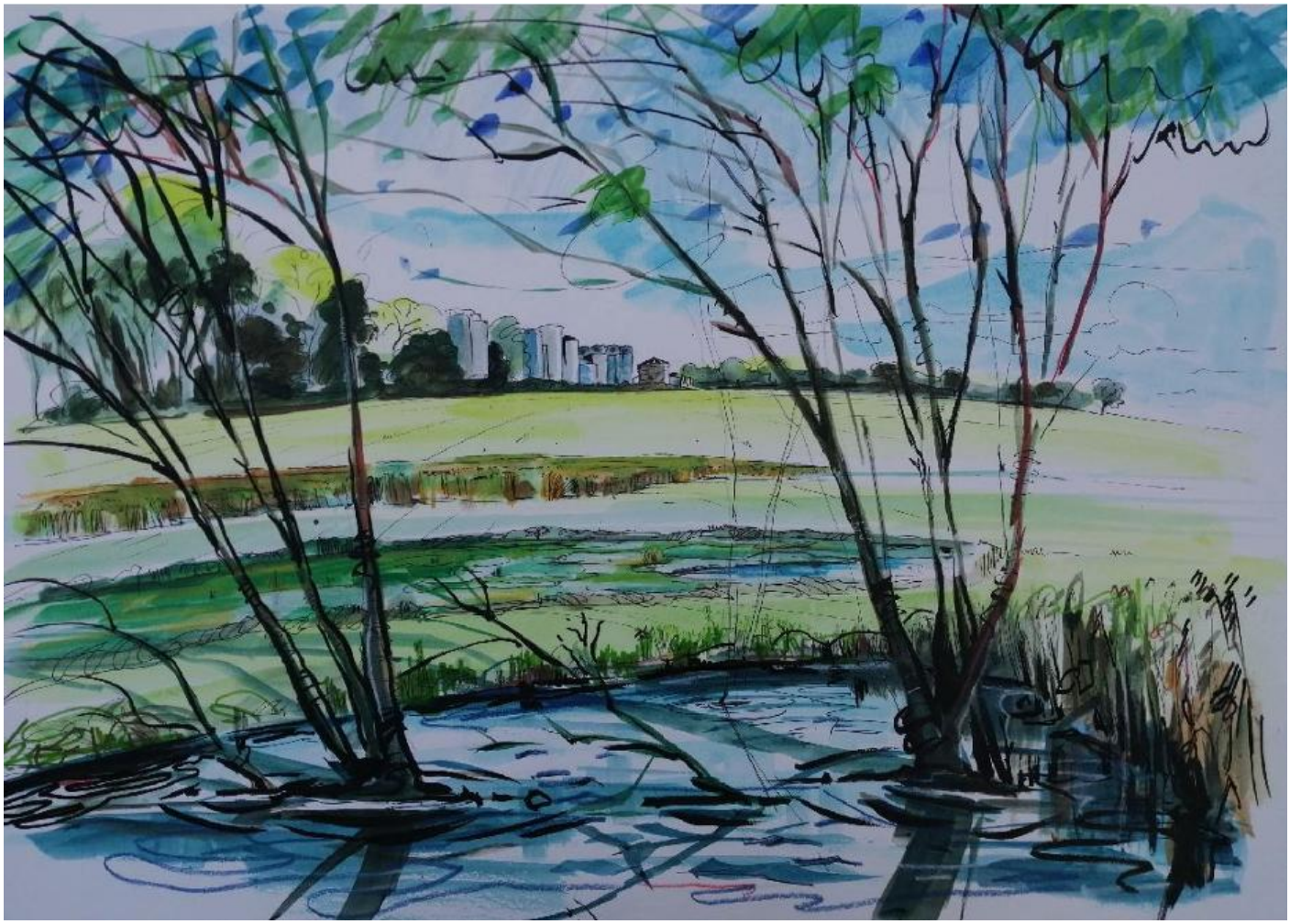

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1. Introduction

1.1 Background

Aspall Cyder Ltd (**Aspall**) operate a cider manufacturing plant at The Cyder House, Stowmarket IP14 6PD (**the Cydery**). Aspall hold an Installation Permit (Ref. EPR/GP3432QA) that includes consent to discharge up to 210 m^3/day of treated effluent from the Installation.

The effluent from the Cydery, alongside rainfall dependent surface water run-off from the Cydery environs, are directed to an on-site activated sludge biological treatment system with subsequent discharge to an unnamed tributary of the River Deben (effluent point W1). Discharge is somewhat constrained by the treatment system and some excess effluent is tankered off-site to suitably licenced facility.

Aspall have undergone detailed discussions with West Lay Ltd (**West Lay**, **the Operator** and applicant), to utilise adjacent land as an engineered wetland which will ultimately treat the effluent from the Cydery.

During inception discussions, between Aspall, West Lay and the Environment Agency (EA) there was concern that the engineered wetland system would not meet Food Drink and Milk, Best Available Techniques (BAT) particularly with respect to effluent treatment BAT conclusion 12. The EA advised that "*If the engineered wetland was proposed as a secondary/ tertiary treatment step to the existing effluent treatment we would be less concerned*". Consequently, it is proposed that the Engineered Wetland will serve as polishing treatment to the existing treatment system.

During normal operations the treated effluent will be consumed via evapotranspiration processes in the wetland. However, the Engineered Wetland will include provision for a discharge (WL1) from the final treatment pond (Pond 4) to an unnamed tributary of the River Deben, to allow for conditions following periods of prolonged / heavy rainfall when evapotranspiration levels are low, or emergencies. During normal operations the discharge will be closed.

1.2 Pre-application advice

Pre-application advice for the above was sought from the EA, who provided written advice on 07 February 2025. The advice confirmed:

1. Aspall to apply to vary the Aspall Installation Permit EPR/GP3432QA to include Multi-Operator Installation (MOI) conditions, and
2. West Lay Ltd to apply to add a waste treatment facility as a Directly Associated Activity (DAA) of the Cydery Installation permit.

This report constitutes the Permit Application Supporting Information document for West Lay Ltd (item 2). It is accompanied by the relevant application forms (Part A, Part B2, Part B3, Part B6 and Part F1) and supporting documents.

Aspall are progressing an application to vary their Installation Permit (EPR/GP3432QA) to reflect the use of the Engineered Wetland. We have coordinated closely with Aspall in the preparation and submission of this application and report.

In addition to the formal pre-application advice sought from the EA, lengthy discussion have been ongoing between Aspall, West Lay and the EA. The following members of EA staff are familiar with the proposals and support the plans; Alison Hart (local officer), Bethany Wignall (Senior Officer, Food and Intensive Farming), Nicola Neill, Rich Croll (Principal Permitting Officer Installations, Food and Drink Permitting Team), Rachael

Grills (Senior Advisor, Food and Drink Lead at the EA (MLAU – Environment and Business Energy and Manufacturing Industries).

1.3 Permit application(s)

1.3.1 Bespoke permit application

This Permit application comprises a bespoke Permit application for the inclusion of an Engineered Wetland as a polishing treatment of effluent as DAA to the Cydery Installation Permit EPR/GP3432QA. The Engineered Wetland is the subject of this Permit application, the extent of which is shown on the Site Layout Plan.

This Permit application seeks to;

- Add an Engineered Wetland as a DAA to the Cydery installation, providing polishing treating of effluent.
- Add a discharge point (WL1) from the Engineered Wetland.

The DAA boundary is shown on Permit Boundary Plan – Installation edged in green (solid line) and the existing Cydery installation boundary is shown edged in green (dotted line).

1.3.2 Installation Permit variation

In parallel, Aspall are submitting a variation application to;

- include Multi-Operator Installation (MOI) conditions to their permit.

To maximise regulator and applicant efficiency, we request that both applications be determined by the same officer / team of officers.

1.4 Bespoke Permit application

This application comprises;

- Application forms Part A, Part B2, Part B3, Part B6 and Part F1
- Technical Competence Management, evidence of registration
- Site Condition Report
- Odour Management Plan
- Drainage Strategy
- Environmental Risk Assessment

1.4.1 Technical competence

The activity comprises a DAA associated with the treatment of waste from the associated Cydery installation. The proposed activity does not align directly within the categories defined in the CIWM qualifications risk-tier table. Nevertheless, as the wetlands will receive a single waste stream through a piped discharge equipped with a lockable valve, the operation is considered to present a low level of environmental and operational risk. On this basis, the Operator has registered to complete an Environmental Permitting Operators Certificate (EPOC) course. A copy of the registration for EPOC course is provided in Appendix B.

Table 1-1 Table of permitted activities and proposed changes (West Lay)

Activity description	Application to site / limits
None	
Directly Associated Activity	
Polishing treatment of effluent from treatment plant.	Collection and polishing treatment within Engineered Wetland of pre-treated process effluent to discharge of treated effluent to surface water. Total storage volume 51,850m^3. Throughput of 76,650m$^{3[1]}$.
Discharge to surface water	Discharge of treated effluent 210m^3/day
Raw Materials Handling and Storage	Includes receipt and storage, of bulk raw materials to be used in process. Chalk will be used in the process. Stored off-site. c. 500kg/annum
Storage of non-hazardous waste pending treatment or reuse	Generation, storage and handling of liquid and solid wastes. From generation of waste to their removal off-site. Inclusion of waste materials from routine clearing of effluent treatment ponds. Storage of harvested vegetation or desludging on site pending desiccation / chipping prior to re-use or recovery.
Treatment of non-hazardous waste	Chipping of vegetative waste from pond Engineered Wetland maintenance for re-use. Desiccation of sludge prior to re-use.
Recovery of waste on site	Re-use of chipped vegetated material on grassed areas on site as mulch.

[1] Assumes receipt of maximum inflow volume of 210m3/d for 365 days per year, conservative maximum.

Table 1-2 Waste Types to be accepted on site

Waste code	Waste description
02	**Agriculture /Hunting /Fishing /Food Processing**
02 07	Production of alcoholic and non-alcoholic beverages (except coffee tea and cocoa).
02 07 05	Sludges from on-site effluent treatment

Table 1-3 Wastes stored / treated on site

Waste code	Waste description
02	**Agriculture /Hunting /Fishing /Food Processing**
02 01	Agriculture – horticulture – aquaculture – forestry – hunting and fishing
02 01 03	Plant tissue waste
02 07	Production of alcoholic and non-alcoholic beverages (except coffee tea and cocoa)
02 07 05	Sludges from on-site treatment

1.5 Permitting History

Cyder has been produced at the Cydery since 1728. In 2018 the business was acquired by Molson Coors Brewing Company (UK) Ltd. This was followed by a period of investment and upgrades to the facility including the installation and effluent treatment plant (ETP). The development led to the submission of a Permit application in 2019 and the Permit (EPR/GP3432QA) was issued in 2021.

1.6 Guidance

The following guidance documents are considered the most applicable (in part) to the proposed variation and have been referenced in the preparation of this document.

Reference	Title
FDM BREF/BATc	The European Commission's Best Available Techniques (BAT) Reference Document and BAT Conclusions Document on Food, Drink and Milk Industries (December 2019) which includes guidance for the treatment and processing of vegetable raw materials.

1.7 Permit Boundary and layout

The addition of Engineered Wetland to the Installation Permit requires an amendment to the Permitted boundary of the Installation. The boundary of the Engineered Wetland is shown on the Permit Boundary Plan edged in solid green line, with the associated installation boundary shown in dotted green line.

The new boundary is shown on the following drawings, provided in Appendix A to this application support document:

- Appendix A: Drawing 321890 DW01 – Permit Boundary Plan
- Appendix A: Drawing 321890 DW02 – Site Layout Plan
- Appendix A: Drawing 321890 DW03 – Sensitive Receptors Plan

2. Non-Technical Summary

Cyder has been produced at the Cydery since 1728. The Cydery is set in a rural setting approximately 1 km north of Debenham, Suffolk. In 2018 the Cydery was acquired by Molson Coors Brewing Company (UK) Ltd followed by some investment, an Environmental Permit (EPR/GP3432QA) was applied for in 2019 and subsequently issued in 2021.

The Permit introduced more stringent discharge limits than those previously in place, which were more challenging to achieve consistently. Despite ongoing investment in the on-site Effluent Treatment Plant (ETP), achieving consistent compliance with the discharge consent to the river has remained challenging, often requiring the use of tankers to remove excess wastewater from the site for off-site treatment.

To address this issue, the site proposes to utilise the Engineered Wetland as a polishing stage for effluent which will have been treated through the on-site ETP. The engineered wetland will be located on land adjacent to the site and operated by West Lay Ltd (the Operator) under their own Environmental Permit. As a nature-based treatment solution, this removes a compliance challenge for the Cydery while providing a habitat within the local landscape.

This Permit application seeks to include the Engineered Wetland as polishing treatment stage for the Installation. It will also include a new discharge point (WL1). As the wetland will be predominately consumptive, discharge will only take place during extremely heavy rainfall when evapotranspiration rates are low, which is expected to be in winter months. As discharge from the Cydery will be redirected to the wetland, the present discharge point (W1) will be effectively inactive. W1 will remain permitted as a contingency discharge point with all existing permit limits continuing to apply to any discharge made via this route. In effect, the discharge remains unchanged but responsibility for compliance changes from Aspall to West Lay.

A Site Condition Report (Appendix C) has been prepared which documents the land condition now. An intrusive investigation was undertaken to confirm absence of contamination and confirms the presence and permeability of the in-situ clay (to be impermeable).

The risks of the proposal have been considered:

- Surface water – Discharge limits remain unchanged from those permitted by the Aspall permit in 2019 and consequently the existing H1 assessment of risk to surface water is considered to remain relevant, and the proposed arrangements reduce the risk to the environment, by reducing discharge volumes via evapotranspiration.
- Groundwater – the wetland is sited in clay geology with a measured permeability of max. 5.8×10^{-8} m/s which is considered to be impermeable.
- Odour – The wetland will be carefully managed by the Operator in accordance with the Operating Manual. Aerators will be implemented to ensure oxygenation of the upper treatment ponds and prevent fermentation. The wetlands vegetation will be cleared annually to ensure adequate conditions of light, flow and oxygen, preventing stagnancy which might lead to odour generation.
- Noise – There is considered to be no noise sources on site.
- Dust – being wet and vegetated, there is no risk of dust from the wetland area.

The Operator will ensure technical competence management by completion of an EPOC course. Operations will be managed in accordance with a written management system in line with extant EA guidance.

3. Process Description

3.1 Introduction

Effluent treatment from the Cydery is undertaken by an ETP. To consistently meet consented limits, throughputs through the ETP have been somewhat limited. To prevent operational constrictions, it is proposed that the wetland will offer a nature-based polishing treatment, allowing the site greater flexibility and less down-time.

It is proposed that the Cydery effluent will continue to be treated via the ETP. The engineered wetland will provide a nature-based polishing step which will allow greater operational flexibility in meeting discharge limits consistently.

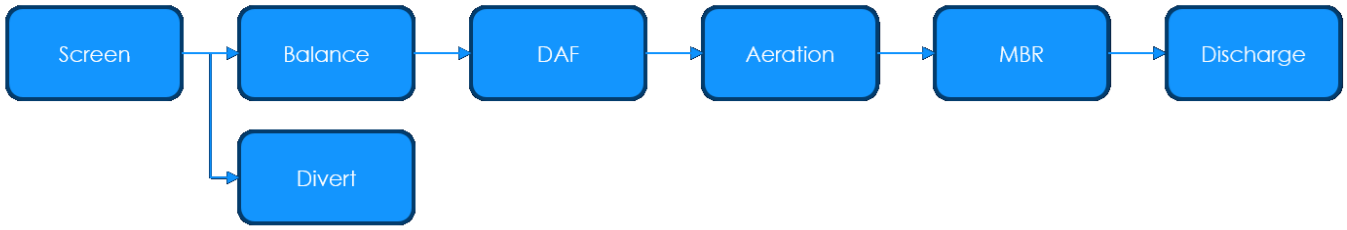
The wetland is situated within clay geology (confirmed permeability max. 5.8×10^{-8} m/s) and so is not in continuity with controlled waters (groundwater or surface water) except for the discharge point (WL1). WL1 will be controlled via a manual shut off valve, which will be maintained in the off position, unless discharging. Quality of water in Pond 4 will be sampled prior to discharge. If water meets the consented limits, it may be discharged by manually opening the valve.

If the water quality does not meet the consented limits, it will not be discharged, but will be recirculated and stored within the Engineered Wetland until it is suitable for discharge. The Engineered Wetland has c.52,850 m^3 storage capacity. In the very unlikely scenario that levels approach this capacity, water may be tankered off site. The Operator may also elect to cease receiving effluent from the Cydery at any point. The risk of discharge of effluent in excess of consented limits, is negligible.

3.2 Existing treatment process

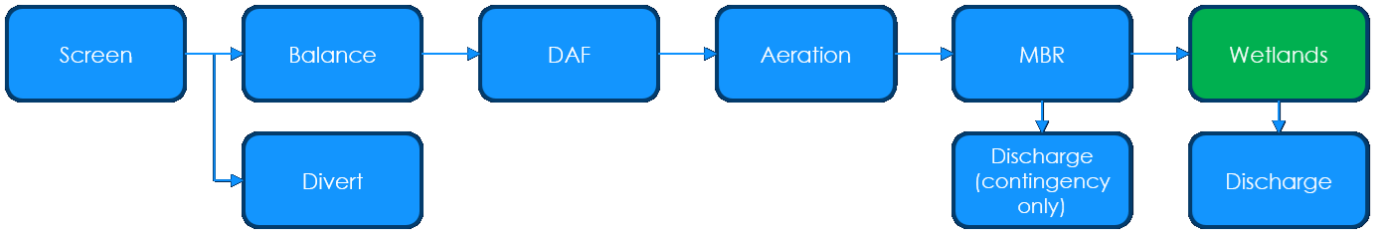
Wastewater from the Cydery currently follows the steps shown in Figure 3-1. Effluent is screened, enters a balance tank, proceeds to a Dissolved Air Flotation (DAF) plant, aeration, membrane filtration (MBR) and is then discharged if discharge criteria is met. The effluent is subject to monitoring post MBR and if it does not meet the criteria, it is held, retreated or tankered off site.

Figure 3-1 Wastewater treatment flow diagram - current



The proposed treatment process is included in Figure 3-1 below, with additional detail and an explanation of changes included thereafter.

Figure 3-2 Wastewater treatment flow diagram – proposed



As can be observed from the process flows above, the proposed treatment process (Figure 3-2) will remain broadly the same as current (Figure 3-1), except instead of being discharged into the watercourse via discharge point W1, the wastewater will instead go via discharge point WT1 from Aspall into Pond 1 of the Engineered Wetland. Discharge (via WL1) will occur only in times of heavy rainfall and if discharge criteria is met.

Following discharge into Pond 1, the effluent flows as follows;

- Gravity flow from Pond 1 to Pond 4. Reverse flow between Ponds 4 and 1 is controlled by submersible pumps. The pumps are powered by a mixture of solar panels, batteries and diesel generator (if necessary).
- In normal operating conditions, it is considered that there will be no discharge from the site. In the event of heavy rainfall or storm conditions, treated effluent combined with rainfall will be discharged via the new discharge point, WL1.
- The quality of water in Pond 4 will be tested prior to discharge to check it meets the discharge criteria. In the event that it doesn't, the water in Pond 4 can be pumped back to Pond 1 for further treatment via the wetland and/or tankered off-site.
- At any point in the process, water from Pond 4 can be returned to Pond 1 should the quality be determined to not meet the quality for discharge.
- Periodically, sludge which has accumulated in Pond 1 will be pumped to Pond 5. The sludge will be allowed to dry out and desiccate in Pond 5. The desiccated sludge will then be used to grow a grass sward as part of the wetland.

It is relevant to note that the entry point of the discharge from W1 or WL1 is into the same location (see Site Layout Plan 321890 DW02). This is no change to the maximum discharge volume (210 m^3/day) nor discharge consent quality limits.

Whilst WL1 is a new discharge point, when discharge is occurring from WL1, W1 will not be active and so it is an effective replacement. W1 remains a consented discharge point as contingency only. Consequently, it is considered that the risks posed by the 'new' discharge to the environment remain unchanged.

A Drainage Strategy report was prepared for the wetlands during the design stage, to support the planning application (see Appendix D). The Drainage Strategy confirm the total capacity of the wetlands during normal operation and additional freeboard, demonstrating that it can cope with 1 in 100 year flood event without discharging. That report labels the wetland ponds in a different way to those presented in this application. The key in Table 3-1 below shows how the labelling has changed.

Table 3-1 Key for wetland pond references (old and new)

Pond reference	Drainage Strategy reference
Pond 1	Pond G
Pond 2	Pond D
Pond 3	Pond C
Pond 4	Pond B
Pond 5	Pond H

3.2.1 Energy consumption

The Site will use minimal energy to operate the treatment wetland.

Aeration will be supplied by an on-site windmill. Pumps will be powered by a combination of wind power, battery and generator, where necessary.

Energy usage within the Aspall plant is considered to remain unchanged, though the reduction in tanker usage will reduce overall energy consumption.

Electricity and oil use are measured at the Cydery. The specific energy consumption of energy per hl of finished product is a site KPI. West Lay will share the energy consumption of the wetland with Aspall so they may include it in their calculations.

3.2.2 Water usage

The Engineered Wetland will not use potable water save for some for sanitation in the site office which is considered to be negligible.

3.2.3 Waste handling and reduction

Liquid waste

No liquid waste is produced from the Engineered Wetland.

Liquid will become waste if the wetland approaches capacity, does not meet discharge criteria at which point it will be tankered off site. This would be considered an emergency situation.

Solid waste

As part of ongoing and sustainable management of the wetland, the following solid waste streams are anticipated from routine maintenance:

1. Solid wastes arising from the desludging of Pond 1 on an annual basis, will be allowed to dry and desiccate in Pond 5. The desiccated sludge will then be used to grow a grass sward as part of the

wetland. Any desiccated sludge which is surplus to requirements will be used as a fertiliser and soil improver on the wider estate under a waste exemption.

2. To maintain the diversity of species and avoid the domination of one, vegetation in Pond 2 will be periodically thinned. The resulting cuttings will be dried and chipped on site (DAA treatment). The resulting chippings will be reused on site as mulch or used on the wider estate under a waste exemption.
3. To maintain on-going diversity and ensure no single species dominates, vegetation in Pond 3 will be thinned. The resulting material will be composted on site (DAA composting activity). It is proposed that this compost would be used on the wider estate by registration of a waste exemption.
4. Commercial coppicing of the willow beds in Pond 4 will be periodically undertaken; the willow will be sold as a product for use in heritage fencing.

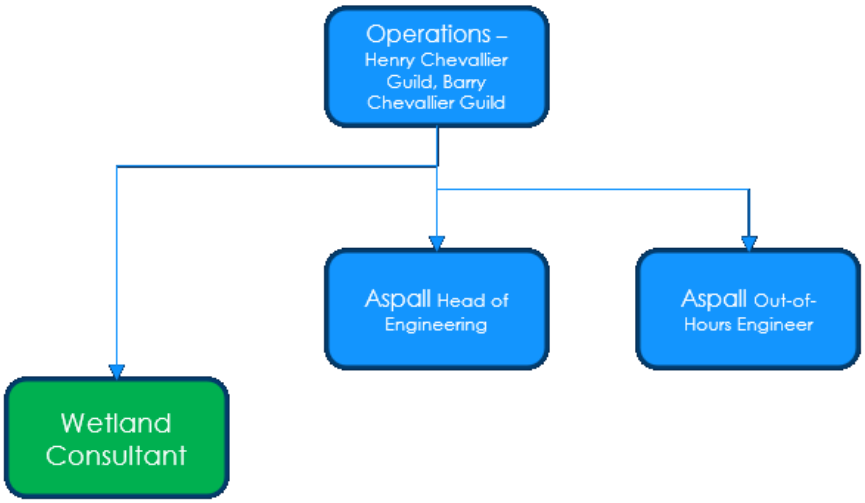
All solid waste stream details will be recorded on site and duty of care checks made on all waste carriers used. Waste figures will be reviewed annually, no waste will be sent directly to landfill and efforts will be focused on minimising waste production and maximising recycling.

3.2.4 Maintenance

This maintenance programme is addressed within the environmental management system/ Operational Manual to ensure that all assets which pose an environmental risk are captured within the maintenance schedules.

3.2.5 Organisational structure

The directors of West Lay Ltd are also responsible for day to day operations. They will regularly liaise with Aspall, specifically the engineering department, in relation to accepting effluent, quality, flow and any issues as they arise. West Lay employ a wetland consultant to help advise on ongoing management, maintenance or challenges.



Name	Role	Employer	Contact Details
Henry Chevallier Guild	Operations / TCM	West Lay	[redacted]
Barry Chevallier Guild	Operations / TCM	West Lay	[redacted]
Tim Watts	Wetland Consultant	Framlingham Environmental	[redacted]

Name	Role	Employer	Contact Details
Scott Sumpter	Head of Engineering	Aspall Cydery	[redacted]
n/a	Out of hours engineer (24/7)	Aspall Cydery	[redacted]

4. Emissions to Water

4.1 Channelled Emissions to Water

4.1.1 Surface Water

Surface Water Emissions

The wetland will have a designated discharge point (WL1). WL1 discharges to essentially (immediately adjacent to) the same location as the existing discharge point (W1), operated by Aspall.

With the proposed changes, there will be no discharge via W1 during normal operation. W1 remains consented for contingency only. In that event, there would be no discharge via WL1 and if discharge via WL1 was necessary for volume purposes, this would be tankered off-site.

It is considered that the proposed alteration to the discharge (from W1 via the ETP to from WL1 via ETP plus wetland), presents no increased risk to the environment as the discharge limits remain unchanged.

A H1 risk assessment was carried out in 2019 for the existing discharge consent. It concluded that the discharge would not impact on the environment. The limits modelled in that H1 assessment were higher than the final consented limits. Consequently, it is considered that the conclusions of the original H1 assessment remain valid.

Effluent Emissions

4.1.2 Sewer, Effluent Treatment Plant or Other Transfers Off-site

There are no discharges to sewer from the site.

In the event that water quality does not meet the consented limits and volumes must be reduced due to heavy rainfall events, water will be tankered from the site to a suitably permitted facility.

4.1.3 Groundwater

There are no point source emissions to groundwater. The wetlands are clay-lined.

Intrusive investigations on site confirm the presence of indigenous clays with an in-situ permeability of $5.8x10^{-8}$m/s, which is considered to be impermeable for the purposes of the wetland construction.

There is significant freeboard capacity within the wetland such that fugitive discharge to groundwater cannot occur from the ponds.

4.2 Priority Hazardous Substances and Priority Substances

Substances with the potential to have an adverse effect on groundwater or on the water environment and are defined in the Water Framework Directive (WFD) and related legislation:

- The EU Water Framework Directive (2000/60/EC);
- The EC Groundwater Directive (80/68/EEC);
- The EC Groundwater Directive (2006/118/EC);
- The EC Dangerous Substances Directive (76/464/EEC); and
- The Environmental Quality Standards Directive (2008/105/EC).

A detailed list of substances, which represent priorities for regulatory control, is currently maintained and updated by the European Chemicals Agency (ECHA) and can be accessed online at https://echa.europa.eu/fr/ann-x-priority-subs-water-dir-2000-60.

The Cydery does not currently use any of the substances defined as priorities for control by the WFD and nor will the proposed variation to the installation make use of such substances.

4.3 Climate Change Assessment

A changing climate can affect processes on site including services and infrastructure. The table below considers how the most prevalent scenarios will be dealt with.

Issue	Impact	Mitigation	Risk	Timing	Further action
Storms	Overflow of wetland to controlled waters due to increased rainfall.	Ample freeboard will be maintained within the system to account for storm events and increased rainfall. Inflow to the wetland from installation can be stopped in such instances.	Effluent enters the nearby watercourses. Effluent does not contain dangerous substances. Constituents will be diluted with additional water loading so impacts are likely to be reduced.	0 – 100 years	n/a
Extreme rainfall	As above	As above	As above	As above	n/a
Increase in summer temperatures	Risk to vegetation stress. Increased evapotranspiration.	Well maintained vegetation with addition of more effluent, vegetation thinning where necessary.	Vegetative stress and reduced treatment capacity.	0-100 years	Process can be cycled if treatment fails. Replanting where necessary. Adjustment of inflows to account for any changes.
Decrease in winter temperatures	Risk to vegetation stress. Freezing of pipes, damage to infrastructure.	Maintain wetlands. Replace damaged infrastructure when necessary. Aeration will reduce change of freezing, maintain consistent inflows to assist movement.	Vegetative stress and reduced treatment capacity.	0-100 years	Process can be cycled if treatment fails. Replating where necessary. Adjustment of inflows to account for any changes.

5. Raw Materials

5.1 Raw and Auxiliary Materials

Raw materials used on site will be limited to the use of chalk to neutralise pH, c.500kg per year.

The chalk will be stored off-site and imported when required.

Raw Material	Chemical Nature/ Composition/ Function	Expected Annual Usage	Environmental Fate of Material	Environmental Impact	Alternatives
Chalk	Neutralises acid in environment, aids phosphate removal, improves microbial activity, enhances substrate absorption, supports plant growth and long-term treatment stability.	500 kg	Neutralised by acid in environment	Neutralises acidity in wetland	-

5.1.1 Raw Material Inventory

The Operator will keep an up-to-date inventory of raw materials consumed on Site.

5.2 Water Use

Water will not be consumed on site.

6. Management and Environmental Risk

6.1 Environmental Management System (EMS)

The effluent treatment will be undertaken in accordance with a written Environmental Management System (EMS). A copy of the EMS summary is provided below.

The complexity of an EMS is proportionate to the proposed development and the site specific EMS will be developed in accordance with the latest EA Guidance (available at: Develop a management system: environmental permits - GOV.UK (www.gov.uk)). The EMS will explain how West Lay will manage their activities whilst minimising the risk to the environment.

Table 6-1 EMS Summary

Section		Description
1	Site Infrastructure Plan	A plan showing the permit boundary, site layout with storage locations, drainage and nearby sensitive receptors including, water courses, protected habitats and buildings.
2	Site Operations	Description of the effluent treatment activity and any associated waste management activities.
3	Site Equipment and Maintenance Plan	Details on the manufacturers recommendations for maintaining infrastructure and equipment.
4	Contingency Plan	The steps taken in the event of a breakdown, shutdown or in the event of abnormal operating conditions.
5	Accident Prevention and Management Plan	A plan describing how to deal with incidents or events that have the potential to pollute the environment or result in a non-compliance to the permit.
6	Changing Climate	Considerations of how a changing climate could affect waste activities or ability to comply with the permit.
7	Complaints Procedure	Methodology for dealing with a compliant including; records, investigation and action.
8	Competence and Training	Roles and responsibilities of staff will be defined along with training and qualifications of staff or contractors.
9	Records	Record management will be determined including timescales and locations of documents required to comply with the permit and legislation (for example duty of care requirements).
10	EMS Review	A commitment to review the EMS and check waste activities are in compliance with the permit. Defined timescales or events resulting in an EMS review will also be included.

The Site's Operational Manual addresses a number of the above for the purposes of determining the permit. A copy is provided as Appendix E. This operating manual will form part of the EMS.

6.2 Environmental Risk Assessment

An Environmental Risk Assessment was undertaken and is presented as Appendix F, which concluded that risks to the environment post controls were low.

A separate odour management plan documents the actions to be taken to prevent malodour, a copy is provided as Appendix G.

6.3 Accident Prevention and Mitigation

6.3.1 Identifying Hazards

Hazards have been systematically assessed to determine their overall environmental significance. This assessment takes into account both the likelihood and potential severity of the occurrence of each aspect to create an overall risk profile for the environment, the business and for interested parties, including the local community and other stakeholders.

6.3.2 Assessing the Risks

Considering accident scenarios includes an estimate, for each potential environmental accident scenario, of:

- Likelihood – the probability of the event taking place;
- Severity – the potential environmental impact as a result of the event occurring; and
- Overall risk to the environment – through combination of likelihood and severity.

A ranking system is used that attempts to objectively quantify each of these parameters. The tables below describe the ranking systems for the likelihood, severity and overall risk, respectively.

Score	Category	Range
1	Extremely unlikely	Incident occurs less than once in a million years
2	Very unlikely	Incident occurs between once per million and once every 10,000 years
3	Unlikely	Incident occurs between once per 10,000 years and once every 100 years
4	Somewhat unlikely	Incident occurs between once per hundred years and once every 10 years
5	Fairly probable	Incident occurs between once per 10 years and once per year
6	Probable	Incident occurs at least once per year

Score	Category	Definition
1	Minor	▪ nuisance on site only (no off-site effects) ▪ no outside complaint
2	Noticeable	▪ noticeable nuisance off-site e.g. discernible odours ▪ minor breach of permitted emission limits, but no environmental harm ▪ one or two complaints from the public
3	Significant	▪ severe and sustained nuisance, e.g. strong offensive odours or noise disturbance ▪ major breach of permitted emissions limits with possibility of prosecution ▪ numerous public complaints
4	Severe	▪ hospital treatment required ▪ public warning and off-site emergency plan invoked ▪ hazardous substance releases into water course with ½ mile effect

Score	Category	Definition
5	Major	▪ evacuation of local populace ▪ temporary disabling and hospitalisation ▪ serious toxic effect on beneficial or protected species ▪ widespread but not persistent damage to land ▪ significant fish kill over 5 mile range
6	Catastrophic	▪ major airborne release with serious offsite effects ▪ site shutdown ▪ serious contamination of groundwater or watercourse with extensive loss of aquatic life

Likelihood	Severity of consequence					
	Minor	Noticeable	Significant	Severe	Major	Catastrophic
Extremely unlikely	1	2	3	4	5	6
Very unlikely	2	4	6	8	10	12
Unlikely	3	6	9	12	15	18
Somewhat unlikely	4	8	12	16	20	24
Fairly probable	5	10	15	20	25	30
Probable	6	12	18	24	30	36

Following the scoring system identified, the scenarios have been placed in the following categories:

- Acceptable (or low risk) – unshaded;
- Acceptable if the risk is controlled as far as is practicable (medium risk) – orange; and
- Unacceptable (high risk) – red.

The estimated overall risks have been assessed to determine the appropriate measures to be undertaken to reduce the risk of accidents and minimise any resulting environmental impact. Appropriate measures may include:

- management techniques, such as standard operating procedures, and work instructions;
- preventative measures, such as abatement plant or secondary containment measures (e.g. bunds); and
- remediation techniques for use in the event of an incident, such as spill kits or drain covers.

The management programme in place at the site has emerged from this analysis and is focused on addressing the highest risk scenarios as a priority.

6.3.3 Techniques to Reduce Risks

The following general measures will be undertaken to minimise the risk and effects of accidents:

- Procedures put in place to record all accidents and to mitigate their consequences. This includes procedures to:
  - Manage and control raw materials and wastes;
  - Control operations;
  - Address non-conformities (including emergencies) and implement corrective or preventative actions; and
  - Control and respond to leaks, spills and emergencies.
  - Accident reporting; and
  - Audits including environmental elements.
- Specialised training needs are reviewed and identified on an annual basis which includes selected personnel being trained in emergency preparedness and response. This covers incident response techniques, including chemical and liquid spill containment and all activities with potentially significant environmental effects;
- Routine safety inspections are undertaken to ensure that equipment is suitable for use;
- A preventative maintenance programme has also been implemented at the installation to minimise the risk of unplanned stoppages and potentially serious incidents; and
- Internal audits are undertaken of all emergency and spill procedures.

6.3.4 Safety

Safe working practices are ensured by adherence to company procedures and systems. Pertinent features of these are summarised below:

- Staff training – Staff training includes techniques for the recognition and control of potential environmental incidents. Contractors also receive training appropriate to their role on site.
- Process control – Process equipment is designed and operated to ensure that process parameters are controlled within acceptable limits.
- Incidents – Abnormal occurrences resulting in injury, loss of material, damage to buildings or equipment are subject to a reporting and investigating procedure that is designed to establish the basic cause and to prevent future recurrence.
- Near-miss reporting – The reporting and investigation processes utilised for abnormal occurrences is also used in the event of near-miss occurrences in which incidents are narrowly avoided.
- Site Security – The site maintains a high level of security to reduce the risk of theft and vandalism

Accident or abnormal release scenario	Receptor	Pathway	Likelihood of occurrence	Consequences of occurrence	Severity of occurrence	Risk Rating	Actions taken or proposed to minimise the chances of it happening	Actions planned if the event does occur
Failure of discharge point valve	Controlled waters	Discharge of double treated and polished effluent into the River Deben	Unlikely (3)	Loss of containment to Pond 4. Release of treated effluent to surface water which may/ may not meet discharge criteria.	Noticeable (2)	Low	Discharge valve is manually operated and remains in closed position. Discharge valve is only opened when a discharge is required and if treated effluent meets the discharge criteria.	Valve is closed. Reason for opening is investigated and rectified. If breach is procedural, procedures are updated. Notify the EA is discharge limits have been breach.
Flood – from rivers and seas	Controlled waters	Flood waters mobilise treated effluent discharge to surface water	Unlikely (3) Site not within flood zone.	Discharge of treated effluent to surface water	Noticeable (2)	Low	Wetland design – not in continuity with groundwater. Visual screening bund to south will impede inflow from surface water in flood.	Implement actions to minimise impact where possible. Notify EA.
Flood – surface water	Controlled waters	Surface water run-off to wetland, over-flowing to controlled waters	Unlikely (3) Freeboard in wetland demonstrated to be sufficient for 1 in 100 yr + CC flood event.	Discharge of treated effluent to surface water	Noticeable (2)	Low	Maintain water levels at design levels. Control inflow of effluent and surface water run-off from Aspall installation.	Stop inflow from Installation. Implement actions to minimise impact where possible. Notify EA.
Failure of controls at effluent inlet – wetland receives effluent at higher concentrations or flow than agreed.	Wetland	Inflow of effluent to wetland via piped connection	Somewhat unlikely (4)	Adverse impact to wetland	Noticeable (2)	Low	Procedural controls for monitoring quality and flow of inflow. Closable valve which can be shut to prevent inflow, diverting to W1 discharge point (or tankered off site)	Close inlet valve. Review circumstances leading to the release. Review procedures if necessary.
Fire	Local population and ecological receptors	Windblown dispersion	Unlikely (3)	Release to atmosphere. Some waste matter generated. Release of odour.	Significant (3)	Low	Fire alarm systems installed and maintained. Automatic shutdown of all high temperature	Inform relevant authorities. Review site procedures if necessary.

Accident or abnormal release scenario	Receptor	Pathway	Likelihood of occurrence	Consequences of occurrence	Severity of occurrence	Risk Rating	Actions taken or proposed to minimise the chances of it happening	Actions planned if the event does occur
							systems in the event of abnormal operating conditions. Flammable chemicals segregated from the rest of materials storage and fitted with fire prevention measures. DSEAR assessments carried out for potential ignition sources.	
Vandalism	Local population. Ecological receptors. Controlled waters.	Wind blown dispersion. Overland run-off to controlled waters	Unlikely (3)	Range of damage to equipment, pipe work with consequent release to ground / controlled waters.	Noticeable (2)	Low	Site security measures are in place including fencing and bund. Regular inspections of site take place.	Address any specific equipment damage. Reinstate and review security measures.

7. Monitoring

7.1 Emissions to Surface Water

The engineered wetland treatment system is designed to be consumptive i.e. during normal conditions, effluent will be consumed by evapotranspiration.

Discharge will only occur following prolonged heavy rainfall during periods of low evapotranspiration. In normal operating conditions, the discharge valve will remain closed. The discharge must be manually opened to facilitate discharge.

Water quality in Pond 4 will be confirmed by testing compliance with the discharge limits, prior to discharge.

Discharge will not exceed a rate of 210m^3/day. Discharge will be controlled by a manually operated valve from Pond 4.

The discharge will continue to meet the quality standards set out in the Aspall Installation Permit (see Table 7-1). Discharge quality will be sampled from Pond 4.

Table 7-1 Discharge – monitoring schedule

Parameter	Unit	Limit	Reference period	Frequency	Standard/ method
Volume	m^3/day	210	Spot sample	Daily (if discharging)	Self-monitoring of flow scheme
Total suspended solids	mg/l	20	Spot sample	Daily (if discharging)	BS EN 872
BOD	mg/l	10	Spot sample	Monthly (if discharging)	BS EN 1899-1
Ammonia (as N)	mg/l	3	Spot sample	Daily (if discharging)	BS EN ISO 11732
Total Phosphorus	mg/l	1	Spot sample	Daily (if discharging)	BS EN ISO 15681-1
Total Nitrogen	mg/l	20	Spot sample	Daily (if discharging)	BS EN 12260
pH	pH units	6-9	Spot sample	Daily (if discharging)	BS ISO 10523
COD	mg/l	100	Spot sample	Daily (if discharging)	BS ISO 15705
Oil and grease	-	None visible	Spot sample	Daily (if discharging)	Visual inspection

7.2 Emissions to Groundwater

There are no emissions to groundwater associated with the proposed activity. No monitoring of emissions to groundwater is, therefore, required.

7.3 Emissions to Air

There are no channelled emissions to air associated with the proposed activity. No monitoring of emissions to air is, therefore, required.

8. BAT Assessment

The following section details a BAT assessment, based on the Food, Drink and Milk Industries BATc/BREF documents, for the proposed wastewater treatment operation operated by West Lay.

8.1 Food, Drink and Milk Industries BAT

The following table shows the Food, Drink and Milk Industries BAT Conclusions which are applicable to the proposed operation and how it will comply.

BAT Conclusion	Description	Assessment
General BAT		
BAT 1	To improve the overall environmental performance, BAT is to elaborate and implement an environmental management system (EMS).	See Section 7.1. The Site will operate in accordance with a written management system which covers all aspects required by BAT1. The scope of the EMS is related to the nature, scale and complexity of the activity, and the range of environmental impacts it may have.
BAT 2	To increase resource efficiency and to reduce emissions, BAT is to establish, maintain and regularly review (including when a significant change occurs) an inventory of water, energy and raw materials consumption as well as of waste water and waste gas streams, as part of the environmental management system (see BAT 1)	The Operator will track the consumption of water, energy and raw materials so that they may be considered as part of the wider Cydery resource efficiency considerations. There shall be minimal change to the forms of raw materials used onsite following this proposed variation, (500kg of chalk only).
BAT 3	For relevant emissions to water as identified by the inventory of waste water streams (see BAT 2), BAT is to monitor key process parameters (e.g. continuous monitoring of waste water flow, pH and temperature) at key locations (e.g. at the inlet and/or outlet of the pre-treatment, at the inlet to the final treatment, at the point where the emission leaves the installation).	Inflow to the wetland is monitored by Aspall. Discharge from the wetland will be monitored by West Lay, see Section 7.1. The proposed monitoring programme for water emissions from the engineered wetland is given in Section 7.1.
BAT 4	BAT is to monitor emissions to water with at least the frequency given in the FDM BATc document and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.	See Section 7.1.

BAT Conclusion	Description	Assessment
BAT 5	BAT is to monitor channelled emissions to air with at least the frequency given in the FDM BATc document and in accordance with EN standards.	No channelled emissions to air. N/A.
BAT 6	To increase energy efficiency, BAT is to use an energy efficiency plan (BAT 6(a)) and an appropriate combination of the common techniques listen in technique 6b within the table in the BATc.	The engineered wetland is designed to operate as passively as possible, limiting the intervention necessary. However, ponds are artificially aerated to ensure effluent is treated in short order and prevent nuisance. The aeration pumps are to be powered by a dedicated on-site windmill. The Site commits to using the most energy efficient methods of operation. It is considered that maintaining an Energy Efficiency Plan is disproportionate to the scale of the activity and the above meets BAT.
BAT 7	To reduce water consumption and the volume of waste water discharged, BAT is to use BAT 7(a) and one or a combination of the techniques (b) to (k) given below. (a) water recycling and/or reuse (b) optimisation of water flow (c) optimisation of water nozzles and hoses (d) segregation of water streams Techniques related to cleaning operations: (e) dry cleaning (f) pigging system for pipes (g) high-pressure cleaning (h) optimisation of chemical dosing and water use in cleaning-in-place (CIP) (i) low-pressure foam and/or gel cleaning (j) optimised design and construction of equipment and process areas (k) cleaning of equipment as soon as possible	It is considered that this BAT conclusion is not applicable as the wetland will not consume potable water. Aspall Cydery manage the water usage involved in the production of cider and there are no changes proposed as part of this application. Discharge of treated wastewater from the site will be minimised due to the biological treatment proposed and evapotranspiration.

BAT Conclusion	Description	Assessment
BAT 8	To prevent or reduce the use of harmful substances, e.g., in cleaning and disinfection, BAT is to use one or a combination of the techniques given below. (a) proper selection of cleaning chemicals and/or disinfectants (b) reuse of cleaning chemicals in cleaning-in-place (CIP) (c) dry cleaning (d) optimised design and construction of equipment and process areas	N/A. There will be no cleaning of the wetland involving the use of harmful substances.
BAT 9	To prevent emissions of ozone-depleting substances and of substances with a high global warming potential from cooling and freezing, BAT is to use refrigerants without ozone depletion potential and with a low global warming potential.	N/A. There are no refrigerants proposed within this application.
BAT 10	To increase resource efficiency, BAT is to use one or a combination of the techniques given below: (a) anaerobic digestion (depending on quantity and/or nature of residues) (b) use of residues (depending on legal reuse) (c) separation of residues (d) recovery and reuse of residues from the pasteuriser (liquid food only) (e) phosphorous recovery as struvite (applies to waste water streams with total phosphorus content >50mg/l and significant flow). (f) use of waste water for land spreading (only where agronomic benefit and other environmental risk factors).	N/a Site receives treated wastewater only and so the combination of resource efficiency measures listed are considered not to apply. Recovered materials from the maintenance of the wetland will be reused where possible i.e. desiccation of sludge for reseeding of the ponds, mulching of vegetation cleared from ponds and harvesting of willow for use by local willow merchants.

BAT Conclusion	Description	Assessment
BAT 11	To prevent uncontrolled emissions to water, BAT is to provide an appropriate buffer storage capacity for waste water.	The wetland has been designed with in-built freeboard volume capacity to ensure ample capacity for effluent plus rainfall, see Drainage Strategy.
BAT 12	To reduce emissions to water, BAT is to use an appropriate combination of the techniques given below. Preliminary, primary and general treatment (a) equalisation (b) neutralisation (c) physical separation, e.g., screens, sieves, grit separators etc. Aerobic and/or anaerobic treatment (secondary treatment) (d) aerobic and/or anaerobic treatment (e.g., activated sludge, aerobic lagoon etc. Nitrogen removal (e) nitrification and/or denitrification (f) partial nitritation – anaerobic ammonium oxidation Phosphorous recovery and/or removal (g) phosphorous recovery as struvite (h) precipitation (i) enhanced biological phosphorous removal Final solids removal	Wastewater received to the wetland will have been pre-treated in the Aspall Cydery wastewater treatment plant using the following techniques; • Screening, settlement, aeration, membrane filtration and finally wetland treatment. Notwithstanding the pre-treatment in the ETP, the wastewater from the Cydery will undergo the following treatment within the wetland; • Aerobic – the wetland will be aerated using aeration pumps. • Nutrients (i.e. nitrogen, phosphorus) will be removed by plant uptake within the wetland. • Any incidental solids will be allowed to settle and subsequently removed. • The Willow Beds will polish the water.

BAT Conclusion	Description	Assessment
	(j) coagulation and flocculation (k) sedimentation (l) filtration (e.g., sand filtration, microfiltration, ultrafiltration) (m) flotation The BAT-associated emission levels (BAT-AELs) for emissions to water given in Table 1 of the FDM BATc document apply to direct emissions to a receiving water body.	
BAT 13	To prevent or, where that is not practicable, to reduce noise emissions, BAT is to set up, implement and regularly review a noise management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements: - a protocol containing actions and timelines; - a protocol for conduction noise emissions monitoring; - a protocol for response to identified noise events, e.g., complaints; - a noise reduction programme designed to identify the source(s), to measure/estimate noise and vibration exposure, to characterise the contributions of the sources and to implement prevention and/or reduction measures.	N/a. Noise nuisance is not expected at nearby receptors due to absence of noise generating sources.
BAT 14	To prevent or, where that is not practicable, to reduce noise emissions, BAT is to use one or a combination of the techniques given below.	N/a. Noise nuisance is not expected at nearby receptors due to absence of noise generating sources.

BAT Conclusion	Description	Assessment
	(a) appropriate location of equipment and buildings (b) operational measures (c) low-noise equipment (d) noise control equipment (e) noise abatement	
BAT 15	To prevent or, where that is not practicable, to reduce odour emissions, BAT is to set up, implement and regularly review an odour management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements: - a protocol containing actions and timelines; - a protocol for conducting odour monitoring; - a protocol for response to identified odour incidents e.g., complaints; - an odour prevention and reduction programme designed to identify the source(s); to measure/estimate odour exposure: to characterise the contributions of the sources; and to implement prevention and/or reduction measures.	Odour at the Site is to be controlled by regular maintenance. The Odour Management Plan will be adhered to.
BAT 16	To increase energy efficiency in green fodder processing, BAT is to use an appropriate combination of the techniques specified in BAT 6 and of the techniques given below.	N/a. No green fodder processing.
BAT 17	To reduce channelled dust emissions to air, BAT is to use one of the techniques given below.	N/a. No channelled emissions to air.
BAT Conclusions for Brewing		
BAT 18	To increase energy efficiency, BAT is to use an appropriate combination of the techniques specified in BAT 6 and of the techniques given below.	N/a. No brewing undertaken on Site.

BAT Conclusion	Description	Assessment
	(a) Mashing-in at higher temperatures (b) Decrease of the evaporation rate during wort boiling (c) Increase of the degree of high-gravity brewing	
BAT 19	To reduce the quantity of waste sent for disposal, BAT is to use one or both of the techniques given below. (a) Recovery and (re)use of yeast after fermentation (b) Recovery and (re)use of natural filter materials	N/a as the wetland does not involve brewing. Notwithstanding, the site proposes to re-use products from the wetland where possible, see Section 3.2.
BAT 20	To reduce channelled dust emissions to air, BAT is to use a bag filter or both a cyclone and a bag filter.	N/a/ no channelled emissions to air.
BAT Conclusions for dairies		
BAT 21- 27	[BAT Conclusions for dairies]	N/a.
BAT Conclusions for Grain Milling		
BAT 28	To reduce channelled dust emissions to air, BAT is to use a bag filter.	N/a. No grain milling.
BAT Conclusions for meat processing		
BAT 29 -		N/a. No meat processing on site.
BAT Conclusions for oilseed processing and vegetable refining		
BAT 30 – 32		N/a. No oilseed or vegetable refining on site.
BAT Conclusions for soft drinks and nectar/juice made from processed fruit and vegetables		

BAT Conclusion	Description	Assessment
BAT 33	To increase energy efficiency, BAT is to use an appropriate combination of the techniques specified in BAT 6 and of the techniques given below.	n/a to wetland.
BAT Conclusions for starch production		
BAT 34	To reduce channelled dust emissions to air from starch, protein and fibre drying, BAT is to use one or a combination of the techniques given below. Bag filter Cyclone Wet scrubber	N/a. No starch production.
BAT Conclusions for sugar production		
BAT 35 – 37	[sugar production]	N/a. No sugar production carried out on site.

Appendices

Appendix A
Drawings

Appendix B
TCM Registration

Appendix C
Site Condition Report

Appendix D
Drainage Strategy

Appendix E
Operating Manual

Appendix F
Environmental Risk Assessment

Appendix G
Odour Management Plan