Non-technical summary

Stantec

1 Context and scope

This application is being made due to changes to the Environment Agency (EA) interpretation of the environmental permitting exclusion for Urban Wastewater Activities (under Environmental Permitting (England and Wales) Regulations 2016 (EPR) Schedule 1, Part 2, Chapter 5, Section 5.4). The EA interpretation now requires that anaerobic digestion (AD) plants treating over 100 tonnes/day (t/d) are classified as installations for the purposes of EPR. Furthermore, it has been determined that, in calculating Digester capacity, there should be no distinction between imported or indigenous sludges.

The Wessex Water (WW) Trowbridge Bioresources Centre (Trowbridge BC), which forms part of the wider Trowbridge Water Recycling Centre (WRC), exceeds the 100t/d throughput limit and it has therefore been agreed that a variation to an existing waste operation Environmental Permit (EP) (Ref. EPR/BB3934AG), is required to add Schedule 5.4 Part A(1)b(i) for AD treatment activities. Note that WW is making no changes to the processes within the installation, which is being permitted on the basis of how it is currently operated under the existing EP (Ref. EPR/BB3934AG).

Trowbridge BC is co-located with Trowbridge WRC, which is collectively referred to as 'the Trowbridge site' or 'the Site' in this report. Both Trowbridge BC and Trowbridge WRC are operated by Wessex Water Services Ltd. (the Operator), though the CHP and Gas to Grid system is operated by Wessex Water Enterprises Ltd.

Within the WRC, the urban wastewater is effectively treated to required final effluent discharge standards and the associated sludge is treated within the sludge treatment installation to a standard to allow for disposal or recovery. Currently sludge from the installation is sent for recovery.

This Environmental Permit application provides the necessary documentation to confirm that the proposed operations at Trowbridge BC achieves the required best available techniques (BAT) for the installation.

1.1 Site location

The Trowbridge Site is located at Trowbridge WRC, Bradford Road, Trowbridge, Wiltshire, BA14 9BJ (the Site) and is centred on National Grid Reference 384760, 158790. The Site is located at the north-westerly extent of Trowbridge town and is approximately 12 km to the south-east of central Bath. Figure 1-2 shows the location of the Site.

We acknowledge that the address given on the existing EP is incorrect and request that it is changed to align with the address provided above. This correct address has been used throughout the application document.

1.2 Operators

The existing Environmental Permit (EP) (EPR/BB3934AG – SR2008 No. 19) to which this application relates is held by Wessex Water Services Limited (the Operator). The Operator also holds a wastewater discharge EP for the discharge of secondary treated effluent from the co-located with Trowbridge WRC, under Permit number 102153. There are two other EP's located on the Site which are operated by a separate entity, Wessex Water Enterprises Ltd, which regulate the following activities:

- Permit number EPR/HB3602TR – Bespoke Permit for combustion of biogas from sewage sludge digesters and gas to grid activities. The CHP and Gas to Grid activities are directly associated activities to the anaerobic digestion activity.

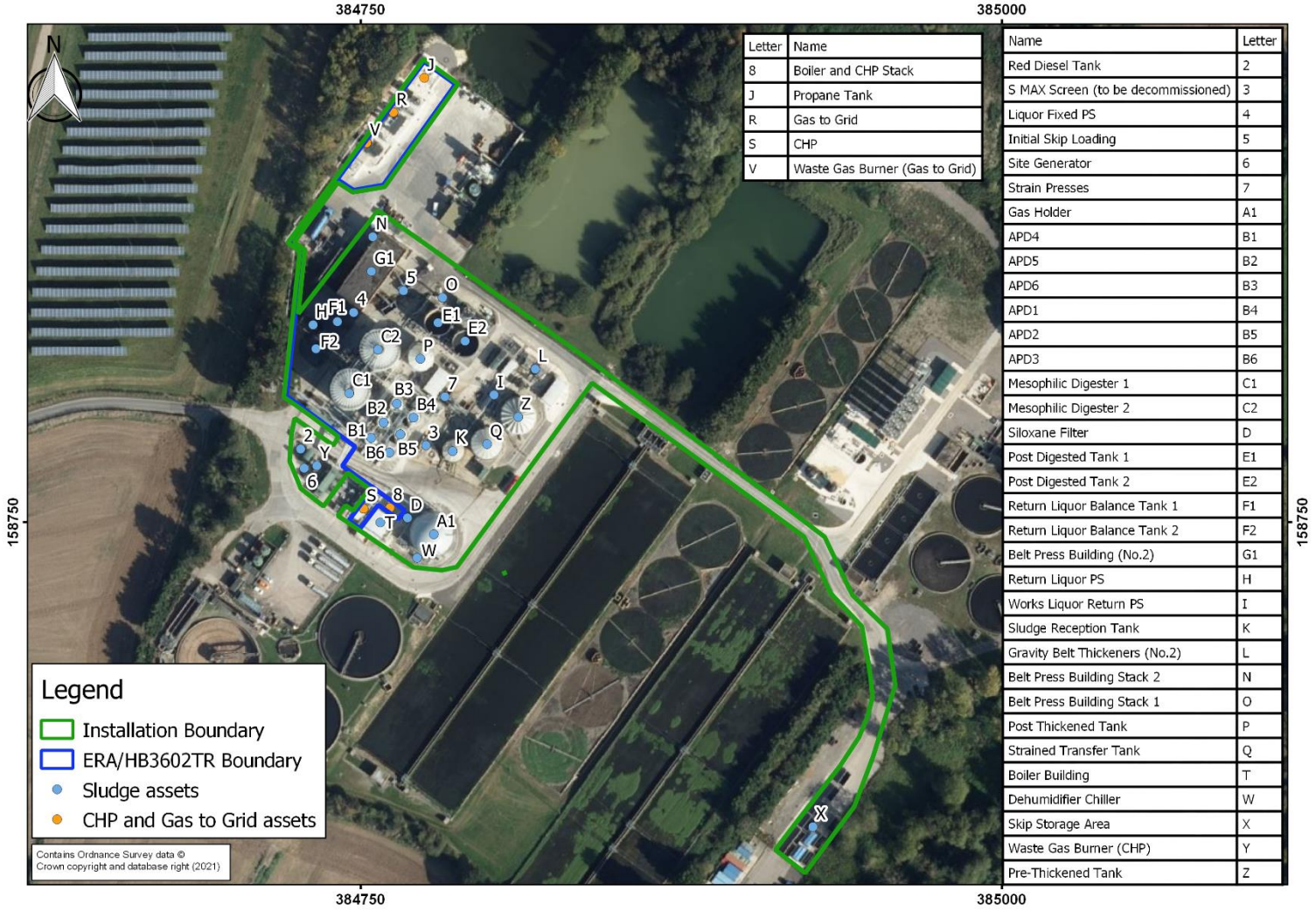
- Permit number EPR/HB3205TW/T001 (with conditions included in Waste Management License Ref. W940075WD): Biological treatment and discharge for disposal.

It is anticipated that all other EP's will remain in place following this EP variation. It is acknowledged that there are multiple EP boundaries on the Site and that these boundaries, in particular the boundary regulating Biogas and Gas to Grid activities, do not accurately reflect the location of activities undertaken under their respective Environmental Permits.

We therefore request that the Environment Agency (EA) act to reconcile the extent of these boundaries as part of this application, to ensure that the Site is easily regulated going forward. Proposed boundaries that accurately incorporate the assets and activities of each Environmental Permit are shown on Figure 1-1 Environmental Permit Boundaries The proposed EP boundary for EPR/HB3602TR (CHP & Gas to Grid) is shown on Figure 3 and the proposed AD Installation Boundary for Trowbridge BC is shown on Figure 2.

We wish to highlight that no assets will fall outside of a permitted area following the reconciliation of boundaries. To clarify, all assets that are currently permitted will remain permitted and the boundary change is only to ensure the correct assets are covered by the correct operator and correct environmental permit.

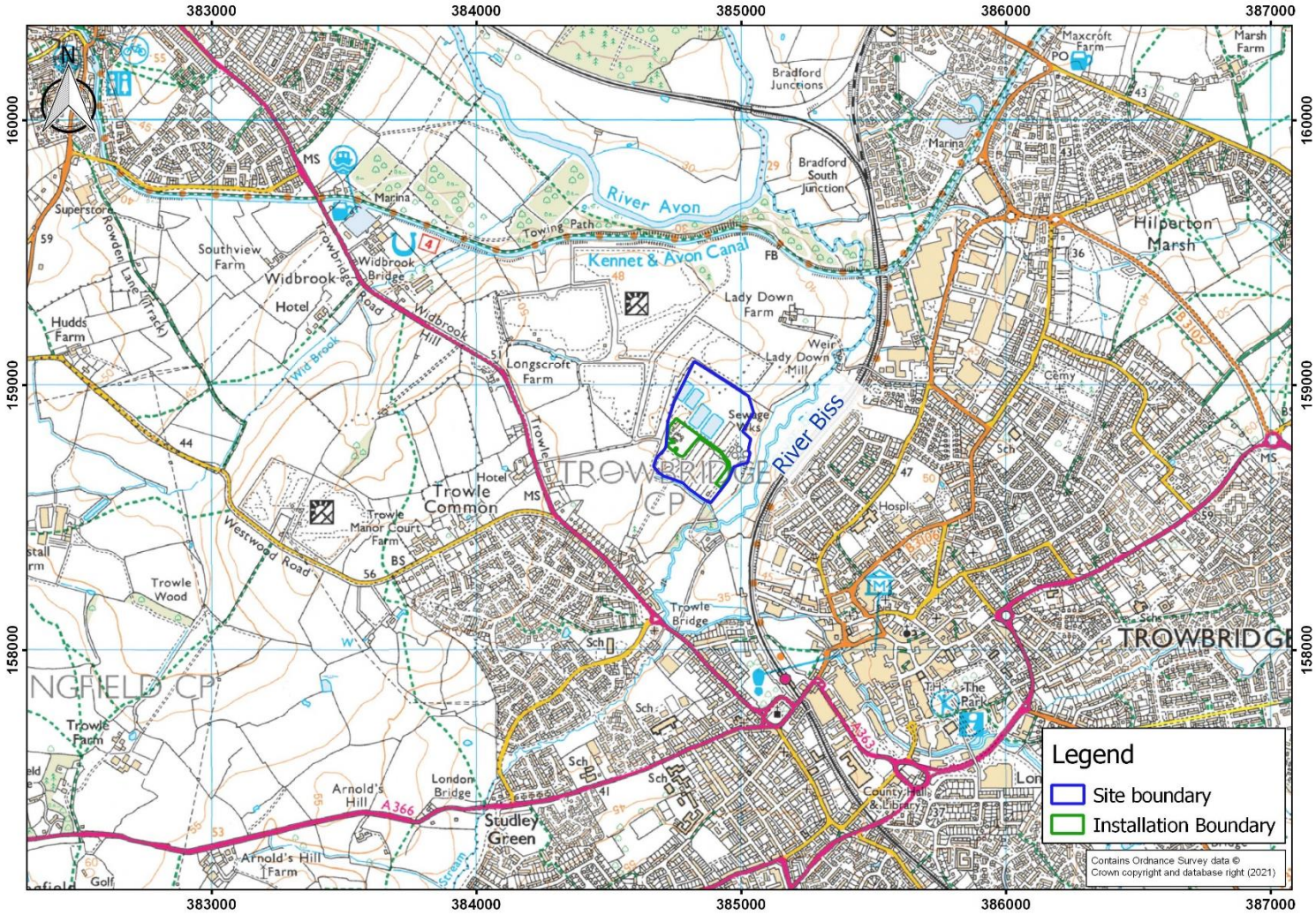
Figure 1-1 Environmental Permit Boundaries



Letter	Name
8	Boiler and CHP Stack
J	Propane Tank
R	Gas to Grid
S	CHP
V	Waste Gas Burner (Gas to Grid)

Name	Letter
Red Diesel Tank	2
S MAX Screen (to be decommissioned)	3
Liquor Fixed PS	4
Initial Skip Loading	5
Site Generator	6
Strain Presses	7
Gas Holder	A1
APD4	B1
APD5	B2
APD6	B3
APD1	B4
APD2	B5
APD3	B6
Mesophilic Digester 1	C1
Mesophilic Digester 2	C2
Siloxane Filter	D
Post Digested Tank 1	E1
Post Digested Tank 2	E2
Return Liquor Balance Tank 1	F1
Return Liquor Balance Tank 2	F2
Belt Press Building (No.2)	G1
Return Liquor PS	H
Works Liquor Return PS	I
Sludge Reception Tank	K
Gravity Belt Thickeners (No.2)	L
Belt Press Building Stack 2	N
Belt Press Building Stack 1	O
Post Thickened Tank	P
Strained Transfer Tank	Q
Boiler Building	T
Dehumidifier Chiller	W
Skip Storage Area	X
Waste Gas Burner (CHP)	Y
Pre-Thickened Tank	Z

Figure 1-2 Site Location



1.3 Operator Details

The Environmental Permit will be held by Wessex Water Services Ltd (Company Number 02366648) (the Operator). Link to Companies House is included below:

https://find-and-update.company-information.service.gov.uk/company/02366648

Director details, including dates of birth for all directors and secretaries, is included in Table 1.1. Matt Wheeldon (Director of Assets and Compliance) is the director who has completed the declaration for this application under delegated authority from Andrew Pymer.

Table 1.1 Director Details

Name	Position	Date of Birth
Ruth Esme Jefferson	Secretary	[redacted]
David Martin Barclay	Director	
Kathleen Wai Lin	Director	
David Huw Davies	Director	
Tim Gardam	Director	
James Anthony McKenna	Director	
Kate Mingay	Director	
Andrew Fraser Pymer	Director	
Fiona Clare Reynolds	Director	
Mohammed Habedat	Director	
Colin Frank Skellett	Director	
John Alexander Thompson	Director	
Kevin Charles Wall	Director	
Francis Sock Ping Yeoh	Director	
Keong Hann Yoeh	Director	

Name	Position	Date of Birth
Dato' Mark Seok Kah Yeoh	Director	[redacted]
Dato Seok Hong Yeoh	Director	

1.4 Summary of Site Activities

A summary description of all activities carried out with the Trowbridge BC is provided below.

Stationary Technical Unit	Directly Associated Activities
Anaerobic digestion of indigenous and imported sludges >100te/day	**Sludge / cake import and storage** **Sludge screening** **Sludge thickening** **Liquor balancing** **Digester boilers** **Waste gas burner (flare stack)** **Dewatering** **CHP (operated by Wessex Water Enterprises Ltd under permit reference EPR/HB3602TR)** **Gas to Grid (operated by Wessex Water Enterprises Ltd under permit reference EPR/HB3602TR)**

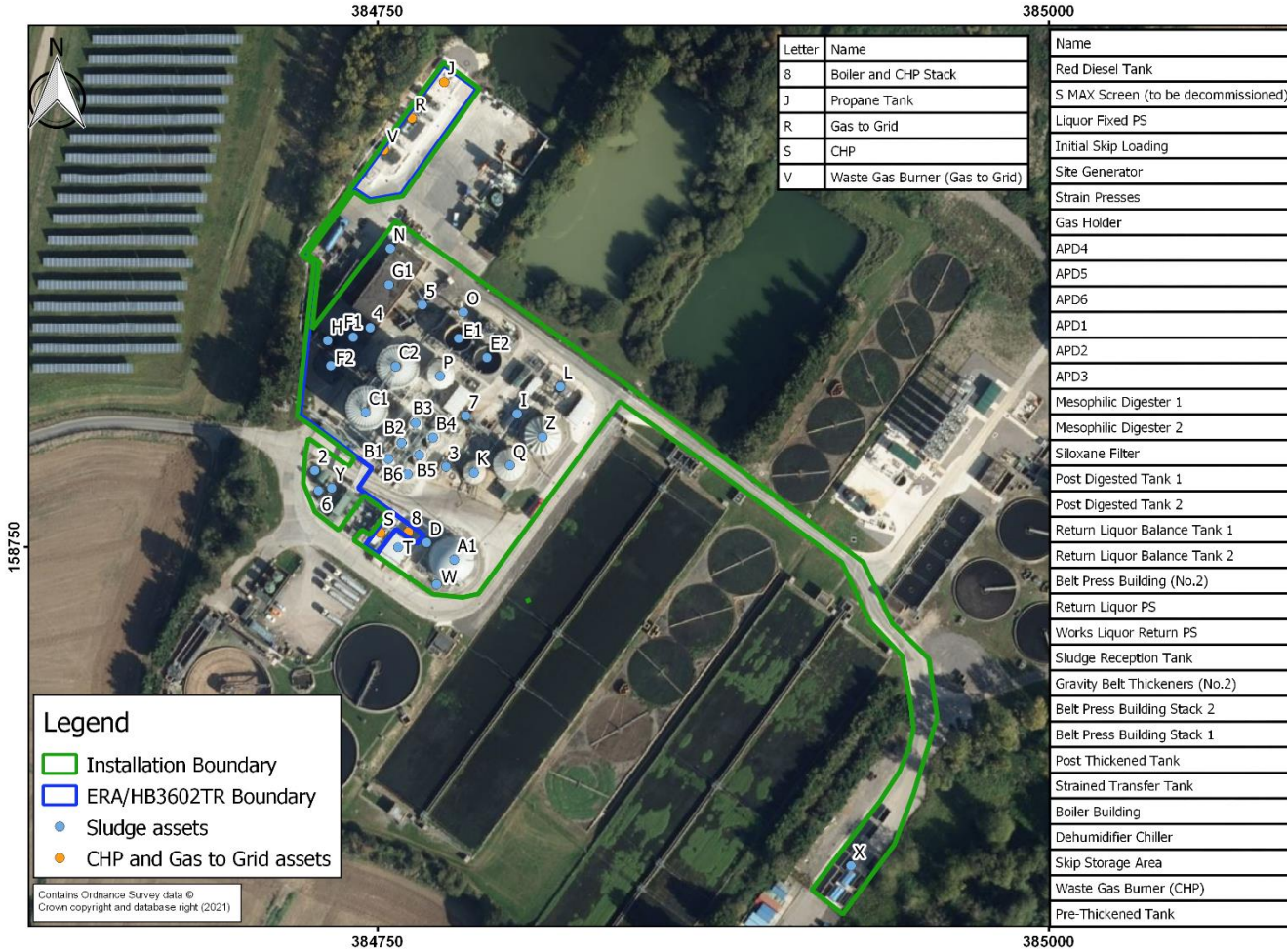
1.5 Overview of activities

The Trowbridge BC treats indigenous sewage sludges arising from sewage treatment processes operated within the wider Trowbridge WRC, as well as sewage sludges generated by smaller WW 'satellite' sewage works. The principal activities undertaken within the installation include:

- Sludge reception and screening;
- Raw sludge thickening;
- Anaerobic digestion (including associated heat generation from Digester Boiler to support AD activities);
- Liquor balancing;

- Digested sludge dewatering;
- Storage and maturation of digested sludge prior to transfer off site for land spreading as an agricultural soil conditioning agent;
- Raw material storage and use;
- Surface water and process liquor collection and transfer to Trowbridge WRC for treatment; and
- Waste storage and transfer off site.

The information below is a non-technical description of the sludge treatment process, including the key assets and associated infrastructure at Trowbridge WRC. The process is displayed pictorially in the Process Flow Diagram (PFD) as Figure 1-3. The location of the assets and infrastructure referred to are shown in Figure 1-4 Installation Boundary and Site Layout



. A Photolog of the assets is shown in **Appendix 12.**

This information will be used to identify and assess the significance of the main sources of contamination (i.e., locations where sludges and liquors are stored / transferred) at the WRC

that would have the potential to cause pollution of the ground and / or the local water environment.

Sludge treatment process

The following provides a summary description of the sludge treatment process at the Trowbridge BC. Each asset in the summary description is provided with a corresponding letter which is referenced in Figure 1-1 or 1-4 in order to show its location within the installation.

- Imported sludge is transferred from tankers into a Sludge reception tank [K], as well as primary indigenous sludge. Previously a SMAX screen [3] screened the imported sludge before being discharged into the reception tank but the asset has failed and is now decommissioned. This storage tank is also where the site's indigenous primary sludge is discharged.

- The sludge from the reception tank flow is pumped forward to the 2no. strain presses [7].

- Strained Sludge is transferred to 2no. Gravity Belt Thickeners (GBT) feed tanks via two holding tanks (strained transfer tank [Q] and pre-thickened tank [Z]). The 2no. GBTs [L] liquors are transferred to the head of the works via the return liquor PS [H].

- The thickened sludge is pumped to the Post Thickened Tank [P] before being forwarded for digestion.

- The digestion process is made up of two phases; the Acid Phase Digestion (APD) (B1 – B6) and Mesophillic Anaerobic Digestion (MAD) (C1 & C2) which make up the first phase, and Secondary Digesters making up the second phase. The 'Digester Boiler' (T) supplies heat directly to the APD (B1 – B6), which is current operated around 30 ^{o}C. Residual heat is used in the MAD (C1 & C2) to facilitate biological activity.

- Digested sludge is pumped from the Secondary Digester (E1 & E2) to two Sludge Dewatering Belts. Filtrate generated by dewatering is forwarded to two Liquor Balancing Tanks (concentration tanks) (F1 & F2) before being pumped via Filtrate Return Pumps to the head of works for treatment at Trowbridge WRC. The digested cake ('sludge cake') from the dewatering activity is conveyed into skips in the Skip Storage Area (X) before being sent off Site for disposal.

- The biogas is primarily utilised by the gas to grid system. If the biogas does not meet the required standard or the gas to grid system has failed the biogas will be utilised by the CHP and the boilers. To ensure that no biogas is vented to atmosphere the site has two waste gas burners. The gas to grid waste gas burner is operated by WWEL and the CHP waste gas burner is operated by WWSL.

- The waste gas burner design includes the provision of a gas holder with sufficient capacity (4 hours of gas generation) and the use of high integrity relief valves. Plant management includes balancing the gas system and using advanced process control.

- The CHP process is designed to optimise the use of biogas and minimise the potential for releases to air. When biogas is available it is preferentially used to power the CHP engine and provide energy to be used by the site or resold to the National Grid with

excess heat being used to maintain the optimum operational temperature of the primary digester. Note that the CHP and gas to grid activities are operated by WWEL.

- Under normal operating conditions, biogas is burned in either the CHP engine or dual fuel boilers. When biogas volumes are in excess of operational requirements and cannot be reduced sufficiently by operation of the engine and boilers, it is abated by the flare stack. The flare stack is designed and operated in accordance with Landfill Technical Guidance Note (LFTGN) 05. Records for the past year show that the CHP flare (Y) has operated for 298 hours and is therefore below the requirements for emissions testing (operational for more than 10% of a year (876 hours)). In the unlikely event that there is still excess biogas in the gasholder it is vented to air via the pressure release valve (PRVs), however this situation is only anticipated in an emergency event when all planned combustion and abatement operations are unable to operate. There are, therefore, no planned emissions of biogas to the atmosphere under normal operations. The only potential for biogas releases to air could occur in an emergency situation, whereby emergency control and shutdown procedures would be put into action.

Figure 1-3 Installation: Process Flow Diagram

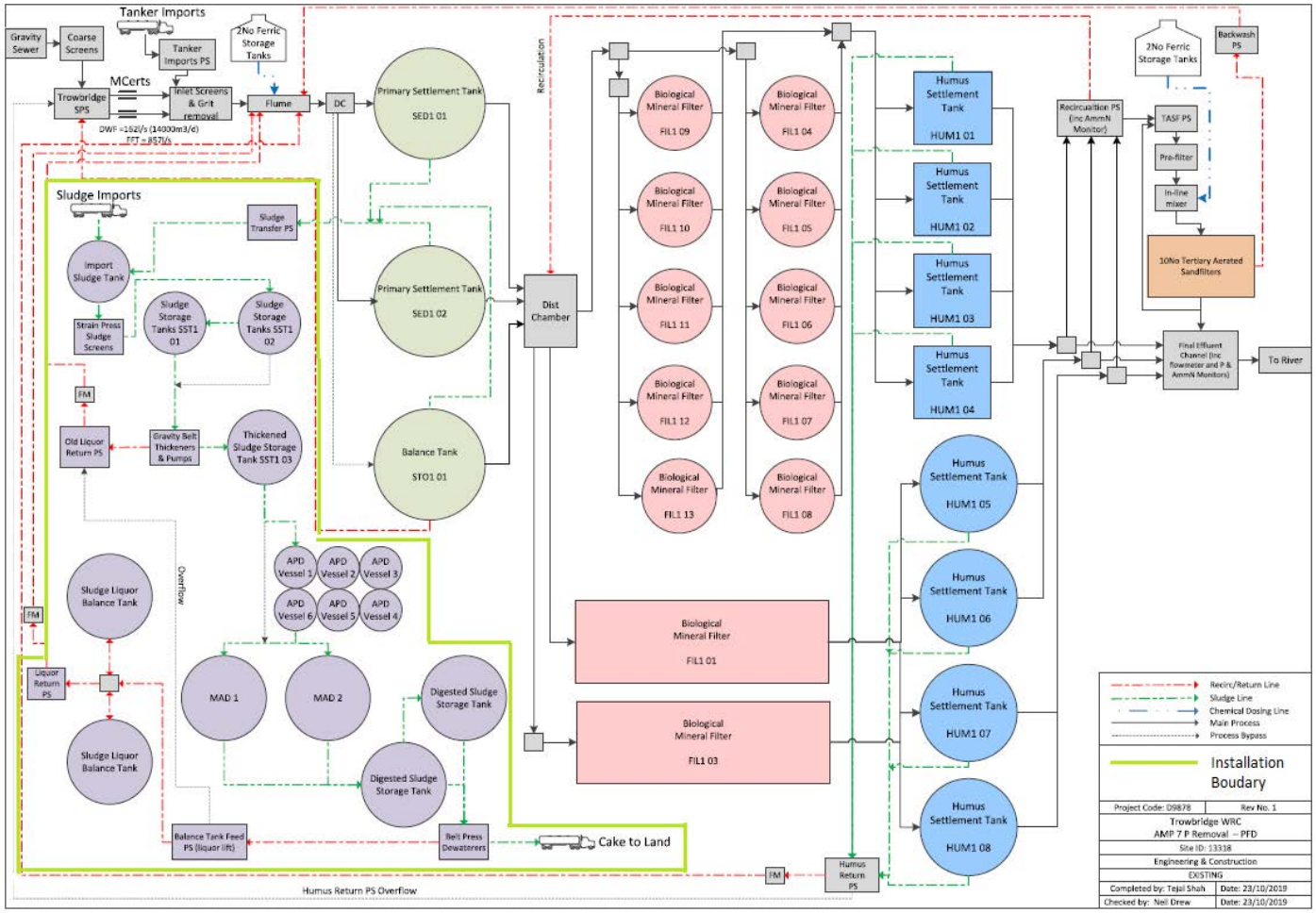
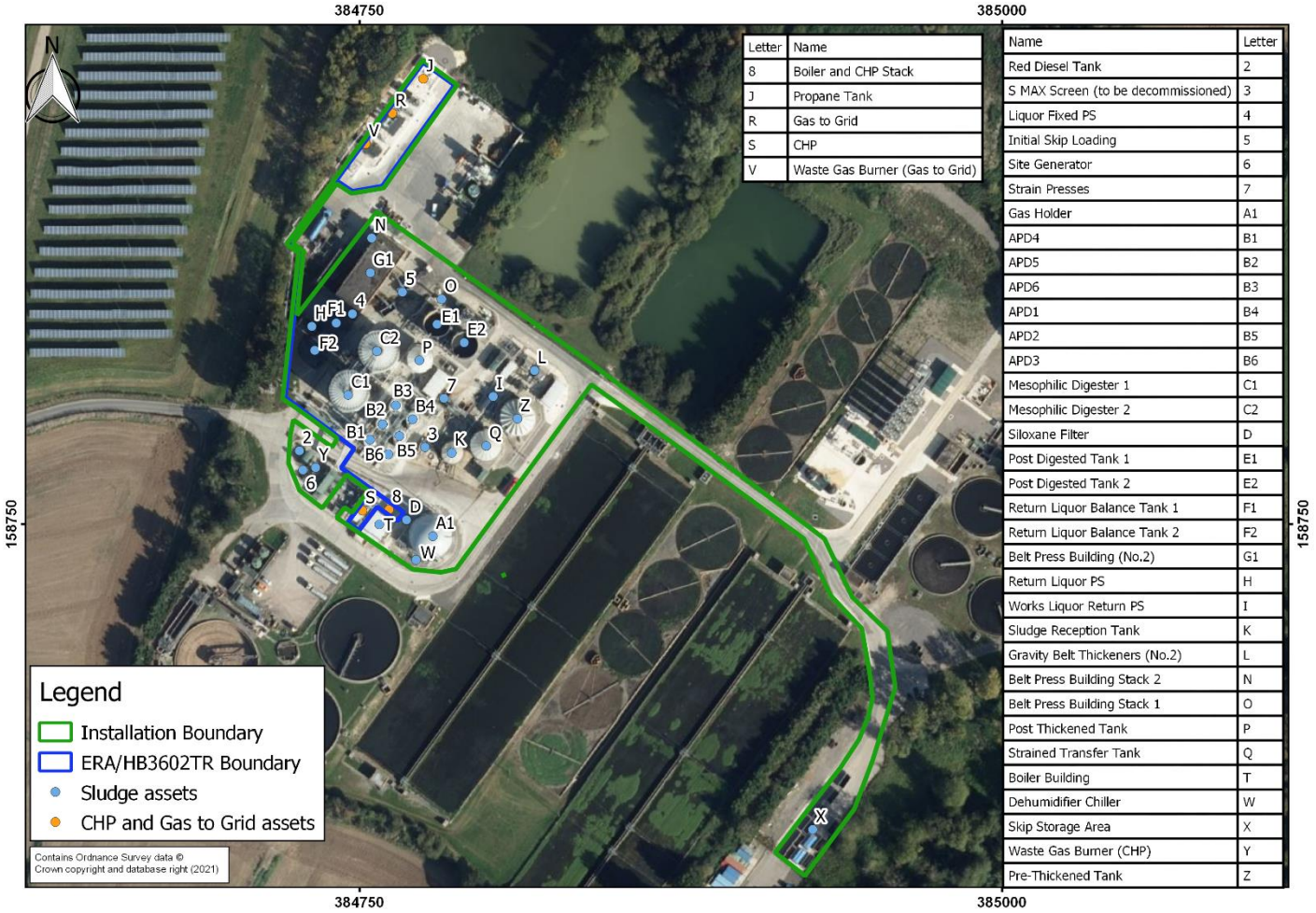


Figure 1-4 Installation Boundary and Site Layout



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APD6	B3
APD1	B4
APD2	B5
APD3	B6
Mesophilic Digester 1	C1
Mesophilic Digester 2	C2
Siloxane Filter	D
Post Digested Tank 1	E1
Post Digested Tank 2	E2
Return Liquor Balance Tank 1	F1
Return Liquor Balance Tank 2	F2
Belt Press Building (No.2)	G1
Return Liquor PS	H
Works Liquor Return PS	I
Sludge Reception Tank	K
Gravity Belt Thickeners (No.2)	L
Belt Press Building Stack 2	N
Belt Press Building Stack 1	O
Post Thickened Tank	P
Strained Transfer Tank	Q
Boiler Building	T
Dehumidifier Chiller	W
Skip Storage Area	X
Waste Gas Burner (CHP)	Y
Pre-Thickened Tank	Z

1.1 Point Source & Fugitive Emissions

Point Source Emissions to Air

Point source emissions to air from the installation are from the boilers associated with the Digester (Digester Boiler), the Siloxane Plant and the two stacks that serve the Belt Press Building. The CHP [S] will be operated under EP Ref. EPR/HB3602TR and is therefore not included as a point source emission. The locations of point source emissions to air are shown on Figure 1-4. The site operates an emergency containerised diesel generator in the event of power failure. The generator is not used for Triad or other services and operates for less than 50 hours per annum and is therefore not a Specified Generator.

The Environmental Risk Assessment (**Appendix 7**) includes further information relating to the risk posed to air from point source emissions on the Site and control measures adopted by the Operator to mitigate these risks.

Point Source Emissions to Surface Water, Groundwater and Sewer

Process effluents, that is, condensate, Belt Press liquors and other process liquors are captured and discharged to the sealed drainage system for return back to the off Installation WRC for treatment; final effluent from the WRC is discharged under EP Ref. 102153.

A robust risk assessment process (EQRA) is provided as **Appendix 6** of this application. The EQRA is based on the source-pathway-receptor model as prescribed by CIRIA 736, and in accordance with sector guidance. The EQRA and the associated risk of harm scores have been applied to provide an indication of BAT or BAT equivalent measures for the containment of fugitive emissions to ground/groundwater. A risk of harm score of less than 5 shows the source-pathway-receptor linkage to be such that the risk of significant pollution arising from a fugitive emission is sufficiently low to allow for a BAT or BAT equivalent justification to be determined.

The Environmental Risk Assessment (**Appendix 7**) includes further information relating to the risk posed to surface water, groundwater and sewage from the proposed operations and control measures adopted by the Operator to mitigate these risks.

Fugitive Emissions to Surface Water, Groundwater and Sewer

Any accidental spills are captured and directed to the sealed drainage system for discharge to the “off Installation”, but “on site” WRC for treatment.

A robust risk assessment process (EQRA) is provided as **Appendix 6** of this application, which includes an assessment of the leak prevention systems in place on the Site.

The Environmental Risk Assessment (**Appendix 7**) includes further information relating to the risk posed to surface water, groundwater and sewage from the proposed operations and control measures adopted by the Operator to mitigate these risks.

Odour

The Operator has an Odour Management Plan (**Appendix 8**) which is implemented on Site.

Monitoring

The Operator will conduct regular visual checks as part of their inspection regime, which will include observing and actioning any potential risks to the environment from fugitive

emissions e.g. pests, vermin, litter, mud, dust, noise and odour. The Environmental Risk Assessment (**Appendix 7**) provides further information with regard to inspection regimes.

1.2 Management

WW will operate an Environmental Management System (EMS) in line with prevailing Environment Agency guidance – How to Develop a Management System: Environmental Permits (2020)1 and BAT 1. A summary of the EMS is shown in **Appendix 3**.

A Technically Competent Manager (TCM), Dan Selby, will be present on the Site. Dan has a WAMITAB Level 4 Medium Risk Operator Competence qualification for Non-Hazardous Waste Treatment and Transfer, which was awarded in January 2020. Dan's qualification includes two optional units; 'transfer and disposal from non-hazardous waste treatment and recovery operations' and 'managing site operations for the treatment of non-hazardous waste'. A copy of Dan's certificate is provided in **Appendix 2.**

WW is certified to ISO 9001 and is subject to the WW group policies, to include noise and odour. Compliance with the policies and procedures is monitored by Group Audit.

1.3 Raw Materials

Raw materials used in the installation include Polyelectrolyte, Diesel, Antifoam, Ferric Sulphate and Oil. Details for these raw materials, including maximum amount stored on the Site and annual throughput (both in cubic metres), are included in Section III Supporting Information. Volumes are used in place of tonnes as these raw materials are liquids and any conversion factor used would result in an inaccurate figure.

In the wider Site, Potable Water and Final Effluent are used. Details are not provided for these raw materials, as the amounts used vary wildly and it would be incredibly difficult to separate and calculate what proportion are used within the Installation.

1.4 Waste

Waste from the sludge screen is routinely collected from the Site by a registered waste carrier, for disposal. Sewage sludge is routinely treated to a standard that allows the sludge to be recovered for agricultural benefit.

1.5 Energy

The Operator has a dedicated Energy Team within the business and strives to ensure their energy usage is as efficient as possible and that energy is managed on the Site. The Operator has regular Energy Savings Opportunity Scheme (ESOS) audits to identify areas of improvement. Further information can be found in the Energy Management Plan (**Appendix 10**).

Energy is generated on the Site by the Combined Heat & Power (CHP) facility, which is operated under a separate EP Ref. EPR/HB3602TR, and from mains electricity.

1 Develop a management system: environmental permits - GOV.UK (www.gov.uk)

1.6 Environmental Accidents / Incidents

The Operator will implement an Accident Management Plan (AMP) (**Appendix 11**) which will form part of the EMS for the Site. The AMP includes how the Operator will identify and manage environmental accidents and incidents which may occur on the Site e.g. breakdown of equipment, spills / leaks, fires, flooding, utility failure etc.

1.7 Noise and Vibration

WW have a company-wide Noise Management Policy (NMP). The purpose of the NMP is to ensure that impacts associated with noise and vibration are dealt with appropriately during the design, construction, maintenance and operation of WW assets. The NMP requires that WW conduct a noise survey to assess the impact of any new assets, during installation and commissioning, to determine whether a proposed development is at risk from creating noise nuisance.

A Noise and Vibration Risk Assessment (**Appendix 9**) has been prepared in accordance with prevailing EA Guidance and in line with BAT conclusions 17 & 18. The Noise and Vibration Risk Assessment concludes that the risk posed to nearby sensitive receptors by the biological treatment operations is low.
Noise is minimised by appropriate design and the planned reliability centered maintenance will ensure appropriate maintenance and servicing schedules. Vehicle movement is confined to sludge tankers, operational service vehicles and deliveries. Road layout is designed to ensure safe vehicle movements minimizing manoeuvring requirements where possible.

1.8 Site Closure

A Site Condition Report has been prepared as part of the installation application. This Site Condition Report (**Appendix 4**) has been prepared in accordance with EA H5 'Site Condition Report' Guidance'.

1.9 Installation - Operators

In the Wessex Water Group, there are two companies: Wessex Water Services Ltd and Wessex Water Enterprises Ltd. The former being the economically regulated water and sewerage company. The latter being a commercial trading company producing power, heat, gas etc.

The two companies trade services between each other, and ownership of assets is clearly defined.

It is the intention that all EP's held on the Site, by WWSL and WWEL, will remain in place following the variation of the EP Ref. EPR/BB3934AG.

1.10 Emission Benchmarks

The rated thermal input of the two Digester Boilers is 0.75 MWth each. As the boilers are existing, having been put into operation before 20 December 2018, aggregation is not required. The boilers do not operate as a combined heat and power combustion plant and therefore are not generators. Therefore, the boilers are excluded from Medium Combustion Plant Directive and specified generator controls.

The diesel-powered backup generator is only used during an emergency and doesn't operate for more than 50 hours a year, this includes the time spent under testing. The generator is therefore excluded from specified generator regulations.

1.11 Impacts

Receptors were identified using local knowledge of the area and appropriate web-based searches and other existing information to assess the impact of the installation on the surrounding environment. The Environmental Risk Assessment (**Appendix 7**) includes the impacts posed by the installation and the mitigation measures proposed by the Operator to minimize the impact on the environment.

1.12 Habitats Regulations

A Nature and Heritage Conservation Screening Report has been completed by the Environment Agency for the Site (**Appendix 13**). The Nature and Heritage Conservation Screening Report identifies a number of protected sites; however, no sites are located within 2 km of Trowbridge BC.