

1 Non-technical summary

1.1 Overview of the site and activities

Budds Farm is a Sludge Treatment Centre (STC) (also known as the “Site”) and an associated Wastewater Treatment Works (WTW). The address of the Site is Southmoor Lane, Havant, Hampshire, PO9 1JW with the National Grid reference: SU 70722 05539.

The WTW is operated under the Urban Wastewater Treatment (England and Wales) Regulations 1994 and has a standalone Water Discharge Activity Environmental Permit, that will remain an independent permitted activity.

The STC operation is a non-hazardous waste activity which is currently carried out under registered S1, D5, S2 and U6 exemptions. The waste activity comprises imports, physio-chemical and anaerobic digestion treatment, and the storage of waste, all for recovery purposes. The STC handles waste derived from the wastewater treatment process, either indigenously produced on-site or imported from other Southern Water owned assets.

The site currently has two Environmental Permits in operation. Permit EPR/AP3392HG is a tankered waste permit existing on-site and permit EPR/ZP3235XJ, allows for the running of two biogas fuelled combined heat and power (CHP) engines. The CHP engines generate electricity for the site, one is classed as a tranche A and one as a tranche B. Several directly associated activities (DAAs) are also permitted and include sludge and cake reception, storage and blending, treatment of grit and screenings and dewatering.

Southern Water wishes to vary permit EPR/KB3435RB into an installation permit for the Site into a single consolidated permit to include:

- Anaerobic digestion of sludge
- Acceptance of waste to the head of the works (as a waste activity)

The CHPs and boilers will be DAA's to the installation activity, with an additional waste activity for the acceptance of waste to the head of the works.

Anaerobic digestion of sludge

As advised by the Environment Agency through consultation at WaterUK Waste and Recycling Network and a letter sent to all Water and Sewage Companies at director level in July 2019, Southern Water is applying to vary the above mentioned existing bespoke permits into a Bespoke Installation Permit for the STC waste activity. Following a joint decision made by Environment Agency and DEFRA that AD treatment facilities at WTW STCs are covered by the Industrial Emissions Directive and can no longer operate under standard environmental permits or exemptions.

The primary permitted installation activity will be the AD treatment facility. The AD facility will treat indigenously produced and imported sludges. Permitted Directly Associated Activities (DAAs) will be the import of waste from other WTW assets; the physio-chemical treatment of imported and indigenously produced sludges; the storage of indigenously produced sludges, imported sludges and the sludge cake from the AD facility; the storage of biogas derived from the AD treatment of waste and the combustion of biogas in an on-site Combined Heat and Power plant (CHP). In the event the CHP cannot run in an emergency or due to operational issues, biogas will be combusted via an on-site flare stack and/or back-up boiler system.

Acceptance of liquid sludge waste (digestate) at post digestion, for dewatering.

Post digested liquid sludge (digestate) from other Southern Water sites enters at the post digestion tanks, for dewatering at the centrifuges. The process aligns with the process description of the anaerobic digestion from the post digestion tanks onwards. The activity is a contingency measure, whereby there is limited capacity at other sites to dewater digestate, for example process shutdown.

Acceptance of waste to the head of the works

Southern Water wishes to remain able to accept waste to the head of the works. This is currently carried out under permit AP3392HG. The tankered liquid waste is discharged to the dedicated reception facilities, before joining the incoming, indigenous flows, from the sewer network, into the head of works to be treated through the WtW. The total annual tonnage to be accepted will remain at 339,202 wet tonnes.

1.2 Overview of the STC process

Budds Farm STC is the largest STC operated by Southern Water and currently treats indigenous sludge from Havant and Eastney Wastewater Pumping Stations (WPS), as well as accepting imported liquid sludge and sludge cake.

Imported raw sludge cake is discharged into the raw cake reception point and then blended with surplus activated sludge (SAS) from the 2 No. SAS tanks (979m³ each) before being pumped to the 2 No. thickened sludge storage tanks (866m³ each).

The fraction of SAS not blended with imported raw cake is thickened by 5 No. drum thickeners before being stored in the 2 No. thickened sludge storage tanks (866m³ each).

Imported liquid sludge is received in 1 No. sludge reception tank (142m³). Indigenous sludge is transferred to 2 No. sludge holding tanks (156m³ each). It then joins the imported liquid sludge as it is pumped through 2 No. strain presses and stored in 2 No. screened sludge storage tanks (135m³ each). From here it is passed through 2 No drum thickeners before being stored in the 2 No. thickened sludge storage tanks (866m³ each).

Thickened sludge is fed to 5 No. anaerobic digesters (2750m³ each) operating between 33 to 38°C. The temperature is automatically maintained by heat exchangers. All tanks capable of producing biogas are sealed and connected to the biogas system.

Digested sludge is transferred to 2 No. post digestion storage tanks (866m³ each) before being dewatered by 3 No. centrifuges. Lime is injected to digested sludge during dewatering which enables digested sludge cake to be disposed to farmland directly from 1 No. cake storage silo (220m³).

Biogas produced from these tanks are stored within 1 No. biogas holder (2100m³) before being combusted at high temperatures within 2 No. CHPs (1 No. 5.04MWth and 1 No. 2.59MWth) or 3 No. dual fuel boilers (2.81MWth each) where it is used to generate heat (i.e. to control the temperature of the digestion process) and electricity for the Site. Excess gas is burned in the 1 No. flare stack.

SAS and raw sludge thickener filtrate, centrate from the dewatering centrifuges and biogas condensates all gravitates to the liquor sump. The sludge liquor is then routed to the Havant PST flow distribution chamber.

All tanks and key equipment are covered or enclosed and connected to either the biogas system or OCU.

Odour from the main sludge treatment building, containing the sludge cake reception and all primary sludge treatment processes is controlled via 1 No. Odour Control Unit (OCU), a

chemical scrubber system with total flow rate of 53,100 m³/hour (there is no carbon filter). Treated odour streams are discharged into the environment through OCU stack and are monitored hourly to ensure the absence of odorous compounds.

A Cobra Odourmaster Mobile unit is retained on site for emergency or unexpected odour and/or dust emissions, this unit sprays a fine mist which suppresses odour and dust.

Treated air is dispersed via a 14m stack to the atmosphere, process parameters including pH, chlorine concentration, redox value and chemical tank levels are continuously monitored and trended on the Supervisory Control and Data Acquisition (SCADA) system.

The specifications of the combustion plant are presented in Table 1.1.

Table 1.1: Combustion Plant Details

	CHP1	CHP2	Boiler 1, 2, 3
Make/Model Number	CAT G3520	MTU 12V4000L32FB	Strebel Boiler RU3S 11
Date that MCP became operational/was commissioned	April 2008	2017	2002
Thermal Input (MWth)	5.04	2.59	2.81
Stack height (m)	15	8.3	15
Fuel used (biogas, diesel etc)	Biogas	Biogas	Biogas or natural gas
Estimated total hours of operation per year (based on data collected between May 2023-May 2024)	Unrestricted	Unrestricted	Boiler 1: 1261 Boiler 2: 542 Boiler 3: 332
MCPD and SG Regs status	Existing MCP Tranche A	Existing MCP Tranche B	Existing MCP

The IED permit will include:

- 5 No. Anaerobic digesters (2,750m³ each) (covered)
- 2 No. Strainpresses (covered)
- 2 No. sludge holding tanks (156m³ each) (covered)
- 2 No. screened sludge storage tanks (135m³ each) (covered)
- 2 No. thickened sludge storage tanks (TSST) (866m³ each) (covered)
- 2 No. post digestion storage tanks (PDST) (866m³ each) (covered)
- 2 No. surplus activated sludge (SAS) holding tanks (979m³ each) (covered)
- Reception areas:
 - 3 No. Tankered waste reception areas (for cess, chemical toilet and tankered trade waste)
 - Tankered waste reception area 2 also includes 1 No. tankered trade waste reception tank (1032m³)
 - 1 No. Cake waste reception area (covered)
 - 1 No. Sludge reception area including 1 No sludge reception tank (142m³) (covered)

- 1 No. Cake silo (220m³) (covered)
- 1 No. Alternative cake bay (40 tonnes) (covered)
- 7 No. Drum thickeners (covered)
- 3 No. Dual fuel boilers (biogas/natural) (2.81MWth each)
- 2 No. CHP units (1 No. 5.04MWth and 1 No. 2.59MWth)
- 1 No. Biogas burner (flare stack)
- 1 No. Gas bag holder (2,100m³)
- 1 No. OCU (wet chemical scrubber system – no carbon filter)
- 3 No. Centrifuges (covered)
- 1 No. Liming tank (21m³) (covered)
- 2 No. Alternative sludge holding tanks (784m³ each) (covered)

The following are the outputs from the process:

- Liquors from the STC process are recirculated through the WTW system via the Havant PST flow distribution chamber.
- Screenings and grit – deposited into skips before being removed off-site.
- Biogas – stored in an existing gas holder, then either:
 - Burnt in the CHP or back-up boilers to generate electricity for use on-site
 - Flared in the waste biogas burner.
- Cake – stored in a cake storage silo prior to being shipped off-site for recycling to agriculture (soil conditioner).

1.3 Summary of key technical standards

Table 1.2 lists the technical guidance notes (TGNs) used to inform the techniques and measures proposed to prevent and reduce waste arising and emissions of substances, including during periods of start-up and shut down, momentary stoppage and malfunction, and leaks.

Table 1.2: Part C3, Question 3a, Table 3a: Technical standards

Installation name		
Budds FarmSTC		
C3 – Installation		
Description of the schedule 1 activity or directly associated activity	Best available technique (BATC, BREF or TGN reference)	Document reference
Section 5.4 non-hazardous waste installation - anaerobic digestion installation regulated under the Industrial Emissions Directive, utilisation biogas for energy	<ul style="list-style-type: none"> • Biological waste treatment: appropriate measures for permitted facilities • Non-hazardous and inert waste: appropriate measures for permitted facilities 	<ul style="list-style-type: none"> • https://www.gov.uk/guidance/biological-waste-treatment-appropriate-measures-for-permitted-facilities/1-when-appropriate-measures-apply • https://www.gov.uk/guidance/non-hazardous-and-inert-waste-appropriate-measures-for-permitted-facilities
Section 5.4 non-hazardous waste installation – liquor treatment.		
B4 – Waste activities		
Description of the waste operation	Appropriate measure (TGN reference)	Document reference

Installation name	Budds FarmSTC	
Acceptance of digestate for dewatering	<ul style="list-style-type: none"> ● Non-hazardous and inert waste: appropriate measures for permitted facilities ● Biological waste treatment: appropriate measures for permitted facilities 	<ul style="list-style-type: none"> ● https://www.gov.uk/guidance/non-hazardous-and-inert-waste-appropriate-measures-for-permitted-facilities ● https://www.gov.uk/guidance/biological-waste-treatment-appropriate-measures-for-permitted-facilities/1-when-appropriate-measures-apply
General		
All activities	Guidance	Document reference
	<ul style="list-style-type: none"> ● Monitoring stack emissions: technical guidance for selecting a monitoring approach ● M1 sampling requirements for stack emission monitoring ● Environment Agency environmental permitting guidance, including: ● Risk assessments for your environmental permit ● Energy efficiency (Energy efficiency for combustion and energy from waste power plants) ● Noise assessment and control ● H4 Odour management ● H5 Site condition report ● Control and monitor emissions for your environmental permit 	<ul style="list-style-type: none"> ● https://www.gov.uk/guidance/monitoring-stack-emissions-technical-guidance-for-selecting-a-monitoring-approach ● https://www.gov.uk/government/publications/m1-sampling-requirements-for-stack-emission-monitoring ● https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit ● https://www.gov.uk/guidance/energy-efficiency-standards-for-industrial-plants-to-get-environmental-permits ● https://www.gov.uk/government/publications/noise-and-vibration-management-environmental-permits ● https://www.gov.uk/government/publications/environmental-permitting-h4-odour-management ● https://www.gov.uk/government/publications/environmental-permitting-h5-site-condition-report ● https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit

1.4 Revisions since 2022 application submission

The application was first submitted in 2022. This Main Supporting Document includes details that have been updated following feedback received over the past three years in relation to IED permit applications for the anaerobic digestion of sewage sludge. Table 1.3 provides a summary of the stand-alone documents included as part of this application, and the amendments where applicable. Where a document has not been amended due to it being remaining applicable, the original reference number remains unchanged. Where a document has been updated this document will supersede any previous versions.

Table 1.3: Summary of revisions

Document name	Latest document reference	Summary of amendments
Main supporting document	790101_MSD_Main_BUD January 2025	Resubmitted – updated to include wider feedback from the Environment Agency and response to Request for Information December 2024.
Environmental Risk Assessment	790101_ERA_BUD January 2025	Resubmitted – updated to include the addition of ‘firewater’ management into App B table, flare and CHP information and incidents of storming.
Environmental Constraints Maps	790101_ERA_Maps_BUD February 2024	Resubmitted. Human receptor map screening distance increased to 2km
Bio-aerosol Risk Assessment	790101_ERA_BioaRA_BUD February 2024	Resubmitted – updated to include bio-aerosol monitoring proposals and new windrose.
Odour Management Plan	790101_ERA_OdourMP_BUD January 2025	Resubmitted – updated to include feedback from the Environment Agency and response to Request for Information December 2024.
Climate Change Risk Assessment	790101_ERA_CCRA_BUD	No change. To be included as part of the management system for the site.
Site Condition Report	790101_MSD_SCR_BUD January 2025	Site scope defined and screening distances clarified in relation to STC permit boundary. Updated in response to Request for Information December 2024.
BAT analysis	790101_MSD_BAT_BUD January 2025	Resubmitted – updated to include changes by Southern Water and wider feedback from the Environment Agency and response to Request for Information December 2024.
Site Layout and Location Plan	790101_MSD_SiteLayoutPlan_BUD January 2025	Resubmitted – updated to reflect proposed secondary containment, liquor transfer point, liquor sampling point and changes to point source emissions in response to Request for Information December 2024.
Drainage Plan	790101_MSD_DrainagePlan_BUD	No change
Schematics	790101_MSD_Schematics_BUD January 2025	Resubmitted – updated to include separation of AD and waste activities in response to Request for Information December 2024
Environmental Management System Certificate	790101_MSD_EMS December 2023	Resubmitted. Certificate has been renewed.
Relevant Offences	790101_MSD_RelevantOffences December 2023	Updated to December 2023.
Details of Directors	790101_MSD_Directors February 2024	Up to date at time of resubmission in February 2024.
Competency assessment certificates	790101_MSD_CompetencyAssessmentCertificates	Retracted, and replaced with Competency Management System.
Competency Management System	790101_MSD_CMS December 2023	Substitutes CoTC assessment certificates
Material Safety Data Sheets	790101_MSD_MSDS_BUD February 2024	Updated at time of resubmission in February 2024.
Leak Detection and Repair Plan	790101_MSD_LDAR_BUD February 2024	Additional document

Duty of Care	790101_MSD_DutyofCare_BUD February 2024	Additional document but superseded by the Waste Acceptance document listed below.
Waste Acceptance	790101_WasteAcceptance_BUD January 2025	Additional document - supersedes 790101_MSD_DutyofCare_BUD February 2024
CIRIA assessment and modelling	790101-MMD-IED-BUD-CA-C-001- IED ADBA tool P02 January 2025	Additional document. updated as part of response to Request for Information December 2024 Supersedes 790101-MMD-IED-BUD-CA-C-001 Do nothing(Tank Failure Only) 790101-MMD-IED-BUD-CA-C-001 Do nothing(With Rainfall) 790101-MMD-IED-BUD-CA-C-001 Option 1(Tank Failure Only) 790101-MMD-IED-BUD-CA-C-001 Option 1(With Rainfall) 790101-MMD-IED-BUD-CA-C-001 Option 2(Tank Failure Only) 790101-MMD-IED-BUD-CA-C-001 Option 2(With Rainfall)
Residue Management Plan	790101_MSD_ResidueMP_BUD January 2025	Updated to include wider feedback from the Environment Agency and responses to Request for Information from other sites.
Accident Management Plan	790101_MSD_AMP_BUD February 2024	Additional document.
Updated containment overview	790101_MSD_ContainmentOverview_ BUD February 2024	Additional document – Superseded by 790101-MMD-IED-BUD-CA-C-001-IED ADBA tool P02 January 2025.
Implementation Plan	790101_MSD_ImplementationPlan December 2023	Additional document
Form Part A	790101_App_PartA_BUD	No change
Form Part B4	790101_App_PartB4_BUD January 2025	Additional document, in response to Request for Information December 2024
Form Part C2	790101_App_PartC2_BUD	No change
Form Part C3	790101_App_PartC3_BUD	No change
Form Part B6	790101_App_PartB6_BUD	Additional document (not previously required)
Form Part F1	790101_App_PartF1_BUD	No change
Envirocheck Report	790101_MSD_SCR_BUD_AppB_Envi rocheck	Additional document, updated as part of response to Request for Information December 2024
Waste transfer notes	790101_WasteTransferNotes_BUD January 2025	Additional document, updated as part of response to Request for Information December 2024
Sampling proposal	790101_Sampling proposal_BUD January 2025	Additional document, updated as part of response to Request for Information December 2024
Appropriate Measures Assessment	790101_Appropriate Measures_BUD January 2025	Additional document, included as part of response to Request for Information December 2024