1 Non-technical summary

1.1 Overview of the site and activities

Motney Hill is a Wastewater Treatment Works (WTW) and Sludge Treatment Centre (STC). The address for the Site is Motney Hill Road, Lower Rainham, Gillingham, Kent ME8 7UA (National Grid Reference: TQ 8295 6838). The WTW is operated under the Urban Wastewater Treatment Regulations and has a standalone Water Discharge Activity Environmental Permit, this will remain an independent permitted activity. The STC operation is a non-hazardous waste activity which is currently carried out under a (registered T21 exemption). The waste activity comprises imports, physio-chemical and anaerobic digestion (AD) treatment, and the storage of waste, all for recovery purposes. The STC solely handles waste derived from the wastewater treatment process, either indigenously produced on-site or imported from other Southern Water owned assets.

As advised by the Environment Agency through consultation at the 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 for a Bespoke Installation Permit for the STC waste activity, as a joint Environment Agency and DEFRA decision has been made that AD treatment facilities at WTWs and STCs are covered by the Industrial Emissions Directive and can no longer operate under T21 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 produces 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.

With the changes on the Environmental Permitting Regulations due after 2023, fats, oil and grease and food wastes will be treated (in the future) in the AD facility and co-digested to improve the quality of cake produced and the biogas yields produced for combustion in the on-site CHP.

1.2 Overview of the process

The Site is an STC with liquid sludge import facilities, but it does not regularly receive sludge imports. Indigenous primary sludge is screened and stored in 1 No. Sludge Reception Tanks (previously as picket fence thickeners), then thickened by 2 No. duty / standby gravity belt thickeners. Surplus activated sludge (SAS) is stored in 2 No. SAS storage tanks and thickened by 3 No. drum thickeners. Thickened sludge is mixed in 1 No. thickened sludge storage tank.

Thickened sludge is fed to 2 No. conventional mesophilic anaerobic digesters operating at round 35°C. Digested sludge is stored in 1 No. post digestion sludge storage tank before being dewatered by 2 No. duty, standby centrifuges. Dewatered digested cake is stored on-site before being transported off-site for recycling to farmland. Biogas produced by the digesters is used by CHP to generate electricity. Centrate and liquor from the sludge thickeners gravitates to the liquor balancing tank, before being returned by the liquor pumping station to the head of secondary treatment. This arrangement sends significant extra loads of solids and biochemical

oxygen demand (BOD) to secondary treatment from the return liquor without primary settlement but is necessary to prevent liquors being sent to storm overflow of settled sewage when flows are in excess of 813 l/s.

The IED permit will include:

- Sludge reception tank 1 No (300m^3).
- Sludge screens (duty/standby) 2 No. (6mm 2d)
- Gravity belt thickener feed tanks 2 No. (293m^3)
- Gravity belt thickeners 2 No.
- SAS storage tanks 2 No. (614m^3)
- SAS drum thickeners 3 No.
- Thickened sludge storage tank 1 No. (2,035m^3)
- Digesters 2 No. (4,500m^3 and 3,500m^3)
- Post digestion storage tank 1 No. (2,035m^3)
- Emergency storage tank 1 No. (2,275m^3)
- Centrifuges 2 No.
- Liquor balancing tank 1 No. (345m^3)
- Cake storage bays 7 No. (6,500m^2) with volumetric storage capacity of approximately 8,500m^3
- CHP unit 1 No.
- Auxiliary boiler 4 No. (duel fuel: biogas or gas oil):
  - Digester 1, boiler 1: 300Kw, boiler 2: 510kW;
  - Digester 2, boiler 1: 582Kw, boiler 2: 670kW;
- Gas bag holder 1 No. (780m^3)
- Biogas burner (flare) 2 No.
- Standby generators 2 No. (1 No. 1,500kW for WTW and 1 No. 516kW for STC). Both run on gas oil.

The following are outputs from the process:

- Cake (dewatered post digestion sludge) - stored in cake bays before being shipped for use as a fertiliser;
- Bio-gas - stored in an existing gas holder, then passed through siloxane filters, then either:
  - Burnt in CHPs, with the power exported to the grid;
  - Flared in the waste biogas burner.
- Grit and screenings (small amount) ‑ deposited in skips before taken off-site.

1.3 Summary of key technical standards

Table 1.1 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 1.1: Part B3, Question 3, Table 3a - Technical standards

Installation name	Motney Hill STC	
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	• How to Comply with Your Environmental Permit Additional Guidance for Anaerobic Digestion • Best available techniques (BAT) conclusions, for the recovery and disposal of hazardous and non-hazardous waste (SGN S5.06)	• https://www.wiseenvironment.co.uk/wp-content/uploads/2020/07/ How-to-Comply-with-Your-Environmental-Permit-Additional-Guidance-for-Anaerobic-Digestion.pdf • http://eippcb.jrc.ec.europa.eu/reference/BREF/BATC_CWW.pdf • https://www.gov.uk/government/publications/sector-guidancenote-s506-recovery-anddisposal-of-hazardous-and-nonhazardous-waste
General	• How to comply with your environmental permit • 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 – H2 Energy efficiency (Energy efficiency for combustion and energy from waste power plants) – H3 Noise assessment and control – H4 Odour management – H5 Site condition report – Control and monitor emissions for your environmental permit	• https://www.gov.uk/government/publications/how-to-comply-withyour-environmental-permit • 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/government/publications/energy-efficiencyfor-combustion-and-energyfrom-waste-power-plants • https://www.gov.uk/government/publications/environmentalpermitting-h3-part-2-noiseassessment-and-control • https://www.gov.uk/government/publications/environmentalpermitting-h4-odourmanagement • https://www.gov.uk/government/publications/environmentalpermitting-h5-site-conditionreport • https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit

Source: Mott MacDonald

1.4 Additional information

The following application forms have been completed to support the application and have been submitted as stand-alone documents:

- Part A: About You (Document reference 790101_App_PartA_MOT)
- Part B2: Varying a bespoke permit (Document reference 790101_App_PartB2_MOT)
- Part B3: Variation to a bespoke installation permit (Document reference 790101_App_PartB3_MOT)
- Part F1: Charges and declarations (Document reference 790101_App_PartF1_MOT)

The main body of the Permit application document ('the Main Supporting Document') includes all the supplementary information required in response to relevant questions within the Part A,

Part B2, Part B3 and Part F1 application forms for which there was insufficient space on the forms to answer the questions in full.

The Environmental Permit variation application document ('the Main Supporting Document') consists of two main parts:

- Chapter 5 provides the general information required to inform Part B2 relating to the variation of a bespoke permit; and
- Chapter 6 provides the more detailed information required to inform Part B3 relating to the variation of a bespoke installation permit.

Part F1 covers the required financial information required for payment of the application fee.

Additional information included as part of this submission and not as stand-alone documents, are found in the following appendices:

- Appendix A – European Waste Catalogue (EWC) Codes

Stand-alone documents included as part of this submission, are detailed below:

- Environmental Risk Assessment – Document reference 790101_ERA_MOT
- Environmental Constraints Maps – Document reference 790101_ERA_Maps_MOT
- Bio-aerosol Risk Assessment – Document reference 790101_ERA_BioaRA_MOT
- Odour Management Plan - Document reference 790101_ERA_OdourMP_MOT
- Climate Change Risk Assessment – Document reference 790101_ERA_CCRA_MOT
- Site Condition Report – Document reference 790101_MSD_SCR_MOT
- BAT analysis - Document reference 790101_MSD_BAT_MOT
- Site Layout and Location Plan – Document reference 790101_MSD_SiteLayoutPlan_MOT
- Drainage Plan – Document reference 790101_MSD_DrainagePlan_MOT
- Schematics - Document reference 790101_MSD_Schematics_MOT
- Environmental Management System Certificate – Document reference 790101_MSD_EMS_MOT
- Relevant Offences – Document reference 790101_MSD_RelevantOffences_MOT
- Details of Directors – Document reference 790101_MSD_Directors_MOT
- Material Safety Data Sheets – Document reference 790101_MSD_MSDS_MOT