Southern Water Goddard's Green Sludge Treatment Work Permit Application – Response to Environment Agency v2

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Table 1: Response to Environment Agency

Topic of relevancy	Question no.	Question	Response
Surrender of combustion plant	1	Please can you re-submit your E2 form, part A and non-technical summary through our permitting system as a separate application.	E2 form, Part A and the non-technical summary have been submitted to PSC@environment-agency.gov.uk on 28/11/2024 as a separate application.
Thermal Hydrolysis Plant	2	Explain how the THP plant meets BAT from point of permit issue or remove this from your application.	THP system installation has been completed and is in operation utilising third party support as SW gains familiarity with the new system. The THP process consists of a 130m^3 silo feeding, a 130m^3 pulper vessel, which feeds into four reactors on a batch basis (totalling 8m^3). The reactor vessels discharge to a 4m^3 flash tank which feeds the digester.

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			Silos/Tanks/vessels volumes have been added to ADBA Tool (790101-MMD-IED-GOD-CA-C-001 ADBA Tool P03) and the process updated in the MSD (790101_MSD_Main_GOD November 2024). The BAT document (ref 790101_BAT_GOD December 2024) has been updated to include how the THP meets the requirements of BAT as per stated in the following text. The THP project commenced in AMP6 (2015-2020) with the design and construction of the plant. The equipment forming the THP plant consists of sludge being received into a 4m3 pulper vessel, which feeds into four 'reactors' of 2m3 each on a batch basis. The reactor vessels discharge to a flash tank (4m3) which feeds the digester. Relevant BAT assessment updates are: BAT 1. The THP system has been installed and commissioned, handover from the construction contractor to Southern Water operational teams is ongoing with suitable third-party support while all training and familiarisation is completed for SW staff. For example, the BOAS training for the boiler requires 12 months of training and supervisory oversight, this training is ongoing. Appropriate operating documents and procedures are available. BAT 2c. The THP has a means of tracking the waste and system inventory utilising instrumentation and SCADA. BAT 4. The facility installed optimally (within the constraints of the existing site) in the centre of the site between digestion and cake storage. The facility is sized to provide a specific throughput rate and does perform a general storage function as many other tanks on side do. The throughput of the site is SCADA controlled and includes the related designer-determined control instrumentation. BAT 8, & 14. The system is sealed except for emergency vents. THP vessels are fitted with a set-pressure/rated burst disc, short pipe and subsequent pressure relief valve (PRV). The pipe section is fitted with a pressure sensor. If the burst disc is breached the pressure sensor will identify the issue, record as alarm on SCADA and automatically commence a safe shut down. Depending on the cause the PRV may operate to mitigate the overpressure risk. The release occurrence and duration would be identifiable from SCADA data. The THP has been designed by a competent specialist and equipment selection has been made in line with the applicable standards.

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			BAT 17. The site is manned and (as above) a specific THP operating team are in place. Daily site checks are completed whereby any identified issues will be logged and remediated by the relevant contractor. BAT 19. The THP plant is located on a concrete pad with boundary walls. The THP plant is located on a concrete pad with boundary walls to the east and west. The area falls east to site drainage through which and ultimately pumped to the liquor treatment plant. The THP plant consists of a total of 16m^3 in pressure vessels that are not 'standard' tanks. The evaluation for containment for the THP plan alone establishes application of the 110% rule (to the largest tank of 4m^3) and thus a containment requirement of 4.4m^3. The area within which the THP is located is old cake bays (resurfaced for THP project), the area of this bay is 1,800m^2 so the spill equates to a maximum depth of 2.5mm. In practice this would fall towards the drainage system. The THP area is considered to meet BAT in that a spill would be contained on site. The subsequent guidance outlining the specific requirement to meet CIRIA C736 was not available at the time of design specification. The THP will become part of the 'East Bund' for the site, as such improvements will be detailed and completed in line with our wider secondary containment improvement plans which will be submitted to the EA for approval. The THP returns require additional testing that is not in place to current BAT understanding, this forms part of our plans with respect to site improvements. The THP sits 'within' the existing STC processes in the sense that it is not the point of acceptance or discharge of waste in or out of site. The indirect emissions to water characterisation and BAU sampling and testing requirements are not considered to apply directly to this portion of the process and these will be implemented under the relevant IC improvement.
Secondary containment solution	3	a) Update '790101-MMD-IED-GOD-CA-C-001 ADBA Tool P03 (3)' that includes all tanks, identify how the THP will be BAT compliant from point 1, and clearly demonstrate your secondary containment solution provides sufficient volume and includes all tanks. b) Provide a list of all tanks that are to be included as part of this application, include the tank volume, if it is open or closed, and the above ground storage volume. c) Update all your documents to ensure that tanks are consistently named and have the same volumes throughout your application.	a) The ADBA tool has been reviewed and has been amended. The ADBA tool is provided as 790101-MMD-IED-GOD-CA-C-001 ADBA Tool P04 b) All tank volumes have been provided in the ADBA tool, previously only the above ground volumes were shown. All relevant volumes have now been included, along with whether they are open or closed. This is also replicated in a table below this response. c) All documents have been updated to ensure that tanks are consistently named and have the same volumes throughout. Below

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			this table is an additional table which has been provided to confirm the tank volumes. The 790101_MSD_Main_GOD December 2024 and 790101_ERA_OdourMP_GOD December 2024 have also been amended accordingly.
Emission point for the HoW	4	Please confirm if emission point S5 is for the head of works activity. If not confirm the HoW emission point	It is confirmed that emission point S5 is the emission point from the cess reception to the head of works.
Emissions from the AD and LTP process	5	If required, update your application and site plans to reflect your indirect emissions to water and sampling points.	The site layout plan has been updated to remove emissions that will be treated through the LTP. The site layout plan only includes indirect emissions to water, including that of the LTP, condensate and surface water emissions. The sampling plan (790101_Sampling proposal_GOD December 2024) and the 790101_MSD_Main_GOD December 2024 have also been updated to reflect these changes.
Flare operation	6	This statement does not meet BAT and proposals must be submitted with your application. a) Provide your solution for compliance with BAT 15 and 16. b) Explain if your current flare is monitored and how many hours on average it is operating, and what it is monitored for. c) If it is operating over then update your air quality impact assessment to include the flare.	Southern Water confirm that Goddard's Green is complaint with BAT 15 and 16. The BAT Assessment has been amended to remove the statements "BAT is to use flaring only for safety reasons or for non-routine operating conditions (e.g. start-ups, shutdowns) by using both of the techniques given below. "which are identified as providing the correct plant design which includes the provision of a gas recovery system with sufficient capacity, and plant management which includes balancing the gas system and using advanced process control." You have advised in your application that "It is recognised that not all BAT-required parameters are monitored and work is planned to provide the required equipment to meet BAT. A plan providing the measures required to become BAT compliant will be provided within 6 months of permit issue.", and "This is part of a Biogas programme of projects to ensure assets are correctly sized and operate within the requirements. It is accepted that not all BAT requirements are currently met and a plan outlining the measures to be completed to meet BAT will be provided within 6 months of permit issue. The updated BAT is provided as 790101_BAT_GOD December 2024 Southern Water acknowledges that the flare is appropriate for emergency use (such as breakdown and maintenance). Southern Water confirms that they plan to keep the existing CHP and flare at Goddard's Green as it meets the Site's requirements for biogas combustion. However, work is likely to be required to be fully BAT compliant for access, ports and measuring/monitoring devices.

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			Gas modelling shows the site is not expected to flare outside of maintenance or emergency scenarios. The available gas modelling shows flaring would be for around 0.2% of the year for maintenance activities. The existing flare and CHP are to be retained at this site but additional work is anticipated to be required to fully meet BAT (note, this is with respect to non-emissions or frequency of flare use considerations, e.g. access to testing ports). The detail of this is under review and any identified scope will be completed in AMP8. The Goddards meter is currently not operating as required (fault) and is scheduled for replacement under BAU by Ops, this is not linked to IED timescales/scope. This site has been undertaking THP commissioning, this poses an additional challenge in collation and reporting of data for steady-state operation (BAU). Temperature data is available (but direct recording of operating hours is not), this data infers there was a maximum potential of 1222 hours operation for the last year (7.17%), however, this does not reflect actual hours as the data records an occurrence within a given hour, when in reality the flare is highly unlikely to operate for the full hour, thus overestimating the flare use. The meter replacement will ensure all required signals for data collation and reporting are provided. The flare use data forms part of wider data collation and reporting (IT) system improvements planned to meet BAT 2c for inventory, BAT 11 energy and has an influence on BATs 15b, 16b and 21c for incident reporting (re. PVRVs and gas system management). Further information is being collated in line with discussions with the SSD LIA (KS) on 3/12/24 and will be provided in due course (regarding asset replacement plans and timescales but will be provided for all sites even though no asset replacements are required here).

Tank List	Tank Capacity (m^3)	Is Tank Covered	Above Ground Volume (m^3)	In Bund

Primary Digester 1	1932	Yes	1810	East
Primary Digester 2	1932	Yes	1810	East
Post Digestion Storage Tank 1	312	Yes	312 (Tank is above ground)	East
Post Digestion Storage Tank 2	312	Yes	312 (Tank is above ground)	East
Post Screening Storage Tank 1	500	Yes	500 (Tank is above ground)	East
Post Screening Storage Tank 2	500	Yes	500 (Tank is above ground)	East
Thickened Sludge Storage Tank	400	Yes	400 (Tank is above ground)	East
Cake Blending Tank	57	Yes	57 (Tank is above ground)	East
Sludge Reception Tank	98	Yes	98 (Tank is above ground)	East
THP Pulper	4	Yes (vessel)	4 (Vessel is above ground)	East
THP Reactor 1	2	Yes (vessel)	2 (Vessel is above ground)	East
THP Reactor 2	2	Yes (vessel)	2 (Vessel is above ground)	East
THP Reactor 3	2	Yes (vessel)	2 (Vessel is above ground)	East
THP Reactor 4	2	Yes (vessel)	2 (Vessel is above ground)	East

THP Flash Tank	4	Yes (vessel)	4 (Vessel is above ground)	East
THP Feed Silo	130	Yes	130 (Tank is above ground)	East
Polymer storage tank 1	3	Yes	3 (Tank is above ground)	East
Polymer storage tank 2	3	Yes	3 (Tank is above ground)	East
Polymer storage tank 3	3	Yes	3 (Tank is above ground)	East
Polymer storage tank (THP)	7.3	Yes	7.3 (Tank is above ground)	East
Polymer Make-up Tank (THP)	3	Yes	3 (Tank is above ground)	East
Liquor Treatment Plant	2500	No	2500 (Tank is above ground)	West
Liquor Storage Tank	2626	Raw (centre tank) yes, treated (outside perimeter) no	Above ground tank. Centre tank raw liquor of capacity 1342m3, outside tank treated liquor capacity 1284m3. The total tank volume for containment calcs is 2626m3	West
Auxiliary Sludge Storage Tank 1	2500	Yes	2500 (Tank is above ground)	West
Auxiliary Sludge Storage Tank 2	2500	Yes	2500 (Tank is above ground)	West