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Dear Holly Linham,

**RE: Improvement Conditions (9, 11, 13 and 14) for Reading IED Permit
EPR/MP338LU/V004**

Thank you for meeting with us on the 3rd January 2024 to discuss the general risk assessment approach to secondary containment of Thames Water Utilities Limited's (TWUL) Sludge Treatment Centres (and specifically to that at TWUL's Reading Site) and the additional questions we raised on the Reading IED Permit and the Improvement Conditions which included deadlines (for certain aspects of those Improvement Conditions) of 24 January 2024. We thought it was a useful and productive meeting.

As discussed in the meeting, we would like to formally request extensions to the deadlines set in the Reading IED Permit for the following Improvement Conditions,:

1. IC9 - Improvement condition for secondary containment design
2. IC11 - Improvement conditions for establishing an inventory of liquid waste water discharged from anaerobic digestion and associated activities (AR1 – AR10) – (a) Sampling programme
3. IC13 - Improvement condition for review of effectiveness of abatement plan
4. IC14 - Improvement condition for establishing an inventory of liquid waste water discharged from the Head of works waste operation/installation activity - (AR11) – (a) Sampling programme

The following sections sets out the rationale behind each extension request, the actions we are currently undertaking and the date we anticipate we will be able to achieve delivery.

1. IC9 - Improvement condition for secondary containment design

The Improvement Condition IC9 is as follows, with a current deadline for submission to the Environment Agency (EA) of the 'secondary containment implementation plan' by the 24th January 2024 (being 6 months after permit issue):

Ref	Requirement	Date
IC9	<p>The operator shall submit a written 'secondary containment implementation plan' and shall obtain the Environment Agency's written approval to it. The plan shall contain the finalised designs and an implementation schedule for the identified secondary containment systems proposed in the document <i>Reading STC IED Containment Options Report, dated May 2023</i>. The finalised design(s) and specifications shall be produced by appropriate competent individuals (qualified civil or structural engineer), in accordance with the risk assessment methodology detailed within CIRIA C736 (2014) guidance.</p> <p>The plan shall include but not be limited to the following components:</p> <ul style="list-style-type: none"> • An updated BAT assessment with specific regard to BAT 19 of the Waste Treatment BREF. • An assessment of the suitability for providing containment when subjected to the dynamic and static loads caused by catastrophic tank failure. • Finalised designs and specifications of the proposed secondary containment proposal completed by appropriate competent individuals. • A program of works with timescales for the commissioning of the secondary containment systems to comply with CIRIA C736 (2014) guidance, or equivalent. • An updated site and infrastructure plan. • A preventative maintenance and inspection regime 	<p>6 months of permit issue or such other date as agreed in writing with the EA</p> <p>Implementation of all required and approved containment improvements must be completed by 31/12/2024</p>

As discussed in the presentation provided by TWUL on the 3rd January and the accompanying paper, TWUL have been developing the 'secondary containment implementation plan' and as part of this have reviewed the risk-based assessment that was included in the Reading STC IED Containment Options Report, dated May 2023. We would like to request that TWUL is granted an extended deadline to submit the Secondary Containment Implementation Plan to the EA, of 30th June 2024 for the following reasons:

- a) as discussed in the meeting we said that it would take around 4 months to complete a detailed design and we have added an additional month to cover the quotation and instruction period.
- b) The updated BAT assessment has identified opportunities that will determine how we deliver the remainder of IC9. It has considered credible failure scenarios, and therefore the containment provision that is required. This review (which we submit to satisfy the first requirement of IC9 of an updated BAT assessment with specific regard to BAT19) concludes that a different risk assessment approach than stated in the permit is appropriate, i.e., a smaller volume of containment and further consideration of local containment and/or with operational intervention. Alternatives being considered are at the concept stage. Please see the paper included in

Appendix A. This makes clear that there are alternative options which may provide the same degree of environmental protection but at a lower cost.

- c) TWUL met with Defra, Ofwat and the EA on the 13th December 2023 to discuss the assumptions underlying the scope of the IED Enhancement Case in the PR24 submission. Questions were raised on the CIRIA C736 guidance on credible failure, which could not be answered in the meeting. TWUL were asked to follow-up with an email query to all attendees. The questions were directed to Clive Humphreys on the 14th December and acknowledged on the same day, but a formal response is yet to be received. This could impact the approach to risk assessment in the updated BAT assessment.
- d) In order to prepare finalised design(s) and specifications including the five subsequent bullet point actions required to be included in the containment plan under IC9, we require the EA’s feedback on the paper included as Appendix A so as to revise the final containment options accordingly.

As such, we request that TWUL is granted an extension of 5 months to the deadline applicable to its submission of the plan to the EA. This is likely to have a potential delay to the implementation programme and timescale.

In addition to the above, we would like to apply the approach to risk assessment of secondary containment to all TWUL IED facilities, as you are likely aware currently 23 of TWUL’s permit applications for such facilities are being considered by the EA, and 2 have currently been granted (Reading, see above and Camberley). As such, this has wider application and it is critical to TWUL to fully understand how to approach this issue.

2. IC11a – for establishing an inventory of liquid waste water discharged from anaerobic digestion and associated activities (AR1 – AR10)

The Improvement Condition IC11a is as follows, with a current deadline for TWUL to submit a sampling programme by the 24th January 2024:

Ref	Requirement	Date
IC11a	<p>The operator shall submit a sampling programme in relation to waste water streams and shall obtain the Environment Agency’s written approval to it. The sampling programme shall be designed to fully characterise the waste waters discharged to Reading wastewater treatment works (WwTW) from emission points S1, S2 and S3 in (table S3.2 of this permit).</p> <p>The programme shall include but not be limited to a methodology for a minimum of one 24-hour flow proportional sample a month, for each emission point, for a period of 12 months. The programme shall detail the sampling methods/standards used. Sampling methods shall be in accordance with BAT conclusion 20 of the Waste Treatment BREF.</p> <p>The programme shall include the National Grid Reference (NGR) of the sampling point(s) location(s). The programme shall establish the characteristics of the liquid waste water streams and shall include as a minimum for each emission point:</p> <ul style="list-style-type: none"> • Average values and variability of flow, pH, temperature and conductivity. • Average concentration and load values of all relevant substances and their variability. 	<p>A sampling programme shall be submitted within 6 months of issue of this permit</p>

	<ul style="list-style-type: none"> • Data on bioeliminability. <p>The programme shall sample for all relevant substances and must include:</p> <ul style="list-style-type: none"> • Hydrocarbon oil index (HOI) (mg/l) • Free cyanide (CN⁻) (mg/l) • Adsorbable organically bound halogens (AOX) (mg/l) • Metals and metalloids; arsenic (expressed as As), cadmium (expressed as Cd), chromium (expressed as Cr), hexavalent chromium (expressed as Cr(VI)), copper (expressed as Cu), lead (expressed as Pb), nickel (expressed as Ni), mercury (expressed as Hg), zinc (expressed as Zn) (µg/l) <p>The operator shall submit the collected monitoring data in writing to the EA according to agreed reporting periods.</p> <p>The sampling programme shall be produced in accordance with EA guidance:</p> <ul style="list-style-type: none"> • Specific substances and priority hazardous substances – Surface water pollution risk for your environmental permit Surface water pollution risk assessment for your environmental permit – GOV.UK (www.gov.uk). • Monitoring discharges to water: guidance on selecting a monitoring approach Monitoring discharges to water: guidance on selecting a monitoring approach – GOV.UK (www.gov.uk). The programme must be carried out as approved or agreed in advance in writing by the Environment Agency. <p>The monitoring programme shall be carried out and the monitoring data submitted in accordance with the Environment Agency's written approval.</p>	
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As discussed in our meeting with you on the 3rd January we would like to request this IC is put 'on hold' pending the outcome of the Water UK/EA Task & Finish (TaF) Group discussions, which the National EA is involved in. Those discussions will impact how the sampling programme is designed. Alternatively, a delayed delivery date could be included (e.g. the delivery date extended by 4 months). However, there is a risk that if there is not a resolution as part of the wider discussions this may need to be delayed further. The key reasons for this request are:

- UKAS labs are not able to assess a waste sample to the accredited method for all the parameters (~156 parameters including specific substances and priority hazardous substances) detailed in the EA's guidance on Surface water pollution risk assessment for your environmental permit.
- Discussions are ongoing with the Water UK/EA Task & Finish (TaF) Group as to the UK lab capacity and its capability to sample and analyse to the required standards and the industry's proposal is that a site-specific sample list be determined.
- Pending the outcome of these discussions with the Water UK/EA Task and Finish (TaF) group the liquor sampling requirements may change and the practicalities of the forthcoming IC deadlines has been recognised by the National EA (Clive Humphreys). The WaSCs (Water and Sewerage Companies) are providing a briefing paper on this and this issue has been

discussed at every TaF meeting since September with the practical issues being highlighted. Clive confirmed in the TaF sessions on the 17th January that he would contact the Area Sludge Leads about the technical challenges and difficulties in meeting IC deadlines.

3. IC14a – Improvement condition for establishing an inventory of liquid waste water discharged from the Head of works waste operation/installation activity (AR11)

The Improvement Condition IC14a is as follows, with a deadline of the 24th January 2024:

Ref	Requirement	Date
IC14a	<p>The operator shall submit a sampling programme in relation to waste water streams and shall obtain the EA’s written approval to it. The sampling programme shall be designed to fully characterise the waste waters discharged to Reading wastewater treatment works (WwTW) from emission point T5 in (table S3.2 of the permit).</p> <p>The programme should include but not be limited to a methodology for a minimum of one 24-hour flow proportional sample a month, for the emission point, for a period of 12 months. The programme shall detail the sampling methods/standards used. Sampling methods shall be in line with Non-hazardous and inert waste: appropriate measures for permitted facilities https://www.gov.uk/guidance/non-hazardous-and-inert-waste-appropriate-measures-for-permitted-facilities).</p> <p>The programme shall include the National Grid Reference (NGR) of the sampling point(s) location(s).</p> <p>The programme shall establish the characteristics of the liquid waste water streams and shall include as a minimum for each emission point:</p> <ul style="list-style-type: none"> • Average values and variability of flow, pH, temperature and conductivity. • Average concentration and load values of all relevant substances and their variability. • Data on bioeliminability. <p>The operator shall submit the collected monitoring data in writing to the EA according to agreed reporting periods.</p> <p>The sampling programme shall be produced in accordance with EA guidance:</p> <ul style="list-style-type: none"> • Specific substances and priority hazardous substances – <i>Surface water pollution risk for your environmental permit</i> Surface water pollution risk assessment for your environmental permit – GOV.UK (www.gov.uk). • Monitoring discharges to water: <i>guidance on selecting a monitoring approach</i> Monitoring discharges to water: guidance on selecting a monitoring approach – GOV.UK (www.gov.uk). <p>The monitoring programme shall be carried out and the monitoring data submitted in accordance with the Environment Agency’s written approval.</p>	Within 6 months of issue of this permit

As discussed in our meeting with you on the 3rd January and again as per the reasoning for IC11a, we would like to request this IC is put 'on hold' pending the outcome of the Water UK/EA Task & Finish (TaF) Group discussions. Those discussions will impact how the sampling programme is designed. Alternatively, a delayed delivery date could be included (e.g. the delivery date extended by 4 months). However, there is a risk that if there is not a resolution as part of the wider discussions this may need to be delayed further. The key reasons for this request are:

- UKAS labs are not able to assess a waste sample to the accredited method for all the parameters (~156 parameters including specific substances and priority hazardous substances) detailed in the EA's guidance on Surface water pollution risk assessment for your environmental permit.
- Discussions are ongoing with the Water UK/EA Task & Finish Group as to UK lab capacity and its capability to sample and analyse to the required standards and the industry's proposal is that a site-specific sample list be determined.
- Pending the outcome of these discussions with the Water UK/EA Task & Finish (TaF) Group the effluent sampling requirements may change and the practicalities of the forthcoming IC deadlines has been recognised by National EA (Clive Humphreys). The WaSCs are providing a briefing paper on this and this issue has been discussed at every TaF meeting since September with the practical issues being highlighted. Clive confirmed in the TaF sessions on the 17th January that he would contact the Area Sludge Leads about the technical challenges and difficulties in meeting IC deadlines.

4. IC13 – Improvement condition for review of effectiveness of abatement plant

The Improvement Condition IC13 is as follows, with a deadline of the 24th January 2024:

Ref	Requirement	Date
IC13	<p>The operator shall carry out a review of the abatement plant at emission points A15 on the site plan in schedule 7, to determine whether the measures have been effective and adequate to prevent and where not possible minimise emissions released to air including but not limited to odour and ammonia. The operator shall submit a written report to the EA following this review for assessment and approval. The report shall include but not be limited to the following aspects:</p> <ul style="list-style-type: none"> • Full investigation and characterisation of the waste gas streams. • Evidence that the pollutants of the waste gas stream will be controlled and/or abated either by the abatement plant or by the proposed abatement systems. • Abatement stack monitoring results (including but not limited to odour and ammonia). • Abatement process monitoring results (including but not limited to odour and ammonia). • Details of air quality quantitative impact assessment including modelling and a proposal for site-specific “action levels” (including but not limited to odour concentration, hydrogen sulphide and ammonia). • Odour monitoring results at the site boundary. • Records of odour complaints and odour related incidents. • Recommendations for improvement including the replacement or upgrading of the abatement plant. • Timescales for implementation of improvements to the abatement plant. <p>The operator shall implement the improvements in line with the timescales as approved by the EA.</p>	6 months of permit issue or such other date as agreed in writing with the Environment Agency

As discussed in our meeting with you on the 3rd January we would like to request that TWUL is granted an extended deadline to submit the written report of the review of the abatement plant to the EA, until the 30th April 2024 for the following reasons:

- Parts required for rehabilitation works to fix the OCU came with long lead times to procure. There was then limited availability of framework suppliers to fit the parts.
- We had some outstanding queries following advice from our specialist contractors on the process monitoring requirements of the Odour Control Units (OCUs) (Table S3.4) and on the monitoring requirement of the standby carbon OCU at Reading, which is only in use less than once in every 10-years of operation. These were discussed with yourselves on the 3rd January.
- As such we need to redo the odour monitoring of the OCU and this will delay the impact assessment and finalising the full report as required by IC13. We will, of course, endeavour to submit the report ahead of this extended deadline, if possible.

We would also like to request the following considerations:

- This is our first IED permit and IC on IED odour measurements.
- The IED programme team were focused on ensuring all 18 IED permit applications were submitted by the deadline of 20th December.

We thank you for your time on the 3rd January and for your consideration of these IC extensions. Given the impending deadline for these IC's we would really appreciate a prompt response at the earliest opportunity as to whether these requests are acceptable to the EA.

Whilst our discussions specifically relate to the Reading STC, this also has implications as to how we deal with comparable ICs which are likely to be included in our other IED permits and/or how we address BAT risk assessments for all 25 STC sites and the secondary containment solutions proposed.

Yours sincerely,



Gareth Parry
Director of Scientific and Environmental Assurance

Appendix A

Reading STW – IED Containment Technical Note