

PR24

Cost Adjustment Claim: New waste permit obligations at physico-chemical sludge treatment sites that previously had PPC permits

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A company specific cost adjustment claim to reflect higher than historical costs, arising from changes in regulatory requirements for 13 physico-chemical sludge treatment sites, to operate under bespoke waste permits and comply with Appropriate Measures guidance.

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Cost Adjustment Claim Submission

Cost adjustment claim submission	
Title:	<p>New waste permit obligations at physico-chemical sludge treatment sites that previously had PPC permits</p> <p>A company-specific cost adjustment claim to reflect higher than historical costs, arising from changes in regulatory requirements for 13 physico-chemical sludge treatment sites, to operate under bespoke waste permits and comply with Appropriate Measures guidance.</p>
Price control:	Bioresources
Total value of cost adjustment claim for AMP8:	<p>£78.086 million</p> <p>(A further £11.319 million in Wastewater network + is excluded from this claim)</p>
Cost adjustment headline:	<p>This cost adjustment claim requests additional allowance for meeting our waste compliance regulatory obligations at 13 physico-chemical sludge treatment sites in AMP8. These sites undertake raw sludge thickening or dewatering. The majority of our physico-chemical sludge treatment sites are to be regulated under bespoke waste permits. This is a consequence of the Environment Agency approach to regulating sites with a historical use of sludge disposal outlets (incineration) rather than under exemptions from waste legislation. This generates more onerous regulatory obligations, over and above that incurred by equivalent sites operated by other companies. The cost models do not reflect the additional costs associated with meeting more stringent tiers of regulation and therefore an allowance is required in addition to modelled costs.</p> <p>Allowances made through this cost adjustment claim will ensure we have the efficient resources in the bioresources price control to deliver regulatory compliance with our obligations, specified under Environment Agency statutory guidance.</p>

1. Cost adjustment case summary

Gate	Summary	Location reference
Need for cost adjustment	<ul style="list-style-type: none"> As a consequence of the constrained agricultural landbank for recycling biosolids in the North West, and the historical use of sludge disposal outlets when sludge to sea was banned, as well as the subsequent evolution of waste legislative requirements, the majority of our physico-chemical sludge treatment sites are currently regulated under Pollution Prevention and Control (PPC) permits. It has been recognised in previous price reviews that our physico-chemical sites are uniquely regulated in the sector, and have incurred higher costs than equivalent sites operated under T21 waste exemptions. We demonstrate that we operate a significantly greater number of physico-chemical sludge treatment sites than any other company at this higher regulatory tier. Now these PPC permits are to be varied by the EA to bespoke waste permits, this will introduce significant new environmental protection requirements at these specific sites. We will incur material additional costs to demonstrate compliance with 'Appropriate Measures' statutory guidance at these sites. Despite our sludge disposal outlet at our incineration plant no longer being in operation, the Environment Agency (EA) has ruled out the potential for these sites to operate under the industry standard T21 waste exemptions. The cost models, based on the volume of sludge processed, do not reflect the additional costs associated with meeting the more stringent requirements of bespoke waste permits and therefore, an allowance is required as an addition to modelled costs. The base cost allowance is not sufficient to deliver the substantial £78.086 million investment required in AMP8 to deliver compliance with the new waste permit obligations. 	<p>Section 3: Need for adjustment</p> <p>3.1</p> <p>Figure 4</p> <p>Table 2</p> <p>3.4</p>
Cost efficiency	<ul style="list-style-type: none"> We have undertaken a programme of site assessment and estimating to derive bottom-up costs for AMP8 waste treatment compliance at our physico-chemical sludge treatment centres. We have extrapolated learning from our AMP7 Industrial Emissions Directive (IED) programme at anaerobic digestion sites to enable consistent assumptions for developing cost estimates and to understand what proposals will be acceptable to the EA. As the regulation of physico-chemical sludge treatment to recovery outlets under Bespoke Waste Permits is not typical, there are no agreed industry benchmarks for cost of compliance. We have, however, sought third party-assurance of our costing methodology to ensure our cost estimates are robust and efficient We have taken steps to control costs for customers and have pursued and promoted the use of a risk assessment approach with the EA. We seek to use management and monitoring techniques to demonstrate compliance in preference to capital investment works. Acceptance of these measures has been limited by the EA which is pursuing a precautionary and risk-averse approach to setting requirements. 	<p>Section 4: Cost efficiency</p> <p>4.1</p> <p>4.2</p> <p>4.4</p>

<p>Need for investment</p>	<ul style="list-style-type: none"> Clarification of the regulatory obligations at our physico-chemical sites has identified a clear and unambiguous need for investment to comply with bespoke waste permits. Bespoke waste permits convey a new requirement to comply with Appropriate Measures standards, which reflects a step change in regulatory expectations for waste treatment and will generate significant, additional investment needs. The key requirements driving investment are: <ul style="list-style-type: none"> Cover all open bulk storage tanks; Vent tanks through suitable abatement; Secondary containment constructed to CIRIA 736 standards; and Provide secondary containment and leakage detection for sub-surface pipework, sumps and storage vessels. These sites have incurred higher costs historically, but the new requirements require an additional £78.086 million of investment in AMP8. 	<p>Section 5: Need for investment</p> <p>5.1</p> <p>5.1.6</p>
<p>Best options for customers</p>	<ul style="list-style-type: none"> We have considered a range of options including ‘do nothing’. We are presenting the lowest cost option to deliver compliance on behalf of customers. The benefits delivered through the investment will be compliance against our bespoke waste permits. The investment will increase the level of protection for the environment from the harmful effects of industrial activities. This will reduce the environmental impacts of releases to land, air and water from our sludge treatment activities. We have proposed a pragmatic timescale to deliver waste treatment compliance, based on feasibility and deliverability challenges, and recognising the scale of investment required. We have sought to align investment with other works on sites, and ensure sites can remain operational during the works. So far as possible, we have ensured that our proposed investment is efficient through alignment with our bioresources long-term delivery strategy. We avoid retaining physico-chemical IED permits as these costs may be considered abortive if we do not re-start incineration activities in future. 	<p>Section 6: Best option for customers</p> <p>Table 6</p> <p>6.1.5</p> <p>6.2</p>
<p>Customer protection</p>	<ul style="list-style-type: none"> Compliance requirements are highly site specific and the exact requirements will not be known until we progress each individual permit variation. We have developed an efficient cost to deliver a clear scope of works. If specific scope is not required at a site, or we agree a lesser interpretation of the regulatory requirements, we commit to handing back unspent monies to customers through lower bills. The EA will ensure that the environment is protected in this area on behalf of customers through the AMP8 introduction of a common industry Environmental Performance Assessment (EPA) metric for waste treatment compliance. Moreover, non-delivery of the outputs will likely incur prosecution and fines by the EA. If non-compliance is through deliberate actions by the company this is likely to influence the scale of any fines issued. 	<p>Section 7: Customer protection</p> <p>7.1</p> <p>7.1.8</p>

2. Introduction

2.1 Document purpose

2.1.1 Evolving and more stringent regulation of sewage sludge treatment is leading to increasing environmental protection requirements across our sludge treatment sites. The change in requirements is driving higher than historical sludge treatment costs and as such we are submitting two separate cost adjustment claims:

(1) **Industrial Emissions Directive compliance at anaerobic digestion sites.** This is an industry-wide adjustment (as it impacts on all companies) with a claim value for United Utilities Water (UUW) of £172.594 million. This claim is specific to regulatory changes at our (biological) sludge digestion sites.

(2) **New waste permit obligations at physico-chemical sludge treatment sites that previously had PPC permits.** This is a company-specific adjustment with a claim value of £78.086 million. This claim is specific to regulatory changes at our (non-biological) sludge thickening and dewatering sites (hereafter “physico-chemical” sludge treatment sites).

2.1.2 Claim 1 is set out in cost adjustment claim document, *UUW_CAC_004: Industrial Emissions Directive (IED) compliance at Anaerobic Digestion (AD) sites*. We set out the costs to comply with the additional requirements emanating from the 2022 ‘Appropriate Measures’ statutory guidance in AMP8, as an ongoing consequence of regulation under the IED, and why additional cost allowance is required, in addition to the cost models. The scope of this claim is separate and distinct, and over and above AMP7 IED compliance costs, which result from the 2018 BAT guidance. Allowances made through this cost adjustment claim will ensure full regulatory compliance for a defined scope of requirements to meet environmental protection standards.

2.1.3 This document relates to Claim 2: New waste permit obligations at physico-chemical sludge treatment sites that previously had PPC permits, only. We have only included costs for the bioresources price control in the cost adjustment claim (£78.086 million). We have not included the costs for the physico-chemical sludge treatment sites in the wastewater network plus price control in the cost adjustment claim (£11.319 million).

2.1.4 There is also significant change in the regulation of sludge disposal activities that may further impact the Bioresources Price Control. The regulation of sludge to land activities is out with the scope of this document, which addresses sludge treatment activities only. Through our Business Plan submission we will promote management of these other significant regulatory risks through a landbank uncertainty mechanism.

2.1.5 There is also significant change in the regulation of sludge disposal activities that may further impact the bioresources price control. The regulation of sludge to land activities is outside the scope of this document, which addresses sludge treatment activities only.

2.1.6 Through our Business Plan submission we will promote management of these other significant regulatory risks through an uncertainty mechanism.

2.2 Structure of this document

2.2.1 We have divided our cost adjustment claim into the following sections:

- (a) The remainder of this section provides background on the evolving regulation of sewage sludge treatment and how this is leading to the need for two separate cost adjustments.
- (b) **Section 3** provides an overview of the need for this cost adjustment, explaining that the EA approach to regulating sites under bespoke waste permits, outside our control, leads us to

having greater regulatory obligations than other water companies. This increases our operating costs and capital investment requirements beyond others in the sector.

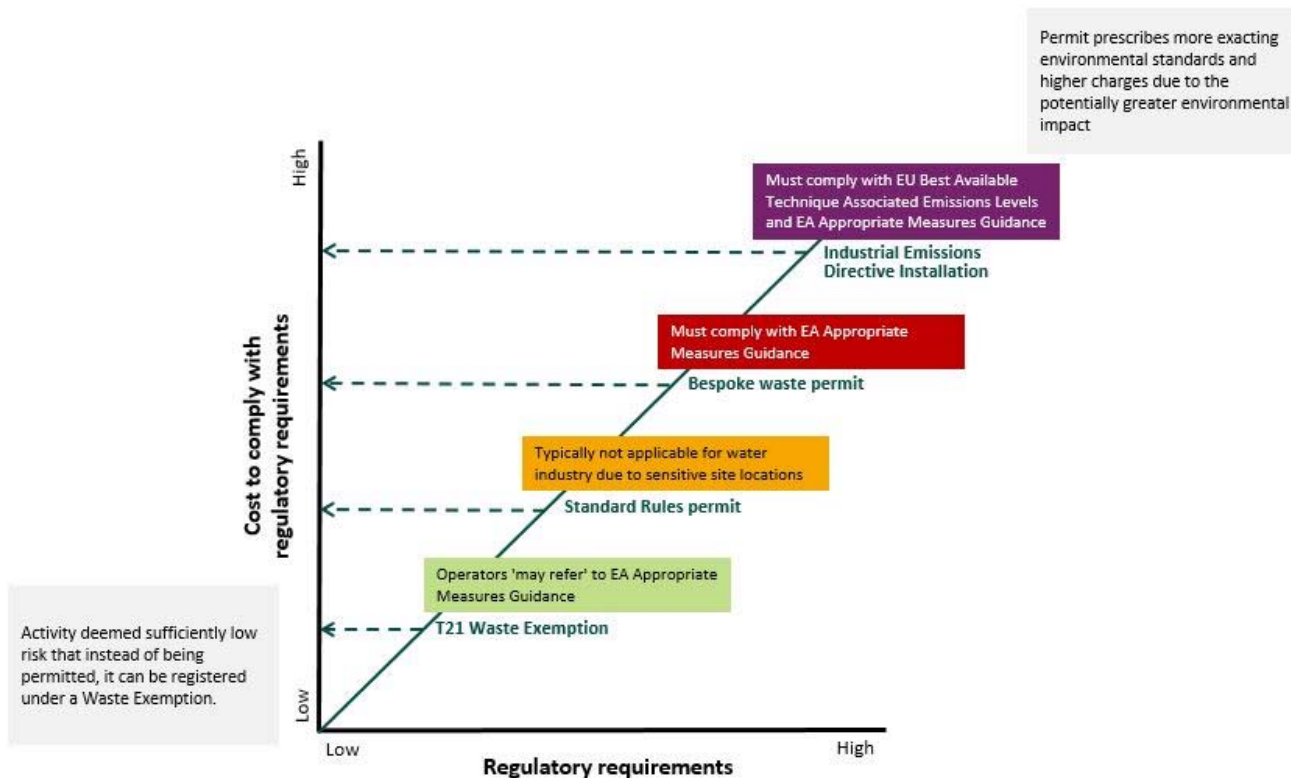
- (c) **Section 4** provides evidence that our costs to comply with our waste permitting obligations are efficient. We explain the opportunities, through innovation and alternative solutions, we have explored with the Environment Agency (EA) to seek to reduce compliance costs.
- (d) **Section 5** provides clear evidence of the investment need, including the scale and timing of investment, to meet our statutory obligations.
- (e) **Section 6** sets out our approach to optioneering to demonstrate we have considered a range of options, including 'do nothing', to deliver bespoke waste permit compliance.
- (f) Finally, in **Section 7** we explain how customers are protected if the investment is cancelled or reduced in scope.

2.3 Environmental Regulatory Framework

Background

- 2.3.1 We present in this section the context detailing the evolution of the regulation of sewage sludge treatment at both physico-chemical and AD sites, common across both cost adjustment claims. We explain that the regulation of sewage sludge treatment is undergoing significant transformation. Activities are becoming more stringently regulated with ever increasing requirements for environmental protection.
- 2.3.2 The EA implements environmental permitting through the Environmental Permitting Regulations (EPR) framework, which uses a risk-based approach, dependent on the environmental risk of the activity. Regulation ranges from sufficiently low risk activities, that can be registered at no cost under a waste exemption, to installations under the Industrial Emissions Directive (IED), that are required to comply with more exacting environmental standards and incur high operational charges. A schematic to show these tiers of regulation is presented in Figure 1.

Figure 1 – Tiers of waste regulation that may be applied through the EPR framework



- 2.3.3 Historically, there have been different regulatory regimes for sludge treatment sites based on the ultimate outlet of the sludge they treat, rather than the process operating on-site. Operations are classed as either:
- (a) **Recovery:** Supplying sludge to a recovery outlet (operations are classified as having a principal objective to ensure that the waste serves a useful purpose i.e. biosolids recycling to agricultural or land restoration).
 - (b) **Disposal:** Supplying (or the potential to supply) sludge to a disposal outlet (operations are classified as being primarily aimed at getting rid of waste i.e. landfill or incineration).
- 2.3.4 Disposal operations have historically been regulated more onerously, reflecting the greater environmental impact associated with the ultimate disposal outlet. The consequence of which is that two equivalent sites, carrying out the same processes, may be permitted under different regulatory regimes and incur different operating costs.
- 2.3.5 In Figure 2, and the remainder of this section, we set out a timeline to summarise regulatory changes at both disposal and recovery operations.

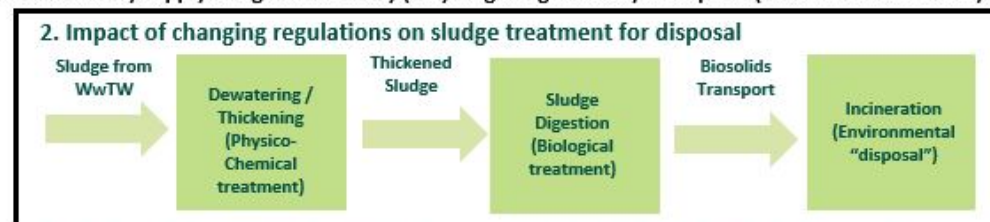
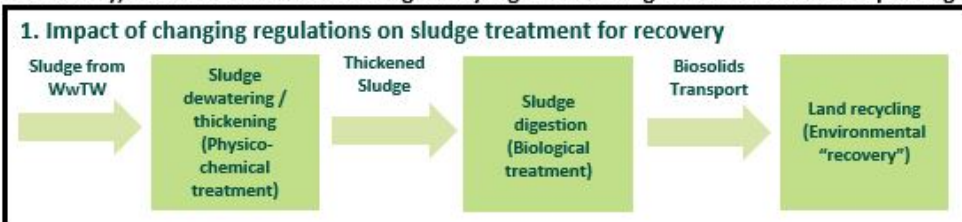
How the Waste Framework works differently

- 2.3.6 Since 2019 sludge treatment activities are regulated through the EU Waste Framework Directive. Prior to this, regulation of sludge treatment was covered by the Urban Wastewater Treatment Directive (UWWTD), which governs wastewater treatment activities in England.
- 2.3.7 An implication of regulation under the Waste Framework Directive, is that the bioresources price control operates under unique water industry circumstances. Significant environmental investment needs can arise, but these needs are not being recognised in the Water Industry National Environment Programme (WINEP), and nor do they originate through primary legislative change (but through updated guidance). The waste treatment compliance needs set out in this cost adjustment claim, have arisen in exactly these circumstances: Guidance detailing how to comply with primary legislation has changed, rather than the legislation itself.

- 2.3.8 In these circumstances we consider that a cost adjustment claim would seem to be an appropriate way to ensure that we are able to recover efficiently incurred expenditure relating to enhanced waste treatment compliance standards. As IED compliance is a pre-existing obligation dating from 2019 (or even earlier for a subset of our sites) we do not consider an enhancement claim would be appropriate. However, we do recognise that significant parts of the AMP8 investment need may be considered typically as enhancement expenditure. The main issue for the company is that we are facing a significant increase to costs of compliance resulting from the 2022 guidance, which will need to be recovered from customers.
- 2.3.9 Under the Waste Framework Directive there is a requirement to comply with ‘Best Available Technique’ or ‘BAT’ standards. Importantly, it is implicit that BAT standards will continue to evolve, as improvements in BAT are developed, driven by changes in technology and tightening of standards, and therefore these sites will continue to attract periodic investment needs. The Waste Framework Directive is specifically designed to allow for these continuous updates to standards, and frequent and numerous changes to the EPR framework can be made within the EA’s control, rather than requiring primary legislative change.
- 2.3.10 The EA can make changes to government websites and guidance without the need for public consultation. This can lead to new or tighter standards being implemented with a quick turnaround and these types of changes cannot always be predicted or accounted for in water company planning cycles. This can leave the operator with limited time to respond, especially if multiple facilities are impacted by the changes, and it poses challenges in terms of the practicality and funding of delivery. Moreover, within the Waste Framework Directive, there is no ‘hands-off period’, unlike for wastewater discharge permits that prevent further guidance or permit changes for four years following a change. There is a possibility that investment decisions could be out of date before they are delivered, creating an additional level of investment risk.
- 2.3.11 Guidance documents under the Waste Framework Directive, although termed ‘guidance’, are legally enforceable through the waste permitting process. While guidance itself is not law and does not operate to override legal duties or obligations, government advice and guidance, may in practice, have the “force of law” and the EA Appropriate Measures guidance makes it clear that the standards are enforceable, and these measures are likened to Environmental Permit conditions and associated compliance with those.

Figure 2 - Summary of the evolution of regulation of sludge treatment

Historically, there have been different regulatory regimes for sludge treatment centres depending on whether they supply sludge for recovery (recycling to agriculture) or disposal (incineration or landfill).



Permitting regime	Sludge dewatering / thickening (Physico-chemical treatment)	Sludge digestion (Biological treatment)
Pre-2019	Sites operate under T21 exemption from waste legislation. Activity already covered under the UWWTD and therefore excluded from the IED scope (known as the "UWWTD exclusion")	Sites operate under T21 exemption from waste legislation Activity already covered under the UWWTD and therefore excluded from the IED scope (known as the "UWWTD exclusion")
2019	No change	July 2019 EA confirm implementation of the IED with respect to sewage sludge, having concluded that sewage sludge is not an activity covered by the UWWTD and is therefore within the scope of the IED. IED compliance requirements set out in European Commission 2018 BAT reference (BREF) document. (per Green Recovery requirements)
2022	No change	September 2022 EA issues their guidance on IED compliance for the sector, Appropriate Measures for the Biological Treatment of Waste. Requirements go significantly beyond those set out in BREF.
Additional costs claimed	-	Cost of additional work required by 2022 guidance, above that expected from 2018 guidance (i.e. the work in excess of the Green Recovery requirements)
Which Cost Adjustment Claim?	N/A	Industrial Emissions Directive compliance at anaerobic digestion sites UUW_CAC_004

Permitting regime	Sludge dewatering / thickening (Physico-chemical treatment)	Sludge digestion (Biological treatment)
Pre-2019	Sites permitted under the former PPC Directive (which was subsumed into IED). IED implementation deferred by the EA whilst legal clarification over the applicability of the "UWWTD exclusion" sought.	Sites permitted under the former PPC Directive (which was subsumed into IED). IED implementation deferred by the EA whilst legal clarification over the applicability of the "UWWTD exclusion" sought.
2019	July 2019 EA confirm implementation of the IED with respect to sewage sludge, having concluded that sewage sludge is not an activity covered by the UWWTD and is therefore within the scope of the IED. Existing PPC permits to be varied to IED permits. IED compliance requirements set out in European Commission 2018 BAT reference (BREF) document (per Green Recovery requirements)	July 2019 EA confirm implementation of the IED with respect to sewage sludge, having concluded that sewage sludge is not an activity covered by the UWWTD and is therefore within the scope of the IED. Existing PPC permits to be varied to IED permits. IED compliance requirements set out in European Commission 2018 BAT reference (BREF) document (per Green Recovery requirements)
2022	EA confirm sites are no longer above the IED threshold (as incineration has ceased). Sites to operate under Bespoke Waste Permits and not the IED. Introduces a requirement to comply with Appropriate Measures Guidance.	September 2022 EA issues their guidance on IED compliance for the sector, Appropriate Measures for the Biological Treatment of Waste. Requirements go significantly beyond those set out in BREF.
Additional costs claimed	Cost of additional work required by Bespoke Waste Permit and Appropriate Measures, above that to comply with baseline PPC permit	Cost of additional work required by 2022 guidance, above that expected from 2018 guidance (i.e. the work in excess of the Green Recovery requirements)
Which Cost Adjustment Claim?	New waste permit obligations at physico-chemical sludge treatment sites that previously had PPC permits UUW_CAC_005	Industrial Emissions Directive compliance at anaerobic digestion sites UUW_CAC_004

2.4 Regulation of sewage sludge treatment prior to 2019

- Pre-2019 the majority of sludge treatment centres operated under exemptions from waste legislation.
- Only those sites that supplied (or had the potential to supply) sludge to a disposal outlet (i.e. incinerator) were regulated under permits.
- Sites were permitted under PPC (later subsumed into IED). IED permitting was deferred while the EA sought legal clarification over whether it applied.
- At PR19 we were allowed £8.4 million of costs in addition to modelled costs in the Bioresources price control, to account for the increased operating cost of complying with PPC permits.

- 2.4.1 Sewage sludge treatment for **recovery** benefitted from an exclusion from the EU Waste Framework Directive (WFD) and did not need to comply with IED:
- Regulation of sludge treatment was already covered by the UWWTD (known as the ‘UWWTD exclusion’).
 - Sites typically operated under a T21 exemption and permitting was not required.
 - This applied regardless of whether sites were undertaking AD or physico-chemical treatment.
- 2.4.2 Sewage sludge treatment for **disposal** was regulated under Pollution Prevention and Control (England and Wales) Regulations 2000¹. A 2006 court ruling² deemed that any intermediate sludge treatment before the sewage sludge reached the disposal outlet for incineration should be included in the permitting regime. The implication of this determination resulted in us requiring a significant number of physico-chemical sludge treatment centres, as well as AD sites, to be permitted under PPC.
- 2.4.3 PPC was subsumed into IED³ and in 2013 the EA led a variation process that sought to change PPC permits to IED permits. We appealed the permit variations, as at the time there was much disagreement about whether the treatment of sewage sludge was an activity covered by the UWWTD exclusion. We also challenged that, should they become IED permitted, then the PPC permits had been incorrectly classified by the EA as ‘disposal’ as opposed to a ‘mix of recovery and disposal’. The impact of this was that all physico-chemical sludge treatment centres supplying sludge would also need to be permitted as IED Installations.
- 2.4.4 In July 2014 the EA issued the “Industrial Emissions Directive – Waste Sector update” which formally deferred permitting requirements to allow time for further consideration of the regulations and the interpretation of the UWWTD exclusion clause⁴. While legal clarification was being sought, these sites continued (and still continue) to operate under PPC permits (held in abeyance).
- 2.4.5 It has been recognised in previous price reviews that our physico-chemical sites are uniquely regulated in the sector, and have incurred higher costs than equivalent sites operated under T21 waste exemptions.

¹ The PPC regulations were made in order to transpose into domestic law the Integrated Pollution Prevention and Control Directive (96/61/EEC) or IPPC.

² England and Wales Court of Appeal (Civil Division), “United Utilities Water Plc V Environment Agency for England and Wales,” 19 05 2006.

³ Directive 2010/75/EU on industrial emissions (IED) entered into force on 6 January 2011 and was transposed into UK regulations on 20 February 2013.

⁴ Environment Agency, Briefing: Industrial Emissions Directive – Waste Sector, July 2014.

2.5 IED implementation in 2019

- In 2019 the EA confirmed implementation of IED for sludge treatment. This captured:
 - All industry AD Sites (regardless of whether previously exempt or PPC permitted)
 - Uniquely, our physico-chemical sites which held existing PPC permits. All other recovery physico-chemical sites continued to operate under a T21 waste exemption.
- All sites captured by IED were now required to comply with the measures set out within 2018 BREF Conclusions
- In 2021 we submitted a Green Recovery proposal which was rejected as the EA confirmed that IED compliance was an AMP7 obligation (albeit unfunded). IED compliance with the 2018 BREF was estimated to cost:
 - £59.8 million at our AD Sites
 - £7.4 million at our physico-chemical treatment sites

- 2.5.1 The regulatory position over IED implementation was clarified in July 2019, when the EA wrote to companies⁵ to inform us that it was now implementing IED with respect to sewage sludge. This marked the first time that the IED regulations had been formally confirmed to apply to any of our (and the whole water industry's) sludge treatment activities. The regulatory compliance date for IED permitting was set as August 2022.
- 2.5.2 Following notification by the EA of its intent to commence implementation of IED we identified the sites requiring IED permits:
- Nine AD sites required a permit variation from existing PPC permits
 - Seven AD sites required permits for the first time
 - Fifteen physico-chemical sludge treatment sites required a permit variation from existing PPC permits.
- 2.5.3 Implementation of IED has had significant implications for the whole water industry in AMP7. It introduced a requirement for sites, now regulated under IED, to increase environmental protection to meet Best Available Techniques (BAT) for waste treatment for the first time. The European Commission defines BAT to be applied for the specific installations covered within the IED scope, which means the best economically and technically viable techniques to prevent, minimise and reduce emissions to air, water, and land. These BAT conclusions were established in 2018 when the Commission Implementing Decision (EU) 2018/14476⁶ BAT reference document (BREF) was published.
- 2.5.4 We were not informed of the legal clarification to comply with IED at the time of our PR19 submission. Therefore we did not submit an enhancement claim at PR19 to ensure provision of adequate resources to comply with the IED. Companies which challenged their PR19 determination with the Competition and Markets Authority and included for IED were awarded an allowance to comply with the IED in AMP7. This has created a distortion in the bioresources market in AMP7.
- 2.5.5 Our understanding is that Ofwat considers those companies that did not challenge their PR19 determination with the Competition and Markets Authority should meet the AMP7 IED costs. However, if through the PR24 process AMP7 costs for IED are to be allowed, then this will need to be a consistent approach applied across the industry.

⁵ Letter from EA to water industry, *Industrial Emissions Directive*, 8 July 2019

⁶ https://eur-lex.europa.eu/legal-content/EN/TXT/?toc=OJ:L:2018:208:TOC&uri=uriserv:OJ.L_.2018.208.01.0038.01.ENG

- 2.5.6 In 2021 we submitted a Green Recovery proposal⁷ to seek funding to deliver compliance with the IED. This was unsuccessful as the EA declared that IED is an AMP7 obligation. The Green Recovery proposal identified the estimated costs to comply with the 2018 BREF:
- £59.8 million across our 16 AD Sites
 - £7.4 million across our 15 physico-chemical treatment sites
- 2.5.7 While IED compliance should have been an AMP7 enhancement allowance, we have continued to undertake work to comply with IED. We anticipate by the AMP7 this situation will have led us to absorb £66.030 million of unfunded IED compliance costs.

2.6 Updated regulatory requirements in 2022

AD sites:

- All industry AD Sites are now required to additionally comply with 2022 Appropriate Measures for the Biological Treatment of Waste.
- Appropriate Measures has further raised the bar in the level of environmental protection required creating an additional investment need, over and above 2018 BREF requirements.
- Compliance costs at AD sites have risen by £172.594 million.

Physico-chemical treatment sites (this claim):

- Our sites no longer meet the threshold to be regulated as IED waste installations.
- Existing permits are to be varied to bespoke waste permits, introducing a requirement to comply with statutory Appropriate Measures guidance.
- Compliance costs at physico-chemical treatment sites have risen by £89.405 million across bioresources and Wastewater Network plus.
- We have only included costs of £78.086 million for the bioresources price control in the cost adjustment claim.

At AD sites

- 2.6.1 The gap to raise existing sites to meet IED compliance at AD sites has been further compounded by the publication of “Appropriate Measures for the Biological Treatment of Waste” on 21st September 2022⁸, (hereafter “Appropriate Measures”). The EA, as the competent authority for implementing IED in England, has provided interpretation of the BAT conclusions for England. This document, although termed ‘guidance’, is legally enforceable through the IED permitting process.
- 2.6.2 Appropriate Measures has further raised the bar in the level of environmental protection required, setting out new and more onerous standards to be achieved. It has led to significant IED compliance scope creep, and moreover the timing of the publication, after our initial IED applications had been made, has generated significant re-design and re-engineering of solutions.
- 2.6.3 There are three core aspects to the 2022 Appropriate Measures that create an additional investment need, over and above 2018 BREF requirements:
- (i) More stringent and onerous compliance requirements (based on specified Technical Reference Documentation)
 - (ii) Prescriptive compliance criteria: The 2018 BREF Document includes terminology that is open to flexibility and practicability, whereas the EA’s “Biological Waste Treatment: Appropriate

⁷https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/main-documents/gr0005---emissions-regulations-and-the-journey-to-zero-carbon-redacted.pdf

⁸ <https://www.gov.uk/guidance/biological-waste-treatment-appropriate-measures-for-permitted-facilities>

Measures for Permitted Facilities” uses terminology such as ‘you must’. This limits the use of risk assessment to demonstrate that an equivalent level of environmental protection is being or can be achieved to capital investment, particularly when seeking to apply these standards retrospectively.

(iii) Additional sludge treatment activities covered by the document including storage of digestate material.

2.6.4 A detailed assessment and comparison of 2018 BREF requirements versus 2022 Appropriate Measures has been independently undertaken by Atkins⁹. This report clearly sets out the evidence for the additional circa £2.0billion of investment needs across the industry. The majority of additional scope is associated with secondary containment and covering of storage, both driven by Appropriate Measures requirements. The consequence of the scope increase of the Appropriate Measures is summarised below:

- IED compliance cost prior to Appropriate Measures: Our Green Recovery proposal quantified the cost of complying with IED for AD sites based on the 2018 BREF and review with the EA was £59.8 million.
- Since our Green Recovery submission we have reduced our number of AD sites from 16 to 13. This rationalisation has been accelerated due to the significant capital investment needed to comply with Appropriate Measures in AMP8.
- The accelerated rationalisation of sites enables us to avoid wasteful investment in meeting Appropriate Measures guidance standards at sites that would ultimately have been closed in the medium term as we implement our long-term delivery strategy.
- The total cost of compliance for the scope over and above the 2018 BREF compliance scope rejected in AMP7 is £172.594 million. This is set out in our cost adjustment claim for £172.594 million in document *UUW_CAC_004: Industrial Emissions Directive compliance at anaerobic digestion sites*.

2.6.5 This activity is not reflected in the historical dataset or within the cost assessment framework and Ofwat’s modelled allowance is insufficient to fulfil our legal obligations. The AMP7 green recovery proposal was rejected as Ofwat considered this an existing requirement and therefore expected to be funded from base expenditure. Recognising this, we are submitting a cost adjustment claim rather than an enhancement case to meet the additional AMP8 costs of IED compliance at our AD Sites.

At physico-chemical sludge treatment sites (this claim)

2.6.6 With respect to our physico-chemical treatment sites operating under PPC permits the aim of the EA was to vary the existing permits to IED permits. The EA-led permit variation process commenced in 2021 when we were issued with Notices Requiring Information under Regulation 61(1) of the Environmental Permitting Regulations 2016. The information requests aimed to inform the EA about the current operation of the sites and compliance with BAT, to inform the EA review of permits.

2.6.7 At the time we submitted our Regulation 61 responses the disposal outlet at our incineration plant had ceased day-to-day operation. Following submission of our Regulation 61 responses, which outlined the latest operating position, we received a letter from the EA in March 2022 stating¹⁰:

“you confirmed your facilities will operate below the IED threshold and you will vary the permits to reflect the ongoing activities in the near future. On this basis, we agreed not to progress with the permit reviews.”

2.6.8 The letter agreed that for these sites because they no longer supplied sludge to a disposal outlet, they did not meet the threshold to be regulated as IED Waste Installations. Permits at these sites should instead be varied to a tier within the EPR regulatory framework known as “Bespoke Waste Permits”.

⁹ Atkins, Industrial Emissions Directive Supporting Document, 31 May 2023 (for Water UK).

¹⁰ Letter from the EA, *Reg 61 – WaSC sludge treatment BAT review*, 4 March 2022.

This tier has no requirement to comply with 2018 BREF. Costs of £7.4 million in AMP7 to comply with IED, and as set out in our Green Recovery proposal were therefore negated.

- 2.6.9 Varying the existing PPC permits to bespoke waste permits will, however, introduce a requirement to comply with statutory Appropriate Measures guidance¹¹. As we have set out to the EA, we believe that these sites should be eligible to operate under T21 waste exemptions¹². We are concerned that 13 of our physico-chemical sites are being subjected to more onerous regulatory requirements, and greater waste treatment compliance costs, than at other equivalent sites across the water industry, which are operating under T21 exemptions. The EA has stated that operating under T21 exemptions would be an unacceptable reduction to the level of environmental protection afforded at these sites, and they require bespoke waste permits.
- 2.6.10 The change in requirements to operate under bespoke waste permits and comply with Appropriate Measures guidance is driving higher than historical sludge treatment costs. We have incurred higher costs in the past due to the specific application of the regulatory framework to these sites, but these are expected to increase in AMP8 as a consequence of needing to comply with Appropriate Measures.
- 2.6.11 Compliance costs at physico-chemical treatment sites have risen by £89.405 million across bioresources and Wastewater network plus price controls. The impact of this is specific to ourselves and cost models do not reflect this activity. These are not IED compliance costs, so cannot be assumed to have been part of previously rejected IED claim for AMP7.

2.7 Summary of the need for cost adjustment

- 2.7.1 As set out above, there have been significant changes to the regulation of sewage sludge treatment that will lead to additional sludge treatment costs being incurred in AMP8 and beyond. The change in requirements is driving higher than historical sludge treatment costs and as such we are submitting two separate cost adjustment claims.
- 2.7.2 We expect all companies to be seeking to recover costs at PR24 as there will need to be some form of adjustment to account for greater regulatory compliance costs. We consider a cost adjustment to be the most appropriate mechanism to recover costs, as IED is a pre-existing obligation, although we recognise that a lot of the investment will fall in AMP8 and may be considered enhancement.

(1) Industrial Emissions Directive compliance at anaerobic digestion sites.

- 2.7.3 A cost adjustment claim to reflect higher than historical expenditure requirements at 13 AD sites to comply with Appropriate Measures guidance. This is an industry wide adjustment with a claim value for Uuw of £172.594 million.
- 2.7.4 This cost adjustment claim is valid because:
- The additional expenditure requirements result from the 2022 publication of new statutory guidance and are outside of our control.
 - This activity isn't reflected in the historical dataset or within the cost assessment framework and Ofwat's modelled allowance is insufficient to fulfil our legal obligations.
 - The scope of this claim is over and above the prior IED Green Recovery proposal that Ofwat has already rejected for AMP7.

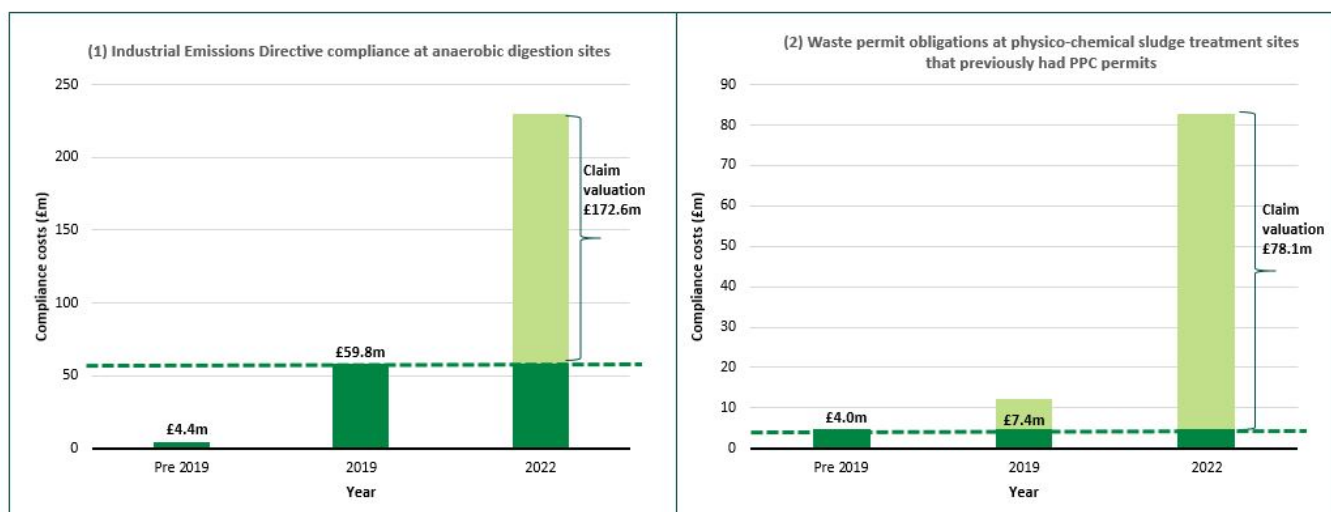
(1) New waste permit obligations at physico-chemical sludge treatment sites that previously had PPC permits (this claim).

¹¹ Which Appropriate Measures Guidance is unclear. We have asked the EA to clarify requirements between, *Chemical waste: appropriate measures for permitted facilities* (<https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities>) or *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>). The Compliance requirements do not vary significantly between the two documents.

¹² Uuw letter to EA 26 May 2023.

- 2.7.5 A company-specific cost adjustment claim to reflect higher than historical costs, arising from changes in regulatory requirements for 13 physico-chemical sludge treatment sites, to operate under bespoke waste permits and comply with Appropriate Measures guidance. The requirement arises from a legacy of the sites ever having supplied (or had the potential to supply) sludge for disposal at our incineration plant and the specific EA approach to implementing the EPR framework. Claim value of £78.086 million.
- 2.7.6 To be clear, our cost adjustment claim only included costs of £78.086 million for activity in the bioresources price control.
- 2.7.7 We will incur further costs at four physico-chemical sludge treatment sites that are within the Ofwat boundary for Wastewater network plus. We consider that under the PR24 methodology this cost does not meet the materiality threshold for a cost adjustment claim relating to the Wastewater network plus price control. Therefore, we have not included the costs to comply with appropriate measures at physico-chemical sludge treatment sites in the Wastewater network plus price control in the cost adjustment claim (£11.319 million).
- 2.7.8 This cost adjustment claim is valid because:
 - The additional expenditure requirements arise from changing regulatory requirements to comply with bespoke waste permits and are outside of our control.
 - The impact is specific to ourselves and cost models do not reflect this activity. Ofwat’s modelled allowance is insufficient to fulfil our legal obligations.
 - We have incurred higher costs in the past due to the nature of the regulatory framework applied to these sites, but costs are expected to increase significantly in AMP8 as a consequence of needing to comply with Appropriate Measures.
 - These sites are no longer required to comply with IED and therefore, the scope cannot be assumed to have been part of previously rejected IED claim for AMP7.
- 2.7.9 Figure 3 is a summary of the valuation for each of the two cost adjustment claims. Cost estimates have been developed through a bottom-up engineering assessment at each site.

Figure 3 – Cost adjustment claim valuations



2.8 Scope of this cost adjustment

- 2.8.1 This claim is for a £78.086 million cost adjustment to base totex:
 - Additional totex at 13 Bioresources physico-chemical sludge treatment sites of £78.086 million
- 2.8.2 The site list comprises:

- Eleven sites, which have always operated as physico-chemical sludge treatment centres and hold PPC permits (held in abeyance)
- Two sites formerly operated above the IED threshold by undertaking AD. To ensure efficient costs to meet IED compliance we are ceasing digestion at these locations in AMP7 and these will operate as physico-chemical sludge treatment centres going forwards. Like the remainder of the sites, due to their legacy of formerly being above the IED threshold, the existing permits will be varied to bespoke waste permits and incur Appropriate Measures compliance costs. Costs to close the sites, decommission assets and put in place new sludge thickening or dewatering assets are AMP7 base costs, absorbed by the business (and included in our unsuccessful Green Recovery proposal). This claim is solely associated with the additional costs incurred by these sites from being regulated as bespoke waste permits, rather than under T21 waste exemptions.

2.8.3 All sites have never before been required to comply with Appropriate Measures standards. Anticipated expenditure to comply with the greater tier of regulation and new and more onerous service standards, reflect a step change in regulatory expectations for waste treatment. Costs are for scope over and above that of the existing permits, for which we were allowed costs in addition to the modelled costs at PR19.

2.8.4 In Table 1 we present a summary of the AMP8 cost adjustment claim. A build-up of the costs by site and scope item is presented in section 4 (Cost efficiency). The cost models, based on the volume of sludge processed, do not reflect the additional costs associated with meeting more stringent tiers of regulation and therefore, an allowance is required in addition to the modelled costs. Our cost allowance is not sufficient to deliver the substantial investment required in AMP8 to comply with the new obligations associated with bespoke waste permits.

Table 1 - Summary of cost adjustment claim

Price control	Number of sites	Totex (£m)					
		FY26	FY27	FY28	FY29	FY30	AMP8
Bioresources	13	£12.706	£21.789	£22.288	£18.080	£3.224	£78.086

2.8.5 Sludge treatment activities at physico-chemical sludge treatment centres are distributed across both price controls because the price control boundary does not relate to the environmental regulatory boundary. The regulatory boundary between regulation under UWWTD (wastewater) and WFD (sludge treatment) is the point at which sludge is produced in the process, whereas the price control boundary is the point at which sludge is thickened to greater than ten per cent dry solids or sludge imports are received into the process.

2.8.6 The regulatory obligations and associated need for cost adjustment is the same, regardless of price control boundary. The Ofwat PR24 methodology sets a materiality threshold which is met for the bioresources price control but not the Wastewater network plus price control. This explains why this cost adjustment claim is only related to the bioresources price control. There is a further £11.319 million of costs that we will incur in the Wastewater network plus price control that we have not included in this claim.

2.8.7 Costs are profiled across AMP8 to deliver compliance with Appropriate Measures. Assumptions on delivery timescales are set out in Section 5.

2.8.8 The cost adjustment claim for £172.594 million of costs incurred at our AD sludge treatment sites is in document, *UUW_CAC_004: Industrial Emissions Directive compliance at anaerobic digestion sites*.

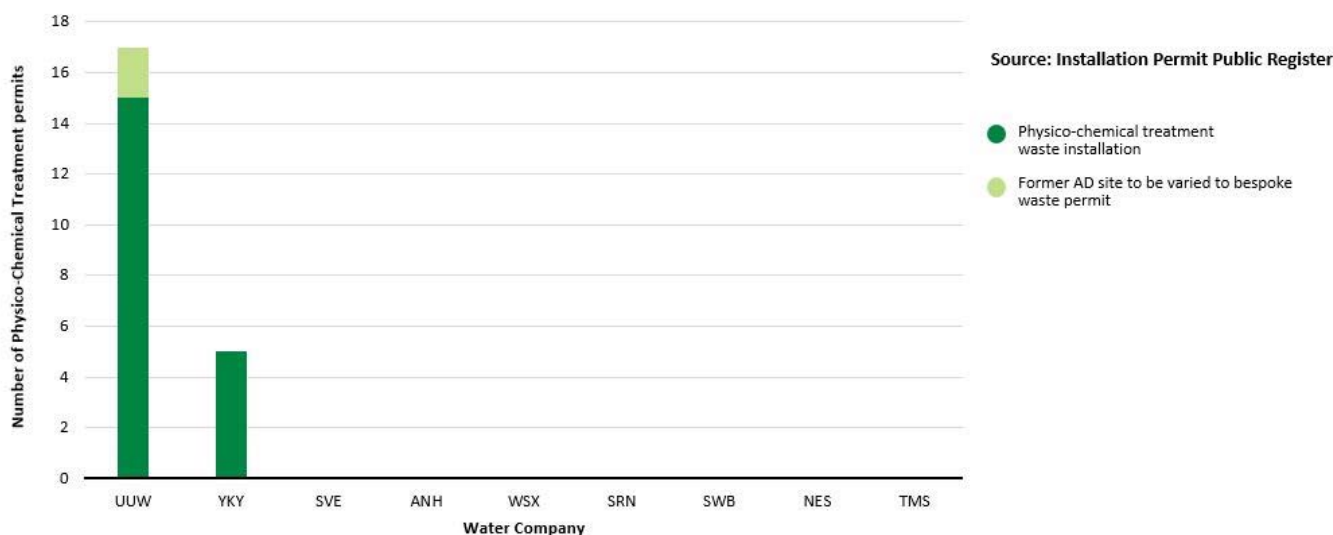
3. Need for adjustment

3.1 Unique circumstances

3.1.1 As a consequence of the constrained agricultural landbank for recycling biosolids in the North West, and the historical use of sludge disposal outlets (such as incineration) when sludge disposal to sea was banned, as well as the subsequent evolution of waste legislative requirements, the majority of our physico-chemical sludge treatment sites are currently regulated under Pollution Prevention and Control (PPC) permits.

3.1.2 We present in Figure 4 a summary of the number of PPC (or IED) permits held at physico-chemical sludge treatment centres¹³. It can clearly be seen that we are an outlier, having a large number of physico-chemical waste treatment permits. All other companies, other than Yorkshire Water, do not hold any physico-chemical waste installation permits.

Figure 4 - Comparison on waste permits held by WaSCs in England



3.1.3 Incineration has now ceased and we have been working with the EA to clarify the regulatory status of our physico-chemical sludge treatment centres. The EA has agreed that, as these sites no longer supply sludge to a disposal outlet, they do not meet the threshold to be regulated as IED Waste Installations. This has negated the need to vary existing permits to IED permits and comply with compliance standards set out in the 2018 BREF (AMP7 costs for this were set out in our Green Recovery proposal).

3.1.4 However, the EA has determined that permits should instead be varied to the regulatory tier called ‘Bespoke Waste Permits’. This introduces a requirement to comply with statutory Appropriate Measures guidance and is driving investment to meet additional requirements set out in the guidance.

3.1.5 This application of the regulatory framework places much more stringent regulation on our physico-chemical treatment sites than for the physico-chemical sites for most other companies (that were not previously linked to a disposal route, and hence were not previously subject to PPC permits). The EA has ruled out the potential for these sites to operate under T21 waste regulation exemptions, despite this being industry standard regulation for this activity type.

3.1.6 In Table 2 we present a summary of the extra over regulatory requirements between:

- (a) Sites operating under T21 Waste Exemptions (industry standard position)

¹³ Source: Installation Permit Public Register <https://environment.data.gov.uk/public-register/view/search-industrial-installations> 03 May 2023

- (b) Sites regulated under Bespoke Waste Permits (UUV physico-chemical sludge treatment sites)
- (c) Sites regulated as IED Waste Installations (understood position of UUV physico-chemical sludge treatment sites in 2019, when IED was first implemented with respect to sewage sludge).

Table 2 - Summary of compliance requirements at sites operating under different tiers of the environmental permitting framework

Activity	T21 Waste Exemption	Bespoke Waste Permit	IED Waste Installation
Annual permit subsistence fees	N/A	£5,877/year	£11,019/year
Regulatory inspections	Ad hoc	Annual	Annual
Maintenance and compliance	Set out in operators’ management system	Set out in legally enforceable permit conditions	Set out in legally enforceable permit conditions
Compliance With Appropriate Measures i.e.:			
<ul style="list-style-type: none"> • Sludge storage on impermeable surfacing compliant with CIRIA 736¹⁴ • Secondary containment of bulk storage compliant with CIRIA 736 • Covering of all bulk storage tanks. • Abatement of emissions from bulk storage 	‘May refer to’	Must comply	Must comply
Compliance with 2018 BAT conclusions (BREF)	N/A	N/A	Must comply

3.1.7 In discussions with the EA, we have reduced the regulatory obligations at these sites from being permitted as IED Installations to being permitted under Bespoke Waste Permits. This has reduced our expectation of additional annual permitting fees and the need to comply with 2018 BREF.

3.1.8 Despite negating the need to comply with IED, it can be seen that we still have a significantly greater regulatory obligation at our physico-chemical sludge treatment sites, than equivalent sites operated across the industry under T21 Waste Exemptions.

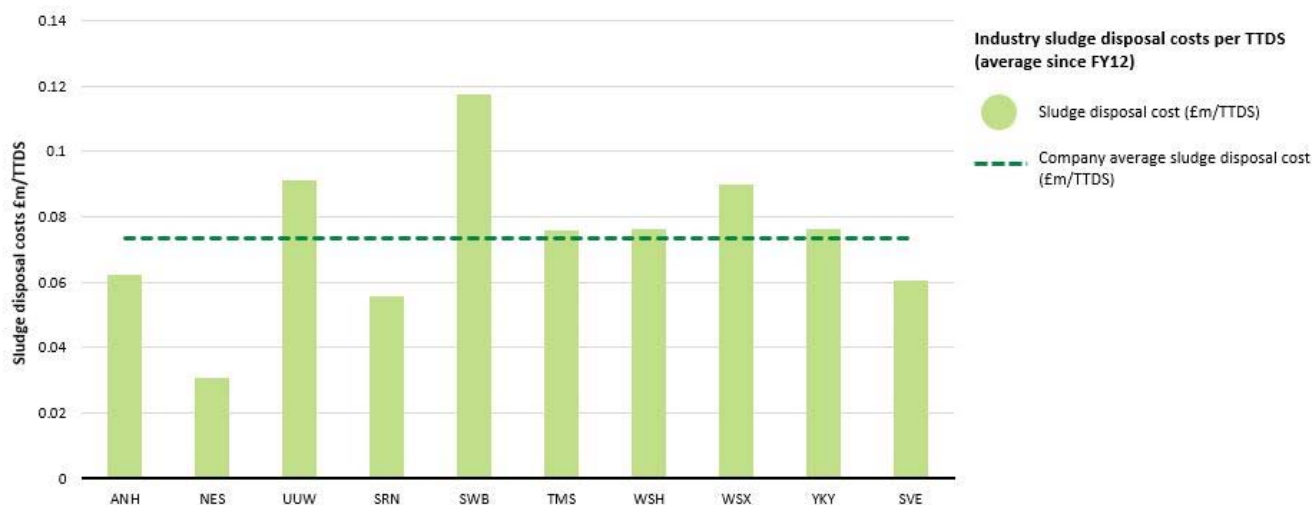
3.1.9 Having Bespoke Waste Permits and needing to comply with Appropriate Measures guidance is driving the need to comply with prescriptive asset standards. Specific new, additional investment scope required to be delivered in AMP8 is presented in section 4 (Cost efficiency). These compliance requirements are over and above the compliance requirements set out in existing PPC permits.

Higher costs in the round

3.1.10 For the reasons we set out in section 3.1.1, we have incurred higher than average sludge disposal costs. A summary of sludge disposal costs is presented in Figure 5.

¹⁴The CIRIA guidance “Containment systems for the prevention of pollution: Secondary, tertiary and other measures for industrial and commercial premises” was published in 2014.

Figure 5 - Industry average sludge disposal costs



- 3.1.11 The decision to move away from sludge incineration to a sludge recycling service through improvements to our landbank finding service and service provision to farmers has moved our activities to be similar to other WaSCs. Operational efficiencies gained, have been offset by the increasing quantity of biosolids recycled to agriculture and the consequential greater distance to travel from our sludge treatment centres.
- 3.1.12 To find adequate landbank we have a greater distance to travel to recycle than any other company, which will result result in higher sludge recycling costs. Grieve Strategic, National Landbank Modelling (2022) demonstrates that under current regulatory conditions the average maximum haulage distance we are required to travel to recycle biosolids to land is 71km, compared to an industry average of 44km¹⁵.
- 3.1.13 The EA approach requires these physico-chemical sludge treatment sites undertaking recovery operations to be regulated at a higher environmental risk tier within the EPR framework because of the historical outlet for the treated product rather than reflecting current operations. This decision leads to significantly higher regulatory obligations and compliance costs at our physico-chemical sludge treatment centres, reflecting a step change in environmental protection obligations compared to the T21 exemption, widely used across the industry for the equivalent activity.
- 3.1.14 At two sites, which formerly operated above the IED threshold by undertaking AD, we are absorbing in base costs over £7.5million of costs to cease digestion, decommission assets and put in place, where appropriate, new sludge thickening or dewatering assets. These costs do not form part of this claim. The claim is solely associated with the additional costs incurred by these sites now being regulated as Bespoke Waste Permits, rather than waste exemptions. Any maintenance efficiencies gained through ceasing digestion are more than off-set by the costs absorbed to convert these sites.
- 3.1.15 In summary, any cost saving from stopping incinerating, to bring costs closer in line with others in the sector, cannot be considered to offset the continued increased regulatory burden at our physico-chemical sites. These higher costs are also compounded by further additional costs incurred at our AD sites now regulated under the IED (as set out in our cost adjustment claim *UUW_CAC_004: Industrial Emissions Directive compliance at anaerobic digestion sites*).

¹⁵ Grieve Strategic and ADAS, National Landbank Study.

3.2 Management control

- 3.2.1 Waste legislative changes have been introduced and evolved since we invested in incineration when sludge disposal to sea was banned. The investment required at our physico-chemical sludge treatment centres results from the application of the regulatory framework in England, and is outside of our control.
- 3.2.2 As we set out in section 2, the disparity between regulation of physico-chemical sludge treatment centres, supplying sludge to a recovery outlet versus a disposal outlet is well understood. We have previously challenged and failed to overturn a 2006 court ruling that physico-chemical treatment sites that feed a disposal outlet are within the scope of the waste regulations¹⁶.
- 3.2.3 When the EA first sought to apply the IED to our AD sites in 2013 we challenged its position, arguing that regulation of our sludge treatment activities was an activity already covered by the UWWTD. This deferred the implementation of IED until 2019, at which time agreement between all UK regulators was reached. At that time, on the basis of legal advice provided to WaterUK, it was felt there was no remaining uncertainty in our statutory obligations, and no recourse for further legal action.
- 3.2.4 Moreover, the application of Appropriate Measures guidance through IED permitting is not subject to cost-benefit assessment and any alternative measures we may propose are subject to EA approval. The EA has ultimate control over the standards set for each of our sites through the permitting processes.
- 3.2.5 While acknowledging that the increased regulatory burden results from factors outside of management control, we have taken steps to control costs for customers:
- By the end of AMP7 we will have absorbed £66.030 million of unfunded IED costs. These costs have not been passed onto customers.
 - This cost adjustment claim excludes a further £11.319 million to comply with Bespoke Waste Permits at non-Bioresources sites (in Wastewater network plus).
 - Moving to a recovery operation rather than disposal (incineration) has allowed us to successfully negotiate with the EA to reduce the regulatory obligations at our physico-chemical sludge treatment sites from IED Installations to operating under Bespoke Waste Permits, avoiding the additional costs to meet IED BAT at these sites.
 - As we set out in section 6, we will ensure that we deliver investment to meet new obligations, as efficiently as possible. We will seek to re-use available information and data, such as odour modelling, air quality modelling, CCTV surveys and structural surveys. Through re-use of this company information we will minimise the work required to demonstrate compliance and the costs to customers.
 - As far as possible we will use management and monitoring techniques to demonstrate Appropriate Measures compliance in preference to capital investment works. However, acceptance of these risk-based measures is reliant on EA agreement. Through permitting to date, the EA has pursued a precautionary and risk-averse approach to setting requirements.
- 3.2.6 We have controlled costs for customers by only seeking a cost adjustment for capital improvements and on-going operating costs. Permit application fees and compliance elements, which are considered 'good practice' requirements (e.g. enhanced site management plans) will be implemented as soon as possible, and the costs absorbed through base allowances.
- 3.2.7 No potential cost savings (i.e. spend to save opportunities) are anticipated from these improvements. The improvements will not deliver any benefits to sludge quality or efficiencies in the operating process. The types of interventions, (to cover tanks, reduce odour emissions, provide secondary containment of

¹⁶ England and Wales Court of Appeal (Civil Division), "United Utilities Water Plc V Environment Agency for England and Wales," 19 05 2006

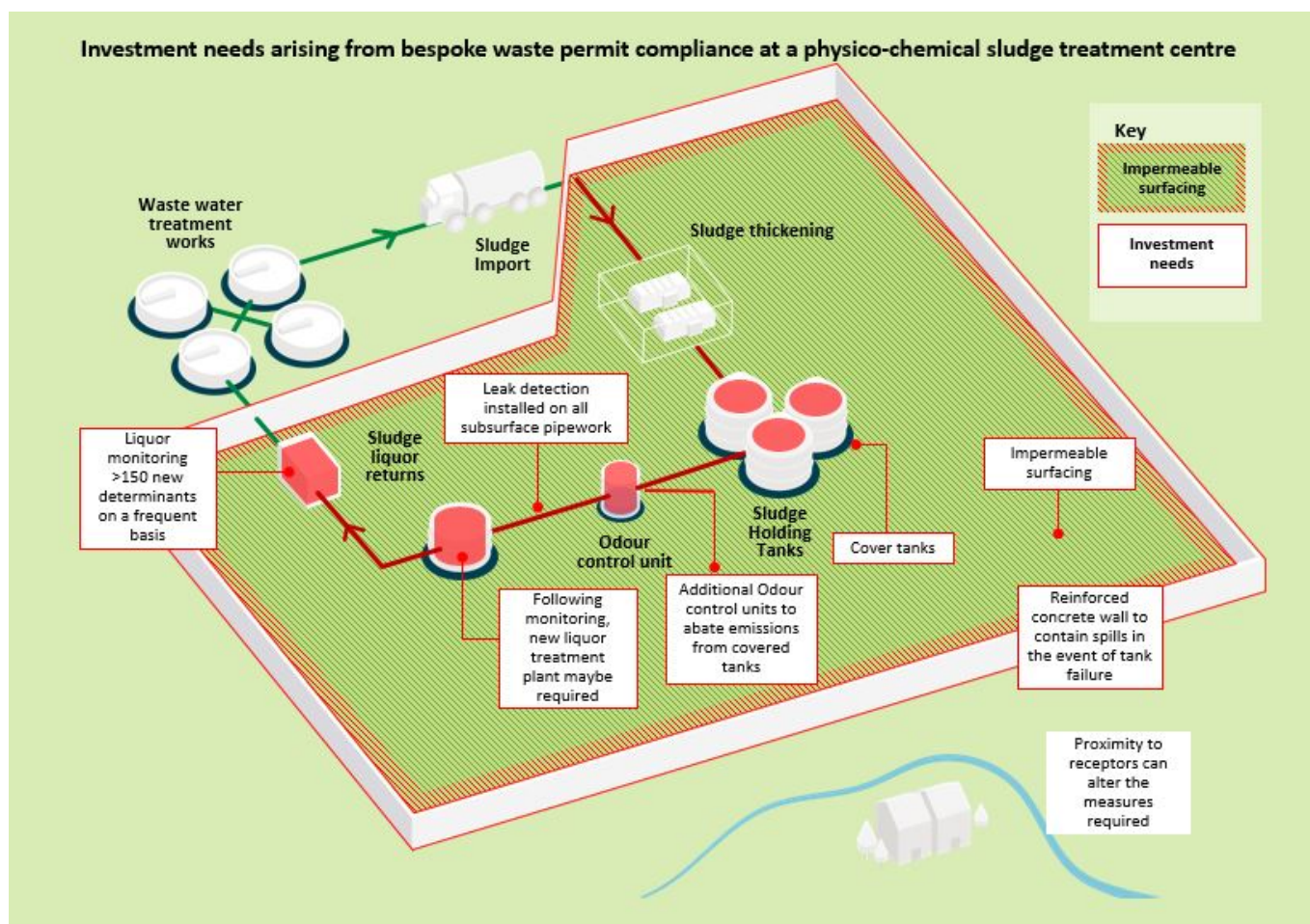
potential spills and bunding of assets) are solely in place to reduce the risk of pollution from site activities.

3.3 Materiality

3.3.1 This claim is for a £78.086 million cost adjustment to base totex. The vast majority of the costs are driven by the requirement to meet the latest standards for waste treatment, as set out in Appropriate Measures guidance. These represent a step change in requirements at our existing permitted sites. These sites, despite having held PPC permits for at least ten years, must be retrofitted to meet entirely new service standards, driving material additional costs.

3.3.2 We present in Figure 6 examples of the explicit requirements of the Appropriate Measures guidance.

Figure 6 - Material investment needs arising at a physico-chemical sludge treatment centre



3.3.3 The scale of investment required to meet these new service standards is material, and cannot be absorbed through existing cost allowances. To put the scale of the investment need into perspective, the investment required to comply is over £78.086 million, and more than a fifth of the entire bioresources price control allowance for AMP7. It is clear that this level of investment cannot be met through existing cost allowances as they are too large a proportion of botex.

3.3.4 Compliance costs have not yet been incurred, and will only be in evidence once we go through the permit variation process at each of the sites and start to comply with the new requirements. We have developed an efficient cost to deliver a clear scope of works using independent consultancy expertise to understand the latest EA permitting requirements to make a quantitative assessment of the expenditure requirements.

3.4 Adjustment to allowances (including implicit allowance)

- 3.4.1 At PR19 ongoing costs arising from maintenance of our existing permits at our physico-chemical sludge treatment sites were acknowledged to be outside cost models and were allowed as unmodelled IED costs. Our reported data in these lines includes both costs at physico-chemical sludge treatment centres and AD sites.
- 3.4.2 The PR24 methodology also recognises that IED compliance costs, due to sites being regulated at a higher regulatory tier, are not included in the cost models. The bespoke waste permit compliance costs should be considered in the same manner: Our sites are regulated at a higher regulatory tier leading to greater compliance costs that are not reflected in the cost models.
- 3.4.3 The PR24 methodology refers only to the on-going compliance costs of IED compliance. The majority of costs set out within the cost adjustment claim are the capital costs for compliance with latest waste treatment standards. We consider that these costs should also be recognised in addition to the modelled allowance.
- 3.4.4 The bioresources cost models include no cost drivers that consider the additional costs incurred when sites are permitted at a more stringent regulatory tier. The cost models are based only on the volume of sludge processed and sparsity factors, neither of which is a determining factor of the costs of regulatory compliance at a physico-chemical sludge treatment sites. Compliance costs are site specific, independent of the volume of sludge processed, and stem from the type of environmental permit held at the site, the assets operating on sites, and site sensitivity factors.
- 3.4.5 We are unique in requiring this number of physico-chemical treatment sites to comply with the bespoke waste permit tier within the EPR framework. Equivalent sites operated by other companies will not be regulated to comply with these standards. Compliance costs, as only incurred by UUW, would therefore not be subject to a future AMP catch-up within the costs models, as other companies are not required to make this investment.
- 3.4.6 We will consider the implications of this activity and future changes to cost models at PR29 to ensure we can secure the efficient on-going resources to maintain this service standard in subsequent AMPs.

Implicit allowance

- 3.4.7 There is no implicit allowance for compliance with more stringent regulations as these requirements are an addition to base service provision. The majority of costs set out within the cost adjustment claim are the capital costs for compliance with the latest statutory Appropriate Measures standards. These represent a step-change in acceptable waste treatment standards in England and are over and above existing PPC permit conditions.
- 3.4.8 The scope of works within this cost adjustment claim relates to new assets, not replacement or refurbishment of existing assets. We present in Table 3 a summary of our cost estimating assumptions, to demonstrate that there is no implicit allowance for any of the individual scope elements that make up the cost adjustment claim.

Table 3 - Estimating assumptions for cost adjustment claim

Bespoke waste permit compliance element	Estimating assumptions	Included in cost adjustment
Permit applications and site management plans	Costs for permit applications and review of permit conditions will be absorbed through base costs in AMP7.	Costs not included
Odour control	Cost estimates are for new odour control units, associated with abatement of vented emissions from covering tanks. Any refurbishment or maintenance of existing units to meet new standards have been excluded from the cost adjustment claim.	Costs included for new odour control units only
Leak detection	Cost estimates are for flow meters at the start and finish of pipe runs. No costs have been included to replace or maintain existing pipework. There is a possibility that once capital works commence maintenance issues will be uncovered and repairs will be undertaken through base allowances.	Costs included
Containment Walls, kerbing, access and impermeable surfacing	Costs are for new areas of containment only including walls kerbing, access and hardstanding. Repairs to existing areas of hardstanding will be undertaken through base allowances.	Costs included for new containment only
Covering of tanks	Costs have been assumed to cover existing tanks only. No costs have been allowed to repair or replace existing tanks. It has been assumed that it is possible to retrospectively fit covers to existing tanks.	Costs included for covering tanks only
Additional instrumentation	Costs included for new instrumentation.	Costs included
Liquor monitoring	Lab analysis costs included for new determinants over and above existing requirements. No associated personnel cost have been included.	Costs included
Site closures	Costs to decommission assets and install new sludge thickening or dewatering assets at two former sites are being absorbed. The claim is solely associated with the additional costs incurred by these sites now being regulated as bespoke waste permits, rather than waste exemptions (covered in line items above).	Costs not included

3.4.9 The decision to stop incineration has led to some efficiencies in our operating model. Any costs savings from stopping incineration, bring our costs closer in line with others in the sector, but are offset by the additional work done, and distance to travel to recycle biosolids to agriculture.

3.4.10 Also, the decision to stop incineration as a disposal operation and undertake recycling to agriculture as a recovery operation has not, as we set out in this document, removed the higher regulatory obligations and compliance costs at our physico-chemical sludge treatment centres. The scale of the compliance requirements at these physico-chemical sludge treatment centres is material when compared to other companies.

Timing of expenditure

3.4.11 The requirement to comply with Appropriate Measures standards applies across these sites at the point at which these permits are varied and this will instigate a legal requirement to comply with statutory appropriate measures guidance.

3.4.12 We note that Appropriate Measures guidance, for other wastes, treatment types or industries, set out a common expectation on timescales for compliance with long-term and capital-intensive improvement: *“Operators should complete these improvements as soon as practicable and within 3 years¹⁷”*.

3.4.13 Expenditure to ensure compliance with Appropriate Measures at physico-chemical sludge treatment centres cannot be accelerated to be delivered in AMP7. The permit variation process will take time and the scale of the investment required is so complex and significant, and too great a proportion of botex to be absorbed.

3.4.14 For additional information on delivery timescales please see sections 5.1.13 to 5.1.15.

¹⁷ <https://www.gov.uk/guidance/non-hazardous-and-inert-waste-appropriate-measures-for-permitted-facilities/1-when-appropriate-measures-apply> section 1.3

4. Cost efficiency

4.1 Development of efficient cost estimates

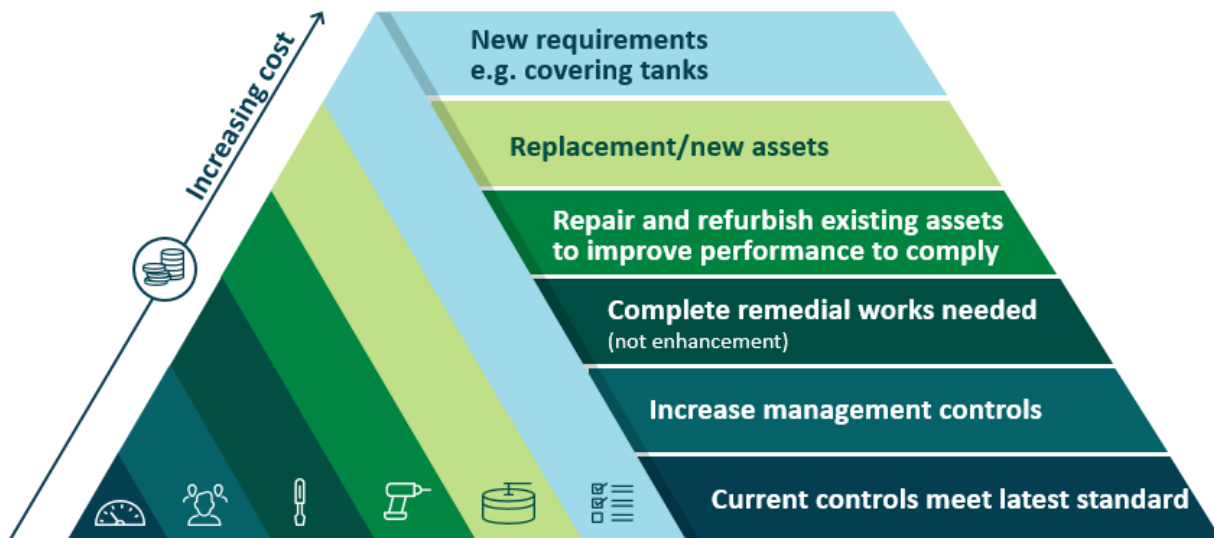
- 4.1.1 In this section we demonstrate that our cost estimates for delivering compliance with Appropriate Measures guidance are efficient. Appropriate Measures is a prescriptive set of guidance, not subject to cost benefit assessment and therefore, there are limited opportunities to make efficiencies in the scope that can be delivered. However, as we demonstrate in this section, we are doing as much as possible to reduce costs for customers.
- 4.1.2 We have undertaken a significant programme of surveys, site assessments, modelling, engineering design and estimating to derive bottom-up costs for Appropriate Measures compliance. We have extrapolated learning from AMP7 IED permitting to developing Appropriate Measures compliance cost estimates and to understand what alternative proposals (if any) will be acceptable to the EA.
- 4.1.3 We have limited the scope of this cost adjustment claim to only the scope items where we have certainty in requirements, and explicit standards set out in Appropriate Measures guidance.
- 4.1.4 We have excluded other scope items, such as the need to demolish and replace open tanks, covering sludge lagoons, or new liquor treatment plants to improve the quality of discharges back to a wastewater treatment works (see section 7.1.3 to 7.1.6 for more details). These requirements are too uncertain at present to include within this claim. However, given the potential scale of scope and cost increases, we will, through our Business Plan submission, promote management of these compliance scope risks through an uncertainty mechanism. We may seek to revise the cost adjustment claim value in future, if further work or scope requirements are confirmed by the EA make it appropriate to do so.
- 4.1.5 In Table 4 we present a summary of costs by scope item. There are four key scope items that are driving the uplift in required capital expenditure. These items are all specific requirements in Appropriate Measures guidance and are much more onerous than the requirements of existing permits. The majority of the cost relates to secondary containment and tank covering with associated odour control scope items.
- 4.1.6 The majority of the opex relates to the emissions control and abatement related to the covering of open storage tanks.

Table 4 - Summary of cost adjustment claim scope by site

Site	Capacity TDS	Price Control	New Odour control units (£m)	Leak detection (£m)	Secondary containment (£m)	Cover tanks (£m)	Total capex (£m)	AMP8 Opex total (£m)	AMP8 Totex total (£m)
Crewe	10,928	Bioresources	£2.555	£0.248	£8.207	£1.460	£12.471	£0.801	£13.272
Dukinfield	1,892	Bioresources	£2.403	£0.165	£5.500	£0.682	£8.750	£0.324	£9.073
Fazakerley	3,724	Bioresources	£1.067	£0.207	£3.378	£0.162	£4.814	£0.312	£5.126
Fleetwood	6,020	Bioresources	-	£0.248	£2.515	-	£2.763	£0.194	£2.957
Hillhouse	2,413	Bioresources	£1.573	£0.207	£2.980	£0.487	£5.247	£0.431	£5.678
Huyton	2,134	Bioresources	£1.041	£0.289	£3.370	£0.150	£4.850	£0.308	£5.158
Hyndburn	6,651	Bioresources	£0.601	£0.331	£5.150	£0.012	£6.093	£0.264	£6.357
Preston	7,901	Bioresources	-	£0.207	£5.961	-	£6.168	£0.195	£6.362
Rochdale	5,575	Bioresources	-	£0.248	£2.809	-	£3.057	£0.146	£3.203
Runcorn	2,950	Bioresources	-	£0.083	£3.589	-	£3.672	£0.154	£3.827
Sale	4,162	Bioresources	£1.968	£0.124	£1.896	£0.834	£4.822	£0.631	£5.452
St Helens	3,803	Bioresources	£1.313	£0.166	£1.940	£0.301	£3.719	£0.422	£4.141
Wigan	7,589	Bioresources	-	£0.331	£6.963	-	£7.294	£0.185	£7.479
Total Bioresources	65,742		£12.522	£2.851	£54.259	£4.088	£73.720	£4.366	£78.086

- 4.1.7 The scope for complying with Appropriate Measures is highly site specific as it depends on the design and configuration of assets operating on site, as well as site sensitivity factors, such as proximity to watercourses, underlying geology and the distance to nearby receptors.
- 4.1.8 This uncertainty and sensitivity of costs is acknowledged by the EA in the context of IED, which stated that ‘accurate estimates of the costs attributable to IED will only be available once all the site and company-specific factors have been assessed and the review or issue of permits has been completed’¹⁸. The same principles apply to bespoke waste permit compliance.
- 4.1.9 In the absence of finalised permits and a full scope of works, a series of assumptions have been made over the likely works that will be required, and is based on learning from our AMP7 IED programme at AD sites. As well as relying on our own experience we have engaged with other WaSCs to understand their experience of IED permitting, and sought the support of technical expertise from multiple consultants to understand best practice outside the sector.
- 4.1.10 In developing measures to demonstrate compliance with Appropriate Measures guidance we will use management and monitoring techniques in preference to capital investment works. We will seek to minimise scope wherever possible in order to ensure we are efficient in delivering compliance. This hierarchy of interventions, to ensure delivery of efficient solutions, is presented in Figure 7.

Figure 7 - Hierarchy of interventions to demonstrate bespoke waste permit compliance



4.2 Cost benchmarking

- 4.2.1 As the regulation of physico-chemical sludge treatment to recovery outlets under Bespoke Waste Permits is not typical, there are no agreed industry benchmarks for cost of compliance. We have, however, sought third party-assurance of our costing methodology to ensure our cost estimates are robust and efficient (see section 4.5).
- 4.2.2 Our PR24 capital cost estimating approach has been based on data collected over AMP3 to AMP7 and updated to reflect the present market conditions under which we and the UK water industry are operating. Mott Macdonald (MM) has provided us an estimating service over AMP6 and AMP7. They also provide an estimating service to a number of other UK water companies, which allows them to provide a benchmarked approach to our PR24 capital cost estimates.
- 4.2.3 The capital costs consist of Contractor Direct Costs, Contractor Indirect Costs, U UW Risk, U UW Costs to Serve and U UW Corporate Overhead. MM have benchmarked U UW’s direct costs and cost curves and

¹⁸ https://assets.publishing.service.gov.uk/media/60702370e90e076f5589bb8f/Final_Report_-_web_version_-_CMA.pdf (pg382)

assessed the water industry construction inflation based on their Construction Industry Basket of Goods index.

- 4.2.4 Delivery of this scheme will be across a portfolio of multiple projects, across multiple sites. We have experience of delivering work at all of these sites, and project managing the work to ensure that it is delivered effectively and efficiently, and as such we are confident that we have the technical skills and capabilities to deliver this work. Furthermore, we will drive delivery efficiencies through batching at a programme level or with other ongoing projects at site level.

4.3 Developing alternative solutions with the EA

- 4.3.1 We have held multiple PPC permits since at least 2013. As such we have developed considerable internal capability in order to deliver the additional compliance work set out in this submission. We have experience in developing permit applications, undertaking risk assessments to avoid unnecessary capital investments and ensuring that we continue to comply with our permits. However, despite this experience, through the AMP7 IED permit application process at our AD sites, it has proven challenging to come to agreement with the EA over the deployment of any alternative or risk-based proposals that provide equivalent environmental protection at lower costs for customers.

- 4.3.2 For example, to demonstrate compliance with spill containment requirements, our existing permit applications were determined using our Environmental Quantitative Risk Assessment (EQRA) approach. This looked at asset condition, and the source-pathway-receptor methodology to prioritise the risk to the environment from tanks and pipework. This significantly reduced the capital requirements at the time.

- 4.3.3 The EA, through Appropriate Measures, requires that all assessments are undertaken using the ABDA tool and CIRIA 736 methodology¹⁹ and has rejected our EQRA approach. The EA response to our IED application at Ellesmere Port stated:

“The EQRA report is not an equivalent to a CIRIA 736 assessment and does not demonstrate BAT”

- 4.3.4 The response goes on to state:

“CIRIA 736 is considered the industry standard of choice and is based on the source-pathway-receptor approach to risk assessment. It proves a clear methodology for demonstrating BAT, appropriate measures and compliance with permit conditions”.

- 4.3.5 There are several significant factors in using the ABDA tool and CIRIA 736 methodology that drive additional costs:

- While not explicitly stated, the ADDBA guidance is aimed at smaller, new build Anaerobic Digestion developments rather than existing wastewater treatment works. The guidance does not reflect that in retrospective application to existing sites, the costs of upgrading existing facilities might outweigh the environmental benefits, and therefore are not viable.
- The CIRIA assessment process leads to all sites as having a “high” environmental hazard rating, as the default classification under CIRIA 736. Applying a “high” environmental hazard rating all but guarantees an overall site classification of Class 2 (equivalent to a petrochemical or cyanide facility). The Class then determines the quality/integrity of the surface that needs to be impermeable to provide the containment volume. For example, Class 2 would typically require reinforced concrete, whereas Class 1 may be achieved with impermeable membranes or good underlying geology. It is recognised that specific areas of a site may require a higher level of integrity but these should be

¹⁹ The CIRIA guidance “Containment systems for the prevention of pollution: Secondary, tertiary and other measures for industrial and commercial premises” was published in 2014 and is described as being “applicable to the containment of a wide range of inventories and to all sizes of site from small commercial premises with a single storage tank, through to large chemical and petrochemical sites.”. In 2016, the Anaerobic Digestion and Bioresources Association (ADBA) produced a spreadsheet tool and associated guidance document¹⁹ as a “guide to secondary containment at anaerobic digestion (AD) plants” that drew “upon the principles and methodologies within CIRIA 736.”

identified by risk assessment and area-specific measures proposed, proportionate to the risk, not a default classification of the entire site.

- CIRIA guidance considers two scenarios for secondary containment volume; whichever is the greatest of 110 per cent of the volume of the largest tank within the bund; or 25 per cent of total capacity of all tanks within the bund. For the 25 per cent rule to apply there must be a credible scenario(s) where multiple tanks could fail catastrophically at the same time. The EA require use of the 25 per cent rule, which is driving additional costs at applicable sites.
- Furthermore, when retrospectively applying the 25 per cent rule to existing sites, the only practical location to install a bund, is often towards the boundary of a site. In this case, all tanks across a sites are contained within the same bund. Having to contain 25 per cent of total capacity of all tanks within a single bund can result in a much greater containment volume (and cost) than bunding smaller areas.
- A further consideration in developing containment solutions is the increased carbon cost (embedded and operational), which is not considered against the risks associated with retaining permeable areas i.e. consideration of the environment as a whole through this methodology.

4.4 Thinking differently: Developing more efficient solutions

4.4.1 Although Appropriate Measures sets out a prescriptive set of compliance requirements, we have challenged all areas of scope using our Minimum Viable Product (MVP) methodology to ensure our solutions are as efficient as possible, while delivering compliance. Our totex costs capture opportunities discussed in this section (where they are likely to be acceptable to the EA) and have reduced the overall costs of compliance for customers.

4.4.2 We present in Table 5, a summary of the opportunities considered to ensure our solutions are as efficient as possible. We have assessed a wide-range of scope solutions and approaches and our engineering team has ranked and developed these opportunities to identify potential efficiencies in the capital programme. Where we consider the opportunities have a likelihood of acceptance by the EA as compliant solutions we have included these efficiencies in cost estimating.

Table 5 Summary of cost efficiency opportunities already assumed

Opportunity	Rationale	Value of opportunity	Likely EA position⁺
Covering tanks	Retrospectively fitting covers to tanks rather than full tank replacement	C. £31m	Accept – approach accepted through EA permitting to-date
Flow meter installation	Installation of flow meters on either end of subsurface pipework, in preference to moving all subsurface pipework above ground.	Not costed	Accept – approach accepted through EA permitting to-date
FIDO leak detection	Lower cost alternative to flow meter installation in below ground pipework	Up to £2m	Uncertain if approach will be accepted by the EA. Further trials required at Blackburn. Efficiency can not be assumed to be accepted.
Reduction in total containment volume within bunds	Reducing height of concrete walls and areas of impermeable surfacing by containing 110 per cent of the volume of the largest tank, rather than 25 per cent of total capacity of all tanks within the bund. Higher walls also incur high cost per linear meter.	Not costed	Unlikely the approach will be accepted by the EA as a non-compliant solution. Efficiency can not be assumed to be accepted.
Reduction in impermeable surfacing area within bunds	Use of risk assessment at sites with impermeable underlying geology to reduce the areas of hardstanding required.	Not costed	Unlikely the approach will be accepted by the EA as a non-compliant solution. Efficiency can not be assumed to be accepted.
Alternatives to cast in-situ reinforced concrete walls	Lower costs alternatives to provide bunding around tanks	Up to 25 per cent reduction against reinforced concrete wall costs	Unlikely the approach will be accepted by the EA as a non-compliant solution. Alternatives only suitable for ‘Class 1’ sites. All sludge treatment centres classed as ‘Class 2’ sites by default under CIRIA methods.

+ Where an opportunity is marked as ‘Accept’, the cost savings have already been included in the overall costs presented, and demonstrates how we have built up efficient costs.

- 4.4.3 Given the large costs to meet CIRIA 736, the largest efficiency opportunities stem from the potential to reduce the areas of impermeable surfaces and spill volume to be contained. We have proposed through our IED permit applications to reduce the amount of impermeable surfacing contained within a bund. We suggest that at site locations with impermeable underlying geology, the likelihood of pollution reaching a receptor (and given the speed of any clean-up of lost material) is sufficiently low to not require hardstanding across the site. The ADBA tool doesn’t reflect ground conditions and therefore this solution would require a deviation from Appropriate Measures.
- 4.4.4 We have considered opportunities for alternatives to cast in-situ reinforced concrete walls, to bund a site and provide spill containment in the event of catastrophic tank failure. The alternatives considered included plastic barriers, sand bags, earth bunds, or legato blocks. All were considered to be only applicable to sites with a Class 1 site classification.
- 4.4.5 Our innovation team is seeking to identify alternative approaches to leak detection on sub-surface infrastructure. We are trialling Artificial Intelligence Leak Detection in partnership with FIDO Tech Ltd at Blackburn wastewater treatment works as an alternative to installing flow meters for leak detection. This is a low cost solution deployed on our water network. This is a fully automatic process that analyses thousands of acoustic sound files instantly, providing standardised daily outputs to deliver leakage detection efficiency improvements. The greater accuracy from acoustic monitoring can also inform repair prioritisation through its innovative leak sizing capability.

4.5 Assurance of this submission

- 4.5.1 We have sought external assurance from PwC for the methodology and information used to derive our claim value. An extract from PwC's report is provided below.
- 4.5.2 *"As a result of the work performed, we can conclude that management has developed a detailed and logical methodology for producing each cost build and the approach followed to develop the cost estimates appears robust. We have undertaken detailed walkthroughs to understand the source of the cost data and rationale for assumptions and estimates made. We have not identified any priority actions which require attention in advance of the submission."*

5. Need for investment

5.1 New regulatory requirement

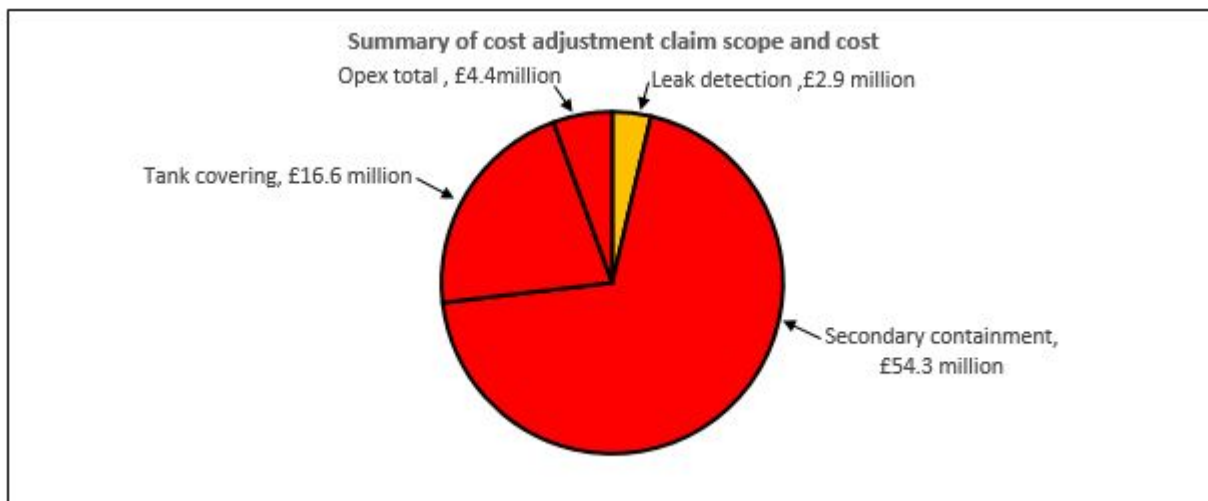
- 5.1.1 Clarification of the regulatory obligations at our physico-chemical sites has identified a clear and unambiguous need for investment to comply with the Bespoke Waste Permits EPR framework regulatory tier.
- 5.1.2 We have reduced the regulatory burden at these sites from being IED Installations to operating under Bespoke Waste Permits. However, the EA does not support full reduction in regulatory obligations and for these sites to operate under T21 waste exemptions, as a legacy of the sites ever having supplied sludge to a disposal outlet. A consequence of this application of the regulatory framework is that a permit variation must be undertaken at each site to demonstrate compliance with the latest statutory Appropriate Measures guidance.
- 5.1.3 We seek further understanding of the explicit requirements, and justification for the need in our letter to the EA of May 2023²⁰. This seeks to ensure that we meet the expectations of the EA, but also, on behalf of customers, we do not deliver investment that is not required.
- 5.1.4 We have not, to date, been required to invest in our sites to meet Appropriate Measures standards. The standards set out within Appropriate Measures guidance are new and more onerous service standards, reflecting a step change in regulatory expectations for waste treatment and will generate significant, additional investment needs at these sites. The requirements go above and beyond the permit conditions set out within existing PPC permits and may mean that, even systems that were installed relatively recently, require upgrade or replacement.
- 5.1.5 Evidence of the more onerous and prescriptive requirements required under Appropriate Measures (albeit in reference to our AD sites) has been identified through Atkins' 2023²¹ assessment. This has identified that the EA, through their statutory duty to reduce potentially harmful emissions, have adopted a precautionary principal approach in setting their Appropriate Measures guidance. This has resulted in many requirements being more onerous than those in existing PPC permits. The EA has deemed the risk posed by permitted facilities that handle sewage sludge are higher than when the sites were originally permitted.
- 5.1.6 The key areas of scope from Appropriate Measures that are driving new investment requirements are prescriptive requirements to:
- Cover all open bulk storage tanks;
 - Vent tanks through suitable abatement;
 - Secondary containment constructed to CIRIA 736 standards; and
 - Provide secondary containment and leakage detection for sub-surface pipework, sumps and storage vessels.
- 5.1.7 We have produced a pie chart in Figure 8 to illustrate the relative cost by scope item, and used the Atkins' red, amber, green, categorisation of requirements, to demonstrate how it aligns to the 2022 Appropriate Measures guidance requirements, over and above the requirements of the 2018 BREF.
- 5.1.8 The pie chart shows that our scope clearly aligns with those areas where Appropriate Measures requirements significantly exceed those of the 2018 BREF, in Atkins' assessment.

²⁰ U UW letter to EA, *Clarification of regulatory obligations at physico-chemical sludge treatment sites*, 26th May 2023

²¹ Atkins, Industrial Emissions Directive Supporting Document, 31st May 2023 (for Water UK)

- 5.1.9 The scope associated with red coloured sectors of the pie chart are all new scope items to meet new obligations in Appropriate Measures, so all the costs for these scope items are included in the cost adjustment claim.
- 5.1.10 The small scope associated with amber coloured sector of the pie chart is leak detection, which was identified as an item where Appropriate Measures requirements go above those set out by BREF. We have included the full scope and cost (£2.9 million) for leak detection in this cost adjustment claim as these sites are not currently required to meet the 2018 BREF or the 2022 Appropriate Measures guidance.

Figure 8 – Pie chart showing the cost adjustment claim scope and cost, aligned to Atkins’ (red, amber, green assessment) comparison of requirements between the 2018 BREF and the 2022 Appropriate Measures guidance



- 5.1.11 At the point at which these permits are varied this will instigate a legal requirement to comply with Appropriate Measures guidance. We have proposed a pragmatic timescale for waste treatment compliance, based on feasibility and deliverability challenges, and recognising the scale of investment required.
- 5.1.12 We have sought to align investment with other works on sites, and ensure sites can remain operational during the works. In addition, needs must be considered under wider planning regulations and Construction Design and Management (CDM) Regulations, which have the potential to add necessary delays to construction completion.
- 5.1.13 We set out below the timescales to implement the changes.
 - (1) **Permit variations:** We will seek to agree our 13 bioresources (and four Wastewater Network plus) permit submissions in tranches. We anticipate the programme running for one year, completing variation submissions in late FY25.
 - (2) **Site-specific improvements:** We will seek to complete within three years from permits being issued, unless defined through the permitting process that specific improvements will take longer.
 - a. Initial compliance focus will be on management control improvements which can be implemented without physical changes to assets or processes, and is expected to take 12 months post permit-issue. This work is to be delivered through base cost allowances.
 - b. Improvements requiring capital investment we will seek to deliver from FY25 to the end of AMP8. This provides the necessary time to undertake procurement activities and front-end project development to enable implementation.

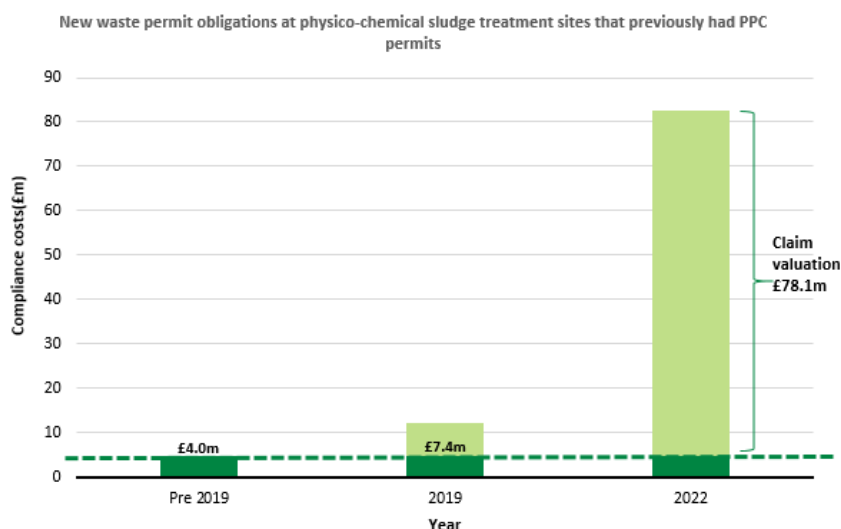
- 5.1.14 The timescales set out are dependent on EA acceptance of our proposals. We note that the AMP7 IED permitting of our 13 AD sites, has at the time of writing, taken over two years from first submission of an application and we are yet to have a permit application determined or to receive a draft permit.
- 5.1.15 It is not in customers’ interest to invest before the requirements and scope are agreed through the permitting process. We will not start to invest to deliver capital improvements to meet Appropriate Measures standards until we have certainty in the scope required by the EA to avoid inefficient spend on behalf of customers.
- 5.1.16 In addition, two sites required to comply with bespoke waste permits, were formerly AD sites. To avoid disproportionate IED investment at these sites which have a finite lifespan, the sites are being converted to operate as physico-chemical sludge treatment centres. Like the remainder of the sites, due to their legacy of formerly being above the IED threshold the existing permit will be varied to bespoke waste permits.

5.2 Funding for physico-chemical treatment permits in previous price reviews

5.2.1 It has been recognised in previous price reviews that our physico-chemical sites are uniquely regulated in the sector, and have incurred higher costs than equivalent sites operated under T21 waste exemptions. In Figure 9, we illustrate how this cost adjustment has been valued, recognising funding in in previous price reviews:

- (a) **Pre 2019:** These sites were regulated under the existing PPC permits. Minimal costs incurred related to the administration, compliance and maintenance of those permits. We were allowed unmodelled costs of £4.0 million associated with this requirement at PR19.
- (b) **2019:** Post-PR19 submission we received notification that the EA was to implement IED with respect to sewage sludge. At the time we understood that the EA would vary the existing PPC permits to IED permits. This would require compliance with the requirement set out in the 2018 BREF. Through our Green Recovery proposal we sought £7.4 million of costs for compliance with 2018 BREF. This claim was not successful as the EA stated that compliance was an AMP7 requirement.
- (c) **2022:** As a consequence of ceasing incineration, in 2022, the EA clarified these sites would now be regulated under bespoke waste permits, negating IED investment. Compliance with bespoke waste permits drives additional, alternative costs to comply with Appropriate Measures guidance. This cost adjustment claim is for costs above the £4.0 million of costs allowed at PR19.

Figure 9 - Valuation of cost adjustment claim



- 5.2.2 The change in requirements to meet bespoke waste permits and Appropriate Measures guidance is driving higher than historical sludge treatment costs. Although we have incurred higher costs in the past due to the unique regulation of these sites, costs are expected to increase by £78.086 million in AMP8.
- 5.2.3 We are seeking to secure efficient financial resources through a cost adjustment claim as permit compliance is an existing obligation, but this is the latest iteration of standards that we must comply with. As these are new compliance standards, costs are not reflected in econometric models and there is no provision in Ofwat's Final Methodology to fund compliance at these sites. These are not IED compliance costs, so cannot be assumed to have been part of previously rejected IED claim for AMP7.

5.3 Customer support for investment

- 5.3.1 Customers and regulators expect that we are compliant with our regulatory and legal obligations and it is our non-negotiable responsibility. We need to be fully compliant with our statutory commitments in order to maintain our trusted brand reputation with customers, communities and our regulators.
- 5.3.2 We have not commissioned specific customer research associated with this cost adjustment claim as it would not drive change in the programme we are delivering, as we are proposing compliance at the lowest cost for customers.

6. Best option for customers

6.1 Options assessment

6.1.1 The focus of optioneering has been to identify the lowest cost and best value approach to meeting our statutory waste permitting requirements.

6.1.2 The following options were identified and discounted at the early stages of the optioneering process:

1. **Do nothing:** this option was discounted as we must operate our assets to meet legal requirements and 'do nothing' would result in environmental non-compliance.
2. **Alternative treatment for all sludge:** this option was discounted as the additional costs involved in delivering Appropriate Measures compliance are comparatively small when compared to the cost of building new assets to treat all the sludge.

6.1.3 In Table 6 we set out the options we have considered to meet the need.

Table 6 - Options considered to meet new waste permit obligations at physico-chemical sludge treatment sites that previously had PPC permits

Option	Rationale	Select /reject	Reason
Alternative permitting approaches to bespoke waste permits			
Sites regulated as T21 exemptions	<p>Surrender existing site permits and operate sites under T21 waste exemptions.</p> <p>Bring compliance at these site in line with the rest of the industry</p>	Reject	Not acceptable to the Environment Agency
Retain existing PPC permits (to be varied to IED permits), rather than sites being regulated as waste operations.	<p>Retain 'D' code in existing permits and sites are regulated as IED Installations. Permit variations would be required and sites must comply with:</p> <ul style="list-style-type: none"> • EU Best Available Technique Associated Emissions Levels; and • EA Appropriate Measures Guidance 	Reject	Higher cost than preferred solution. Does not align with our Bioresources Long-term Delivery Strategy as the additional costs may be abortive in the long term if we do not restart incineration
Stop all physico-chemical treatment to fall outside permitting regulations.	<p>Stop all treatment activities at these sites that are classified as physico-chemical treatment (including sludge dewatering, thickening, screening). There would be no activities to regulate and, therefore, it would fall outside the permitting regime.</p> <p>Transfer raw, unscreened, unthickened sludges for onward treatment at anaerobic digestion sites.</p>	Reject	<p>Not feasible or practical.</p> <p>It would be infeasible to stop producing thickened and dewatered sludges at these sites and transport only unscreened unthickened liquid. This would have a greater cost and carbon impact.</p>
Stop all physico-chemical treatment and trade for treatment via the market	<p>Stop all treatment activities at these sites that are classified as physico-chemical treatment (including sludge dewatering, thickening, screening). There would be no activities to regulate and therefore it would fall outside the permitting regime.</p> <p>Transfer raw, unscreened, unthickened sludges for onward treatment via the market.</p>	Reject	<p>Not feasible or practical.</p> <p>It would be infeasible to stop producing and dewatered sludges at these sites and transport only unscreened, unthickened liquid. This would have a greater cost and carbon impact.</p> <p>Our market research has indicated little appetite for any product other than dewatered sludge cake.</p>
Options to comply with bespoke waste permits			
Minimum Viable Product (MVP) Solution	<p>All efficiencies in capital programme identified. We successfully agree with the EA:</p> <ul style="list-style-type: none"> • Acceptance of containment of 110 per cent of the volume of the largest tank within the bund (not 25 per cent of total capacity of all tanks) • Sites rating downgraded to Class 1 under CIRIA assessment, minimising impermeable surfacing areas, and use of alternatives to reinforced concrete walls 	Reject	It is considered unlikely that solutions are acceptable to the Environment Agency, as they deviate from Appropriate Measures requirements.

Option	Rationale	Select /reject	Reason
Limited Risk Assessment approach to demonstrate compliance with Appropriate Measures	<p>Efficiencies realised where we have high confidence in EA acceptance:</p> <ul style="list-style-type: none"> • Full compliance with CIRIA 736, and no opportunities to reduce requirements. • Assume it is possible to retrospectively cover tanks, rather than replace. • Assume efficiency benefits through flow monitoring approach to leak detection. 	Select	A balanced approach that minimises costs as far as possible, while having a high confidence in acceptance of the proposals by the EA.
Precautionary compliance with Appropriate Measures	<p>Risk averse capex proposals guaranteed of EA acceptance. Include full costs to replace assets (i.e. tanks).</p>	Reject	Inefficient capital expenditure for no additional environmental benefit

6.1.4 Compliance with Appropriate Measures standards is prescriptive and there are limited options to meet compliance. We have sought to propose alternative measures to the EA to deliver equivalent benefit. To control costs for customers we seek to use management and monitoring techniques to demonstrate compliance in preference to capital investment works. Acceptance of these measures is limited as the EA are pursuing a precautionary and risk-averse approach to setting requirements.

6.1.5 Our preferred solution is a balanced approach that minimises costs as far as possible, while having a high confidence in acceptance of the proposals by the EA. We are meeting customers’ expectations by delivering our regulatory obligations as efficiently as possible. As we are selecting the lowest cost, feasible option, we have not sought customer views on selection of the preferred solution.

6.1.6 The benefits delivered through this investment are full regulatory compliance with our obligations, and enable upgrade and improvement to meet evolving standards specified under EA statutory guidance. These are designed to achieve a high level of protection for the environment, reducing the risk of pollution or environmental harm from our activities.

6.1.7 We aim to seek the lowest cost to comply to deliver these benefits. There will be no benefit to operational efficiencies or any AMP8 performance commitments through implementation of these measures. Through our options development process we have sought to minimise the increased carbon cost (embedded and operational) of the proposed solutions.

6.2 Delivery of this scheme

6.2.1 Compliance requirements are highly site-specific and the exact requirements will not be known until we progress each individual permit variation. As such, there is uncertainty over the scale of expected compliance costs. We have utilised knowledge gained through our AMP7 IED permitting process to understand what proposals will be acceptable to the EA and minimise the uncertainty. In addition, we have engaged support from multiple independent consultancies to understand best practice and take learning from outside the water industry.

6.2.2 We will not start to invest to deliver improvements to meet Appropriate Measures standards until we have certainty in the scope required by the EA to avoid inefficient spend on behalf of customers.

6.2.3 So far as possible, we have ensured that our proposed investment is efficient through alignment with our Bioresources Long-term Delivery Strategy. We avoid retaining physico-chemical IED permits as these costs may be considered abortive if we do not re-start incineration activities in future.

6.2.4 The nature of the work; multiple disparate compliance works; entwined with day-to-day operations; and across a large number of existing operational sites, makes it inappropriate to seek to deliver through a market solution. There are no opportunities for third-party funding through this cost adjustment claim, as the works are entirely restricted to our asset base.

7. Customer protection

7.1 Price Control Deliverable

- 7.1.1 Compliance requirements are highly site specific and the exact requirements will not be known until we progress each individual permit variation. As such, there is an element of uncertainty over the full and final scope of works for Appropriate Measures compliance. If investment is not required at a site, or specific scope items are not required, we commit to handing back unspent monies to customers through a Price Control Deliverable (PCD) mechanism.
- 7.1.2 We have minimised this risk, by ensuring that the scope of this cost adjustment claim, is for items where we have certainty in requirements, and there are explicit standards set out in Appropriate Measures guidance. In developing our scope we have had to make specific assumptions to define the cost which are presented in document.
- 7.1.3 There are three main areas where scope could increase based on further review with the EA and detailed design to confirm solutions. These are:
- (a) Increase in scale of containment;
 - (b) Fully enclosing cake pads and fitting odour control; and
 - (c) We cannot cover existing open tanks and these need to be replaced and fitted with appropriate abatement.
- 7.1.4 We estimate the maximum cost increase for these three items is an additional circa £50 million and is not currently included in this claim, pending further review with the EA and detailed design to confirm solutions.
- 7.1.5 We have also excluded another scope item from this claim, which is the need for new liquor treatment plants. This scope is presently too uncertain to include within this claim.
- 7.1.6 We will work with the EA to realise the efficiencies included in our scope of work for this claim. However, given the potential scale of scope and cost increases, we will, through our Business Plan submission, promote management of these compliance scope risks through an uncertainty mechanism. We may seek to revise the cost adjustment claim value in future, if further work or scope requirements are confirmed by the EA make it appropriate to do so.
- 7.1.7 We recognise the need to develop a PCD to ensure that customers are protected. Details of the PCD will form part of our business plan submission, alongside our enhancement proposals. To support the process we propose that Ofwat collect Appropriate Measures and IED capital compliance costs alongside APR data in AMP8. This would allow monitoring of spend against these pre-existing obligations.
- 7.1.8 The EA ensures that the environment is protected in this area on behalf of customers and will monitor performance through a common industry Environmental Performance Assessment (EPA) metric for Waste Compliance. This is a new EPA measure in AMP8 and reflects the increased regulatory scrutiny and increasing regulator expectations for our waste treatment activities.
- 7.1.9 If we fail to deliver the improvements outlined in this cost adjustment claim we will fail to achieve 100 per cent compliance with our statutory obligations under the EPA Waste Treatment Compliance metric.
- 7.1.10 Moreover, non-delivery of the improvements may also incur the following additional penalties:
- **Prosecution and fines** – If a scheme is not delivered it is very likely that our resulting non-compliance may result in prosecution by the EA²². If non-compliance is through deliberate actions by the company this is likely to influence the scale of any fines issued.

²² EA Letter to Uuw 7 June 2023

- **Reputational impact of EPA** – We have received a leading four star rating under the Agency’s EPA for five out of the last seven years. The assessment currently consists of seven metrics, six of which must be green (including the core metric), with no red metrics to achieve four star performance. In AMP8 we expect the EPA to include a waste treatment compliance metric, and the requirements to achieve a four star performance rating to become increasingly stringent.
- **Additional cost** – There is no cost sharing mechanisms with customers in the bioresources price control and the additional cost to dispose of any non-compliant biosolids to alternative outlets such as restoration would be for the company to accept.

Glossary

Abbreviation	Name	Description
AD	Anaerobic Digestion	Anaerobic digestion is a biological process through which bacteria break down organic matter.
AAD	Advanced AD	A biological process designed to extract a greater quantity of biogas and produce enhanced quality biosolids for recycling.
ADBA	Anaerobic Digestion and Bioresources Association	Anaerobic Digestion and Bioresources Association represent over 300 organisations involved in the UK anaerobic digestion and bioresources industry.
AMP	Asset Management Plan (or Period)	An AMP is a water company's detailed description of its investment plans for its assets. AMP is often used as a shorthand name for the companies' business plans. See also Business Plan.
AMP7	Asset Management Plan 7	Refers to the planning period between 2020 and 2025.
AMP8	Asset Management Plan 8	Refers to the planning period between 2025 and 2030.
Appropriate Measures for the Biological Treatment of Waste	Appropriate Measures for the Biological Treatment of Waste	Guidance published in 2022 impacting Anaerobic Digestion sites providing EA interpretation of the BAT conclusions for England.
Appropriate Measures standards	Appropriate Measures standards	Appropriate measures are the standards that operators should meet to comply with their environmental permit requirements.
APR	Annual Performance Report	Annual data collection provided to Ofwat by companies.
BAT (standards)	Best Available Techniques	BAT means the available techniques which are the best for preventing or minimising emissions and impacts on the environment. 'Techniques' include both the technology used and the way the installation is designed, built, maintained, operated and decommissioned.
Bespoke Waste Permit	Bespoke Waste Permit	A type of site environmental permit within the Environmental Permitting Regulatory framework
Bioresources		Name for sewage sludge
Biosolids	Biosolids	Organic matter recycled from sewage, and used in agriculture as fertiliser.
Biological Treatment	Biological Treatment	Biological treatment methods use microorganisms, mostly bacteria, in the biological decomposition of wastes to stabilise end products
BREF	Best Available Technique Reference Documents	BREFs bring together users' real-world experiences of BAT to provide reference information for regulators to use when determining permit conditions.
CCTV	Closed Circuit Television	A TV system in which signals are not publicly distributed but are monitored, primarily for surveillance and security.
CIRIA	Construction Industry Research and Information Association	CIRIA is the Construction Industry Research and Information Association, a neutral, independent and not-for-profit body. They work collaboratively across the construction industry to identify good practice.

CIRIA 736	CIRIA 736	Guidance with respect to containment systems for the prevention of water pollution from industrial incidents produced by CIRIA and referenced in Appropriate Measures.
CDM	Construction Design and Management Regulations	The Construction (Design & Management) Regulations (CDM 2015) are the main set of regulations for managing the health, safety and welfare of construction projects. CDM applies to all building and construction work and includes new build, demolition, refurbishment, extensions, conversions, repair and maintenance.
CMA	CMA	Competition and Markets Authority
EA	Environment Agency	The Environment Agency is a Non-Departmental Public Body (NDPB) and carries out its statutory and regulatory functions with technical expertise, impartiality and transparency, principally across England and at arm's length from its principal sponsor, Defra. In addition, the Environment Agency also works with, and delivers duties on behalf of, a range of other UK Government departments.
EPA	EPA	Environmental Performance Assessment conducted annually by the EA to evaluate water company's' environmental performance.
EPR	EPR	Environmental Permitting Regulations
EQRA	EQRA	Environmental Qualitative Risk Assessment
EU	EU	European Union
Green Recovery	Green Recovery	Water companies were invited to propose investment to support the country's green economic recovery from the COVID pandemic.
IED	Industrial Emissions Directive	A European Union Directive which commits European Union member states to control and reduce the impact of industrial emissions on the environment.
IED Installation	IED Installation	A type of environmental permit for a site required to comply with IED.
MM	Mott Macdonald	Mott Macdonald independent consultant
MVP	MVP	Minimum Viable Product
Net zero	Net Zero Carbon	Means that any carbon emissions are balanced by absorbing an equivalent amount from the atmosphere in order to meet the 1.5°C global warming target in the Paris Agreement
Ofwat	Ofwat	Water Services Regulation Authority
physico-chemical	physico-chemical	Physico chemical treatment involves using chemicals or physical properties to provide thickening or dewatering.
PPC	PPC	Pollution prevention and control
PR19	Ofwat's Price Review for AMP7 2021-2025	The process of setting appointed water companies' price limits.
PR24	Ofwat's Price Review for AMP7 2026-2030	The process of setting appointed water companies' price limits.
Regulation 61	Regulation 61	A provision for regulators to obtain information to support a review of conditions in environmental permits.
T21	T21 exemption	The T21 exemption allows you to recover wastes such as sewage grits, screenings and sewage sludge at a waste water treatment works.
tCO2e	Tonnes of carbon dioxide equivalent	Unit of measurement for greenhouse gas emission reporting.
TDS	TDS	Tonnes dry solid a unit of measurement for biosolids (TTDS thousand tonnes dry solids)
UUW	UUW	United Utilities Water

Urban Waste Water Treatment Regulations	Urban Waste Water Treatment Regulations	Regulations for the treatment and discharge of urban waste water, and the treatment and discharge of waste water from certain industrial sectors.
UWWTD	UWWTD	Urban Wastewater Treatment Directive
WaSCs	WaSCs	Water and sewerage companies
WFD	Waste Framework Directive	The Waste Framework Directive is a European Union Directive concerned with "measures to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use.
WINEP	WINEP	Water Industry National Environment Programme
WISER	Water Industry Strategic Environmental Requirements	WISER is issued jointly by the Environment Agency and Natural England to describe the environmental, resilience and flood risk obligations that must be taken into account when developing business plans.
WwN+	WwN+	Wastewater Network plus
WwTW	WwTW	Wastewater Treatment Works

Appendix A

The following information provides details for items in the footnotes that are not publically available.

A.1 Footnote 4

A.2 Footnote 5

A.3 Footnote 10

[✂]



A.4 Footnote 12 and 20

[✂]



A.5 Footnote 22

[✂]



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Water for the North West