

Economic asset valuation for the bioresources RCV allocation at PR19

United Utilities Water
Supporting overview of the submission

September 2017

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1. Introduction

This document sets out our overall approach to the valuation of UUW's bioresources assets, as at 31 March 2020. In developing this valuation, we have sought to follow the principles set out in Ofwat's guidance: "Economic asset valuation for the bioresources RCV allocation at PR19". We have also undertaken cross checks to confirm that the RCV allocation based on economic value is appropriate and protects customers' interests.

We commissioned CH2M to assure the submission and have reviewed the submission and the assurance of the submission with the UUW Board. CH2M's assurance findings and a signed UUW Board assurance statement are provided as Appendices to this overview.

This overview document is structured as follows:

2. Defining the modern equivalent asset
3. The approach to costing
4. Adjustments to gross values
5. Assurance procedures
6. Cross-checks
7. Summary of results

In addition to this overview we have provided separate table commentaries for the tables below, with commentary on the Table 5 reconciliation to APR Table 4E being provided within section 3.5 of this overview document.

Table 1	Summary - RCV
Table 2	Summary MEAV
Tables 3 and 4	Site detailed data (sludge thickening plants and sludge treatment centres)
Table 6	Inputs

Each Table commentary is structured as follows:

- Purpose of the data
- Systems and critical reports – providing information on the system or report, its purpose and the assurance status of the information in the system or report.
- Methodology and data outputs – reviewing the approach and the output from each section of the relevant tables.

We have sought to provide detail on all the key assumptions we have made in developing the valuation within this submission, with the table below showing where in our submission we have included information to support our proposals, using the list set out in Table 4.5 in Ofwat's guidance.

Item in Table 4.5		Principal coverage in our submission
1	A clear explanation of the approach taken to the valuation.	Overview Sections 2 to 4 Table 6 commentary

	Item in Table 4.5	Principal coverage in our submission
2	A rationale of the valuation approach and how it satisfies the guidance document.	Overview Section 2.1 to 2.4
3	A clear explanation for how the economic value of the assets has been assessed, both how the hypothetical new asset has been defined and adjustments made to reflect the life and differences in economic value for the actual assets . A commentary for the submission tables, cross-referenced to supporting evidence may be useful.	Overview Section 3 Table 6 commentary
4	An explanation of the sources of asset cost, asset life and operating cost and revenue information, and the degree of confidence that WaSCs have in this data.	Overview Section 4.1 for asset life information Table 3 and 4 commentaries for operating cost and revenue sources Table 6 commentary for asset cost sources
5	An overview of the sludge assets should be provided: We expect this to include: <ul style="list-style-type: none"> • An asset description. • Site and capacity information. 	Table 6 Table 6 commentary pages 1 to 11
6	Land values separately disclosed and approach to valuations explained.	Table 6 Overview section 3.4 Table 6 commentary page 12
7	An overview of the sludge processes for each site.	Table 6 Table 6 commentary pages 5 to 11
8	Where applicable an explanation for “ on-costs ”, which have been added to project values. This, is not limited to, and could include: <ul style="list-style-type: none"> • Project Overheads (project management, central overheads, etc.). • Risk and contingencies applied. • Any Preliminaries. • Design and Management Factors. • Any commercial settlements arising from disputes. 	Overview Section 3.2 Table 6 commentary page 9
9	An explanation of the assurance procedures undertaken.	Overview Section 5 Assurance Report Page 1 of each table commentary
10	A description of the cross checks that the WaSC has considered and the sensitivity of the proposed allocation to the approach taken. WaSCs should confirm that they have followed the specific expectations set out in this guidance. Explanation of how the impact on wholesale charges, including trade effluent, has been considered should be included. Where appropriate please support the explanations with evidence .	Overview Sections 6 and 2.2
11	An explanation of the proposed RCV allocation taking into account all of the above.	Overview Section 7

2. Defining the modern equivalent asset

2.1 The overall approach

In developing this submission, we have followed the approach set out in the guidance of determining what would represent best economic value for the future Bioresources market, with our analysis being based upon an analysis of lowest whole-life costs.

It should be recognised that this is the first time that we have been required to calculate the Bioresources RCV. This is a complex process and to produce this submission we have needed to extract data from a wide range of different sources and make judgements and assumptions on a number of matters, including the use of hypothetical assets and cost apportionments.

This overview document and the supporting table commentaries therefore focuses on highlighting the significant areas in the valuation and on the assumptions that we have made in developing the submission. We also highlight the key systems and data sources that have been used to develop this submission (in the Table commentaries) and set out the assurance status of these systems. Some of these systems will continue to be developed and further assured through the PR19 process and as such costs are likely to change, but we would expect that those changes would not have a material effect upon the proposed approach or the overall scale of the valuation.

Our proposed RCV valuation is based upon a hypothetical asset valuation, rather than an actual asset valuation. This approach produces a significantly lower RCV valuation than the current gross asset value, but we consider that this valuation provides best economic value for the future market.

The key factor in the difference between the two valuations and the key assumption within our valuation relates to our proposed handling of our Digested sludge incineration plant at Shell Green and the associated Mersey valley sludge pipeline, which transfers digested sludge to Shell Green from the major sludge facilities in Greater Manchester and Merseyside.

We provide commentary and explanation of our handling of Shell Green below. This is then followed by a review of each of the other key factors and assumptions that we have made in developing the valuation.

2.2 Shell Green and the Mersey Valley Sludge Pipeline

We constructed an incineration plant at Shell Green in 1999, and this was further developed in 2010. The incinerator addressed concerns about future availability of the landbank, and particular issues about the availability of disposal to land in the North West, given the limited extent of arable farming in the region.

The Mersey Valley Sludge Pipeline (MVSP) transports digested sludge to the incinerator at Shell Green and hence is a key component of the incineration process. The MVSP is an 86 km pipeline from Oldham to Liverpool, originally constructed for disposal of sludge at sea. Its use was changed (to make effective use of an existing asset) to take sludge to the Shell Green incinerator following the discontinuation of the sea disposal route. No other company has similar sludge assets on this scale, both in terms of incineration and the pipeline.

We raised the issue of treatment of the MVSP in our response to Ofwat's consultation on the guidance. Following this the final guidance took account of this issue, adding reference to taking a proportionate approach to infrastructure assets where this is a significant issue.

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The analysis we have undertaken to develop this submission shows that we would not build either the pipeline or incinerator today, nor would a potential entrant construct such assets. This is on the basis of whole-life costs. Given uncertainties on future sludge technology and costs it would not be appropriate to build such a high-cost, long-life asset. Changing technology in energy generation from sludge digestion, energy prices, and government support for renewable energy have all affected the economics of sludge disposal. There has been a general move away from incineration. This was noted in the CEPA report commissioned by Ofwat in 2016:

“incineration plants, which are costly pieces of plant typically built in the 1990s as an alternative means of disposing of sludge, when it was clear that the route to sea was to be closed off and there were concerns about the future availability of the land-bank. Some of these plants are still in operation, although others have been mothballed or decommissioned as digestion technology has advanced, reducing the volumes of sludge cake which need to be disposed of to land”¹.

In order to determine the least cost approach for these assets, we weighed up:

- The construction costs for Shell Green and the MVSP.
- The operating costs of Shell Green as compared to costs of disposal to land.
- The construction costs for the additional thickening capacity plants which would be needed to replace the thickening capacity at Shell Green.

As part of this analysis we considered a number of alternative options including:

- Continuing use of MVSP, and thickening and incineration at Shell Green.
- Continuing use of MVSP and thickening at Shell Green – but ceasing incineration and dispose of the sludge from Shell Green to land.
- Cease use of MVSP and Shell Green – increase thickening capacity and secondary digestion capacity at sites which currently use Shell Green.

The total estimated construction costs for Shell Green and the MVSP, if built today, are £450m, as shown below:

Shell Green (Incineration, dewatering and liquor treatment)	£341m
MVSP	£83m
Secondary digestion at Davyhulme	£26m
Total	£450m

For the purposes of assessing the least-cost approach, currently mothballed assets at Shell Green were excluded, giving a gross value of £337m. This value is significantly higher than the cost of £118m for the additional assets at sites which currently use the MVSP (secondary digestion, dewatering, liquor treatment and odour control).

The process for developing the costs in the table above and for valuing the hypothetical assets in table 6 was led by our engineering partner, Jacobs and is summarised below:

¹ Targeted review of sludge and water resources, Cambridge Economic Policy Associates, March 2016

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- a) Process Block Diagrams were developed for each Bioresources site. To ensure consistency between sites we used templates that generate process blocks based on our Project Coding guide and our asset standards. The inputs to the templates were developed collaboratively between Jacobs' staff and United Utilities' experts. Each process block was sized according to our asset standards based on the 2016-2017 sludge treatment loads and forecast future loads. The Blocks aligned to United Utilities' Project Coding Guide.
- b) We valued each process block using United Utilities' Unit Cost Database (UCD). The UCD is also aligned to the Project Coding Guide. The UCD has been used to support every price review since PR94. The UCD undergoes regular audit and assurance to support price reviews. As this submission is 12 months before our Final Business Plan the database is still being finalised prior to being reassured later this year for use in our PR19 Final Business Plan.
- c) The outputs of the Unit Cost database are then processed to align them to the process stages of Table 6. The asset lives for the hypothetical assets (Table 6 block G) are based on the breakdown by asset lives provided by the UCD. The average asset lives are weighted by value, not by depreciation, as are all of the asset lives in this submission.

In addition, operating costs are higher on the basis of using the MVSP and the Shell Green site than would be the case with land disposal from the sites which currently use the MVSP. The additional operating costs have an NPV of £80m (see table below, with the additional cost explained in more detail in Section 4.2) which is included in Lines 150 and 162 of Table 6. Therefore the overall NPV of continuing to use the MVSP and Shell Green incineration is a net cost of nearly £300m.

Our proposed RCV valuation is therefore based upon the hypothetical assets and operation at the sites which currently use the MVSP and shell Green, rather than being based upon continued use of these assets. The removal of the valuations for MVSP and Shell Green are the main reason for the differences between the NMEAV at March 2017 and the proposed RCV shown in Table 1.

The impact of Shell Green and the other material factors that contribute to this difference are shown in the table below.

	£m
NMEAV at March 2017	820.4
Additions/Depreciation 2017-18 to 2019-20	(56.0)
NMEAV at March 2020 (per Table 1)	764.4
Shell Green NMEAV at March 2020	(160.9)
MVSP NMEAV at March 2020	(39.8)
Opex adjustment for sludge treatment:	(47.6)
Opex adjustment for sludge disposal:	(32.8)
Subtotal	483.3
Proposed RCV at March 2020	383.1
Remaining difference	100.2

The remaining difference is due to a number of factors, including increased efficiency since the last valuation and changes in the approach to valuation since PR09.

2.3 Approach to sludge thickening

Ofwat's methodology does not require a valuation of thickening sites on a hypothetical basis. However, we consider that a hypothetical approach is appropriate, particularly in view of the decision that we would not build on the Shell Green site, which contains significant thickening assets. This will achieve the objective of providing a valuation which represents best economic value for the future market. This decision means that the dewatering facilities at Shell Green have to be hypothetically located elsewhere.

2.4 Approach to infrastructure assets

Ofwat's guidance states that: "Where WaSCs consider that the valuation of infrastructure assets is significant to the overall valuation it should take a proportionate approach... in other cases we expect infrastructure assets to be valued on the basis of a new build construction cost".

As noted above, we have analysed the MVSP separately, and identified that we would not build such an asset today, and have therefore not included this asset within our valuation. For other assets, we have followed the approach on basing the valuation on construction cost.

2.5 Asset boundary

The boundary between Wastewater Network plus and the Bioresources business (BR) used for this valuation is the first process that thickens the sludge to greater than 10% solids or the first process following an import of sewage sludge. Our approach follows the guidelines set out in RAG4.06. This changes the boundary from that used for 2015-16 reporting, which affects comparisons between this submission and the Annual Performance Report for 2015-16.

There are a number of sludge holding tanks on Network Plus land that only serve to store and combine sludge from smaller sites. No dewatering, thickening or treatment takes place at these sites. Ofwat guidance is that these should be defined as Bioresources assets.

2.6 Site capacity

Capacities of existing assets are presented by process. The capacities shown are based on the annual design capacity at March 2020. The methodology which we have used to determine the capacities for digestion sites is as follows (with the exception of Davyhulme):

- 1) Confirm digestion throughput in tds/year at the site based on time in the process required to achieve digested sludge compliance standards.
- 2) Utilise the calculated digestion capacity in tds/year to confirm the throughput for all upstream and downstream processes as these are limited by digester throughput.

For Davyhulme, the design throughput of the plant is defined by the pre-treatment process (thermal hydrolysis) rather than digester capacity. Therefore, the average annual design throughput for the process blocks is set by the pre-treatment process.

In view of the assumption that we no longer use the MVSP or the incinerator, we considered that it was appropriate to use hypothetical capacity rather than actual existing capacity for valuing the hypothetical

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assets. All the sites which were connected to the Mersey Valley Sludge Pipeline (MVSP) have new hypothetical assets (secondary digestion, dewatering digested sludge, liquor treatment) where needed. Therefore, the capacity of the assets needs to reflect forecast throughputs rather than historic asset capacity. This is to ensure new assets are not oversized.

The approach is set out in more detail below:

Capacities that are the same for Block B and C

(equates to 126,227 TDS/yr of total 229,941 tDS/yr – 55% of total Block C capacity)

- a. In defining capacities, Leigh and Burnley are set at current design capacities. These are STCs that have recently been rebuilt.
- b. Davyhulme processing capacity is set in line with its design for existing assets. Davyhulme bioresources assets were redeveloped and commissioned in AMP5. Additional assets have been added to reflect it being decoupled from the Mersey Valley Sludge Pipeline (MVSP).
- c. Ellesmere Port is being redeveloped in 2019 and the capacity presented is as in Block D.

Adjusted Capacities for Mersey Valley Pipeline Sites

(equates to 64,896 TDS/yr of total 229,941 tDS/yr – 28% of total Block C capacity).

For sites on the MVSP (other than Davyhulme), which are Dukinfield, Oldham, Bury, Bolton, Warrington, St Helens and Liverpool, the capacities have been reassessed to meet requirements based on future needs with no MVSP. These hypothetical capacities are based on current sludge volumes being processed and location of sludge for import. This has supported defining the capacities for these sites which would be suitable for future operation and also to size the additional assets for these sites to enable them to operate stand-alone (no longer connected to the MVSP). The approach leads to some differences between current and hypothetical capacity. For example, Warrington hypothetical capacity is greater than current because of the current throughput volume. For Bolton, hypothetical capacity is lower than current capacity. This is because the current site is oversized as compared to throughput and headroom requirements.

Remaining STCs

(equates to 38,816 TDS/yr of total 229,941 tDS/yr – 17% of total Block C capacity).

For the remaining sites (Blackburn, Lancaster, Southport, Stockport, Carlisle and Workington) we have adjusted capacities based on current/future sludge volumes. This is to support developing an overall regional system for sludge processing.

Our approach provides regional hypothetical capacity that exceeds throughput to deliver required headroom to ensure that we can meet our service obligations. Overall, the capacity assumed is sufficient to meet throughput plus headroom, and this also applies at individual sites with two exceptions (St. Helens and Dukinfield), where there are small differences. Our design approach would allow us to meet this throughput within the available hypothetical capacity.

Mothballed assets

We have considered the value of capacity of mothballed assets, which are maintained so that they can be used to meet potential operational requirements in the future. Our approach for these was to consider:

- Their value, using our cost model for asset replacement and remaining life using accounting lives.

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- The probability of these assets being used
- The number of years of their remaining life for which they might be used.

Applying this approach showed that the value is not material to the valuation – less than £1m.

2.7 Location of facilities

We have based our approach on the existing configuration of sites, with the exception of Shell Green and the Mersey Valley Pipeline discussed in Section 2.2.

Three sites are not currently defined as Bioresources assets but will become so by 2020 – by this date they will receive imports. These are Ambleside, Grange-Over-Sands and Eccles. These sites are, therefore, included in the valuation, but have no historic cost data (2015-16 or 2016-17) as they are not current Bioresources sites.

2.8 Level of valuation

We have carried out our valuation for all sites at a process level, in line with the guidance which requests that this approach be adopted as far as possible.

2.9 Asset ownership

We are planning to complete an extension of the Ellesmere Port site by 2020 and have included this extension in our valuation. However, we are considering construction and ownership of the new project by a subsidiary of United Utilities. This would not be part of the regulated business.

If we follow this approach, then the value will need to be removed in the revised valuation included with the business plan submission. This would reduce return and RCV run-off in the revenue requirement, but we would require a matching adjustment to opex to reflect the charge from the new business to United Utilities Water.

2.10 Transport

We have used our transport database (Tranman), which includes values, age and expected replacement date, and allowed for projected changes to 2020.

2.11 Cost of capital

As required in Ofwat's guidance, we have used the PR14 real weighted average cost of capital of 3.6%. We will revise the valuation, using the updated cost of capital, in the business plan tables.

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3. Approach to Costing

3.1 Source of capital costs

The capital costs are derived from our capital cost database (IPES). We used a process block diagram to develop processes with yardsticks for Bioresources sites. This process is the same as that adopted for PR19 forecasts, and we are using the same cost curves.

3.2 On-costs

All costs include site-specific, construction and contractor add-ons, tender to outturn adjustments, and United Utilities add-on costs and overheads.

3.3 Management and general costs

Management and general assets have been allocated to a specific site where possible. Other assets (e.g. at our headquarters at Lingley Mere, Warrington) have been apportioned across all sites.

This approach follows the guidance, which states that: “companies should include under a focused valuation an element of asset value for any assets the bioresources business materially relies on, that they believe they have not separately considered in their calculation of economic value”. However, as also noted in the consultation, these assets “will typically fall under network+ under principal use. Where this is the case, then under the RAGs bioresources will pay a recharge to reflect their usage of the assets in the regulatory accounts”.

This means that the costs of these will be included twice – as return on RCV and RCV run-off, and also a recharge from Network+. We suggest that this double-counting could be addressed by removing these assets from the Bioresources RCV.

Sludge disposal management and general is shown as nil to reflect the much reduced asset base and employee numbers under the hypothetical valuation approach, with a switch from incineration to sludge disposal to land. Sludge transport management and general is also shown as nil. We do not currently allocate our M&G assets to sludge transport, and given the low asset base and employee numbers in this service, the allocation of M&G assets would be immaterial.

3.4 Land values

We have used a standard value of £0.4m per hectare, which is the value for industrial land in the North West region, as published by DCLG and referred to in Ofwat’s guidance.

The valuation is based on the same land use as is currently used for Bioresources assets, with the exception that the Shell Green land is not required as there are no hypothetical assets on the site. The valuation has been based on a desk-top analysis of land area attributable to Bioresources. This plan was then checked and verified by a process engineer.

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3.5 Reconciliation to APR (Table 5)

In 2015/16, the annual operating expenditure for sludge treatment was reported in the APR as £22.678m. Table 5 has been updated to reflect RAG 4.06 and therefore the operating expenditure has reduced to £16.777m. This is a result of the 13 co-located sites being re-classified into sewage treatment from sludge treatment as a result of the sludge boundary definition changes. In addition, the costs of incineration of treated sludge have been reclassified to sludge disposal. This is consistent with reporting of operating expenditure for 2016/17.

3.6 Treatment of operating costs

Operating costs values for the Mersey Valley Sludge Pipeline and the Shell Green caking and incineration site have been retained with the sites for Table 3 and 4 but apportioned across the satellite sites in Table 6. This affects lines 169-172.

The operating costs in table 3 and 4 are actual values and hence apply to the actual assets – they also do not enter into the economic valuation. However, the values in Table 6 lines 169 to 172 have been adjusted for better consistency with the hypothetical operating costs and to prevent negative site valuation.

The hypothetical valuations have all the sludge treatment and disposal functions at the sludge treatment sites. On the basis that in practice we continue to operate at Shell Green, then there is a negative economic adjustment to the valuation to reflect actual operating costs compared with the hypothetical operating costs without Shell Green. We have apportioned costs of operating these assets amongst those treatment centres that use the pipeline and Shell Green.

Sites are not sub-metered and the split between Network Plus and Bioresources is the same as that used in the 2015-16 accounts. All power savings and income from energy generation are attributed to Bioresources.

4. Adjustments to gross values

4.1 Adjustments for asset age

To estimate remaining asset lives, we have used our “Pioneer” tool and not accounting asset lives. Pioneer stores asset data and failure information to inform asset replacement dates. It includes asset performance and condition data. Derived asset lives are then weighted by gross value.

Where there is a difference between asset life of the hypothetical asset and remaining life of the actual asset we have adjusted the value in line with the approach set out in the guidance, i.e. making adjustments for differences in age between the hypothetical and existing asset will reflect the proportion of the discount rate over the asset life

4.2 Adjustments for operating costs and income

We have followed the methodology set out in the guidance to adjust values for differences in operating costs and income between actual and hypothetical assets.

We have made an adjustment at the company level for the difference between existing incineration costs and disposal of sludge to land. This is included in line 162 of Table 6. We have assumed that we continue to operate the incinerator (although this would not be the most economic approach on a new-build basis, it may be economic given that the capacity currently exists, i.e. is a sunk cost). This continued operation is currently under review and any change in this position will be included in our final proposed RCV, submitted with the business plan.

Our hypothetical new build costs were based on an assumption that all of the digested sludge would be applied to agricultural land. This would generate a significant reduction to the costs of the Bioresources business, estimated at £3.361m per year. In calculating this adjustment we have made the following assumptions:

- Sites where there is no change to throughput of sludge, we have assumed current costs of sludge to land operations per RR17, so for these assets the hypothetical costs are identical to the forecast costs.
- Sites where the hypothetical sludge throughput is increased because there is no Shell Green incinerator have been calculated based on revised throughput multiplied by the current average cost of sending sludge to land inclusive of overhead. £14.04 per wet tonne.
- The hypothetical sludge to land volume is calculated based on asset standard for destruction of sludge through digestion

We have used the current average cost as it can be supported by operational data. Actual average costs could differ as:

- For the hypothetical asset, the available treated sludge would be distributed over a wider area, giving access to more outlets.
- The hypothetical assets provide more enhanced sludge and this would open up additional avenues for disposal.
- The available land may be further away than we have anticipated and there may be greater competition for the land-bank.

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As these factors operate in different directions, we have not made any overall adjustment.

Adjustments to opex for thickening and MVSP costs have been allocated across sites. A total of £46m adjustment has been made for the additional opex and IRE at the Shell Green dewatering plant and on the Digested Sludge pipeline. The opex and IRE are £8.12m per year, and the additional costs that the hypothetical assets would require are estimated at £2.36m. The difference of £5.76m has been apportioned across the sites that currently benefit from the caking services in proportion to the gross valuation of the hypothetical assets at those sites. For each site a net present value adjustment has been made based on the average asset life at each site, using the approach set out in the guidelines.

For energy generation, we have assumed that ROCs continue, in line with the approach set out in the Reckon / Jacobs report, page 66.

5. Assurance

5.1 Assurance approach and findings

We have applied the same risk based assurance framework for this information that we have adopted for our 2016/17 regulatory reporting, including our Annual Performance Report and that we will be adopting for our PR19 submissions. This framework is described in more detail on our [web site](#).

As a result of applying this framework we have adopted a three lines of assurance approach.

1. Data providers, their managers and business unit directors have produced and approve the data and audit trails that were developed to support the values and data reported within this submission. With the reported data having been reviewed and signed off up to U UW Board level.
2. The Economic Regulation team have provided oversight to the process and reviewed the information and audit trails. With UU corporate Audit undertaking a review of the accuracy of the data within the submission
3. The U UW Independent Technical Auditor (CH2M) has reviewed the data methodologies and audit trails, using agreed upon procedures and have provided a detailed review and an independent technical assurance statement for the Board.

Much of the data included within this submission has been derived from the same base data that was used for our Annual Performance Report. A detailed audit of the data collection and reporting process used for our Annual Performance Report was undertaken by our independent technical auditor, CH2M, to provide assurance that the data can be reported reliably, accurately and completely and in accordance with reporting requirements.

In addition to the existing assurance of much of this data and the first line assurance that has been undertaken, UU Corporate Audit have also completed sample testing of individual entries on the draft Ofwat submission data tables and have assessed compliance with the overall assurance process.

Their audit covered sample testing of individual entries on the draft Ofwat submission data tables by verifying entries back to source (e.g. underlying records, audited regulatory accounts) and/or re-performance of calculations. On the basis of the sample testing, their review concluded that *“data tables populated for the draft Ofwat bioresources submission are supported by underlying records and calculations and that all the required sign-offs have been obtained from management”*.

Independent assurance was also undertaken by CH2M. As part of this audit they reviewed:

- The data tables, to ensure consistency with source data and Ofwat guidance, and to ensure that the supporting information accurately explains the process of populating the tables.
- The assumptions and limitations that we have stated, and use the review of data tables to identify if further assumptions or limitations should be stated.
- The source data supporting the data tables, to:
 - assure the process of determining the asset values, and the quality of the source data; and,
 - evaluate the reliability of the information extracted from source systems, including underlying accounting records.
- The data tables, accompanying commentary and source data to assure that the RCV allocation is appropriate and in accordance with Ofwat guidance.

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CH2M prepared an initial draft report, setting out a number of issues to be addressed. Their final report was presented to the UUW Board, and confirmed that all the significant issues raised and concluded that:

“your approach has been pragmatic and has focused on the significant components of the valuation as required.

To summarise our review of your methodologies, submission tables and data, we consider that your submission is consistent with the methodology specified by Ofwat, and that there are no material reasons why the Board cannot provide the Board Assurance Statement required by Ofwat”.

The results of the assurance process were presented to and reviewed by the UUW Limited Board, who developed and signed an assurance statement in support of this submission.

5.2 Transparency

We believe that it is important that the process taken to value WASC’s bioresources assets and to provide a level playing field for bioresources trading is transparent. This will both support stakeholders in understand WASC’s proposals and will support WASC’s in developing better and more consistent RCV allocations for PR19.

In support of this we have published this overview document, including the gross valuation of assets (£820m) and our proposed RCV allocation, the net economic value of assets (£383m), on [our web site](#).

We are also developing and plan to publish a new bioresources section on our website. This will provide access to the market information data, as set out in Ofwat’s draft market information guidance (published in April 2017) and will also contain a copy of this overview submission.

6. Cross-checks

6.1 Impact on charges

We have considered whether the proposed allocation of the RCV has an impact on customer bills or on the company's ability to set charges in line with both charging rules and competition law.

We have undertaken modelling to assess the impact on charges. Our current approach to charges uses post-privatisation capex as the basis for attributing returns to the different parts of the value chain. This approach means that the current allocation of returns to Bioresources is higher than would result from the allocation set out in this submission.

In broad terms, the reallocation of RCV would lead to increases in cost allocations towards surface water and highways drainage charges and away from foul charges. Before allowing for any other changes, this would lead to increases of around 6% on surface water drainage charges, although there would be corresponding reductions in charges for foul. However, this is one of a number of considerations in setting charges to reflect costs and the latest approach to price-setting. We consider that there may not be any net impact, and any impact can be managed in a staged way to manage incidence effects and any significant impacts on customer bills.

6.2 Alternative approaches

We have considered the alternative approaches set out in the guidance. Approaches based on existing MEAVs or on expenditure since privatisation would not meet the requirement of producing an RCV which will lead to efficient market prices. This is principally because of the key issue of the Shell Green incinerator and MVSP, which would not be built in today's market. Expenditure on these assets is reflected in both MEAVs and post-privatisation expenditure. Therefore excluding these assets results in a significant difference between MEAV and the hypothetical valuation, and between post-privatisation expenditure and the hypothetical valuation.

For the same reasons, an approach based on future expected spend would not align with the market pricing approach (because our hypothetical assets are very different from the assets which we currently have). Our overall approach is, however, in line with that we use for forecasting future spend, in that we use the same capital costs and the same strategy modelling tool.

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7. Summary of results

The overall result of the valuation is to produce:

- A gross asset value of £820m.
- A net asset value of £383m.

We consider that this meets the objective for the RCV, in that it represents best economic value for the future market. Therefore we propose a Bioresources RCV of £383m, subject to adjustments in our business plan submission, to reflect any updates, the latest cost of capital estimate, and feedback from Ofwat.

