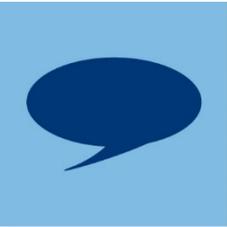


Welcome to 4th sludge working group meeting

15 June 2016

	Agenda Item	Time
1	May Water 2020 document – sludge overview: Alison Fergusson & Andy Chesworth	10am to 11:00 am
2	The form of price control: Jacob Wood	11:00am to 12:00pm
3	Proposals for UKWIR projects – Alison Fergusson <ul style="list-style-type: none"> • Evaluating sludge bids • Defining sludge products in standard market contracts and information databases • Pricing sludge liquor treatment 	12:00 to 12:30pm
	Lunch	12:30pm to 1pm
4	Asset valuation of sludge: Andrew Boardman <ul style="list-style-type: none"> • Objectives of a revaluation and developing guidance/ assumptions • CEPA report: findings/ assumptions around MEAV valuations • Discussion of options for how to carry out a revaluation. 	1pm to 2:15pm
5	Regulatory Accounting Guidelines (RAGs): Rob Lee <ul style="list-style-type: none"> • Implications of the sludge boundary on RAGs • Discussion on the RAG consultation 	2:15pm to 3pm
6	Environmental Regulations: Mat Davis <ul style="list-style-type: none"> • Discussion of agenda item for July meeting on the environmental regulations. 	3pm to 3:30pm
7	Actions and setting the agenda for next meeting	3:30pm to 3:45pm

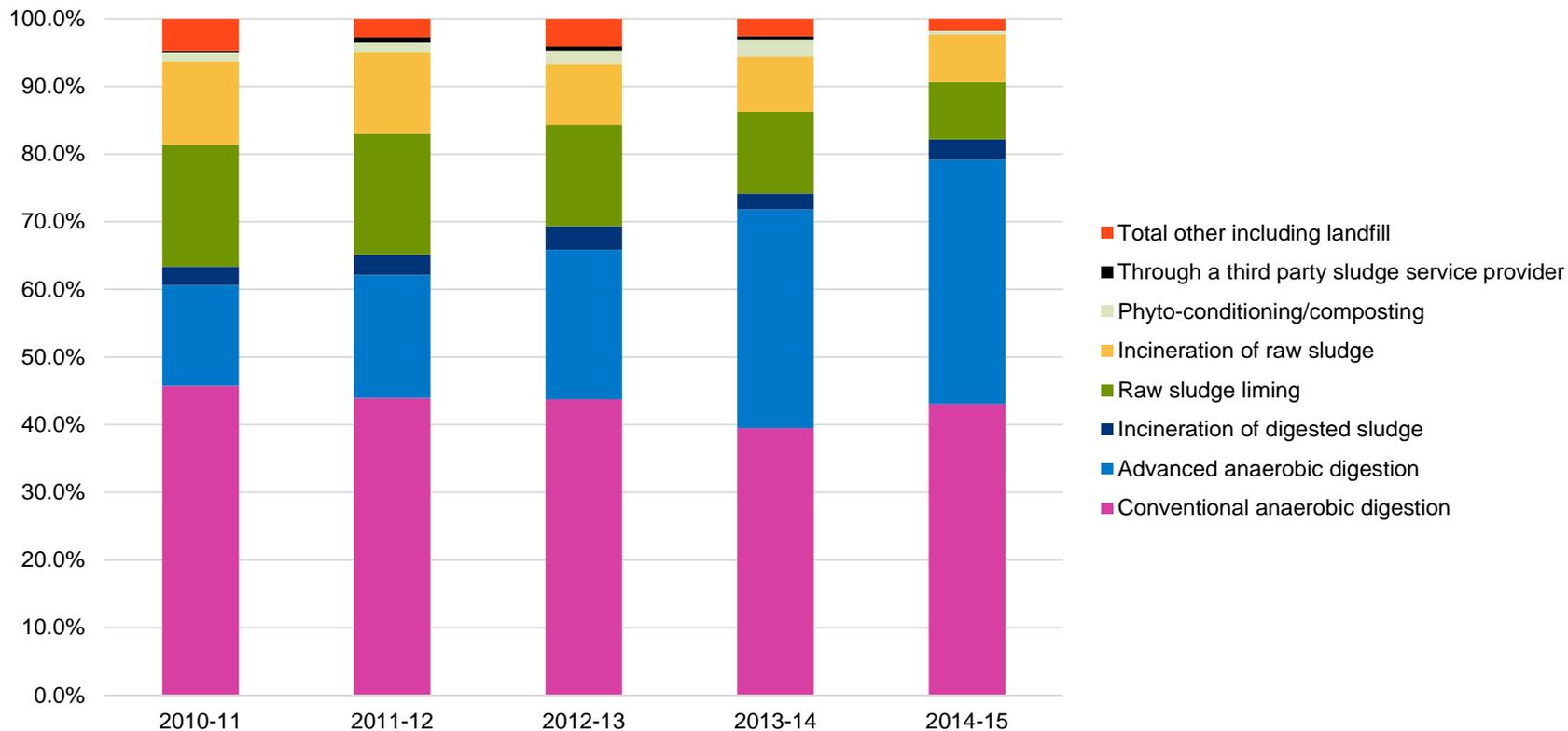
Summary of May document for sludge



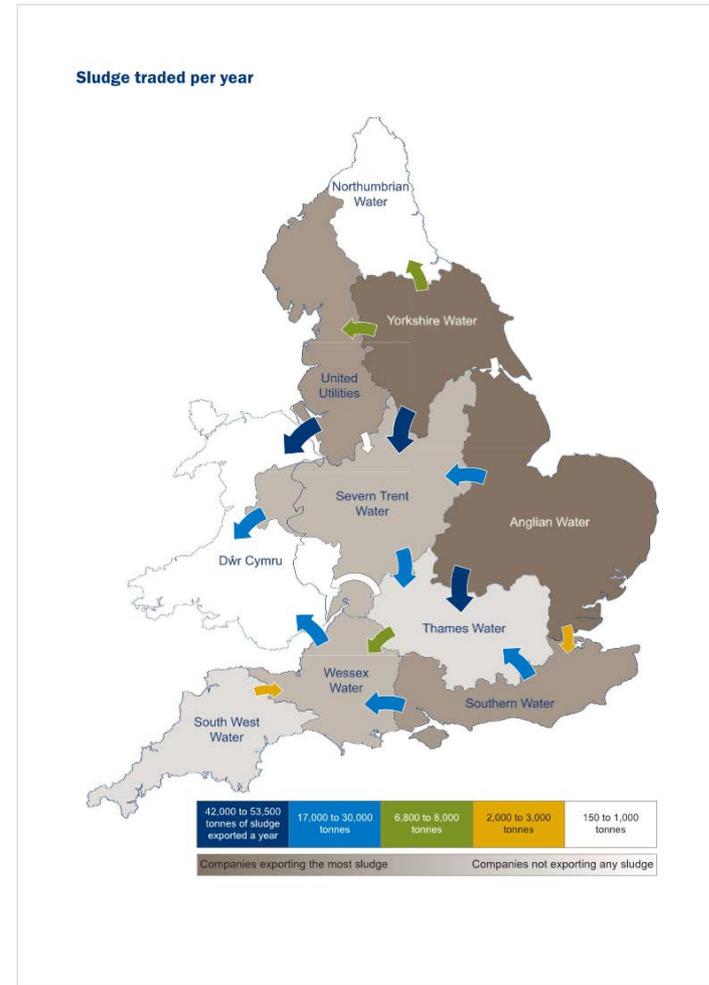
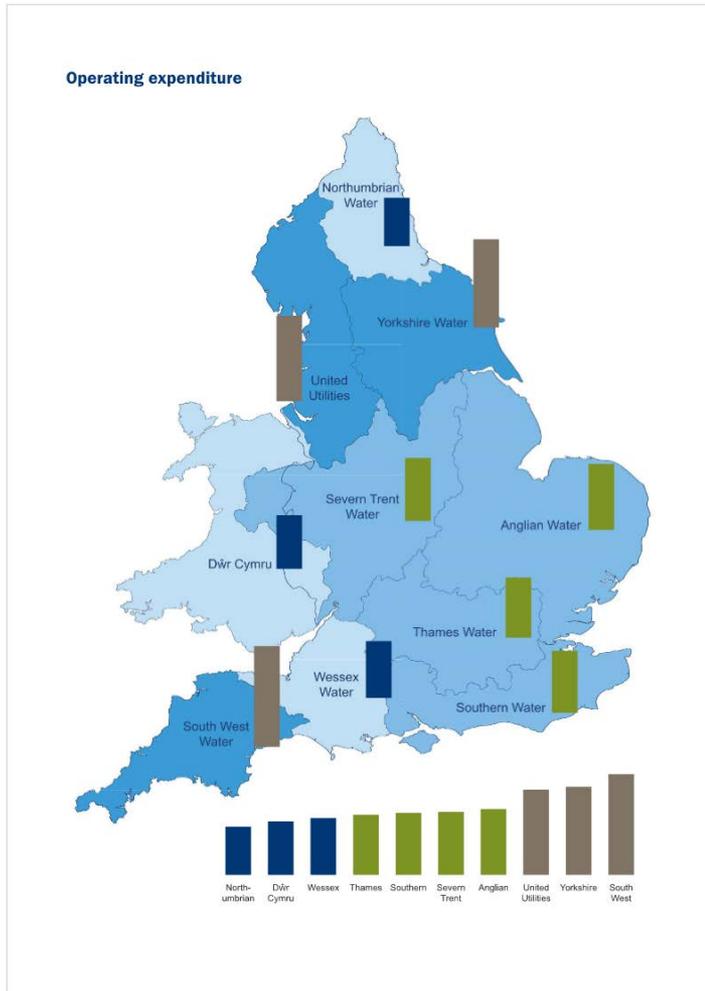
- Broad agreement that there is scope for markets in sludge.
- General agreement that information provision will stimulate the market.
- Where there is support for RCV allocation it should be “focussed” so that there is no discount for being a water company in the field of sludge treatment.

- Mixed on whether case for separate binding price control has been made.
- Where they agree on a separate control, some argue RCV allocation is not necessary.
- Mixed views on making bid activity transparent to all – some suggest Ofwat collects information to asses market activity.
- Mixed on whether information platform needs to be independently managed.

WaSC	Red	EA	Green
WaSC	Red	NRW	Green
WaSC	Orange	CCWater	Green
WaSC	Orange	Citizen Advic	Green
WaSC	Green	CIWEM	Yellow
WaSC	Green	Waste Firms	Green
WaSC	Green	Consultant	Red
WaSC	Green	NFU	Green
WaSC	Green	Investor	Red
WaSC	Green	Investor	Yellow



Company data from information request.



Modelled opex benefit = £161m 30 yr NPV

30 yr NPV (where appropriate)	Benefits	Costs
England	£359m to £1,338m	£26m to £52m
Wales	£13m to £48m	£3m to £6m
Total	£372m to £1,386m	£29m to £58m

Even low end assumption of benefits significantly outweighs the costs



Market information:

- Companies will publish limited information on location, contract duration and the sludge volumes of successful bids, but not prices of successful contracts;
- Companies will record information on all bids received by WaSCs for sludge services and provide to Ofwat if required;
- A specific licence change is necessary so that companies are required to provide information to support markets and to ensure the data is reliable and accurate;
- WaSCs will be expected to demonstrate the effectiveness of their approach to procuring sludge services (including self-provision) in their 2019 business plan;
- Ofwat expects market participants to develop standard products and standards contract terms to facilitate commercial discussions; and
- Ofwat will monitor if the lack of bid assessment guidelines hinders market development.



Price control:

- We will set a separate binding price control for sludge activities in the 2019 price review (PR19);
- We will set the sludge price control at a company level rather than site level;
- We will set a five-year price control at PR19, but we will consider what the length of any control should be in future;
- We will set an average revenue control to regulate sludge, which will need a measure to reflect the volume of sludge produced by WaSCs (more later...);
- A licence change is needed to set a separate sludge control;
- We will leave sludge system operator functions with incumbent companies;
- We will monitor the markets to see how effectively they develop and consider any changes to the system operation function in the future; and
- We will not introduce sludge trading incentives at PR19.

RCV & Risk

Andy Chesworth



Pre 2020 RCV – protected; Post 2020 RCV – at risk

WaSC under no obligation to trade - retains 'make or buy' decision - no risk of stranding in 2020-25

We concluded that development of an RCV guarantee mechanism at this time:

- Unnecessary
- Inconsistent with regulatory best practice
- Lacks clear customer benefit

Could lead to perverse outcomes – trades may be entered into simply to benefit from guarantee payments or decisions are made that ignore sunk investment – in both cases customers pay more

Commitment to reconsider merits of RCV guarantee mechanism for pre-2020 RCV, if required, at PR24. For PR24 we assume:

- WaSC continues to own the make or buy decision
- Run-off of pre-2020 RCV and new investment means pre-2020 RCV is a decreasing proportion of bio-resources RCV



Decision - Average revenue control with exposure to volume risk

WaSC receives same revenue for given volume irrespective of treatment and disposal route

Control over the choice of disposal route - using own assets or disposal via third party

Risk that volumes could change due to changes in the economy – this may be non-diversifiable risk and so could impact on WACC but:

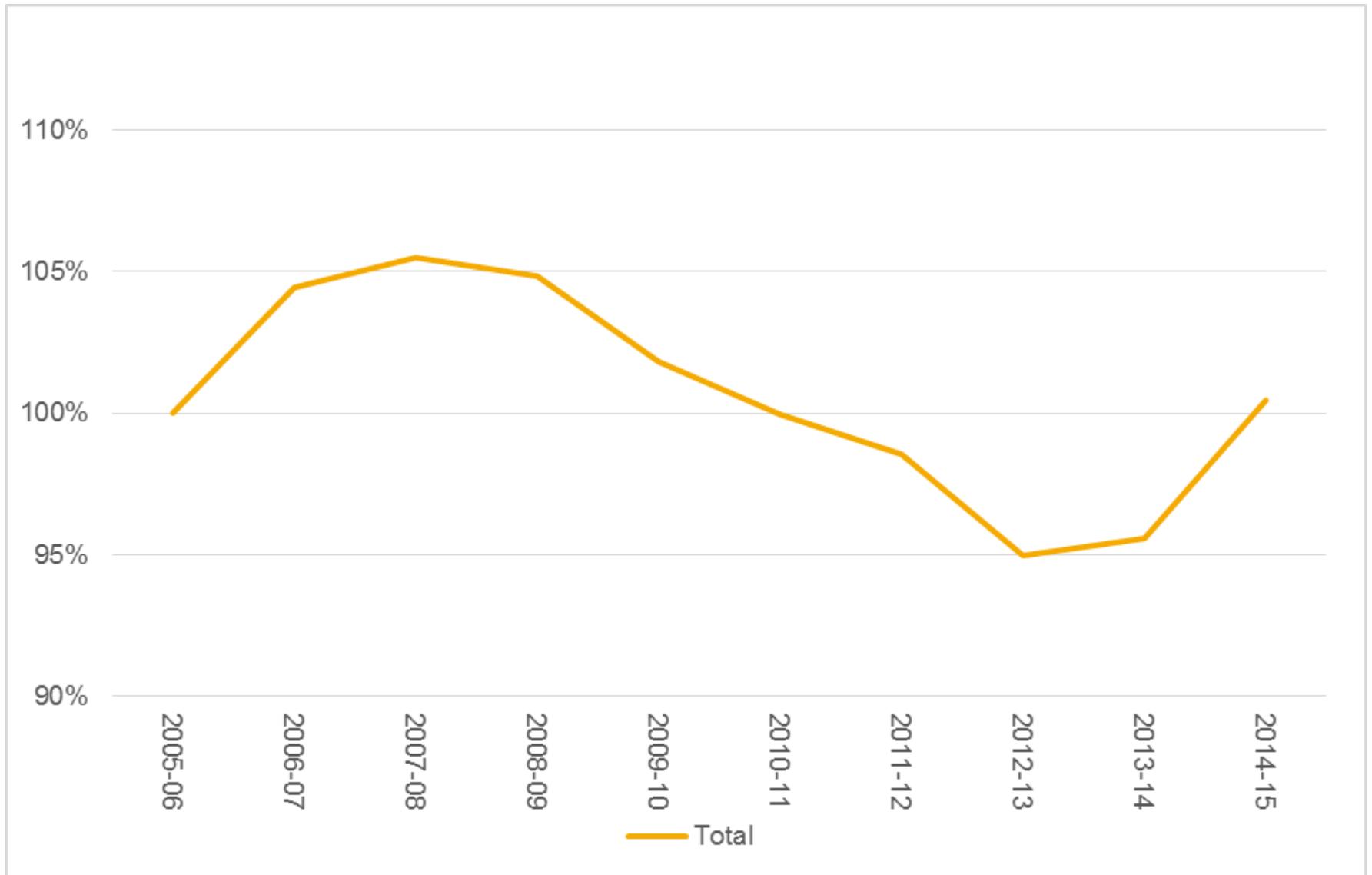
- Opportunities for gains to be made from use of spare capacity
- PwC evidence showed increase in asset beta from the introduction of a volume control offset by an increase in capital intensity due to focussed RCV allocation

We consider insufficient evidence to support view of a higher WACC

Our analysis highlights the importance of appropriate central volumetric assumption for the price control

Further work required on definition of volume, assessment of the central estimate, ensuring customers share in the benefit where appointed assets generate income from trading arrangements, RCV allocation

Sludge volumes – variation over time



The form of sludge price control

Jacob Wood

What is the “form of control” ?

- The form of control is the way Ofwat defines the money that companies can get for providing sludge services.

Where is the “form of control” set?

- The form of control for each price review is set in the price review methodology statement.
- There is a statutory consultation on the methodology (July 2017).
- The form of control is not set out in the licence.

Why is the “form of control” important?

- Different forms of control result in different balances of risk between companies and their customers.
- They can also provide more or less useful information to other market participants.
- The form of control also creates incentives for companies to act in certain ways.

Options we considered for the form of control

Achieving our objectives

Addressing known problems

Practicality

1 Total revenue control

Does not promote markets. Would provide guaranteed revenue which would ensure resilience when demand is low, but not when demand is high.

✗

Changes in volumes do not affect revenues.

✗

Can be set on existing data.

✓

2 Total revenue control with adjustment factor

More effective at promoting markets than option 1, but less than options 3 and 4. Would not provide signals

Revenue control does reflect changes in revenues, but with a time lag and in an indirect manner.

Can be set on existing data – but would need ongoing additional data for adjustments.

✓

3 Average revenue control
Decision

Targeted approach. Would promote markets.

✓

Revenue control affected by changes in volumes, similar to revenues of a competitive firm.

✓

Can be set on existing data, but there may be measurement issues to address.

4 Price cap – through tariff basket

Targeted approach. Would promote markets.

✓

Price cap directly relates revenues to volumes, but cap reduces flexibility to adjust prices compared to an average revenue control – important when data on cost drivers for pricing limited.

✓

Could require more specific price information related to chemical composition of sludge.

✗

An average revenue control will be set as:

$$\text{Average revenue control per unit} = \frac{(\text{PAYG} + \text{depreciation} + \text{RCV return})}{\text{units}}$$

Outturn revenue will therefore depend on outturn units, while the average revenue control will depend on forecast units.

We thus need to decide what units to set the average revenue control on. We have considered:

1. Tonnes of dry solids
2. Population equivalent

1 Tonnes of dry solids

Preferred option

Would subject WaSCs to volume risk from weather and population changes – increases value of information on resilience requirements.

Promotes markets by providing clear price signal for market participants.



A “commodity”-type measure; companies would be paid for what they treat – but it does not reflect full cost of treatment as chemical composition not accounted for.

Creates perverse incentive to increase the tonnes of dry solids artificially eg by reducing screening.

Would encourage further measurement of sludge which would introduce cost, but provide market with information.

Companies already familiar with tonnes of dry solids.

Measurement issues – tonnes of dry solids not measured everywhere or necessarily consistently.

2 Population equivalent

Would subject WaSCs to volume risk from population changes only.

Provides more limited market signal.

Population equivalent more closely tied to actual sludge treated than a total revenue control, but not a “commodity” measure.

Population equivalent not easily manipulated, so no perverse incentive created.

Companies already familiar with population equivalent measure.

Can be calculated with no further measurement.



Achieving our objectives

Addressing known problems

Practicality

How should “over” or “under” recovery of revenue be dealt with in the average revenue control?

How should we assess efficient costs for providing sludge services?

How much of an efficiency challenge should we apply?

How should revenues from trading, energy generation, sale of biosolids and use of appointee assets for non-appointed business be taken account of in the price control?

September
2016

- Where possible, further clarity will be provided on the form of control ahead of the consultation on licence conditions

Oct / Nov
2016

- Industry workshops on design and other issues.

July 2017

- Consultation on methodology for PR19.

December
2017

- Publication of methodology statement for PR19.

The sludge working group going forward
Alison Fergusson



- Definitions of market information to publish, including contracts let.
- Sludge volumes for average revenue control:
 - How do we measure tonnes dry solids?
 - How do we get a central view of expected sludge volumes?
 - What happens if actual volumes vary significantly (up or down) from forecast?
- Objectives and issues associated with valuing sludge assets for RCV allocation.
- Implications of environmental regulatory regime and the perceived barriers to markets
- How do we assess efficient costs for sludge services?
- How is income from trading with other WaSCs, energy generation, biosolids sales, and using appointed assets for non-appointed business accounted for in setting the average revenue control?
- Possibly look at standard product definitions for “market trades”?

Proposals for UKWIR projects

Alison Fergusson



1. Water 2020 – Evaluating Sludge Bids

The main objective will be to:

- Develop high-level guidelines for assessing sludge bids. This should consider how to identify the lowest whole-life cost taking into account all relevant and material price and non-price terms. This work should draw on the outputs of the other proposed UKWIR regulation project below.

2. Water 2020 - Defining Sludge Products in Standard Market Contracts and Information Databases

The main objectives will be to:

- Identify the factors affecting sludge products and measure how these vary across the industry.
- Seek to define standard products and common variances that can be applied across the industry - at the end of the sewage treatment and/or start of sludge treatment.
- Suggest how these standard product terms could be implemented for the market information databases and standard contract terms.
- Identify areas that cannot be standardised and suggest how these could be dealt with within the database and any standard market contracts.



- 1. Support approaches to the sludge control?**
- 2. Demonstrating non-discrimination when assessing bids?**
- 3. Developing market codes?**

What does the sector need to facilitate markets in sludge that is outside Ofwat's immediate remit of operating the price control?

What can wait till after methodology consultation in summer 2017?

Put your proposal together with key objectives for one UKWIR sludge project. 15 minutes.

Lunch

Asset valuation of sludge: Andrew Boardman

Why do we need a valuation for sludge assets?

Regulatory **purpose**:

- **Price control**: a value for assets in a separate sludge price control
 average revenue
- **Trading prices** (or gate prices)
- **Allocation of RCV** (100% to equal sludge asset value – focused approach)

Other purpose:

- **Competition Act** – any price must be justifiable with respect to cost

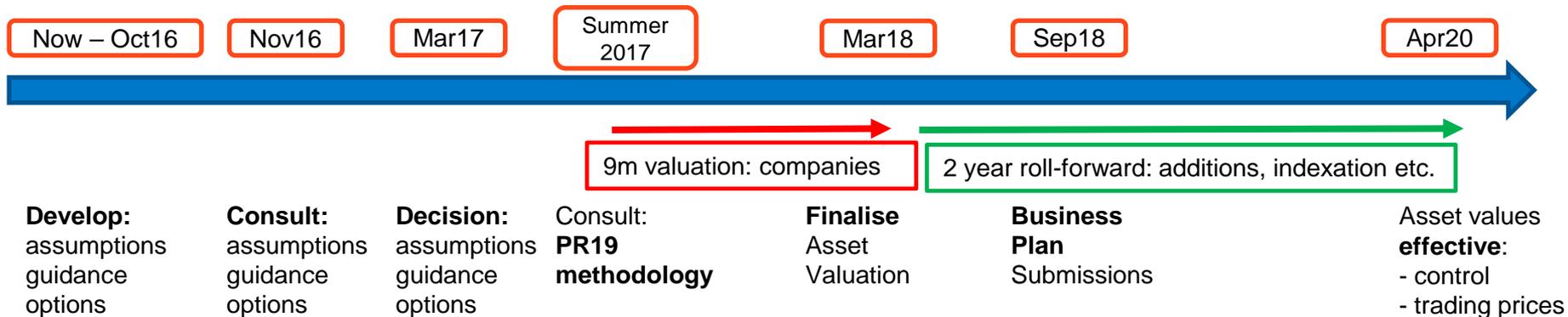
Economic **objectives**:

- **Incentivise** new entrants and efficient trades between existing WASCs
- **Level playing field**: (a) between WASCs (b) with third parties
- **Cost recovery** by incumbent (could be current or historical cost) – and thereby safeguard the benefit to customers

Developing guidance:

- **Many different possible ways** of valuing an asset – even more so under current cost accounting (today’s prices) [CEPA found a wide variation in (a) valuations (b) assumptions – see later]
- **Basis** for choosing assumptions & developing guidelines: establishing the regulatory purpose and economic objectives should help
- **Trade-off** perhaps where these purposes/ objectives conflict
- **A unique asset valuation**, consistent across all uses of it? Or could we have different valuations for different purposes?
- **Methodology for roll-forward** valuation from 2018 to 2020: Or delay valuation till 2020 or forecast a 2020 value?

Timetable (illustrative):



CEPA found a wide variation in:

- a) valuations (mainly based on PR09 – with some adjustments to update to now)
- b) assumptions

Assumptions:

- **greenfield vs. existing?**: blank canvas or existing configuration, choice of site (telecoms – “scorched node”)
- **economies of scale?**: whether and how should be incorporated;
- **technology?**: MEA (modern equivalent) or replacement of existing assets;
- **individual asset level or process level?**;
- **abandoned, decommissioned or mothballed assets**;
- **net or gross MEA valuations?**; and
- **boundary issues** between sewerage and sludge;
- **Management and General (M&G) assets?**: how are they allocated?

Increasing Ofwat involvement

	Option	Pros	Cons
1	Use PR09 MEAV and index forward	<ul style="list-style-type: none"> • Simple • Low cost • Quick 	<ul style="list-style-type: none"> • Lacks accuracy • Bakes in existing variations in valuations & assumptions • 10 years out-of-date (ref asset lives 10 to 20 yrs)
2	Companies do own valuation	<ul style="list-style-type: none"> • Company ownership, less intrusive • Companies know their assets best 	<ul style="list-style-type: none"> • Consistency – requires good guidance/ specified assumptions • May lack objectivity – requires independent assurance
3	Bottom-up unit cost model	<ul style="list-style-type: none"> • Simple, quick • Conceptually easy to understand & relate to physical set-up • Consistency • Fits with current cost “price list” for asset 	<ul style="list-style-type: none"> • Likely to undervalue a site/ overstate efficiency (e.g. greenfield vs. existing) – may need uplift factor • Theoretical • May miss real-life complications • Reduced company ownership (though they could be involved in developing the model) • Costs processes rather than assets
4	Single, independent valuer - all companies	<ul style="list-style-type: none"> • Consistency • Limited need for assurance – since independent • Perceived objectivity for third parties 	<ul style="list-style-type: none"> • Who bears the cost? • Requires development of single set of guidance/ assumptions • Long time – if valuations carried out consecutively (cf. company led valuations in parallel) • Less reflective of individual company situations? • Reduced company ownership

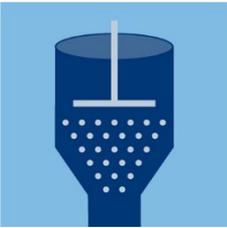
Combinations of approaches:

of course, it may be possible to combine/ compare two different approaches to arrive at a more robust result

1. Have we identified the right regulatory purposes & economic objectives?
2. Thoughts on how we develop the guidance?
3. Questions on the illustrative timetable?
4. Initial views on assumptions:
 - i. Have we identified all of the key assumptions?
 - ii. What choice would you make on each assumption?
5. Approaches to valuation – which ones do you prefer? Why?

Regulatory Accounting Guidelines (RAGs): Rob Lee

Timeline	
30 March	Launch RAG consultation
25 May	Publish Water 2020 decision document
22 June	RAG consultation closes
15 July	Deadline for 2015-16 Annual Performance Report
20 July	Deadline for Water 2020 consultation responses
August/September	Consult on any further changes to RAGs (4 weeks)
September- November	Publish: <ul style="list-style-type: none"> • Information notice; • summary of responses; and • finalised RAGs • Data capture system



- Current starting point of the sludge business unit is “the discharge of sewage sludge from sewage treatment process into pipework leading to sludge treatment processes; or to holding tanks for tankering to a sludge treatment site” .
- Unlikely that a third party would provide sludge storage facilities.
- Propose to change so that **sludge activities start at the point that transport begins**.
- This change would removes from the inventory of sludge assets all basic sludge holding tanks on wastewater treatment works.
- Assets **with moving mechanical parts** that thicken sludge prior to it being transported or treated should be sludge assets.
- At wastewater treatment sites without sludge treatment centres these assets can be used as part of a sludge transport optimisation activity, which is a sludge activity.

Sewage treatment & disposal

<p>Description</p>	<p>Receive untreated sewage from the sewage collection system into treatment works, undertake treatment processes and discharge treated wastewater into rivers, etc and sewage sludge to treatment processes. Includes all direct costs associated with sewage treatment including terminal pumping costs.</p> <p>Inputs: Untreated sewage from sewage collection network.</p> <p>Outputs: Treated wastewater into receiving watercourses, discharge of sewage sludge for transfer to sludge treatment processes.</p> <p>Excludes imported liquor treatment.</p>
<p>Boundary points</p>	<p>Start: Sewage arriving at the inlet to sewage treatment works.</p> <p>End: Consented sampling point at point of discharge of treated wastewater to receiving watercourse; discharge of sewage sludge from sewage treatment process into pipework leading to sludge treatment processes; or to holding tanks for tankering to sludge treatment site.</p> <p>A 'holding tank' for this purpose would include a tank that consolidates sludge by passive means or that has a basic level of mechanical thickening.</p>
<p>Assets</p>	<ul style="list-style-type: none"> • Liquor pipework from sludge treatment to sewage treatment site. • Liquor plants. • Pumps, valves and other ancillary assets. • Vehicles. • IT assets. • Premises.

Sludge transport

<p>Description</p>	<p>This service includes the transport of sludge from the sewage to the sludge treatment plant. All types of transport, and associated fuel costs, are included within this service. However, transport within the treatment plant or between sludge treatment plants is not included in this service, which is instead an activity of the 'sludge treatment' service.</p>
<p>Boundary points</p>	<p>Start: point of discharge of sludge from holding tanks or sewage treatment process into pipework or tankers for transport to sludge treatment processes.</p> <p>End: input of sludge into sludge treatment works.</p>
<p>Assets</p>	<ul style="list-style-type: none"> •Pipework from sewage treatment site to sludge treatment site. •Pumps, valves and other ancillary assets. •Vehicles. •IT assets. •Premises.



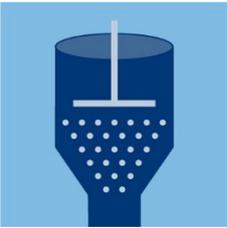
- Liquor treatment costs charged to sludge price control unit.
- No change to current accounting separation boundary affecting liquor treatment.
- Charges for liquor treatment should be cost reflective, transparent and applied consistently to third-party and incumbent liquors.
- Proposing that companies develop an appropriate method of calculating liquor treatment charges.
- Our initial view is based on a 'modified Mogden' formula, including ammonia concentration.



Q1 Do you agree that sludge holding tanks with only passive thickening should be network plus assets?

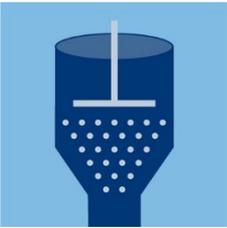
Q2 a) Do you agree that sludge liquor treatment costs should be charged on the basis of a modified Mogden formula which includes a factor for ammonia concentration?

Q2 b) Do you agree that these liquor treatment charges should be calculated on a company average basis, as they are currently for trade effluent charges?



At the moment, there is no readily available supply-side information on where sludge is produced, its quantity or its quality. The evidence from water companies and potential entrants to sludge markets suggests that better information would help markets develop. This would enable potential market participants, including WaSCs, to identify opportunities to supply services to sludge producers.

In the May document, **we proposed that only data on quantity and demand should be required.** This is because more time is needed to develop accurate cost data and it is likely to be more expensive to provide this information. As markets develop, we can review the requirements on companies. We will continue to work with the sector on cost or price data, so that this information can be provided, if needed.



The information provided in relation to the sludge produced at WwTWs, would include:

- location of the WwTW site;
- volume of sludge produced;
- the dry solids concentration of the sludge;
- storage constraints (how often collection is required);
- information on sludge quality (for smaller sites, a proxy such as treatment process could be used); and
- Any particular points that market participants may need to know, such as restrictions on the size of tanker that can access the site, or unusual constituents of the sludge.

While **we have decided not to require cost information or a derived ‘gate price’**, we expect to return to this issue in the future as we consider it a necessary step for further market development. We will also consider whether it would be more helpful to focus on sludge treatment sites and transport costs separately, so reduce detail and complexity of required information.

Environmental regulations: Facilitated by EA

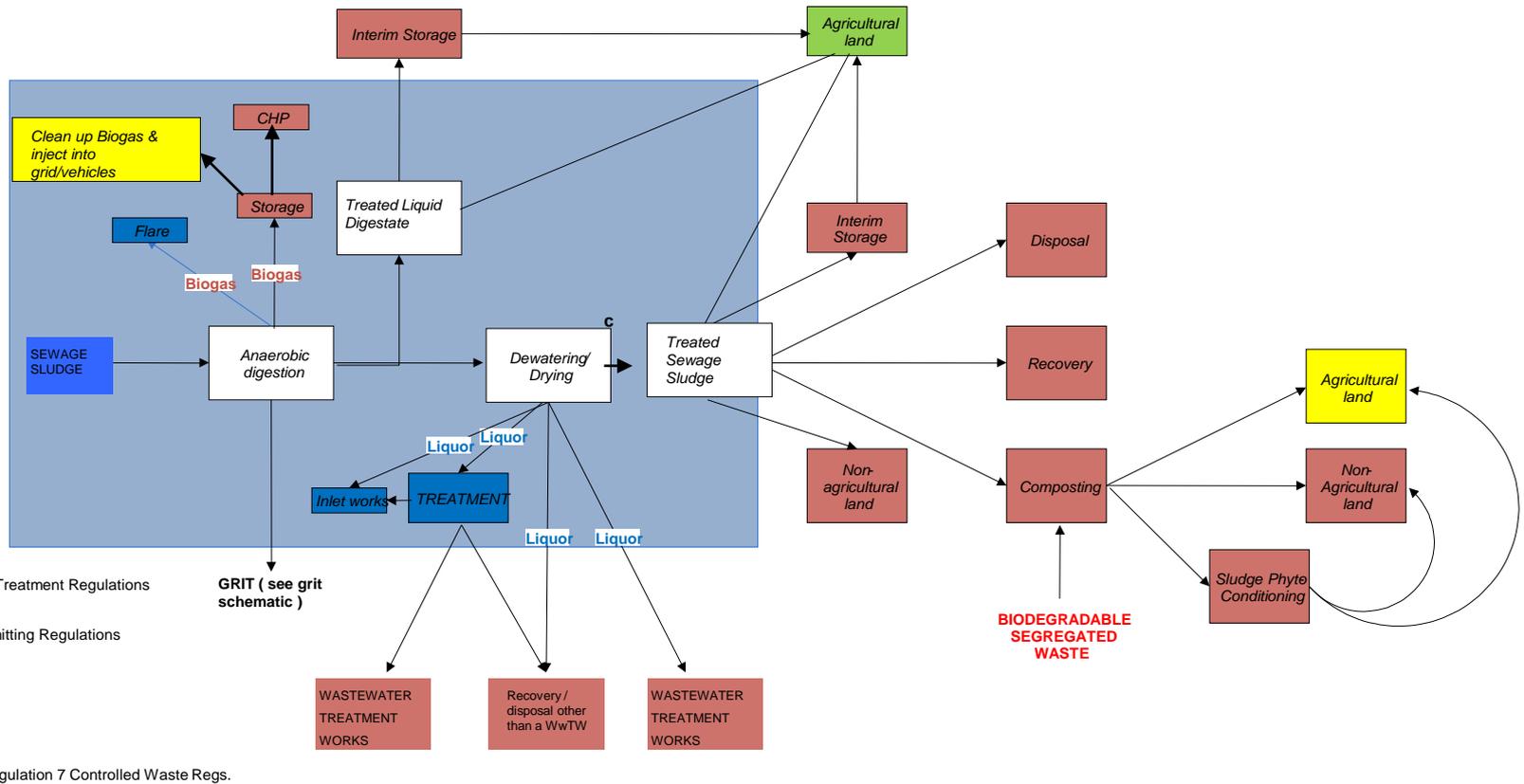
Environment regulations surrounding sludge treatment and recycling to land

Mat Davis
Senior Advisor, Environment Agency

Clive Humphreys
Senior Advisor, Environment Agency

CIWEM, 20th January 2016

SLUDGE TREATMENT INDIGENOUS



The Environmental Regulatory Framework as applicable to water industry wastes – as agreed by industry/ Agency TaF – June 2011 (Version 1) edit

Environmental Regulations – possible agenda topics.

- ➔ Controlled Waste Regulation exclusion.

- ➔ Industrial Emissions Directive exclusion for UWWTD activities.

- ➔ Influent/imports at a Sewage Treatment Works –
 - Waste Water
 - Other waste waters
 - Wastes in a liquid form.
 - Other organic wastes

- ➔ Regulatory Gap Analysis –
 - EPR compared to non-EPR control of activities

Actions and setting the agenda for next meeting