

**United Utilities Water Ltd**

**AMP6 Outcome delivery incentives  
definition document**

**April 2017**

## Preamble

This document is designed to provide additional technical details of the definitions of the outcomes and measures of success (performance commitments) that were defined as part of PR14 and which will be used to monitor and incentivise the delivery of our commitments during the AMP6 period.

The content is intended to support the information published within the PR14 final determination, UUW company specific appendix – [link to UUW company specific appendix](#).

This document is designed to support the content within the final determination. If any inconsistencies are contained within this document, they are unintentional and the final determination remains the definitive definitions for each of these measures.<sup>1</sup>

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<sup>1</sup> The incentive rates initially set out within the company specific appendix, were subsequently recalibrated to reflect UUW's final menu choices - [link to UUW recalibrated incentive rates](#)

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# Water service outcomes

**Promise – Provide you with great water**

**Outcome - Your drinking water is safe and clean**

Measure of Success - Average drinking water safety plan risk score Measure

Measure of Success - Water quality events of category 3 and above

Measure of Success - Water quality service index

**Outcome – You have a reliable supply of water now and in the future**

Measure of Success - Average minutes supply lost per property (per annum)

Measure of Success – Reliable Water Service Index

Measure of Success - Security of Supply Index

Measure of Success - Total leakage at or below target

Measure of Success - Resilience of impounding reservoirs

Measure of Success - Thirlmere transfer into West Cumbria

**Promise – Give you value for money**

**Outcome - Bills for you and future customers are fair**

Measure of Success - Number of free meters installed

**Promise - Protect and enhance the environment**

**Outcome - The natural environment is protected and improved in the way we deliver our services**

Measure of Success - Contribution to rivers improved (water programme)

**Promise - Deliver customer service you can rely on**

**Outcome – You're highly satisfied with our service and find it easy to do business with us**

Measure of Success - Delivering our commitments to developers, local authorities and highway authorities (still to be formally signed off) <sup>1</sup>

## Notes

<sup>1</sup> Details of the definition of the measure “delivering our commitments to developers, local authorities and highway authorities” are not provided in this version of the definition documents. The measure uses a range of internal Key Performance Indicators to track how well we deliver our new connections services.

# Average drinking water safety plan risk score      Reputational

Promise – Provide you with great water

Outcome - Your drinking water is safe and clean

## Measure of Success - Average drinking water safety plan risk score

The quality of the drinking water we provide to customers could potentially be compromised by a wide range of issues, from the presence of pesticides or algae in surface water to nitrates and solvents in groundwater.

By identifying and understanding these potential risks, we can implement effective control measures that safeguard water quality at our treatment works and in our distribution network.

Through a proactive approach to risk management, we can protect public health and give customers confidence in our drinking water quality. The aim of this measure is to ensure that we effectively manage these potential risks to water quality.

The measure is a reputational measure therefore does not directly carry a financial reward or penalty, with these penalties and rewards being delivered through other more directly customer facing measures.

Over the period 2015-20 we aim to maintain the current level of risk.

### About this measure

Our drinking water safety plan process identifies potential hazards which could affect the quality of drinking water, analyses the risk posed, and then implements control measures to combat the identified risks.

A risk score is produced, based upon the likelihood of an issue occurring, taking account of the current control measures in place. This measure is derived by the average of all drinking water safety plan risk scores with current control measures in place.

### Measure of Success description

The Drinking Water Safety Plan risk management system is our corporate drinking water quality risk management tool, which is central to the way we ensure safe, clean drinking water now and in the future. This system is consistent with the regulatory requirements governing drinking water in England and Wales. It contains information on the risk of hazardous events, control measures, monitoring and risk scores. It also allows actions to be raised, tracked and reported.

The Drinking Water Safety Plan process involves the identification of all potential hazards to the quality of drinking water. The risk of those identified hazards impacting on water quality is then determined. Control measures are then identified and implemented and a reduced drinking water safety plan risk score is derived. The methodology is aligned with WHO<sup>2</sup> and [DWI](#)<sup>3</sup> codes of practice.

The Measure of Success describes, in numerical terms, the comparative level of risk to drinking water quality across the business and over time. We will also ensure that all unacceptable risks are addressed. Unacceptable risks are defined by us as those with a drinking water safety plan risk score of 10 or greater.

We began recording the average Drinking Water Safety Plan (DWSP) risk score in 2013, so previous performance for this measure is not available. Benchmarking against other water companies is not currently possible because each water company operates their Drinking Water Safety Plan system in different ways. However, to ensure consistency with the industry, we do communicate frequently with other water companies on this matter through the Drinking Water Safety Plan Industry Forum.

### Unit of measure

The average of all DWSP risk scores is calculated as a number. The measure of success is reported to one decimal place.

### Measure of success calculation

The measure is an average of all DWSP risk scores with current control measures in place. This is calculated from the Drinking Water Safety Plan risk management system which is owned by our Quality and Scientific Services Team.

The score is calculated as follows:

1. The risk score is the product of the likelihood of an event occurring and the probability of a consequence occurring, times the consequence type
2. A 'risk scoring' report is run from the above database for 'All risk scores for facilities' selecting 'all zones and 'all facility types'
3. Within this report under the 'Risk Score with current controls' column scores of zero are verified with the Asset Manager and either marked as not applicable or rescored. Not applicable scores are excluded
4. An average is then calculated from the remaining risk scores with current controls to give the average Drinking Water Safety Plan score

The variables used to calculate each Drinking Water Safety Plan score are shown below. The level selected for each of the criteria is determined by the Asset Manager completing the assessment, using guidance documents to ensure a consistent scoring process.

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<sup>2</sup> WHO Water safety plan manual (WSP manual), 2009

<sup>3</sup> DWI – A brief guide to drinking water safety plans October 2005

Hazardous Event Likelihood		Probability of Consequence	
Level	Description	Level	Description
5	More than 12 events per year	5	90 in 100 events (90%)
4	3 to 12 events every year	4	60 in 100 events (60%)
3	1 or 2 events every year	3	30 in 100 events (30%)
2	Less than 1 event every year	2	10 in 100 events (10%)
1	Less than 1 event every three years	1	1 in 100 events (1%)

✕

Consequence Type		
Level	Description	Detailed Description
5	Public Health Impact	Someone's health is potentially adversely affected due to water quality.
4	Regulatory Impact	Significant PCV infringement or prosecution is a likely outcome.
3	Aesthetic Impact	PCV infringement and customers can notice change to water quality e.g. colour, smell, taste.
2	Compliance Impact	Isolated PCV infringement.
1	No Detectable Impact	A change in water quality that would not result in a PCV infringement or be detectable by a customer.

**Figure 1: The Drinking Water Safety Plan three stage risk assessment process**

Each DWSP risk assessment is reviewed on a cyclic basis, typically annually. In addition, risk assessments are reviewed in response to specified 'triggering events' which include, inter alia:

- Operational incidents
- Unusual water quality results
- Observations arising from audits or site inspections
- Delivery of a capital programme (reduction of risk score)
- DWI information letters or industry-wide assessment letters

The starting average DWSP risk score of 3.9 was calculated in July 2013 using data from the Drinking Water Safety Plan database at 30 June 2013. The DWI Information Letters [02/2014](#) and [01/2015](#) and their associated Annexes outline the updated regulatory reporting requirements for water companies DWSP risk assessments. In response to these Information Letters we have carried out significant IT alterations to the DWSP Management System to ensure we meet the regulatory requirements. The main changes, which have impacted the average DWSP risk score are:

- Reporting by hazardous events rather than hazards. Each hazardous event may have more than one hazard associated with it resulting in an increase in the number of hazardous events.
- Split of consumer hazardous events from DMZ level into WSZ. Increase from 33 consumer risk assessments to 224 risk assessments.

The changes above have resulted in an increase in the number of hazardous events, the average risk score and the number of hazardous events with a risk score of 10 and above.

Category	October 2014	October 2015
Number of hazardous events	19,904	64,791
Number of risk scores $\geq$ 10	310	1,221
Average risk score	3.9	4.3

**Figure 2: The impact of the updated regulatory requirements on the average drinking water safety plan score**

We submitted the updated DWSP risk assessments to the DWI on 01 October 2015. We do not envisage any further significant changes to the number of hazardous events and consequently the average risk score.

Scores will be calculated annually at the end of March each year to determine the performance level to be reported under this measure.

### Performance targets

Our goal is to maintain an average risk score at the same level as the 2014/15 AMP6 starting risk level. This value was initially stated as 3.9, however based upon the revised calculation process described above this has been restated as 4.3<sup>4</sup> and remains a constant target throughout the 2015-20 period.

Average drinking water safety plan risk score	14/15	15/16	16/17	17/18	18/19	19/20
Performance Commitment	4.3	4.3	4.3	4.3	4.3	4.3

**Figure 3: Average Drinking Water Safety Plan MoS restated<sup>3</sup> performance commitments**

We decided not to set an improving target for this measure because the potential impact of wider external factors such as climate change and more stringent water quality standards is likely to make it increasingly challenging to maintain the 4.3 score in successive years. This approach of maintaining existing risk levels is also consistent with our customer willingness to pay research.

### Penalties and rewards

This measure of success is reputational only and therefore carries no associated financial reward or penalty.

### Assumptions made calculating the score

Based on expert judgement, our average risk score of 4.3 is an acceptable base level of risk to maintain throughout AMP6. Implementing the Drinking Water Inspectorate prescribed list of hazards during AMP6 has caused us to revise our risk scoring system. However, the resulting change in scoring methodology has not impacted our planned interventions or existing control measures.

DWSP risk assessments cover, water treatment works, associated supply systems and customer premises. The provision of information to or from Inset Appointees or other statutory water undertakers who either supply treated water to UU or receive a bulk supply of water from the company is covered. However, it excludes risk assessments and reporting activities associated with concessionary supplies. These are contained in a separate, standalone database and report.

<sup>4</sup> The original performance commitment of 3.9 reported in accordance with DWI reporting requirements as stated in DWI Information Letters [02/2014](#) and [01/2015](#) is restated as 4.3. This represents the same level of risk as the 2014/15 starting level.

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# Water quality events of category 3 and above

## Penalty

Promise – Provide you with great water

Outcome – Your drinking water is safe and clean

**Measure of Success - Water quality events of category 3 and above**

Water quality events of Category 3 or above are issues with the public water supply which require detailed investigation, and have the potential to affect customers' confidence in their supply.

As well as affecting the quality of the water we provide to customers, these events can result in regulatory sanctions, such as prosecution from the Drinking Water Inspectorate (DWI) and severe reputational damage.

In order to protect customer health and reduce interruptions to service, it's vitally important that we continue to reduce the number of these events in the years ahead. The maximum penalty we could incur in the 2015-20 period is £3.87m. We aim to reduce the number of category 3 or above events over 2015- 20.

### About this measure

This measure of success monitors the number of water quality events at category 3, 4 and 5, according to the [DWI's classification](#). The measure is an existing metric reported in the DWI [Chief Inspector's Annual Report](#) on drinking water quality and the same DWI parameters will be used to report this measure for each calendar year.

We have been a relatively poor performer in relation to DWI category 3 or above water quality events, with our performance being in the lower quartile of the industry.

Our aim is to reduce the number of these events in AMP6 and AMP7, especially the number of repeat events, resulting in an even more reliable service for customers, with fewer issues with taste, odour and discolouration.

We will achieve this improvement through a combination of: improved asset maintenance; operational changes associated with our assets; ancillary changes (such as high quality training of our staff and contractors) and through targeted interventions and enhancements as a result of lessons learnt from previous events.

**Measure of success description**

Water quality events are placed in five categories by the DWI, according to their level of seriousness:

1. Not significant – least potential negative impact on public confidence in the water supply.
2. Minor – some potential for negative impact on public confidence in the water supply, but not requiring significant level of investigation.
3. Significant – potential for negative impact on public confidence in the water supply requiring a detailed investigation and assessment of the event by a warranted Inspector.
4. Major – significant potential for negative impact on public confidence in the water supply requiring a detailed investigation and assessment of the event by a warranted Inspector, possibly with additional internal and external support.
5. Serious - Significant potential for negative impact on public confidence in the water supply requiring a detailed investigation and assessment of the event by a warranted Inspector with additional internal and external support at all seniority levels.

This measure is an annual count of water quality events classified by the Drinking Water Inspectorate as category 3 (significant), category 4 (major) or category 5 (serious)<sup>5</sup>.

Water quality events are also split by the Drinking Water Inspectorate into those occurring at a water treatment works, in the network and all other events. These other events can include individual property related events.

The measure is aligned with DWI reporting of events and covers all of the aforementioned water quality events.

**Unit of measure**

The number of events classed as category 3 and above per calendar year.

**Measure of success calculation**

The measure is the sum of all water quality events classified by the Drinking Water Inspectorate as category 3 or above in a calendar year.

**Performance commitments**

The table below shows our intention to drive down water quality events of category 3 or above, each year until 2020.

Our performance commitments, together with the penalty risks, are shown in Figure 4.

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<sup>5</sup> Classification of events is detailed in the DWI document 'Guidance on the Notification of Events'

Water Quality Events – DWI Cat 3 or above	Unit	15/16	16/17	17/18	18/19	19/20
Performance Commitment	Nr/yr.	12	11	10	9	7
Penalty Collar	Nr/yr.	15	15	15	15	15
Penalty Deadband	Nr/yr.	12	11	10	9	7

**Figure 4: DWI category 3 and above water quality events MoS performance commitments and incentive structure**

## Penalties

This performance commitment only carries a penalty, not a reward, as it was felt inappropriate to earn a reward for water quality incidents. The penalty should provide sufficient incentive to drive an improved performance.

A penalty of £0.149m would be incurred for each category 3 (or above) event. The maximum penalty we could incur in AMP6 is £3.87m.

The penalty collar has been set at a consistent level of 15 events per year throughout AMP6.

Whilst the penalty collar is the same each year, our decreasing performance commitment target means that we could pay a greater penalty year on year if we fall short. This is designed to help to drive our performance improvements, and reflects our confidence in the business process changes we are making.

## Examples of incidents categorised as category 3 and above by the DWI

The examples below are descriptions of historic incidents taken from the DWI Chief Inspectors Report, covering England and Wales and do not therefore reflect incidents occurred within the U UW region.

### Category 3 – Significant

Brown and discoloured water supplied to 5,591 customers for five hours due to third party mains damage. The mains were flushed to remove the discolouration and the affected area was sampled. A fittings inspection was carried out at the request of a nearby food manufacturer who had been testing their sprinkler system. No contraventions were found, but it was confirmed that there had been a burst on the sprinkler system on the morning of the event. The DWI was satisfied with the handling of the event and it was categorised as significant. If the DWI had not been satisfied the event could have received a higher classification.

### Category 4 – Major

A boil water notice was issued to 175,000 customers, lasting one day, due to microbiological contamination at the treatment works. The company sampled the affected area, made alterations to treatment works disinfection process, reduced flow through the works and investigated and reviewed risks on the catchment.

## Water quality events of category 3 and above

## Penalty

The DWI concluded that the company had inadequate procedures and an inadequate disinfection treatment process. To safeguard public health, the DWI issued a Notice under Regulation 28(4)(d) of the Water Supply (Water Quality) Regulations. This Notice also set out various changes that needed to be made to the works, including new filtration facilities and a new contact tank. The company was also required to restrict flows and to improve the disinfection process.

### Category 5 - Serious

Work on a service reservoir generated customer taste and odour complaints affecting 3,750 customers for three days. The company was alerted to the issue by customer complaints and promptly identified work on a service reservoir as the cause of the incident. The company issued a restriction of use notice, distributed bottled water, sampled the affected area, by-passed and cleaned the service reservoir.

Factors that resulted in the DWI categorising the incident as serious included the fact that the Environment Agency (EA) were not informed of a discharge of water containing styrene. The DWI were highly critical of the lack of contractor control and required the company to improve its management of contract staff. The contractors were not trained under the 'Blue Card' scheme and there were concerns that the reservoir was returned to service without adequate checks of water quality. The risk assessment process was deemed to be poor. The DWI recommended the company review and improve communication to consumers during events because consumers had been confused and worried by the lack of detail over the areas affected.

### **Example Incentive Calculation**

#### **Example: We have 11 water quality events of category 3 or above in 2017/18**

Annual penalty = (no. of events actual performance - penalty deadband) x incentive rate

2017/18 Penalty = (11-10) x -0.149 = -£0.149m

### **Assumptions**

The current event categorisation was introduced by the DWI in 2009 to ensure consistency of reporting and it is assumed that there will be no change in categorisation / reporting of DWI events during the AMP6 period 2015-2020. If a change does occur, we will review the impact of this change and may seek to agree a new equivalent baseline for our target, which we would seek to agree with the DWI.

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Promise – Provide you with great water

Outcome - Your drinking water is safe and clean

**Measure of Success - Water quality service index**

The Water quality service index monitors performance across a number of different chemical and biological water quality standards. The impact of customer contacts on this measure is designed to be significantly greater than the impact of the regulatory measures. This reflects the fact that the company's customers expressed a willingness to pay for improvements to the appearance, taste and smell of their drinking water, but were generally happy with drinking water quality. It is also important to note that there are other sanctions that would be imposed if the company's water quality performance deteriorated, such as DWI enforcement action.

This measure can attract both a penalty and a reward. The maximum reward we can gain over the 2015-20 period for outperformance is £9.8 million, while the maximum penalty for underperformance is £18.1 million. The penalty is based on the performance of all six of the sub-measures making up this measure. The only sub-measure that contributes to the reward is outperformance of the number of unwanted customer contacts for water quality, given that the other sub-measures are already DWI requirements.

## About this measure

The water quality service index measures our performance in providing customers with great quality water, each and every day.

There are six sub-measures which contribute to an overall index score, with the index score being assessed annually. These sub-measures are already familiar, as we use them in our audited performance reports to the Drinking Water Inspectorate. The index is based on measures we report to the DWI on a calendar year basis and therefore this measure is also based on calendar year performance. E.g. Performance reported in 2015-16 will be based on 1<sup>st</sup> January to 31<sup>st</sup> December 2015 performance.

## Measure of success description

The index combines six measures similar to measures we have reported against historically to give an overall view of water quality and the health of our assets, for example, turbidity and coliforms non-compliance measures at water treatment works. It also includes a customer facing element to reflect the number of customer contacts associated with water quality.

We are aiming to operate and maintain our assets over the 2015-20 period in a manner which ensures that there is no deterioration in water quality performance and that the number of water quality complaints we receive reduces over the period.

The Water Quality Service Index is made up of the following sub-measures:	Sub-measure description:	Sample location
<b>WTW Coliform non-compliance (%)</b>	Coliforms are bacteria present in the aquatic environment, soil and vegetation. While they do not usually cause serious illness themselves, they can indicate the presence of other pathogenic organisms. This measure is calculated by taking the absolute number of samples containing coliforms as a percentage of the total number of coliform samples taken from the company's WTWs.	Water treatment works (final water)
<b>SR Integrity Index</b>	Microbiological sampling takes place at service reservoirs as a check on their integrity and to check the quality of water as it travels through the water network. This is also a DWI measure and is calculated by taking the average compliance for coliform bacteria and E.coli across the all the company's service reservoirs.	Service Reservoirs
<b>No. of WTW turbidity fails</b>	Turbidity is the cloudiness caused by large numbers of individual particles. The measurement of turbidity is one of the key tests of water quality. This measure is calculated as the number of samples taken from water treatment works with turbidity >1 NTU, per calendar year.	Water treatment works (final water)
<b>Mean zonal compliance</b>	The <a href="#">Mean zonal compliance</a> is a DWI measure, which assesses overall drinking water quality. It is calculated by taking the average of the mean zonal compliance percentage for 39 parameters across all the company's water supply zones.	Customer's tap
<b>Distribution Maintenance Index (%)</b>	The <a href="#">Distribution maintenance index</a> is a DWI measure, which is calculated by taking the average mean zonal compliance for turbidity, iron and manganese samples at customer's taps. The water quality data is held on the company's corporate system OMS.	Customer's tap
<b>No. unwanted customer contacts for water quality (per year)</b>	<p>This measure is based on the number of contacts the company receives relating to the quality of water at the customer's property.</p> <p>The measure is derived from the number of written and telephone contacts as recorded on the company's corporate system during a calendar year relating to either:</p> <ul style="list-style-type: none"> <li>a) discoloured water (including – brown/ black/ orange/ blue/ green) and</li> <li>b) all taste and odour contacts</li> </ul>	N/A

Figure 5: Overview of WQSI sub-measures

### Unit of measure

This measure is an index score and is therefore reported as a number with no units. It will be reported to one decimal place. A higher index score relates to better performance.

### Calculating the Index Score

The index score is calculated by multiplying the actual performance by the weighting for each sub-measure. The weighting are based upon either the valuations that customers put on a service failure or on our own internal valuation of the cost of failure.

- For customer contacts, a valuation based on the findings of our customer willingness to pay research (Eftec and ICS consulting UU PR14 customer valuations study May 2013)
- For the five DWI regulatory water quality sub-measures the internal valuation, used in our investment prioritisation system, based on the cost of the failure

The sum of actual performance x weighting for each sub-measure is then added to a constant (-15628.2236) to produce the overall index score. The constant was added to scale the PC so that it gave a starting index score of 100, when the index was first developed. For the three sub-measures that represent failure or non-compliance, the weightings are negative.

Figure 6 below shows an illustration of how the index score would be calculated. Each actual sub-measure performance is multiplied by the weighting. The sum of actual performance x weighting is then added to a constant of -15628.2236.

Performance targets	Sub-measure incentive contribution	Example <sup>6</sup> performance data	Weighting	Example performance x weighting
WTW Coliform non-compliance (%)	Penalty only	0.04	-16.21713	-0.649
SR Integrity Index	Penalty only	99.96	37.39056	3737.560
No. of WTW turbidity fails	Penalty only	3	-0.07654	-0.230
Mean zonal compliance	Penalty only	99.94	116.54919	11647.926
Distribution Maintenance Index	Penalty only	99.88	4.48247	447.709
No. unwanted customer contacts for water quality (per year)	Penalty & reward	9226	-0.00944	-87.100
<b>Total weighted sum of sub-measures</b>				<b>15745.22</b>

$$\text{WQSI Index Score} = (\text{weighted sum of sub-measures} + \text{constant})$$

$$= 15745.22 + (-15628.2236) = 117.0 \text{ (to 1 decimal place)}$$

**Figure 6: Example calculation of how the WQSI score is calculated**

<sup>6</sup> This is not an example of historical or target performance it is an example of performance that would trigger a penalty

### Performance commitments and incentives

The targets for the five water quality sub-measures within the index are generally based upon maintaining our 2014/15 performance. The exception to this being mean zonal compliance, where we are aiming to achieve 100% compliance by 2017/18 and have set a specific sub incentive for this measure (See Figure 9 below).

The target for water quality customer contacts in the index is based on our customer willingness to pay research which found customers are willing to pay for aesthetic improvements. We aim to reduce the number of unwanted customer contacts that we receive.

A higher index score relates to better performance. In 2014/15 our actual performance was 109.112, which exceeded the target value of 107.199 that we included within our PR14 business plan. An index score greater than this indicates further improvement in performance and a lower index score indicates a deterioration in performance. The index score is based upon calendar year performance and will be reported annually. There is a reward and penalty incentive associated with this measure.

Our performance commitments for the index, together with the reward opportunities and penalty risks, are illustrated in Figure 7.

	Performance Commitments (Index Score)				
	2014/15	2015/16	2016/17	2017/18	2018/19
Performance Commitments	119.3	130.3	145.9	145.9	145.9
Penalty collar	114.6	125.6	141.2	141.2	141.2
Penalty deadband	119.3	130.3	145.9	145.9	145.9
Reward deadband	119.3	130.3	145.9	145.9	145.9
Reward cap	124.0	135.0	150.6	150.6	150.6

Penalty incentive rate (£m/Index unit/year)	<b>0.770</b>
Reward incentive rate (£m/Index unit/year)	<b>0.417</b>

**Figure 7: Performance commitments and incentive structure**

This measure contains no deadband (the deadbands are the same value as the performance commitment) and as such any variation in performance from target will lead to some penalty or reward.

The penalty collar and reward cap are both set at 4.7 index points above or below the target and move with the performance commitment through the period to retain a consistent level of exposure.

The performance commitments in Figure 7 above are based on the sub-measures performance levels shown in Figure 8 below, which give an indication of performance across each of the different sub-measures.

The reward and penalty is however, based upon the overall index score (and mean zonal compliance score), rather than the individual performance of the individual sub measures.

WQSI – Sub-measures targets	Unit	15/16	16/17	17/18	18/19	19/20
WTW Coliform non-compliance	%	0.04	0.04	0.04	0.04	0.04
SR integrity index	%	99.96	99.96	99.96	99.96	99.96
WTW turbidity fails	Nr	3	3	3	3	3
Mean zonal compliance	%	99.96	99.96	100	100	100
Distribution maintenance index	%	99.88	99.88	99.88	99.88	99.88
Unwanted customer contacts for water quality	Nr	9,229	8,065	6,904	6,904	6,904

**Figure 8: Sub-measure performance assumptions forming the basis of WQSI performance commitment**

The required change in performance level for each sub-measure to give a one-point change in the index is:

- WTW Coliform non-compliance (%) = 0.06
- SR Integrity Index (%) = 0.03
- No. of WTW Turbidity Fails = 13
- Mean Zonal Compliance (%) = 0.01
- Distribution Maintenance Index (%) = 0.23
- No. of unwanted Customer Contacts for WQ (Nr) = 106

### Mean Zonal Compliance sub-measure

Mean zonal compliance is a particularly important sub-measure that measures water quality against 39 water quality standards. To reflect the significance of this measure, we are seeking to achieve 100% compliance against this measure by 2017/18 and will report performance against this measure separately.

From 2017/18 onwards we have also set a specific penalty incentive for this-sub measure, which would generate a standalone penalty and would also act as a “gateway check” for the overall index. This would mean that even if the Water Quality Service index score is above the reward deadband then a reward would only be warranted if performance for the MZC sub-measure is also above the MZC penalty deadband (99.95).

	Performance commitment	Penalty collar	Penalty deadband
<b>Mean Zonal Compliance</b>	100.00	99.93	99.95

Penalty incentive rate (£m/0.01%/year)	<b>0.770</b>
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**Figure 9: Additional mean zonal compliance penalty threshold applies from 2017/18**

**Combination of the two measures**

In addition to acting as a standalone measure, the MZC score also acts as a “gateway check” for any reward on the overall index. Figure 10 below shows how the combination of performance against both measures can result in single or combined penalties and rewards.

		Overall index	
		Pass	Fail
MZC sub measure	Pass	Potential WQSI reward	WQSI penalty (only)
	Fail	MZC penalty (only)	The greater of the MZC penalty or the Index Penalty

**Figure 10: Combination of the two measures**

**Process for calculating the mean zonal compliance incentive value (years 2017/18 to 2019/20)**

1. If this MZC score is below the penalty deadband (99.95) then a penalty will be incurred and no reward can be achieved for the overall index
  - a. If the score is below the penalty collar then the penalty is calculated as (penalty collar – penalty dead band) x 100 x incentive rate
  - b. If the score is above the penalty collar but below the penalty deadband, the penalty is calculated as (actual performance – penalty deadband) x 100 x incentive rate

**Process for calculation of the water quality service incentive payments**

The size of any penalty associated with the WQSI is determined by the under-performance of **all** six sub-measures.

The size of any reward is however based upon the out-performance of the customer contact sub-measure only.

For the reward calculation the other five (water quality) sub-measures do not contribute to the reward as water quality compliance is a statutory obligation and it was not deemed to be appropriate to gain a reward for meeting our statutory obligations.

Therefore the size of any WQSI reward is based upon the actual customer contact value plus the lower of the sum of the actual scores or the target scores, for the five water quality compliance measures.

This means that if these five scores were contributing to a reward this would not be accounted for in the reward score, but if they were contributing to a penalty this would be accounted for and would reduce the size of the reward (see example 4 later in this section).

The size of any WQSI penalty and reward is calculated via the following process:

1. Calculate the WQSI score based upon the actual values for the six sub-measures, by
  - a. multiplying the actual performance for each sub-measure by the weighting for that measure
  - b. sum the scores for each sub-measure and
  - c. add the constant to generate the index score
  
2. Penalty Calculation - If the index score is below the penalty deadband a penalty will be incurred.
  - a. If the index score is below the penalty collar for the year, then the penalty is calculated as (penalty deadband - penalty collar ) x penalty incentive rate
  - b. If the score is above the penalty collar then the penalty is calculated as (actual performance – penalty deadband) x incentive rate
  
3. Reward calculation - If the index score is above the reward deadband a reward could be incurred. The following three sub-steps are used to determine whether a reward is warranted and the size of that reward:
  - a. Calculate the sum of the five water quality measures using the actual scores and the sum of the five water quality measures using the years target scores
  - b. Add the lower of these two figures to the score for the actual number of unwanted customer contacts and the constant to generate the index score
  - c. Calculate the reward based upon the index score determined by step b:
    - i. If the resultant index score is below the reward deadband no reward is warranted
    - ii. If the resultant index score is above the reward deadband but below the reward cap, for the year, then the reward is calculated as (resultant index score – reward deadband ) x penalty incentive rate
    - iii. If the resultant index score is above the reward cap, for the year, then the reward is calculated as (reward cap – reward deadband ) x penalty incentive rate

## Examples

### Mean Zonal Compliance based penalties:

Example 1: Year 2017/18: mean zonal compliance performance 99.92: WQSI score 147.0

As the MZC score is below the penalty collar (99.93) then the MZC penalty calculation is (penalty deadband - penalty collar) x incentive rate

$$\text{MZC Penalty} = (99.95 - 99.93) \times 100 \times \text{£}0.77\text{m} = \text{£}1.54\text{m}$$

As the WQSI is above the reward deadband (145.9) then a WQSI reward could have been applied.

However, as the MZC is in penalty, no WQSI reward would be applied and the MZC penalty of £1.54m would be the net penalty applied for this measure for this year.

**Water Quality Service Index based penalties**

Example 2: Year 2017/18: MZC score 100.00, other measures as shown on the table below:

Note – as the MZC = 100, no MZC penalty would be applicable

WQSI Step 1 - Calculate the index score:

Performance targets	Sub-measure incentive contribution	Actual Performance (example)	Weighting	Actual Performance x weighting
WTW Coliform non-compliance (%)	Penalty only	0.04	-16.21713	-0.649
SR Integrity Index	Penalty only	99.96	37.39056	3737.560
No. of WTW turbidity fails	Penalty only	3.00	-0.07654	-0.230
Mean zonal compliance	Penalty only	100.00	116.54919	11654.919
Distribution Maintenance Index	Penalty only	99.88	4.48247	447.709
No. unwanted customer contacts for water quality	Penalty & reward	7250	-0.00944	-68.440
<b>Weighted score – Total</b>				15,770.870
<b>Constant</b>				-15,628.2236
<b>Index score (weighted score total + constant)</b>				<b>142.65</b>

Step 2 – Penalty calculation - As the index score is below the 2017/18 penalty deadband (145.9) and above the 2017/18 penalty collar (141.2) then the penalty is calculated as (penalty deadband - actual performance ) x incentive rate

$$\text{Actual Penalty} = (145.90 - 142.65) \times \text{£}0.770 = \text{£}2.50\text{m}$$

**Potential penalties for both the WQSI and MZC**

Example 3: Year 2018/19: mean zonal compliance performance 99.94, WQSI score = 144.00

As the MZC score is above the 2018/19 penalty collar (99.93) then the MZC penalty calculation is (penalty dead band - actual performance) x incentive rate

$$\text{MZC Penalty} = (99.95 - 99.94) \times 100 \times \text{£}0.77\text{m} = \text{£}0.77\text{m}$$

As the WQSI is above the 2018/19 penalty collar (141.2) then the penalty is calculated as (penalty deadband - actual performance ) x incentive rate

$$\text{Actual Penalty} = (145.90 - 144.00) \times \text{£}0.770 = \text{£}1.46\text{m}$$

As the WQSI penalty is greater the penalty value applied to this measure would be £1.46m.

## WQSI based rewards

Example 4: Year 2015/16 values as set out in the table below

Note the MZC index only operates from 2017/18 onwards and as such a reward could be warranted.

Step 1 - Calculate the water quality service index score using the six actual scores

Performance targets	Sub-measure incentive contribution	Actual Performance (example)	Weighting <sup>7</sup>	Actual Performance x weighting
WTW Coliform non-compliance (%)	Penalty only	0.06	-16.21713	-0.973
SR Integrity Index	Penalty only	99.98	37.39056	3738.308
No. of WTW turbidity fails	Penalty only	1	-0.07654	-0.077
Mean zonal compliance	Penalty only	99.96	116.54919	11650.257
Distribution Maintenance Index	Penalty only	99.89	4.48247	447.754
No. unwanted customer contacts for water quality	Penalty & reward	9,171	-0.00944	-86.574
<b>Weighted score – Total</b>				<b>15,748.70</b>
<b>Constant</b>				<b>-15,628.22<sup>8</sup></b>
<b>Index score (weighted score total + constant)</b>				<b>120.47</b>

As this score is above the 2016/17 reward deadband a reward could be applied.

Step 2 (Reward calculation) – sub-step a) calculate the sum of the five water quality measures using the actual values and the target values:

Performance targets	Weighting	Target	Score	Actual	Score
WTW Coliform non-compliance (%)	-16.21713	0.04	-0.6486852	0.06	-0.9730278
SR Integrity Index	37.39056	99.96	3737.560378	99.98	3738.308189
No. of WTW turbidity fails	-0.07654	3	-0.22962	1	-0.07654
Mean zonal compliance	116.54919	99.96	11650.25703	99.96	11650.25703
Distribution maintenance index	4.48247	99.88	447.7091036	99.89	447.7539283
<b>Total</b>			<b>15834.64821</b>		<b>15835.26958</b>

<sup>7</sup> Weightings have been rounded for illustrative purposes.

<sup>8</sup> The constant has been rounded for illustrative purposes.

Sub-step b) – Add the actual unwanted customer score to the constant and to the lower of the water quality scores, to calculate the resultant index score for use in the reward calculation.

Factor	Score
<b>Lower of the five water quality scores (target or actual)</b>	15834.64821
<b>Unwanted customer contacts score</b>	-86.5742
<b>Weighted score - Total</b>	15748.07397
<b>Constant</b>	-15,628.22
<b>Resultant Index score (weighted score total + constant)</b>	<b>119.8540</b>

Sub step c) Calculate the reward - As this resultant index score is above the 2015/16 reward deadband of 119.3 but below the reward cap of 124.0 the reward calculation is (index score – reward deadband) \* reward incentive rate:

$$\text{Reward} = (119.8540 - 119.3) \times 0.417 = \text{£}0.23\text{m}$$

Note that the reward would have been £0.49m if the actual score for the five water quality sub-measures had been used in the reward calculation.

### Assumptions

The measure includes all unwanted customer contacts (excluding contacts associated with water quality events) to align with the information reported to the DWI. Contacts associated with water quality events are covered by another measure (Water quality category 3 events and above).

Events are classified in accordance with the [DWI guidance on the notification of events](#).

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**Promise – Provide you with great water**

**Outcome – You have a reliable supply of water now and in the future**

**Measure of Success - Average minutes supply lost per property (per annum)**

Our customers expect a reliable water supply, with minimal interruptions. Substantial investment since privatisation has seen improvements to our ability to provide continuous supply to customers. Over the next five years, we will aim to reduce the time of supply lost through use of proactive detection systems that enable us to identify a problem on the network and improve response time. The potential impact on service will be reduced through continuing to proactively manage pressure in our water network and the investment targeted at strategic mains, which are key to maintaining supplies.

The maximum penalty we could incur in the period 2015-20 is £51.84m and the maximum reward is £59.67m.

### **About this performance measure**

Our performance is measured in terms of the number of minutes customers are left without water, where the interruption to supply is greater than three hours.

This figure is averaged across all properties in the region. In 2014/15, for example, the average was 18 minutes.

Unplanned interruptions, such as bursts, and planned interruptions, such as mains replacement work where we need to switch the water off, are all included in the calculation.

In 2015-2020, we will need to reduce the average interruption time by several minutes, in order to meet our targets.

### **Measure of success definition**

This measure tracks the length of interruption to supply, in minutes averaged for all properties in the region experiencing an interruption greater than three hours. This includes planned and unplanned interruptions and fully aligns with the definition of the Ofwat key performance indicator introduced in 2012/13 of the same name.

### **Unit of measure**

Number of minutes and seconds i.e. mm:ss.

**Measure of success calculation and definitions**

Number of minutes lost in the year as a consequence of supply interruption greater than three hours (irrespective of whether these were planned, unplanned or caused by a third party) divided by the total number of properties served.

Unplanned interruptions:

The length of time for an interruption is based on a 'No supply unplanned' event being generated in our corporate work management system, E-respond. This data is validated using supporting pressure and flow data from data loggers within the water network and recorded on corporate telemetry systems. A property list is generated to confirm the exact numbers and addresses of the properties affected.

Planned interruptions:

Planned interruption information is captured on our Alliance Partner system and transferred via Excel to our performance team, for validation and reconciliation against our GSS (Guaranteed Standards of Service) records.

Properties served:

Per property served is the number of connected properties (domestic and non-domestic) for water supply. This includes properties which are connected but not billed (for example, temporarily unoccupied) but excludes properties which have been permanently disconnected. A group of properties supplied by a single connection are counted as multiple properties. They are only treated as a single property if a single bill covers all properties in the group.

Regular internal audits are carried out to verify the accuracy of the data relating to planned and unplanned interruptions. The validated data is used to calculate an annual average number of minutes supply lost per property, based on the total number of properties connected to the United Utilities supply network.

Performance will be assessed annually with the penalty or reward being based upon actual performance in the year compared against the performance commitment for that financial year.

### Performance commitments

Our intention is to reach (and hopefully exceed) a 12 minute target through phased, year-on-year improvement. Our performance commitments, together with the reward opportunities and penalty risks, are shown below:

	Starting Level 14/15	15/16	16/17	17/18	18/19	19/20
Performance Commitments	18:00	16:00	14:00	12:00	12:00	12:00
Penalty collar		20:00	20:00	14:00	14:00	14:00
Penalty deadband		18:00	18:00	12:00	12:00	12:00
Reward deadband		12:00	12:00	12:00	12:00	12:00
Reward cap		9:00	9:00	9:00	9:00	9:00

**Figure 11: Average minutes lost MoS performance commitments and incentive structure**

Every minute that we reduce will represent a significant achievement. For example, one minute can be thought of in terms of 4,494 properties losing water for 12 hours. Bringing down our average, therefore, requires us to reduce disruption to many thousands of additional customers each year.

### Rewards and penalties: in detail

We need an improvement in current performance to reduce average minutes lost by six minutes. In 2015/16 and 2016/17 a deadband has to be passed before we incur a penalty or reward. From 2017/18 onwards there is no deadband, a penalty or reward will be incurred if performance deviates from the performance commitment.

The reward rate is £3.978m per minute, whilst the penalty rate is £5.184m per minute. The maximum reward we can gain in AMP6 for outperformance is £59.67m, while the maximum penalty for underperformance is £51.84m.

#### Example 1: If Average minutes lost for 2017/18 was 14:00.

Annual penalty = (ave minutes lost actual performance - penalty deadband) x penalty incentive rate

2017/18 Penalty = (14:00-12:00) x 5.184 = £10.368m

**Example 2: If Average minutes lost for 2017/18 was 10:00.**

Annual reward = (reward deadband - ave minutes lost actual performance) x reward incentive rate

2017/18 Reward = (12:00-10:00) x 3.978 = £7.956m

**Assumptions**

The data used in this measure is based on accurately capturing the time the water was isolated and restored for planned and unplanned 'no supply events' on our corporate data systems. The interruption time for all properties with an interruption to supply lasting greater than three hours are included in this calculation. An investigation will be completed to determine whether properties have experienced a supply interruption. The following activities are used to validate supply issues:

- Confirmation following a site investigation that water is not available from the first cold tap in the property;
- Telephone call to/from a customer confirming no water following site investigation to confirm the interruption is not caused by a private supply problem;
- Network modelling and pressure monitoring – supply interruption is assumed if pressure in the main adjacent to the property is <4m/head (unless other activities confirm there is still a supply). This data is validated by flow and pressure data captured from data loggers within our water network and recorded on the corporate NetBase system.

If a repeat interruption occurs less than one hour after a previous interruption it is classed as one interruption starting from when the first interruption started to the end of the second interruption. If the time between interruptions is one hour or more they are treated as separate interruptions. Supply interruptions includes all planned and unplanned interruptions greater than three hours including interruptions caused by third parties.

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**Promise – Provide you with great water**

**Outcome – You have a reliable supply of water now and in the future**

**Measure of Success – Reliable water service index**

Interruptions to water supply can be hugely disruptive for our domestic and commercial customers. This index has been developed using measures that monitor the impact of interruptions to water supply. The index is made up of four key measures associated with water supply availability, including poor pressure and mains bursts.

Our target is to maintain consistent performance through the period 2015-20, which reflects the feedback from our customer research. This measure attracts both a penalty and a reward, although to earn a reward there would need to be a significant improvement in performance. The maximum reward we could gain over the five year period is £29.85m, while the maximum penalty we could incur is £39.87m.

The penalty calculation is based on the performance of all four of the sub-measures that make up this index. The sub-measure “bursts” is excluded from the reward calculation, as this is more of an underlying “asset health indicator” than a “customer service” measure.

## **About this measure**

The index is designed to assess the reliability of the water network in providing a continuous water supply to customers. The index combines four measures that are similar to measures that we have reported against historically. Three of these measures are customer service measures and directly reflect the impact upon customers, with one of the measures being an “asset health” measure that is designed to assess the underlying risk to water availability.

The index consists of the following four sub-measures:

- Total mains bursts (asset health indicator)
- Interruptions greater than 12 hours (customer service indicator)
- Poor pressure (customer service indicator)
- No. unwanted customer contacts for water availability (per year) (customer service indicator)

**Measure of success description**

The description and key features of each sub-measure within the index are detailed in Figure 12 below. Definitions for each measure are set out in the assumptions section of this document.

The reliable water service index is made up of the following sub-measures:	Sub-measure description:
Total bursts	This is the number of mains repairs recorded on our corporate work management system. This is used as a proxy for number of mains bursts. The definition is based on the historic Ofwat serviceability reporting requirements.
Interruptions greater than 12 hours	The number of properties impacted by unplanned interruptions to supply lasting more than 12 hours. In line with our statutory requirements this includes any planned interruption greater than 12 hours in which we fail to warn the customers adequately. Unplanned interruptions are recorded on our corporate system, E-respond. Planned interruptions (including failure to warn customers adequately) are captured by our alliance partners' reporting systems. This measure excludes overruns of planned and warned interruptions.
Poor pressure	<p>The number of properties on the company DG2 low pressure register at the financial year end (31st March) calculated using data captured on the corporate system NetBase.</p> <p>Properties that are receiving less than 10m head of water at the stop-tap, are placed on the UUW DG2 defined register, which is in line with the Ofwat standard level of service for pressure.</p> <p>Pressure is recorded on data loggers throughout our network. This data is transmitted to a central system every 15 minutes and is transmitted to and stored in NetBase. NetBase highlights any properties that are receiving less than 15 metres head pressure for greater than one hour. This data is validated by the network performance engineer.</p> <p>Where the low pressure is not resolved within an acceptable time period, the engineer will propose an addition to the low pressure register within NetBase. This is confirmed by the Low Pressure Expert Group which governs the additions to and removals from the low pressure register.</p>
No. unwanted customer contacts for water availability (per year)	The number of contacts relating to the availability of water at the customer property. This is the number of inbound contacts for availability recorded on the corporate system during a financial year. All contacts are recorded and assigned to a contact code so that the number of contacts relating to a specific issue such as water availability can be identified.

**Figure 12: Reliable water service index MoS sub-measure definition**

Our target is to maintain a consistent level of service to customers throughout AMP6 and AMP7, based on 2014/15 levels, through solid performance in all the four sub-measures.

**Unit of measure**

The measure is calculated as an index score and as such is reported as a number with no units. The index will be rounded down and reported to a single decimal place, for example 100.09 would be presented as 100.0.

**Measure of success calculation**

The index score is calculated by multiplying the actual performance for each sub-measure by the weighting for that sub-measure. The sum of actual performance x weighting for each sub-measure is summed and then added to a constant value of 134.147 to generate the index value. An example of this calculation is set out in Figure 13 (note the values in Figure 13 have been rounded to 3 decimal places for illustrative purposes).

Performance targets	Sub-measure incentive contribution	Actual Performance (example)	Weighting <sup>9</sup>	Actual x weighting
Total bursts	Penalty only	6,000	-0.002022	-12.131
Interruptions greater than 12 hours	Penalty and reward	730	-0.007902	-5.768
Poor pressure	Penalty and reward	272	-0.008468	-2.303
No. unwanted customer contacts for water availability (per year)	Penalty and reward	50,000	-0.000329	-16.463
<b>Weighted score – Total</b>				<b>-36.67</b>
<b>Constant</b>				<b>134.147<sup>10</sup></b>
<b>Index score (weighted score total + constant)</b>				<b>97.477</b>

Note that a score above 100 represents outperformance of the target and a score below 100 represents underperformance of the target.

**Figure 13: Reliable water service index MoS example calculation**

<sup>9</sup> The weightings have been rounded for illustrative purposes

<sup>10</sup> The constant has been rounded for illustrative purposes.

**Performance commitments**

Our performance commitments, together with the reward opportunities and penalty risks, are shown in Figure 14 below:

	Starting Level	Performance Commitments (Index Score)				
	2014/15	15/16	16/17	17/18	18/19	19/20
Performance Commitments	100.000	100.000	100.000	100.000	100.000	100.000
Penalty collar		94.000	94.500	95.000	95.500	96.000
Penalty deadband		95.000	95.500	96.000	96.500	97.000
Reward deadband		103.000	103.000	103.000	103.000	103.000
Reward cap		104.000	104.000	104.000	104.000	104.000

**Figure 14: Reliable water service index MoS performance commitments and incentive structure**

Figure 15 shows the annual targets for each sub-measure, for most measures these are indicative values with the index score being used as the basis for any penalty reward calculations. For the burst measure the actual value or target value can be used in the calculation, to ensure that a reward is not generated by outperformance of this “asset health” indicator.

Indicator	Unit	Performance Target)				
		15/16	16/17	17/18	18/19	19/20
Total bursts	Number/ year	5,080	5,080	5,080	5,080	5,080
Interruptions	>12 hours Number of properties / total number of properties	730	730	730	730	730
Pressure	Number of properties on DG2 register / total number of properties	272	272	272	272	272
Customer contacts for water availability	Contacts/year	48,000	48,000	48,000	48,000	48,000

**Figure 15: Reliable water service index MoS sub measure targets**

Our target is to maintain consistent performance throughout AMP6. We have included deadbands for this measure, because a significant proportion of the variability in performance is due to factors beyond our control, specifically weather. Both extreme cold and extreme dry weather can lead to substantial increases in mains bursts and associated interruptions, leakage and customer contacts.

Sufficiently exceeding the target and reward cap in any given year (and thereby earning a reward) would require a significant improvement in performance. By way of illustration, a single index point broadly equates to either:

- 494 fewer bursts;
- 126 fewer interruptions of more than 12 hours duration;
- 118 fewer DG2 properties
- 3,037 fewer customer contacts.

### Rewards and penalties

The reward rate for this measure is £5.970m and the penalty rate is £7.974m per index point per year. The maximum reward we can gain in AMP6 for outperformance is £29.85m, while the maximum penalty for underperformance is £39.87m

All the sub-measures can contribute to a potential penalty, however a reward can only be earned through outperformance of the customer service measures of; customer contacts, poor pressure and interruptions greater than 12 hours.

### Calculating the annual penalty

A penalty will be incurred if performance drops below the penalty deadband, with the maximum penalty being capped by the penalty collar value.

To calculate the size of the penalty:

1. Calculate the index score by adding the weighted score of all four sub-measures to the constant (see Figure 13 above).
2. Assess whether the resultant index score is higher than the penalty deadband, where this is the case no penalty is incurred.
3. Assess whether this index score is lower than the penalty collar, where this is the case use the penalty collar value rather than the index value as the basis of the penalty calculation.
4. Subtract the index score or penalty collar (determined through step 3) from the penalty deadband.
5. Multiply the value determined in step 4 by the incentive rate.

**Example penalty calculation for 2015/16****Example 1 Index score 94.356**

Step 1 – Calculate the index score as demonstrated in figure 13 above, in this case 94.356

Step 2 - as 94.356 is not greater than the penalty deadband of 95.000 a penalty will apply.

Step 3 - as 94.356 is not less than the penalty collar of 94.000 the index score (rather than the penalty collar) is used to determine the penalty

Step 4 - Subtract the index score from the penalty deadband  $(95.000 - 94.356) = 0.644$

Step 5 - multiply this value by the incentive rate  $(0.644 \times -7.974) = -£5.135\text{m}$

Penalty = £5.135m

**Example 2 Index score 93.356**

Step 1 – Calculate the index score as demonstrated in figure 13 above

Step 2 - As 93.356 is not greater than the penalty deadband of 95.000 a penalty will apply.

Step 3 - As 93.356 is less than the penalty collar of 94.000 the penalty collar (rather than the index score) is used to determine the penalty

Step 4 - Subtract the penalty collar from the penalty deadband  $(95.000 - 94.000) = 1.000$

Step 5 - Multiply this value by the incentive rate  $(1.000 \times -7.974) = -£7.974\text{m}$

Penalty = £7.974m

**Calculating the annual reward**

A reward is not generated by outperformance of the asset health ("penalty only") sub-measure, bursts.

To calculate the size of the reward

1. Assess whether the actual performance of the bursts sub-measure is above or below the target performance for the burst measure. Where the performance is better than the target use the target in the penalty index calculation, otherwise use the actual burst score.
2. Calculate the index score using the actual burst value or target burst value determined through step 1.
3. Assess whether the resultant index score is lower than the reward deadband, where this is the case no reward is incurred.
4. Assess whether this index score is higher than the reward cap, where this is the case use the reward cap value rather than the index value, as the basis of the reward calculation.
5. Subtract the reward dead band from the index score or reward cap (determined through step 4).
6. Multiply the value determined in step 5 by the incentive rate.

**Example reward calculation for 2017/18****Example 1 Actual burst value = 6,000, 2017/18 burst target 5080**

Step 1 - As the actual burst value is greater (worse) than the burst target this value should be used in the calculation of the index score:

Step 2 - Calculate the index score:

Performance targets	Sub-measure incentive contribution	Actual Performance (example)	Weighting	Actual Performance x weighting
Total bursts	Penalty only	6,000	-0.002022	-12.131
Interruptions greater than 12 hours	Penalty and reward	727	-0.007902	-5.745
Poor pressure	Penalty and reward	273	-0.008468	-2.312
No. unwanted customer contacts for water availability (per year)	Penalty and reward	32,000	-0.00033	-10.528
<b>Weighted score - Total</b>				<b>-30.716</b>
<b>Constant</b>				<b>134.147</b>
<b>Index score (weighted score total + constant)</b>				<b>103.431</b>

Step 3 - As 103.431 is not less than the reward deadband of 103.000 a reward will apply.

Step 4 – As 103.431 is not greater than the reward cap of 104.000 the index score (rather than the reward cap) is used to determine the penalty

Step 5 - Subtract the reward deadband from the index score (103.431 – 103.000) = 0.431

Step 6 - Multiply this value by the incentive rate to generate the annual reward (0.431 x 5.970) = £2.573m

Reward = £2.573m

**Example 2 Actual burst value = 4,500, 2017/18 burst target 5080**

Step 1 – As the actual burst value is lower (better) than the burst target this value would generate a greater reward and as such the target value (not the actual value) is used in the calculation of the index score:

Step 2 - Calculate the index score:

Performance targets	Sub-measure incentive contribution	Actual Performance (example)	Weighting	Actual Performance x weighting
Total bursts	Penalty only	5,080	-0.002022	-10.271
Interruptions greater than 12 hours	Penalty and reward	727	-0.007902	-5.745
Poor pressure	Penalty and reward	273	-0.008468	-2.312
No. unwanted customer contacts for water availability (per year)	Penalty and reward	38,000	-0.00033	-12.502
<b>Weighted score - Total</b>				<b>-30.830</b>
<b>Constant</b>				<b>134.147</b>
<b>Index score (weighted score total + constant)</b>				<b>103.316</b>

Step 3 - As 103.316 is not less than the reward deadband of 103.000 a reward will apply.

Step 4 – As 103.316 is not greater than the reward cap of 104.000 the index score (rather than the reward cap) is used to determine the penalty

Step 5 - Subtract the reward deadband from the index score (103.316 – 103.000) = 0.316

Step 6 - Multiply this value by the incentive rate to generate the annual reward (0.316 x 5.970) = £1.889m

Reward = £1.889m

Note if the actual value of 4,500 bursts had been used then the index score would have increased to 104.489, this would have exceeded the reward cap and the maximum reward of £5.97m would have been incurred.

**Assumptions made in calculating this index**

The definitions for each sub measure are consistent with the definitions used in previous regulatory reporting to OFWAT and are taken from June Return guidance 2011.

- **Total bursts:**

Includes all physical repair work to water mains from which water is lost which is attributable to pipes, joints or joint material failures or movement, or caused or deemed to be caused by conditions or original pipe laying or subsequent changes in ground conditions (such as changes to a road formation, loading, etc where the costs of repair cannot be recovered from a third party). This includes ferrule failures that are attributable to mains material condition or local ground movements, but does not include incidents of ferrule failure due to ferrule materials or poor workmanship, or associated with the communication pipe connection.

This excludes maintenance work on valve packings, hydrant seals, air valves etc. Although, all leakage occurring at locations or through joint or material failures which would have been designed for the life of the main (irrespective of whether earlier failure occurs) is regarded as mains bursts. Failure of consumable or maintainable items (valve packings etc.) are excluded, as are valve, hydrant, washout and air valve replacements.

Incidents of over-pressure or pressure cycling, and surge failures etc. which reflect the system operating conditions, even where these failures are accidental rather than associated with weaknesses in pipe condition, are included.

All third party damage is excluded where costs are potentially recovered from a third party.

- **Interruptions greater than 12 hours:**

The number of properties affected by interruptions of more than twelve hours' duration to supply which are unplanned, un-warned (excluding overruns of planned and warned interruptions) except for those caused directly by third parties.

It includes interruptions for which customers are notified less than 48 hours in advance and warned interruptions which begins before the time stated on the warning notice, regardless of whether or not there was 48 hours advance warning.

- **Poor pressure:**

The total number of properties in the area of water supply which, at the end of the financial year (31st March), have received and are likely to continue to receive a pressure of less than 10m head. There may be a small number of properties added to and removed from the register within the year where low pressure has been identified and resolved.

- **No. unwanted contacts for water availability (per year)**

Number of unwanted contacts relating to water availability (this includes repeat and chase calls and telephone complaints).

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Promise - Provide you with great water

Outcome – You have a reliable supply of water now and in the future

**Measure of Success - Security of supply index**

Our customers don't expect us to run out of water. Ensuring there are always adequate supplies, while minimising our impact on the environment, requires us to plan far into the future, and anticipate a wide range of issues, from climate change to population growth.

Effective resource planning will ensure we can keep the regions water flowing, and avoid the use of hosepipe bans and drought permits more frequently than should be expected. There is no reward associated with this measure, but there is a maximum penalty of £66m over the 2015-20 period, reflecting the high importance that customers place on security of supply.

## **About this performance measure**

The Security of Supply Index (SOSI) measures our success in meeting the region's demand for water, and is expressed as an index score out of 100.

A score of 100 indicates that we have sufficient water and that a hosepipe ban or drought permit is not expected to occur more than once in 20 years.

The Security of Supply Index assesses whether we have a sufficient surplus of supply over demand. The assessment of demand, which is based upon an equivalent dry year, includes an uncertainty allowance, called target headroom. The levels set out in our Water Resources Management Plan (WRMP) are used as the starting point for the calculation with these values being reviewed each year and compared to our long-term forecast.

The index drops below 100 if available supplies in one or more of our four Water Resource Zones (Carlisle, Integrated, North Eden and West Cumbria), falls below the equivalent dry year demand including target headroom.

## **Measure of success description**

The measure is based upon a previous Ofwat KPI that has historically been reported upon. A score of 100 indicates that the company has sufficient water and all customers should expect to receive the planned level of service for hosepipe bans and drought permits (or better). The index is weighted by the size of an impact and the number of customers affected. Therefore, a lower score could indicate more customers are affected and/or the impact on the affected customers is large. Compared to the original Ofwat metric, our measure of success is reported to a greater level of resolution in order to differentiate performance and for the purpose of the incentive.

### Unit of measure

The index will be reported to three decimal places, so that any performance shortfall and resulting penalty is fully scalable.

### Measure of success calculation

The SOSI describes a company's ability to meet its planned levels of service for average demand in a dry year and, where a company considers it a driver of their water resource planning, for demand during the critical (or peak) period of a dry year.

The calculation of the SOSI measure of success is a five step process summarised below, and is based on the industry standard Ofwat methodology which has been used in annual Regulatory Reporting historically and reported as an Ofwat KPI. This is summarised as follows:

- Step 1: For each resource zone, calculate the dry year (or critical period) available headroom by subtracting the reported annual average distribution input (adjusted by a dry year or critical period factor) from the water available for use (WAFU), as reported in the WRMP (and reviewed in the Annual Review of the WRMP<sup>11</sup>), accounting for bulk imports and bulk exports. Bulk imports and exports should be based on a dry year and be consistent with the assumptions in the WRMP.
- Step 2: The index is based on the difference between the calculated dry year (or critical period) available headroom and the target headroom in each resource zone. This 'surplus/deficit' is expressed as a percentage of the sum of dry year (or critical period) distribution input and target headroom. This gives a measure of the size of the surplus or deficit in relation to the demand that is expected to be met during a dry year (or critical period), plus the headroom each company believes is necessary.
- Step 3: Take the population figures for each resource zone. The population in each resource zone with a headroom deficit is expressed as a percentage of the company's total population. Where the resource zone is not in deficit, zero is entered.
- Step 4: Zonal scores are derived by multiplying the percentage of population affected by the square of the deficit for each resource zone. This means that the index is a function of the square of the deficit, so that large deficits affecting small resource zones weigh in the overall index. Then multiply the product for each resource zone by 100, and sum to produce the overall company score.
- Step 5: The final company-wide security of supply index is then calculated as:  $(1 - \text{overall total company score}) \times 100$ .

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<sup>11</sup> This is a formal part of the WRMP process, and reports any changes to the formally adopted, long-term WRMP position and forecasts. Where relevant, annual values quoted may therefore differ from the main WRMP where an updated position is reported to Defra through the Annual WRMP process (in line with the guidelines associated with [that process](#)).

For our measure of success we will report the lower of the dry year and critical period index scores. It should be noted that the Ofwat definition states that the Security of Supply Index should be rounded down to the nearest whole number. However, for our region this does not give sufficient sensitivity to measure potential reductions in customer Levels of Service as part of a robust incentive. The Security of Supply Index is therefore quoted to three decimal places, to ensure that any penalty is scalable and that smaller performance variance may be differentiated from larger ones. This ensures customers also benefit from greater transparency on the performance and service they are experiencing.

The process is completed for dry year demand in all resource zones, and repeated using critical period demands in the Carlisle and West Cumbria Resource Zones due to the short duration of the critical periods in these resource zone. For the purpose of the incentive, the lower of the two calculations is used to derive any penalty due (i.e. the incentive is defined by the worst-case position). Along with the latest supply and demand position, we will report our performance in the Annual Review of the WRMP, which is sent to Defra and published on our website<sup>12</sup>. The measure is calculated each year for the 12 month period from April to March inclusive, and normally reported in June.

Ref	Data	Definition	Input/Calculation
1	Water Resource Zone	The largest possible zone in which all resources, including external transfers, can be shared and hence the zone in which all customers experience the same risk of supply failure from a resource shortfall.	Input (from WRMP and/or Annual WRMP review)
2	Water available for use (WAFU)	Water available for use (EA definition) is defined as deployable output less sustainability reductions and reductions made for outage allowance in a resource zone.	Input (from WRMP and/or Annual WRMP review)
3	Bulk imports	Volume of water imported from other companies in bulk supplies by the appointed business. Include treated imports and untreated imports which are treated by the appointed business, but exclude non-potable supplies. Bulk imports should be based on a dry year (e.g. maximum amounts requested under contract) and be consistent with the assumptions in the WRMP.	Input (from WRMP and/or Annual WRMP review)
4	Bulk exports	Volume of water exported to other companies in bulk supplies by the appointed business. Include treated exports and untreated exports which are treated by the appointed business. In line with the WRMP and the derivation of WAFU, we also include non-potable exports within this value. Bulk exports should be based on a dry year (e.g. maximum amounts that the appointed business may be obliged to supply) and be consistent with the assumptions within the WRMP.	Input (from WRMP and/or Annual WRMP review)

<sup>12</sup> Our Final Water Resources Management Plan and Annual Review of the Water Resources Management Plan can be read at <http://corporate.unitedutilities.com/waterresourcesplan>

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Ref	Data	Definition	Input/Calculation
5	Dry year (or critical period) distribution input	<p>Distribution input recorded during the year adjusted by a dry year factor to estimate the equivalent dry year. The dry year factor should be based on a combination of:</p> <ul style="list-style-type: none"> <li>- the relationship between normal and dry year distribution input forecasts assumed in the WRMP; and</li> <li>- any difference between the report year conditions and those that defined in the normal year WRMP distribution input forecast (e.g. reflecting changes in the underlying consumption)</li> </ul> <p>The critical period distribution input (where relevant) takes the dry year distribution input, and increases this further by an uplift factor as defined within the WRMP.</p> <p>Where revisions to the WRMP values have been subsequently reported to Defra in the Annual WRMP, then these would be utilised as part of the calculations to ensure the best available datasets are being utilised.</p>	Calculated: Dry year (or critical period) factor applied to Ref 6.
6	Reporting year distribution input	The average amount of potable water entering the distribution system at the point of production.	Input
7	Dry year available headroom	The difference between water available for use (including bulk imports and exports) and dry year annual average demand (expressed as distribution input) at any given point in time.	Calculated: the sum of Ref 2 and Ref 3, minus Ref 4 and 5.
8	Target headroom	The threshold or minimum acceptable headroom which, under the conditions assumed for the forecast of dry year annual average demand, would trigger the need for the introduction of those water management activities (from source to end use) that would result in an increase in water available for use or a decrease in demand. Target headroom should be consistent with that used in the company's WRMP (or latest value subsequently reported to Defra in the Annual WRMP review) to maintain the balance between supply and demand.	Input (from WRMP and/or Annual WRMP review)
9	Surplus/deficit	The amount of water available after meeting demand and target headroom (i.e. the difference between available headroom and target headroom).	Calculated: Ref 7 minus Ref 8.
10	Percentage surplus/deficit	The percentage of water available after meeting demand and target headroom.	Calculated: Ref 9 divided by Ref 5.
11	Zonal population	The total average resident population in the water resource zone.	Input
12	Percentage of total population with headroom deficit	The proportion of the company's customers that are exposed to a headroom deficit.	Calculated: If Ref 10 is less than zero, then divide Ref 11 by the company total of Ref 11.
13	Zonal Index (percentage deficit <sup>2</sup> x % population affected x 100)	The security of supply Index score for each individual resource zone. The index is a function of the square of the deficit, so that large deficits affecting small resource zones weigh in the overall index.	Calculated: Ref 10 squared, multiplied by Ref 12, and then multiplied by 100.

Ref	Data	Definition	Input/Calculation
14	Security of supply Index	The overall security of supply Index score for the company.	Calculated: Company total of Ref 13 subtracted from one, and then multiplied by 100.

**Figure 16: Security of supply definitions**

### Performance targets

Our aim is to ensure a zero or positive supply-demand balance (no deficit) at all times throughout the planning horizon, from the current year through to 2040.

Our performance target of an index score of 100 throughout AMP6 is consistent with this long-term aim.

	Starting Level	Performance Commitments (Index)				
	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
<b>Performance Commitments</b>	100.000	100.000	100.000	100.000	100.000	100.000
<b>Penalty collar</b>		96.000	96.000	96.000	96.000	96.000
<b>Penalty deadband</b>		100.000	100.000	100.000	100.000	100.000

<b>Penalty incentive rate (£m/index point/year)</b>	3.330
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**Figure 17: Security of supply MoS performance commitments and incentive structure**

There are a number of different scenarios which could potentially cause our index score to fall below 100. Potential influences that could negatively impact the supply-demand balance underpinning the SOSI calculations include, for example, reductions in the capability of our assets or in the availability of water sources, and increases in dry year demand. The impact will depend on the scale of the changes observed, and the net impact (noting that opposing influences could also be favourable to the supply-demand balance, i.e. if the position is better than previous forecasts).

### Penalties

This measure does not carry a reward, only a penalty if our performance falls below our performance target. The penalty rate is £3.330m per index point per annum. There is no penalty 'deadband' for this measure either, meaning a dip below our performance target would incur an immediate penalty. The penalty is scalable, being reported to three decimal places.

**Example calculation**Example 1: If the Security of supply Index for 2017/18 is 99.000

As actual performance is below target a penalty will be incurred

As the actual performance is above the penalty collar then the actual performance, rather than the penalty collar is used in the calculation of the penalty.

Annual penalty = (penalty deadband-security of supply index actual performance) x penalty incentive rate

2017/18 Penalty = (100.000-99.000) x 3.330= £3.330m

Example 2: If the Security of supply Index for 2017/18 is 95.000

As actual performance is below target a penalty will be incurred

As the actual performance is below the penalty collar then the penalty collar, rather than the actual performance is used in the calculation of the penalty.

Annual penalty = (penalty deadband-penalty collar) x penalty incentive rate

2017/18 Penalty = (100.000-96.000) x 3.330 = £13.30m.

**Assumptions**

We have assumed that standard national methodology for calculating the security of supply index will not change. Similarly, we have assumed that guidance associated with the Annual WRMP review will remain consistent with previous reporting years.

Customer benefit values have been derived for changes to levels of service for drought permit and water use restriction frequencies from the PR14 Stage 2 Customer Valuation Study. These have been incorporated into the incentive mechanism for the Security of Supply Index.

Our baseline demand forecasts include the effects of the following:

- Continuation of existing leakage control policies to maintain regional total leakage at 462.7 MI/d from 2015/16;
- Continuation of existing water efficiency activities;
- Continue to meter all new properties;
- Continuation of the currently planned free meter option scheme; and
- Continue with existing tariff structures for water bills.

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**Promise – Provide you with great water**

**Outcome – You have a reliable supply of water now and in the future**

**Measure of Success - Total leakage at or below target**

Customers feel strongly about leakage on our network, and want us to continue to work hard to prevent water from going to waste.

At the same time, there is an important balance to be struck between tackling leaks, and keeping customers' bills affordable.

Our strategy for 2015-2020 is therefore to maintain current performance levels (2014/15). This represents a strong, continuing commitment to spotting, and stopping leaks across the network, without impacting adversely on bills.

The maximum reward we can earn across 2015-20 is £70.31m and the largest penalty we can incur is £218.70m.

This performance commitment is one of the six measures that will measure our progress in delivering the 'you have a reliable supply of water now and in the future' Outcome. This Outcome is one of the two Outcomes under the Customer Promise 'to provide great water'. The Measure records the MI/d variance from the company's leakage target set in our Water Resources Management Plan<sup>13</sup>, with leakage outperformance shown as a positive value.

The performance commitment is based on whether the company is above or below its existing leakage target (462.65 MI/d). This target is considerably below the Company's estimate of both the short-run Economic level of leakage (ELL) (682.9 MI/d) and the sustainable economic level of leakage (SELL) (605.7 MI/d).

### Measure of success description

In the UK, leakage is defined as loss of water from any point downstream of a water treatment works, up to and including the customer's supply pipe. It includes water lost from connections to properties (communication pipes) and the associated supply pipes owned by customers, known as supply pipe leakage.

Leakage management contributes to the overall reduction in demand and plays a key role in our management of water resources. The sustainable economic level of leakage is the level beyond which, taking into account environmental and social costs, it is less cost effective to continue to drive leakage levels down, than it is to develop new sources of water or to implement additional demand management options.

<sup>13</sup> Both the revised draft Water Resources Management Plan 2013, which was used to prepare the company's [Business Plan](#), and the final Water Resources Management Plan 2015 have the same leakage targets.

In accordance with water resource planning guidance (Environment Agency, 2012) leakage levels cannot increase over the period 2015 to 2040 and should be managed at the sustainable economic level, or current levels, whichever is lower.

We have been significantly below the sustainable economic level since 2004. Therefore our total leakage target from 2015 to 2040 is to maintain leakage at 2014/15 target levels, which are at or below the sustainable economic level.

Total leakage is expressed as a 12 month average, measured over the period 1st April to 31st March.

Leakage levels can vary with weather conditions. For example, during cold winters more leaks occur. For this reason we would expect leakage to vary from year to year, within a range below the target.

### Unit measure

The unit of measure is megalitres per day variance from the target (MI/d variance). The measure will be reported to two decimal places.

### Measure of success calculation

Best practice is to estimate total leakage using two nationally-agreed methods, the integrated flow approach ('top down') and the minimum night flow approach ('bottom up'), which are reconciled to demonstrate a robust water balance for regulatory reporting.

The measure of success will be calculated according to the methodology used for regulatory reporting of the water balance at 31 March each year.

Total leakage at, or below, target is calculated by subtracting the volume of total leakage from the target. A value of 0 indicates that the target has been met.

- **A value greater than 0** (i.e. a positive value) indicates out-performance and that the volume of total leakage is less than the target.
- **A value less than 0** (i.e. a negative value) indicates that the target has been exceeded/failed.

The total leakage target used in this calculation is 462.7 MI/d for every year. This is consistent with the 2014/15 target from Ofwat's 2009 final determination and it is consistent with the level of leakage assumed in United Utilities' 2014 final water resources management plan.

### Performance commitments

Rather than providing an absolute leakage value for each year of AMP6, our performance is instead measured as a relative value against our annual target of 462.7 MI/d.

A value of 0 (zero) indicates that the target has been met. A value greater than 0 indicates that the volume of leakage is less than the target. A value less than 0 (i.e. negative) indicates that the target has been exceeded/failed.

Figure 18 illustrates our goal to consistently reach our leakage target throughout the AMP.

	Starting Level 2014/15	Performance Commitments (MI/d variance)				
		2015/16	2016/17	2017/18	2018/19	2019/20
Performance Commitments	0.00	0.00	0.00	0.00	0.00	0.00
Penalty collar		-30.00	-30.00	-30.00	-30.00	-30.00
Penalty deadband		0.00	0.00	0.00	0.00	0.00
Reward deadband		11.20	11.20	11.20	11.20	11.20
Reward cap		30.00	30.00	30.00	30.00	30.00

Penalty incentive rate (£m/MI/day variance /year)	1.458
Reward incentive rate (£m/MI/day variance /year)	0.748

Figure 18: Leakage MoS performance commitments and incentive structure

### Rewards and penalties

By outperforming our leakage target, we can gain a reward of £0.748m per MI/d (once we have gone beyond the deadband). A penalty of £1.458m per MI/d would apply for any underperformance.

There is no penalty deadband, given the high priority customers and stakeholders place on preventing leakage from deteriorating. As such, we would incur an immediate penalty by failing to reach our target in any given year.

There is, however, a penalty collar, to protect us against an isolated event outside reasonable planning assumptions.

**Example calculations**

Example 1: Total Leakage for 2016/17 is 472.7 MI/d

472.7 MI/d is 10.00 MI/d above the 462.7 MI/d target.

**The reported value therefore equals -10.00 MI/d variance**

Annual penalty = (leakage variance - penalty deadband) x penalty incentive rate

2017/18 Penalty = (10.00 - 0.00) x 1.458 = £14.58m

**The annual penalty for 2016/17 would be £14.580m**

Example 2: Total Leakage for 2017/18 is 450.7 MI/d

450.7 MI/d is 12.00 MI/d below the 462.7 MI/d target.

**The reported value therefore equals 12.00 MI/d variance**

Annual reward = (leakage variance - reward deadband) x reward incentive rate

2017/18 Reward = (12.00 - 11.20) x 0.748 = £0.5984m

**The annual reward for 2017/18 would be £0.598m**

Example 3: Total Leakage for 2018/19 is 453.7 MI/d

453.7 MI/d is 9.00 MI/d below the 462.7 MI/d target

**The reported value therefore equals 9.00 MI/d variance**

As 9.00 MI/d is less than the reward deadband of 11.20 MI/d no reward is due.

**No annual penalty or reward would be incurred in 2018/19**

**Assumptions**

The measure is designed to adhere to the guidance and to be aligned to the SELL calculations in the water resources management plan and to be consistent with the methodology for calculating total leakage in [Ofwat's June return reporting requirements and definitions manual, March 2011](#).

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Promise – Provide you with great water

Outcome – You have a reliable supply of water now and in the future

## Measure of Success - Resilience of impounding reservoirs

United Utilities is the largest reservoir operator in England. Our reservoirs are situated across the North West. Our reservoirs that hold more than 25,000m<sup>3</sup> are registered under the Reservoirs Act 1975, and are subject to regular safety inspections by government appointed engineers.

Although the likelihood of a reservoir failure is extremely low, the consequences, for public safety, could be very serious. Our programme of interventions will provide a year on year reduction in the risk of reservoir failure to 'as low as reasonably practical' (based on Health and Safety Executive guidance) over a number of five year AMP periods.

There is no reward associated with the measure but there is a maximum penalty of £14.1m over the 2015-20 period.

### About this measure

We have used recognised industry best practice to assess the probability of failure of our dams, and the results of these assessments have been used to develop a prioritised schedule of engineering interventions that will pro-actively reduce the risk of failure.

This will deliver a year on year reduction in the risk posed by our reservoirs over the 2015-20 and successive AMP periods.

The exact schedule of interventions will be kept under constant review, and will evolve as our understanding of each dam improves with further investigation, and as the condition of each dam changes. Changes to the programme are approved through our internal business planning process.

With the expected implementation of Phase 2 of the Flood and Water Management Act 2010 (FWMA) during AMP6, the threshold for registration as a statutory reservoir will change to 10,000m<sup>3</sup> and reservoirs will be subject to a risk-based review by the Environment Agency.

### Measure of success description

Each impounding structure within which water is contained, for example, open reservoirs, service reservoirs, process tanks or sludge lagoons, has a certain inherent probability of failure. Whilst the probability of failure is low, the consequences could be significant for communities living downstream.

The annual probability of failure of our structures has been assessed as part of United Utilities' Assessment process, using recognised methodologies for assessing the risk of flood failure, internal erosion and seismic stability. At present, assessments have been carried out on open reservoirs and service reservoirs under the remit of the Reservoirs Act 1975 and on non-statutory open reservoirs.

In the future, it is expected that the Reservoirs Act 1975 will be revised to include all impounding structures which hold more than 10,000 cubic metres of water which could escape if that structure failed. The new legislation was originally expected to come into force some time in 2015, this hasn't happened and there has been no revision to the original timescales. If the new legislation is introduced, all new statutory reservoirs will be added to the Portfolio Risk Assessment process, and will be subject to assessment for the risk of flood failure, internal erosion, and seismic stability for the first time.

### Units of measure

The measure of success corresponds to the amount of risk reduction achieved each year. We first started to record the risk reduction of reservoir failure on 1<sup>st</sup> April 2007, and report progress against this measure as the cumulative reduction since this date.

The annual probability of failure at each dam, in its current state, has been assessed. Where work is carried out to reduce the risk of failure, then a new (lower) annual probability of failure can be calculated. The difference between the pre-intervention probability of failure, and the lower post-intervention probability of failure equates to the amount of risk reduction achieved. The risk reduction achieved across all of the projects completed in a given year are summed to give the total risk reduction achieved in that year.

### Measure of success calculation

The calculations in this measure of success have used recognised methodologies for calculating risk of flood failure (based on annual return period calculated by the Environment Agency), the risk of internal erosion (using the University of New South Wales methodology) and for seismic stability (using the Building Research Establishment methodology).

Potential failure modes for impounding structures are varied and include, for example:

- Flood, including overtopping of the impounding structure, out of channel flow in spillways, blockage of the overflow structure;
- Earthquake; and
- Normal operating conditions, internal erosion and stability.

Statutory open and service reservoirs have been assessed for the likely probability of failure from these potential failure modes. We account for up to 29 modes of failure at individual reservoirs. The total annual probability of failure from all these failure modes is then added together and this represents the overall risk of a catastrophic failure.

United Utilities has an ongoing process to review and prioritise interventions to reduce the risk of failure across the portfolio of reservoirs (called the Portfolio Risk Assessment). Given there are a number of potential failure modes, each asset may have a number of different remedial measures required to reduce the probability of that asset failing. Each of the remedial measures is then prioritised according to guidance published by the Health and Safety Executive

The measure of success is based upon the reduction in the annual probability of failure of our reservoirs, rather than a measure of the absolute risk of failure. Reporting the absolute risk of failure, or changes thereof, can only be assessed in light of certainty around baseline risk level. This measure is based on the risk reduction achieved because of the uncertainty in the portfolio of reservoirs to be covered under Phase 2 of FWMA 2010 and Environment Agency risk based review.

Reduction in annual probability of failure will be measured as the difference between the pre-project probability of failure (from the Portfolio Risk Assessment process) and the post project probability calculated as part of the intervention project.

The pre-project probability of failure figure is based upon screening modelling tools. A key first step in every project will be to validate the probability of failure calculations using the results from detailed geotechnical ground investigations or hydraulic modelling. This will both confirm the need for the project and help to refine the solution required.

If the validated probability of failure figures for the reservoir, based on detailed investigation, are acceptable based on application of the HSE guidance, the difference between the pre and post investigation probabilities of failure will be reported as the risk reduction for the project.

Where, (in the majority of cases), the detailed investigations confirm the originally calculated probability of failure, then the project will move forward to the design and delivery phase. Risk reduction will be reported when the project is physically constructed to a standard agreed by a Qualified Civil Engineer.

The measure is represented as the cumulative reduction in annual probability of reservoir failure multiplied by 1000, (multiplied in order to provide a meaningful metric and to ease communication with stakeholders).

The targets were set based on a programme, which was designed to reduce the probability of dam failure to tolerable levels (less than  $1.00 \times 10^{-4}$ ) based on Health and Safety Executive guidance.

Performance will be assessed annually and reported on a financial year basis.

## Performance commitments

Figure 19 below shows the performance commitment for the five years of AMP6 (2015-2020). At the end of 2014/15 the cumulative reduction in risk since April 2007 was 152.78<sup>14</sup>. The performance commitments for AMP6 reflect a further cumulative reduction in the risk of reservoir failure over the AMP6 period.

The performance commitment is defined as the cumulative reduction in total annual probability of failure of the reservoirs receiving interventions within the risk assessment programme, multiplied by 1000.

	Starting Level	Performance Commitments (Aggregate reduction in risk)				
	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
<b>Performance Commitments</b>	152.78	161.20	163.21	164.44	164.87	165.27
<b>Penalty collar</b>		152.51	152.51	152.51	152.51	152.51
<b>Penalty deadband</b>		161.20	163.21	164.44	164.87	165.27

**Figure 19: Resilience of Impounding Reservoirs MoS performance commitments and incentive structure**

## Rewards and penalties

This performance commitment carries a financial penalty, but not a reward since resilience of impounding reservoirs is a mandatory requirement for public safety. The penalty rate has been set at £0.25m per index point, and the maximum penalty we can incur in AMP6 is £3.19m.

The penalty deadband for this measure are the same values as the performance commitment in each year of the AMP. This effectually means that penalty would be triggered as soon as actual performance falls below the target, in any given year of AMP6.

## Example calculation

The 2015/16 incentive is based on the the risk reduction achieved across all of the projects completed in 2015/16 which are summed to give the total risk reduction achieved in that year.

### Example 1: Calculating an incentive for 2015/16

Step 1 – Say, for example, we deliver 10 projects in 2015/16 that deliver a total risk reduction of 7.22.

<sup>14</sup> The actual starting level (152.78) for 2014/15 was higher than originally estimated (152.51) in our business plan, reflecting a bigger reduction in risk during 2014/15.

Step 2 - The risk reduction for 2015/16 is added to the previous years cumulative risk reduction. (152.78 for 2014/15 plus 7.22 for 2015/16 gives a cumulative reduction in risk of 160.00.)

Step 3 - This value is compared to the annual performance commitment target of 161.20 to determine the size of any penalty. Annual penalty = (penalty deadband - reservoir resilience cumulative risk score ) x penalty incentive rate.

$$2015/16 \text{ annual penalty} = (161.20 - 160.00) \times \text{£}0.25\text{m} = \text{£}300\text{k}$$

#### Example 2: Calculating an incentive for 2016/17

Step 1 – Say, for example, no additional projects are delivered in 2016/17 so the additional risk reduction is zero.

Step 2 - The risk reduction for 2015/16 is added to the previous years cumulative risk reduction. (160.00 for 2015/16 plus 0.00 for 2016/17 gives a cumulative reduction in risk of 160.00.)

Step 3 - This value is compared to the annual performance commitment target of 163.21 to determine the size of any penalty. Annual penalty = (penalty deadband - reservoir resilience cumulative risk score ) x penalty incentive rate.

$$2016/17 \text{ annual penalty} = (163.21 - 160.00) \times \text{£}0.25\text{m} = \text{£}803\text{k}$$

### **Assumptions**

The Portfolio Risk Assessment is a desk top exercise based on best practice. Validation of the assessment will be completed using geotechnical and geophysical investigations and/or hydraulic modelling. If the detailed investigation reveals a revised risk of failure that is acceptable according to United Utilities interpretation of HSE guidance then the reservoir will be removed from the programme and the risk reduction will be reported as the difference between the initial screening and the detailed high confidence score.

If the detailed investigation confirms that the risk of failure still needs to be addressed, then the reservoir remains in the programme and we will deliver a solution to reduce the probability of failure to below 1 in 10,000. Part of the design process is to calculate what the risk of failure will be once the solution is constructed and to obtain confirmation / agreement from an external (non-UU) government appointed Qualified Civil Engineer (a specific appointment under the Reservoir Act 1975).

When the solution is constructed to the approval of the Qualified Civil Engineer, the risk benefit (the difference between pre project and post project probability of failure) is added to the rolling total.

The programme of work will be reprioritised during the AMP to reflect the investigation findings.

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# Thirlmere transfer into West Cumbria Penalty and reward

**Promise – Provide you with great water**

**Outcome – You have a reliable supply of water now and in the future**

**Measure of Success - Thirlmere transfer into West Cumbria**

The local population in West Cumbria currently relies on water sources close to home, including Ennerdale Water, a naturally-occurring lake which plays host to protected wildlife.

To protect this wildlife, which includes rare freshwater mussels, we are required under the Habitats Directive to reduce the amount of water we take from the lake, and ultimately, cease abstraction entirely.

To secure a long-term water supply for West Cumbria while meeting this environmental obligation, we consulted local people on three potential supply solutions. The preferred option was to bring water into the area from Thirlmere reservoir, through a major new pipeline.

Our target is to deliver this demanding project by March 2022. The incentive is designed to protect customers against late or non-delivery of the investment and to encourage early completion of the project. The theoretical maximum penalty of £191.88m is unlikely to materialise as this would only apply if we failed to meet any of the milestones over the 2015-20 period.

The maximum reward of £22.88m could only be achieved if we finish the entire project by the end of March 2020 as opposed to 2022. This reward would contribute towards the additional costs that would be incurred by the company in delivering the additional workload.

## About this performance measure

The measure will see us gain a financial reward if we manage to outperform the already stretching delivery targets for the project, or incur penalties if we fail to hit our deadlines. Any reward would offset the efficient cost of early delivery, removing the disincentive to do so.

Progress will be measured as a cumulative percentage, with a value of 100 indicating that the project has been completed and is in use, supplying water from Thirlmere to customers in West Cumbria.

The performance measure has been designed to work with the AMP6 totex incentives to ensure that the company is appropriately incentivised to deliver the project as early as practical and to protect customers from the impacts of any under or over delivery (see combined example at the end of this definition document).

Meeting our targets for each successive year of AMP6 will be very demanding, given the scale and complexity of the project. However, we recognise the major importance of this scheme for local people and the local environment, and are committed to making good progress.

**Measure of success description**

The Thirlmere transfer project is the preferred solution to maintain security of supply in our West Cumbria resource zone in the light of a statutory requirement to cease abstraction from Ennerdale Water as soon as practicable. In developing our Water Resource Management Plan three alternatives were subjected to public consultation with the majority of respondents who stated a preference supporting the Thirlmere transfer option. This option was also supported by customer research and willingness to pay.

The rationale for this measure is to provide a commitment that encourages the delivery of the project as soon as practicably possible. The performance commitment therefore ensures that we are incentivised (or rather 'not dis-incentivised') to outperform the already stretching delivery targets, but equally to ensure that if the target progress at FY20 is not achieved, for whatever reason, our customers are protected. The measure indicates project progress as a percentage with a value of 100 per cent indicating that the project is in use supplying water from Thirlmere reservoir to customers in West Cumbria. The calculation of percentage progress is similar to "earned value" in project management, where completion of milestones is recognised as completing a proportion of the baseline project value. A symmetric penalty and reward financial incentive will apply at the end of FY20 based on progress at that point. This is to ensure that the company is appropriately incentivised to protect customers and to deliver its statutory obligation.

The performance commitment does not incentivise us to deliver the project more efficiently (below target cost), this aspect of the project is appropriately addressed through the totex incentive scheme.

**Unit of measure**

The unit of measure is the cumulative percentage of the project that has been completed. We will report the Thirlmere transfer to West Cumbria measure to zero decimal places.

**Measure of success calculation**

The performance commitment targets have been developed based on the project delivery plan available at the time of the PR14 price review submission. This gave a project in use date of 31/03/2022 (FY22). The project comprises new water mains, a new treatment works and new service reservoirs.

Milestones have been defined and weighted in relation to the proportion of the baseline project value. The milestones that have been used to define the performance commitment targets are illustrated in Figure 20.

Estimated completion year	Milestone	Weight (%)	Cumulative progress (%)
FY16	Tender documents (scope book) submitted to bidders	1.00	
FY16	Planning application submitted	1.00	
<b>FY16 total</b>		<b>2.00</b>	<b>2</b>
FY17	Contract awarded	1.50	
FY17	Planning application approved	1.50	
<b>FY17 total</b>		<b>3.00</b>	<b>5</b>
FY18	Construction started on site	7.66	
FY18	First 23.12% of main in the ground	8.34	
<b>FY18 total</b>		<b>16.00</b>	<b>21</b>
FY19	Substructure of WTW complete	0.85	
FY19	Substructure of SRs complete	0.85	
FY19	Next 29.64% of main in the ground	30.30	
<b>FY19 total</b>		<b>32.00</b>	<b>53</b>
FY20	Thirlmere Bridge End connection works complete	3.68	
FY20	Next 27.27% of main in the ground	25.32	
<b>FY20 total</b>		<b>29.00</b>	<b>82</b>
FY21	Superstructure of WTW complete	2.18	
FY21	Next 12.54% of main in the ground	7.82	
<b>FY21 total</b>		<b>10.00</b>	<b>92</b>
FY22	SRs complete	0.65	
FY22	WTW complete	0.65	
FY22	Final 7.43% of main in the ground	6.71	
<b>FY22 total</b>		<b>8.00</b>	<b>100</b>

**Figure 20: Project milestones and weightings used to define the performance commitments**

### Performance targets

Our target is to complete at least 82% of the project by the end of AMP6. As the table below illustrates, our cumulative completion targets for each year will increase, as the project develops momentum.

Our performance commitments, together with the reward opportunities and penalty risks, are shown in Figure 21.

	Starting Level	Performance Commitments				
	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
<b>Performance Commitments</b>	0%	2%	5%	21%	53%	82%
<b>Penalty collar</b>		2%	5%	21%	53%	0%
<b>Penalty deadband</b>		2%	5%	21%	53%	82%
<b>Reward deadband</b>		2%	5%	21%	53%	82%
<b>Reward cap</b>		2%	5%	21%	53%	100%

**Figure 21: Thirlmere transfer into West Cumbria MoS performance commitments and incentive structure**

The penalty rate is £2.340m and reward rate is £1.271m per 1% per year.

As shown in the table above, the penalty and reward collars are directly aligned to our performance commitment until 2019/20. This means that we would not incur a penalty or reward until 2019/20. There are no deadbands within this performance commitment, and therefore we would incur a penalty for any failure to reach our target in 2019/20 and would earn a reward for the delivery of any additional milestones, in addition to our 82% target for 2019/20.

### Example calculations

Example 1: The Thirlmere Bridge End connection works milestone equates to 3.68% and as such the cumulative percentage completion would be 78%.

Penalty calculation = (penalty deadband - % project complete) x penalty incentive rate

Penalty = (82 - 78) x 2.34 = £9.36m

Example 2: We deliver all planned milestones, and complete the superstructure of the WTW by the end of 2019/2020.

The Superstructure of the WTW complete milestone equates to 2.18% and as such the cumulative percentage completion would be 84%

Reward calculation = (% project complete – reward deadband) x reward incentive rate

Reward = (84 - 82) x 1.274 = £2.548m

### **Interaction with the Totex incentive mechanism**

This measure of success performance incentive is designed to work together with the AMP6 regulatory totex incentives to provide balanced incentives to protect both the customers and the company.

In principle the totex incentives are designed to share the impact of any under or overspend against initial assumptions between customers and the company, so for example if the company underspends by £10m then the company would retain about £5m of this saving and about £5m would be returned to customers through the PR19 price review process.

The combined performance commitment and totex incentive ensures that customers are financially protected for under delivery so that they only pay in AMP6 for the extent of delivery within the AMP. The example below sets out how the totex incentive and this measure of success incentive measure combine.

### **Combined totex and ODI incentives example calculation**

In practice there are a number of additional complexities to the totex incentives, which are applied at aggregate level and not project level so the following example has been necessarily simplified.

Example 3: A one year delay in planning approval, results in a delay to milestone delivery and a reduction in annual expenditure.

Figure 3 shows how this delay could impact upon milestone delivery (by delaying the programme by a year) and therefore on the measure of success incentive penalty.

Actual completion year	Milestone	Weight (%)	Cumulative progress (%)
FY16	Tender documents (scope book) submitted to bidders	1.00	
FY16	Planning application submitted	1.00	
<b>FY16 total</b>		<b>2.00</b>	<b>2.00</b>
FY17	Contract awarded	1.50	
<b>FY17 total</b>		<b>1.50</b>	<b>3.50</b>
FY18	Planning application approved	1.50	
<b>FY18 total</b>		<b>1.50</b>	<b>5.00</b>
FY19	Construction started on site	7.66	
FY19	First 23.12% of main in the ground	8.34	
<b>FY19 total</b>		<b>16.00</b>	<b>21.00</b>
FY20	Substructure of WTW complete	0.85	
FY20	Substructure of SRs complete	0.85	
FY20	Next 29.64% of main in the ground	30.30	
<b>FY20 total</b>		<b>29.00</b>	<b>53.00</b>

**Figure 22: Project milestones and weightings used to define the performance commitments**

The 53% reported for FY20 in Figure 22, should be compared against the performance commitment of 82% in Figure 1

Penalty calculation = (penalty deadband - % project complete) x penalty incentive rate

Penalty = (82-53) x 2.34 = £67.860m

The delay to the programme would also result in a delay in the expenditure profile and therefore reduce the cumulative expenditure incurred on the project in the AMP6 period. Figure 23 below shows how the expenditure and therefore the totex incentive changes.

	FY16	FY17	FY18	FY19	FY20
Initial estimate of annual expenditure (£m)	4	8	40	83	73
Initial estimate of cumulative expenditure (£m)	4	12	52	133	206
Actual expenditure in year (£m)	4	8	2	38	83
Actual cumulative expenditure (£m)	4	12	14	52	133
Variance in cumulative expenditure (£m)	0	0	(38)	(81)	(73)
Cost returned to customers at PR19 (= 0.5 * (cumulative variance))	-	-			36.5

**Figure 23: Impact of delay on expenditure and totex incentive**

The total penalty returned to customers at PR19 would be:

- Measure of success (ODI) penalty = £67.860m
- Totex incentive = £36.5m
- ☑ Total = £104.360m

This combined penalty is greater than the reduced expenditure incurred by the company (£73m).

Therefore the aggregate effect of the ODI and the totex incentive acting in combination is to incentivise UU to avoid any delays to the project and protect customers by returning at least the expenditure initially allowed in price limits.

### Assumptions

In our customer research and consultations the preferred plan is supported by customers and this is supported by our customer challenge group. Therefore we consider it to be appropriate to assume that customers are willing to pay the project cost.

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## Contribution to rivers improved (water) Penalty and reward

**Promise - Protect and enhance the environment**

**Outcome - The natural environment is protected and improved in the way we deliver our services**

**Measure of Success - Contribution to rivers improved (water programme)**

Customers value the role we play in protecting and enhancing the natural environment and want us to continue with these important activities in the years ahead.

Over the 2015 to 2020 period, we are set to deliver a wide range of schemes which will improve rivers, protect endangered species and safeguard areas of special ecological interest. These range from constructing an eel pass on the River Lune to a sediment management scheme which will improve the River Cocker downstream of Crummock Water.

The contribution to rivers improved (water) measure of success is delivered through two main programmes:

- The delivery of an agreed number of kilometres of river improvement through completion of schemes agreed with the EA in the National Environment Programme (NEP)
- Additional kilometres improved through changing United Utilities abstraction at the four abstraction incentive mechanism (AIM) sites.

The maximum theoretical penalty if we fail to deliver the programme is £21.0m over the 2015-20 period. The maximum reward we could earn from delivering the programme early is £2.7m.

### About this measure

This measure and performance commitment will primarily be achieved by delivering a range of projects under the Environment Agency's National Environment Programme – a programme which ensures that water companies meet European Directives, and statutory environmental obligations.

For the purposes of this measure, the projects within this programme are measured in terms of the number of kilometres of rivers improved on completion of the project. Schemes include:

- **Eel pass** on the south bank of Forge weir on the River Lune;
- **Eel monitoring and feasibility studies** for “trap and truck” eel passage systems and need for silver eel intake screening at five reservoir sites;
- **Provision of new compensation flows** at Poaka Beck, Readycon Dean and Horse Coppice reservoirs to meet the Water Framework Directive;
- **Preparation and implementation of sediment plans** at our River Calder intake and Crummock, Stocks, Jumbles, Dovestone, Goyt and Alston reservoir systems; and
- **Low flow alleviation** at Tarnbrook Wyre.

Alongside our National Environment Programme commitments, we also have potential to change our abstraction at four environmentally sensitive sites in the North West. These activities will also contribute to this performance commitment. In total, our target is to improve 159.5 km of river by 2020.

**Measure of success description**

We are committed to improving the ecological status of water bodies impacted by our water service activities and there is a statutory requirement for us to prepare and agree with the Environment Agency and Defra, the National Environment Programme.

By fulfilling our water service environmental commitments, identified in the National Environment Programme, we will help mitigate the environmental impact of our water service assets and activities and will ensure compliance with environmental legislation. This measure tracks our progress against the number of required water enhancement schemes that form part of our National Environment Programme. The targets agreed with Ofwat were based on the draft National Environment Programme phase 3. The final National Environment Programme phase 5 published by the EA in January 2016 does not include three schemes originally included in phase 3. The target for delivery of this measure of success is 159.5km of rivers improved, as originally agreed with Ofwat. The three schemes not included in NEP5 are equivalent to 3.71km of rivers improved. There are schemes on the National Environment Programme that form part of the Sustainable Catchment Management Programme (SCaMP). However, it has been agreed that as these schemes are to maintain existing water quality rather than improve it; they will not form part of the measure and are not included in the target of 159.5km of river improvement.

We will also include a two sided adjustment to the reported length based on abstraction under the Q95 Abstraction Incentive Mechanism (AIM) threshold. This kilometre length is based on the kilometres that could show an improvement, and in proportion to the change in abstraction. We have included the two AIM sites identified by Ofwat (River Gelt and Aughertree Springs) and included two further sites with widely recognised abstraction issues (Ennerdale Water and the River Calder, a tributary of the River Wyre).

The total length of rivers improved is based on the sum of the improvement delivered from completion of each scheme articulated in the draft National Environment Programme.

**Unit of measure**

The unit of measure is kilometres (km). The measure will be reported to one decimal place.

**Measure of success calculation**

We have given each enhancement scheme in the National Environment Programme a fixed value for the km of river improvement that it will deliver upon completion. This has been derived using the Environment Agency's geographical information system Water Framework Directive layer (WFD GIS). The list of NEP projects and the km of river improvement assigned to each project is set out within the United Utilities Water company specific appendix to the PR14 final determination. The total improvement to be realised from these projects (159.5km) gives the delivery target for the measure.

The targets and performance reporting will use this fixed kilometre of river, so that performance measurement is not affected by potential future changes in the WFD GIS data. It is not feasible to conduct detailed surveys after each scheme to look at exactly how many km have been improved as ecological improvement can take many years to embed after successful delivery of a scheme.

When calculating the improvement from fish and eel projects, the equivalent river length improved is one sixth of the total water body length upstream of our asset using WFD GIS. This approach is in line with River Basin Management Plan (RBMP) guidance. If there is more than one project on a river, the total length is weighted between the projects based on the distance between the assets and their positions relative to each other – this is to avoid double counting of benefits.

The length improved from flow and sediment projects is equal to the length downstream of our asset to the water body boundary using WFD GIS. However, with some Heavily Modified Water Bodies (HMWB), the length improved is equal to 2.5 times the upstream catchment area using the Flood Estimation Handbook where this is greater than the total water body length downstream to the water body boundary. If more than one project is delivered on the same asset, the total length is divided equally between the projects.

The AIM abstraction could have an effect by either increasing or decreasing the total length of river improved. This means that we will incur a penalty if we abstract more than the historic average under AIM and incur a reward if abstraction under the threshold is reduced.

The calculation of the river length used in the annual assessment is based upon two factors: a) the total length of river affected and b) the actual level of abstraction below the 'Low' river flow threshold compared to the 2007-2013 average annual abstraction below the "Low" river flow threshold.

If abstraction in any year is at historic average levels for each site then no river length is added to, or removed from, the reported rivers improved value for that year. If no abstraction is made in that year, then the full river length for that site would be added. If abstraction is at half the average value 50% of the river length would be added. Similarly if abstraction is at 150% of the average 50% of the river length would be removed from the reported rivers improved value for that year. For each AIM site the adjustment cannot be greater than the river length associated with that site.

As projects are completed, an output in use certificate is produced. The date on the output in use certificate is copied onto the Environment Agency tracking spreadsheet, this is submitted annually to the Environment Agency to confirm completion.

The total benefit achieved throughout the period is calculated and reported on a cumulative basis for NEP projects and annually for AIM. This reflects the fact that the NEP projects will bring a benefit each year after project completion, whereas AIM reflects the actual level of abstraction that can vary from year to year.

**Performance commitments**

Our performance commitments, together with the reward opportunities and penalty risks, are shown in Figure 24 below:

Contribution to rivers improved (water programme)	Unit	15/16	16/17	17/18	18/19	19/20
Performance Commitment	km (cumulative total)	0.0	6.6	6.6	6.6	159.5
Penalty collar	km (cumulative total)	-2.0	-2.0	-2.0	-2.0	-2.0
Penalty deadband	km (cumulative total)	0.0	6.6	6.6	6.6	159.5
Reward deadband	km (cumulative total)	0.0	6.6	6.6	6.6	159.5
Reward cap	km (cumulative total)	2.0	13.2	13.2	13.2	234.0

Penalty incentive rate (£m/km/year)	0.111
Reward incentive rate (£m/km/year)	0.028

**Figure 24: Contribution to Km Rivers improved (water programme) MoS performance commitments and incentive structure**

We have calibrated our incentive rates against the ‘contribution to rivers improved’ wastewater performance commitment, in order to be consistent across the business.

The delivery date for most of the water enhancement schemes in the National Environment Programme is 31 March 2020. As a result, Figure 24 above shows a marked jump in total kilometres of river improved in the final year of AMP6.

The deadbands for the measure are set at the performance commitment, which means that any under or over delivery would result in some penalty or reward.

The penalty collar is set at -2km for each year. This exposes all the NEP programme to potential penalty but limits the exposure of the company to a severe drought impacting our ability to meet our AIM targets (i.e. an event outside of our control).

The reward cap is 2km in FY16, 2 x target in FY17, FY18 and FY19, and the target plus 74.5km in FY20. In practice the FY20 reward cap is nominal because in practice we can only deliver river benefits in FY20 beyond the target by outperforming our AIM target, and the maximum outperformance benefit we can deliver is 36.8km.

## Rewards and penalties

Penalties are calculated by multiplying the equivalent river length by £0.111m. The maximum penalty we could incur in AMP6 would be £21.0 million (includes both the National Environment Programme and AIM). As well as the financial penalty associated with not delivering the target, there will also be negative reputational consequences with the Environment Agency.

## Example river length calculations

### Example - NEP km improved scheme and calculation

Crummock sediment management scheme is designed to improve the River Cocker downstream of Crummock Water. Using WFD GIS data we have estimated that 4.6 km of river could benefit from this scheme and this length has been included in the 159.5 km target.

The scheme needs to be completed by 31/03/2020, if we fail to deliver this scheme by this date we will incur a penalty through the measure of success and could also be subject to additional sanctions from the Environment Agency. This measure also provides the potential to earn a reward if we deliver the scheme and the environmental improvements ahead of the NEP date.

### Example - AIM km improved scheme and calculation

Aughertree Springs is part of the Quarry Hill system which comprises a range of surface water and ground water sources. Abstraction from Aughertree Springs can affect flow in the River Ellen (measured at the Environment Agency's Bullgill gauging station). The length of river affected by the Aughertree Springs AIM abstraction is 5.24 km.

During 2007-2013 the average annual abstraction from Aughertree below the 'Low' river flow threshold of was 0.36 Ml/yr. If we were able to reduce abstraction from Aughertree Spring to zero at times when the flow in the river is below the 'Low' threshold it would lead to a contribution of 5.24 km (5.24 x 100%) to rivers improved. If we were able to reduce annual abstraction by half then the contribution to this measure would also be halved to 5.24 km x 50% (2.62 km).

The maximum benefit from AIM (if no abstraction were to occur at any of the four AIM sites at times of low flow) is 36.8 km.

If AIM abstraction at Aughertree Springs increased to the highest annual level recorded during 2007-2013 of 2.17 Ml (this occurred during 2010-2011), this would result in a reduction to the kilometres improved measure, noting this is capped to 5.24 km. The reduction is calculated by the formula:

$((2007-2013 \text{ average abstraction} - \text{actual abstraction}) / 2007-2013 \text{ average abstraction}) \times \text{km potentially improved.}$

**Example penalty and reward calculation**Example 1: 4km of river improved in 2017-2018 against a target of 6.6 km

Annual penalty = (penalty deadband - actual km rivers improved) x penalty incentive

$$\text{Annual penalty} = (6.6 - 4.0) \times 0.111 = \text{£}0.289\text{m}$$

Example 2: 14 km of river improved in 2017-2018 against a target of 6.6 km

As the actual length of river exceeds the reward cap of 13.2km, then the reward cap is used in calculating the reward value)

Annual reward = (reward cap - reward deadband) x reward incentive

$$\text{Annual reward} = (13.2 - 6.6) \times 0.028 = \text{£}0.185\text{m}$$

Example 3: reduced abstraction from the Aughtertree Springs

The maximum potential km length associated with the Aughtertree Springs is 5.24 km. If we were able to reduce annual abstraction by 20% of the 2007-13 average abstraction level the impact would be to increase the rivers improved value by 1.0km (5.24 x 20%).

If the NEP was being delivered to schedule and no other penalties or rewards were being incurred, then this would result in a reward of £0.028m (1.0 km multiplied by the reward rate of £0.028m).

Combination of impacts

If the abstraction impact from example 3 was additional to the NEP performance in example 1 then the total rivers improved length would be 5km (4km through the NEP (Example 1) and 1km through AIM). This would result in a net penalty of £0.122m (6.6km – 5.0km) x £0.111 /km

If this abstraction impact was additional to the NEP performance in example 2 then as the NEP performance already exceeded the reward cap, no additional reward would be incurred.

Potential scale of AIM impacts

The maximum benefit from AIM (if no abstraction were to occur at any of the four AIM sites at times of low flow) is 36.8 km, which (ignoring capping impacts) has the potential to earn a reward of up to £1.03m per year. In contrast the km impact of abstraction increasing at all four sites to the extent the full 36.8km is impacted, would generate a penalty of £4.1m (ignoring capping).

## Assumptions and Risks

The primary benefit for delivering each National Environment Programme scheme is an improvement in a specified length of river, measured in kilometres. There are also requirements in delivering the scheme to comply with abstraction licences and regulation commitments which have benefits for other measures of success.

There are some schemes and benefits within the National Environment Programme that do not map directly to this measure of success, specifically woodland diseases and owned catchment land maintenance. These interventions are not included in the target and are not subject to the incentive framework for this measure.

The contribution to rivers improved performance commitment targets are based on the total improvement of each of the individual schemes, which were included in the draft National Environment Programme Phase 3 and included within our PR14 business plan.

Since the PR14 process the draft National Environment Programme Phase 5 has been produced. Overall there are relatively few changes between the originally assumed schemes and the NEP5 requirements, although three schemes have been removed from the programme and the delivery dates of two schemes have been accelerated.

The three schemes (and associated rivers improved lengths) which have been removed from the programme are:

- River Lune at Forge weir - Eel passage on the north bank of the river – this has been provided by a third party (Lune Hydro) (1.54km)
- Old Water river intake on the River Gelt, Carlisle – implementation of a new prescribed flow and fish passage - excluded on the grounds of disproportionate cost (0.74km)
- River Ellen - implement a higher prescribed Q95 flow–excluded as UUW will cease abstraction from this source in 2022 as part of the Thirlmere link scheme to supply West Cumbria (1.43km)

The two schemes, which have been accelerated are:

- Stage 3 assessments & UKTAG flow guidance assessments, from Mar 2020 to 2017 (3.79 km)
- Wyre Calder (Barnacre), from March 2020 to October 2018 (5.50km)

If we deliver the two accelerated schemes to the new earlier NEP5 date, we will outperform the performance commitment target in these years and earn a reward (to partially compensate for the costs of accelerating these schemes). However, as we will no longer be able to deliver the three removed projects we will underperform the final year's performance commitment target and incur a penalty (to partially compensate for the initial funding allowance for these projects, which is no longer required).

Over the five year period the impact of these penalties and rewards should broadly net off, although by delivering to the new NEP5 profile, we will report a variance against the initial performance commitment targets.

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**Promise – Give you value for money**

**Outcome - Bills for you and future customers are fair**

**Measure of Success - Number of free water meters installed**

This measure relates to the number of water meters that we install for free. Domestic customers can apply to have a water meter fitted free of charge. This scheme applies to customers who are charged on a Rateable Value (RV) tariff and wish to benefit from a lower bill. The transfer of customers from rateable value to a meter can also have a beneficial impact upon the supply demand balance within the water network as metered customers will typically use less water.

This measure is reputational as; we have an obligation to install meters when requested; customers who opt for a meter typically benefit financially from lower bills and we have other financial measures which cover supply demand issues. We have set our targets for the take-up of free meter options, based on historical performance, predictions in customer behaviour using the UKWIR econometric opting model and additional uptake from targeted activity.

## About this measure

The measure is delivered as a result of the underlying base level of demand and through two types of specific intervention:

- The targeted promotion of free water meters to customers to help manage debt issues.
- The installation of free water meters to support operational process and policy improvements.

Under the Water Industry Act (1990) we are legally required to provide free water meters to customers who request them, provided that it is practical and not unreasonably expensive to install the device at the customer's property.

The free meter performance commitments in our Business Plan and this measure are the same as the forecasts in our modelling for our revised draft Water Resource Management Plan 2013.

## Measure of success description

The measure includes those customers who have had a meter installed within the financial reporting year. The number of meters installed under the Free Meter Option Scheme has been reported historically as part of our annual regulatory reporting.

Customers can revert back to rateable value within a 24 month period of the meter being fitted. Currently 1% of customers revert back to rateable value each year.

Where a meter cannot be installed due to pipework or installation issues the customer can opt to be charged on an Assessed Volumetric Charge (AVC) or if they are a single person living alone a Single Person Household Tariff (SPHT). These customer are not included in the reported number of free meters installed.

**Unit of measure**

The unit of measure is the number of meters installed. The measure is reported as a number. There are no decimal places.

**Measure calculation**

The Measure is the number of meters fitted in a financial year. There is no calculation for this measure. The data is reported directly from United Utilities Integrated Management System (UUIMS).

**Performance commitments and incentives**

Performance will be assessed annually and reported on a financial year basis.

	Starting Level 2014/15	Performance Commitments (no. free meters)				
		2015/16	2016/17	2017/18	2018/19	2019/20
Performance Commitments	53,544	61,644	59,325	57,394	47,421	46,054

**Figure 25 – Performance commitments**

**Rewards and penalties**

The measure of success ‘number of free meters installed’ is a reputational incentive measure. The reason there is no associated financial incentive is that this is a statutory requirement driven by customer demand. This means that actual numbers delivered in any year are dependent upon customer demand rather than company performance.

If any under delivery of free meters, was to impact upon overall supply demand balance of the network then this could impact upon the security of supply index measure of success, which does contain a financial penalty.

**Assumptions**

We have made the following assumptions when forecasting the numbers of customers opting to have a meter installed;

- Base growth of 229,000 in line with previous AMP's.
- A targeted campaign to help 25,000 customers in hardship to reduce their annual water charge by having a meter installed.
- An additional 18,000 customers will have meters installed where we need to make policy or pipework changes to improve customer satisfaction.

We have set our targets for the take-up of free meter options, based upon historical performance and predictions in customer behaviour using the UKWIR econometric opting model. In setting this target we have assumed that customers will continue to 'opt in' to be metered at similar rates to that which we have experienced in recent years, as customers become more aware of the benefits of being metered.

We have also included additional targeted promotion as explained in our PR14 Business Plan and our Statement of Response to our draft Water Resources Management Plan 2013. Beyond AMP6 we expect the take-up of free meters to slightly decline as a result of the reduced number of customers who would benefit based on the rateable value of their property. Although any price increases can drive increased demand for free meters.

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# Wastewater service outcomes

**Promise – Dispose of your wastewater**

**Outcome – Your wastewater is removed and treated without you ever noticing**

Measure of Success: Private sewers service index

Measure of Success: Wastewater network performance index

**Outcome – The risk of sewer flooding for homes and businesses is reduced**

Measure of Success: Future flood risk Measure of

Success: Sewer flooding index

**Promise - Protect and enhance the environment**

**Outcome - The natural environment is protected and improved in the way we deliver our services**

Measure of Success: Contribution to rivers improved (Ww) <sup>1</sup>

Measure of Success: Protecting rivers from deterioration due to population growth Measure of Success:

Maintaining our WwTW

Measure of Success: Serious pollution incidents Measure of

Success: Category 3 pollution incidents Measure of Success:

Satisfactory sludge disposal

**Outcome - The NW's bathing and shellfish waters are cleaner through our work and that of others**

Measure of Success: Contribution to bathing waters improved <sup>1</sup>

**Outcome – Our services and assets are fit for a changing climate and our carbon footprint is reduced**

Key performance indicator: Quantity of renewable energy generated <sup>2</sup>

Key performance indicator: Operational carbon footprint <sup>2</sup>

## Notes

<sup>1</sup> the contribution to rivers improved and bathing water measures are subject to review following the finalisation of NEP5

<sup>2</sup> further definition for the two KPI's supporting the outcome our services and assets are fit for a changing climate and our carbon footprint is reduced are not included in this version of the definition documents

**Promise – Dispose of your wastewater**

**Outcome – Your wastewater is removed and treated without you ever noticing**

**Measure of Success - Private sewers index**

In October 2011, more than 32,000 km of sewers and lateral drains which had previously been in private ownership transferred to UU. This effectively doubled our network overnight. This sewer network varies widely in its quality and state of repair, during AMP6 our performance in managing these transferred assets is being measured separately to the rest of the wastewater network.

### **About this measure**

This performance commitment (PC) informs how well the transferred private sewers and lateral drains are being maintained through an assessment of asset performance and asset service indicators. The measure will be calculated annually using five sub-measures; blockages, collapses, pollution, internal flooding and external flooding. These sub-measures are weighted according to the impact that they have on customers', as assessed through willingness to pay assessments (derived from sewer flooding, pollution and odour). The measure does not include an indicator for equipment failure as this largely relates to the performance of private pumping stations that do not transfer to our ownership until October 2016, and hence their performance is at present unknown.

We have combined the basket of five sub-measures into a single index as we consider that interactions between these sub-measures in terms of cause, effect and work required to address service failure, are so intrinsically interlinked that separation into individual measures is not practicable. For example, we expect that, as in AMP5, much of the reduction, we are planning in sewer flooding and pollution will be achieved in combination with work to reduce sewer blockages and collapses.

Although the public and transferred assets have many similarities, we have developed separate measures as our knowledge regarding the condition and performance of these two asset types is, of necessity, very different.

The definition of blockages, collapses and properties/areas flooding is in line with the June Return regulatory reporting requirements that were published by Ofwat until 2010/11 (Tables 3, 3a and 16a). All flooding events are net of severe weather defined (as in AMP5) as a storm with a return period greater than one in 20 years. The categorisation of pollution incidents is as defined in the Environment Agency Operational Instruction 1602 (version January 2013). Category 4 pollution incidents are not included in this assessment. Pollution incidents that arise solely through data provided by the monitors installed as part of the NEP agreed with the Environment Agency (S8, rB5, EDM1 or EDM2 drivers) will not be included in this assessment. Pollution incidents will also not be included where assets have performed in compliance with their permits.

This measure only includes service failure attributable to the sewers and lateral drains that transferred to our ownership on 1 October 2011 under the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011.

This measure does not include rising main failure, equipment failure, pollution or flooding incidents directly attributable to the failure of a private pumping station that will transfer to our ownership in October 2016 as the performance of these assets is at present entirely unknown. In order to proactively manage the transfer of private pumping stations between now and the full transfer in 2016, we have begun progressively transferring them. Whilst this does mean that, some private pumping stations are transferring earlier than the October 2016 date they remain excluded from this measure.

The measure does however, include service failures associated with the assets upstream of any private pumping station. We believe this position is compatible with the position set out in Ofwat's June 2011 'Private sewers and Serviceability' discussion paper.

### Measure of success description

This measure is calculated as a weighted score based on the number of blockages, collapses, pollution incidents, and internal and external flooding events from the transferred sewers. They are therefore reflective of customers own priorities and represent the relative 'value' that customers place on the sub-measures used to assess maintenance of the transferred assets.

The unit of measure is an index score scaled so that '100' represents our actual FY14 performance and '0' represents zero service failures, with the magnitude of the change in the score directly proportional to actual performance.

Five sub-measures are used in the calculation of the index score. These are:

- Number of sewer blockages where the cause is on the transferred sewer or lateral drains
- Number of sewer collapses where the cause is on the transferred sewer or lateral drains
- Number of pollution incidents where the cause is on the transferred sewer or lateral drains
- Number of properties flooded internally where the cause is on the transferred sewer or lateral drains (due to overloaded sewers or other causes) excluding severe weather
- Number of areas flooded externally where the cause is on the transferred sewer or lateral drains (due to overloaded sewers or other causes) excluding severe weather

### Unit of measure

This measure will be assessed by an index which is explained in the example below. This will be assessed on a financial year basis and will be reported to one decimal place.

### Measure of success calculation

In order to combine the five sub-measures into an overall index the individual sub-measures have been weighted using values from, or derived from, our PR14 willingness to pay data, as follows:

- Internal flooding due to hydraulic overload or other causes = 297.5
- External flooding due to hydraulic overload of other causes = 46.6
- Pollution incidents (category 3) = 1,516.3
- Blockages = 59.3
- Collapses = 97.1

The willingness to pay research values used to weight the sub-measures for internal and external flooding and pollution are taken directly from the loss values from our PR14 willingness to pay survey data.

The willingness to pay values used to weight the sub-measures for blockages and collapses have been derived from our PR14 willingness to pay data as we do not have direct customer valuations for changes in performance for these sub-measures. They are calculated by determining the number of blockages and collapses (over the previous three years of AMP5) that resulted in a service failure (e.g. flooding, pollution or nuisance) for which we have a customer willingness to pay valuation.

In calculating the index score the actual performance for each sub-measure is multiplied by the weighting factor and this is then converted to an index score by comparison to our actual FY14 performance.

### Performance targets

Over the next five years we aim to provide a stable service for our customers which will maintain an index score of 100. The performance commitment is based upon achievement of the overall index score rather than meeting any specific targets for the sub-measures. However, the development of our performance commitment was based on the breakdown of sub-measures shown in Figure 1 below. The index score will reduce if performance improves and there are less operational incidents on our transferred network.

	Performance Commitments				
	2015/16	2016/17	2017/18	2018/19	2019/20
Blockages	15,518	15,518	15,518	15,518	15,518
Collapses	467	467	467	467	467
Pollution incidents	4	4	4	4	4
Internal flooding – Hydraulic & FOC	401	401	401	401	401
External flooding – Hydraulic & FOC	4,820	4,820	4,820	4,820	4,820
<b>Performance Commitment</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Figure 1: Performance commitments for AMP6



### Penalties and rewards

Both penalties and rewards can be applied as a consequence of our performance against this measure. The performance targets and rates of penalty and reward are as set out in figure 2 below.

	Starting Level 2014/15	Performance Commitment				
		2015/16	2016/17	2017/18	2018/19	2019/20
<b>Performance Commitments</b>	<b>105.8</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>Penalty collar</b>		102.0	102.0	102.0	102.0	102.0
<b>Penalty deadband</b>		101.2	101.2	101.2	101.2	101.2
<b>Reward deadband</b>		98.8	98.8	98.8	98.8	98.8
<b>Reward cap</b>		91.9	91.9	91.9	91.9	91.9

<b>Penalty incentive rate (£m/index point)</b>	4.204
<b>Reward incentive rate (£m/index point)</b>	1.069

Figure 2: Performance commitments and ODI structure based on the Final Determination

The performance commitment has symmetrical deadbands that are designed to reflect the inherent variability in annual performance as a consequence of weather and other annual variations. The measure has a relative wide reward band (the gap between the reward deadband and reward cap). This has been designed to incentivise cost beneficial out-performance of the PC target, based on the continued implementation of our 'first time resolution' operating model.

The maximum penalty that can be applied in any year is £3.368m, with a potential penalty across the AMP6 period of £16.8m. The maximum annual reward could be £7.376m, with a potential maximum reward over the five years of £36.9m.

**Example calculation**

To calculate the index score for actual or target performance the following two step calculation is used:

*Total index =*  
*(number of properties flooded internally due to hydraulic overload or other causes pa x 297.5)*  
*+ (number of areas flooded externally due to hydraulic overload or other causes pa x 46.6)*  
*+ (number pollution incidents pa x 1,516.3)*  
*+ (number of blockages pa x 59.3)*  
*+ (number of collapses pa x 97.1)*

The total index score is then standardised by dividing this raw index score by: (In year index score/ FY14 index score) x 100

For example if our performance was as set out in the table below, this performance would result in an index score of 99.3, which would not generate a reward or penalty as it lines within the deadband.

	Actual performance	Weighting	Index score
Blockages	15,203	59.3	901,538
Collapses	470	97.1	45,637
Pollution incidents	3	1516.3	4,549
Internal flooding – Hydraulic & FOC	454	297.5	135,065
External flooding – Hydraulic & FOC	4,723	46.6	220,092
Total index score			1,306,881
FY14 total index score			1,315,538
In year index score/ FY14 index score) x 100			<b>99.3</b>

**Figure 3: Example calculation of private sewers index**

Where the index score is higher (worse) than both the performance commitment and the penalty deadband a penalty would be incurred.

If the index score is lower (better) than the penalty collar then the penalty would equal the actual index minus the penalty deadband multiplied the penalty incentive rate.

If the index score is higher (worse) than the penalty collar then the penalty would equal the penalty collar minus the penalty deadband times the penalty incentive rate.

The reward calculations work in the same way as the penalty calculations

### Assumptions made in calculating this index

The targets for this measure do not include any direct service failure from the private pumping stations or rising mains that transfer to our ownership in AMP6 (as outlined earlier). It is recognised that some private pumping stations will transfer to our ownership prior to the full transfer date of October 2016, any incidents from assets that have transferred early will not be included within this measure.

The number of properties flooded internally, the number of areas flooded externally, and the number of blockages and collapses is taken from our Wastewater Incident Reporting System in accordance with the relevant internal regulatory reporting methodology. The number of pollution incidents is taken from our Pollution Incident Reporting System in accordance with the relevant regulatory reporting methodology.

The definitions for each sub measure are consistent with the definitions used in previous regulatory reporting to Ofwat and are taken from its June return guidance doc 2011.

- The number of properties flooded internally due to overloaded sewers (excluding severe weather) is as defined in the Ofwat AMP5 June Return reporting requirements (version January 2011) as the number of properties affected by internal flooding incidents due to overloaded sewers and should include properties where an uninhabited cellar is the only part affected by the flooding.
- The number of properties flooded internally due to other causes is as defined in the Ofwat AMP5 June Return reporting requirements as the number of properties affected by flooding incidents from equipment failures (but not from transferred assets), blockages or collapses (collectively grouped as other causes). This should include properties where an uninhabited cellar is the only part affected by the flooding. All properties flooded due to other causes should be counted in the return even if the flooding incident was caused by factors beyond the company's control (third party damage or "customer abuse").
- Number of areas flooded externally due to overloaded sewers (excluding severe weather) is as defined in the Ofwat AMP5 June Return reporting requirements (version January 2011) for Table 3a as flooding that is not classed as internal. For reporting purposes, external areas will be split into curtilages, highways and other external areas. All incidents should be recorded irrespective of size. An overloaded sewer is defined as when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded. No account should be taken of the severity of the storm causing the incident.
- The number of areas flooded externally due to other causes is as defined in the Ofwat AMP5 June Return reporting requirements (version January 2011) for Table 3a Line 8 as The number of external areas affected by flooding incidents from equipment failures, blockages or collapses (collectively grouped as other causes). All areas flooded due to other causes should be counted in the return even if the flooding incident was caused by factors beyond the company's control (third party damage or "customer abuse").
- The categorisation of pollution incidents is as defined in the Environment Agency Operational Instruction 16\_02 (version January 2013). Category 4 pollution incidents are not included in this measure.

- The number of blockages - number of sewer blockage events that required clearing. Exclude blockages cleared as good will on private sewers and private drains. A blockage is an obstruction in a sewer which causes a reportable problem (not caused by hydraulic overload), such as flooding or discharge to a watercourse, unusable sanitation, surcharged sewers or odour.
- The number of collapses - number of sewer collapses on all sewers. Includes bursts to rising mains, even where failures are accidental rather than weakness in pipe condition. All third party damage should be excluded where costs are potentially (rather than actually) recovered from a third party.

## Notes

The information we currently hold about private sewers is limited to data that we have been able to collect since their transfer. Targets have been set based on the best performance to date of these transferred assets. Weather patterns and customer activity can both adversely impact on the performance against this measure.

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**Promise – Dispose of your wastewater**

**Outcome – Your wastewater is removed and treated without you ever noticing**

**Measure of Success - Wastewater network performance index**

Our customers have told us they want a sewerage service that allows them to simply flush and forget. This requires us to keep our vast sewer network in good working order, to minimise the blockages, collapses and equipment failures that can be so disruptive. The condition and performance of our sewers, rising mains, pumping stations, combined sewer overflows and detention tanks all have an important part to play.

## About this measure

This performance commitment measures how well we maintain our sewer network, by minimising problems that can cause disruption to customers. A total of four sub-measures count towards an overall index score. These are blockages, collapses, rising main bursts and equipment failures. Each sub-measure is weighted based on the value that customers place on avoiding these service failures. Assets that were transferred to our ownership in October 2011 are excluded from this measure – as these are covered by a separate performance commitment the Private Sewers Index. Historically, blockages have been the most significant factor in network performance, owing to the sheer number of them. This is reflected in the new performance measure with the impact of blockages being dominant compared to other sub-measures.

In order to improve the reliability of our wastewater network in 2015-2020, we need to target our investment more effectively through better cost benefit analysis to maximise the benefit from every pound spent. We also need to continue to educate our customers not to flush or pour items which can contribute to blockages.

## Measure of success description

This measure is calculated as a weighted score based on; the number of blockages, collapses, equipment failures and rising main bursts per annum on the public assets. The weightings used to calculate the index are derived from the valuations for sewer flooding, pollution and odour from our PR14 willingness to pay survey and therefore represent the relative 'value' that customers place on the individual sub-measures used to assess maintenance of our sewerage assets.

The unit of measure is an index score scaled so that '100' represents our actual FY14 performance and '0' represents zero service failures, with the magnitude of the change in the score directly proportional to actual performance.

Four sub-measures are used in the calculation of the index score:

- Number of sewer blockages from public assets
- Number of sewer collapses from public assets
- Number of rising main bursts from public assets
- Number of equipment failures from public assets

### Unit of measure

This measure of success will be calculated as an index over a financial year, and will be reported to one decimal place.

### Measure of success calculation

In order to combine the four sub-measures into an overall index the individual sub-measures have been weighted using values derived from our PR14 willingness to pay data, as follows:

- Blockages = 26.1 (derived gain value)
- Collapses = 97.1 (derived loss value)
- Rising main bursts = 485.2 (derived loss value)
- Equipment failures = 6.3 (derived loss value)

The values used to weight the four sub-measures given above have been derived from our PR14 willingness to pay data as we do not have direct customer valuations for changes in performance for these sub-measures. They are calculated by determining the number of blockages, collapses, rising main bursts and equipment failures (over the last three years) that resulted in a service failure (e.g. flooding, pollution or nuisance) for which we have a customer willingness to pay valuation. By summing the willingness to pay value of the incidents that caused a service failure (e.g. number of blockages that caused pollution multiplied by the willingness to pay value for pollution) and dividing this by the total number of incidents we have calculated a derived willingness to pay value.

In calculating the index score the actual performance for each sub-measure is multiplied by the weighting factor and this is then converted to an index score when compared to our actual FY14 performance.

### Performance targets

Over the next five years we aim to provide an improving service for our customers this is shown by a reduction in the index score. Achievement of the performance commitment target is our regulatory obligation rather than meeting specific sub-measure targets. However, the development of our performance commitment at PR14 was based on the breakdown of sub-measures shown below. The index score will reduce if performance improves, and there will be less flooding incidents on our network.

	Performance Commitments				
	2015/16	2016/17	2017/18	2018/19	2019/20
Blockages	8,754	8,425	8,015	7,604	7,358
Collapses	444	444	444	444	444
Rising mains bursts	40	40	40	40	40
Equipment failures	2,403	2,383	2,358	2,333	2,318
<b>Performance Commitment</b>	<b>106.2</b>	<b>103.2</b>	<b>99.4</b>	<b>95.6</b>	<b>93.4</b>

Figure 4: Performance commitments for AMP6

## Penalties and rewards

This measure is subject to a penalty only mechanism. The rate of penalty is as set out in the table below.

	Starting Level 2014/15	Performance Commitment				
		2015/16	2016/17	2017/18	2018/19	2019/20
Performance Commitments	108.4	106.2	103.2	99.4	95.6	93.4
Penalty collar		115.4	112.4	108.6	104.8	102.6
Penalty deadband		108.9	105.8	101.9	98.0	95.7

Penalty incentive rate (£m/index point)	2.298
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Figure 5: Performance commitments and ODI structure based on the Final Determination

This measure is incentivised with penalty only.

## Example calculation

To calculate the index for actual or target performance the following calculation is used:

$$\begin{aligned}
 \text{Index} = & \\
 & (\text{number of blockages pa} \times 26.1) \\
 & + (\text{number of collapses pa} \times 97.1) \\
 & + (\text{number of rising main bursts} \times 485.2) \\
 & + (\text{number of equipment failures} \times 6.3)
 \end{aligned}$$

The index score is then standardised by:  $(\text{In year index score} / \text{Index score for FY14}) \times 100$ .

For example if our performance was as set out in the table below, this would not result in a penalty as it is within the deadband.

	Actual performance	Weighting	Index score
Blockages	7,358	26.1	192,044
Collapses	444	97.1	43,112
Rising main bursts	40	485.2	19,408
Equipment failures	2,318	6.3	14,608
Total index score			269,168
FY14 total index score			288,266
In year index score / Index score for FY14) x 100			<b>93.4</b>

Figure 6: Example calculation of sewers flooding index

**Assumptions made in calculation this measure**

The number of blockages, collapses, rising main failures or equipment failures is taken from the Wastewater Incident Reporting System. The definitions for each sub measure are consistent with the definitions used in previous regulatory reporting to Ofwat and are taken from its June return guidance 2011.

- The number of blockages – number of sewer blockage events that required clearing. Blockages should be excluded when they are cleared as good will on private sewers and private drains. A blockage is an obstruction in a sewer which causes a reportable problem (not caused by hydraulic overload), such as flooding or discharge to a watercourse, unusable sanitation, surcharged sewers or odour.
- The number of collapses – number of sewer collapses on all sewers. All third party damage should be excluded where costs are potentially (rather than actually) recovered from a third party.
- The number of rising main failures - number of repairs to rising main pipe where a rising main can be classed as are pipes that carry sewage by pumping under pressure or under suction (for example where sewage is moved under vacuum) from a powered asset (for example a pumping station).
- The number of equipment failures – the total number of sewerage equipment failures which had, or were likely to have, a detrimental impact on service to customers or the environment.

**Equipment includes**

- Pumping stations (foul, surface water or combined)
- Overflows (CSO and emergency)
- Penstocks
- Anti-flood valves
- Vacuum sewerage systems
- Storage tanks
- Flow control devices (e.g. Hydrobrakes)
- Real-time telemetry control systems
- Oil interceptors
- Chemical dosing

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**Promise – Dispose of your wastewater**

**Outcome – The risk of flooding for homes and businesses is reduced**

**Measure of Success - Future flood risk**

Internal flooding of properties, in which sewage enters the home, is the most disruptive type of flooding that can occur and requires more intensive intervention from us in order to reduce the risk of this type of flooding occurring.

### **About this measure**

This performance commitment measures the number of properties at risk of flooding affecting a ground floor living space. The measure is calculated using network models to identify the number of properties that are shown to be at risk of flooding from sewers during a 1 in 20-year storm.

Using models in this way to predict flooding is a relatively new approach, and we will be refining and developing our methodology throughout the next five years. Due to the on-going development of this measure, it is not subject to any financial incentives or penalties during AMP6.

### **Measure of success description**

Our future flood risk measure is forward looking and uses our Sewerage Management Planning (SMP) process to predict the number of properties at risk of suffering high consequence (defined as flooding of ground floor living space) future sewer flooding. The risk level is calculated using predicted flood volumes and surcharge levels from our hydraulic sewer models combined with overland flow routing models, and measures the number of properties at risk of being significantly impacted by flooding from a storm with a 1 in 20 year return period.

This is a new measure and as such will be subject to on-going development over the next five years as we improve our hydraulic modelling capability and refine our SMP process. With this process being designed to allow us to have improved our calculation methodology by PR19. Thus our target performance over AMP6 is not based on an on-going recalculation of the number of 'at risk' properties using hydraulic modelling, as this would introduce a high level of uncertainty (due to the unknown impact of model improvements and increasing demand due to development) into the calculation. Rather it is based on the reduction in the number of properties at risk of high consequence flooding measured against the 2015 baseline.

### **Unit of measure**

This is a measure of the total number of properties that are at risk of flooding in the region. This will be measured in whole numbers.

**Measure of success calculation**

Our network hydraulic models were calibrated for growth and development to a 2020 design horizon and run to generate predicted flood volumes and locations. These were input to the overland flood routing models to show which properties were predicted to be impacted by the flooding. A property is assessed to be at risk of high consequence flooding (defined as flooding above floor level in living space) if the predicted depth of ponded sewage at the exterior wall of the property was at least 150mm. It is assumed that 150mm of ponded sewage (above damp proof course/door threshold) is of sufficient depth to cause flooding of living spaces.

In determining our target we made an assessment of the total number of ‘high consequence’ properties that during the development of PR14 we planned to address in the AMP6 period.

**Performance targets**

The performance commitment for this measure can be seen outlined in the table below. The performance commitment has been set to reduce the number of properties at risk of high consequence flooding over AMP6. This target is based on both customers’ and stakeholders expressed support for an improvement in the level of service that we currently provide.

	Starting Level 2014/15	Performance Commitments				
		2015/16	2016/17	2017/18	2018/19	2019/20
Performance Commitments	16,568	16,511	16,436	16,341	16,247	16,190

Figure 7: Performance commitments and ODI structure based on the Final Determination

**Penalties and rewards**

In AMP6 this measure will be reputational only and so no penalty or reward will be applied.

**Example calculation**

As this measure is based on information developed from hydraulic modelling an example calculation is not applicable.

**Assumptions made in calculation of this measure**

This is assessed using network models, which have been developed using a number of assumptions. These models may be refined as the AMP progresses. Careful consideration and understanding needs to be made of the impact that improving models may have on this measure.

As we progress through the AMP6 period we will remove properties from being ‘at risk’ where work is completed which removes the risk of flooding however we will not add properties to the list where risk is identified as the target was set on the basis of removals rather than a net reduction.

The targets for this measure were set based on a depth of flooding and therefore for the purposes of this measure cellar flooding risk is not included.

Properties will be removed from being classed as 'at risk' where a scheme is completed which offers 1 in 30 year protection or mitigation is installed which removes the risk of flooding.

This is a new measure which needs to be monitored and refined as the AMP progresses. As our understanding of modelling techniques develops our approach to this measure may change. We will report on this as part of our annual regulatory submission and incorporate our revised approach into our planning for AMP7.

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**Promise – Dispose of your wastewater**

**Outcome – The risk of sewer flooding for homes and businesses is reduced**

**Measure of Success - Sewer flooding index**

This measure provides an assessment of performance with respect to reducing sewer flooding, and is designed to provide a direct measure of customer experience. It combines internal flooding, external flooding and repeat flooding (as defined in the AMP5 Ofwat key performance indicator (KPI), but excluding severe weather). It includes both flooding caused by hydraulic incapacity and other causes, but does not differentiate between the two causes, as customers cannot be expected to differentiate and the experience is equally unpleasant. Our sewer flooding index includes only flooding from our public network as flooding from transferred sewers is included in our private sewers service index.

## About this measure

This performance commitment requires us to deliver a significant reduction in sewer flooding incidents by 2020. A number of sub-measures, weighted according to the value our customers place on them contribute to an overall index score. These sub-measures are internal property flooding; external flooding and repeat flooding (where a customer suffers internal flooding following a previous flooding incident, either internal or external, in the previous 10 year period). The performance commitment includes flooding caused by hydraulic incapacity of our sewers and other causes of flooding such as blockages, collapses and equipment failures, and it does not differentiate between the causes as they have the same impact on the customer.

The targets we have been set for 2015-2020 were derived by Ofwat as part of the PR14 price determination process and are based upon non-normalised, industry-wide upper quartile targets. These targets are significantly tougher than the targets that we initially included within our business plan and which were designed to be cost beneficial and reflect the specific circumstances (asset base, weather conditions etc.) in the North West. It would therefore, require a significant effort to achieve these targets and we are reviewing the way in which we operate to ensure that we can maximise the benefit to customers. In particular, we plan to target investment to reduce the risk of repeat flooding – an issue which causes distress for our customers and can have a significant impact on our index scores.

## Measure of success description

We have combined a basket of sub-measures including internal, external and repeat flooding into a single index as we consider that interactions between these sub-measures in terms of the cause, effect and work required to address the failure, are so intrinsically interlinked that separation into individual measures is not practicable. For example we expect that much of the reduction we are planning in external flooding and repeat flooding will be achieved in through combined schemes in the same location to address internal flooding; thus making separation of internal and external flooding into individual measures problematic.

The unit of measure is an index score scaled so that '100' represents our actual FY14 performance and '0' represents zero service failures, with the magnitude of the change in the score directly proportional to actual performance.

Five sub-measures are used in the calculation of the index score. These are:

- Properties flooded internally due to other causes
- Properties flooded internally due to hydraulic overload
- Areas flooded externally due to other causes
- Areas flooded externally due to hydraulic overload
- Repeat flooding (excluding severe weather)

The number of properties and areas flooding is produced in accordance with Ofwat's June Return 2011 regulatory reporting requirements for Tables 3 and 3a.

Repeat flooding is produced in accordance with Ofwat's March 2012 KPI Guidance document.

All flooding events are net of severe weather defined (as in AMP5) as a storm with a return period greater than one in 20 years, the measure includes flooding at properties that are recorded on the flooding register.

The performance commitment includes only flooding caused by issues on our public network, flooding caused by issues on assets which transferred to our ownership through the transfer of private sewers is included in our private sewers service index.

Flooding is heavily impacted by weather patterns therefore our measure contains relatively large deadbands, despite this achievement of our targets will be more challenging in times of higher intensity rainfall.

### **Unit of measure**

This performance commitment will be measured using an index, and will be recorded to one decimal place. The measure is assessed on a financial year basis.

### **Measure of success calculation**

In order to combine the five sub-measures into an overall index the individual sub-measures have been weighted using values derived from our PR14 willingness to pay research data, as follows:

- Internal flooding due to other causes = 117.1
- Internal flooding due to hydraulic overload = 117.1
- External flooding due to other causes = 26.3
- External flooding due to hydraulic overload = 26.3
- Repeat flooding incidents = 117.1
- 

In calculating the index score the actual performance for each sub-measure is multiplied by the weighting factor and this is then converted to an index score by comparison to our actual FY14 performance.

## Performance targets

Over the next five years we have been set an improving service target, this is shown by a reduction in the index score. The performance commitment is based upon achieving the overall index score, rather than achieving any specific targets for any of the sub measures. However, an indicative breakdown of sub-values that would be required to meet this target is shown below. The index score reduces if performance improves, and there are less flooding incidents on our network.

	Performance Commitments				
	2015/16	2016/17	2017/18	2018/19	2019/20
Internal flooding due to other causes	607	491	375	375	375
Internal flooding due to hydraulic overload	100	78	55	55	55
Areas flooded due to other causes	3,878	3,715	3,512	3,309	3,187
Areas flooded due to hydraulic overload	499	499	499	499	499
Repeat flooding	367	338	303	267	246
<b>Performance Commitment</b>	<b>93.1</b>	<b>83.9</b>	<b>73.9</b>	<b>70.3</b>	<b>68.1</b>

Figure 8: Performance commitments for AMP6

## Penalties and rewards

Both penalties and rewards can be applied to this measure. The rates of penalty and reward are as set out in the table below.

	Starting Level 2014/15	Performance Commitment				
		2015/16	2016/17	2017/18	2018/19	2019/20
Performance Commitments	101.6	93.1	83.9	73.9	70.3	68.1
Penalty collar		114.1	104.1	93.2	88.8	86.1
Penalty deadband		103.7	93.7	82.8	78.4	75.7
Reward deadband		82.6	74.0	65.0	62.2	60.5
Reward cap		70.4	61.4	51.9	48.7	46.8

<b>Penalty incentive rate (£m/index point)</b>	<b>2.032</b>
<b>Reward incentive rate (£m/index point)</b>	<b>1.050</b>

Figure 9: Performance commitments and ODI structure based on the Final Determination

This measure is incentivised with both rewards and penalties. For each index point above the penalty collar a penalty of £2.032m will be applied with a maximum penalty of £21.133m per year. For each index point below the reward deadband a reward of £1.05m will be applied with a maximum yearly reward ranging from £12.810m in FY16 to £14.385m in FY20.

### Example calculation

To calculate the index for actual or target performance the following two step calculation is used:

$$\begin{aligned}
 \text{Total index score} = & (\text{number of properties flooded due to other causes} \times 117.1) \\
 & + (\text{number of properties flooded due to hydraulic overload} \times 117.1) \\
 & + (\text{number of areas flooded due to other causes} \times 26.3) \\
 & + (\text{number of areas flooded due to hydraulic overload} \times 26.3) \\
 & + (\text{number repeat flooding incidents} \times 117.1)
 \end{aligned}$$

The total index score is then standardised by: (annual index score / FY14 index score) x 100.

**Example 1** Performance as shown in table below: year 2015/16.

	Actual performance	Weighting	Index score
Internal flooding – FOC	700	117.1	81,970
Internal flooding – hydraulic	100	117.1	11,710
Areas flooding – FOC	3,500	26.3	92,050
Areas flooding – hydraulic	500	26.3	13,150
Repeat flooding	350	117.1	40,985
Total index score			239,865
FY14 total index score			258,753
Calculated performance (annual total index score / FY14 total index score) x 100			<b>92.7</b>

**Figure 10: Example calculation of sewers flooding index**

As the index score of 92.7 is lower (better) than the 2016 target of 93.1 but within the penalty and reward deadbands (82.6 to 103.7) no penalty or reward is incurred.

Example 2: If this same level of performance was delivered in 2017/18 then the index score of 92.7 would be higher (worse) than both the performance commitment (73.9) and the penalty deadband (82.8) and as such a penalty would be incurred. The value of the penalty would equal actual index minus the penalty deadband times the penalty incentive rate.

$$\text{Penalty} = (92.7 - 82.8) \times £2.032\text{m} = £20.177\text{m}$$

**Example 3:** If this same level of performance was delivered in 2019/20 then the index score of 92.7 would be higher (worse) than both the performance commitment (68.1), the penalty deadband (75.7) and the penalty collar (86.1) as such the value of the penalty would equal penalty collar minus the penalty deadband times the penalty incentive rate.

$$\text{Penalty} = (86.1 - 75.7) \times \text{£}2.032\text{m} = \text{£}21.133\text{m}$$

### Assumptions made in the calculation of this measure

This index is calculated using the following information data; number of properties flooded internally, number of areas flooded externally and the number of repeat incidents. Each of these is defined below.

- Internal flooding – The number of properties flooded internally due to overloaded sewers and other causes (blockages, collapses and equipment failures) is as defined in the Ofwat AMP5 June Return reporting requirements (version January 2011). This should include properties where an uninhabited cellar is the only part affected by the hydraulic or flooding other causes flooding. All properties flooded due to other causes should be counted even if the flooding incident was caused by factors beyond the company’s control (third party damage or “customer abuse”). Any properties flooded due to severe weather are excluded.
- External flooding – Number of areas flooded externally due to overloaded or flooding other causes (blockages, collapses and equipment failures) is as defined in the Ofwat AMP5 June Return reporting requirements (version January 2011). All incidents should be recorded irrespective of size of the flood. All areas flooded due to other causes should be counted even if the flooding incident was caused by factors beyond the company’s control (third party damage or “customer abuse”). Any properties flooded due to severe weather are excluded.
- Repeat incidents – Number of repeat flooding incidents is as defined in the AMP5 Ofwat key performance indicator guidance document (March 2012) as the number of incidents of internal sewer flooding for properties that have flooded within the last ten years. This should include any incident of internal flooding of a property in the year where a flooding incident, either internal or external, has been reported by the property in the previous ten years. Multiple incidents at a property in the year should be counted separately. This should exclude incidents due to exceptionally severe weather greater than a 1 in 20-year storm.

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**Promise - Protect and enhance the environment**

**Outcome - The natural environment is protected and improved in the way we deliver our services**

**Measure of Success - Contribution to rivers improved (Ww programme)**

### Introduction

The contribution to rivers improved performance commitment measures the contribution that we are planning to make to improve river quality in the period 2015-2020. Delivering these improvements will be achieved through a defined programme of work that is agreed with the Environment Agency (EA).

The majority of this programme is made up from schemes designed to improve the quality of our consented wastewater discharges. Each scheme has been converted into the km of river that will be improved through completion of the project. The monetary valuation that has been used as the basis for the incentives for this measure have been provided by customers, through willingness to pay surveys undertaken during the PR14 process.

In addition to the schemes which will directly improve the quality of our discharges, the programme also includes a number of investigations and the installation of a number of monitors on our assets. These schemes have also been allocated a nominal river length improvement, to recognise their importance in achieving the longer term outcome of this measure and have been included within the overall performance commitment target.

The original programme that was agreed with the EA and used to form the basis of the final determination performance commitment. The programme has subsequently been revised and as such we will be reporting performance and incentive payments against both the revised programme agreed with the EA and the original programme.

### Document purpose

This document: -

- Sets out the detailed definition for the contribution to rivers improved (wastewater programme) measure of success;
- Explains how the contribution to rivers improved measure fits within our AMP6 plan in terms of our Customer Promises and Outcomes;
- Sets out the performance commitments and incentive structure that was outlined in the Final Determination for AMP6;
- Provides a step by step explanation as to how the measure is calculated and reported; and
- Provides detailed definitions for key attributes within the measure.

The definitions, performance targets and calculations set out in this document are designed to be complimentary to the information published with the final determination and subsequent corrigendum on the Ofwat web site. If there are any differences between the two documents these are unintentional and the final determination wording will take precedence.

### Measure of success summary and context

The 'contribution to rivers improved (wastewater programme)' measure of success is one of the six wastewater measures that will allow us to track our progress in delivering the Outcome 'The natural environment is protected and improved in the way we deliver our services'.

This Outcome is one of the three Outcomes under the Customer Promise to 'Protect and enhance the environment'. The Outcome and Customer Promise associated with this measure are shown in Figure 1: The hierarchy for this measure below.

Customer Promise	Protect and enhance the environment
Outcome	The natural environment is protected and improved in the way we deliver our services
Measure of Success	Contribution to rivers improved (wastewater)

Figure 1: The hierarchy for this measure

## 1. Measure of success description

This performance commitment captures the contribution we expect to make in improving river quality to achieve good ecological status (or good ecological potential for heavily modified water bodies) under the Water Framework Directive, by delivering a programme of schemes agreed with the EA.

This performance commitment requires us to deliver a significant improvement in river quality by 2020 through completion of defined projects as agreed with the EA. The completion of a project will require an 'Output in use certificate' to be completed, signed by relevant managers within United Utilities Water (UUW) and agreed with the EA. The date on the output in use document will act as the completion date of the project.

The programme also delivers improvements required to meet other environmental legislation, such as the Urban Wastewater Treatment Directive, the Freshwater Fish Directive, the Wildlife and Countryside Act and the Biodiversity Strategy for England. The dates by which the schemes are required to be completed are (with a few exceptions) as set out in the EA's National Environment Programme (NEP). A list of the drivers is described in appendix C.

There were a number of errors in the original performance commitment target included within the final determination, with these errors being recognised, accepted and revised in the corrigendum on the Ofwat. Additionally following the final determination, the Environment Agency has published National Environment Programme phase 5. This has included a number of revisions to the project list that was initially used to develop our PR14 performance commitment targets. We will therefore report against both the initial performance commitment target (as set out in the corrigendum on the Ofwat web site) and against the performance commitment as revised to reflect the post NEP5 position and set out in this document.

### Unit of measure

This measure of success is in km of river length improved.

### Decimal places

For performance reporting purposes the index will be presented to two decimal place and rounding will be used to convert a greater number of decimal places as appropriate for reporting. To determine any reward or penalty associated with this measure the full number of decimal places resulting from the calculation will be used and the financial reward/penalty will be reported in £m to six decimal places in line with Ofwat guidance.

### Measure of success calculation

The equivalent river length improved for each scheme, is based upon the length of river, in km, that is forecast to achieve 'good status' under WFD classification as a consequence of the implementation of the scheme. The river improved length is set out on a scheme by scheme basis with these lengths being defined and fixed as part of the initial definition of the programme.

Where a number of schemes contribute to the improvement of a specific river length, a proportion of this length has been allocated to each scheme, the "improvement factor". To ensure that the overall benefits of the programme are not over estimated, the sum of the improvement factors for the schemes affecting any river length are set to one.

The calculation is as set out below: -

$$\text{Equivalent river length (km)} = (\text{length of receiving water body/number of projects being delivered on this water body}) \times \text{improvement factor}$$

Where water bodies are forecast to be improved, but 'good status' will not be achieved, a scaled down equivalent river length improved has been calculated and used in the performance commitment target.

A complete list of schemes and associated information including delivery dates and associated river length improvements can be found in Appendix B.

## Performance targets

This performance commitment will be achieved through the delivery of a series of schemes. Each scheme has a pre-defined length of river improved allocated to it (measured in km).

The original delivery and performance commitment target profile, as set out within our PR14 business plan, was developed from a set projects agreed with the EA as part of the development of the price review process.

As this programme was still subject to ongoing discussions at the time of periodic review, a small number of errors were included within the performance commitment target initially published in the final determination. These have subsequently been revised and a corrected performance commitment target has subsequently been published in a corrigendum on the Ofwat web site. The corrected cumulative performance commitment target for the PR14 programme is set out in figure 2 below:

	Performance Commitment				
	2015/16	2016/17	2017/18	2018/19	2019/20
Km of rivers improved (cumulative across the AMP)	0.75	15.41	98.14	145.39	355.22

**Figure 2: Performance commitments post corrigendum (but not reflecting NEP5)**

In addition and subsequent to PR14, the EA published NEP5. We have worked with the EA to ensure that the revisions to the programme are broadly cost and benefit neutral. The revised programme does however, deliver a slightly different profile when converted into river lengths than the original programme.

The performance commitment targets set out in Figure 3 below reflect the updated (NEP5) programme. Over the next five years we aim to deliver the programme of work set out by and agreed with the EA through NEP5 and as such will focus our reporting on delivery against these targets dates.

The cumulative annual km of river improved target to align with NEP5 is as set out below.

	Performance Commitment				
	2015/16	2016/17	2017/18	2018/19	2019/20
Km of rivers improved (cumulative across the AMP)	0.75	14.12	121.83	173.38	345.97

**Figure 3: Performance commitments for AMP6**

## Penalties and rewards

The Outcome Delivery Incentives (ODI) set as part of our AMP6 contract include both penalties and rewards against this measure. The size of these incentives is based upon customer valuations derived through willingness to pay exercises, with the incentives being designed to both penalise late delivery and also to incentivise the company to deliver projects and environmental benefits earlier than scheduled where it is cost beneficial to do so.

The performance commitment, and associated penalty and reward dead bands, caps, collars and incentive rates, reflecting the NEP5 programme are as set out in figure 4 below.

	Starting Level 2014/15	AMP6				
		2015/16	2016/17	2017/18	2018/19	2019/20
Performance Commitment	0	0.75	14.12	121.83	173.38	345.97
Penalty collar		0.00	0.00	0.00	0.00	0.00
Penalty deadband		0.75	14.12	121.83	173.38	345.97
Reward deadband		0.75	14.12	121.83	173.38	345.97
Reward cap		1.50	28.23	243.66	346.77	691.94

Penalty incentive rate	0.111
Reward incentive rate	0.028

**Figure 4: Performance commitments and ODI structure based on the AMP6 Final Determination**

The targets set out above are based upon the cumulative length of river improved through the AMP6 period and are based upon the agreed (NEP5) programme of work. The rates for reward and penalty are set out above.

The impact of potential revisions to the timing or nature of the programme are set out below.

Changes in delivery dates: With a programme of this size and complexity, it is possible that some schemes may not be delivered to the planned delivery dates. Any schemes, which are later than the date set out in the NEP would be subject to separate regulatory sanctions from the EA. This performance commitment is designed to be additional and complementary to those sanctions, by focussing on the environmental benefit delivered by the programme.

Therefore, if one project was to be delayed but another project of equal benefit was accelerated, then this would still deliver the same overall environmental benefit and could allow the annual performance commitment target to be achieved. As these revisions to delivery dates, could still however, result in EA sanctions, we would look to identify potential risks and opportunities early in the programme and seek to gain EA support for changes to delivery dates through an exchange mechanism.

Changes in schemes: Any changes in schemes would require the EA's formal approval through either the NEP or exchange mechanism processes. We will therefore not be able to unilaterally compensate for the non-delivery of any agreed schemes, by delivering alternative schemes without the agreement of the Environment Agency.

## Performance calculation methodology

### Performance commitment

The programme is assessed at individual project level with each scheme in the programme having a specific and pre-defined "length of river improved" associated with it. Each scheme also has a specific delivery date (a regulatory date) set out in either NEP5 or the preceding programme, which was used to develop the PR14 corrigendum programme.

The performance commitment target is therefore based upon the cumulative length of rivers associated with the schemes that should be delivered each year to meet the target delivery dates. The actual length reported is calculated based upon the length of river associated with the actual projects delivered, at the time of measurement.

As the performance commitment is based upon the impact upon the river and NOT the delivery of the individual schemes within the programme, a delay in one project can be offset by an equivalent acceleration in an equivalent project.

### Incentive calculation

As a number of the schemes in the programme deliver during the year rather than at year end it is possible to report that the cumulative annual target has been met but that there could still be a penalty (or reward) applied if, for example a project due to be completed on 30th November was not completed until 30th March.

The scale of the incentive for any delay or acceleration is based upon the length of the river impact and the number of days between the project completion date and regulatory date. The incentive payment reflects the length of the delay or acceleration in delivery, based upon an 'ODI factor' that is generated from the sliding scale in Figure 5 below:

271-365 days early	181-270 days early	91-180 days early	1-90 days early	On time	1-90 days late	91-180 days late	181-270 days late	271-365 days late
1.00	0.75	0.50	0.25	0.00	-0.25	-0.50	-0.75	-1.00

**Figure 5: Project delivery sliding scale**

*Note - The sliding scale profile described in figure 5 effectively covers a timeframe from 'delivery a year early' to 'delivery a year late'. In order to appropriately capture the impact of any projects that are delivered more than a year early or late, The ODI factor profile will continue to rise or fall at the same rate, following the same duration pattern, into years two, three, four and five.*

The ODI factor for each project is then multiplied by its associated length of river improved (Km) in order to calculate an 'impact on outcome' figure, which takes into account both the scale of the impact of the project and the scale of any delay/acceleration.

To ensure that penalties and rewards are proportionate to the delay or acceleration in the river improvement that has occurred over the entire programme, the individual scheme level impacts are summed to produce a net total 'impact on outcome' figure. This net total is used as the basis of the incentive calculation. If this net position is a positive number, then a reward will be generated. If the net position is negative, then a penalty will be generated.

### Example calculations

The penalty and rewards will be based on the net 'impact on outcome' position. The simplistic examples below are designed to demonstrate how a potential penalty or reward position will be calculated.

#### Example 1: Impact of delay

Project	Km's of River improved	Regulatory date	Project completion date	Classification	ODI Factor	Impact on Outcome	
A	3.20	31/01/17	31/03/17	Late 1-90	-0.25	-0.80	
						Penalty rate	0.111
						<b>Net penalty</b>	<b>-0.0888</b>

In example 1, the assumption is made that all projects within the programme are delivered to schedule, with only one project not being delivered to the target date.

The penalty is calculated based upon the length of river improved (3.20km) multiplied by the ODI factor (0.25) to produce an overall impact on the ODI of minus 0.80 "Km years". The ODI factor of 0.25 is taken from figure 5 above and reflects the delay of between 1 and 90 days.

The impact on outcome (0.80) is then multiplied by the penalty incentive rate to produce the resultant penalty £0.0888m.

#### Example 2: Impact of acceleration

Project	Km's of River improved	Regulatory date	Project completion date	Classification	ODI Factor	Impact on Outcome	
B	3.20	31/03/17	31/01/17	Early 1-90	0.25	0.80	
						Reward rate	0.028
						<b>Net reward</b>	<b>0.0224</b>

In example 2, the assumption is made that all projects within the programme are delivered to schedule, with only one project not being delivered to the target date. The length of river improved being the same as example 1 and the acceleration being directly comparable to the delay in example 1.

The Impact on Outcome is calculated in the same way as example 1 and multiplied by the reward rate to produce the

overall reward (£0.224m)

As the reward rate is lower than the penalty rate the reward in example 2 is lower than the penalty in example 1.

**Example 3: Impact of delay and acceleration – zero net position**

Project	Km's of River improved	Regulatory date	Project completion date	Classification	ODI Factor	Impact on Outcome
A	3.20	31/01/17	31/03/17	Late 1-90	0.25	-0.80
B	3.20	31/03/17	31/01/17	Early 1-90	0.25	0.80
Net position						0.00
Incentive rate						n/a
<b>Net incentive</b>						<b>0.0000</b>

Example 3, shows that if the comparable delays from example 1 and accelerations from example 2 both occurred these impacts would directly net off and the net impact on Outcome would be zero and as such no penalty or reward would be applicable.

**Example 4: Impact of Km's and delay and acceleration – zero net position**

Project	Km's of River improved	Regulatory date	Project completion date	Classification	ODI Factor	Impact on Outcome
A	3.20	31/01/17	31/03/17	Late 91-180	-0.50	-1.6000
B	6.40	31/03/17	31/10/16	Early 1-90	0.25	1.6000
Net position						-0.000
Incentive rate						n/a
<b>Net incentive</b>						<b>0.0000</b>

Example 4 shows how a relatively short delay for a smaller project would net off against a relatively shorter acceleration for a larger project.

**Example 5: Impact of and delays and acceleration over an AMP – net position**

Project	Km's of River improved	Regulatory date	Project completion date	Classification	ODI Factor	Impact on Outcome
A	3.20	31/01/17	31/03/17	Late 91-180	-0.50	-1.6000
B	6.40	31/03/17	31/10/16	Early 1-90	0.25	1.6000
C	6.30	31/03/18	21/12/17	Early 91-180	0.50	3.1500
D	5.06	31/03/19	31/04/19	Late 1-90	-0.25	-1.2625
E	4.40	31/03/19	06/12/19	Late 181-270	-0.75	-3.3000
Net position						-1.4125
Penalty rate						0.111
<b>Net penalty</b>						<b>0.156788</b>

**25.36**

Example 5 shows the impact of a number of delays and accelerations across a number of years.

The net Impact on Outcome in this example is minus 1.4125, this is therefore multiplied by the penalty rate of 0.111 to generate the net penalty of £0.156788m. With this penalty calculated using all decimal points and displayed to 6 decimal points.

**Annual reporting of performance and accommodating NEP5 changes**

For annual reporting purposes the schemes delivered, or due to be delivered, up to the end of the reporting year, will be assessed and a cumulative annual performance commitment length and net penalty or reward will be calculated. The annual figures will therefore become the difference between the cumulative figures at the report year minus the cumulative figures from the preceding year.

This assessment process will be undertaken and reported twice, once comparing actual delivery dates against the current (NEP5) target dates and also separately comparing the actual delivery dates against the PR14 corrigendum performance commitment projects and dates. The way that projects which have been added or removed to the programme are handled in this reporting is set out in Example 6 below.

The penalty or reward calculated through both comparisons together with the actual length of river improved will be reported each year in our Annual Performance Report. With the incentive value based upon the comparison against the current NEP targets, being reported within the APR tables, as this reflects our actual position against our current targets.

**Example 6: Additions or removals from the programme**

Project	Km's of River improved	Regulatory date	Project completion date	Classification	ODI Factor	Impact on Outcome
F	6.40	31/03/20	removed	Late 1 year	-1.00	-6.40
G	3.20	added	31/03/19	Early 2 years	2.00	6.40
					Net position	0.00
					Incentive rate	n/a
					<b>Net incentive</b>	<b>0.000</b>

Example 6 shows how projects which have been added to or removed from the original programme through NEP5 will be handled in the calculation of penalties and rewards in the comparison of actual delivery dates to PR14 corrigendum target dates. This example is not applicable to the comparison to the NEP target dates, where a consistent population of projects is being measured.

In example 6 project F which was originally due to be completed on 31<sup>st</sup> March 2020, but has been removed from the programme in NEP5. The ODI factor associated with this project has been set to 1.00 to reflect the reduction in environmental benefit by removing this project, even though this benefit is incurred in AMP7. (If a project was added with a 31<sup>st</sup> March 2020 delivery date, this would also be set an ODI factor of 1.00 to reflect the additional benefit delivered).

Project G has also been added to the programme and is required to be delivered by 31/03/19. The ODI factor for this project is set to 2.00. This is made up from 1.0 to reflect the project being added and then an additional 1.00 to reflect the additional 1 years benefit delivered by this project during the AMP6 period. (If a project was removed from the programme with an original target date of 31<sup>st</sup> March 2019, then this would also have an ODI factor of 2.00 applied to it).

In this example the Impact on Outcome of the two revisions to the programme sums to zero and no incentive would be applicable. We would however report both variances (and the resultant zero impact upon the ODI) in our Annual Performance Reporting.

**Appendix A - Definitions**

Water Framework Directive: The Water Framework Directive (WFD) is a piece of European legislation brought into force in 2000. The aim of this directive is to establish a framework in which water bodies (inland surface waters, estuaries, coastal waters and groundwater) are protected. For the WFD to deliver protection of water bodies, the Environment Agency produce River Basin Management Plans for each water body outlining the programme of work to ensure the water body meets WFD standards by 2027.

The ecological status of all water bodies will fall into one of five classes (high, good, moderate, poor or bad). The classification of a water body will depend on several defined criteria including ecological and chemical status; each component of the classification is assessed individually with the lowest scoring component defining the overall classification of the water body.

As a water company there are three ways in which we effect the water bodies in our region: biological oxygen demand (BOD), phosphorus and ammonia. To achieve 'good potential' for our water bodies, all three must reach a level at or below that defined by the WFD.

By delivering a project which results in a water body achieving 'good potential' status then the length (in km) of that water body can be claimed as part of this performance commitment. If a project delivers a measurable improvement

but does not deliver a change in classification to good, then a percentage of the total km improved can be claimed. The programme of work and associated dates and km improved can be found in the Wholesale Wastewater Book of Obligations which is owned and maintained by Asset Management.

**Output in Use Certificate:** The Output in Use Certificate is a document this must be completed by the project team once the work required to meet the performance commitment is finished. This document is signed by the Programme Sponsor, the Environmental Regulation team and the Wholesale Regulatory Contract Team before being stored in the Output in Use Library.

The date of project completion recorded on the Output in Use Certificate is used for regulatory reporting and is also recorded in the Environment Agency tracking spreadsheet to enable recording of completion of schemes within the NEP. At the point of claiming an output it is essential that an evidence pack is available for submitting to the Environment Agency and that any associated permit is in place.

## Appendix B - Programme

The programme which has been agreed with the EA is outlined in the table below:

Scheme name	Driver	Length of river improved (km's)	UU delivery date
Year 1 - EDM1 sites	EDM1	0.39	31/03/2016
FY16 – Flow programme	Flow 4	0.36	31/03/2016
Elterwater - phosphorus reduction, sediment removal or treatment scheme	I1	0.97	31/03/2017
Marton North (Cassia)	Flow 3	0.37	31/03/2017
Knutsford Moor Pumping Station / Moor Pool (Tatton Mere)	I5	0.37	31/03/2017
EDM2 Programme FY17	EDM2	1.34	31/03/2017
WwTW Low P pilot plant trials for AMP6	WFD	0.00	31/03/2017
FY17 – Chemicals programme	Various	9.95	31/03/2017
FY17 – Flow programme	Various	0.36	31/03/2017
Chorley WwTW Storm Tanks	WFD	0.00	30/04/2017
Chorley WwTW	ND1	12.70	17/08/2017
Oldham WwTW	F1a, UID1	2.60	30/09/2017
River Loud and Chipping Brook catchment investigation	WFDi	0.37	30/09/2017
Mere Platts Pumping Station	I1	1.19	07/12/2017
Davyhulme WwTW	F1a	2.43	26/01/2018
Dalston WwTW	ND2	7.60	31/03/2018
Whaley Bridge WwTW	ND1	12.90	31/03/2018
Horwich WwTW	ND2	24.93	31/03/2018
Cleator WwTW	ND2	14.40	31/03/2018
EDM2 Programme FY18	EDM2	3.53	31/03/2018
Tarvin WwTW	ND1	18.90	31/03/2018
FY18 – Chemicals programme	Various	5.87	31/03/2018
FY18 – Flow programme	Various	0.30	31/03/2018
Nantwich WwTW	U2	1.82	14/11/2018
Nantwich WwTW	WFD	1.82	14/11/2018
Crewe WwTW	U2	1.82	14/11/2018
Winsford WwTW	U2	3.64	14/11/2018
Northwich WwTW	U2	1.06	14/11/2018
Altrincham WwTW	U2	1.37	14/11/2018
Darwen WwTW	U2	1.50	14/11/2018
Blackburn WWTW	U2	3.38	14/11/2018
Garstang WwTW	U2	1.51	14/11/2018
Irlam WwTW	U2	0.00	31/12/2018

Kendal WwTW	ND1	20.21	20/03/2019
Outgate WWTW	I1	0.37	31/03/2019
Cuddington WwTW	WFD, ND2	2.64	31/03/2019
EDM2 Programme FY19	EDM2	3.47	31/03/2019
FY19 – Chemicals programme	Various	6.58	31/03/2019
FY19 – Flow programme	Various	0.36	31/03/2019
Horwich WwTW	WFD	2.94	14/08/2019
Manchester Ship Canal Aeration	F1a	6.44	31/03/2020
Crewe WwTW	WFD	5.46	31/03/2020
Wigton WwTW	WFD	16.79	31/03/2020
Calthwaite WwTW	WFD	6.06	31/03/2020
Kidsgrove WwTW and Kidsgrove WwTW Storm Tanks	WFD	5.87	31/03/2020
Lawton Gate wwTW, Lawton Gate WwTW Storm Tanks and Lawton Gate WwTW Inlet Overflow	WFD	2.91	31/03/2020
Oakmere WwTW	WFD	2.64	31/03/2020
Northwich WwTW	WFD	1.06	31/03/2020
OLD0100 - Snipe Clough	WFD	0.24	31/03/2020
OLD0109 - Hathershaw Playing Fields CSO	WFD	1.26	31/03/2020
OLD0120 - 250 MTRS D/S Of Ashton Road CSO	WFD	1.26	31/03/2020
OLD0151 - Abbeyhills Road/Lees New Road	WFD	1.82	31/03/2020
Failsworth WwTW Storm Tanks & Failsworth WwTW Inlet Overflow	WFD	5.81	31/03/2020
Billinge South WwTW	WFD	2.16	31/03/2020
Halsall WwTW and Haskayne WwTW	WFD	12.99	31/03/2020
CHR0021, Harrison's Farm Storm Spill	WFD	1.20	31/03/2020
CHR0012, South Park Hall Road/ Stocks Lane CSO	WFD	1.20	31/03/2020
HYN0005, NR Coppy Clough STW CSO	WFD	0.60	31/03/2020
HYN0008, Oswaldtwistle CSO	WFD	0.60	31/03/2020
HYN0003, Rishton Sewerage System CSO	WFD	2.33	31/03/2020
Colne WwTW	WFD	4.45	31/03/2020
RIB0017, Langho Sewer, Petre Arms Roundabout	WFD	0.13	31/03/2020
RIB0019, South of Old Langho Road	WFD	0.13	31/03/2020
Billington WwTW Storm Tanks	WFD	0.51	31/03/2020
Barton WwTW	WFD	4.30	31/03/2020
Aspatria WwTW	WFD	7.44	31/03/2020
Hayton WwTW	WFD	7.48	31/03/2020
West Newton	WFD	7.48	31/03/2020
Whalley WwTW	WFD	1.00	31/03/2020
Grasmere WwTW	Biod1	0.78	31/03/2020
Grasmere WwTW Storm Overflow	Biod1	0.78	31/03/2020
Glebe Road CSO (LAK0045)	Biod1	5.70	31/03/2020
Windermere WwTW	Biod1	5.70	31/03/2020
Ambleside WwTW	Biod1	5.70	31/03/2020
Hayfield WwTW	WFD	16.70	31/03/2020
Contaminated Surface Water - Inland	L1	0.18	31/03/2020
Investigate actual contribution of sewage effluent to contaminant of concern within groundwater safeguard zones.	DrW2	0.37	31/03/2020
EDM2 Programme FY20 (468 monitors)	EDM2	2.81	31/03/2020
MAN0131 Berry Brow/Edge Lane (TAM0004) CSO	WFD	1.20	31/03/2020
Winsford WwTW	WFD	3.64	31/03/2020

Darwen WwTW	WFD	1.48	31/03/2020
Darwen WwTW Storm Tanks	WFD	1.48	31/03/2020
Blackburn WwTW	WFD	4.40	31/03/2020
FY20 – Chemicals programme	Various	6.59	31/03/2020
FY20 – Flow programme	Various	0.54	31/03/2020

<b>345.97</b>
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## Appendix C – Drivers

Driver Code	Description
<b>Urban Waste Water Treatment Directive</b>	
U2	Schemes to improve discharges associated with 2011 inland sensitive areas (eutrophic) designations.
UID1	Schemes to improve unsatisfactory storm discharges in relation to UWWTD.
<b>Freshwater Fish Directive</b>	
F1a	Schemes to correct statistically significant failures with Imperative Standards for existing designations.
<b>CROW Act</b>	
I1	Schemes to improve discharges, where there is a requirement agreed by the conservation agencies and the Environment Agency, to remove more or different nutrients than required by the UWWTD and Habitats Directive.
I5	Investigations agreed by the conservation agencies and the Environment Agency to assess the impact of water company assets on the requirements of the CROW Act.
<b>Biodiversity 2020</b>	
Biod1	Schemes to improve discharges, where there is a requirement agreed by the conservation agencies and the Environment Agency, beyond the requirements of UWWTD, Habitats Directive and CROW Act to meet outcomes under Biodiversity 2020 or the NERC Act.
<b>Flow monitoring</b>	
Flow3	Schemes to provide flow monitoring at STWs.
Flow4	Schemes to provide pass forward flow monitoring at storm overflows.
EDM1	Schemes requiring event duration monitoring from storm discharges identified as high significance, other than bathing and shellfish waters.
EDM2	Event duration monitoring of storm discharges identified as medium significance.
<b>Drinking Water Protected Areas</b>	
DrW2	Investigations by water companies to fully characterise abstractions where catchment schemes may be beneficial.
<b>Water Framework Directive</b>	
WFD1	Measures to meet objectives for Water Framework Directive
<b>Water Framework Directive - No Deterioration</b>	
ND1	Schemes to meet requirements of WFD No Deterioration for ammonia.
ND2	Schemes to meet requirements of WFD No Deterioration for phosphorus.
<b>Water Framework Directive - Phosphorus trials</b>	
P1b	Assess process optimisation techniques to achieve low P effluent concentrations.
P1c	Investigations into innovative P technologies (at lab or pilot stage) to assess techniques that could reduce effluent concentrations to 0.1mg/l or less.
<b>Local Priority Schemes</b>	

L1	Locally significant measures not eligible under WFD, or any other driver, but clearly supported by customer willingness to pay and a positive cost benefit ratio.
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**Promise - Protect and enhance the environment**

**Outcome - The natural environment is protected and improved in the way we deliver our services**

**Measure of Success - Protecting rivers from deterioration due to population growth**

Customers value our role as a custodian of the natural environment but they also want us to support the growth of the North West economy. Growing populations, expanding industry and more housing developments all put pressure on our wastewater treatment works. As this pressure intensifies, we need to intervene by making upgrades to our treatment facilities, so that the quality of the treated wastewater we return to the environment remains consistently high. This, in turn, helps to safeguard the quality of our rivers, even as populations grow.

## About this measure

This performance commitment measures the contribution we will make in 2015-2020 to prevent the deterioration of river water quality, by investing in our wastewater treatment works to increase treatment capacity. It estimates the length of river, in kilometres, that would otherwise deteriorate if we did not intervene in this way. There are a wide range of investment schemes that will contribute to this measure throughout AMP6. These have been identified using a risk-based approach that looks at demand on our treatment works in the face of predicted population growth.

Unlike the “contribution to rivers improved (wastewater programme)” and “contribution to bathing waters improved” performance commitments, we are under no statutory obligation to deliver additional capacity at specific sites. We can be flexible in responding to emerging new demands, such as an unforeseen housing development, but we need to ensure that any sites that do emerge during the AMP will enable us to deliver the overall target, within budget, and not to put at risk compliance at other sites that may then need to be deferred to AMP7.

## Measure of success description

This performance commitment captures the contribution we expect to make in preventing the deterioration in river water quality due to increased discharges from our wastewater treatment works, caused by local growth in population or increased industrial discharges. As demand grows the risk of our wastewater treatment works becoming non-compliant increases; eventually we need to intervene. If there are no alternative interventions to manage demand in the catchment we will increase the treatment works capacity to ensure there is no deterioration in the receiving water body.

The performance commitment is expressed as an estimation of the length of river protected from deterioration that would otherwise occur if we did not intervene. The programme of schemes contributing to this measure has been developed through our integrated asset planning process to address supply-demand issues at our wastewater treatment works. Schemes were identified using a risk based approach to the assessment of both the probability and potential consequences of changes to the supply-demand balance using the forecast future population at 2020. High risk WwTWs were subject to further engineering studies to confirm needs and support option development.

### Unit of measure

This measure is assessed as km of river length equivalent protected and will be assessed to one decimal place. Performance will be measured on a financial year basis.

### Measure of success calculation

The river length protected has been calculated on a scheme by scheme basis:

- The programme of schemes was identified using a risk based approach to the assessment of both the probability and potential consequences of changes to the supply-demand balance using the forecast future population at 2020, via our integrated asset planning process.
- The river length protected by each scheme is based on the length of the receiving water body for each treatment works, as designated by the Environment Agency in their analysis for the Water Framework Directive.
- The river length protected is proportioned by the population equivalent served by a works, as a proxy for the environmental impact of the decline in effective capacity of the treatment works, due to increasing demand. As such the largest discharges are assumed to have the largest environmental impacts.
- The current population equivalent of a works is divided by the total current population equivalent of all treatment works discharging to the water body. Therefore the river length protected is adjusted proportionally by the current population equivalent of the treatment works where additional capacity is being provided, compared to the total current population of all treatment works discharging to that water body length.
- The programme outlined below is an assumed programme. Changes to this may occur as demand changed across our region. It is very likely that changes will be made to this programme.

River length for works (km) = (population equivalent of works / total population equivalent of all works discharging to receiving water body) x length of receiving water body

The exception to this is for treatment works that do not discharge to a river and therefore no river length is available for them. For these WwTW we have used the population equivalents and calculated river lengths for the rest of the region to derive a trendline. The equation derived from the trendline is then applied to all works that do not discharge to river to calculate a nominal river length protected. The only treatment works in the current AMP6 programme which does not discharge to river is Silloth WwTW. This treatment works has a population equivalent of 4,199. So, for Silloth, the river length for works is calculated (using the regression equation from the trend line) as:

$0.00006 \times 4,199.3 + 7.3707 = 7.6\text{km}$ . This is the length of river protected recorded for this works in our current AMP6 programme.

**Performance targets**

Over the five year period we aim to deliver a programme of work that will prevent deterioration of the rivers in our region. The km of river protected target for this measure is as set out below.

	Performance Commitments				
	2015/16	2016/17	2017/18	2018/19	2019/20
Km of rivers protected (cumulative across the AMP)	1.8	1.8	190.1	316.7	346.6

Figure 11: Performance commitments for AMP6

This performance commitment will be achieved through the delivery of a series of projects. Each project will contribute to a length of river protected (measured in km’s). Whilst the target has been developed from a proposed set of schemes, there may be cases where the growth does not develop and it would therefore not be appropriate to complete a scheme. In these cases schemes can be exchanged and an alternative programme delivered which provides the benefit.

**Penalties and rewards**

This commitment will be incentivised by a penalty only. A penalty of £0.058m will be applied to this measure for every penalty point below the performance commitment.

	Starting Level 2014/15	Performance Commitments (risk score)				
		2015/16	2016/17	2017/18	2018/19	2019/20
Performance Commitments	0.0	1.8	1.8	190.1	316.7	346.6
Penalty collar		0.0	0.0	0.0	0.0	0.0
Penalty deadband		1.8	1.8	190.1	316.7	346.6

<b>Penalty incentive rate</b>	<b>£0.058m/km</b>
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Figure 12: Performance commitments and ODI structure based on the Final Determination

To ensure that penalties are proportionate to the delay that has occurred, a sliding scale will be applied to the annual penalty as follows:

- 25% for 1-90 days late
- 50% for 91-180 days late
- 75% for 181-270 days late
- 100% for 271-365 days late

**Example calculations**

The penalties generated for this programme of work will be assessed and recalculated based upon the cumulative km of river protected as the programme is delivered, according to the agreed programme of work which is outlined in figure 3 below. The examples below demonstrate how a potential penalty will be calculated. All projects within this programme have a delivery date of 31st March so will only begin to accrue a penalty from the 1st April. For example a project not delivered in 2018 will begin to accrue a penalty in 2019.

**Example 1 Delay to a single project from one financial year to the following financial year**

The assumed project is Macclesfield, which delivers a river length equivalent of 25.6km

Target delivery date                      31/03/18 - Actual delivery date                      30/04/18 (30 days late)

If all other projects delivered to schedule then the river length protected that would be reported in FY18 would be 164.5km (25.6km below the 190.1km target).

The penalty incurred in FY19 would equal the value of the under delivery \* incentive rate \* sliding scale factor:

**Penalty = £0.371m** (25.6 km x £0.058 (penalty incentive rate) x 0.25 (25% for 0-90 days late))

As the project would be delivered in FY19 (assuming all other projects deliver to schedule) then the cumulative value reported for FY19 would be at the target of 316.7km and no further penalty would be incurred.

**Example 2 Delay to a single project from one financial year to a later financial year**

The assumed project is again Macclesfield, which delivers a river length equivalent of 25.6km

Target delivery date                      31/03/18 - Actual delivery date                      30/04/19 (1 year, 30 days late)

If all other projects delivered to schedule then the river length protected that would be reported in both FY18 and FY19 would be 164.5km (25.6km below the 190.1km target).

The penalty incurred would equal the value of the under delivery x incentive rate x sliding scale factor:

Penalty = 25.6 km x £0.058 (penalty incentive rate) x 1.25 (as full year late, plus 30 days) = £1.856m

**Total penalty = £1.856m**

As the project would be delivered in FY20 (assuming all other projects deliver to schedule) then the cumulative value reported for FY20 would be at the target of 346.6km

**Example 3 Acceleration to a project from one financial year to the following financial year**

This example assumes that the project at Winsford WwTW, which delivers a river length equivalent of 14.6 km is accelerated and delivered in the previous financial year.

Target delivery date            31/03/19

Actual delivery date            30/03/18

If all other projects delivered to schedule then the river length protected that would be reported in FY18 would be 204.7km (14.6km above the 190.1km target).

As this measure is a penalty only incentive, no reward would be incurred.

**Example 4 Delay to one project and acceleration to another project**

This example combines example one and example three and again assumes that the delayed project is Macclesfield, which delivers a river length equivalent of 25.6km

Target delivery date            31/03/18

Actual delivery date            30/04/18 (30 days late)

It also assumes that the project at Winsford WwTW, which delivers a river length equivalent of 14.6 km is accelerated and delivered in the previous financial year.

Target delivery date            31/03/19

Actual delivery date            30/03/18

If all other projects delivered to schedule then the river length protected that would be reported in FY18 would be 179.1km, 11.0km below the target (190.1km target – 25.6km for Macclesfield + 14.6km for Winsford).

The penalty incurred in FY19 for Macclesfield and Winsford would equal:

$11.1\text{km} * \text{£}0.058 \text{ (penalty incentive rate)} * 0.25 \text{ (25\% for 0-90 days late)} = \text{£}0.160\text{m}$

Therefore the penalty associated with Macclesfield would be partially mitigated by the additional environmental benefit delivered by the acceleration of Winsford.

**Assumptions made in calculation this measure**

The table below highlights the assumed programme of work as at the start of AMP6.

Scheme Name/Name of Discharge/Investigation	UU target delivery date	RLE (KM)
Kingsmill	2016	1.8
Davyhulme	2018	125.5
Cockermouth	2018	15.2
Brigham (transfer to Cockermouth)	2018	1.3
Papcastle (transfer to Cockermouth)	2018	0.6
Whalley	2018	0.2
Macclesfield	2018	25.6
Chorley	2018	18.9
Wetheral & Great Corby	2018	1
Burscough	2019	27.2
Silloth	2019	7.6
Dearham	2019	10
Clitheroe	2019	10.9
Alsager	2019	5.4
Sandbach	2019	8.6
Endmoor	2019	11
Bootle	2019	29.8
Winsford	2019	14.6
Partington	2019	1.4
Cuddington (transfer to Northwich as part of Lower Weaver Rationalisation project)	2020	4.3
Oakmere (transfer to Northwich as part of Lower Weaver Rationalisation project)	2020	0.6
Knutsford	2020	25

Figure 13: Assumed programme of work for protecting rivers from deterioration caused by population growth

This programme on work will be flexed as the AMP progresses so that projects can be targeted to those areas where growth is progressing and conversely projects can be stopped if the supply and demand growth is not apparent. All projects are assumed to be delivering to the 31st March.

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**Promise - Protect and enhance the environment**

**Outcome - The natural environment is protected and improved in the way we deliver our services**

**Measure of Success - Maintaining our WwTW**

Our wastewater treatment works (WwTW) play a crucial role in ensuring that we meet our environmental responsibilities, by returning high quality treated wastewater to the environment. These works vary significantly in size, process type and asset age, and we need to ensure that we make the appropriate combination of operation, maintenance and investment to ensure that we are able to keep our works fully compliant.

## About this measure

Each of our WwTW has a discharge consent that has been set by the Environment Agency. This index measure is designed to provide a comprehensive view of the service our wastewater treatment assets are providing to customers and the environment. It monitors our works performance against their consents and measures the number of WwTW failing their consents, together with those works which are at high and medium risk of failure.

## Measure of success description

This performance commitment informs how well our wastewater treatment assets are protecting customers and the environment. It is an index of three sub-measures focussed on WwTW performance and compliance. The calculation for one of the sub-measures (failing WwTW) is based on the AMP5 assessment of non-infrastructure serviceability. The other two sub-measures are more forward looking and are based on compliance risk (developed and used within our business over a number of years).

The measure excludes descriptive only consents conditions and is based upon the number of failing wastewater treatment works assessed through;

- Compliance with Water Resource Act conditions (both sanitary and non-sanitary)
- 99% Ultra violet (UV) annual dosing requirements
- Compliance with Urban Wastewater Treatment Directive conditions on Biochemical Oxygen Demand (BOD), Nitrogen (N) and Phosphorus (P)

Flow conditions and failure caused by factors outside company control, where the Environment Agency accept the reasons for failure, are excluded from the assessment. A fuller explanation of the assessment of failing works is provided in the assumptions section of this document.

The number of works at risk is established from a monthly risk assessment made up of operator self-monitoring and routine samples collected. The monthly risk rating for each works is based upon the actual performance compared against the active consent and the level of variability in the samples. The monthly risk assessments for each works are averaged to produce the annual risk score used within the measure. Further details of the risk assessment process are provided in the assumptions section of this document.

In order to combine the three different performance sub-measures into an overall index that reflects the potential impact upon the environment, the relative size of the WwTW is also taken into account.

Four size bands are used in the index. These size bands are determined using the population equivalent of each WwTW and are based upon the six size bands that have been used for regulatory reporting (June return and Asset Inventory), within the water industry, for a number of years.

For the purposes of this measure, the four smaller size bands are grouped together into the new small size band, size band five works are classified as medium and size band 6 works have been split into two separate bands 6a (large) and 6b (very large).

UU operates 65 size band 6 works with a total PE served of 7.7m and there is a massive range in Population Equivalent (PE) in these works. For example Horwich, our smallest band 6 works has a PE of 26,000, whilst Davyhulme, our largest band 6 works, has a PE of almost one million (983,000). To better reflect the impact of any failure at these works, they were placed in ascending order of PE and then grouped into two equal categories so that each category served the same number of cumulative customers (approx. 3.9m). The 6a large works category (the smaller size band 6 works) incorporates 54 of the 65 works with the 6b very large works category including the remaining 11 size band 6 works.

Each of the four categories in the index (including the small and medium sized works categories) has been assigned a weighting within the index between one and ten. This was calculated by taking the average PE of the works in each category, taking the square root of that number and reflecting the difference in the four numbers in terms of a ratio. This means that the resulting weighting is correlated to population equivalent.

Size Band	Weighting	No of works
Small (size band 1-4)	1	476
Medium (size band 5)	2	29
Large (size band 6a)	4	54
Very large (size band 6b)	10	11

Figure 14: WwTW size bands and numbers of works (2013/14 data)

**Unit of measure**

This measure is assessed by an index the details of which are set out below. The measure is assessed on a calendar year basis and will be reported to two decimal places.

**Measure of success calculation**

In order to combine the three different sub-measures into an overall index, each size band of WwTW has been assigned a points value based on its size band and the level of failure. This is illustrated in Figure 15 below. An example calculation is shown later in this document.

	Size Band	Index points per WwTW
Failed works	Size band 1-4	4.0967
	Size band 5	8.1934
	Size band 6A	16.3867
	Size band 6B	40.9668
High risk	Size band 1-4	0.0819
	Size band 5	0.1639
	Size band 6	0.8193
Medium risk	Size band 1-4	0.0410
	Size band 5	0.0819
	Size band 6	0.4097

Figure 15: Points awarded for medium risk, high risk and failing works

### Performance targets

Over the next five years we aim to provide an improving service for our customers. Achievement of the overall performance commitment target is our regulatory obligation rather than meeting a specific targets for each of the three sub-measures. The index score will reduce if performance improves. The performance commitments are tabled below.

	Performance Commitments				
	2015	2016	2017	2018	2019
<b>Performance Commitment</b>	<b>83.00</b>	<b>83.00</b>	<b>83.00</b>	<b>54.32</b>	<b>46.13</b>

Figure 16: Performance commitments for AMP6

### Penalties and rewards

This measure is incentivised by penalties only. The rates of penalty are shown in the table below.

	Starting Level	Performance Commitment				
	2015	2016	2017	2018	2019	2020
<b>Performance Commitments</b>	113.97	83.00	83.00	83.00	54.32	46.13
<b>Penalty collar</b>		155.40	155.40	155.40	126.72	118.53
<b>Penalty deadband</b>		113.30	113.30	113.30	84.62	76.43

<b>Penalty incentive rate (£m/index point)</b>	<b>0.572</b>
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Figure 17: Performance commitments and ODI structure based on Final Determination

The maximum penalty that could be applied in each year for underperformance would be £24.08m (the penalty collar minus the penalty deadband multiplied by the incentive rate), with a total potential penalty across the AMP6 period of £120.40m. A reduction in index score is an improvement in performance.

**Example calculation**

The table below illustrates how this index would work in practise. This table uses a 2018 example, using some indicative figures for number of failing works and risk points.

Size band	Number	Index points per WwTW	Total index points
<b>Wastewater Treatment Works at medium risk</b>			
Size band 1-4	10	0.0410	0.4100
Size band 5	10	0.0819	0.8190
Size band 6a	10	0.4097	4.0970
			5.3260
<b>Wastewater Treatment Works at high risk</b>			
Size band 1-4	10	0.0819	0.8190
Size band 5	10	0.1639	1.6390
Size band 6a	10	0.8193	8.1930
			10.6510
<b>Wastewater Treatment Works failing</b>			
Size band 1-4	1	4.0967	4.0967
Size band 5	2	8.1934	16.3868
Size band 6a	1	16.3867	16.3867
Size band 6b	1	40.9668	40.9668
	5		77.8370
<b>Wastewater Treatment Works at risk of failing (either high or medium)</b>			
<b>Total index score</b>			<b>93.814</b>
2018 Deadband			84.620
Index points above deadband			9.194
<b>Penalty for 2018 (£0.572m for every point above deadband)</b>			<b>£5.259m</b>

Figure 18: Example calculation for the maintaining our WwTW measure of success

Note if the level of performance shown in the table above was to occur in 2019 (rather than 2018) then as the performance commitment target for this year is tighter, then the penalty would be increased as shown in Figure 19 below:

<b>Total index score</b>	<b>93.814</b>
2019 Deadband	76.430
Index points above deadband	17.384
<b>Penalty for 2019 (£0.572m for every point above deadband)</b>	<b>£9.944m</b>

Figure 19: 2019 example calculation for the maintaining our WwTW measure of success

**Assumptions made in calculating this index**

Size bands: The size band of each works is assessed each year as part of the regulatory reporting process. If a works has moved size band or has changed from a descriptive consent to numeric or vice versa then it should be assessed against a size band proportionate through the year e.g. three months at size band four and nine months at size band five. Size-band 6b works are fixed and the list cannot be changed throughout AMP6.

Failing works – The table below contains the definition of a failing works. The overall company position for failing works is monitored on a monthly basis, but the official measure of success position is taken at the end of each calendar year. This is because a failing works remains classified as failing for a 12 month calendar period, and so works failing in January will still be classed as failing at the end of December in the same year.

Legislation	Parameter	Compliance Condition
Compliance Conditions Included in the measure of success		
WRA	Sanitary	Absolute
		Compliance with the look up table (LUT) effluent consent conditions
		Upper Tier
WRA	Non-Sanitary	Absolute
		Compliance with the look up table (LUT) effluent consent conditions
		Upper Tier
		Other Absolute
		Annual Average
		pH Range Limits
WRA	UV	Compliance with the required UV dose for 99% of the time (where the period of time is annual or seasonal as specified in the consent conditions)
UWWTD	BOD, N and P	Compliance with the look up table (LUT) effluent consent conditions, Upper Tier, Percentage removal or Annual average

Legislation	Parameter	Compliance Condition
Compliance Conditions Excluded from the measure of success		
WRA	Flow	Any Failure
WRA	Descriptive Conditions	Any Failure
WRA	UV	Non-Compliance with the required dose for more than 2.4 continuous hours in a 24 hour period
UWWTD	COD	Any failure
-	-	Category 1, 2 or 3 CCS potential failures
-	-	Failure due to non or late delivery of schemes
-	-	Number of required OSM and UWW samples taken in year
-	-	Any failure that is officially accepted by the Environment Agency as beyond the control of United Utilities (i.e. illegal trader discharge, abnormal weather etc.)

Figure 20: Failing works guidelines

**Notes:**

- The Urban Wastewater Treatment (UWWT) regulations provide two approaches for BOD, N and P measurement. A works is considered to have met compliance conditions if it passes either of these conditions.
- Should a works fail more than one compliance condition this will only count as a single failing works and double counting will be avoided.
- Data for compliance with descriptive consents and discharge flow consents is subjective and not robust enough to use as part of the measure.
- The measure will be based upon the values for failed works published by the EA in its end of year report. We will seek to agree these figures with the EA beforehand. There is potential for difference of views.
- In the calendar year 2015 a number of works received revised consents for iron part way through the year. The works performance for 2015 was subsequently assessed against the new consents. Iron consents were changed in response to the revised EA consent policy for phosphate removal. Should another comparable instance occur during AMP6, this would be discussed with the EA with a view to agreeing to adopt a similar approach.

Medium and high risk work assessment process

A sampling regime is in place to take and analyse routine and regulatory samples in line with current compliance best practise. Additional samples may be taken outside of this regime which will be used to monitor the performance of each works. The results from these additional samples will not be included in the risk calculations.

The (short term) risk level for each WwTW counted within the measure of success is calculated on a monthly basis. Each individual (monthly) short term risk assessment is made up of one calendar months’ worth of operator self-monitoring and routine samples. All other sample purpose codes are excluded from the measure of success.

There are two steps in the risk assessment for each works. The first step calculates the primary risk score based upon proximity of actual performance to the works consent. The second step factors in the stability or variability in the works performance and samples.

Step 1: Each individual sample result for the numerically consented determinands are compared to the active Permit limit on a determinand by determinand basis and are assigned a proximity value (proximity = Sample/Consent)

Then the average (mean) of those proximity values are taken, which forms the first part of the assessment:

Risk Score	Primary Assessment
Less than 0.25	Negligible
Between 0.25 and 0.50	Low
Between 0.50 and 0.75	Medium
Greater than 0.75	High

Figure 21: Primary assessment in risk calculation

Step 2: The second step is then to assess variability. This is done by taking the standard deviation of the samples, again on a determinand by determinand basis, and dividing it by the average of the samples for the specified determinand. A set of samples is classified as having a high variability if the standard deviation / mean is greater than 50%.

This variability is added to the primary risk assessment to give the final risk classification as shown in figure 22 below:

Primary risk level	Low Variability	High variability
Less than 0.25	Negligible	Low
Between 0.25 and 0.50	Low	Medium
Between 0.50 and 0.75	Medium	High
Greater than 0.75	High	High

Figure 22: Combined risk classification

The combined risk scores for each numerically consented determinand are averaged to provide an overall risk score for the WwTW for that month.

The score for each works used in the performance commitments calculation is the average of the monthly scores through the year.

The total of these average scores for all works within each size band forms the annual points total recorded for each year.

The official year-end position for risk can only be calculated once the calendar year has finished, all samples analysed and any result queries resolved.

### Movement between failing and high risk works

All works have a specified number of samples that should be taken each year and have an allowed number of exceedances in accordance with its permit. For example a 12 samples a year works has two allowed exceedances, and becomes a failing works once it has three failures.

If a works exceeds its total number of allowed exceedances in accordance with its permit, the works would fail for the calendar year. If a works has exceedances in the previous calendar year but still within the rolling 12 months compliance assessment period then the works would not be classed as a failing works on the EA end of year report, as the works will have returned to compliance within that calendar year e.g. the works has had one of its exceedance removed and now only has two failures. This works would now be at high regulatory risk.

The points accrued through the measure of success for failing works increases through the year. However, by using the methodology described above the company's risk score can fluctuate both upwards and downwards on a monthly basis throughout the year.

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**Promise - Protect and enhance the environment**

**Outcome - The natural environment is protected and improved in the way we deliver our services**

**Measure of Success - Serious pollution incidents**

Serious pollution incidents, caused by a failure of our wastewater assets, can be extremely damaging to the environment and to our reputation. Incidents of this nature attract Environment Agency enforcement, and affect public trust. Thankfully, these types of incidents are rare. During AMP5 (2010-2015), we recorded 18 serious pollution incidents, and ultimately, we want to eliminate these damaging incidents entirely. We plan to do this through strategic investment and by developing a more sophisticated and proactive way of managing our assets.

## About this measure

This performance commitment measures the number of category 1 and category 2 incidents that are attributed to failures of our sewers, rising mains, pumping stations, combined sewer overflows, detention tanks, wastewater treatment works and sludge assets. Category 1 incidents are defined by the Environment Agency as having “a major, serious, persistent and/or extensive impact on the environment; people and/or property”. Category 2 incidents are defined as having “a significant impact or effect on the environment, people and/or property”.

Performance will be assessed and reported on a calendar year basis in line with our reporting to the Environment Agency. Pollution incidents arising from private sewers which transferred to us in 2011 and private pumping stations which are being transferred to us in the period to 2016 are not included.

During AMP6 we are installing additional monitoring equipment on our overflow assets to meet new Environment Agency requirements set out within the National Environment Programme (NEP). To maintain consistency with our historic performance measurement, this performance commitment does not include pollution incidents that are identified through new information gained following the installation of this new equipment.

In order to drive down the number of serious pollution incidents over AMP6, we will be taking a multi-faceted approach. This will include proactive monitoring of our network to spot potential issues before they can escalate, root cause analysis of all pollution incidents to prevent repeats and strategic initiatives to improve the management of our network.

## Measure of success description

This performance commitment informs how well our infrastructure and non-infrastructure wastewater assets are protecting the environment. During AMP5 we reported on pollution incidents from foul sewers, CSOs and rising main through the sewerage infrastructure serviceability assessment. For AMP6 we have evolved this assessment to include all pollution incidents arising from the wastewater service, with the exception of those incidents from sewers that transferred to our ownership as part of the 2011 transfer and private pumping stations which will transfer to us in the period to 2016, and those arising solely from data provided by new monitors installed as part of the NEP (see below).

This performance commitment includes category 1 and category 2 incidents from sewers (foul, combined and surface water), rising mains, pumping stations, combined sewer overflows, detention tanks, wastewater treatment works and sludge assets. Category 3 pollution incidents are not included as these form part of our category 3 pollution incident performance commitment. Category 4 pollution incidents are not included in this assessment due to their relative lack of impact, although we will continue to monitor and discuss these incidents with the Environment Agency.

This performance commitment excludes pollution incidents:

- That arise solely through data provided by the monitors installed as part of the NEP agreed with the Environment Agency (S8, rB5, EDM1 or EDM2 drivers). Completion of the work required under these drivers will result in a considerable increase in the number of our CSOs with event/spill monitoring. This may result in us detecting additional pollution incidents that, though having already occurred, we now become aware of (for example where a CSO discharges to a culverted water course). On detection, we will address these ‘new’ incidents through operational, maintenance or quality interventions, as appropriate. As we do not know how many additional incidents the newly installed monitors will identify, we have excluded their impact from this measure.
- Where assets have performed in compliance with their permits.
- From transferred sewers as these incidents are included in our private sewers service index
- From private pumping stations which transfer to our ownership in the period up to 2016
- From water treatment works and water distribution system assets.

**Unit of measure**

This commitment will be measured in whole numbers, with no decimal places and will be based on calendar year data.

**Measure of success calculation**

None required.

**Performance targets**

Over the next five years we aim to reduce the number of serious pollution incidents to zero. The target for this measure is as set out below.

	Performance Commitments				
	2015	2016	2017	2018	2019
Serious pollution incidents	4	4	3	3	0

Figure 23: Performance commitments for AMP6

**Penalties and rewards**

This measure will be incentivised by a penalty only.

	Starting Level 2014/15	Performance Commitments				
		2015/16	2016/17	2017/18	2018/19	2019/20
Performance Commitments	4	4	4	3	3	0
Penalty collar		7	7	6	6	5
Penalty deadband		6	6	5	5	4

<b>Penalty incentive rate (£m per incident)</b>	0.420
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Figure 44: Performance commitments and ODI structure based on the Final Determination

As the penalty collar is always one higher than the penalty deadband, the maximum penalty that can be applied in any year is £0.420m and this would be applied if we exceeded the penalty deadband.

**Example calculation**

None required as the numbers are taken directly from the Environment Agency report.

**Assumptions made in calculating this measure**

It is assumed that only pollution incidents from the assets set out in the description section above are included in this measure.

There is a risk that the Environment Agency may have a different view of pollution incident classification than U UW. However, regular liaison with the EA should minimise this risk.

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**Promise - Protect and enhance the environment**

**Outcome - The natural environment is protected and improved in the way we deliver our services**

**Measure of Success - Category 3 pollution incidents**

This performance commitment measures the number of category 3 pollution incidents that are attributed to our sewers, rising mains, pumping stations, combined sewer overflows, detention tanks, sludge assets and wastewater treatment works. In 2010-2015 there were 1,353 category 3 pollution incidents caused by a failure of our wastewater assets. We have a separate measure category 1 and 2 incidents which have a more serious impact on the environment. Although less serious than category 1 and 2 incidents they still impact on the environment and therefore our intention is to reduce this number during AMP6. These incidents can incur penalties under the Environment Agency's enforcement powers and cause reputational damage.

## About this measure

This measure tracks the number of category 3 incidents attributable to our wastewater assets (excluding the private sewers which were transferred to our ownership in 2011 and private pumping stations which have already transferred or will transfer in the period to 2016). As with category 1 and 2 incidents, we will be measuring our performance across all asset types: sewers (foul, combined and surface water); rising mains; pumping stations; combined sewer overflows; detention tanks; wastewater treatment works and sludge assets – resulting in a comprehensive picture of our performance.

Our performance will be assessed and reported on a calendar year basis in line with our reporting to the Environment Agency. Our strategy for driving down the number of category 3 incidents over the next five years is consistent with our approach to responding to category 1 and 2 incidents. The assets causing pollution are the same - it is simply the level of impact that is different. Through proactive monitoring and strategic investment we believe we can achieve a reduction in pollution during AMP6. During AMP6 we are installing additional monitoring equipment on our overflow assets to meet new Environment Agency requirements as set out in the National Environment Programme (NEP). This performance commitment does not include any pollution incidents that are identified through new information solely gained from this equipment to ensure consistency with our AMP6 target. Category 4 pollution incidents are not included in this assessment due to their lack of environmental impact, but we will continue to monitor and discuss these incidents with the Environment Agency.

## Measure of success description

This performance commitment informs how well our infrastructure and non-infrastructure wastewater assets are protecting the environment. During AMP5 we reported on pollution incidents from foul sewers, CSOs and rising main through the sewerage infrastructure serviceability assessment. For AMP6 we have evolved this assessment to include all pollution incidents arising from the wastewater service, with the exception of those incidents from transferred sewers (as these are included in the Private Sewers Service index), private pumping stations which will transfer to our ownership in the period to 2016 and those arising solely from data provided by new Event Duration Monitors installed as part of the NEP. Permitted discharges will also be excluded from this measure.

This performance commitment measures category 3 pollution incidents. Willingness to pay data informs the scale of the penalty and reward that has been applied to this measure based on customer expectation and experience.

The categorisation of pollution incidents is as defined in the Environment Agency Operational Instruction 1602 (version January 2013).

Category 4 pollution incidents are not included in this assessment due to their lack of impact, but we do monitor and discuss these incidents with the Environment Agency.

### Unit of measure

This measure will be reported as number of incidents and will be reported as whole numbers on a calendar year basis.

### Measure of success calculation

This will report on actual numbers therefore no calculation is required.

### Performance targets

Over the next five years we aim to reduce the number of category 3 pollution incidents. The target for this measure is as set out below.

	Performance Commitments				
	2015	2016	2017	2018	2019
Category 3 pollution incidents	204	201	198	195	191

Figure 25: Performance commitments for AMP6

### Penalties and rewards

This measure will be incentivised using both penalties and rewards. A penalty of £0.282m will be applied for every incident above the penalty deadband up to the collar. A reward of £0.149m will be applied for every incident below the reward collar up to the reward deadband.

The table below provides details of the performance commitment for this measure and the level of penalty that can be applied. An assessment of performance will be made on a calendar year basis.

	Starting Level 2014	Performance Commitments (risk score)				
		2015	2016	2017	2018	2019
Performance Commitments	207	204	201	198	195	191
Penalty collar		223	220	217	214	210
Penalty deadband		211	208	205	202	198
Reward collar		197	194	191	188	184
Reward deadband		175	172	169	166	162

Penalty incentive rate (£m per incident)	0.282
Reward incentive rate (£m per incident)	0.149

Figure 26: Performance commitments and ODI structure based on the Final Determination

### Example calculation

#### *Outperformance*

Performance commitment in 2016 is 201

Actual performance 190

Reward collar of 194 and deadband of 172

Therefore the reward would be 4 (no of incidents below reward collar) x £0.149 (reward per incident between collar and deadband) = £0.596m

#### *Underperformance*

Performance commitment in 2016 of 201

Actual performance 212

Penalty collar of 220 and deadband of 208

Therefore the penalty would be 4 (no of incidents above penalty deadband) x £0.282 (penalty per incident between collar and deadband) = £1.128m

**Assumptions made in calculation this measure**

This measure of success includes category 3 pollution incidents from sewers (foul, combined or surface), rising mains, pumping stations, combined sewer overflows, detention tanks, wastewater treatment works and sludge assets. The data will be collected using a methodology consistent with that used historically for the annual regulatory reporting submission.

The following pollution incidents are not included in this measure:

- Incidents which arise from data provided by event monitors installed as part of the Environment Agency National Environment Programme (S8, rB5 and EDM drivers)
- When assets have performed within consent
- Incidents which arise from transferred sewers (these will be included in the private sewer index) or private pumping stations which will transfer in the period to 2016.
- Incidents which occur from water treatment works or the water network (this will be assessed in a separate KPI).
- There is a risk that the Environment Agency may have a different view of pollution incident classification than us. Although regular liaison with the EA should minimise this risk. The values for the performance commitment will be based on the EA's end of year report.

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**Promise - Protect and enhance the environment**

**Outcome - The natural environment is protected and improved in the way we deliver our services**

**Measure of Success - Satisfactory sludge disposal**

United Utilities produce approximately 180,000 tonnes of raw sludge each year as a result of the wastewater treatment process. This sludge is then treated either through chemical addition or through the digestion process, which has the benefits of treating the sludge to a standard that is suitable for use in agriculture and producing Biogas. The treated sludge that comes out of the digester can either be used as a fertiliser and recycled to agriculture, or burned at our incineration facility at Shell Green. The Biogas which is also produced in the digestion process as a by-product, can be used as a fuel source to generate heat and power. Historically, sludge was seen as waste, but through this process, it is now viewed as a resource that is extremely valuable to the business.

## About this measure

This performance commitment measures how well our sludge treatment and disposal activities are operated with respect to public health, environmental protection and statutory compliance. The measure will help to maintain the confidence of both our regulators and stakeholders in the agricultural sector and wider food chain that use our treated sludge as an alternative to fertiliser. Our performance is measured by a formula which calculates the amount of sludge, in tonnes dry solids, which complies with key legislation. The Water UK definition of satisfactory sludge use used by the Environment Agency is calculated slightly differently to this measure of success as it does not include the disposal of grit and screenings. Both measures will be reported to the appropriate regulators.

## Unit of measure

This measure of success is calculated as the percentage of the total sewage sludge disposed of which cannot be confirmed as complying with the Sludge Use in Agriculture Regulation (SUIA), Safe Sludge Matrix and Environmental Permit Regulations (EPR) (for sludge, grit and screenings disposal). It will be measured to two decimal places.

## Measure of success calculation

Percentage satisfactory sludge disposal =  $1 - ((A - B) / C)$

Where:

- A is the total treated sludge measured in tonnes dry solids plus grit and screenings;
- B is the total treated sludge measured in tonnes dry solids which can be confirmed as complying with the Safe Sludge Matrix, SUIA regulations and EPR; and
- C is the total sludge produced plus grit and screenings measured in tonnes of dry solids.

The sludge compliance data will be collected using a methodology consistent with that used historically for our annual regulatory reporting submission.

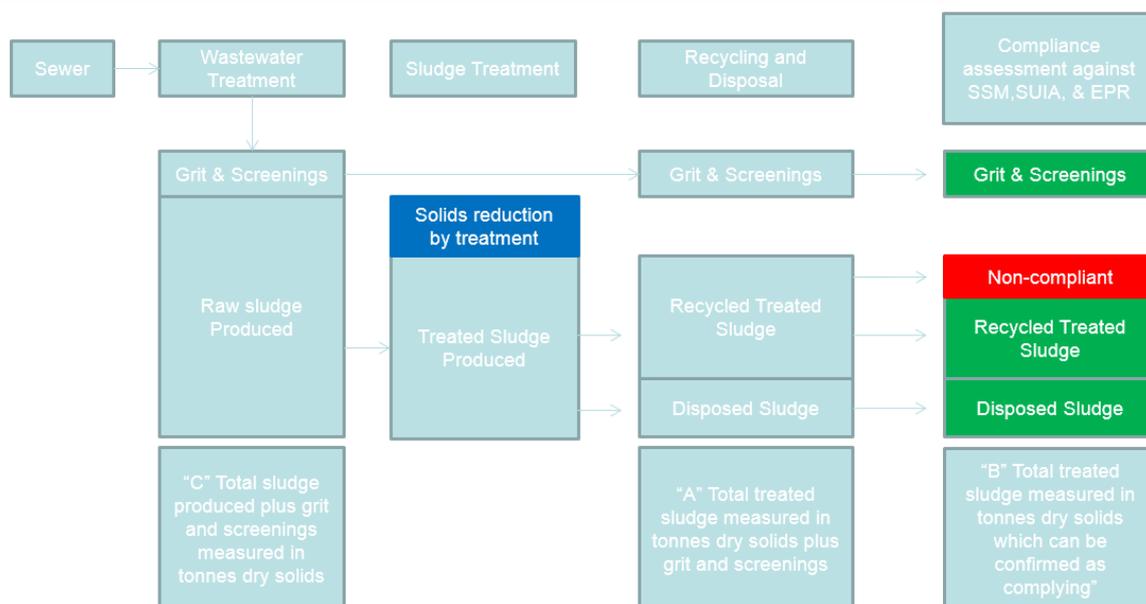


Figure 27: Sludge disposal

Performance targets

The table below shows the performance commitment we have agreed with Ofwat for AMP6. The commitment is that we will achieve 100% satisfactory disposal of our sludge every year. This measure will be assessed on a financial year basis.

	Starting Level 2014/15	Performance Commitment				
		2015/16	2016/17	2017/18	2018/19	2019/20
Performance Commitment	99.94	100.00	100.00	100.00	100.00	100.00

Figure 28: Performance commitment

Penalties and rewards

This measure is associated with a penalty only and not a reward, given that we already have a statutory obligation to comply with the Sludge Use in Agriculture Regulations and Environmental Permitting Regulations. The penalty has been set at a rate of £5.108m/year, which will be applied for each percentage point below the penalty deadband. The maximum penalty that we can incur in any given year is £15.988m, making the maximum theoretical penalty in AMP6 £79.94m. By meeting our performance commitment throughout 2015-2020, we can avoid these extensive penalties.

	Starting Level 2014/15	Performance Commitment				
		2015/16	2016/17	2017/18	2018/19	2019/20
Performance Commitments	99.94	100.00	100.00	100.00	100.00	100.00
Penalty collar		96.72	96.72	96.72	96.72	96.72
Penalty deadband		99.85	99.85	99.85	99.85	99.85

<b>Penalty incentive rate (£m%/year)</b>	<b>5.108</b>
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Figure 29: Performance commitments and ODI structure based on Final Determination

### Example calculation

The tables below show an example of how the percentage of satisfactory sludge disposal is calculated.

Percentage satisfactory sludge disposal =  $1 - ((A-B)/C)$

A	Total treated sludge plus grit and screenings (TDS)	115,000
B	The total treated sludge which can be confirmed as compliant (TDS)	113,500
	A-B	1,500

C	Total sludge produced plus grit and screenings (TDS)	180,000
	(A-B)/C	0.83
	$1 - ((A-B)/C)$	99.17 %

In this worked example, we have produced 1,500 TDS of non-compliant sludge. This equates to a satisfactory sludge disposal percentage of 99.17%.

99.17% is 0.68% below the deadband of 99.85%.

1.68% multiplied by £5.108m per percentage point below the deadband means this performance level would incur a £3.47m penalty.

### Assumptions made in calculation this measure

The calculation of the sludge produced is back-calculated from treated sludge volumes. This is because whilst not all facilities currently measure digester input, treated sludge is measured. This calculation is currently considered to be the best available method of determining raw sludge totals.

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**Promise – Protect and enhance the environment**

**Outcome – The natural environment is protected and improved in the way we deliver our services**

**Measure of Success – Contribution to bathing waters improved**

Even tighter EU bathing water standards have taken effect in 2015, the quality of our coastal waters has never been more important. We are one of many organisations with a role to play in boosting the quality of bathing water on the North West coast, from West Kirby to the Scottish borders. Bathing water quality can be affected by a range of factors, including sewer overflows, water run-off from agricultural land, run-off from roofs and roads, and dog, donkey and bird poo close to the beach. The Environment Agency currently estimates United Utilities' contribution to regional water quality is about 30 per cent demonstrating that our operations have a significant impact.

## About this measure

During AMP6, our aim is to ensure we play our part in ensuring all bathing waters in the North West meet at least the European Union's "sufficient" standard. Additionally, we have a significant number of shellfish beds off the coast of the North West stretching from the Wirral to Solway in Cumbria. In some cases, these shellfish beds can be adversely impacted by bacteria and viruses from sources such as agricultural run-off, private septic tanks and United Utilities' discharges. This either means that shellfish cannot be harvested or additional treatment is required before they are safe for human consumption. This performance commitment measures the contribution we will make to improving bathing waters and shellfish waters in 2015-2020 through delivery of schemes agreed with the Environment Agency.

Shellfish waters have been included in the same measure as bathing waters as many of the shellfish waters are located near bathing waters and many projects provide benefits to both. The agreed programme of works includes requirements to reduce the spill frequency of specific overflows, provision of Ultra Violet (UV) treatment of final effluent discharges, provision of spill monitors on overflows, modelling and other investigations. Our success will be measured against delivery of schemes by the agreed dates shown in the table below. Each scheme is weighted according to its environmental value and the scale of the investment to give a measure termed a "bathing water equivalent" (BWE).

This measure captures the contribution we expect to make in improving bathing water and shellfish water quality in the North West by delivering a programme of schemes agreed with the Environment Agency. Customers have provided their monetary values for improving bathing water quality, and preventing deterioration, through the willingness to pay survey.

The target for AMP6 is to deliver 6.56 BWEs. As part of defining the programme, we have a number of investigations included in our AMP6 programme and a number of monitors to install on our assets and these have been assigned a nominal BWE and included as part of the target, to recognise their importance in achieving the long term outcome.

## Measure of success description

This measure identifies the contribution we will make in improving bathing waters and shellfish waters through delivery of the schemes agreed with the Environment Agency. The impact of each scheme has been converted into a "BWE" based on, the number of bathing/shellfish waters improved by the scheme, the scale of the impact the scheme will make on the bathing water/shellfish waters, and the scale of the costs involved in implementing the scheme.

The performance commitment is calculated from the schemes that the Environment Agency requires us to deliver to contribute to improvements to the bathing waters and shellfish waters across the North West. In the majority of cases the dates by which these schemes are to be completed are set out for us by the Environment Agency in their National Environment Programme. However, there are three schemes where during the PR14 process we informed the Environment Agency that we did not believe the dates they proposed were achievable, for these projects we have aligned our performance commitment with the date we informed the Environment Agency we could complete the required work. A full list of projects and assumed BWEs can be found in the assumptions section. There is a risk that the projects identified for delivery in AMP6 do not deliver the expected benefits. This may result in additional projects being required in AMP7.

### Unit of measure

This measure will be assessed using BWE and will be assessed to two decimal places.

### Measure of success calculation

For each scheme we have identified the number of bathing waters/shellfish waters that will be improved through completion of our work. To generate the required improvement at that bathing water/shellfish water we would need to deliver each of the schemes which impact on that bathing/shellfish water. Therefore if four schemes impact one bathing water each scheme only contributes 0.25 of the overall improvement at that bathing water.

To assess the performance associated with delivery of our contribution we have used the source apportionment analysis provided by the Environment Agency as part of their disproportionate cost assessment. This information identifies the contribution made from our assets. Source apportionment analysis has not been carried out for shellfish waters, to determine our contribution at shellfish waters we have used the average of our contribution at bathing waters which works out at 30%.

To convert this information into a bathing water/shellfish water equivalent for each scheme being delivered we have taken the contribution to each bathing water/shellfish water and multiplied it by the source apportionment value attributed to our assets. Therefore if three of our schemes contribute 39% of the improvement at a single bathing water this equates to 0.13 bathing water/shellfish water equivalents (one bathing water divided by three schemes multiplied by 39% contribution). A final adjustment has been made to this value to take account of the scale of the scheme being delivered and ensure that the BWE equivalent is proportionate to the size of the project being delivered.

On completion of a scheme an Output in Use certificate is produced which contains the date when the work was finished and confirmed as meeting the Environment Agency obligation. The completed Output in Use certificates will be used to determine the projects completed each year and the BWE for these schemes added to give the performance for reporting.

**Performance targets**

Over the next five years we aim to deliver the work required to meet the bathing and shellfish water drivers set out within the National Environment Programme. The BWE target for this measure is as set out below.

	Performance Commitments				
	2015/16	2016/17	2017/18	2018/19	2019/20
BWE (cumulative across the AMP)	0.36	0.66	1.49	3.78	6.56

Figure 30: Performance commitments for AMP6

**Penalties and rewards**

This measure is incentivised by penalties only. The rates of penalty are shown in the table below.

	Starting Level 2014/15	Performance Commitment				
		2015/16	2016/17	2017/18	2018/19	2019/20
Cumulative Performance Commitment	0.00	0.36	0.66	1.49	3.78	6.56
Penalty collar		0.00	0.00	0.00	0.00	0.00
Penalty deadband		0.36	0.66	1.49	3.78	6.56

<b>Penalty incentive rate (£m/BWE)</b>	<b>10.00</b>
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Figure 31: Performance commitments and ODI structure based on Final Determination

To ensure that penalties are proportionate to the delay that has occurred, a sliding scale will be applied to the annual penalty as follows:

- 25% for 1-90 days late
- 50% for 91-180 days late
- 75% for 181-270 days late
- 100% for 271-365 days late

**Example calculation**

The penalties generated for this programme of work will be assessed and recalculated based upon the cumulative BWE delivered by the programme. The examples below demonstrate how a potential penalty would be calculated.

**Example 1 delay in delivery**

Allonby	0.31BWE
Target delivery	31/03/16
Actual delivery	30/04/16

30 days late across a financial year, but all other projects deliver to plan therefore the project would generate a penalty.

Performance commitment value reported for the year would be 0.31BWE below target.

Penalty incurred would equal – 0.31 BWE \* £10.0 (penalty incentive rate) \*0.25 (25% for 0-90 days late)  
= £0.775m

**Example two acceleration in delivery**

Chorley WwTW	0.26 BWE
Target delivery	30/04/17
Actual delivery	30/04/16

One year early, all other projects deliver to plan therefore the programme would not generate a penalty.

Performance commitment value reported for the year would be at target. Therefore, no penalty or reward would be applied.

**Example 3 combination of acceleration and delay**

Chorley WwTW	0.26 BWE
Target delivery	30/04/17
Actual delivery	30/04/18
Manchester Square	0.68 BWE
Target delivery	30/04/18
Actual delivery	30/04/17

One project is a year late, one is a year early. In order to deliver our performance commitment in 2017, we need to deliver 0.66 BWE and 1.49 BWE in 2018. The net impact of these two movements is that an additional 0.42 BWE of BWE will be delivered by 30/04/17, with the cumulative BWE improved being back at the performance commitment target by 30/04/18, as such no penalty would be applied in either year. As this is a penalty only measure no reward would be incurred for the increased delivery at 30/04/17.

**Assumptions made in calculating the index**

The projects that we will deliver and associated BWEs are shown in the table below.

Scheme Name/Name of Discharge/Investigation	Delivery Year	BWE
Allonby WwTW Storm Overflow	31/03/16	0.31
23 Monitors	31/03/16	0.01
145 Monitors	31/03/16	0.04
Misconnections	21/07/16	0.11
Hesketh Bank WwTW Storm Tanks	30/03/17	0.09
Mersey/North Wirral Investigations	31/03/17	0.03
Tidal Ribble and Wyre investigation	31/03/17	0.07
Chorley WwTW Storm Tanks	30/04/17	0.26
Hagg Lane (Midland Tce) Mill H	30/04/17	0.21
Ravenglass WwTW	31/12/17	0.10
Ravenglass WwTW storm tanks	31/12/17	0.10
Ravenglass WwTW inlet CSO	31/12/17	0.10
Kendal WwTW	31/12/17	0.05
30 Monitors	31/03/18	0.01
Manchester Square PS	30/04/18	0.68
Chatsworth Ave PS	30/04/18	0.68
Preston WwTW Storm Tanks	30/04/18	0.68
Ulverston WwTW storm tanks	31/03/19	0.25
Dragley Beck CSO LAK0058**	31/03/19	0.00
Raby cote outfall	30/04/19	0.74
Anchorsholme PS	30/04/19	0.68
Blackburn WwTW Storm Tanks*	31/03/20	0.57
Schola Green Pumping station	30/03/20	0.79

**Figure 32: Projects to be delivered in AMP6 and the associated BWE**

\*The project at Blackburn WwTW Storm Tanks is not planned for completion until FY22. In order to protect customers and ensure there is focus on delivery of this scheme the BWE has been divided across the AMP6 and AMP7 period. The BWE for the full project has been sectional split, with 1.57 BWE to be delivered in AMP6 and 0.31 in AMP7.

\*\*The project at Dragley Beck is being delivered in conjunction with the scheme at Ulverston.

The delivery of this measure is based upon an assumed programme on work shown in the table above. The paragraphs below explains the circumstances under which exchanges to this programme may possibly be made.

Exchange within AMP – We can move projects around within AMP, from our agreed programme of work, for example to compensate for a delayed project we could accelerate another project ideally of equal benefit. This would not change the annual profile of the performance commitment we have made to Ofwat. Therefore if this exchange caused us to under deliver we would incur a penalty until we have caught up with our cumulative profile. We should agree this with the EA, as although we would minimise our risk in terms of penalties, without the EA approval we would be at enforcement risk.

Exchange outside of AMP – This is much more complicated and would require the EA’s formal approval through an exchange mechanism. Exchange projects would need to be comparable in terms of benefits and costs. However, we would still need to meet our AMP6 cumulative performance commitment. Any deviations from this will incur penalties.

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# Retail outcomes

**Promise - Deliver customer service you can rely on**

**Outcome - You are highly satisfied with our service and find it easy to do business with us**

Measure of Success: Service Incentive Mechanism Measure of

Success: Customer experience programme

**Promise - Give you value for money**

**Outcome - Bills for you and future customers are fair**

Measure of Success: Customers saying we offer value for money

Measure of Success: Per household consumption (l/prop/d)

Measure of Success: Number of free water meters installed <sup>1</sup>

**Outcome – You have support if you struggle to pay**

Key performance indicator: Customers helped and supported into making regular payments <sup>2</sup>

**Outcome – The NW's economy is supported by our activities and investment**

Key performance indicator: Partnership leverage <sup>2</sup>

## Notes

<sup>1</sup> Details of this measure of success are provided within the water service section of this document

<sup>2</sup> Further definition for the two KPI's supporting the promise "give you value for money" is not included in this version of the definition documents

**Promise - Deliver customer service you can rely on**

**Outcome - You are highly satisfied with our service and find it easy to do business with us**

**Measure of Success - Service Incentive Mechanism**

The service incentive mechanism (SIM) is an Ofwat measure designed to improve the level of service that water companies provide. It is based on two consumer experience measures.

- A **quantitative measure** based on the number of complaints and unwanted contacts a company receives.
- A **qualitative measure** (one based on the quality of the experience) derived from a consumer experience survey.

These two measures aim to capture both the number of times a company fails to meet the expectations of its consumers, as well as the experience of those consumers. We have not proposed a separate incentive mechanism for this performance commitment as we believe the methodology proposed by Ofwat adequately incentivises the company. Our strategy is to ensure that we remain outside of any penalty zone and to be a high performing water and sewerage company.

The maximum potential penalty is 12% of household retail revenue (£73.968m) over the 2015-20 period and the maximum reward is 6% of householder retail revenue (£36.984m).

## About this measure

Ofwat introduced the service incentive mechanism (SIM) in 2010 as a tool to encourage companies to reduce customer complaints and get things right first time. Ofwat have retained the incentive for the period 2015-20 and we have chosen this as a key measure of success. Our performance in AMP5 has moved us from bottom position to mid position when compared to other WASC's.

Our performance commitment for AMP6 is to achieve an upper quartile ranking for SIM when compared to other water and sewerage companies. Our assumption is that upper quartile water and sewerage company performance will keep us out of the penalty zone. In addition to this measure there are further performance commitments included in the Wholesale ODI framework that compliment SIM i.e. sewer flooding index, average minutes lost per property and the reliable water service index. These measures have significant financial penalties if the company underperforms.

**Measure of success description**

Each year, a score out of 100 (higher is better) is calculated, which is made up of the following two elements.

- Quantitative score (out of 25)** based on the number of written complaints and unwanted phone contacts received. Phone contacts are classified as ‘wanted’ or ‘unwanted’ depending on the reason for the customer’s call. Also, any repeat contacts and calls expressing dissatisfaction are counted as unwanted regardless of the reason for calling. Written complaints are weighted according to the stage of the resolution process. The initial complaint letter or email to a company has a low weight, while the Consumer Council for Water (CCWater) investigating a written complaint carries a heavier weight. This takes account of whether the company resolved the customer’s issue at the first contact.
- Qualitative score (out of 75).** This is an annual score produced by four waves of customer satisfaction surveys that will take place at intervals throughout the year. The surveys are based on contact data that the company provides to an independent market researcher. The market researcher is appointed by Ofwat and will carry out the surveys for all companies. The company is asked to produce a set of data covering all contacts received during the designated period (specified by the researcher). There will be no notice given for this, such that, for example, on a Monday morning companies will be contacted and asked to provide their sample from the previous week. The sample will be provided by 5 pm on the next day (Tuesday). The overall satisfaction score derived from the survey will be weighted so that 50% of it is made up of billing contacts, and 50% of it is made up from operational contacts.

The contacts included will in the main be from households in connection with their bill or an operational matter associated with their household premises. Contacts about operational matters that are not necessarily associated with household premises, such as defective manhole covers, leaking pipes or road works are also included. United Utilities website contacts are included where the customer uses a web form (for example, to make a complaint, request a water meter or set up a Direct Debit) and web-based methods of bill payment (that is, paying their bill through a water company website). Simply browsing the company website for information would not be included.

Customers served	Quantitative measures	Qualitative measures	Incentive
Households customers	‘Unwanted’ phone contacts, written complaints, escalations and CCWater Investigations  (25% of SIM total)	Survey of customers who have been in contact with their company  (75% of SIM total)	Financial and reputational – comparison to other companies’ household service. Maximum annual reward 6% wholesale revenue. Maximum annual penalty 12% wholesale revenue

**Figure 1: Summary of SIM measures**

**Unit of measure**

The unit of measure is a ranking of performance compared to other water and sewerage companies. We will report the SIM score to zero decimal places.

**Measure of success calculation**

Performance data is collected in accordance with the Ofwat's information note "IN 15/03 Guidance on collecting information for the service incentive mechanism from 1 April 2015" published in March 2015.

Performance data for the quantitative element will be submitted to Ofwat on an annual basis (July). This captures unwanted contacts from customers and includes any contact that express dissatisfaction or inconvenience. This is worth 25% of the overall SIM score.

Performance data for the qualitative element will be collated by Ofwat via an independent research agency. This will be a customer survey and covers an interview with a random sample of household customers. This is worth 75% of the overall SIM score.

The calculation methodology is determined by Ofwat.

**Example calculation**Contact score calculation

All contacts are from households as set out in the guidance.

$$\frac{[(\text{Unwanted phone contacts} \times 1) + (\text{written complaints} \times 5) + (\text{escalated written complaints} \times 100) + (\text{CCW investigated complaints} \times 1000)]}{(\text{connected household properties}/1000)}$$

Quantitative component calculation

$$\{1 - [(C - CL) / (CH - CL)]\} \times WC$$

Where

- C = total annual contact score (see above)
- CL = contact score minimum (set at 0)
- CH = contact score maximum (set at 500)
- WC = contact score weighting (set at 25)

Qualitative component calculation

$$\{(S - LS) / (HS - LS)\} \times WS$$

Where

- S = qualitative survey annual average score
- LS = minimum survey score possible (set at 1)
- HS = maximum survey score possible (set at 5)
- WS = survey weighting (set at 75)

### Performance commitments and incentives

We believe that providing good service costs less, and that aspiring for a lower target would result in a higher cost household retail plan. We aim to reduce costs by striving to eliminate failure and improve first time resolution. This is cost beneficial as it drives Domestic Retail costs closer to the average cost to serve, reflects customers' willingness to pay for investment on the network and gives customers confidence in the service we provide. The performance commitments illustrated below are optimal from a cost benefit position.

Performance Commitments (ranking)					
	2015/16	2016/17	2017/18	2018/19	2019/20
Performance Commitments	UQ WaSC				

Figure 2: SIM performance commitments

### Rewards and penalties

The structure is asymmetric with incentives of up to 6% of household retail revenue and penalties up to minus 12%. Any reward or penalty will be applied at the end of the regulatory period 2015-20. The estimated maximum annual penalties and rewards for AMP6 are illustrated below.

	2015/16	2016/17	2017/18	2018/19	2019/20	AMP6 Total
Maximum annual penalty (£m)	15.852	15.312	14.568	13.968	14.268	73.968
Maximum annual reward (£m)	7.926	7.656	7.284	6.984	7.134	36.984

Figure 3: Estimated maximum annual and AMP6 penalties and rewards based on the Final Determination

### Assumptions

#### Reward and Penalty – Revenue assumptions

The maximum rewards and penalties above are a percentage of the household retail revenue as assumed at the final determination. The revenue is dependent on the number of customers therefore is subject to change in AMP6. The household retail revenue stated in Figure 4 is in 2013/14 prices however this is equivalent to outturn prices as Ofwat did not allow RPI inflation.

	2015-16	2016-17	2017-18	2018-19	2019-20	AMP6 total
Household retail revenue (including an allowance for the net margin)	132.1	127.6	121.4	116.4	118.9	616.4

**Figure 4: Assumed Household retail revenue used to estimate AMP6 SIM penalties and rewards**

### Household customers

When referring to customer contacts customers are defined as any household user of water and wastewater services, including account holders. Currently the definition of households/non-households is consistent with the definition used for company's 2015-20 business plans. During 2015-20 the intention is to periodically update the definition so it remains consistent with the definition for 'eligibility to switch'. Essentially, the SIM includes all those who are not eligible to switch.

### Customer calls

This covers all customer calls to all lines (including operational lines) into the company 24 hours a day, 7 days a week, regardless of whether the line is a principal advertised contact point or whether the call was taken outside office hours, including:

- calls to automated systems;
- switchboards;
- debt collection agencies;
- where the customer has been provided with a number and they make direct contact with back offices;
- company works and depots and contractors (such as contact with a local depot/contractor during operational work); and
- calls dealt with by automatic transactions/interactive voice recognition systems and recorded messages (such as message manager).

To ensure all contacts are captured, it also includes representatives, such as the Consumer Council for Water (CCWater), Citizens Advice or solicitors, where they are acting on a customer's behalf. It also includes contacts from people (including local authority staff) who may not directly be customers and make contact about services – for example, to report a defective manhole cover or a leaking pipe.

### Repeat calls

Customer calling for the first time to report a leak. Companies can count the first call from that customer as 'wanted' (unless it is a complaint). Calls about leaks on the customer's household supply pipe are also counted in this way. Repeat/chase calls from that customer are counted as 'unwanted' (unless the company can demonstrate robustly that the contact is a call back for an appointment).

Customer calling for the first time to report or request assistance with frozen private household pipework. Companies can count the first call from that customer as 'wanted' (unless it is a complaint). Repeat/chase calls from that customer are counted as 'unwanted' (unless the company can demonstrate robustly that the contact is a call back for an appointment). If companies cannot distinguish robustly between first-time and repeat/chase calls, all of these calls are counted as 'unwanted'. If, at the point of the first call, companies cannot diagnose/identify the issue as a private issue (that is, the customer's responsibility) then all calls are counted as 'unwanted', by default.

## Exclusions

Developer services. This service mostly interfaces with builders, plumbers and property developers (that is, commercial entities). It is not a typical point of contact for household customers. Therefore, contacts that are dealt with by developer services are not included in the SIM. This includes where companies have separate specific contact channels used solely for developer services, or where a customer service operator or agent transfers customers to developer services.

The SIM does not capture the views of those customers who do not contact the company. Nor does it include forms of communication such as social networking sites or blogs where these are anonymous. Provided they can be identified robustly as such, non-household customers eligible to switch supplier are excluded from the SIM statistics. This is regardless of whether they have switched or not.

Provided that they can identify them robustly, the companies may exclude:

- non-customer calls – for example, calls from contractors and suppliers;
- calls made by a company's field operatives to company offices;
- wrong numbers, including calls where a customer is referred to another company (that is, where the customer has contacted the wrong company);
- calls where the customer is calling about a non-appointed activity and the call has no connection with the appointed business;
- calls from non-households (or their representatives) where at the time of the call it is clear that the reason is solely about their non-household account or service to premises covered by their account;
- calls dealt with by developer services; and
- calls regarding ongoing legal cases.
- Calls to organisations acting as agents for the company, such as local authority sewerage agencies, contractors and debt collection agencies.

However, where the number of customer calls to an individual agency or contractor is below 1% of the total number received by the company, these may be excluded. This is to avoid undue data burden. The 1% is with a denominator of total calls including the agency calls – since the number of calls should be known even if it is a data burden to provide the detailed customer information.

[Complaints reviewed by the water redress scheme \(WATRS\) and non-household complaints are not included in the household SIM.](#)

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**Promise - Deliver customer service you can rely on**

**Outcome - You're highly satisfied with our service and find it easy to do business with us**

**Measure of success – Customer experience programme**

Over the AMP6 period we will be investing £43m to deliver enhanced customer service and to reduce the cost of serving customers. This measure of success is to protect customers from non-delivery of the customer experience programme. Failure to deliver the investment will incur a penalty at the end of AMP6. The incentive protects customers by returning up to half of any programme funding back to customers if the outturn costs of the programme are lower than allowed for at Ofwat's final determination. The incentive also penalises the company £8.8m p.a. for not fully delivering the Customer experience programme by 31 March 2019.

## **About this measure**

In our retail household plan we proposed to invest £43m over AMP6 to implement a programme of IT driven enhancement projects which would both improve customer service and reduce cost to serve.

This investment covered two elements;

1. Expenditure related to the replacement and maintenance of existing retail systems
2. Expenditure relating to enhancements of our existing systems and capabilities.

At the draft determination Ofwat asked for more evidence to demonstrate that customers would be protected from non-delivery of the customer experience programme included in the household retail business plan. To address these concerns we developed the customer experience programme MoS that was supported by the Customer Challenge Group (CCG) and included in the U UW draft determination representation.

## **Measure of success description**

The customer experience programme is investment in systems to deliver enhanced customer service at a lower cost. The scope of the programme is illustrated in Figure 5.

Technology	Role	Scope of AMP6 transformation requirement	Proposed AMP6 solution and benefits
<b>CRM</b>	A system to capture and manage information on customers from their interactions with the organisation across all contact channels and facilitate the resolution of their enquiries through pre-defined process workflows and case management capability. A CRM system is often used to provide a 'single view' of the customer and is usually the central system used by contact centre staff. CRM can also deliver other capabilities, such as knowledge management and social media	Multiple systems are currently used to manage customer contacts. Alto, the billing system, provides contact history and an event log, while MS Dynamics is used to manage non-voice and back office workflow and point solutions are in place for social media and knowledge management. Within the Retail Service business, SAP CRM is used to manage work allocation.	Implementation of a new common CRM system supporting frontline customer contact across Retail Billing and Retail Service, facilitating a better, more seamless customer experience. All contact details will be recorded in this system, enabling a single customer view of contact history and helping the agent dealing with the contact to understand the likely context for the call. Having a central source of customer information will also provide the organisation with a rich source of customer data, supporting better prediction of customer behaviour.
		Having multiple systems in place limits agent efficiency and the organisation's ability to gather meaningful data about its' customers. A single customer view is not possible and the lack of process workflow automation prevents the organisation from analysing processing time for non-voice activities effectively.	The solution will integrate with core systems in both businesses such as Alto, SAP CRM and Debt Management, and will provide the 'gateway' into those systems for agents.
<b>Web Content Management System</b>	Web management technology enables users within the business to update and manage website content and format that content for presentation to the customer across a range of devices.	The current multiple web management systems have been heavily customised, making it difficult for UU to make changes. The website also lacks flexibility, offering very limited scope for internal resources to make changes which often have to be sent to an external service provider for implementation.	New Web Content Management technology providing a more responsive, adaptable and easily updated website, optimised for mobile, which gives the organisation better control over content with a lower cost to change. This will enable the organisation to provide better web content and encourage channel migration.

Technology	Role	Scope of AMP6 transformation requirement	Proposed AMP6 solution and benefits
<b>Multi-channel routing</b>	Routes contacts from customers to agents, based on business rules and agent skills. Multi-channel routing allows for a greater range of channels than traditional telephony, including webchat, social media and email, to be routed together.	The organisation is currently dependent on a number of point solutions to route contacts from different channels, including telephone, email, webchat and social media, to agent resources in the contact centre. Having multiple solutions with limited integration creates significant challenges for the organisation in planning and monitoring workforce efficiency as it limits the ability of both the routing technology and the workforce management technology to get a 'single view of the agent'.	Implementation of multi-channel routing capability to route customer contacts in a unified and integrated manner across a wide range of contact channels, including webchat, social media, email and telephone to improve operational efficiency and the customer experience.
			The new capability will be provided through an upgrade to the existing solution (Avaya Aura)
<b>Workforce Optimisation</b>	A contact centre system which manages forecasting volume, scheduling staff to meet that volume and monitoring their adherence to the schedule. Workforce optimisation suites also provide performance management and training management capability.	Our current solution (Aspect e-WFM) provides forecasting, scheduling and real-time monitoring for voice contacts; however the solution, as configured, does not comprehensively cover non-voice interactions and back office workload, which limits the organisation's ability to efficiently utilise the workforce. This also means that there is no 'single view' of agent performance - non-telephony time is hard to measure and manage and disparate sources of information cannot easily be brought together.	New Workforce Optimisation solution to improve the forecasting, scheduling and monitoring of all interactions across all channels in an integrated fashion, providing enhanced efficiency benefits and making performance management information available to management through systems rather than the manual process that currently must be undertaken.
<b>Analytics capability</b>	Provides the ability to analyse data from within the organisation and present the results back.	The business currently has a number of analytical tools, including SPSS, FastStats, SAP analytics and some licenses for Tableau; however the strategic capability for analytics needs to be developed which will include the development of skills and rollout of appropriate tools.	A new strategic analytical capability will be developed providing predictive analytical models based on customer segmentation which will be used to deliver a tailored, more personalised interaction using predicted customer needs and recommended next best actions. Analytics will also be used to drive improvements in areas including proactive contact, bill cycle smoothing and channel migration and debt management.

Figure 5: Scope of the customer experience programme

Under the cost to serve methodology the company can recover the depreciation relating to allowed IT expenditure.

This ODI protects customers by returning half of any funding for this scheme (via payments for depreciation) back to customers if the outturn costs of the programme are lower than allowed for in the company's price limit. It allows the company to retain half of any excess funding so that there is an incentive for it to make cost savings on the customer experience programme and to share them with customers. This ODI also penalises the company for not fully delivering the customer experience programme by 31 March 2019.

The indicative cost breakdown for enhancements of our existing systems and capabilities is illustrated in Figure 6.

Technology	Cost (£m)
<b>Replacement and Maintenance of Essential Systems</b>	
Debt Management replacement	4.0
Billing system upgrades	6.5
System refreshes ( applications requiring software upgrades)	7.6
Billing system functional changes	2.0
<b>Enhancing existing essential systems and capability</b>	
CRM	10.0
Multi channel routing	1.2
Workforce optimisation	2.0
Analytic capabilities	4.5
Web content management system	10.0
Delivering as a single programme and company wide efficiencies	(4.8)
<b>Submission</b>	<b>43.0</b>

**Figure 6: Customer experience programme costs**

### Unit of measure

The unit of measure is £ million cumulative depreciation of customer experience programme delivered. We will report the Customer experience programme MoS to three decimal places.

### Measure of success calculation

The calculation of the performance measure is the cumulative depreciation charge for IT related expenditure (see figure 7 below). The depreciation is calculated on an annual basis at year end based on the 'project in use'<sup>15</sup> date for each system or capability delivered.

There is a UU standard process for the calculation of depreciation.

The depreciation associated with existing retail systems and depreciation associated with new capabilities (i.e. the Customer Experience Programme) will be reported separately. The depreciation is calculated using the spend, commissioning date and the Asset type (which determines the life applied in SAP to the asset), at the time of commission. The calculation in SAP is based on the Net Book Value (NBV) divided by the remaining life of the asset. This is to ensure that any additional spend which may be applied to the project after the commissioning date is captured within the future depreciation charge. The process is consistent with methodology used for AMP5 and the PR14 submission.

<sup>15</sup> Project in use is defined as the date that the asset or system is commissioned.

### Performance commitments and incentives

In line with Ofwat's methodology the performance commitments for AMP6 are based on the depreciation of our profiled expenditure for this programme in AMP6.

The performance commitments, expenditure profile and depreciation in Figure 7 are based on the final determination.

Measure of Success	Unit	2015/16	2016/17	2017/18	2018/19	2019/20
Customer experience cumulative depreciation PC (FD)	£ million cumulative depreciation	1.053	3.370	6.396	10.860	17.769
Customer experience delivery PC (FD)	Full delivery/not full delivery	Not full delivery	Not full delivery	Not full delivery	Full delivery	Full delivery
Penalty collar 1		N/A	N/A	N/A	N/A	0
Penalty deadband 1		N/A	N/A	N/A	N/A	17.769
Penalty deadband 2		N/A	N/A	N/A	Not full delivery	Not full delivery
Reward deadband 2		N/A	N/A	N/A	Full delivery	Full delivery

Penalty type	Penalty rate
Penalty 1	£0.5 per £1 of cumulative depreciation
Penalty 2	£8.88m for non-delivery per year

**Figure 7: Customer experience programme performance commitments and incentive structure**

### Rewards and penalties

The ODI is designed to ensure that customers only pay in AMP6 for actual progress achieved, so any delay (as measured at FY20) results in the appropriate financial penalty on UU to ensure customers are reimbursed.

There are two penalty mechanisms associated with this ODI.

Penalty one protects customers if the costs are less than the cumulative depreciation set out in Figure 7 above. The penalty returns £0.5 per £1 of cumulative depreciation back to customers.

Penalty two penalises us for not fully delivering the customer experience programme by 31 March 2019. A penalty of £8.88m will be incurred for non-delivery. The maximum annual penalty that can be incurred from this element of the incentive is £8.8m, with the incentive being applied on a pro rata basis, such that if the programme is delivered half a year late a penalty of £4.4m would apply.

	Unit	2015/16	2016/17	2017/18	2018/19	2019/20
Performance Commitment	£ million cumulative depreciation	1.053	3.37	6.396	10.86	17.769
Actual performance	£ million cumulative depreciation	<b>2.000</b>	<b>4.000</b>	<b>7.000</b>	<b>10.000</b>	<b>17.000</b>
Number of days after 31 March 2019 that the customer experience plan fully delivered?						<b>30</b>
Penalty 1	£ million	$= (17.000 - 17.769) / 2$				<b>-0.385</b>
Penalty 2	£ million	$= £8.8m * 30 / 365$				<b>-0.723</b>
Total penalty £m	£ million	Penalty 1 plus Penalty 2				<b>-1.108</b>

**Figure 8: Example penalty calculation for delivering investment 30 days late**

### Assumptions

‘Full delivery’ is defined as the implementation of all new technology, business processes and organisational changes, and evidence that all affected household customers are being managed through the new technology platforms and processes (CRM, multi-channel routing, workforce optimisation, analytic capabilities, web contact management system and debt management).

The company will evidence delivery of all these aspects of the programme through milestone reporting to ‘Your Voice’, our independent Customer Panel. This evidence will also include ‘benefit drivers’ which are linked to the technology components such as increased self-serve, call reduction and failure demand, increased occupancy and first time resolution. The full programme will be assured by an external auditor to confirm the level of expenditure and delivery of technology solutions.

This performance measure will be reported on an annual basis but the penalties will only be applied in the final year of AMP6. The measure is cumulative over the AMP.

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**Promise - Give you value for money**

**Outcome - Bills for you and future customers are fair**

**Measure of success - Customers saying we offer value for money**

In our research<sup>16</sup> 88% of domestic customers said that value for money was important to them. This measure relates to the number of domestic customers saying we offer value for money in our customer research survey. We are aiming to increase the percentage of customers saying we offer value for money to 53% over the 2015/20 period. This is a reputational only measure with no associated financial penalty or reward.

## About this measure

This performance commitment relates to a customer research survey question that asks customers about value for money from United Utilities. The question forms part of a quarterly brand tracker survey and is conducted by an independent research agency on the company's behalf.

## Measure of success description

The measure is part of the quarterly brand tracker survey. It is designed to demonstrate that customers believe that we offer good value. The brand tracker survey is conducted by an independent research agency of UU's behalf.

The research represents the geographic spread of the customer base (Greater Manchester (28%), Merseyside (15%), Cumbria (10%), Lancashire (27%) & Cheshire (19%) and other areas (1%), Urban 28%, Suburban 53%, Rural 19%).

The research targets the Socio-demographic profile of the customer base:

- ☐ Age 18-24 (11%), 25-34 (19%), 35- 44 (21%), 45-54 (18%), 55-64 (16%), 65+ (15%). Gender split 65% Female, 35% Male.
- Mosaic Group Alpha Territory (2%), Professional Rewards (11%), Rural Solitude (3%), Small Town Diversity (8%), Active Retirement (3%), Suburban Mindset (19%), Careers & Kids (6%), New Homemakers (4%), Ex-Council Community (8%), Claimant Culture (6%), Upper Floor Living (2%), Elderly Needs (3%), Industrial Heritage (10%), Terraced Melting Pot (11%), Liberal Opinions (5%). 70% Homeownership, 25% Rental, 4% Other.
- Metered 41% not metered 57%, not known 2%, consumer sample. Metered 50%, Not Metered 46%, not known 4%, business sample.

<sup>16</sup> Customer Promises Research 2013

This measure targets 1,100 customers on a quarterly basis (900 domestic and 200 commercial). Customers are asked to rate their satisfaction based on 5 ratings

1. Very satisfied
2. Satisfied
3. Neither satisfied or dissatisfied
4. Dissatisfied
5. Very dissatisfied

The calculation is based on the percentage number of domestic customers indicating that customers are very satisfied (1) and satisfied (2). Performance for this area will capture domestic customers only. Performance is measured annually, based on the average of four quarterly surveys.

#### **Unit of measure**

The measure is reflected as a percentage (%). There are no decimal places.

#### **Measure of success calculation**

Total number of domestic customers indicating that they are very satisfied (1) and satisfied (2) in the brand tracker survey, per financial year divided by the total number of domestic customers who completed brand tracker surveys per financial year. Reported as a percentage.

#### **Performance commitments and incentives**

Due to the limited data we have for this measure we have set a target which we believe is a realistic but challenging target. As we gain more data for this measure we will comment on the effectiveness of the initial targets and may choose to internally restate our targets.

	Starting Level 2014/15	Performance Commitments (percentage)				
		2015/16	2016/17	2017/18	2018/19	2019/20
<b>Performance Commitments</b>	47	49	50	51	52	53
<b>Penalty collar</b>		NULL	NULL	NULL	NULL	NULL
<b>Penalty deadband</b>		44.74	45.74	46.74	47.74	48.74
<b>Reward deadband</b>		51.26	52.26	53.26	54.26	55.26
<b>Reward cap</b>		NULL	NULL	NULL	NULL	NULL

**Figure 9: Customer experience programme costs**

The upper and lower deadbands have been developed based on the 3.26% confidence limit tolerance of the brand tracker survey, as confirmed by McCann, who conduct the survey on our behalf.

### Rewards and penalties

This is a reputational only measure.

### Assumptions

In setting the targets we have used the following assumptions;

- Improvements in service will have a positive impact on customers' views
- Improving our customers' understanding of what we do will improve the result
- Our 'Value for Money' campaign will positively impact customer perception of the service we provide.

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**Promise – Give you value for money**

**Outcome - Bills for you and future customers are fair**

**Measure of Success - Per household consumption (l/prop/d)**

This measure is an existing measure reported annually to our regulators in the annual review of the Water Resources Management Plan. It is the average volume of water used by a household property per day. We cannot directly control customer behaviour, although we can influence it through water efficiency promotion and metering uptake.

## About this measure

This measure is the average volume of water used by a household property. The forecast per household consumption is taken from the Water Resources Management Plan<sup>17</sup>. The forecast is based on assumptions around customer behaviour, weather conditions as well as company water efficiency and metering activity. Therefore a financial incentive is not applicable for this Measure of Success. The forecast is based on our understanding of current and actual customer behaviour by analysing historic trends and shows a continuation of the historic trends.

## Measure of success description

Per household consumption is the average volume of water used by a household property. It includes both measured and unmeasured households and is an average over the 12 month period from 1<sup>st</sup> April to 31<sup>st</sup> March each year. The measure is calculated using the same water balance process that is used for total leakage reporting. We have previously reported performance against this measure in the annual review of the Water Resources Management Plan and will continue to do so.

## Unit of measure

The unit of measure is litres per property per day (l/prop/d). The measure will be reported to zero decimal places, which is equivalent to three significant figures and therefore a suitable degree of precision.

## Measure of success calculation

Per household consumption is an output of the water balance calculation, which we report annually to Ofwat and the Environment Agency.

The calculation is based on;

1. total consumption (Ml/d) for household measured and unmeasured;
2. divided by total number of measured and unmeasured household properties (excluding voids)

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<sup>17</sup> Both the revised draft Water Resources Management Plan 2013, which was used to prepare the company's Business Plan, and the final Water Resources Management Plan 2015 have the same forecasts of household consumption.

**Performance commitments and incentives**

Performance will be assessed annually and reported on a financial year basis.

	Starting Level	Performance Commitments (Index score)				
	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Performance Commitments	297	294	292	289	286	284

**Figure 10 – Performance commitments and ODI structure based on the Final Determination**

Analysis by the Met Office for our Water Resources Management Plan gave the expected variability of household consumption with weather conditions. For example in hot, dry summers the demand for water is higher. This work was used to set deadbands for the measure of success. The upper bound is consistent with the water resources management plan dry year uplift (a 9.42% increase in consumption); the lower bound is consistent with lowest level of weather related demand that we would expect (a 1.44% decrease in consumption). Variability within the deadband would be expected for the range of weather conditions normally experienced in North West England.