Response to Draft Determination

Water Mains Length Totex Model Input Data

Issue

The water econometric cost assessment models used to calculate the Draft Determination funding allowance for water infrastructure use input variables, including the historical mains length renewed and relined. The years of historical data used by Ofwat in the Draft Determination, namely 2006/07 to 2012/13, are not reflective of the length of mains renewal required to meet our customer promises and our statutory duties in AMP6. As a consequence, this results in an underfunding of water infrastructure totex by £23m. For more detail refer to Section 4, Water Service Cost Assessment Models.

This underfunding in the Draft Determination also creates an immediate risk of financial penalty for non-delivery against the performance commitments via the Outcome Delivery Incentive framework.

The additional evidence in our representation demonstrates why the historical data range of 2006/07 to 2012/13 is inappropriate for use as input data for the econometric models in that:

- The low replacement rate contributed to both an increasing mains burst rate and a failure of the 2010/11 leakage target
- The period coincided with the poor asset management capability within the Company at the time, which was recognised in the PR09 process with the worst AMA assessment of the industry.
- Our mains replacement is now planned using industry best practice risk assessment, deterioration models and prioritisation systems
- Our asset management capability has improved significantly and this has been independently assured

Corrective action was put in place by the Company from 2010/11 and the improvements in capability and increased rate of mains renewal from 2010/11 to 2013/14 have subsequently improved performance for mains bursts and leakage. When using historical rates of activity as part of the econometric model framework, this 2010/11 to 2013/14 period is therefore appropriate.

We consider that these Company specific issues need to be taken into account within the Final Determination.

Remedy

We request that the actual mains lengths for the years 2010/11 to 2013/14 (average 58.9 km p.a) are used as the historical data to inform the water econometric cost models in the Final Determination.
Summary of the evidence

1. Justification

We have had further opportunity to review the econometric models which inform the Draft Determination funding allowance for water infrastructure.

We recognise that the Ofwat methodology uses historical i.e. observed data, as an input variable into these models. We are not suggesting that the principle of using observed data should be changed as this would be a change to the industry wide method.

Our representation sets out the Company specific issues which we consider need to be taken into account, with respect to the period of observed data being used in the Draft Determination.

The Draft Determination allowance is based upon historical activity from the 2006/07 to 2012/13 timeframe. For Southern Water, this included the period 2006/07 to 2009/10 which had a period of insufficient renewal of our water network. Consequently the leakage targets were failed and bursts on the water network increased significantly.

Our leakage target was re-negotiated in 2010/11 with appropriate compensation to be made to customers via PR14. This customer compensation has been accepted by Ofwat in the Draft Determination.

In addition to the new leakage target, corrective action was put in place in 2010/11 to ensure an increase in the length of mains renewals. This brought mains bursts within control and enabled the achievement of the re-negotiated leakage target.

Southern Water is unusual in that its asset management capability had been eroded with a change in management approach and ‘outsourcing’ of its technical skills at the start of AMP4 (2005/06).

This loss of technical skill was recognised by Ofwat in the ‘Asset Management Assessment’ which was used to assess asset management capability as part of PR09. Southern Water was confirmed as the poorest in the industry for all four sub-services including water infrastructure. This lack of capability directly contributed to the Company’s ability to understand the requirements of the network and the activity required to ensure burst rates and leakage were managed appropriately.

Recognising the failure of the decision to outsource technical asset management capability and the impact this had on performance the Company has spent the last four years improving its capability and management. Our improvements in asset management have been independently assured in 2012, 2013 and 2014 which have confirmed the major improvements delivered.
In summary:

- The low replacement rate between 2006/07 and 2009/10 contributed to both an increasing mains burst rate and a failure of the 2010/11 leakage target.
- The period coincided with the poor asset management capability within the Company at the time, which was recognised in the PR09 process with the worst Asset Management Assessment of the industry.
- Corrective action was put in place and the improvements in capability and increased rate of mains renewal from 2010/11 to 2013/14 have improved performance to ensure that mains burst rates and leakage are now in control and in target.
- When using historical rates of activity as part of the econometric model framework, this 2010/11 to 2013/14 period is appropriate as mains bursts and leakage have been controlled.
- Our actual lengths of mains renewals in 2010/11 to 2013/14 are similar to those planned for AMP6 (62 km p.a.), which is derived from industry best practice deterioration modelling.

We therefore request that the actual mains lengths, renewed and relined, for the years 2010/11 to 2013/14 (average 58.9 km p.a.) are used as the historical data to inform the water econometric cost models in the Final Determination.

2. Evidence

2.1 Historical activity and performance

The Draft Determination allowance is based upon historical activity from the period 2006/07 to 2012/13. For Southern Water, this included a significant period (2006/07-2009/10) where there was insufficient activity by the Company on its water network to control performance.

The average length renewed from 2006/07 to 2012/13 was 43.6 km p.a. However for 2006/7 to 2009/10 the annual average activity was only 24.4km, and almost halted completely, at only 3km mains renewed in 2009/10. The average activity per annum is set out in Table 1.

Table 1: Water network renewal activity

<table>
<thead>
<tr>
<th>Years</th>
<th>Renewal activity (km p.a.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006/07 - 2009/10</td>
<td>24.4</td>
</tr>
<tr>
<td>2006/07 - 2012/13</td>
<td>43.6</td>
</tr>
<tr>
<td>2006/07 - 2012/13 (excl. 2009/10)</td>
<td>50.4</td>
</tr>
<tr>
<td>2010/11 - 2013/14</td>
<td>58.9</td>
</tr>
</tbody>
</table>
As a result of the inadequate activity until 2009/10, bursts on the water network increased significantly (See Figure 1) and leakage targets were failed (See Table 2).

![Water network activity and performance](image)

**Figure 1: Water network activity and performance**

**Table 2: Leakage performance**

<table>
<thead>
<tr>
<th>Total leakage (ML/d)</th>
<th>2010-11</th>
<th>2011-12</th>
<th>2012-13</th>
<th>2013-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target (original)</td>
<td>83</td>
<td>80</td>
<td>79</td>
<td>78</td>
</tr>
<tr>
<td>Target (revised)</td>
<td>n/a</td>
<td>93</td>
<td>90</td>
<td>89</td>
</tr>
<tr>
<td>Outturn</td>
<td>92</td>
<td>82</td>
<td>81</td>
<td>85</td>
</tr>
</tbody>
</table>

From 2010/11 corrective action was put in place, significantly increasing the length of mains renewals. The average mains renewed from 2010/11 to 2013/14 was 58.9 km. This brought mains bursts within control and enabled the achievement of the renegotiated leakage target from 2011/12.

In addition, without an appropriate proactive mains renewals programme, this is not the least cost approach to service. Our deterioration modelling, which we used to forecast our water mains replacement requirements, looked at a long term balance of risk to find the optimal cost effective programme for 2015 – 2020, as shown in Figure 2. The risk measure is a combination of the failure risk and the costs.

Reactive maintenance is significantly more costly and with higher risk than the proactive maintenance (orange).
Southern Water is also unusual in that the asset management capability had been eroded with a change in management approach and ‘outsourcing’ of its technical skills at the start of AMP4 (2005/06). This loss of technical skill was recognised in the ‘Asset Management Assessment’ (AMA) which was used to assess asset management capability as part of the PR09 process (See Annex 1).

At PR09, Southern Water was identified as the poorest in the industry for all four sub-services including water infrastructure (See Table 3). This lack of capability within AMP4 directly contributed to the ability to understand the requirements of the network and the activity required to ensure burst rates and leakage were managed appropriately.

Table 3: Water Infrastructure Asset Management Assessment scores

<table>
<thead>
<tr>
<th>Water Infrastructure AMA scores</th>
<th>FD09</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry Max</td>
<td>3.8</td>
<td>n/a</td>
</tr>
<tr>
<td>Industry Average</td>
<td>3.5</td>
<td>n/a</td>
</tr>
<tr>
<td>Industry Minimum</td>
<td>2.7</td>
<td>n/a</td>
</tr>
<tr>
<td>Southern Water</td>
<td>2.7</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Recognising the failure of the decision to outsource technical asset management capability and the impact this had on performance the Company has improved its capability and management over the last four years. This included the creation of a new Asset Management function in 2010, a capability change programme and a high degree of insourcing of technical specialists in the various asset management disciplines.

The Company has built best practice risk processes and asset management systems, supported by data quality improvement initiatives. These have improved how we plan, prioritise and deliver our activities and more appropriately identifies the water mains renewals required to provide the appropriate service for our customers.

Our improvements in asset management have been independently assured in 2012, 2013 and 2014. These have confirmed the major improvements delivered. (See Annex 2).
2.2 Assessment of financial significance

The years of historical data used, in Southern Water’s case, are not reflective of the length of mains renewal required to meet customer promises, the 2015-2020 performance commitment, asset health and our statutory duties.

The implicit allowance of water infrastructure activity is £89.76 million, as per Table 4, compared with our June 2014 2015-2020 forecast of £113.58 million.

As a consequence there is funding gap in for water infrastructure totex of £23.82 million.

Table 4: Draft Determination allowance

<table>
<thead>
<tr>
<th>June2014 Business Plan update £m</th>
<th>Water Infrastructure Draft Determination (upper quartile) £m</th>
<th>Variance £m</th>
</tr>
</thead>
<tbody>
<tr>
<td>113.58</td>
<td>89.76</td>
<td>23.82</td>
</tr>
</tbody>
</table>

We have calculated the financial value as a consequence of changing the historical renewal activity to 58.9 km (2010/11-2013/14) in two stages (Table 5).
1. Replacing the mains replacement length in the Ofwat cost models used for the Draft Determination with lengths from individual scenarios
2. Calculating the difference in the resultant totex figure (upper quartile efficiency) between Draft Determination and the respective scenario.

Table 5: Financial value of representation

<table>
<thead>
<tr>
<th>Draft Determination</th>
<th>Modelled Totex estimate (Upper Quartile) £m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draft Determination</td>
<td>695.78</td>
</tr>
<tr>
<td>Representation</td>
<td>704.32</td>
</tr>
<tr>
<td>Variance</td>
<td>8.55</td>
</tr>
</tbody>
</table>

We have reviewed the Draft Determination representation for materiality against the special case threshold of 0.5% totex for the water wholesale service. The representation case is £8.55m which is above the materiality threshold of £3.85m (see Table 6).

Table 6: Assessment of materiality

<table>
<thead>
<tr>
<th>Water service Draft Determination</th>
<th>Materiality @ 0.5% £m</th>
<th>Representation value £m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Totex cost threshold £m</td>
<td>3.85</td>
<td>8.55</td>
</tr>
<tr>
<td>770.60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.3 Deep dive tests

The basis of the water mains length representation is a change in the input variable to the water econometric models, using the 2010/11-2013/14 actual renewals and relining lengths.

As such the deep dive tests of need, cost benefit, cost robustness and customer protection do not apply in the same way as a special cost case for a specific unmodelled totex scheme.

Therefore, in our assessment against these tests we comment for each test in turn, but the response is specific to a case which reflects an input variable adjustment, rather than totex scheme.

2.3.1 Need

The need for water mains renewal is to ensure that we meet our customer promises, performance commitments and statutory duties. These include compliance with targets for:

- Water mains bursts
- Interruptions to supply
- Leakage
- Discolouration contacts
- Mean zonal compliance

We have demonstrated in Section 2 that the mains length input variable based upon 2006/07-2012/13 historical period is unduly influenced by the 2006/07-2009/10 period. This was clearly insufficient renewal activity to meet our leakage target and the mains burst performance level. We therefore request that the 2010/11-2013/14 period is used as the input variable.

Our water mains activity forecast for 2015-2020 increases further but we recognise that the Ofwat methodology uses historical i.e. observed data, as an input variable into these models. We are not suggesting that the principle of using observed data should be changed as this would be a change to the industry wide method.

We recognise that the water totex model results in a different £/km value for a given length and have therefore calculated the variance based upon running the whole model with different input length variable.

In responding generally on the water totex models we have also provided an update on our WRMP variable, which we note will have a negative impact upon our water totex threshold.

In conclusion we have demonstrated the need for revised water mains length activity variables into the water totex econometric model.

2.3.2 Cost benefit
This test relates to cost optioneering and cost benefit analysis for special cost cases.

We do not think this test is directly applicable to a changing input variable, as the cost optioneering within the econometric models will be accounted for via the industry wide cost data that has been used to create the model.

Therefore this test is not fully applicable to a cost model input variable, in the same way as it would be for a specific scheme.

However, in planning our activity for mains renewal we have carried out an industry best practice risk based approach which is supported by asset deterioration modelling. Using this we identify and optimise our mains renewal programme to ensure the long term least cost for customers.

We review proactive and reactive balances of work and how this impacts performance over the long term, which is particularly relevant to ensuring asset health and the long term service to customers.

Pioneer deterioration modelling is a risk based software system which identifies optimal future investment to achieve specified service levels at least cost. We use Pioneer deterioration modelling to forecast our routine, like for like, asset maintenance requirements for all four sub-services, including water infrastructure mains renewals.

Our model is data rich and, incorporates over 300,000 individual water main lengths - each one having over ten attributes, including age, material, diameter, soil type and traffic loading. Using over 16,000 burst records over the last 10 years we have developed a robust deterioration model, validated to over 90 per cent accuracy against actual results.

Our mains replacement programme is targeted to achieve stable performance, primarily with respect to mains bursts which can result in interruptions to supplies to our customers and also leakage. There are also secondary benefits which include reduced customer contacts for discolouration and improved performance for iron compliance.

Our deterioration modelling, which we used to forecast our water mains replacement requirements, looked at a long term balance of risk to find the optimal cost effective programme for 2015 – 2020, as shown in Figure 3.
The expected service failures over the next three review periods were forecast and applying a weighting to each of the failures, allows a relative risk score to be determined.

If, in the future, a reactive maintenance only approach was adopted, i.e. repair or replace on failure, then the risk (performance and cost) level would increase (represented by the blue line in the graph). If alternatively, we undertake expenditure on a planned and reactive basis, at the level forecast by the deterioration modelling, future performance will be stable at the required level (represented by the orange line).

To achieve a balanced plan across our water service as a whole we have optimised our deterioration modelling across both infrastructure and non-infrastructure to achieve an integrated result to provide stable asset health and service to customers.

Therefore we consider that our planning approach ensures the least cost option is selected and that this meets the cost benefit test.

2.3.3 Cost robustness

This test relates to detailed cost analysis and efficiency for special cost cases. We do not think this test is directly applicable to a changing input variable, as the cost efficiency associated with the use of the variable within the econometric models will be accounted for via the industry wide costs that has been used to create the model.

Therefore this test is not applicable to a cost model input variable specifically.

However, we have provided additional information within our Draft Determination representation Woolmans Wood special case, which confirms that our own cost estimates are based upon robust and efficient cost models.
We have confirmed the materiality threshold for a cost case has been met and have explained the inter-relationship with the Woolmans Wood cost case as set out in Section 2.4.

We have presented each case as a stand-alone case, but have highlighted for transparency and fairness a potential overlap which should be taken into account if both cases are successful.

2.3.4 Customer protection

This test relates to the protection to customers for either risk to performance and / or incremental totex impacts.

We do not think this test is directly applicable to a changing input variable, as the cost and efficiency associated with the use of the variable within the econometric models will be accounted for via the industry wide costs that have been used to create the model.

In addition the performance commitments for 2015-2020 and their outcome delivery incentives will continue to protect customers from under performance, in particular for the following measures:

- Water mains bursts
- Interruptions to supply
- Leakage
- Discolouration contacts
- Mean zonal compliance

Therefore we consider that the performance commitments already provide sufficient customer protection, and no further customer protection is required for an input variable special case.

We note that this is consistent with the assessment of the Peacehaven Input Variable special case, as reflected in the Draft Determination deep dive feedback.

2.4 Inter-relationship with the Draft Determination representation on Woolmans Wood

Within our Draft Determination representations on Water Infrastructure we have also made a special case for the statutory driven undertaking for Woolmans Wood. This is a mains renewal scheme to address discolouration contacts. For more details refer to Section 5, Woolmans Wood Mains Replacement Scheme Phase 2

As Phase 1 of the activity for Woolmans Wood was carried out within AMP5, we have assessed the overlap between the two representations. This is explained in more detail in the Woolmans Wood special case.

Each case is financially significant in its own right even if reduced for the potential overlap. However should each case be successful in the Final Determination, we would expect that the overlap identified between the two individual cases is taken account of, as set out in Table 7.
Table 7: Inter-relationship between Water Mains and Woolmans Wood special cases

<table>
<thead>
<tr>
<th>Case</th>
<th>£m</th>
</tr>
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<tbody>
<tr>
<td>Water Mains Special Case</td>
<td>8.55</td>
</tr>
<tr>
<td>Woolmans Wood Special Case</td>
<td>9.86</td>
</tr>
<tr>
<td>Overlap between the two cases</td>
<td>-3.87</td>
</tr>
<tr>
<td>Combined special case</td>
<td>14.54</td>
</tr>
</tbody>
</table>

3. Board Engagement

The Board has approved the water mains case as part of our Draft Determination representations.

4. Customer Challenge Group

As this representation is in respect of an input variable to the water service totex econometric models we have not required further consultation on our proposals with the Customer Challenge Group.

5. External Assurance

This representation is in respect of an input variable to the water service totex econometric models with water mains activity data for 2010/11-2013/14. This data has already been externally assured as part of the August 2013 and August 2014 data table submissions to Ofwat.

6. Annexes

Annex 1 – PR09 Asset Management Assessment
Annex 2 – Southern Water Asset Management Assessment reports
Annex 3 – Water cost model totex estimates
### Table 1: AMA Sub-service scores by company

<table>
<thead>
<tr>
<th></th>
<th>Water Infrastructure</th>
<th>Water Non-Infrastructure</th>
<th>Sewerage Infrastructure</th>
<th>Sewerage Non-Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water and sewerage companies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anglian</td>
<td>3.6</td>
<td>3.4</td>
<td>3.5</td>
<td>3.4</td>
</tr>
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<td>Dwr Cymru</td>
<td>3.3</td>
<td>2.8</td>
<td>3.1</td>
<td>3.0</td>
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<tr>
<td>United Utilities</td>
<td>3.4</td>
<td>3.4</td>
<td>3.1</td>
<td>3.5</td>
</tr>
<tr>
<td>Northumbrian</td>
<td>3.1</td>
<td>3.0</td>
<td>3.5</td>
<td>3.0</td>
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<tr>
<td>Severn Trent</td>
<td>3.7</td>
<td>3.6</td>
<td>3.3</td>
<td>3.6</td>
</tr>
<tr>
<td>South West</td>
<td>3.4</td>
<td>3.0</td>
<td>3.5</td>
<td>3.0</td>
</tr>
<tr>
<td><strong>Southern</strong></td>
<td><strong>2.7</strong></td>
<td><strong>2.6</strong></td>
<td><strong>3.0</strong></td>
<td><strong>2.6</strong></td>
</tr>
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<td>Thames</td>
<td>3.5</td>
<td>3.3</td>
<td>3.3</td>
<td>3.3</td>
</tr>
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<td>Wessex</td>
<td>3.5</td>
<td>3.1</td>
<td>3.6</td>
<td>3.1</td>
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<td>Yorkshire</td>
<td>3.7</td>
<td>3.6</td>
<td>3.5</td>
<td>3.6</td>
</tr>
<tr>
<td><strong>Water only companies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bournemouth and West Hampshire</td>
<td>3.4</td>
<td>3.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bristol</td>
<td>3.1</td>
<td>3.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cambridge</td>
<td>3.8</td>
<td>3.7</td>
<td></td>
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</tr>
<tr>
<td>Dee Valley</td>
<td>3.8</td>
<td>3.6</td>
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</tr>
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<td>Portsmouth</td>
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<td>South East</td>
<td>3.1</td>
<td>3.2</td>
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<td>South Staffs</td>
<td>3.6</td>
<td>3.6</td>
<td></td>
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<tr>
<td>Sutton &amp; East Surrey</td>
<td>3.7</td>
<td>3.3</td>
<td></td>
<td></td>
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<tr>
<td>Veolia Central</td>
<td>3.5</td>
<td>3.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Veolia East</td>
<td>3.6</td>
<td>3.6</td>
<td></td>
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<tr>
<td>Veolia Southeast</td>
<td>3.5</td>
<td>3.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>3.5</strong></td>
<td><strong>3.3</strong></td>
<td><strong>3.4</strong></td>
<td><strong>3.2</strong></td>
</tr>
</tbody>
</table>

(Source of data: Future water and sewerage charges 2010-15 Final Determinations, Chapter 4, Page 79, Table 32)
SOUTHERN WATER

ASSET MANAGEMENT ASSESSMENT

2014 REVIEW
REPORTING AND BALANCE

28 April 2014

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Our report is for the attention of the Board of Southern Water only. The work we have undertaken is private and confidential, and we do not accept or assume responsibility to any other party for our work, for the report or for the opinions we have formed. Unless stated otherwise, all matters and issues referred to in our report arise from our work on the Asset Management Assessment 2014 review of Reporting and Balance. Our report should not be used or relied upon for any other purpose or by any third party.
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<td>18</td>
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Asset Management Capability

1 SUMMARY
Southern Water has undergone an ambitious transformation project since the start of AMP5 to put in place the capability to develop and then implement the PR14 business plan. Our objective is to provide an independent assessment, based on Ofwat’s AMA system used at the last Periodic Review, of how successful Southern Water has been in demonstrating the processes used to “Balance” the plan and the quality of “Reporting” used to indicate the current state and capability of asset planning at Southern Water.

2 Conclusions and Executive Summary
Earlier reviews by SMC revealed very significant progress in developing asset management capability from a weak position at PR09. This progress is now exhibited in a clear and concise business plan which is focused on delivering stable service to customers with performance enhancements in priority areas selected by customers. This has been achieved within a financial framework of bill increases below inflation and a position where the company is able to finance its activities in a sustainable manner.

This review is focused on the capability developed to deliver the modelling outputs which allow the plan to be balanced and the ability to report on those outputs. We were explicitly required not to assess the accuracy or validity of the absolute values of those outputs. There has been a major improvement from PR09 in the internal ability to model service impacts and in developing the risk based approach to asset management. This is evident through the results of the optimisation modelling and the use of sensitivity analysis to test the validity of the results. The financial modelling capability to accommodate different scenarios for costs of capital, investment levels, timing and revenue projections is also evident.

This ability to model effectively differing variables to achieve a desired result is clear even if it might be argued that the end result is not “balanced” within the strict interpretation of the Ofwat assessment criteria from PR09 which requires inter alia:

“The plan successfully addresses (balance\(^1\)) such that the customers’ risk (as evidenced by service levels and expenditure assumptions for prices) is broadly equivalent to the company’s risk (as evidenced by expenditure risk and service failure risk).”

We believe that Southern Water have demonstrated a capability to model customer risk and company risk for different and changing variables effectively. We intuitively feel the plan is skewed to reduce customer risk and as a result the position between customer risk and company risk is probably not “broadly equivalent”. However this perception is not material to an assessment of asset management capability. Our focus is on the ability to undertake analysis at a varied number of levels and to inform management decisions from that analysis.

In any case the decisions on the plan outcomes and the degree of plan balance (or imbalance) are matters for the Board in setting the strategic direction of the company. In

\(^1\) “Balance” is implied by the context but does not appear in the Ofwat PR09 guidance
the changed regulatory environment for PR14 it is probably no longer appropriate to seek “broad equivalence” between the differing risk parameters. It is clear that the asset management and modelling capability exists to achieve a number of differing scenarios and strategic goals. It is also apparent that there has been close Board involvement in defining the criteria for service and financial elements to be used for modelling and in developing and owning the final plan.

The PR14 business plan is clearly written and focuses on the selected scenario of stable service with performance enhancements in areas selected by customers and bill increases below inflation. There is little discussion, within the documents reviewed, of alternative scenarios and the impacts on service, investment and bills. This abbreviated approach, compared to previous Periodic Reviews, is a conscious decision as indicated by the following quote:

“You should probably be aware that we were reporting deliberately in the new world of outcomes and were also being deliberately brief, as PR09 was seen as overkill on detail for investment cases”.

While this position is entirely understandable it has provided little opportunity to reveal to Ofwat the depth of expertise which now exists at Southern Water in asset management processes following the low point at PR09. We feel that this may be a missing element within the reporting process as it is clear that the capability exists within the teams.

As a result of this review we are satisfied that asset management capability has been developed and demonstrated which allows for the development of a plan which can meet differing criteria as set out by the regulator and the Board. In our subjective judgment the significant advances in asset management capability which we have observed since our first review in May 2012 are not fully represented within the plan and the supporting documents. The regulator’s confidence in asset management at Southern Water should be significantly increased. In our opinion there were further opportunities for reinforcing this position which were not fully taken up at PR14. We acknowledge that this may have been as a consequence of deliberate decisions on plan presentation but we consider it may nevertheless represent a missed opportunity.

As a result we have assigned scores of 3.7 to reporting and 3.8 to balance. In the context of the overall assessment and building on the results from September 2013 this improves the overall result from 3.75 to 3.8.
Overall assessment

Overall we report a revised AMA score of 3.8 (previously 3.75). The derivation of this score is supported by individual scores at the component level of Ofwat’s AMA methodology.

<table>
<thead>
<tr>
<th>High level area</th>
<th>PR09 FD position</th>
<th>May 12 position</th>
<th>September 2013</th>
<th>February 2014</th>
<th>%age improvement May 2012-February 2014 From FD (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholder Engagement</td>
<td>3.07</td>
<td>3.23</td>
<td>3.83</td>
<td></td>
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</tr>
<tr>
<td>Governance, policy and strategy</td>
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<td>3.33</td>
<td>3.90</td>
<td></td>
<td>17 (80)</td>
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<tr>
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<td>3.00</td>
<td>3.78</td>
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</tr>
<tr>
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<td>3.16</td>
<td>3.76</td>
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<tr>
<td>Systems</td>
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<td>3.39</td>
<td>3.96</td>
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<td></td>
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<tr>
<td>Analysis</td>
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<td>2.90</td>
<td>3.77</td>
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<td>30 (30)</td>
</tr>
<tr>
<td>Reporting</td>
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<td>2.60</td>
<td>3.50</td>
<td>3.7</td>
<td>42 (42)</td>
</tr>
<tr>
<td>Balance</td>
<td>2.60</td>
<td>2.60</td>
<td>3.50</td>
<td>3.8</td>
<td>46 (46)</td>
</tr>
<tr>
<td>Total</td>
<td><strong>2.74</strong></td>
<td><strong>3.07</strong></td>
<td><strong>3.75</strong></td>
<td><strong>3.8</strong></td>
<td><strong>24 (39)</strong></td>
</tr>
</tbody>
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The annexes relating to the reporting and balance elements provide the detail to support these conclusions and provide specific statements on the process followed and findings as appropriate.
Introduction

At the last Periodic Review (PR09) the Asset Management Assessment (AMA) scored companies (from 1 ‘Below expectation’ to 5 ‘Moving the industry forward’) against each of a number of questions grouped under nine headings. In September 2013 we assessed Southern Water’s capability against the criteria developed by Ofwat for the previous Periodic Review in all areas except Reporting and Balance where a generic score was assigned based on a subjective overview of the potential capability in these areas. In this report we make an assessment based on our understanding of Ofwat’s PR09 criteria and the competing pressures to be balanced and reported on in Southern Water’s plan for PR14.

Nature of our review

We have carried out our review in two stages a desk based assessment followed by a more detailed review of selected areas with the company. The company has selected the material it judges best provides the evidence to support our review for the AMA assessment. Our assessment is therefore qualified but we believe the evidence we have seen and the subjective impressions we have gained are nonetheless valid and could possibly be used as a basis for prioritising the presentation of further evidence and the preparation of future submissions, although it is not its primary purpose.

Our report is for the attention of the directors of Southern Water Services Limited only. The work we have undertaken is private and confidential, and we do not accept or assume responsibility to any other party for our work, for the report or for the opinions we have formed, however we agree that copies of this report may be made available to other interested parties including regulators and may be placed in the public domain in accordance with the requirements of the directors. Unless stated otherwise, all matters and issues referred to in our report arise from our work on the Asset Management Capability Assessment (2014) review of Reporting and Balance. Our report should not be used or relied upon for any other purpose or by any third party.

Structure of report

We have structured our report to provide a brief overview / executive summary as part of the main report plus two annexes to cover:

- Reporting
- Balance.

Both annexes are structured to follow the AMA assessment criteria used by Ofwat at PR09. We provide a detailed assessment of each of the Ofwat criteria for Reporting and Balance. Southern Water’s business plan is structured around the outcomes it plans to achieve. Three of the outcomes are relevant to capital maintenance and AMA. We have not found significant differences in our assessment between Southern Water’s treatment of the three outcomes (a constant supply of high quality drinking water, removing sewage cleanly and effectively and looking after the environment) or the four sub-services (WI, WNI, WWI, WWNI). Therefore our report describes our assessment of the overall capability without distinguishing between these components.
4 Background

Following an assessment of the asset management capability development programme at Southern Water in May 2012 a further review was undertaken in September 2013. This demonstrated significant progress with the AMA score increasing from 3.07 to 3.75 following an Ofwat assessment of 2.74 at PR09.

However the scores for the “Reporting” and “Balancing” elements were assigned a generic score of 3.5 at that time as the business plan development for PR14 had not yet reached a point where it could be used as justification of the progress in developing capability. SMC were commissioned to undertake a further review of these two elements using final business plan documents and discussions with relevant team members to form the basis of a reassessment of the scores for Reporting and Balance. This review took place in February 2014.

The original development of the AMPAP process (Asset Management Planning Assessment Process) for UKWIR on behalf of the wider water industry did not include elements for Reporting and Balance. These were added to form the AMA (Asset Management Assessment) process developed by Ofwat to aid their review of the PR09 Business Plan submissions.

The AMA process we have followed to review the progress of Southern Water in developing an asset management capability, and in particular the criteria for the Reporting and Balance outlined in the PR09 guidance, suffers from attempting to force fit our assessment process on objectives whose original purpose has changed significantly for PR14 compared with those originally envisaged. Southern Water have taken a conscious decision to develop their plan to meet specific customer focused objectives and have therefore not included significant discussion on the varied scenarios and the decision making around acceptance and rejection of these alternatives such as may have been included in previous plan submissions.

This decision does not necessarily detract from the plan quality and, indeed, in the context of PR14, is arguably a much more coherent approach. The overall objective for Southern Water is to achieve a plan that is balanced to deliver the best possible outcomes for customers through AMP6. The company have developed a number of outcomes for their PR14 Business Plan and the three outcomes which relate closely to capital maintenance are:

- a constant supply of high quality drinking water
- removing sewage cleanly and effectively
- looking after the environment.

However when attempting to fit the current approach to Reporting and Balance to that developed for PR09 it leads to a number of alignment issues and has created some problems in assigning scores if a strict interpretation of the assessment statements is followed.

Nevertheless it is possible in most cases to develop a view on the progress made in plan development. Where particular PR09 requirements do not fit well with the concept adopted for PR14 by Southern Water they are noted within the text.
We have focused on the development of the asset management capability to perform the reporting and balance functions rather than a strictly limited view of the output of that process as revealed within the PR14 FBP submission. It is however, inevitable, in some cases, that conclusions on the effectiveness of asset management at Southern Water be assessed by using the submitted plan and the processes and discussions revealed within that plan.

It should also be noted that this review considers the Southern Water PR14 Business Plan in isolation and there is no opportunity to peer review the quality of the plan alongside other WASC’s.

5 Support for findings
The high level findings set out in this brief report are supported by two annexes which cover.

- Reporting
- Balance.
## Annex 1: Reporting

The corporate feedback and strategic review processes operate to maintain links between Board objectives and management actions relating to asset planning, the implementation of the plan and the outcomes delivered in terms of costs, activities and impact on service objectives.

It is clear that the plan development process has a strong thread running through it of governance and assurance through a set of internal groups and upward reporting and downward goal setting. Broad objectives have been set by the Board which have been modelled for service and investment outputs with the results being considered through the Regulatory Strategy Steering Group (RSSG).

Refinement of initial objective setting has been undertaken with agreement to changes being reached at the sign–off points and ultimately at Board level. We have commented previously on the close liaison with the CCG and the focused process undertaken in reaching agreement on customer issues and overall plan direction.

The extent of this liaison and development of an agreed common objective is evident through the governance and assurance process and is represented in the FBP. It is clear that the Board has had a strong input into the development of the asset management processes and has reviewed the outputs of these processes in developing the business plan submission.

**External reporting**

Collate the results of the historical and forward looking analysis.

A conscious decision was undertaken by Southern Water to present limited analysis and discussion on the historical performance of, and investment in, the four sub-service areas. Their rationale for this decision is that the past performance and investment were undertaken within a very different management regime and philosophy and were typified by a “boom and bust” approach. Performance assessments (or trends in performance) were considered on a reactive basis with an increase in investment when failures were apparent and a reduction in investment when performance appeared to be improving. There was little analysis of the underlying causes of performance changes and investment was often curtailed when performance shortfalls were rectified.

Southern Water contend (and SMC agree with that contention) that the management philosophy has been radically changed to concentrate on performance to customers and the measures and investment to sustain that performance have now been much more comprehensively analysed. The performance assessments presented in the plan documents are abbreviated and only relate to the period from 2004 and have limited explanatory commentary.

During the review meetings SMC were shown further analysis of performance trends and investment which clearly demonstrated the capability to undertake such analysis. Southern Water have taken a conscious decision that the inclusion of this assessment would not aid the development of the case for service standards and investment in AMP6 and have thus chosen to omit this analysis from the report.
SMC can therefore conclude that the asset management capability exists to undertake the analysis but the depth of that analysis is not readily apparent within the FBP.

Present a well structured case for future service and expenditure.

The case presented within the FBP documents is focused on one scenario with little discussion on alternative approaches. The evolution of the selected scenario is based upon analysis of customer research into the range of service options available with linkage to bill changes that would ensue from service standard changes. The plan is based on customer support for maintaining existing service (i.e. at the levels agreed for AMPS and within the service standard tramlines) with little appetite for service improvements or service reductions, even if the latter was coupled to a bill reduction. In addition to the case for maintaining service standards through capital maintenance (and operational interventions), the case for statutory requirements for quality and supply/demand issues were also developed. These two areas were not reviewed in detail but they were subjected to the same analytical and decision making processes as were apparent for capital maintenance.

Southern Water contend that following initial modelling of the desire for stable service levels at a "no increase" bill level and an assessment that such a plan would be financeable they focused on refining the desired option rather than explore, in detail, possible alternative approaches.

There were a number of re-modelling exercises during the course of the plan development as the extent of investment was clarified, particularly for quality driven projects as the formulation of the NEP was advanced, but the primary focus of stable service and bill increase limited to inflation (or lower) was retained.

In these circumstances Southern Water have stated that they took a conscious decision to focus their discussion in the plan on the single scenario which met the customer requirements. They were also conscious that PR09 documentation, for the industry in general, had been criticised for its quantity and were seeking to achieve a more succinct and shorter plan.

SMC accept the rationale behind this decision but feel that the case would have been improved if brief discussions on alternative scenarios, the sensitivity of variables used in making the case and the related impacts on service and investment had been included.

The changing levels of risk with alternative scenarios would have been a useful addition and would have demonstrated to Ofwat that there was now a comprehensive understanding within the Southern Water asset management process of the inter-relationship between service, investment and risk.

It is clear from this and previous reviews by SMC that this capability exists. Southern Water are a company which have progressed rapidly since a poor performance at PR09 and the opportunity to demonstrate progress in these areas within a formal document may have been a valuable addition to reinforce the message on the progress that has been made.
The overlaps between CM, growth, quality & ESL are identified & appropriate cost allocations made.

The progression to an outcome based planning process and reporting style for PR14 has reduced the requirement for the primary allocation of costs between the above output purpose categories (quality, supply/demand, service level enhancements and capital maintenance). Investment costs have been allocated on this basis for the regulatory data tables but the main focus for cost allocation is now between outcomes.

Southern Water have developed an allocation process which assigns costs to outcomes; the majority of investment is allocated to the following three outcomes:

- A constant supply of high quality drinking water
- Removing wastewater efficiently
- Looking after the environment

A similar process (not reviewed) was used to assign some elements of both M&G and opex to other outcomes. A set of attributes have been developed which feed into the outcomes and to which scheme level investment may be allocated, either on the basis of the type of investment or at a specific scheme level. For instance the sewer jetting activity is attributed to:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Attribute</th>
<th>%age allocation</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewer Jetting</td>
<td>Reliable sewerage</td>
<td>50</td>
<td>Removing wastewater efficiently</td>
</tr>
<tr>
<td></td>
<td>Minimise flooding</td>
<td>45</td>
<td>Removing wastewater efficiently</td>
</tr>
<tr>
<td>Rivers (pollution)</td>
<td></td>
<td>4</td>
<td>Looking after the environment</td>
</tr>
<tr>
<td>Coastal (pollution)</td>
<td></td>
<td>1</td>
<td>Looking after the environment</td>
</tr>
</tbody>
</table>

SMC were provided with a copy of the methodology paper for “Capex and Opex Allocations to Outcomes and Attributes”. This contains a comprehensive matrix for the allocation of investment to applicable headings. Some of the assessments are based on subjective, but experienced, judgement and others are based on the analysis of past investment.

A brief overview indicates that the matrix is both comprehensive, and effectively developed, in the context of percentage allocations. We did not specifically review the allocation into the QBEG headings but it is evident that Southern Water have developed the capability to stratify investment into a number of headings in an effective manner.

Regulatory returns are consistent with internal management reports and have been prepared from the same sources and using the same processes as internal management reports.

The plan has been assured by MWH and there were no anomalies, or inconsistent application of data, noted within their report. We also discussed the overall approach to governance and assurance, which is based on a quality controlled process and seems both comprehensive and effective.
The case presented in asset management plans accurately reflects the process followed.

There is a clear track between the modelling processes and the solutions proposed for capital maintenance. The link is achieved through Pioneer deterioration modelling for the forward looking view with assurance of the modelling outputs being achieved through local operational management sources and through engineering assessment where necessary. In addition schemes are identified and assessed through the Asset Risk Management (ARM) process to provide further input into defining risks to performance and the best means to mitigate such risks.

The development of projects to meet quality, supply/demand and service enhancement (flooding) drivers follows a similar process of scheme specific appraisal. The one exception is for the investment proposed to improve the status of seven bathing beaches to an “excellent” category within AMP6. This requirement is based on customer research into desired improvements. At present the specific beaches have not been identified and following an investigation project on potential beaches a selection will be made on Cost/Benefit grounds. Costs for these seven beaches have been based on average costs for bathing water improvements. The costs were obtained from Southern Water’s technical consultants who have access to their own cost curves from a wider dataset than is available to Southern Water from schemes completed in previous AMP periods.

For the development of other projects a common process for cost estimation is followed.

SMC conclude that the processes followed are consistent and are reflected in the plan development.

The level of detail presented reflects the importance or materiality of each issue.
Investment needs derived from different asset groups have been collectively optimised with the planning objective and support the company’s strategic direction statement and company policy.

The plan is developed to meet the desired outcomes. As such it is focused on the selected scenario and the detailed analysis and discussion is undertaken at that level. The development, for investment purposes, of the attributes leading to outcomes is covered in the plan and supporting documentation at a level appropriate to the service impact of the attribute as well as its investment requirement. Southern Water have taken a conscious decision to reduce the extent of the plan documentation as indicated by the following statement

“You should probably be aware that we were reporting deliberately in the new world of outcomes and were also being deliberately brief, as PR09 was seen as overkill on detail for investment cases”.

In this case the procedures followed at PR09 would not appear to be appropriate. From the work that SMC have reviewed in this and earlier sessions there is a clear asset management capability to flex the processes to cover differing levels of analysis.

It is also apparent that a collective optimisation process has been undertaken at the sub-service level and at service level but not across the water and wastewater service. This seems entirely appropriate.
It is clear in this case that the spirit of the regulatory statement above is being followed through the asset management process even if absolute compliance cannot be demonstrated in the changed context of PR14 to the requirements in place at PR09.

<table>
<thead>
<tr>
<th>8.1</th>
<th>PR09</th>
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<tr>
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<tr>
<td>6.3%</td>
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</table>

7 Annex 2: Balance

The company has achieved a balanced asset management plan that meets planning objectives (as derived from stakeholder needs, affordability, statutory constraints and company aims) and has taken account of phasing and deliverability. It has taken a balanced view of risks across the whole plan and between the company and the customers.

7.1 Overall balance of plan

The plan addresses risk such that that the customers’ risk (as evidenced by service levels and expenditure assumptions for prices) is broadly equivalent in all aspects of service (i.e. across all sub services).

Evidence was provided through the documentation and through discussion that risk profiles could be generated through the optimisation processes. There was little evidence available as to whether the level of customer risk was “broadly equivalent across all sub services” and it is arguable whether this still is a function of business planning for PR14. However it should be possible to define the level of risk (which must have been done through scenario optimisation) and to indicate the “stability” of the risk position chosen. This would then add to the assurance that the methodologies used are valid. The inclusion of such analysis within the plan documentation would have further demonstrated to the regulator the extent of the asset management capability which has been developed at Southern Water and inclusion within the plan would indicate the success of the processes adopted.

The plan successfully addresses such that the customers’ risk (as evidenced by service levels and expenditure assumptions for prices) is broadly equivalent to the company's risk (as evidenced by expenditure risk and service failure risk).

The modelling processes noted above will successfully demonstrate that the capability to develop these risk assessment positions is available within Southern Water.

Adequate lead times have been assumed to ensure sufficient information is gathered to inform planning permissions and detailed solutions.

Support document 5.4 explains the process of cost estimation, scheme development and challenge in the review of complexities.

We appreciated that it was unlikely that there should be much information at this level of detail. Lead times were reviewed as both constraints and risks that were input to Pioneer and Turner and Townsend separately reviewed the output from Scheme Builder (as part of the “Construction Delivery Review” in August 2013).

Southern Water also carried out its own review but we were assured that there was nothing in the plan that could not be managed in normal timescales where exceptional
planning difficulties were likely. We were assured there was no likelihood of anything similar to the Brighton / Hove scheme at Peacehaven.

In addition it was clear through discussion that considerable effort had been made to assess the planning and construction complexities for many of the significant projects. Southern Water are in the process (and close to completion) of appointing delivery partners for PR14. When this appointment process is completed they expect a significant contribution from them on the development of the detailed solutions from both an efficiency and timing aspect. Preparatory work for investigations and other enabling activities has been advanced into AMP5 (2014/15) in some cases.

Southern Water have noted statutory completion dates where they are available and have used the latest information where statutory completion dates are still being confirmed by regulators (DWI, EA, EN).

Southern Water have developed their plan in close liaison with the CCG. One of the CCG aspirations is for “pace” in delivery of the plan elements and this is apparent in the decisions made by Southern Water in defining their plan. The decisions on the delivery of the bathing water schemes noted in subsequent paragraph could have been implemented over two AMP periods with investigations in AMP6 and delivery in AMP7. Southern Water have recognized the CCG aspirations and propose to deliver these projects within AMP6.

In the case of the bathing beaches which are intended to be upgraded to an “excellent” status from the current “sufficient” or “good” categories in response to customer driven aspirations investigation work is necessary and a number of bathing beaches will be investigated and the seven selected on the basis of cost benefit and deliverability. This may become a tight timescale for completion within AMP6 but these issues and the risks have been recognised by Southern Water in their decisions to proceed with this element of the plan.

SMC conclude that timing considerations for projects within the overall plan have been appropriately assessed within the overarching asset management processes and scheme profiling has been adjusted to reflect the project complexities where necessary.

Have they recognised data quality issues within their decisions?

At the review meetings the data quality and the impact of differing data quantity and quality on the development of decisions for service standards and investment were discussed. We were provided with analysis from the sensitivity analysis on the age of pipelines where the further modelling had been undertaken with differing ages from the central estimate i.e. further age variables were introduced for +/- 5 or 10 years and the deterioration analysis rerun. In this case it was shown that introduction of these variables for the age position resulted in a reduction of approximately £12.0m from the original plan position. The reduction breaks down as £3.5m for WNI and £8.5 for WWNI and this revised assessment was taken forward to the final plan (in Business Plan documents 9.1 A constant supply of high quality drinking water – Section 2.6.3 and 15.1 Looking After the Environment – Section 1.6.2.2.4).

The asset management processes at Southern Water are capable of recognising the quality of data and reacting to that data quality through an appropriate level of sensitivity analysis and reassessment.
Has the plan been shown to be sustainable (Service, Environment and financial) in all sub-services?

Southern Water have developed the business plan from a clear set of objectives, particularly from a customer perspective. They have used the developed position on service standards and the necessary investment to achieve them to model whether the plan is financeable within a defined set of financial criteria. As the plan evolved from the service and overall investment position the financeability aspects were re-modelled and refined. This process took place through several iterations of the plan development process. We were informed that full financial modelling took place on approximately twenty occasions (between finalisation of plan costs at the start of October and final submission in December).

Southern Water have clearly demonstrated a capability to model the impacts of service and investment with the resultant impact on the ability to finance the plan. This has not been undertaken at the sub-service level and SMC question the reasons for Ofwat suggesting that it should be undertaken at that level. There is evidence that financial modelling has been undertaken at the service level (water/wastewater).

We take the definition of “sustainable” in this context as the ability to deliver the customer service standards (and other statutory outputs) and sustain Southern Water as a viable business entity. SMC conclude that there is an effective process in place to analyse and define the desired plan.

### 7.2 Overall approach to risk

Optimisation process balances risk across key investment areas in the sub-service.

Optimisation is undertaken through the Pioneer modelling process. This has the capability of developing programmes of work to meet service and/or financial constraints and is therefore capable of developing a balanced programme at a sub-service (or other desired) level. It is highly dependent on the constraints for service and investment positions which are used as inputs to the modelling process to generate a plan to meet the specified criteria. It was revealed through discussions that Southern Water understood the process of optimisation and constraint setting and had the capability to develop programmes in differing directions as directed by the Board in order to meet strategic goals.

Optimisation process balances risk across sub-services.

This element is effectively covered through preceding comments on modelling process.

Has the proposed plan demonstrated that the investment will achieve the central estimate of the serviceability measures?

We did not review but were assured that modelling determines the central estimate by using serviceability target alongside sensitivity analysis and adjusting programme costs.
Southern Water have indicated that they have not specifically addressed whether investment will achieve the central estimate of the serviceability measures. However since investment is planned to maintain stable risk, the implication is that serviceability measures at the end of the current period will be maintained through the plan period.

Is the risk profile broadly stable between 2010 and 2015?

Southern Water has quantified the change in its “Relative risk measure” that would result if it followed a policy of reactive maintenance only. It has also determined the level of investment needed to achieve “stable risk”. Both of these assessments are achieved within Pioneer.

An assessment is made as to how the expenditure compares with the previous period on a like for like basis – if future and recent changes are taken into account (carbon reduction, historic NEP, transfer of private SPS, installation of real time systems (RTS) on the wastewater service; and lane rental, trunk main replacement and critical valves on the water service).

There is a separate further question whether the existing levels of service / risk position that the company is choosing to perpetuate through its policy of "maintain stable" is balanced - and we would expect to see an assessment of sensitivity / performance. We have not seen any assessment as to whether the company could make material differences to performance in some areas for very little marginal investment but were told that would go into areas where improvements were not supported.

In order to optimise the “benefit value” (expressed in pounds) the value of risk is quantified using internal costs and societal costs, consequently risks and benefits (e.g. for non-compliance, odour, sewer flooding and pollution) can be expressed in a common currency. Southern Water weighted the risks using Willingness to Pay values consequently on each service risks can, arguably, be expressed on a common scale, compared to each other and added as appropriate – at the sub-service, service or business level.

Has the asset risk profile been demonstrated across the period?

Southern Water asserts that to achieve a balanced plan “we have optimised our deterioration modelling across both infrastructure and non-infrastructure to achieve an integrated result”.

We saw that optimisation had been undertaken at the service level and had integrated both infrastructure and non-infrastructure elements. We did not see specific evidence of the asset risk profile but it was clear that the modelling and asset management capability was in place to develop such analysis if necessary. Service risk analysis is included in the plan and profiles showing the impact of measures to address service risk over time are included in the Business Plan documents.
Southern Water
Asset Management Capability

9.2

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</tr>
</tbody>
</table>

7.3 Overall quality of the business case

Quality of the business cases is appropriate to the materiality of the investment and consistent throughout the plan.

The business plan for service and associated investment issues is focused on an outcome based approach. As such the outcomes are an aggregate of a number of smaller items and the materiality and extent of work exists at the outcome level. For statutory (NEP etc) objectives further explanation is provided which is relevant to the service impact or investment requirements.

<table>
<thead>
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<th>PR09</th>
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<th>2013</th>
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<td>2.5</td>
<td>2.5[PR09]</td>
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</tbody>
</table>

7.4 Programme Optimisation

Planning processes – has the plan been optimised to deliver maximum benefits?

In reviewing the business plan we felt there were some instances where the company was not portraying itself in the best possible light. It has a well developed risk based approach to identify the most cost effective interventions but it appeared that some confusion of terminology remained in the plan. These may be simple typographical errors or they may reflect a weakness of understanding and therefore also capability. We concluded that they were due to the early stage development of the required skills at depth within the teams because in our discussions at a comparatively senior level the principles were clearly understood.

For example, Southern Water uses “identification” where it appears to mean “interventions” to meet the maintained levels of service, and talks of applying the cost effective planning “principle” where the CMPCF refers to cost effective planning “objective” (See Business Plan documents 9.1, 14.1 and 15.1).

We questioned the stated Ofwat objective of achieving “maximum benefit”, in our view optimisation is to achieve maximum benefit for a given constraint or variable e.g. cost. “Maximum benefit” with unconstrained costs would result in delivering everything at once. We sought to verify the process followed and believe that verifying the results achieved fell to the assurance provider at the time (MWH). We were able to understand the process followed and the setting of constraints, on both cost and performance, and how the company reached decisions.

Is CBA implicit and visible in the decision making process?
Cost benefit analysis is primarily carried out within the Pioneer system, with a separate spread-sheet model being used to validate results and test sensitivities (Business Plan documents 9.2, 14.2 and 15.2).

In the cost benefit analysis the costs are the private costs of implementing solutions and the benefits are obtained from customer willingness to pay (WTP). The same service measure is used throughout the analysis, risks are consistently assessed and WTP has been benchmarked with other water and sewerage companies.

Where feasible investment has been subject to cost-benefit analysis, including for example for:
- Critical national infrastructure (Business Plan document 14.2.1 Eastney CNI Economic Cost Benefit Assessment)
- Service improvements (as set out in Business Plan documents 9.2, 14.2, 15.2)
  (See also reference to quality of the business cases (in preceding section “Overall quality of the business case”)).

The Pioneer system reviews interventions that are generated in response to deterioration as well as those that have been developed as schemes, and then reviews both combined. Interventions to address deterioration only include Health and Safety and planned and reactive (i.e. fix-on-fail) maintenance. Interventions are also developed into schemes for quality enhancements (water quality and the National Environment Programme) and where existing assets are no longer fit for purpose (where design shortcomings have been identified or requirements have changed). Those that are no longer fit for purpose, for whatever reason, are normally identified within ARM. We saw examples of the Pioneer output from the optimisation for schemes.

Through the process of preparing the business plan, and independently of the reviews described above, £189m of investment was taken out of the investment programme.

**Is the programme optimised, prioritised, risk register?**

Through the use of the Pioneer modelling software it is clear that programme has been optimised at the sub-service and service level. Service level constraints were set and projects with appropriate service outputs and cost benefit position were selected to form the programme.

**Has the programme been optimised across the programme (i.e. not just within each asset group)?**

The programme has been optimised within sub services and at the service level. It has not been optimised at the cross service level i.e. between water and waste water.

**For the optimisations are the programme constraints visible, logical and appropriate?**

For PR14 Southern Water did not write down specific constraints in line with the Ofwat AMA assessment criteria. We established that they have been identified and are understood by Southern Water. The key constraints were:
the decision making criteria (which included both customer priorities and statutory obligations) went through both CCG and RSSG before finalisation (including the CCG acceptability assessment as set out in 5.3 Wholesale planning and principles)

the financeability ratios which also acted as constraints on the plan as a whole.

Other constraints on the analysis included:

- the performance enhancements in priority areas selected by customers
- maintaining a stable service position supported by customers
- the decision to adopt a 40 year time horizon for NPV analysis
- no relining of water mains
- the timetable for implementing the Bathing Waters Directive – to allow adequate monitoring.

Has the Board been engaged in the development of the programme constraints?

Board involvement is not written up in the plan other than through the “Board statement”.

The Business Plan is clearly a priority for the executive team and the owners. We have seen evidence of a strong Board commitment to asset management planning and the governance process. The Board commitment to both planning and governance has been clearly evidenced. The Board has provided input on levels of service, outcome delivery statements and monitoring (specifically in relation to flooding, pollution incidents and bathing waters).

For PR14 as well as Board involvement, there has been substantial CCG involvement and interaction between the Board and CCG. The Chief Executive has attended CCG meetings and the CCG chair attended Board meetings.

The main constraint which had input from both the Board and CCG was the message from customers that the company should at least maintain a stable service position and enhance performance in priority areas selected by customers.

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SOUTHERN WATER

ASSET MANAGEMENT ASSESSMENT

REVIEW AS AT AUGUST 2013
Our report is for the attention of the Board of Southern Water only. The work we have undertaken is private and confidential, and we do not accept or assume responsibility to any other party for our work, for the report or for the opinions we have formed. Unless stated otherwise, all matters and issues referred to in our report arise from our work on the Asset Management Assessment 2013 review. Our report should not be used or relied upon for any other purpose or by any third party.
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Asset Management Capability

1 SUMMARY

Southern Water has undergone an ambitious transformation project since the start of AMP5 which has seen the introduction of approximately 85 staff within the refocused Asset Management Directorate bringing with them over 750 years of experience in asset management planning. The selection of the senior management team has been driven by a number of factors but a key requirement was their individual track records in building capability and in motivating teams as well as the development and delivery of good asset management practices. Few other water and sewerage undertakers had the same need to transform their asset management capability in such a compressed timescale to deliver an effective business plan submission for PR14.

At the last Periodic Review (PR09) Ofwat enhanced its methodology for assessing the quality of asset management planning by companies. The Asset Management Assessment (AMA) scored companies (from 1 ‘Below expectation’ to 5 ‘Moving the industry forward’) against each of a number of questions grouped under nine headings. We have assessed Southern Water’s capability against the criteria developed by Ofwat for PR09.

The assessment process for PR14 will be strikingly different from that for PR09. New priorities have come to the fore and the focus has swung from assets to customers or more specifically for asset management the definition of the level of customer service the company can reliably deliver. Performance is now more properly measured in terms customers understand and should, therefore, be more accessible to them. We acknowledge that in this respect we have used an outdated assessment model. However it provides a striking assessment of a core capability that was seriously neglected in AMP4 and has been transformed within AMP5 since Ofwat’s assessment for PR09.

This is the second assessment we have made. We previously reviewed the company’s asset management planning capability in May 2012 and in the comparatively short period of 15 months we have seen remarkable progress in terms of the development and embedment of policies, strategies and overall governance as well as an enhancement of data collection, process development and subsequent analysis.

We report an overall AMA score of 3.75. The derivation of the score is supported by individual scores at the component level of Ofwat’s AMA methodology. The score is a substantial improvement over our previous assessment 3.07 (May 2012) and the PR09 score (2.74). We have seen progress in all areas. In our opinion the main constraint on further progress is also the most impressive feature of progress to date: the degree of embedment. The degree to which new processes have been embedded, in such short timescales is impressive and now, to become fully effective, requires the maturity provided by longer exposure to the asset management policies, strategies and analytical capability. This proven ability to change and improve should mean Southern Water is well placed to meet future challenges.
INTRODUCTION

Ofwat

Ofwat’s asset management assessment (AMA) at PR09 included elements that related to the whole company so that the final score was intended to “reflect the way the individual steps of an asset management planning process have worked together to deliver an efficient and effective future business plan for 2010-15, as well as the quality of each of the individual steps.” Ofwat’s assessment took into account the integrated plan although the result impacted on the capital maintenance investment. The assessment had a significant impact on the financial assumptions for all companies.

Southern Water

Southern Water received the lowest overall scores in the process and the impact of this assessment has reduced the revenue of the company for 2010-15. Southern Water is now reaching the end of the Asset Management Capability Development Programme which was initiated to improve company performance through rectifying past asset management practices and to address many of the issues raised by Ofwat at PR09.

SMC has been commissioned to review the progress of the Capability Development programme and to measure progress against the AMA assessment used by Ofwat at PR09.

Strategic Management Consultants

SMC has a team of consultants that have worked with companies, Ofwat and other regulators in a variety of roles. Three consultants have been permanent staff members of Ofwat. We have been the Reporter team for more than one leading water and sewerage company, each of which has dramatically improved performance, as well as for a Water only Company. A large number of our projects have been to examine data, systems and procedures used by companies and to report on their validity and whether they are appropriate. Such work always relies on establishing a good working relationship with members of staff of the companies, ensuring a thorough understanding of their explanations and making clear any issues we raise.

SMC consultants have all gained their technical expertise from practical application of disciplines in engineering, finance, business planning, procurement and general management in water companies and in non-utility companies; our backgrounds in the water industry, regulation and commercial business underpin our capability to advise on company performance.

Nature of our review

We have carried out our review to a comparatively compressed timetable. We believe that the timescale has been challenging but achievable. To some extent we have been in the hands of the company in so far as the company has selected the material it judges will best provide the evidence to support our AMA assessment. Each review meeting has operated to a compressed timescale and throughout both parties have had to work hard to limit time over-runs. Our assessment is therefore qualified but we believe the evidence we have seen and the subjective impressions we have gained are nonetheless valid and can be used as a basis for prioritising effort in the closing stages of preparation of the plan.

1 PR09/37: Capital maintenance and Asset Management Assessments (AMA) for final determinations – a technical note. (Accessed on 23/6/2012 at the following location http://www.ofwat.gov.uk/publications/pricereviewletters/ltr_pr0937_ama)
3 PREVIOUS REVIEW

As part of the development of its asset management capability Southern Water asked SMC to carry out an independent assessment of AMA performance in May 2012. This assessment was used to provide an independent view of the objectives and effective implementation of the Asset Management Capability Programme and the company’s progress in delivering the programme objectives. The May 2012 assessment noted the significant progress being made but recognized that the compressed timescales represented a significant challenge to the company if an effective PR14 submission was to be delivered. The assessed score at that point was 3.07.

As far as possible the 2012 assessment used Ofwat’s criteria scored from one to five. In addition we were asked to take account of and provide feedback on:

- imminent changes eg work in development but not yet embedded (consequently scores may require ranges)
- quick wins not identified via the review as already in the plan
- the more difficult challenges Southern Water is facing – including how others have approached them elsewhere
- the Company’s presentation of evidence and articulation – including scope for further improvement
- good practice observed elsewhere and / or in development elsewhere (in companies or regulators).

4 CURRENT REVIEW

This further review of the capability programme was commissioned to provide a snapshot of progress as at the end of August 2013. In early September 2013 SMC had audit reviews with Southern Water staff from a number of disciplines, including those responsible for leadership, policy and strategy setting, as well as those responsible for the analytical areas of asset management. A series of presentations were given, and evidence portfolios provided, on the development of the overall asset management capability as well as the day to day asset management practice.

We have benefited from a high level of support from the Company, particularly from the high level of co-ordination brought to the process by the staff in the Asset Management Capability Development Programme team. Staff within the Asset Management teams have been professional in their approach and have devoted considerable resource to developing high quality presentation material and evidence based portfolios. They have been open to questioning and challenge and have responded to requests for clarification and further detail in a timely and helpful fashion.

Our report has benefited from this very full information provided at review meetings and from the Company’s time reviewing our findings and draft commentary. The review process has gone smoothly and we wish to record our appreciation of the efficient and well organised approach and the cooperation we have received from all staff.

5 OVERALL ASSESSMENT

Overall we report an AMA score of 3.75. The derivation of this score is supported by individual scores at the component level of Ofwat’s AMA methodology.
At the 2012 review we saw evidence of substantial changes being implemented and questioned whether the pace of change could be kept up until the FBP was in place. From this review in September 2013, close to completion of the PR14 submission, it is clear that this concern is no longer relevant. Significant improvements in the development of policy and strategy have continued and the development of analytical capability has continued at pace. There is considerable evidence of the continued integration of teams and their use of asset management principles into a day to day “business as usual” (BAU) approach. The degree of embedment already achieved, given the short timescales, is impressive and now requires the maturity, provided by longer exposure to the asset management policies, strategies and analytical capability, to become fully effective.

We particularly noted the development, and deployment across the company, of a comprehensive cost estimation process which is a significant improvement from that noted at the 2012 review. We considered that it was a thorough process, and one of the highest scoring components - the relevant section was therefore scored at 4.

We have seen many signs of improved decision making and an increased focus on service performance measures and their linkages to the set of outcomes developed in conjunction with research on customer priorities for service standards. These activities and improved processes should improve the credibility of the PR14 plan.

There are 31 components to the assessment; for some a single assessment has been made for the whole company, others have been assessed for individual asset groups. We emphasise that this is a subjective assessment based on our understanding of the requirements and the information and explanations we have received. There are a number of areas where we have considered the capability of the process rather than, as would be
ideal, the evidence of the outputs delivered by the process (e.g. “balance” where a complete overview of the business plan and its development was not within the scope of this review and was not available).

6 KEY FINDINGS

We have a number of comparative minor observations which we have grouped under the following themes:

- Stakeholder Engagement; Governance Policy and Strategy
- People and capability
- Integrated processes and systems
- Analysis
- Management and General
- Reporting and Balance

6.1 Stakeholder Engagement; Governance Policy and Strategy

We noted the strong leadership from the Board and the dissemination of objectives throughout the company. There has been a strong drive to establish an independent customer challenge group which has aided the development of a set of effective customer based outcomes for the business. As opposed to the 2012 review the thread of the influence of asset performance on customer service performance is clearly visible and is apparent through discussion with the “Assets” teams at the review presentations. The policy and strategy for asset management is widely understood and in use across the teams.

There has been a widespread programme of engagement and research involving more than 10,000 customers to derive six outcomes which have then been explored in more detail and used as the main building block of the plan. Customers are given appropriate recognition and Outcomes are very prominent and well understood across teams.

A robust governance process is evident with Board level involvement and ownership.

Review scores in this area have continued to improve from the 2012 review and exhibit a significant improvement from the PR09 FD. The development of consistent and strong leadership in defining the direction of the company and in its asset management processes is evident and reflected in the improved assessment.

6.2 People and capability

Recruitment has continued since the 2012 review and the teams are now operating at, or very nearly at, a full complement. Training in asset management principles has been comprehensive and widespread across the asset management teams.

There are two areas where significant improvement would be beneficial.

- An increased awareness of the regulatory context in developing the Price Review plan
- Greater awareness of regulatory accounts and linkage to business plan elements.

In general it is evident that the significant numbers of new recruits have been effectively assimilated into the Southern Water ethos. Training has been effective and fully functional.
teams are now apparent within a comprehensive people management framework. It is clear that there has been a transition from a networking culture to one based upon sound business processes providing firm foundations for future developments.

At the 2012 review we commented that we felt that the company was internally focused as it went through the initial stages of developing its asset management capability. It is now evident there is a much greater involvement in wider industry groups such as UKWIR and WRc and asset management conferences. This will be beneficial in defining best practice (and in introducing Southern’s best practices to a wider audience) and will expose more staff to new ideas and innovative processes. It should aid the progression towards continuous improvement of analytical models, systems and process capability.

6.3 Integrated processes and systems

There has been continued development of the systems and process capability. Data gathering in terms of both quantity and quality has improved but there is still some need for sense checking of data (e.g. default dates used for age parameters in pipeline materials). Cost estimation data has greatly improved and its use in defining intervention costs is consistently applied. We have noted some minor differences in approach between asset areas but feel that they are now minimal compared to the position at the 2012 review.

The analysis of failure trends and the visualisation of performance criteria (instigated by the wastewater non-infrastructure team) was demonstrated through the “concentric squares” analysis for sewage treatment works extended and applied to pumping stations (which were covered within the infrastructure review). It appears that this has proved to be a good basis for reviewing the recent past performance of assets and allowing the information to be imparted across teams.

Knowledge sharing has been improved across teams since the 2012 review. There are still some areas where this could be improved. The effective use of the PARC, DARC and concentric squares techniques used by the wastewater teams for performance monitoring is an innovative way of monitoring risk and performance and would seem potentially to be equally effective when used in the clean water teams but it was not clear if they were in use. We see a further opportunity for the application of best practice if the PARC / DARC approach were to be applied to water. We would therefore like to see evidence of knowledge sharing leading to best practice being consistently adopted by the teams.

6.4 Analysis

There has been significant effort applied to the development of performance assessment for short and medium term issues. The root cause analysis developed for consideration of performance issues and the development of effective interventions is a strong area. There is clear evidence of cross business process (Assets/ Operations) in developing appropriate solutions.

For longer term issues the company has carried out considerable work in bringing an understanding of the Pioneer modelling process in house. This has been a creditable achievement in the time available but further work remains to be done, in particular for failure rate analysis for non-infrastructure assets thus leading to a more effective and robust set of asset deterioration curves. This can only be developed with longer data series than are currently available but will naturally progress provided the company continues to devote sufficient resource to this area.
Further work on linking past investment with historic levels of service would be beneficial in demonstrating the effectiveness of modelling activities and in the linkage of proposed investment levels and service standards. It was not apparent from our review that much of this type of analysis had been undertaken to date.

In response to challenge we were assured that a review of previous performance for different asset classes has been carried out. Linkages and relationships have been explored but none established that give insight as to future requirements. It is clear that the processes and the analytical capability are in place to allow this to be undertaken.

6.5 **Management and General**

The analysis of Management and General investment planning does not fit well into the context of the AMA process. It is clear that a process for defining investment requirements is in place but it is not evident how much analysis there was of risk and performance.

On the basis that the company has demonstrated its capability in asset management processes we have assigned a score of 3.5 to this area.

6.6 **Reporting and Balance**

It is difficult to reach an assessment for Reporting and Balance without a comprehensive review of the Final Business Plan submission which was not available at the time of our review and outside our remit. In each of these areas we have seen evidence that the overall capability is in place and see no reason why an effective report and balanced plan cannot be delivered.

For both Reporting and Balance the company has the potential to score well, we anticipate that could be 3.5+ in both cases but care is needed in assembling the final plan.

As we are not able to review the final plan to demonstrate the quality of the reporting and a balanced plan we have assigned a score of 3.5 to these areas as a reflection of the capabilities shown elsewhere.

7 **SUPPORT FOR FINDINGS**

The high level findings set out in this brief report are supported by technical annexes which cover the four sub-services and additional topics as set out below.

- Stakeholder Engagement; Governance, Policy and Strategy
- Water infrastructure
- Water non-infrastructure
- Wastewater infrastructure
- Wastewater non-infrastructure.
Annex 2 Part 3 – AMA Review Scores Breakdown
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### 1. Strategy

- **Overall approach to risk**: Overall balance of plan
- **Overall quality of the business case**: Choice of the planning objective

### 2. Governance, policy and strategy

- **Historic interventions and impact data**: Intervention Costs
- **Component score weights**: to support risk management

### 3. Management

- **Raw water etc**: contribution
- **M&G infra)**: Water

### 4. Processes

- **Intervention Costs**: Water

### 5. Systems

- **Intervention Costs**: Water

---

**Footnotes**

- **Overall quality of the business case**: Choice of the planning objective
- **Historic interventions and impact data**: Intervention Costs
- **Component score weights**: to support risk management

---

**References**
Annex 3 - Water cost model totex estimates

Table 1: Draft Determination

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Table 2: Representation case using 2010/11-2013/14 actuals

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