Dŵr Cymru
Welsh Water

Leakage Data Request

Supporting document

August 2022

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1. Methodology

1.1. Purpose

The leakage data information request submission comprises of the following documents:

1. **Leakage Data Tables**- "Leakage-data-request WSH.xlsx"
2. This supporting document which contains the independent assurance report and relevant submission commentary outlining our approach for completing the tables

1.2. Background

IN 22/02- Cost Assessment data request outlines the requirement for the leakage data request. The data request provides more granular data relating to the cost and benefits of maintaining and reducing leakage levels to inform Ofwat's approach to assessing companies' proposals in their water resource management plans and PR24 business plans.

1.3 Structure

The document provides line commentary for each of the tables in the submission in following sections:

Leakage Table Commentary
This section provides commentary for the completion of tables LK1, LK2, LK3, LK4, LK5, LK6.

Assurance

We have adopted our "three lines of defence" approach to this submission, in line with our usual approach to regulatory data submissions. Each data line was assigned an owner and peer reviewer, with sign off provided by the responsible manager and director. In addition, the submission has been subject to external assurance from Jacobs.

Jacobs for the Leakage data request concluded that:

- *[The Welsh Water] team has a good understanding of your processes to produce the data in line with Ofwat guidance; and*
- *[The Welsh Water] team's internal commentaries were consistent with the data we saw at the time of reviewing them and did not contain any obviously false or misleading statements in relation to that data.*
- *Data are competently sourced, processed and fit for purpose.*

The Jacobs assurance letter is included in the appendix.

Confidence Grades

Confidence grades have been provided for each component of submission where appropriate. The confidence grades include two components, firstly a letter is assigned for the reliability of the data and secondly a number to reflect the accuracy.

Reliability Bands

A- Measured data from sound textual records, procedures, investigations or analysis properly documented and recognized as the best method of assessment
B- As A, but with minor shortcomings. Examples include old assessment, some missing documentation, some reliance on unconfirmed reports, some use of extrapolation
C- Extrapolation from limited sample for which Grade A or B data is available
D- Unconfirmed verbal reports, cursory inspections or analysis

Accuracy Bands

1. Accuracy to or within +/- 1%
2. Accuracy to or within +/- 5%
3. Accuracy to or within +/- 10%
4. Accuracy to or within +/- 25%

2. Leakage Data Table Commentary

This section provides commentary for the completion of each table in the submission.

2.1. LK1- Leakage Expenditure

The table reports leakage expenditure to maintain and reduce leakage and reports the costs based on activities such as prevent (rehab), prevent (pressure management costs) etc. Expenditure to maintain and reduce leakage is reported in the Annual Performance Report line 6D.16. The additional guidance for this submission identified a number of investment cases that should be included within the leakage costs. Therefore, the data in this submission is different to the APR values due to the inclusion of additional capital costs including investment in Bulk Metering and Pressure Management. Appendix 2 includes the submitted tables in this submission alongside a version to reconcile to the APR tables.

Prevent (rehab)- direct costs- No costs have been allocated to this column as no leakage driven rehab has taken place. There will be a leakage benefit to rehab but this cannot be quantified using our existing data.

Prevent (pressure management)- direct costs- This line includes the installation of pressure management values and regulators as well as ongoing maintenance and replacement of pressure management equipment.

Prevent (calm networks)- direct costs- No costs have been allocated to this line as no leakage driven activity has taken place.

Aware- Direct Costs- This line includes costs associated with flow meter installation and replacement, data logger installation, maintenance and airtime. This line also includes small area monitoring projects and other data projects which aid to the assessment and targeting of leakage.

Locate- Direct Costs- The expenditure reported in this line includes the cost of active leakage control efforts for leakage detection.

Mend- Direct Costs- The expenditure reported in this line includes the cost of repairing leaks on the network including labour, material, reinstatement and traffic management.

Indirect Costs- This line includes staff and overhead costs which are proportionally allocated to leakage.

The table reports leakage expenditure between maintain and reduce. Costs have been directly allocated to maintain and reduce where the activities are primarily related to either maintaining or reducing leakage respectively. Activities including data driven projects and leakage system improvements have been allocated to maintain. Activities such as our 'Cartef' programme, which is our customer side leak reduction programme have been allocated to reduce. Activities that contribute to both maintaining and reducing leakage, predominately leak detection and repair activities have been allocated between maintain and reduce using the Sustainable Economic Level of Leakage (SELL) methodology Active Leakage Control (ALC) cost curves. The methodology assesses the natural rate of rise (NRR) of leakage for each year and estimates required level of activity to offset this level of leakage. An average of the proportion of activity required to maintain current leakage for each respective AMP is used to allocate costs between maintain and reduce.

Confidence grade for this table is B2.

LK1- Leakage: Expenditure

	Line description	Units	DPs	2017-18 Prevent (rehab)- direct costs	2017-18 Prevent (pressure management) - direct costs	2017-18 Prevent (calm networks)- direct costs	2017-18 Aware- direct costs	2017-18 Locate- direct costs	2017-18 Mend - direct costs	2017-18 Indirect costs	2017-18 Total	2018-19 Prevent (rehab)- direct costs	2018-19 Prevent (pressure management) - direct costs	2018-19 Prevent (calm networks)- direct costs	2018-19 Aware- direct costs	2018-19 Locate- direct costs	2018-19 Mend - direct costs	2018-19 Indirect costs	2018-19 Total
				1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
	Price base			Outturn (nominal)								Outturn (nominal)							
	Leakage expenditure																		
1	Maintain expenditure	£m	3	0.000	1.152	0.000	0.680	6.769	14.674	2.723	25.998	0.000	0.858	0.000	1.253	7.076	23.258	2.943	35.388
2	Reduce expenditure	£m	3	0.000	0.060	0.000	0.000	0.671	0.789	0.141	1.661	0.000	0.045	0.000	0.000	1.136	1.182	0.153	2.516
3	Total leakage expenditure	£m	3	0.000	1.212	0.000	0.680	7.440	15.463	2.864	27.659	0.000	0.903	0.000	1.253	8.212	24.440	3.096	37.904
	Leakage expenditure																		
4	Mend supply pipe cost	£m	3								1.533								1.367

2019-20 Prevent (rehab)- direct costs	2019-20 Prevent (pressure management) - direct costs	2019-20 Prevent (calm networks)- direct costs	2019-20 Aware- direct costs	2019-20 Locate- direct costs	2019-20 Mend - direct costs	2019-20 Indirect costs	2019-20 Total	2020-21 Prevent (rehab)- direct costs	2020-21 Prevent (pressure management) - direct costs	2020-21 Prevent (calm networks)- direct costs	2020-21 Aware- direct costs	2020-21 Locate- direct costs	2020-21 Mend - direct costs	2020-21 Indirect costs	2020-21 Total	2021-22 Prevent (rehab)- direct costs	2021-22 Prevent (pressure management) - direct costs	2021-22 Prevent (calm networks)- direct costs	2021-22 Aware- direct costs	2021-22 Locate- direct costs	2021-22 Mend - direct costs	2021-22 Indirect costs	2021-22 Total
1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Outturn (nominal)								Outturn (nominal)								Outturn (nominal)							
0.000	0.793	0.000	0.760	7.460	20.343	3.274	32.630	0.000	1.122	0.000	2.279	7.426	19.865	0.455	31.147	0.000	1.149	0.000	1.648	8.583	18.445	3.003	32.828
0.000	0.041	0.000	0.000	1.201	1.056	0.170	2.468	0.000	0.115	0.000	0.000	0.763	2.042	0.047	2.967	0.000	0.118	0.000	0.000	0.882	1.896	0.229	3.125
0.000	0.834	0.000	0.760	8.661	21.399	3.444	35.098	0.000	1.237	0.000	2.279	8.189	21.907	0.502	34.114	0.000	1.267	0.000	1.648	9.465	20.341	3.232	35.953
							2.539								1.830								3.031

2.2. LK2- Leakage: Prevent Activities

This table reports the leakage prevent activities and attributes. Data is obtained from our pressure reduction values (PRV) database and GIS systems. In line with the definition the data only includes assets that are in use. The PMA boundaries are digitalised in our GIS system and connected properties are assigned to our DMA boundaries within GIS.

Lines 3 and 4 report the number of new PMA and the number of properties covered by new PMAs. The creation date of new schemes has been recorded since 2019. For schemes prior to this date the date of installation is based on reviewing our GIS system and PRV database to identify when the asset was either first digitalised or used.

The confidence grade for this table is A2.

Leakage Prevent activities								
Line description		Units	DPs	2017-18	2018-19	2019-20	2020-21	2021-22
Prevent activities and attributes								
1	Number of properties covered by PMAs with fixed outlet pressure control	000s	3	524.454	579.670	656.033	674.478	699.982
2	Number of properties covered by PMAs with active pressure control	000s	3	235.225	246.989	336.742	369.737	400.967
3	Number of new PMAs	000s	3	0.143	0.329	0.558	0.189	0.223
4	Number of properties covered by new PMAs	000s	3	37.796	66.980	166.116	51.440	56.734

2.3. LK3- Leakage: Aware Activities

Lines 1-5 report data on the characteristics of our District Metered Areas (DMA). DMA boundaries are digitised in our GIS system and connected properties are assigned to this supply geography. Line 1- the number of fully operating DMA is weighted based on the number of months in which they are operable[1]. The confidence grade for these lines is A1.

Lines 6-8 report trunk mains balances. The confidence grades for these lines are A2.
Line 6- Length of trunk mains and upstream network in trunk main balances- We have reported this line as zero as our method to report trunk main and service reservoir leakage is a static estimate based on Background and Burst Estimates (BABE) and is not, at this stage based on trunk mains balances or mass balancing.

Line 7- length of trunk mains- This line reports the total length of trunk main, based upon network that is downstream of DI meters and upstream of the zonal or DMA meters used in reporting leakage.

[1] Query clarification received from Ofwat through the Cost Assessment on the 28th of July 2022.

Line 8- Proportion of trunk mains and upstream network in trunk mains balances- This is a calculated cell.

Leakage Aware activities and attributes

	Line description	Units	DPs	2017-18	2018-19	2019-20	2020-21	2021-22
	DMA characteristics							
1	Number of fully operating DMAs	nr	2	1,065.17	1,070.33	1,067.17	1,051.67	1,111.58
2	25th percentile DMA size	000s	3	0.714	0.715	0.721	0.705	0.711
3	Mean DMA size	000s	3	1.194	1.201	1.207	1.190	1.214
4	75th percentile DMA size	000s	3	1.634	1.644	1.652	1.623	1.651
5	DMA Operability	%	2	91.74	91.50	89.55	88.92	89.68

DMA - District metered areas

	Trunk main balances							
6	Length of trunk mains and upstream network in trunk mains balances	km	3	0.000	0.000	0.000	0.000	0.000
7	Length of trunk mains	km	3	4183.608	4544.135	3705.690	3509.935	3528.589
8	Proportion of trunk mains and upstream network in trunk mains balances.	%	2	0.00	0.00	0.00	0.00	0.00

	Smart networks							
9	Smart networks coverage - permanent acoustic/noise loggers	%	2	0.00	0.00	0.44	0.19	0.50

2.4. LK4- Leakage Locate Activities and Attributes

Line 1- Hours on ALC activity per annum- This line reports the total hours spend of active leakage control activities including temporary acoustic/noise logging. Activity hour data stored and reported on a weekly and monthly basis.

The confidence data for this data is A2.

Leakage Locate activities and attributes

Line description		Units	DPs	2017-18	2018-19	2019-20	2020-21	2021-22
Active leakage control								
1	Hours on ALC activity per annum	hours	0	234,956	270,320	229,368	236,470	265,361

2.5. LK5- Leakage Men Activities and Attributes

Table LK5 reports data on leakage mend activities and attributes. Lines 1-4 report mains repairs and average run time for mains repairs. The number of mains repairs reported includes all leakage jobs in SAP following the LK5.1 and LK5.2 definitions. The line excludes repairs classified as mains fittings but includes main burst repairs as a result of third-party damage and where costs are potentially (rather than actually) recovered from a third party. The values reported in this line are different to those reported in our mains repair performance commitment in the APR which excludes mains repairs because of third-party damage and where costs are potentially (rather than actually) recovered from a third party.

The confidence grade for this data is A2.

Leakage Mend activities and attributes

	Line description	Units	DPs	2017-18	2018-19	2019-20	2020-21	2021-22
	Mains repairs							
1	Number of mains repairs – customer reported	000s	3	2.123	2.169	1.876	1.919	1.892
2	Number of mains repairs – company detected	000s	3	2.079	2.221	2.061	2.115	2.097
3	Average run time for customer reported mains repairs	days	1	6.6	7.9	7.2	9.2	8.2
4	Average run time for company detected mains repairs.	days	1	7.7	7.0	8.5	9.4	9.2
	Mains fittings repairs							
5	Number of mains fittings repairs – customer reported	000s	3	0.885	1.055	1.049	1.151	1.190
6	Number of mains fittings repairs – company detected.	000s	3	1.198	1.226	1.027	1.296	1.379
7	Average run time for customer reported mains fittings repairs	days	1	19.7	21.5	18.2	22.6	26.6
8	Average run time for company detected mains fittings repairs	days	1	21.7	20.9	22.7	21.6	26.3
	Communication pipe repairs							
9	Number of communication pipe repairs – customer reported	000s	3	5.252	6.317	5.068	5.794	5.961
10	Number of communication pipe repairs – company detected	000s	3	7.565	6.66	4.654	5.698	5.872
11	Average run time for customer reported communication pipe repairs	days	1	13.8	15.1	18.3	16.9	16.3
12	Average run time for company detected communication pipe repairs	days	1	13.3	12.5	17.0	17.5	15.8
	Supply pipes repairs							
13	Number of supply pipe repairs – customer reported	000s	3	3.476	4.412	3.013	1.998	3.641
14	Number of supply pipe repairs – company detected	000s	3	3.767	3.354	1.758	1.883	3.068

15	Average run time for customer reported supply pipe repairs	days	1	39.2	39.0	37.9	58.9	43.2
16	Average run time for company detected supply pipe repairs	days	1	56.1	47.8	44.2	133.6	57.9

17	Number of free supply pipe repairs undertaken	000s	3	3.767	4.363	2.981	2.708	3.712
18	Number of supply pipe repairs where financial assistance provided	000s	3	0.462	0.609	0.425	0.485	0.827
19	Number of supply pipe repairs where other support provided	000s	3	7.243	7.766	4.771	3.881	6.709

2.6. LK6- Leakage Levels

We are currently undertaking an extensive review of the components that feed into the leakage reporting process which will take several months to complete. We have reported our 2021-22 performance on a like for like basis with that followed in the 2020-21 APR. Ofwat are aware of the review and we will be providing regular progress updates.

LK6- Line 1- Historical minimum achieved level of leakage- This line reports the minimum weekly achieved level over a 5-year period. This is a theoretical value where the assumption is that all DMA's could be at their historical minima's at the same time. The reported values are derived from the assessment of the weekly averagely minimum night flow at the individual reportable DMAs across a rolling five-year period, where data is available. Historical fixed hour leakage is available from 2016-17 onwards, therefore the data for 2017-18 is only based on 2 years data and 2018-19 is based on 3 years data and 2019-20 is based on 4 years. Data for 2020-21 and 2021-22 is based on 5 years.

The confidence grade for this line is A3.

LK6- Line 2 – Volume of leakage that needs to be saved to maintain current levels- This line reports the Natural Rate of Rise (NRR). The NRR is calculated using the UKWIR method and is built into Waternet, this allows for the method to be dynamic and allows us to run the analysis against all of our DMAs. The reporting data includes the impact of weather. The calculation is based on data from our DMA reporting estimate, due to the methodology it is difficult to separate our weather impacts separately.

The confidence grade for this line is A2.

LK6 Line 3- Leakage improvements delivering benefits in 2020-25- The data reported is in line with the APR reported values. The volumes reported are the leakage benefits consistent with our enhancement schemes selected as part of the final planning options within the company's 2019 Water Resource Management Plan and PR19 Business Plan. The benefits have been delivered from our 'Cartef' programme, which is our customer side leak reduction programme.

The confidence grade for this line is A2.

LK6 Line 4- Total Leakage- This line reports the total leakage, and the data is consistent with the APR line 3F.5.

The confidence grade for this line is A2.

LK6 Line 5- Leakage upstream DMA- This line reports losses between distribution input (DI) meters and the zonal or DMA meters. The line reports post MLE estimates. Leakage upstream of DMA uses our Trunk Mains and Service Reservoir estimates which is a static estimate where year on year differences reflect MLE adjustment. This line is calculated as a proportion of Trunk Mains and Service Reservoir of total leakage (LK6 line 4) applied to Total Distribution leakage (APR table 6B line 10).

The confidence grade for this line is B3.

LK6 Line 6- Distribution main losses- this line is calculated as the total leakage reported in line 4 less customer supply pipe leakage reported in lines 6 to 10 less leakage upstream of DMA in line 5.

The confidence grade for this line is A3.

LK6 Line 7-10- Customer supply pipe losses- the assessment utilises an expanded components-based approach, first developed in 2009, which draws on guidance contained in the UKWIR report 'Towards Best Practice for the Assessment of Supply Pipe Leakage' (2005).

Volumes reflects the actual in year measurement of customer supply pipe leaks and changing property counts. Measured volumes are increasing and unmeasured decreasing reflecting the steady increase in metering year on year. This includes estimated supply leakage on the network upstream of DMA by way of any properties on that area of the network.

The confidence grade for this line is A2.

Leakage levels

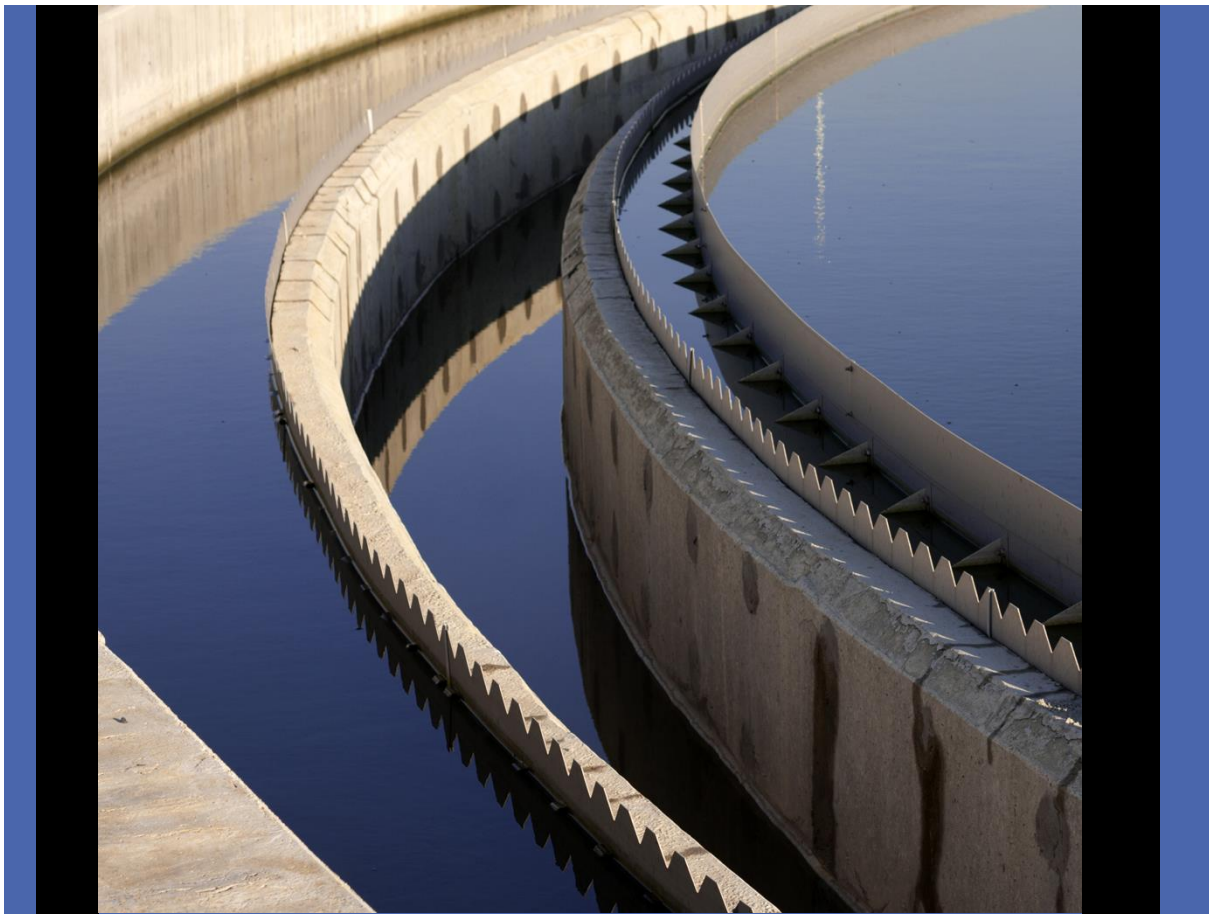
Line description		Units	DPs	2017-18	2018-19	2019-20	2020-21	2021-22
Leakage levels								
1	Historical minimum achieved level of leakage	Ml/day	2	84.17	71.79	65.97	52.32	40.40
2	Volume of leakage that needs to be saved to maintain current level	Ml/day	2	258.67	236.80	233.19	266.38	245.23
3	Leakage improvement delivering benefits in 2020-2025	Ml/day	2	0.00	0.00	0.00	0.90	1.66
4	Total leakage	Ml/day	2	175.42	172.88	173.11	163.62	157.41
Leakage components - post MLE								
5	Leakage upstream of DMA	Ml/day	2	23.60	23.83	22.37	21.61	22.68
6	Distribution main losses	Ml/day	2	100.08	99.23	93.33	84.01	83.96
7	Customer supply pipe losses – measured households	Ml/day	2	15.70	16.31	19.95	19.31	19.54
8	Customer supply pipe losses – unmeasured households	Ml/day	2	32.69	30.11	33.45	34.89	27.39
9	Customer supply pipe losses – measured non-households	Ml/day	2	2.91	2.99	3.55	3.35	3.47
10	Customer supply pipe losses – unmeasured non-households	Ml/day	2	0.44	0.41	0.45	0.47	0.37

Ofwat additional information request: Leakage

Revision no: 1.1

Dŵr Cymru Welsh Water

Non-financial Assurance Services Framework
1 August 2022



Ofwat additional information request: Leakage

Client name: Dŵr Cymru Welsh Water

Project name: Non-financial Assurance Services Framework

Client reference:

Project no: B2271302

Project manager: Alex Reoyo

Revision no: 1.1

Prepared by: Alexandra Martin

Date: 1 August 2022

File name: Leakage additional information request assurance letter

Doc status: FINAL

Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
1.0	25/07/2022	1st draft	SJ	PH	AKM	
1.1	01/08/2022	FINAL	SJ	SGB	AKM	AR

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1 August 2022

Attn: Eleri Rees, Strategy and Regulation Director, Dŵr Cymru Welsh Water

Project name: Non-financial Assurance Services Framework
Project no: B2271302

Subject: Ofwat additional information request – Leakage

Background

In IN20-02 Ofwat requested more granular data relating to the costs and benefits of maintaining and reducing leakage levels. This is to inform its approach to assessing company proposals in water resources management plans and PR24 business plans.

This letter provides an overview of our assurance activity relevant to your submission.

Scope of our assurance

You asked us to undertake a risk-based review to check the robustness and accuracy of the data you intend to submit, including your compliance with the guidance set out in the request. Our assurance of your data is designed to support your own first and second line assurance activity.

Our assurance approach

In July 2022, we met remotely with the individual teams responsible for each of the tables in the request. We reviewed their processes and the data you intend to submit to Ofwat, including the changes you made in response to clarification of the requirements by Ofwat. The submission includes previously reported JR / APR actual data, and APR-related data not submitted historically. Therefore some, but not all, of this data and the supporting processes have been subject to previous or ongoing external assurance.

We have taken a risk-based approach (via sampling) to assessing the completeness, reliability and accuracy of the source data, the robustness of the reported data and the appropriateness of the confidence grade for the data which the team had assigned. We also checked the consistency of internal commentaries with the data we reviewed and ensured that they did not contain any obviously misleading or false statements.

After each audit, we provided you with detailed feedback which explained our assessment of the risk associated with the reported performance figures and set out the actions arising from our assurance.

Findings

Ofwat requested data covering:

- LK1: Leakage expenditure
- LK2: Leakage prevention activities (relating to pressure management areas)
- LK3: Leakage 'awareness' activities (relating to district metered areas etc.)
- LK4: Active Leakage Control (ALC)
- LK5: Leakage 'mend' activities (including repairs to mains, supply pipes and communication pipes)
- LK6: Leakage levels.

We identified a minor error with one data item (part of the LK5 data), which the team corrected during the audit. Otherwise, we found no issues with the reported data, although we identified some non-material actions for the 'LK1' costs part of the request. These include an action to provide commentary explaining the difference between the leakage costs reported in this submission and those reported in the APR. Overall, we rated LK1 as 'low to medium risk' and the remainder of the submission as 'low risk'.

Assurance Statement

Overall, we conclude that:

- your team has a good understanding of your processes to produce the data in line with Ofwat guidance;
- your team's internal commentaries were consistent with the data we saw at the time of reviewing them and did not contain any obviously false or misleading statements in relation to that data; and
- data are competently sourced, processed and fit for purpose.

Yours sincerely,

Alexandra Martin
Director of Operations

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Appendix 2- LK1: Leakage Expenditure

The values reported in LK1: Leakage Expenditure for 2020-21 and 2021-22 are different to the values reported in table 6C of the APR. The data in this submission is different to the APR values due to the inclusion of additional capital costs including investment in Bulk Metering and Pressure Management. The table below removes the additional categories in this data submission to be consistent with the data reported in table 6C of the APR.

				2017-18								2018-19							
Line description		Units	DPs	Prevent (rehab)- direct costs	Prevent (pressure management) - direct costs	Prevent (calm networks)- direct costs	Aware- direct costs	Locate- direct costs	Mend - direct costs	Indirect costs	Total	Prevent (rehab)- direct costs	Prevent (pressure management) - direct costs	Prevent (calm networks)- direct costs	Aware- direct costs	Locate- direct costs	Mend - direct costs	Indirect costs	Total
				1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Price base				Outturn (nominal)								Outturn (nominal)							
Leakage expenditure																			
1	Maintain expenditure	£m	3	0.000	0.000	0.000	0.002	6.769	11.999	2.425	21.195	0.000	0.000	0.000	0.270	7.076	20.893	2.541	30.780
2	Reduce expenditure	£m	3	0.000	0.000	0.000	0.000	0.671	0.651	0.126	1.448	0.000	0.000	0.000	0.000	1.136	1.059	0.132	2.327
3	Total leakage expenditure	£m	3	0.000	0.000	0.000	0.002	7.440	12.650	2.551	22.643	0.000	0.000	0.000	0.270	8.212	21.952	2.673	33.107

2019-20								2020-21								2021-22							
Prevent (rehab)- direct costs	Prevent (pressure management) - direct costs	Prevent (calm networks)- direct costs	Aware- direct costs	Locate- direct costs	Mend - direct costs	Indirect costs	Total	Prevent (rehab)- direct costs	Prevent (pressure management) - direct costs	Prevent (calm networks)- direct costs	Aware- direct costs	Locate- direct costs	Mend - direct costs	Indirect costs	Total	Prevent (rehab)- direct costs	Prevent (pressure management) - direct costs	Prevent (calm networks)- direct costs	Aware- direct costs	Locate- direct costs	Mend - direct costs	Indirect costs	Total
1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Outturn (nominal)								Outturn (nominal)								Outturn (nominal)							
0.000	0.000	0.000	0.070	7.460	17.972	2.956	28.458	0.000	0.000	0.000	0.877	7.426	19.866	0.000	28.169	0.000	0.000	0.000	0.100	8.583	18.445	2.876	30.004
0.000	0.000	0.000	0.000	1.201	0.933	0.153	2.287	0.000	0.000	0.000	0.000	0.763	2.043	0.000	2.806	0.000	0.000	0.000	0.000	0.883	1.896	0.216	2.995
0.000	0.000	0.000	0.070	8.661	18.905	3.109	30.745	0.000	0.000	0.000	0.877	8.189	21.909	0.000	30.975	0.000	0.000	0.000	0.100	9.466	20.341	3.092	32.999