

Independent Limited Assurance Report

to the Management of Thames Water Utilities Limited

Thames Water Utilities Limited (“Thames Water”) commissioned DNV GL Business Assurance Services UK Limited (“DNV GL”, “us” or “we”) to conduct a limited assurance engagement over Selected Information presented in the Green Bond Impact Report 2017/18 (the “Report”) for the period of 1st April 2015 to the 30th November 2017.



Our Conclusion: Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that the Selected Information is not fairly stated and has not been prepared, in all material respects, in accordance with the Criteria.

This conclusion relates only to the Selected Information, and is to be read in the context of this Assurance Report, in particular the inherent limitations explained below.

Selected Information

The scope and boundary of our work is restricted to the key performance indicators included within the Report (the “Selected Information”), listed below:

- Renewable energy generation from Deephams Sewage Treatment Works (17/18) (kWh)
- Effluent discharge prevention at Deephams Sewage Treatment Works (17/18) (MI)
- Carbon emissions avoided (kg of CO₂e)
- Metering (number of meters)
- Mains rehabilitation (kilometres)
- Water savings from leakage prevention and demand reduction (MI/d)

To assess the Selected Information, which includes an assessment of the risk of material misstatement in the Report, we have used Thames Water’s reporting criteria (the “Criteria”), a summary can be found in Appendix A.

We have not performed any work, and do not express any conclusion, on any other information that may be published in the Report or on Thames Water’s website for the current reporting period or for previous periods.

Basis of our conclusion

We are required to plan and perform our work in order to consider the risk of material misstatement of the Selected Information; our work included, but was not restricted to:

- Assessing the appropriateness of the Criteria for the Selected Information;
- Conducting interviews with Thames Water’s management to obtain an understanding of the key processes, systems and controls in place to generate, aggregate and report the Selected Information;
- Performing limited substantive testing of the Selected Information to check that data had been appropriately measured, recorded, collated and reported;
- Reviewing that the evidence, measurements and the context provided to us by Thames Water for the Selected Information is prepared in line with the Criteria; and
- Reading the Report and narrative accompanying the Selected Information, and whether it is in line with the Criteria.

Our competence, independence and quality control

DNV GL established policies and procedures are designed to ensure that DNV GL, its personnel and, where applicable, others are subject to independence requirements (including personnel of other entities of DNV GL) and maintain independence where required by relevant ethical requirements. This engagement work was carried out by an independent team of sustainability assurance professionals. Our multi-disciplinary team consisted of professionals with a combination of environmental and sustainability assurance experience.

Inherent limitations

All assurance engagements are subject to inherent limitations as selective testing (sampling) may not detect errors, fraud or other irregularities. Non-financial data may be subject to greater inherent uncertainty than financial data, given the nature and methods used for calculating, estimating and determining such data. The selection of different, but acceptable, measurement techniques may result in different quantifications between different entities. Our assurance relies on the premise that the data and information provided to us by Thames Water have been provided in good faith. DNV GL expressly disclaims any liability or co-responsibility for any decision a person or an entity may make based on this Independent Limited Assurance Report.

Standard and level of assurance

We performed a **limited** assurance engagement in accordance with the International Standard on Assurance Engagements (ISAE) 3000 revised – ‘Assurance Engagements other than Audits and Reviews of Historical Financial Information’ (revised), issued by the International Auditing and Assurance Standards Board. This standard requires that we comply with ethical requirements and plan and perform the assurance engagement to obtain limited assurance.

DNV GL applies its own management standards and compliance policies for quality control, in accordance with ISO/IEC 17021:2011 - Conformity Assessment Requirements for bodies providing audit and certification of management systems, and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement; and the level of assurance obtained is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. We planned and performed our work to obtain the evidence we considered sufficient to provide a basis for our opinion, so that the risk of this conclusion being in error is reduced but not reduced to very low.

For and on behalf of DNV GL Business Assurance Services UK Limited, London, UK
22nd October 2018



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Responsibilities of Thames Water's Management and DNV GL

The Management of Thames Water have sole responsibility for:

- Preparing and presenting the Selected information in accordance with the Criteria;
- Designing, implementing and maintaining effective internal controls over the information and data, resulting in the preparation of the Selected Information that is free from material misstatements;
- Measuring and reporting the Selected Information based on their established Criteria; and
- Contents and statements contained within the Report and the Criteria.

Our responsibility is to plan and perform our work to obtain limited assurance about whether the Selected Information has been prepared in accordance with the Criteria and to report to Thames Water in the form of an independent limited assurance conclusion, based on the work performed and the evidence obtained. We have not been responsible for the preparation of the Report.

DNV GL Business Assurance

DNV GL Business Assurance Services UK Limited is part of DNV GL – Business Assurance, a global provider of certification, verification, assessment and training services, helping customers to build sustainable business performance.

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Appendix A. Thames Water's Key Performance Indicators (KPIs): Definitions and methodology

The table below has been prepared by Thames Water Utilities Limited, it is intended to provide readers with a summary of the methodologies used by the company to prepare the Selected Information.

KPI	Units	Definition	Comments
Renewable energy generation from Deephams Sewage Treatment Works (17/18)	Kilowatts per hour (kWh)	Amount of renewable energy self generated by our Combined Heat and Power engines. This uses gas extracted from wastewater treatment to create fuel	Half hourly metered data is sent daily (one day in arrears) electronically to Thames Water from our energy provider, under our contract agreements. Metered data is loaded and validated into the corporate energy database (Optima)
Effluent discharge prevention at Deephams Sewage Treatment Works (17/18)	Mega litres (Ml)	Amount of wastewater prevented from being discharged into the river during peak times such as storm events	To determine the magnitude of the storm discharge reduction, real storm events were modelled from the 2017/18 financial year (i.e. events which occurred after the hydraulic capacity of the plant had been increased) against the original plant's hydraulic capacity. Storm flow durations are taken from Thames Water's notices to the Environment Agency.
Carbon emissions avoided	Kilograms of carbon equivalent emissions (kg of CO ₂ e)	Company specific multiples have been applied to translate leakage benefit and renewable energy generated into carbon equivalent emissions avoided	The multiples applied have been calculated using the Carbon Accounting Workbook which is used by all Water Companies by UKWIR (UK Water Industry Research). This includes the population of emissions conversion factors (which convert activities to emissions, e.g. kg of CO ₂ emitted per litre of diesel burnt). These are updated annually by UKWIR to align with government published factors
Metering	Number of meters	Number of meters installed and maintained or replaced based on count data from each of our metering programmes	Meter installs data is taken from the Thames Water Metering System (TWMS). This management system records all meter installations including those from contractors
Mains rehabilitation	Kilometres of mains	We have reported on the length of rehabilitation of two types of mains; <ul style="list-style-type: none"> • Trunk mains which are larger diameter pipes used for clean water (typically 18" or greater) • Distribution mains which are smaller in diameter than trunk mains 	Metric includes all mains delivered by our capital delivery alliance partnership (Eight20). Project outcomes are collated, reviewed and uploaded to a master tracking sheet and our reporting system (SAP)

Appendix A. (contd.)

KPI	Units	Definition	Comments
Water savings from leakage prevention and demand reduction	Mega litres per day (Ml/d)	<p>Leakage is defined as the annual average leakage from our network and customer supply pipes in mega litres per day (Ml/d).</p> <p>Leakage prevention/ benefit is individually tracked against each of the following:</p> <ul style="list-style-type: none"> • Mains replaced (per km) • Pressure management schemes • Number of meters installed 	<p>Metering:</p> <p>Optants programme: Demand - Optant Ml/d saving is based on an assumed unit rate per installation. Leakage - Optant Ml/d saving is based on an assumed unit rate per installation.</p> <p>Progressive Metering Programme: Demand - This is based on an assumed unit rate per installation and claimed at various phases during the customers transition Leakage - This is calculated on the consumption data from the meter. The Ml/d saving is generated from the delta between the continuous flow prior to leak repair and the revised flow profile following leak repair. The average flow for 2 weeks before and after the repair is used to calculate the saving.</p> <p>Bulk meters: Leakage - This is calculated on the consumption data from the bulk meter. The Ml/d saving is generated from the delta between the continuous flow prior to leak repair and the revised flow profile following leak repair. The average flow for 2 weeks before and after the repair is used to calculate the saving.</p> <p>Mains rehabilitation:</p> <p>There are two main methods of calculating mains rehabilitation leakage: large areas (Usually District Meter Areas (DMA)) and small pipe cohorts. The calculation of leakage for large areas (DMA) replacement is very similar to the methodology used for pressure management where a pre-construction and post-construction leakage calculation is carried out. The difference between the two is the leakage saving. In small cohort mains, replacement leakage is taken from our AIM (corporate) systems which holds a leakage estimate against each pipe. When a pipe is replaced the leakage estimate is claimed as the leakage benefit achieved.</p> <p>Pressure Management:</p> <p>All areas for potential pressure management are subject to a leakage calculation (often using a combination of field data and desktop analysis) before being selected for the installation of a pressure control device. When construction and commissioning are completed, a further leakage calculation is carried out. The difference between the two calculations is the leakage saving. The leakage benefit claimed is subject to a sign-off process to ensure the calculation of benefit is appropriate.</p>