# Project Looking Glass

## Report on Long Unread Meters

**Document Control:**

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### Foreword by Market Operator Services Ltd (MOSL)

*Funded by the Market Improvement Fund (ref: 2021-R1-004).*

Accurate and timely customer bills and settlement between trading parties relies on accurate meter read data. Accurate data is essential to the effective functioning of the Non-Household market.

'Project Looking Glass' is a collaboration between MOSL and consultants OccuTrace to investigate and provide accurate data on the root causes for non-household (NHH) water meters being 'long unread'. A long unread meter is any meter associated with an occupied premise that has not had a meter reading entered to the Central Market Operating system (CMOS) for 12 months or more.

The MOSL/Occutrace work involved visiting a cross-section of externally located meters across the NHH market to assess the accuracy of the asset's data, current site conditions and any other obstacles to a meter reading being taken.

The findings of the research are valuable for MOSL and the Metering Committee to raise awareness and work to significantly reduce or eliminate long unread meters in the market. It also provides evidence to help inform the Committee's 2023/24 plan of works and shape future policy making to help improve the market in future.

We would like to thank the OccuTrace team, and the trading parties involved in this important piece of work.

## Executive Summary

This Market Improvement Fund project (Ref 2021-R1-004) was designed to investigate Long Unread Meters (LUMs) in the water retail market. A sample of 1,935 externally located LUMs as registered in CMOS was selected at random. Only external LUMs were included in the sample to reduce the level of direct customer impact arising from the site visits.

OccuTrace, a specialist water industry service provider, were tasked with attempting to find and read these meters, based on the location and customer information held in CMOS and allowing up to a maximum of an hour of on-site investigations.

A total of 493 new meter readings were captured during these visits, and these meter reads have been passed to the appropriate Retailer for entry to CMOS and/or their billing systems. New information was also captured on the meter locations, and this could also be updated in CMOS by the trading parties.

The key findings from the work are divided into the following groups:

| Category of LUM | Key features |
|---|---|
| Definitely readable<br>40% | **Description:** Meters that are easy to find and could be readily included in a meter reading agency's standard reading practice. Possibly not read as expensive to read because of being remote or hard to locate.<br>**Reasons:**<br>• Found and Read (27%)<br>• Chamber found but the meter has been exchanged (8%)<br>• Chamber found but the meter has been removed (5%)<br>**Suggested corrective action:** Retailers to develop contracts with reading agencies to include these meters or to seek alternative reading methods or opportunities. Bilateral should be raised where exchange or removal has taken place. |
| Probably readable<br>12% | **Description:** Meters that take too long to read for meter reading agencies but with some local investigation and pre-visit preparation could be read.<br>**Reasons:**<br>• Asset Issues (5%)<br>• Temporary Access Issues (3%)<br>• H&S Issues (2%)<br>• Customer Issues (1%)<br>**Suggested corrective action:** Paired Trading Parties to conduct a one-off exercise to improve location details, site conditions and other relevant information and update CMOS. |
| Probably unreadable<br>22% | **Description:** Meters where there is little chance of finding them due to site conditions, incorrect location details or inadequate information.<br>**Reasons:**<br>• Insufficient CMOS data/information (20.5%)<br>• Permanent Access Issue (1.5%)<br>**Suggested corrective action:** Retailers to raise a bilateral for Wholesalers to conduct a detailed site and pipework investigation, make any repairs |

| | |
|---|---|
| | or improvements to the meter location as necessary and update location details in CMOS. |
| Almost certainly unreadable<br>26% | **Description:** Meters that may not exist or cannot be found by extensive site investigations, or where premises re-development or change of use occurred<br>**Reasons:**<br>• Meter Chamber Not Found (21%)<br>• Potential Deregistration (5%)<br>**Suggested corrective action:** Retailers to raise bilateral to Wholesalers where evidence demonstrates the meter cannot be found or read. |

Market next steps and recommendations from this work are:

- Occutrace and MOSL have presented their findings to the Metering Committee and prompted the question of "what next?"
- OccuTrace have presented their finding to the market at November 2022 User Forum
- Trading parties will be encouraged to take ownership and use the findings to proactively work together to reduce LUMs within their control
- The market to work together to remove legacy long unread meters by December 2023; MOSL to provide latest list by Wholesaler by December 2022
- MOSL to use this report and it's finding and conclusions to direct and support future metering projects and to drive a potential NHH National Metering Strategy
- Wholesalers to review their new connections and meter replacement processes to ensure every meter installation is clearly seen as an exercise in maintaining long-term meter readability
- MOSL to share finding with the Market Performance Committee (MPC), the Market Performance Framework (MPF) Review and the Data Cleanse Projects to inform decisions and drive reductions in LUMs

## Introduction & Background

Project Looking Glass (PLG) was initiated as a MIF project (Ref 2021-R1-004) to investigate, analyse and report on the root causes of Long Unread Meters (LUMs). It is recognised by all trading parties that LUMs are a significant issue, impacting the ability of retailers to accurately bill customers and compromising the accuracy of settlement charging between wholesalers and retailers. For the market to function efficiently, timely and accurate reading of meters is an essential prerequisite.

In order to reduce the level of direct customer impact arising from the site visits, it was decided to focus solely on external meters (as registered in CMOS) for this project. At the outset of PLG, MOSL provided a CMOS extract of all 112,000 designated external LUMs (60% of the total LUM population of 186,000) to OccuTrace. From this extract, a random sample of approximately 2,000 LUMs was to be created that would act as the 'pot' from which investigation and assessment would take place. OccuTrace performed the fieldwork, data analysis and production of a report detailing the findings (this document).

OccuTrace have an established track record of delivering LUM reduction projects for other water industry clients and an existing network of field agents, with access to appropriate mobile app technology, enabling the project to be completed within 7 months. MOSL and OccuTrace agreed to use a hybrid methodology, part based on that used on previous OccuTrace projects, supplemented with additional requirements and incorporating the Metering Committee's Hard to Read guidance.

A LUM outcome was assessed as being in one of the following 11 categories:

1. Found and Read (including Leading Zero Serial Number Errors)
2. Meter Chamber Not Found
3. Insufficient Information
4. Found but the meter has been exchanged (including both New Meter Tap Tested and Not Tap Tested)
5. Asset Issue
6. Potential Deregistration
7. Chamber found but the meter has been removed
8. H&S Issue
9. Temporary Access Issue
10. Permanent Access Issue
11. Customer Issue – Lack of Cooperation

For PLG, this standard methodology for LUM projects was augmented with additional requirements set by MOSL, namely:

- ***Land Use*** – categorisation of each LUM visited in terms of the meter location being one of:
  - Agricultural
  - Industrial
  - Infrastructure (i.e. railway lines, bridges, roads etc.)
  - Residential
  - Secure Entry
  - Urban High Street
  - Urban Retail Park
- ***What 3 Words*** – establishing the appropriate What 3 Words value for each meter location
- ***Hard to Read Reasons*** – categorisation of each LUM visited in terms of the meter exhibiting up to 3 of the following requirements:

  - 2 Man Lift
  - Barriers and signing required
  - Permanently flooded
  - Pit deeper than 1.2m
  - Read would impact traffic
  - Required special access or arrangements
  - Road closure required
  - Situated in a 50mph road
  - Too high or confined space
- ***Outcome Sub-Categories*** – more detail for specific outcome categories, namely:
  - Meter Chamber Not Found
    - Unable to Locate
    - Address Requires Correction
    - Poor Location Notes
    - Other
  - Insufficient Information
    - Unable to Locate
    - Address Requires Correction
    - Poor Location Notes
    - Other
  - Asset Issue
    - Debris in Chamber
    - Flooded Chamber
    - Jammed Lid
    - Damaged Meter
    - Water Ingress
    - Pit Deeper Than 1.2m
    - Other
  - H&S Issue
    - Situated in Busy Road
    - 2 Man Lift
    - Pit Deeper Than 1.2m
    - Other

**Key data values used in the analysis for this project:**

- **Total number of meters in the market – 1.29m**
- **Total number of LUMs – 186,000 (14%)**

Based on the above project objectives, both MOSL and OccuTrace were confident that PLG would generate a comprehensive and representative random dataset about the state of LUMs in the market.

Good standards of project governance were maintained throughout the delivery of PLG, with fortnightly progress review meetings between MOSL and OccuTrace and regular updates to the Strategic Panels Metering Committee and via the MOSL User Forum.

## Creating the LUM Dataset

It was essential that the sample of LUMs assessed was representative of the overall population that existed in the market at the point of project initiation. In broad terms, the objective was to investigate >1% of external LUMs, geographically spread across all wholesale areas in proportion to the LUM population, to generate statistically significant results. The final random sample generated was 1.7% of the external LUM population.

An analysis of data showed the presence of LUMs in 280 wholesaler / retailer combinations, of which 195 had less than 100 LUMs by number. That left a potential set of 85 wholesaler / retailer combinations where an appropriate sample could be generated. However, it was felt that this approach would lead to a very fragmented view that would not be representative of the LUM population as more than 80% of LUMs are contained within the top 10 wholesaler / retailer combinations.

Instead, a simple sampling approach was applied whereby the site visits were allocated to each wholesale area in proportion to their total LUM population, regardless of which retailer the SPID was registered to. The table below shows that split of LUMs assessed by wholesaler:

| Wholesaler | Number of LUMs in Original Sample | Number of Internal LUMs Excluded | Number of LUMs Assessed | %age of LUMs Assessed |
|---|---|---|---|---|
| AFFINITY-W | 91 | 1 | 90 | 5% |
| ANGLIAN-W | 164 | 44 | 120 | 7% |
| BRISTOL-W | 12 | 1 | 11 | 1% |
| NORTHUM-W | 139 | 5 | 134 | 7% |
| PORTSMOUTH-W | 25 | 0 | 25 | 1% |
| SEVERN-W | 401 | 0 | 401 | 22% |
| SOUTHEAST-W | 221 | 3 | 218 | 12% |
| SOUTHERN-W | 21 | 0 | 21 | 1% |
| SOUTHSTAFF-W | 71 | 10 | 61 | 3% |
| SOUTHWEST-W | 124 | 3 | 121 | 7% |
| SSE-W | 3 | 0 | 3 | 0% |
| SUTTON-W | 25 | 6 | 19 | 1% |
| THAMES-W | 271 | 53 | 218 | 12% |
| WESSEX-W | 16 | 2 | 14 | 1% |
| UNITED-W | 286 | 0 | 286 | 16% |
| YORKSHIRE-W | 65 | 5 | 60 | 3% |
| **Grand Total** | **1,935** | **133** | **1,802** | **100%** |

133 internal meters, but shown in CMOS as external, were identified within the 1,935 sample and these were excluded from further investigation. Of the remaining 1,802 LUMs that were assessed, 1,512 site visits were conducted and 290 were assessed via a desktop exercise as there was insufficient data available in those cases to support a full site visit.

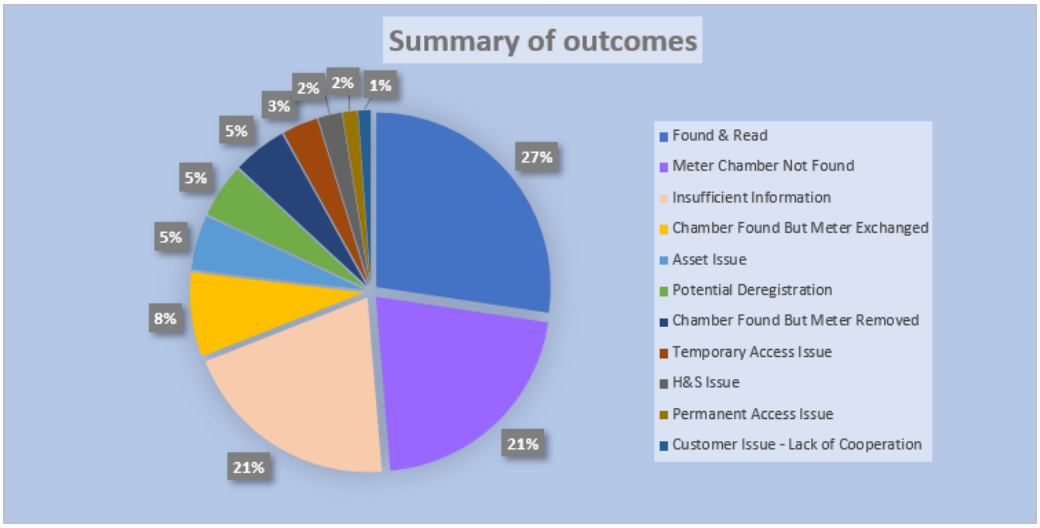
## Outcomes Achieved

The table below shows the headline results for the 1,802 LUMs assessed as part of PLG. Included in the table below is a column for Readable or Unreadable, which is explored further in the next section of the report.

4 levels of confidence are used to categorise the extent to which a LUM is readable:

1. DR = Definitely Readable
2. PR = Probably Readable
3. PU = Probably Unreadable
4. ACU = Almost Certainly Unreadable

| Outcome Category | Readable or Unreadable? | Number of LUMs | %age of LUMs |
|---|---|---|---|
| Found and Read<br>• Leading Zero Serial Number Error – 85 (17%) | DR | 493 | 27% |
| Meter Chamber Not Found | ACU | 384 | 21% |
| Insufficient Information | PU | 367 | 20% |
| Chamber found but the meter has been exchanged<br>• New Meter Tap Tested - 74 (52%)<br>• New Meter Not Tap Tested – 67 (48%) | DR | 141 | 8% |
| Asset Issue | PR | 91 | 5% |
| Potential Deregistration | ACU | 90 | 5% |
| Chamber found but the meter has been removed | DR | 90 | 5% |
| Temporary Access Issue | PR | 60 | 3% |
| H&S Issue | PR | 40 | 2% |
| Permanent Access Issue | PU | 25 | 1% |
| Customer Issue – Lack of Cooperation | PR | 21 | 1% |
| **Grand Total** | | **1,802** | **100%** |



As expected, the largest single category is Found and Read, but the figure of 493 (27%, including those with leading zero serial number data errors) is well below expectations based on previous projects conducted by OccuTrace in the market. Those projects have generated Found and Read figures in the region of 50%.

Part of the explanation for this is likely to be that previous projects will have benefited from additional customer, address or meter location information provided by retailers that is not always present or updated within CMOS. On this project, some retailers were more willing to engage than others and they responded to requests for additional information in a timely manner. For those retailers, the Found and Read percentage is 34%, whereas for the remaining retailers it was 24%. This illustrates the need for a highly collaborative approach and for all available data to be accessible as part of the investigation process and to be updated and maintained within CMOS.

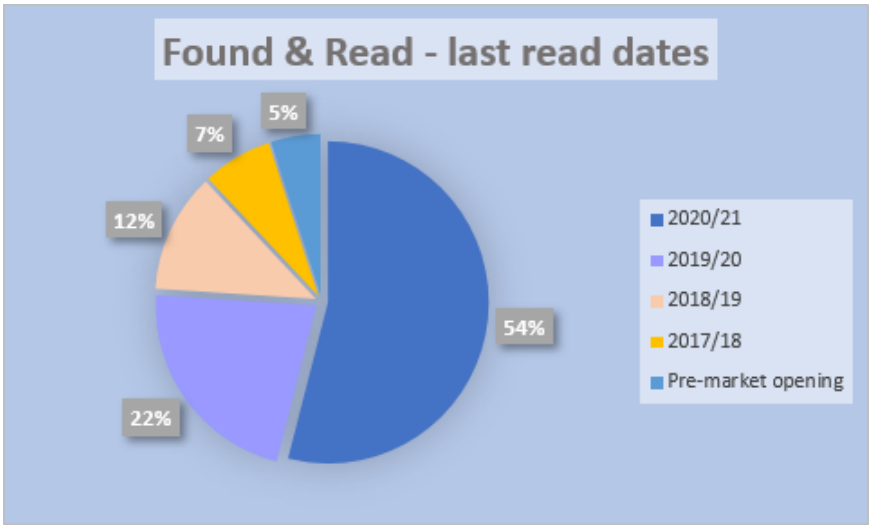
The fact that PLG included both occupied and vacant properties and was assessing external meters only makes these results less comparable to previous projects. Typically, those projects would exclude vacant properties and would always be a mix of external and internal meters. The investigation of internal LUMs necessitates customer contact that may assist the agent in locating and reading a meter.

Whilst the overall figure was 27%, the range for the wholesale areas with the lowest and highest Found and Read figures was very broad, from 14% to 69%. This demonstrates that the ability to find and read a LUM does vary significantly from area to area.

The table below shows the top 3 outcomes by number for each wholesale area, with the percentage figure showing the figure for that area, e.g. 47% of LUMs in wholesale area A were Found and Read, 32% of LUMs in wholesaler area A were Not Found, etc. Wholesalers are assigned to one of 3 groups based on the scale of LUMs within their area from the original 1,935 sample – group 1 is <50, 2 is 50 to 200 and 3 is >200.

| Wholesaler | Scale of LUMs | %age Found and Read | %age Not Found | %age Insufficient Information |
|---|---|---|---|---|
| A | 3 | 47% | 32% | 3% |
| B | 3 | 25% | 18% | 10% |
| C | 3 | 22% | 15% | 31% |
| D | 3 | 22% | 31% | 14% |
| E | 2 | 35% | 15% | 8% |
| F | 2 | 34% | 14% | 16% |
| G | 2 | 25% | 31% | 23% |
| H | 2 | 23% | 15% | 39% |
| I | 2 | 22% | 41% | 11% |
| J | 2 | 17% | 9% | 50% |
| K | 1 | 69% | 16% | 5% |
| L | 1 | 36% | 9% | 27% |
| M | 1 | 33% | 29% | 14% |
| N | 1 | 28% | 24% | 0% |
| O | 1 | 14% | 0% | 71% |

Taking into account all 1,802 assessed LUMs, the last read dates show that 266 (15%) are 'legacy' LUMs, with a last read date pre-market opening, and 648 (36%) are 'recent' LUMs, with a last read date in 2020/21. However, the reliability of the available last read date information in CMOS may be questionable as all meters have a last read date, ranging from 1986 to early 2021.




Comparing the last read date for the 493 meters that were read as part of the project gives the following figures:

- 23 (5%) – Pre-Market Opening
- 36 (7%)– 2017/18
- 59 (12%) – 2018/19
- 107 (22%) – 2019/20
- 268 (54%) – 2020/21

These results are perhaps not surprising in that 'recent' LUMs are more likely to have been Found and Read. It does then beg the question as to the best course of action to resolve the remaining 'legacy' LUMs? If these figures are representative and 15% of the total LUM population are 'legacy', that indicates a figure of over 28,000 that need to be addressed. Adopting a similar approach to that used on PLG is unlikely to have a major impact, so a different approach for 'legacy' LUMs is required. For example, these meters could be passed back to the wholesaler to find and read?

That could also take the form of a more intensive search-based approach, using more specialised resources, or a policy-based approach whereby SPIDs are initially moved to unmeasured and then have new meters installed. Determination of the most appropriate means of addressing this challenge is something that should be considered as part of the Strategic Metering review work.

In order to provide greater insight, specific outcomes were broken down into sub-categories based on observations recorded during the site visits.

***Meter Chamber Not Found – 384 (21%) in total, breakdown as follows:***

- 315 (82%) - Unable to Locate
- 10 (3%) - Address Requires Correction
- 8 (2%) - Poor Location Notes
- 51 (13%) - Other

***Insufficient Information – 367 (20%) in total, breakdown as follows:***

- 247 (67%) - Address Requires Correction
- 80 (22%) - Poor Location Notes
- 16 (4%) - Unable to Locate
- 24 (7%) - Other

***Asset Issues – 91 (5%) in total, breakdown as follows:***

- 24 (26%) - Debris in Chamber
- 19 (21%) - Flooded Chamber
- 19 (21%) - Jammed Lid
- 16 (18%) - Damaged Meter
- 7 (8%) - Water Ingress
- 2 (2%) - Pit Deeper Than 1.2m
- 4 (4%) - Other

***H&S Issue – 40 (2%) in total, breakdown as follows:***

- 19 (48%) - Situated in Busy Road
- 17 (42%) - 2 Man Lift
- 2 (5%) - Pit Deeper Than 1.2m
- 2 (5%) - Other

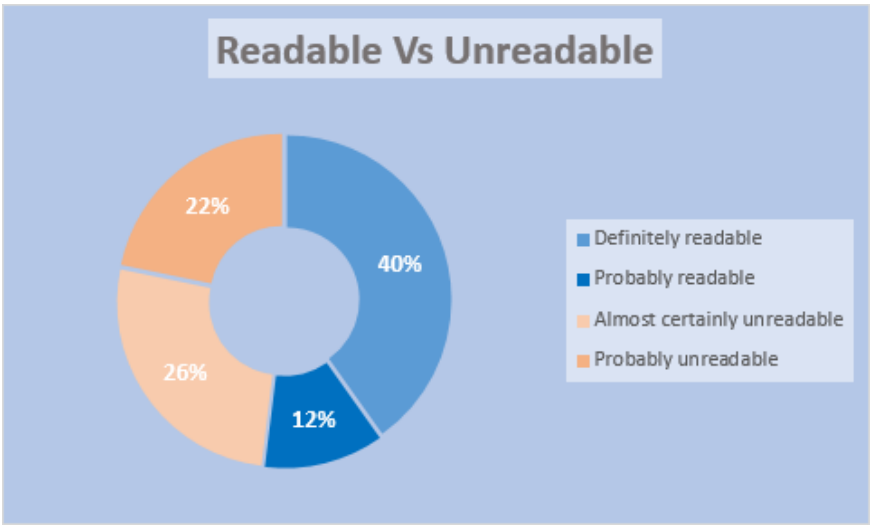
Property address and meter location information are vital to achieve a 'successful' outcome. The above data confirms that this is an area of relative weakness that drives the volume of 'failure' outcomes – Not Found and Insufficient Information. An increased focus on the quality of address and meter location details in CMOS is clearly required, with perhaps stronger incentives under the MPF on all involved parties to create and maintain information that is truly an asset to the market. This report will also feed into the MPF review work being carried out by MOSL.

The overall conclusion to draw from these results is that, as expected, the market collectively faces a complex issue. Achieving significant reductions, and sustaining those lower levels of LUMs, will therefore require a highly collaborative approach, as is currently being demonstrated by some Trading Parties. There are multiple reasons and factors at play as to why LUMs exist. One party alone cannot solve the problem, but all parties working together can certainly achieve significant reductions in the scale of the issue. As a minimum, steps should be taken urgently to ensure that any new meters entering the market are subject to extremely stringent checks in terms of the completeness and accuracy of the associated data. Failure to do so will inevitably mean that some of today's new meters become the LUMs of tomorrow.

## Readable v Unreadable Meters?

The above 11 outcome categories were designated as either:

- ***Definitely Readable*** – 724 (40%) – the meter chamber was located and, if present, a meter was read
- ***Probably Readable*** – 212 (12%) – temporary access, asset or H&S issues currently prevent reading, but either the chamber was located or confidence is high that it can be found
- ***Probably Unreadable*** – 392 (22%) – confidence is low that the meter chamber can be located
- ***Almost Certainly Unreadable*** – 474 (26%) – whilst sufficient information is available to suggest the meter is readable, actual evidence indicates that the meter cannot be read




This analysis shows that approximately 52% of LUMs are readable, given a reasonable amount of time, resources and planning, whereas 48% are either unlikely to be read or would require an unreasonable / disproportionate level of effort, resources and costs to locate, resolve and make readable.

Based on the terminology used here, it is apparent that absolute certainty is in short supply. The only scenario whereby we can say with 100% certainty whether a meter is readable or not is where the correct meter has been read. Where we have an unrecorded exchange or where the chamber is located but the meter has been removed, we have near 100% certainty. Everything else carries a more significant element of doubt and uncertainty.

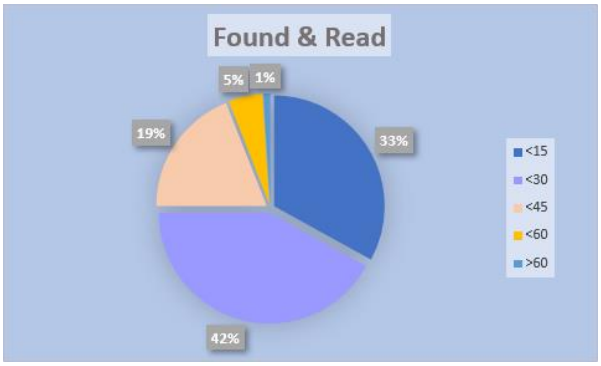
The major positive to take from this is that, based on this sample, we should be highly confident that at least 40% of LUMs are resolvable via existing market mechanisms – cyclic meter reading and meter exchange processes.

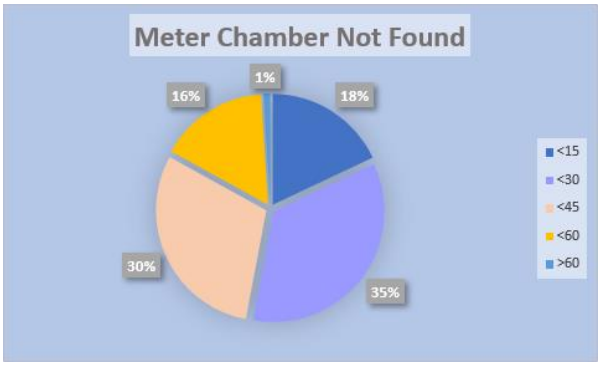
## Time on Site

An important consideration in conducting the PLG site visits and obtaining an outcome is the length of time required to do so. The market needs to function in a cost-effective manner and obtaining a meter reading should be a reasonably low-cost, short-duration activity. That said, as any experienced water industry practitioner knows, some locations are complex to navigate than others, and more time may be required.

Prior to executing PLG, very little was known about the reality of reading LUMs or establishing other outcomes for the meters in question. The table below now shows, for the first time, how much effort is actually required:

| Minutes On Site<br>Outcome Category | <15 | <30 | <45 | <60 | >60 | N/A | Total |
|---|---|---|---|---|---|---|---|
| Found and Read | 163 (33%) | 207 (42%) | 92 (19%) | 26 (5%) | 5 (1%) | 0 (0%) | 493 (100%) |
| Meter Chamber Not Found | 70 (18%) | 135 (35%) | 117 (30%) | 62 (16%) | 5 (1%) | 0 (0%) | 389 (100%) |
| Insufficient Information | 24 | 20 | 27 | 14 | 0 | 282 | 367 |
| Found but the meter has been exchanged | 32 | 58 | 33 | 13 | 5 | 0 | 141 |
| Asset Issue | 27 | 28 | 29 | 7 | 2 | 0 | 93 |
| Potential Deregistration | 20 | 32 | 23 | 6 | 0 | 8 | 89 |
| Chamber found but the meter has been removed | 22 | 50 | 10 | 1 | 3 | 0 | 86 |
| Temporary Access Issue | 26 | 26 | 4 | 2 | 0 | 0 | 62 |
| H&S Issue | 10 | 21 | 8 | 1 | 0 | 0 | 40 |
| Permanent Access Issue | 9 | 10 | 4 | 2 | 0 | 0 | 25 |
| Customer Issue – Lack of Cooperation | 7 | 7 | 5 | 1 | 1 | 0 | 21 |
| **Grand Total** | **410 (23%)** | **594 (33%)** | **352 (20%)** | **135 (7%)** | **21 (1%)** | **290 (16%)** | **1,802 (100%)** |




11% of all LUMs that were visited were Found and Read within 15 minutes; 25% within 30 minutes. Those are the cases for which there can be little doubt that current meter readers are able to 'do the job' and their failure to do so brings into question the quality of service being delivered.

Whilst it might have originally been envisaged that many site visits would require a long duration to achieve an outcome, in fact only 1% of visits lasted more than an hour.

Aggregating the first 3 columns of the table above, 90% of the 1,512 site visits conducted had a duration of less than 45 minutes; 66% less than 30 minutes. For Found and Read meters, 94% of site visits were completed in less that 45 minutes; 75% in less than 30 minutes.

The expected duration for a cyclic meter reading visit will of course be much shorter, typically less than 10 minutes. Visits similar to those conducted by PLG would impact reading schedules and retailers' cost-to-serve figures. However, what this data demonstrates is that the true cost-to-serve calculations for a retailer need to consider the actual effort required across an appropriate range of meter reading scenarios, including meters that are complex and time-consuming to read.

The overall conclusion to draw from this part of the analysis is that the level of LUMs in the market can be reduced materially via cyclic meter reading visits, given an allocation of time that reflects the actual effort involved. Reductions in the level of LUMs of some 15% to 20% should be expected from current meter readers once directed and supported in the appropriate manner.

Retailers moving their commercial models for meter reading services away from 'payment per visit' to 'payment per read' will undoubtedly help to drive this change, as would a review of the MPF incentives regime associated with LUMs. Charges imposed under the MPF on retailers should be proportionate but should also act as a strong incentive to read rather than skip.

## Hard to Read Reasons

As shown in the table below, only 191 LUMs that were visited (13%) were considered to have any "Hard to Read" characteristics, based on the recently issued guidance from the Metering Committee, to be found at https://mosl.co.uk/documents-publications/4865-hard-to-read-meter-definitions/file:

| Primary Hard to Read Reason | Number of LUMs | %age of Total | %age of 191 Hard to Read |
|---|---|---|---|
| Not hard to read | 1,321 | 73% | N/A |
| Not visited | 290 | 16% | N/A |
| Required special access or arrangements | 68 | 4% | 36% |
| 2 Man Lift | 51 | 3% | 27% |
| Pit Deeper than 1.2m | 26 | 1% | 14% |
| Permanently Flooded | 21 | 1% | 11% |
| Too High or Confined Space | 9 | 0.5% | 5% |
| Barriers and Signage Required | 6 | 0.3% | 3% |
| Read Would Impact Traffic | 5 | 0.3% | 2.5% |
| Situated in a 50mph Road | 3 | 0.2% | 1.5% |
| Road Closure Required | 2 | 0.1% | 1% |
| **Grand Total** | **1,802** | **100%** | **100%** |

Of the 191 LUMs that had at least one Hard to Read reason associated with them, 41 (21%) of these resulted in a Found and Read outcome. 35 (18%) were categorised as an Asset Issue, including 12 (6%) that were Permanently Flooded. 32 (17%) were categorised as a H&S Issue, including 17 (9%) that required a 2 Man Lift.

The overall conclusion to draw from this part of the analysis is that meters exhibiting Hard to Read characteristics are not a significant factor in driving the level of LUMs in the market.

## Land Use

Inclusion of Land Use data within PLG presents an opportunity for a predictive measure to be developed. If we know that a particular physical setting increases the probability of a meter becoming a LUM, then we are better placed to introduce appropriate risk-based preventative measures. The table below does indeed show that specific categories of Land Use increase that probability:

| Land Use | Number of LUMs | %age of LUMs | Forecast F&R | Actual F&R | Actual v Forecast | Forecast Not Found | Actual Not Found | Actual v Forecast |
|---|---|---|---|---|---|---|---|---|
| Agricultural | 282 | 19% | 92 | 61 | ***66%*** | 73 | 123 | ***170%*** |
| Industrial | 338 | 22% | 110 | 120 | ***109%*** | 87 | 85 | ***98%*** |
| Infrastructure | 33 | 2% | 11 | 7 | ***65%*** | 8 | 8 | ***94%*** |
| Residential | 358 | 24% | 117 | 99 | ***85%*** | 92 | 85 | ***92%*** |
| Secure Entry | 19 | 1% | 6 | 6 | ***97%*** | 5 | 7 | ***143%*** |
| Urban High Street | 407 | 27% | 133 | 173 | ***130%*** | 105 | 61 | ***58%*** |
| Urban Retail Park | 75 | 5% | 24 | 27 | ***110%*** | 19 | 20 | ***104%*** |
| Total | 1,512 | 100% | 493 | 493 | | 389 | 389 | |
| Not Visited | 290 | | 0 | 0 | | 0 | | |
| **Overall Total** | **1,802** | | **493** | **493** | | **389** | | |

Based on the overall figures of 493 Found and Read and 398 Meter Chamber Not Found, the above table provides insight as to the impact of Land Use on the likelihood of a meter becoming a LUM. It's fair to say that this won't come as any great surprise, but LUMs within an Agricultural setting are statistically much harder to find and much less likely to be read. The same point applies to a lesser extent to Infrastructure and Secure Entry settings.

It is clear from these results that Land Use is a significant factor in determining the likelihood of a meter becoming a LUM, and then remaining a LUM over an extended time period. The overall conclusion to draw from this part of the analysis is that Land Use should be considered as a market data item that is then used to determine the appropriate allocation of mandated remote meter reading technology.

Applying technology-based solutions to settings that are high risk, in terms of meters being hard to find and difficult to read, is recommended as a specific area for consideration as part of the work on future options for metering roles and responsibilities.

## CMOS Data Quality

The primary purpose of PLG was not to conduct an audit of market data quality. However, both MOSL and OccuTrace felt that, after conducting over 1,500 site visits, an assessment could be made as to the accuracy and completeness of the CMOS data used to underpin the delivery of the project.

There are 7 specific items of market data discussed below:

- Meter Size
- Meter Serial Number
- Meter Location Code
- Meter Location Notes
- Property Address
- X,Y Coordinates
- Occupancy Status

***Meter Size***

There were no reported discrepancies in terms of the CMOS data for meter size. Whilst that is good news, it should be tempered with the view that meter size issues are perhaps more likely to exist where the meters were Not Found.

***Meter Serial Number***

85 (17%) out of 493 meters that were Found and Read had an issue with the actual serial number versus the market data value in CMOS.

***Meter Location Code***

As reported above, despite the CMOS extract being exclusively External meters, 133 were subsequently determined to be Internal. That represents 7% of the LUM population, which if extrapolated over the entire meter population would indicate a location data quality issue with some 13,000 meters in the market.

***Location Notes***

Only 88 site visits (6%) ended with a specific Poor Location Notes outcome, but anecdotal evidence would indicate the issue is larger than that. A specific review of 2,400 location notes across the original CMOS extract showed that 207 (9%) were blank and 144 (6%) were extremely vague. This information has been shared with the Metering Committee's Quick Start Project 9, which is looking at Standard Locations guidance including What 3 Words.

Examples of very poor location notes included:

- 14 x "FPATH"
- 11 x "VERGE"
- 3 x "*"
- 2 x "CHAMBER"

***Property Address***

257 site visits (19%) resulted in an Address Requires Correction outcome. That, coupled with the overall figures of 384 Not Found and 367 Insufficient Information confirms that CMOS address data quality is not

where it needs to be to act as a positive contributor to resolving LUM issues. This will feed into MOSL's Data Cleanse Project.

***X,Y Coordinates***

OccuTrace uses a specific and very accurate methodology for establishing the X,Y coordinates for a meter, which involves the use of Google Maps and a manual process to drag a pin to the exact map location for the meter. This is potentially different to other approaches used in the past to generate the X,Y data that is now within CMOS. X,Y data is one of the key tools, particularly in agricultural or industrial settings, for locating a hard-to-find meter and they are the fundamental prerequisite for What 3 Words values, should organisations wish to adopt that method of recording location information.

For the 728 outcomes where a meter was read or the correct chamber was located, X,Y coordinates were recorded by the OccuTrace field agent. The table below shows the comparison with the existing CMOS X,Y data and the distance in meters from one to the other:

| Distance between Current and New X,Y Coordinates | Number of LUMs | %age of LUMS |
|---|---|---|
| <1m | 77 | 11% |
| 1m to 20m | 358 | 49% |
| 20m to 50m | 110 | 15% |
| 50m to 100m | 73 | 10% |
| >100m | 110 | 15% |
| **Grand Total** | **728** | **100%** |

It would be reasonable to expect some minor differences, given the approach used for measurement on PLG is not necessarily the same as that used previously. However, anything greater than 20m, which is 50% of those measured, indicates a concern over data accuracy that could impact someone attempting to locate a meter in a timely manner. These results are worrying and would point to the fact that overall accuracy of X,Y data in CMOS, or even the market as a whole, needs to be significantly improved. With 186,000 LUMs currently in the market, we could be looking at over 90,000 meters requiring an update to X,Y data.

***Occupancy Status***

Where evidence indicated that a change of occupancy status, from Vacant to Occupied or vice versa, was justified this was recorded by the OccuTrace field agents. In overall terms, 273 changes of occupancy status (18%) were identified via these site visits. The changes were 207 Vacant to Occupied and 66 Occupied to Vacant.

## Overall Conclusions

Project Looking Glass has sought to establish hard facts and real-world evidence about Long Unread Meters in order that their number can be reduced in the short to medium term and future occurrences prevented. The data obtained through the assessment of 1,802 external LUMs has confirmed that it is a complex, multi-faceted issue. That said, like any complex problem, it can be tackled in a coordinated manner, with multiple solutions running in parallel to tackle the various problems and deliver the desired end goal.

Here are the top 10 conclusions reached in conducting the data analysis and report preparation:

1. Whilst the assessments completed generate a wide variety of outcomes, the top 4 outcomes by number account for almost 80% of LUMs
2. A significant percentage of LUMs can be read by meter readers, if retailers adjust the total effort required for the full range of meter reading scenarios, including meters that are more complex and time-consuming to read
3. The ability to read a LUM varies considerably from wholesale area to area – meter readers working in some wholesale areas will have to work harder to find and read a meter than those working in other areas
4. The split between LUMs that are readable (within reason) and those that are unreadable (without excessive effort, resources and costs being applied) is roughly 50/50.
5. Legacy LUMs (i.e. meters last read before 1 April 2017) present a much more demanding problem and will require creative thinking and innovative solutions, which may include passing back those meters to wholesalers to address within a specific time period
6. Meters located in Agricultural settings are more challenging to find and read and must therefore be treated carefully from the point of initial planning, installation, and replacement
7. Meters that are deemed 'hard to read' based on the present Metering Committee's guidance are not a significant factor when considering LUMs
8. Property address and location notes in CMOS are generally not up to the quality required to truly help with LUM resolution
9. X,Y coordinates in CMOS are not accurate enough for the majority of LUMs
10. Tackling the LUMs problem will require a highly collaborative approach, with MOSL, Ofwat, Strategic Panel, Retailers, Wholesalers, and their service providers, all working together towards a common goal of accurate and timely meter reads

Noted below are 6 potential areas that could form the basis for future Metering Committee or Industry projects aimed at addressing issues inherent within the LUM space:

- ***Consciously acting to prevent future LUMs when installing new meters***
    - Reviewing the new connections and meter exchange processes and their checkpoints involved in the installation of a new meter to ensure that relevant risk factors are considered, and every meter installation is clearly seen as an exercise in maintaining long-term meter readability.
- ***Mandating the use of meter reading technology in specific physical settings***
    - Where we know, with a high degree of probability, that cost-effective manual reading of meters is unlikely in the future, imposing obligations on trading parties to implement remote meter reading solutions
- ***Tackling specific CMOS data quality weaknesses***

- A targeted meter asset data quality improvement project (as described by the Roles and Responsibilities Strategic Project Phase 2) could be initiated to enrich CMOS data and make it a viable 'single source of the truth'. Specific areas to tackle, based on the experience from PLG, would be Property Address, Meter Location Code, Meter Location Notes and Meter X,Y Coordinates. This could also form part of the current MOSL/Industry Data Cleanse Project. Such a project should also review the processes currently in place for updating these data items within CMOS to ensure that retailers and wholesalers are both able to improve and manage their data quality code obligations on an ongoing basis.

- ***Identification of "phantom" meters***
  - Within the overall LUM population, there are likely to be many cases where a meter has been removed at some point before the market. What we see in the market data is a "phantom" meter. An exercise conducted jointly by each wholesaler/retailer pairing for any given Legacy LUM could fast-track the identification of these and maybe move the SPID to unmeasured, pending meter installation.
- ***Provision of support for retailers obtaining 'out of area' readings***
  - Based on the ease with which some LUMs were found and read, evidence exists to indicate that some wholesaler/retailer combinations result in meters simply not being read. This could arise where a customer is gained in a new geographic area for the retailer in question. A stronger challenge process for 'out of area' meter reading would help to identify risks in this regard, with perhaps a 'meter reader of last resort' obligation being imposed on wholesalers.
- ***A review of the MPF and scale of incentives as they relate to LUMs***
  - As part of the Market Performance Framework Review (MPF) consideration should be given to reviewing and modifying the current incentive structure for Legacy LUMs so that it is correctly targeted and of the right scale to drive and incentivise reduction activities.

The details of each PLG site visit have been shared with the relevant wholesalers and retailers via a portal assigned to each Trading Party.

We would like to thank all those Trading Parties who have proactively used the data that was provided to them from Project Looking Glass and have since also located and read further meters that did not get located during our work.

We would also like to thank the Strategic Panel Metering Committee for their feedback and contributions during this project.