ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

SELWYN DISTRICT COUNCIL AND MERCURY NZ LIMITED

Prepared by: Rebecca Elliot

Date audit commenced: 8 July 2021

Date audit report completed: 19 August 2021

Audit report due date: 30 September 2021

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EXECUTIVE SUMMARY

This audit of the **Selwyn District Council (SDC)** DUML database and processes was conducted at the request of **Mercury NZ Limited (Mercury)** in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1, which became effective on 1 June 2017.

A streetlight database is managed by Orion on behalf of SDC, who is Mercury's customer. Fault, maintenance, new connection and upgrade work is completed by Orion's approved contractors. The contractors provide paperwork to Orion confirming that work is complete, and Orion uses this information to update the database.

The field audit was undertaken of a statistical sample of 351 items of load on 26th and 27th July 2021. This found the database is not confirmed to be accurate within the allowable ±5% accuracy threshold and over submission is likely to be occurring as a result:

- In absolute terms the installed capacity is estimated to be 130 kW lower than the database indicates.
- There is a 95% level of confidence that the installed capacity is between 86 kW and 183 kW lower than the database.
- In absolute terms, total annual consumption is estimated to be 556,400 kWh lower than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 365,700 and 781,300 kWh lower than the database indicates.

The audit found three non-compliances and makes no recommendations. The future risk rating of 18 indicates that the next audit be completed in six months. I have considered this in conjunction with Mercury's responses and recommend that the next audit be in nine months.

The matters raised are detailed below.

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submission information	2.1	11(1) of Schedule 15.3	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated over submission of 556,400 kWh per annum.	Moderate	High	6	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	In absolute terms, total annual consumption is estimated to be 556,400 kWh lower than the DUML database indicates.	Moderate	High	6	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated over submission of 556,400 kWh per annum.	Moderate	High	6	Identified
Future Risk Rating						18	

Future risk rating	0	1-4	5-8	9-15	16-18	19+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Recommendation
		Nil

ISSUES

Subject	Section	Description	Issue
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit observation

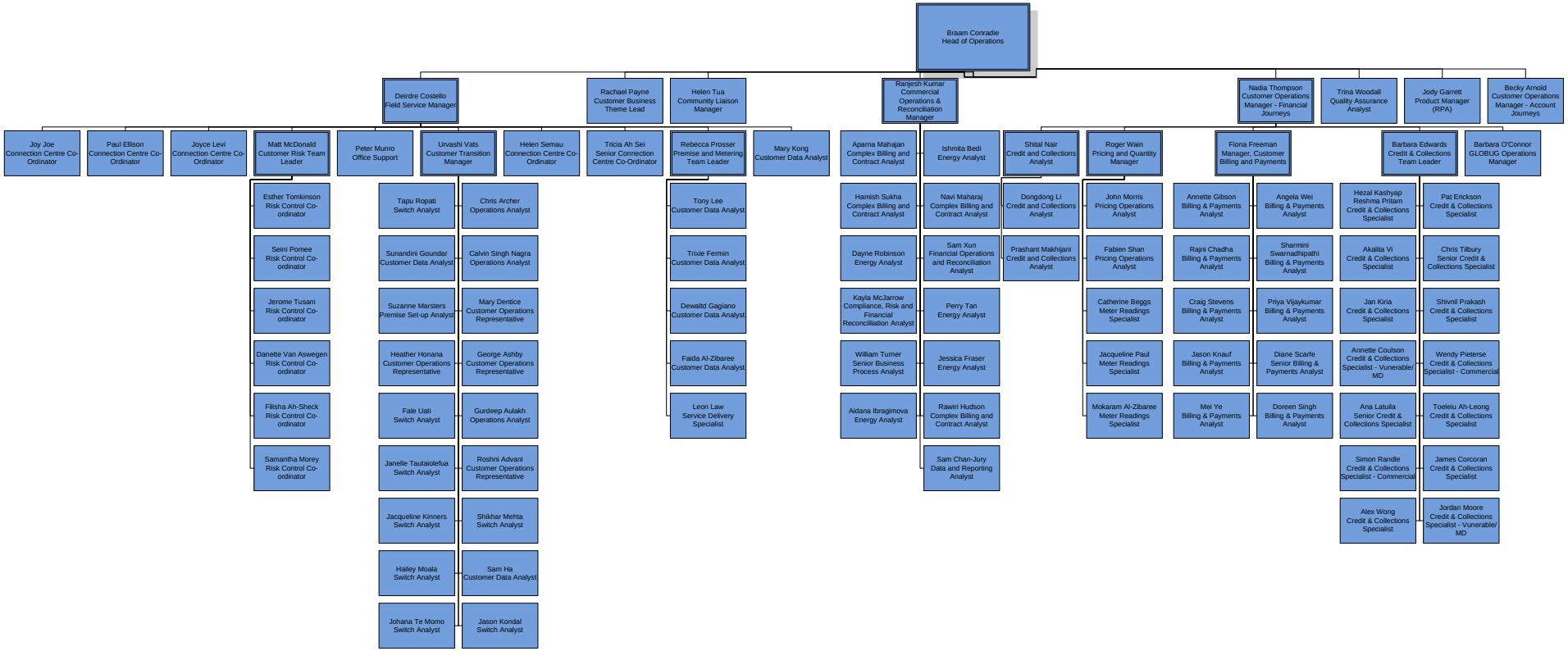
Current code exemptions were reviewed on the Electricity Authority website.

Audit commentary

Mercury has been granted exemption No. 233. This allows them to provide half-hour ("HHR") submission information instead of non-half-hour ("NHH") submission information for distributed unmetered load ("DUML"). This exemption expires on 31 October 2023.

1.2. Structure of Organisation

Mercury provided their current organisational structure:



1.3. Persons involved in this audit

Auditors:

Name	Company	Role
Rebecca Elliot	Veritek Limited	Lead Auditor
Claire Stanley	Veritek Limited	Supporting Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Penny Lawrence	Operations Services	Orion
Kayla McJarrow	Compliance, Risk & Financial Reconciliation Analyst	Mercury Energy

1.4. Hardware and Software

Orion use a purpose-built Oracle Streetlighting/DUML database for the management of the DUML information. Backup and restoration procedures are in place, and access to the Orion network (including the database) is restricted using logins and passwords.

Systems used by the trader to calculate submissions are assessed as part of their reconciliation participant audits.

1.5. Breaches or Breach Allegations

There are no breach allegations relevant to the scope of this audit.

1.6. ICP Data

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0007131640RN99E	Ref Orion_SDC GXP streetlight ICP - ISL0661 GXP SDC Street Lights	ISL0661	HHR	6,210	396,645
0007111135RN743	Ref Orion_SDC GXP streetlight ICP - Isl0331 Gxp Sdc Street Lights	ISL0331	HHR	798	57,024
0007111134RNB06	Ref Orion_SDC GXP streetlight ICP - Hor0331 Gxp Sdc Street Lights	HOR0331	HHR	569	52,110
0007152475RN996	Ref Orion_SDC GXP streetlight ICP Kimberley - West Coast Road	KBY0661	HHR	141	14,851
0007111132RNA89	Ref Orion_SDC GXP streetlight ICP - Gxpclh 0111 Sdc Street Lights	CLH0111	HHR	56	2011
0007111131RN649	Ref Orion_SDC GXP streetlight ICP - Aps0111 Gxp Sdc Street Lights	APS0111	HHR	36	5,158
0007111133RN6CC	Ref Orion_SDC GXP streetlight ICP - Col0111 Cxp Sdc Street Lights	COL0111	HHR	45	1,795
0007131637RN109	Ref Orion_SDC GXP streetlight ICP - HOR0661 GXP SDC Street Lights	HOR0661	HHR	9	697
Total				7,864	530,292

1.7. Authorisation Received

All information was provided directly by Mercury or Orion.

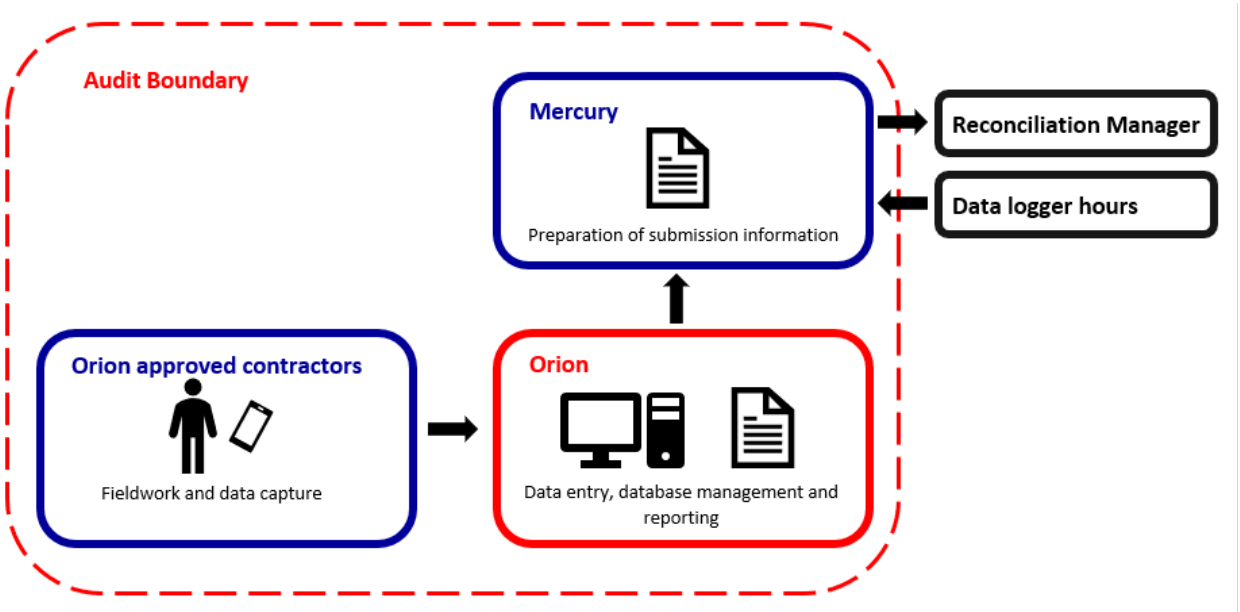
1.8. Scope of Audit

This audit of the SDC DUML database and processes was conducted at the request of Mercury in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied. The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1.

A Streetlighting/DUML database is managed by Orion on behalf of SDC, who is Mercury's customer.

Orion's fault, maintenance, new connection and upgrade work is completed by Orion's approved contractors. The contractors provide paperwork to Orion confirming that work is complete, and Orion uses this information to update the database. A monthly report from the database is provided to Mercury and used to calculate submissions. Mercury submits the DUML load as HHR using the HHR profile. On hours are derived using data logger information.

The scope of the audit encompasses the collection, security, and accuracy of the data, including the preparation of submission information based on the database reporting. The diagram below shows the audit boundaries for clarity.



The field audit was undertaken of a statistical sample of 351 items of load on 26th and 27th July 2021.

1.9. Summary of previous audit

The previous audit of this database was undertaken by Rebecca Elliot of Veritek Limited in December 2020. The summary table below shows the statuses of the non-compliances raised in the previous audit. Further comment is made in the relevant sections of this report.

Table of Non-compliance

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated over submission of 317,100 kWh per annum. Submission's calculations do not take into account changes in lamp wattages during the month.	Still existing Cleared
All load recorded in database	2.5	11(2A) of Schedule 15.3	11 additional items of load found in the field of the sample examined.	Cleared
Database accuracy	3.1	15.2 and 15.37B(b)	In absolute terms, total annual consumption is estimated to be 317,100 kWh lower than the DUML database indicates.	Still existing

Subject	Section	Clause	Non-compliance	Status
Volume information accuracy	3.2	15.2 and 15.37B(c)	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated over submission of 317,100 kWh per annum. Submission's calculations do not take into account changes in lamp wattages during the month.	Still existing Cleared

1.10. Recommendations

Subject	Section	Recommendation	Status
Deriving submission information	2.1	Calculate submission based on changes to the kW value in the database rather than the overall light count.	Cleared

1.11. Distributed unmetered load audits (Clause 16A.26 and 17.295F)

Code reference

Clause 16A.26 and 17.295F

Code related audit information

Retailers must ensure that DUML database audits are completed:

1. *by 1 June 2018 (for DUML that existed prior to 1 June 2017)*
2. *within three months of submission to the reconciliation manager (for new DUML)*
3. *within the timeframe specified by the Authority for DUML that has been audited since 1 June 2017.*

Audit observation

Mercury have requested Veritek to undertake this streetlight audit.

Audit commentary

This audit report confirms that the requirement to conduct an audit has been met for this database within the required timeframe.

Audit outcome

Compliant

2. DUML DATABASE REQUIREMENTS

2.1. Deriving submission information (Clause 11(1) of Schedule 15.3)

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

- *DUML database is up to date*
- *methodology for deriving submission information complies with Schedule 15.5.*

Audit observation

The process for calculation of consumption was examined and the application of profiles was checked. The database was checked for accuracy.

Audit commentary

This clause requires that the distributed unmetered load database must satisfy the requirements of schedule 15.5 regarding the methodology for deriving submission information.

Mercury reconciles this DUML load using the HHR profile in accordance with exemption 233. On and off times are derived from a data logger. Changes are tracked on a daily basis within the database. This is then multiplied by the logger hours to produce the kWh value. I confirmed the calculation for June 2021 was correct.

The current monthly report is compliant, and Mercury completes revision submissions where corrections are required.

The field audit found that the database was not within the allowable +/-5% accuracy threshold. In absolute terms, total annual consumption is estimated to be 556,400 kWh lower than the DUML database indicates. This is detailed further in **section 3.1**.

The previous audit report recorded non-compliance for not tracking load at a daily level. The database contains a “start date” and a “created date”. The start date is entered by the user and reflects the date that the light was installed or changed. The monthly reporting includes the replacement date so that it is clear in the reporting to the trader there has been a change in the field, therefore changes are now tracked at a daily level.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 09-Dec-20 To: 05-Jul-21	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated over submission of 556,400 kWh per annum. Potential impact: High Actual impact: High Audit history: Multiple Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	Controls are rated as moderate. Most of the field audit differences relate to LED upgrades, where there is sometimes a delay between the light being installed and paperwork being received to update the database. The impact is assessed to be high, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
We have confirmed with Orion that the LED upgrade was recently completed. Orion is awaiting the final data from the field to update the database. We believe the completion of this work will greatly increase the database accuracy as most of the database discrepancies are due to delayed updates from the field changes.	Oct21	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
As above.	As above.	

2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3)

Code reference

Clause 11(2)(a) and (aa) of Schedule 15.3

Code related audit information

The DUML database must contain:

- *each ICP identifier for which the retailer is responsible for the DUML*
- *the items of load associated with the ICP identifier.*

Audit observation

The database was checked to confirm the correct ICP was recorded against each item of load. The database contains the POC for each light and this maps to a table recording the ICP.

Audit commentary

All items of load have an ICP recorded against them.

Audit outcome

Compliant

2.3. Location of each item of load (Clause 11(2)(b) of Schedule 15.3)

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

The DUML database must contain the location of each DUML item.

Audit observation

The database was checked to confirm the location is recorded for all items of load.

Audit commentary

The database contains fields for the street name, number, and GPS coordinates. All items of load have GPS coordinates and are locatable.

Audit outcome

Compliant

2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3)

Code reference

Clause 11(2)(c) and (d) of Schedule 15.3

Code related audit information

The DUML database must contain:

- *a description of load type for each item of load and any assumptions regarding the capacity*
- *the capacity of each item in watts.*

Audit observation

The database was checked to confirm that:

- it contained a field for light type and wattage capacity,
- wattage capacities include any ballast or gear wattage, and
- each item of load has a light type, light wattage, and gear wattage recorded.

Audit commentary

The extract provided has fields for lamp type and total wattage and all were populated.

The lamp type in the extract corresponds with a description and total lamp wattage including ballast wattage. The accuracy of the recorded wattages is discussed in **section 3.1**.

Audit outcome

Compliant

2.5. All load recorded in database (Clause 11(2A) of Schedule 15.3)

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

The retailer must ensure that each item of DUML for which it is responsible is recorded in this database.

Audit observation

The field audit was undertaken of a statistical sample of 351 items of load on 26th and 27th July 2021.

Audit commentary

The field audit discrepancies are detailed in the table below:

Light model	Database count	Field count	Light count difference	Wattage recorded incorrectly	Comments
Adcroft Mews (Updated to Austen Place)	3	3		3	3 x 70W HPS recorded in the database but 50W HPS found in the field
Anderson Sq-SE	1	1		1	150W MH recorded in the database, but 60W LED found in the field
Aylesbury Rd	2	2		2	100W HPS recorded in the database but 76W LED found in the field 150W HPS recorded in the database but 76W LED found in the field
Bealey Rd	12	10	-2	9	1 x 100W HPS recorded in the database but 18W LED found in the field 3 x 125W MV recorded in the database but 29W LED found in field 3 x 150W HPS recorded in the database but 76W LED found in the field 2 x 150W HPS recorded in the database but not found in the field 2 x 70W HPS recorded in the database but 18W LED found in the field
Charlbury Dr	8	8		2	2 x 24W LED recorded in the database, but 26W LED found in the field
Coutts La	4	4		4	4 x 70W HPS recorded in the database but 18W LED found in the field
Farringdon Blvd	4	4		3	1 x 70W HPS recorded in the database but 20W LED found in the field 2 x 100W HPS recorded in the database but 20W LED found in the field
Gainsborough Ct	3	3		1	70W HPS recorded in the database but 33W LED found in the field

Light model	Database count	Field count	Light count difference	Wattage recorded incorrectly	Comments
Godley Rd/Aylesbury Rd	1	1		1	100W HPS recorded in the database but 76W LED found in the field
Liffey Reserve	5	4	-1	2	1 x 2*20W FF recorded in the database but not located in the field 1 x 2*20W FF recorded in the database but 18W LED found in the field 1 x 110W HPS recorded in the database 18W LED found in the field
Link Dr	34	33	-1	26	1 x 250W HPS not located in the field 3 x 100W HPS recorded in the database but 99W LED found in field 1 x 150W HPS recorded in the database but 18W LED found in field 16 x 150W HPS recorded in the database but 99W LED found in field 1 x 250 W HPS recorded in the database but 99W LED found in field 1 x 250W HPS recorded in the database but 113W LED found in field 4 x 250W HPS recorded in the database but 99W LED found in field
Radius Loop	5	5		4	1 x 70W HPS recorded in the database but 60W LED found in the field 3 x 70W HPS recorded in the database but 20W LED found in the field
Rockwood Rd	3	3		3	1 x 100W HPS recorded in the database but 29W LED found in the field 2 x 70W HPS recorded in the database but 29W LED found in the field

Light model	Database count	Field count	Light count difference	Wattage recorded incorrectly	Comments
Ross St	5	5		4	1 x 2*30W FF recorded in the database but 18W LED found in the field 1 x 150W HPS recorded in the database but 18W LED found in field 1 x 125W MV recorded in the database but 18W LED found in field 1 x 125W MV recorded in the database but 20W LED found in field
Rotherham Dr	27	27		5	5 x 70W HPS recorded in the database but 18W LED found in the field
Grand Total	**117**	**113**	**-4**	**70**	

Orion followed up with Connetics during the audit to obtain detail of lamps changes, the lamps noted in the table above were updated following the receipt of this information during the audit.

This clause relates to lights in the field that are not recorded in the database. There were no additional items of load found in the field audit. The database accuracy is discussed in **section 3.1**.

Audit outcome

Compliant

2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3)

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

The DUML database must track additions and removals in a manner that allows the total load (in kW) to be retrospectively derived for any given day.

Audit observation

The process for tracking of changes in the database was examined.

Audit commentary

The database functionality achieves compliance with the code.

Audit outcome

Compliant

2.7. Audit trail (Clause 11(4) of Schedule 15.3)

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

The DUML database must incorporate an audit trail of all additions and changes that identify:

- *the before and after values for changes*
- *the date and time of the change or addition*
- *the person who made the addition or change to the database.*

Audit observation

The database was checked for audit trails.

Audit commentary

Orion demonstrated a complete audit trail of all additions and changes to the database information. The user who processed the change is stored in the back end of the database.

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

3.1. Database accuracy (Clause 15.2 and 15.37B(b))

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

Audit must verify that the information recorded in the retailer's DUML database is complete and accurate.

Audit observation

The DUML Statistical Sampling Guideline was used to determine the database accuracy. The table below shows the survey plan.

Plan Item	Comments
Area of interest	Selwyn DC streetlights
Strata	The database contains 7,864 items of load in the Selwyn DC region. The management process is the same for all lights. I created three strata: 1. Street names A-G, 2. Street names H to P, and 3. Street names Q to Z
Area units	I created a pivot table of the roads, and I used a random number generator in a spreadsheet to select a total of 75 sub-units.
Total items of load	351 items of load were checked

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority, and the manufacturer's specifications or in the case of LED lights against the LED light specification.

The process to manage changes made in the field being updated in the database was examined.

Audit commentary

Database accuracy

A field audit was conducted of a statistical sample of 351 items of load. The "database auditing tool" was used to analyse the results, which are shown in the table below.

Result	Percentage	Comments
The point estimate of R	75.4	Wattage from the survey is lower than the database wattage by 24.6%
R_L	65.5	With a 95% level of confidence, it can be concluded that the error could be between -16.1% and -34.5%
R_H	83.9	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 01/02/19. The table below shows that Scenario B (detailed below) applies.

The conclusion from Scenario B is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 16.1% and 34.5% lower than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 130 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 86 kW and 183 kW lower than the database.

In absolute terms, total annual consumption is estimated to be 556,400 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 365,700 and 781,300 kWh lower than the database indicates.

Scenario	Description
A - **Good accuracy, good precision**	This scenario applies if: (a) R_H is less than 1.05; and (b) R_L is greater than 0.95 The conclusion from this scenario is that: (a) the best available estimate indicates that the database is accurate within +/- 5 %; and (b) this is the best outcome.
B - **Poor accuracy, demonstrated with statistical significance**	This scenario applies if: (a) the point estimate of R is less than 0.95 or greater than 1.05 (b) as a result, either R_L is less than 0.95 or R_H is greater than 1.05. There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level
C - **Poor precision**	This scenario applies if: (a) the point estimate of R is between 0.95 and 1.05 (b) R_L is less than 0.95 and/or R_H is greater than 1.05 The conclusion from this scenario is that the best available estimate is not precise enough to conclude that the database is accurate within +/- 5 %

Light description and capacity accuracy

The database was checked against the published standardised wattage table, and manufacturer's specifications where available.

As discussed in **section 2.4**, all lights have a lamp and gear wattage recorded. All wattages and ballasts were recorded correctly.

Address location accuracy

As discussed in **section 2.3**, all lights have an address recorded.

Adcroft Mews is recorded in the database, but the street is named Austen Place. This was confirmed during the field audit and was corrected in the database during the audit.

Change management process findings

Processes to track changes to the database were reviewed.

Fault, maintenance, new connection, and upgrade work is completed by Orion's approved contractors. The contractors provide paperwork to Orion confirming that work is complete, and Orion uses this information to update the Streetlighting/DUML database and GIS. For new subdivisions, this paperwork includes "as built" plans.

Upon receipt, paperwork is checked for completeness and accuracy and any issues are followed up with the contractor. The information is sent to the GIS team so that the GIS can be updated, and then returned to the connections team to update the Streetlighting/DUML database from the date the change or new connection was effective. Once data entry is complete, the values loaded are checked against the paperwork provided. Paperwork is normally promptly provided electronically and processed within two to three business days of receipt. The LED rollout paperwork is discussed below.

All jobs are tracked using job numbers by the connections team as part of the works management process. Late paperwork from contractors, and late updates by the GIS team are followed up. A checklist is followed to ensure that all steps in the process are completed.

Orion's approved contractors have access to a web-based version of the Streetlighting/DUML database in the field and advise Orion's connections team if they notice any discrepancies in the data recorded. Orion's operation team acts on these notifications and checks and updates the data where necessary.

Each month a report is provided in spreadsheet form from the contractor to Orion. The IT team load the information to update the database for all the changes completed for the month. The field audit identified a large number of LED lights in the field that had not been updated in the database. Orion followed up with the contractor, and a file of approx. of 3,106 LED upgrades was provided as it appears that not all updates had been sent through. The details have now been updated in the database. The LED upgrade project is now close to completion, so the database is expected to be a lot more static.

Six monthly outage patrols are completed by Orion's contractors as part of the Selwyn maintenance programme. Outages are also reported by residents within the Selwyn region and work orders are raised with contractors as required.

Festive lights

No festive lights are used in the Selwyn DC region.

Private lights

New private lights are not accepted, and where existing private lights are identified Orion arranges for

New private lights are not accepted, and where existing private lights are identified Orion arranges for standard or shared unmetered load to be created. In the meantime, private unmetered lights are recorded in the database against the correct ICP and therefore these are not included in the council DUML load. I viewed an example of a private streetlight in the database to confirm this.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 09-Dec-20 To: 05-Jul-21	In absolute terms, total annual consumption is estimated to be 556,400 kWh lower than the DUML database indicates. Potential impact: High Actual impact: High Audit history: Multiple times Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	Controls are rated as moderate. Almost all the field audit differences relate to LED upgrades, where there is sometimes a delay between the light being installed and paperwork being received to update the database The impact is assessed to be high, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
We have confirmed with Orion that the LED upgrade was recently completed. Orion is awaiting the final data from the field to update the database. We believe the completion of this work will greatly increase the database accuracy as most of the database discrepancies are due to delayed updates from the field changes.	Oct21	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
As above.	As above.	

3.2. Volume information accuracy (Clause 15.2 and 15.37B(c))

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

The audit must verify that:

- *volume information for the DUML is being calculated accurately*
- *profiles for DUML have been correctly applied.*

Audit observation

The submission was checked for accuracy for the month the database extract was supplied. This included:

- checking the registry to confirm that the ICP has the correct profile and submission flag, and
- checking the database extract combined with the on hours against the submitted figure to confirm accuracy.

Audit commentary

This clause requires that the distributed unmetered load database must satisfy the requirements of schedule 15.5 regarding the methodology for deriving submission information.

Mercury reconciles this DUML load using the HHR profile in accordance with exemption 233. On and off times are derived from a data logger. Changes are tracked on a daily basis within the database. This is then multiplied by the logger hours to produce the kWh value. I confirmed the calculation for June 2021 was correct.

The current monthly report is compliant, and Mercury completes revision submissions where corrections are required.

The field audit found that the database was not within the allowable +/-5% accuracy threshold. In absolute terms, total annual consumption is estimated to be 556,400 kWh lower than the DUML database indicates.

The database contains a "start date" and a "created date". The start date is entered by the user and reflects the date that the light was installed or changed. The monthly reporting includes the replacement date so that it is clear in the reporting to the trader there has been a change in the field.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 09-Dec-20 To: 05-Jul-21	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated over submission of 556,400 kWh per annum. Potential impact: High Actual impact: Unknown Audit history: Multiple Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	Controls are rated as moderate. Most of the field audit differences relate to LED upgrades, where there is sometimes a delay between the light being installed and paperwork being received to update the database. The impact is assessed to be high, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
We have confirmed with Orion that the LED upgrade was recently completed. Orion is awaiting the final data from the field to update the database. We believe the completion of this work will greatly increase the database accuracy as most of the database discrepancies are due to delayed updates from the field changes.	Oct21	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
As above.	As above.	

CONCLUSION

A Streetlighting/DUML database is managed by Orion on behalf of SDC, who is Mercury's customer. Fault, maintenance, new connection and upgrade work is completed by Orion's approved contractors. The contractors provide paperwork to Orion confirming that work is complete, and Orion uses this information to update the database.

The field audit was undertaken of a statistical sample of 351 items of load on 26th and 27th July 2021. This found the database is not confirmed to be accurate within the allowable ±5% accuracy threshold and over submission is likely to be occurring as a result:

- In absolute terms the installed capacity is estimated to be 130 kW lower than the database indicates.
- There is a 95% level of confidence that the installed capacity is between 86 kW and 183 kW lower than the database.
- In absolute terms, total annual consumption is estimated to be 556,400 kWh lower than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 365,700 and 781,300 kWh lower than the database indicates.

The audit found three non-compliances and makes no recommendations. The future risk rating of 18 indicates that the next audit be completed in six months. I have considered this in conjunction with Mercury's responses and recommend that the next audit be in nine months.

PARTICIPANT RESPONSE

Orion have confirmed the completion of their LED upgrade project and they are awaiting finalised data from the field, to update the database accordingly. Once the final updates have taken place, we expect the database accuracy to be high.