

ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

NZTA BOP WEST (WESTLINK)
AND TRUSTPOWER LIMITED

Prepared by: Steve Woods

Date audit commenced: 13 September 2019

Date audit report completed: 20 September 2019

Audit report due date: 20-Sep-19

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EXECUTIVE SUMMARY

This audit of the NZTA lights in the BOP West area (**NZTA BOP West**) DUML database and processes was conducted at the request of Trustpower Limited (**Trustpower**), 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 RAMM database is managed by Westlink on behalf of NZTA and monthly reporting is provided to Trustpower. Westlink manage the maintenance contract, and the maintenance field work is carried out by Horizon. Any new work is managed by NZTA and once completed the information is passed to Westlink to update. Validation of this data occurs prior to being received by Westlink.

Westlink have undertaken a 100% field audit and the results have been updated to RAMM. The main issue is that the Te Puna roundabout lighting has not yet been updated in the database, despite being installed in late 2017 to early 2018.

The audit found four non-compliances and makes one recommendation. The future risk rating of 12 indicates that the next audit be completed in 12 months. I agree with this recommendation. 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	The database data was 7.5% lower than the field data for 100% field audit. This will result in under submission of 14,030 kWh per annum.	Weak	Low	3	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	22 additional light found in the field audit	Weak	Low	3	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The database data was 7.5% lower than the field data for 100% field audit. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot	Weak	Low	3	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database data was 7.5% lower than the field data for 100% field audit. This will result in under submission of 14,030 kWh per annum	Weak	Low	3	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Future Risk Rating						12	

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
Tracking of load change	2.6	Review process to update new lights in RAMM to ensure database accuracy

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

The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

There are no exemptions in place relevant to the scope of this audit.

1.2. Structure of Organisation

Trustpower provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditor:

Steve Woods

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Phillip Barnes	Maintenance Manager	Westlink BOP
Robbie Diederer	Reconciliation Analyst	Trustpower

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by RAMM Software Ltd. The database is commonly known as “RAMM” which stands for “Roading Asset and Maintenance Management”.

Westlink confirmed that the database back-up is in accordance with standard industry procedures. Access to the database is secure by way of password protection.

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	Profile	Number of items of load	Database wattage (watts)
1000525040PC154	Western Bay NZTA - TGA0111	STL	16	3,018
1000525041PCD11	Western Bay NZTA - TGA0331	STL	180	31,748
1000525042PC1D1	Western Bay NZTA - TMI0331	STL	41	5,958
TOTAL			237	40,724

1.7. Authorisation Received

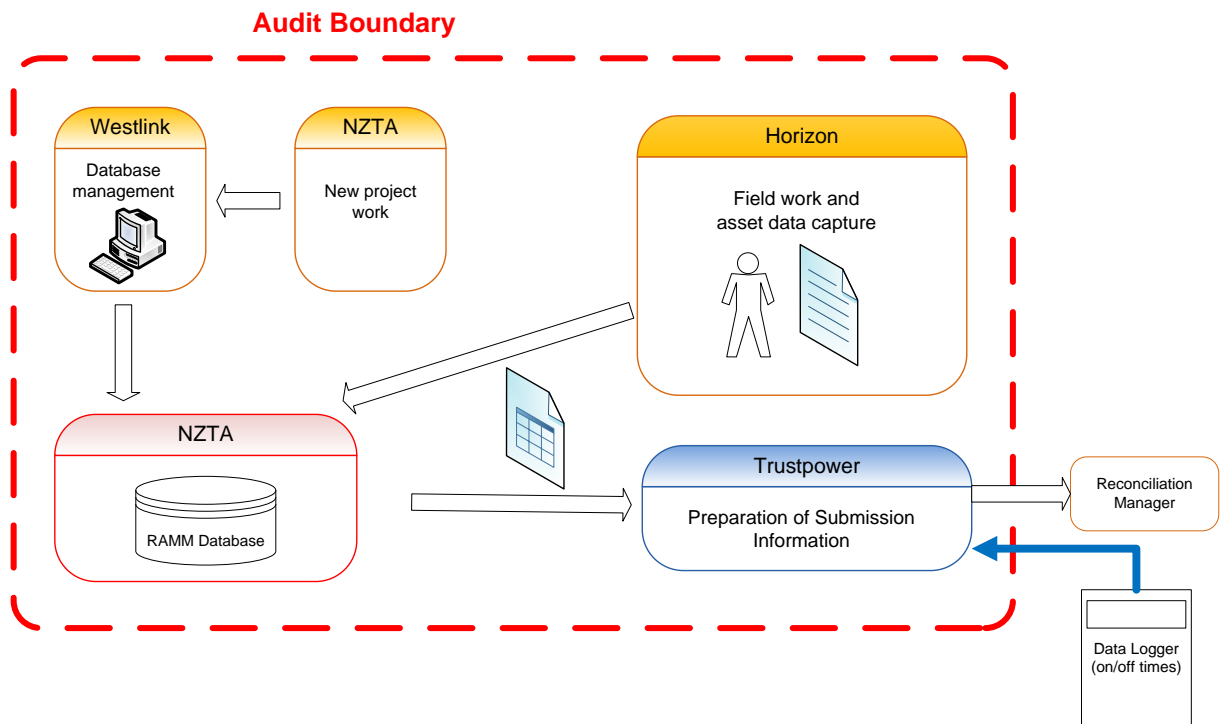
All information was provided directly by Trustpower and Westlink.

1.8. Scope of Audit

This audit of the NZTA lights in the BOP West area (**NZTA BOP West**) DUMML database and processes was conducted at the request of Trustpower Limited (**Trustpower**), 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 DUMML audits version 1.1.

The database is remotely hosted by RAMM Software Ltd. The asset data capture and database population are conducted by Westlink. The maintenance field work is carried out by Horizon. New project work is carried out by NZTA who pass the information to Westlink to load once the project is complete. 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 boundary for clarity.



The field audit was undertaken of all 237 items of load on 13/09/19.

1.9. Summary of previous audit

The previous audit was conducted in March 2019 by Rebecca Elliot of Veritek Limited. The findings from that audit are shown in the tables below.

Subject	Section	Clause	Non-Compliance	Status
DUML Audit	1.10	17.295F of part 17	Audit not completed within 12 months of Part 16A coming into effect.	Cleared
Deriving submission information	2.1	11(1) of Schedule 15.3	The database accuracy is assessed to be 94.5% indicating an estimated over submission of 14,400 kWh per annum. Two items of load with no ICP recorded. Three items of load with zero wattage recorded.	Still existing Cleared Cleared
ICP Identifier	2.2	11(2)(a) & (aa) of schedule 15.3	Two items of load with no ICP recorded.	Cleared
Location of each item of load	2.3	11(2)(b) of schedule 15.3	Ten items of load with insufficient location details.	Cleared
Description and capacity of load	2.4	11(2)(c) & (d) of schedule 15.3	Three items of load with zero wattage recorded.	Cleared
All load recorded in database	2.5	11(2A) of Schedule 15.3	14 additional lights found in the field audit.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	The database accuracy is assessed to be 94.5% indicating an estimated over submission of 14,400 kWh per annum. Two items of load with no ICP recorded. Three items of load with zero wattage recorded.	existing Cleared Cleared
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database accuracy is assessed to be 94.5% indicating an estimated over submission of 14,400 kWh per annum. Two items of load with no ICP recorded. Three items of load with zero wattage recorded.	existing Cleared Cleared

Subject	Section	Recommendation	Status
Tracking of load change	2.6	Trustpower work with NZTA to get results from 100% field audit updated in RAMM.	Still existing
		Review process to update new lights in RAMM to ensure database accuracy	Still existing

1.10. 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

Trustpower 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.

Audit outcome

Compliant

2. DUMML 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:

- DUMML 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

Trustpower reconciles this DUMML load using the STL profile. Trustpower receive monthly wattage reports. Submissions are based on the monthly wattage report, with on and off times derived from data logger information.

I recalculated the submissions for August 2019 using the data logger and database information. I confirmed that the calculation method and result was correct.

As detailed in sections 2.5 and 3.1, the database data was 7.5% lower than the field data for 100% field audit. This will result in under submission of approx. 14,030 kWh per annum. This is recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.1 Clause 11(1) of Schedule 15.3 From: 01-Jan-18 To: 16-Sep-19	The database data was 7.5% lower than the field data for 100% field audit. This will result in under submission of 14,030 kWh per annum. Potential impact: Medium Actual impact: Low Audit history: Once Controls: Weak Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as weak because some database updates have not occurred for more than 18 months. The impact on settlement and participants is minor; therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status

TePuna RAB/ NZTA lights are still to be entered into database. Trustpower will meet with NZTA to improve connection/reporting process.	2 months	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
Trustpower will promote the New Connection process currently being implemented by Tga CC/ WBOPDC	Ongoing	

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.

Audit commentary

All items of load have the ICP recorded.

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 databases were checked to confirm the location is recorded for all items of load.

Audit commentary

The database contains fields for the street address, the displacement from the end of the road and GPS coordinates.

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 it contained a field for lamp type and wattage capacity and included any ballast or gear wattage and that each item of load had a value recorded in these fields.

Audit commentary

The database contains the manufacturers rated wattage and the ballast wattage. The extract provided has fields for lamp and gear make and model. All fields were complete and accurate.

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 the entire database.

Audit commentary

The field audit findings for the sample of lamps was accurate with the exception of the streets detailed in the table below:

Road Name	Database Count	Field Count	Count differences	Wattage differences	Comments
SH2 / TUAPIRO RD INT	2	2	-	1	1 x 70W HPS recorded as 150W HPS
SH36 / WILLIAMS RD INT	1	1	-	1	1 x 150W HPS recorded as 100W HPS
Te Puna roundabout	13	35	+22	13	22 additional lights and all lights are now LED not HPS
GRAND TOTAL			22	15	

This clause relates to lights found in the field but not recorded in the database. The field audit found 22 additional lights in the field.

Westlink have undertaken a 100% field audit and the results have been updated to RAMM. The main issue is that the Te Puna roundabout lighting has not yet been updated in the database, despite being installed in late 2017 to early 2018.

The additional lights found in the field is recorded as non-compliance below. The database accuracy from the field audit is discussed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 01-Jan-18 To: 16-Sep-19	22 additional light found in the field audit. Potential impact: High Actual impact: Low Audit history: Once Controls: Weak Breach risk rating: 3		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as weak because some database updates have not occurred for more than 18 months. The impact on settlement and participants is minor; therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
TePuna RAB/ NZTA lights are still to be entered into database. Trustpower will meet with NZTA to improve connection/reporting process.		2 months	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Trustpower will promote the New Connection process currently being implemented by Tga CC/ WBOPDC		Ongoing	

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 tracks additions and removals as required by this clause. The “light install date” is used to identify the data lights are installed and the date lights are changed.

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

The database has a complete audit trail.

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

A field audit was conducted of all 237 lights.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority.

Audit commentary

Field Audit Findings

The errors in found in the field represent an 10% error rate (based on a percentage of lamp variances of the total lamps counted). The net impact was that the database data was 7.5% lower than the field data for 100% field audit. This will result in under submission of approx. 14,030 kWh per annum.

Wattage and ballast accuracy findings

The database was checked against the published standardised wattage table and confirmed that ballasts applied, and lamp descriptions were correct.

Change management process findings

NZTA carry out all new project work in house. Westlink is provided with new lamp information once NZTA have closed the project. This is often some time after the lights have been electrically connected. Validation of this data occurs prior to being received by Westlink. I recommend that the process to update new lights is reviewed to ensure changes are made in a timely way.

Description	Recommendation	Audited party comment	Remedial action
Tracking of load change	Review process to update new lights in RAMM to ensure database accuracy.	Once new lamps have been vested Trustpower will rework the reconciliation submissions accordingly.	Identified

Horizon carries out the field maintenance for Westlink on behalf of NZTA and they update RAMM directly. Westlink have robust controls in their contract with Horizon and this ensures that field maintenance is captured in a timely and accurate manner.

The current monthly report is provided as a snapshot and this practice is non-compliant. The database contains a "light install date" and a "lamp install date" but there is not a field for "livening date" for newly connected lights. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes.

NZTA BOP West are planning to roll out LED lights, but this is some time away from being deployed.

There are no festive lights connected to the unmetered streetlight circuits and there are no private lights known of.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: unknown To: 28-Feb-19	The database data was 7.5% lower than the field data for 100% field audit. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Potential impact: Medium Actual impact: Low Audit history: Once Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as weak because some database updates have not occurred for more than 18 months. The impact is assessed to be low, because the difference between a monthly snapshot and daily recording of changes is a small percentage of the total consumption for any given month.		
Actions taken to resolve the issue		Completion date	Remedial action status
Will discuss new connection process with NZTA		2 months	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Will endeavour to implement new connection process as used by Tga CC.		Ongoing	

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 burn hours against the submitted figure to confirm accuracy.

Audit commentary

Trustpower reconciles this DUML load using the STL profile. Trustpower receive monthly wattage reports. Submissions are based on the monthly wattage report, with on and off times derived from data logger information.

I recalculated the submissions for August 2019 using the data logger and database information. I confirmed that the calculation method and result was correct.

As detailed in **sections 2.5** and **3.1**, database data was 7.5% lower than the field data for 100% field audit. This will result in under submission of approx. 14,030 kWh per annum. This is recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.2 Clause 15.2 and 15.37B(c) From: 01-Jan-18 To: 16-Sep-19	The database data was 7.5% lower than the field data for 100% field audit. This will result in under submission of 14,030 kWh per annum. Potential impact: Medium Actual impact: Low Audit history: Once Controls: Weak Breach risk rating: 3		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as weak because some database updates have not occurred for more than 18 months. The impact on settlement and participants is minor; therefore the audit risk rating is low		
Actions taken to resolve the issue		Completion date	Remedial action status
This will be corrected once all lamps have been added to database.		Ongoing	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Trustpower continues to work with all parties involved to ensure timely database updates. All parties have acknowledged the urgency of the issue.		Ongoing	

CONCLUSION

A RAMM database is managed by Westlink on behalf of NZTA and monthly reporting is provided to Trustpower. Westlink manage the maintenance contract, and the maintenance field work is carried out by Horizon. Any new work is managed by NZTA and once completed the information is passed to Westlink to update. Validation of this data occurs prior to being received by Westlink.

Westlink have undertaken a 100% field audit and the results have been updated to RAMM. The main issue is that the Te Puna roundabout lighting has not yet been updated in the database, despite being installed in late 2017 to early 2018.

The audit found four non-compliances and makes one recommendation. The future risk rating of 12 indicates that the next audit be completed in 12 months. I agree with this recommendation.

PARTICIPANT RESPONSE

Trustpower will endeavour to get NZTA to implement the new connection process currently being implemented by Tauranga City Council. If this process is used then there should be a clear flow of information passed onto WestLink and the database will be maintained and updated more quickly with the correct data flowing through to Trustpower each month.

The field audit undertaken for this report should be adjusted to read the following;

Trustpower will follow up to have these corrected.

Road Name	Database Count	Field Count	Count differences	Wattage differences	Comments
SH2 / TUAPIRO RD INT	2	2	-	1	1 x 70W HPS recorded as 150W HPS
					CORRECT WILL HAVE DATABASE ADJUSTED
SH2 / PAHOIA RD /ESDAILE RD INT	6	5	-1	-	1 x 150W HPS not found
					6 LAMPS FOUND
SH36 / WILLIAMS RD INT	1	1	-	1	1 x 150W HPS recorded as 100W HPS
					CORRECT WILL HAVE DATABASE ADJUSTED
SH29 / BELK ROAD INT	1	1	-	1	1 x LED recorded as 150W HPS
					INCORRECT; LAMP IS 150W SON..NO ACTION REQUIRED
Te Puna roundabout	13	22	+9	13	9 additional lights and all lights are now LED not HPS
					THERE ARE 38 LED LAMPS 25 EXTRA FROM DATABASE COUNT.
GRAND TOTAL			8	16	