

ELECTRICITY INDUSTRY PARTICIPATION CODE  
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

PORIRUA NZTA  
AND GENESIS ENERGY LIMITED

Prepared by: Steve Woods

Date audit commenced: 10 February 2020

Date audit report completed: 2 August 2020

Audit report due date: 01 November 2019

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## EXECUTIVE SUMMARY

This audit of the **Porirua NZTA** DUMML database and processes was conducted at the request of **Genesis Energy Limited (Genesis)**, 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 scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information. The NZTA ICPs used to be in the Porirua CC database but they are now contained and managed in NZTA's RAMM database. The database is remotely hosted by RAMM Software Ltd.

Field work and new light installations are carried out by Downer, and the maintenance is conducted by Capital Journeys. All contractors update the database using Pocket RAMM.

This is the first audit conducted of the NZTA database. The database is not yet being used for reconciliation purposes. Reconciliation occurs using the data contained in the Porirua CC database.

The table below shows a comparison between my submission calculation from the NZTA database and the actual submission for December 2019. There is a significant under submission due to the use of the PCC database.

ICP Number	Genesis kWh	Recalculated kWh	Difference	Potential annual difference
1001102038UN6D0	5,094	30,767	-25,673	-308,082
1001102039UNA95	18,537	10,068	8,469	101,627
<b>Total</b>	<b>23,631</b>	<b>40,836</b>	<b>17,205 (under submission)</b>	<b>206,454 (under submission)</b>

The database contains the following accuracy issues:

- 14 records do not have a lamp make and model,
- 221 lamp wattages are blank,
- 348 gear wattages are blank, and
- 8 gear wattages are incorrect.

The field audit of 144 lights found 100% accuracy, so if the errors above are remedied and a process is put in place to manage changes and newly connected lights, this database will be an accurate source of information for reconciliation.

The future risk rating of 37 indicates that the next audit be completed in three months. I agree with this recommendation because the remedial actions are all desktop based and should be easy to implement. The under-submission issue needs to be resolved urgently and the short audit period will ensure submission accuracy is checked before too much of it ends up outside the 14-month period. The matters raised are detailed below:

## AUDIT SUMMARY

### NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Audit requirement	1.10	16A.26 and 17.295F	Database not audited within 3 months.	Moderate	Medium	4	Identified
Deriving submission information	2.1	11(1) of Schedule 15.3	Under submission of 206,454 kWh per annum due to the use of an inaccurate database.	Weak	High	9	Investigating
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	Nine items of load with a blank ICP.	None	Low	5	Investigating
Description and capacity of load	2.4	11(2)(b) of Schedule 15.3	14 records do not have a lamp make and model. 340 records have an unknown make and model but have sufficient information to determine wattage. 221 lamp wattages are blank. 348 gear wattages are blank. 8 gear wattages are incorrect.	None	Low	5	Investigating
Database accuracy	3.1	15.2 and 15.37B(b)	A large number of discrepancies exist in the database.	None	Low	5	Investigating
Volume information accuracy	3.2	15.2 and 15.37B(c)	Under submission of 206,454 kWh per annum due to the use of an inaccurate database.	Weak	High	9	Investigating
<b>Future Risk Rating</b>						<b>37</b>	

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

## RECOMMENDATIONS

Subject	Section	Description	Recommendation

## 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**

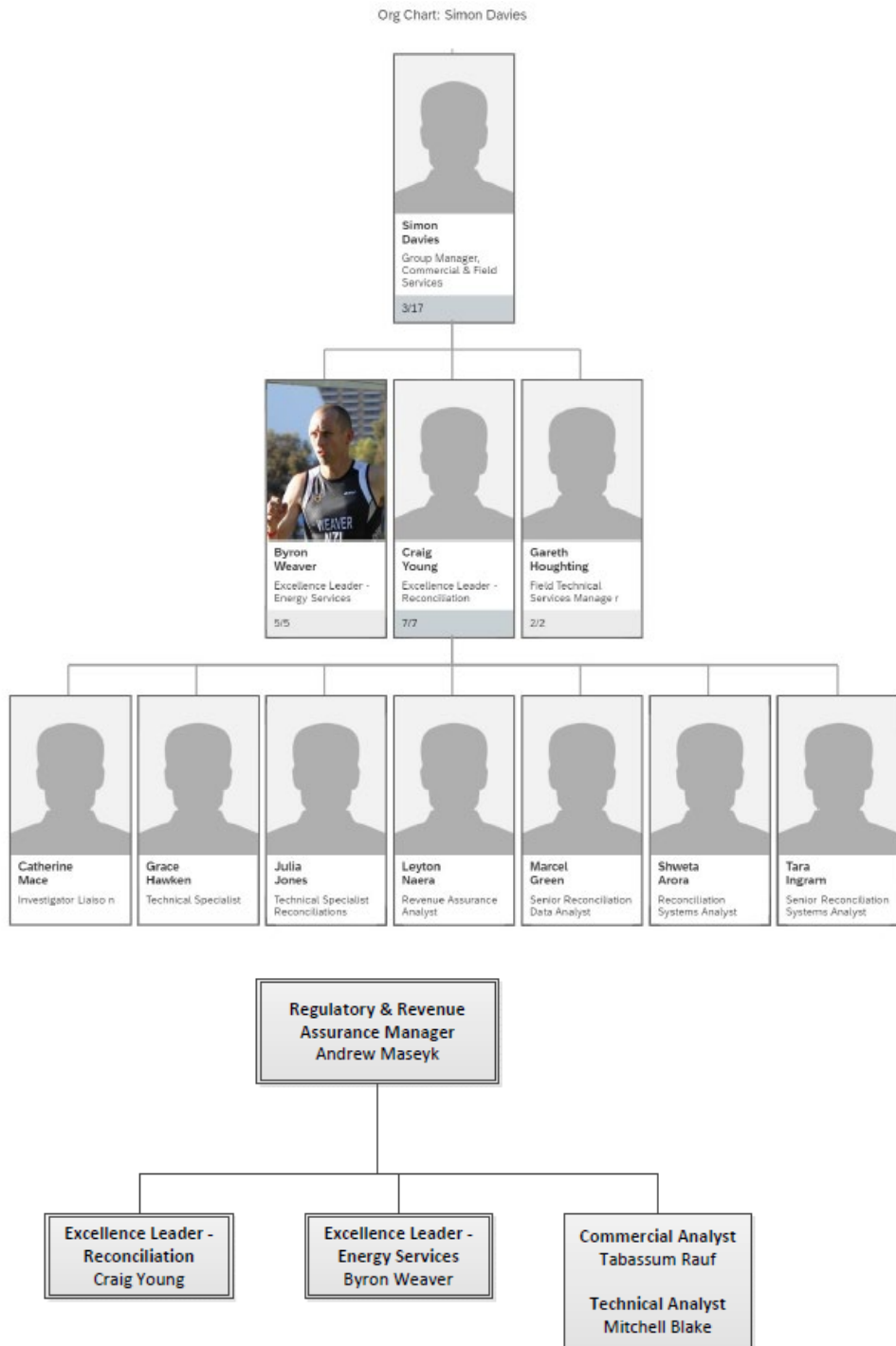
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

#### **Audit commentary**

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

## 1.2. Structure of Organisation

Genesis 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
Craig Young	Excellence Leader - Reconciliation	Genesis Energy
Grace Hawken	Technical Specialist - Reconciliation Team	Genesis Energy
Nick Urlich	Network Manager	NZTA
Colin Tubb	Asset Management Specialist	Capital Journeys

### 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".

NZTA 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	Registry profile	Number of items of load	Database wattage (watts)
1001102038UN6D0	MASTER ICP PORIRUA CC TRANSIT SH1- PUKERUA BAY	CST	410	100,877
1001102039UNA95	MASTER ICP PORIRUA CC TRANSIT SH1	CST	150	33,010
<b>Total</b>			<b>560</b>	<b>133,887</b>



## 1.7. Authorisation Received

All information was provided directly by Genesis or NZTA.

## 1.8. Scope of Audit

This audit of the NZTA DUMML database and processes was conducted at the request of Genesis, 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 scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information. The NZTA ICPs used to be in the Porirua CC database but they are now contained and managed in NZTA's RAMM database. The database is remotely hosted by RAMM Software Ltd.

Field work and new light installations are carried out by Downer, and the maintenance is conducted by Capital Journeys. All contractors update the database using Pocket RAMM.

The field audit was undertaken of a statistical sample of 144 items of load.

## 1.9. Summary of previous audit

This is the first audit undertaken of the NZTA database. The data used to be contained in the Porirua CC database.

## 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 DUMML database audits are completed:*

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

### Audit observation

Genesis have requested Veritek to undertake this streetlight audit.

### Audit commentary

These ICPs used to be included in the Porirua CC DUMML audit, but they were not included in the August 2019 audit and were not separately audited either. Therefore, this audit is considered late.

### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 1.10 With: Clause 16A.26 and 17.295F  From: 01-Aug-19 To: 20-Feb-20	Database not audited within 3 months.  Potential impact: Medium  Actual impact: Medium  Audit history: None  Controls: Moderate  Breach risk rating: 4		
Audit risk rating	Rationale for audit risk rating		
<b>Medium</b>	The controls are rated as moderate. Genesis worked reasonably quickly to identify a database and have an audit once it was identified that PCC was not responsible.  The audit risk rating is medium, because an earlier audit may have identified the submission inaccuracy sooner.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis have worked with NZTA to progress the information required to meet the DUML guidelines. For this to be achieved Genesis had to separate the assets from the PCC dataset and establish the relationship with the NZTA. The settlement process will be revised upon NZTA accepting that the monthly kWh's will be increasing due to PCC's data being out dated.		01/04/2020	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis has established the provision of monthly information from NZTA Porirua's RAMM database.		01/04/2020	

## 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

Genesis reconciles this DUML load using the CST profile and datalogger on/off times as shown in the table below.

ICP Number	Description	Registry profile	Submission profile	On hours based on
1001102038UN6D0	MASTER ICP PORIRUA CC TRANSIT SH1-PUKERUA BAY	CST	CST	Data logger
1001102039UNA95	MASTER ICP PORIRUA CC TRANSIT SH1	CST	CST	Data logger

Reconciliation occurs using the data contained in the PCC database. The NZTA database is not yet being used. The NZTA database contains a large number of blanks in the wattage fields, so I corrected these based on lamp description, and re-calculated what the submission should be for December 2019 using the logger on times.

The table below shows a comparison between my calculation and the actual submission for December 2019.

ICP Number	Genesis kWh	Recalculated kWh	Difference	Potential annual difference
1001102038UN6D0	5,094	30,767	-25,673	-308,082
1001102039UNA95	18,537	10,068	8,469	101,627
<b>Total</b>	<b>23,631</b>	<b>40,836</b>	<b>17,205 (under submission)</b>	<b>206,454 (under submission)</b>

The database contains some inaccurate content, which is discussed in subsequent sections.

On 18 June 2019, the Electricity Authority issued a memo confirming that the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed; and

- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

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 will be recorded if the monthly report process is based on a snapshot, not the historical information showing dates of changes.

### Audit outcome

Non-compliant

Non-compliance	Description	
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3  From: 01-Aug-19 To: 19-Feb-20	Under submission of 206,454 kWh per annum due to the use of an inaccurate database.  Potential impact: High  Actual impact: High  Audit history: None  Controls: Weak  Breach risk rating: 9	
Audit risk rating	Rationale for audit risk rating	
<b>High</b>	The controls are rated as weak because the most current database is not being used, and the most current database is not yet completely populated.  The audit risk rating is high based on kWh variances detailed above.	
Actions taken to resolve the issue	Completion date	Remedial action status
Genesis have worked with NZTA to progress the information required to meet the DUML guidelines. For this to be achieved Genesis had to separate the assets from the PCC dataset and establish the relationship with the NZTA. The settlement process will be revised upon NZTA accepting that the monthly kWh's will be increasing based off the information held within RAMM.	01/06/2020	Investigating
Preventative actions taken to ensure no further issues will occur	Completion date	
Genesis has established the provision of monthly information from NZTA Porirua's RAMM database. Genesis will be reviewing the information provided and report exceptions back to Capital Journey's for corrections to be made.  Genesis has discussed that the new connection process should be reviewed and the Distributor, should not be allowing any new asset connections without the trader's acceptance.	01/06/2020	

## 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 DUMML database must contain:

- each ICP identifier for which the retailer is responsible for the DUMML
- 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

The database contains nine records with a blank ICP.

### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.2 With: Clause 11(2)(a) and (aa) of Schedule 15.3 From: 01-Aug-19 To: 19-Feb-20	Nine items of load with a blank ICP. Potential impact: Low Actual impact: Low Audit history: None Controls: None Breach risk rating: 5		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	Controls are not in place to identify this type of discrepancy. The audit risk rating is low based on the small number of discrepancies.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis will request all asset ICP information to be updated		01/06/2020	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis has established the provision of monthly information from NZTA Porirua's RAMM database. Genesis will be reviewing the information provided and report exceptions back to Capital Journey's for corrections to be made.		01/06/2020	

### 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 and also GPS coordinates.

All items of load have GPS coordinates populated.

#### 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 following discrepancies:

- 14 records do not have a lamp make and model,
- 340 records have an unknown make and model but have sufficient information to determine wattage,
- 221 lamp wattages are blank,
- 348 gear wattages are blank, and
- 8 gear wattages are incorrect.

The accuracy of lamp descriptions, wattages and ballasts is recorded in **section 3.1**.

#### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.4 With: Clause 11(2)(b) of Schedule 15.3 From: 01-Aug-19 To: 19-Feb-20	14 records do not have a lamp make and model. 340 records have an unknown make and model but have sufficient information to determine wattage. 221 lamp wattages are blank 348 gear wattages are blank 8 gear wattages are incorrect Potential impact: High Actual impact: Low Audit history: None Controls: None Breach risk rating: 5		
Audit risk rating	Rationale for audit risk rating		
Low	Controls are not in place to identify this type of discrepancy. The audit risk rating is low because this data is not used for submission. If this data was used for submission, the error would be high.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis will request all asset ICP information to be updated		01/06/2020	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis has established the provision of monthly information from NZTA Porirua's RAMM database. Genesis will be reviewing the information provided and report exceptions back to Capital Journey's for corrections to be made.		01/06/2020	

## 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 not based on a statistical sample due to the difficulty in checking lighting on motorways and state highways. I selected 144 lights where the checks could be conducted from the footpath, an over bridge or where it was safe to stop at the roadside.

### Audit commentary

A complete field audit was conducted in October 2019. My field audit found 100% accuracy for all 144 lights checked.

**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 DUMML 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 RAMM database functionality achieves compliance with the code.

The change management process and the compliance of the database reporting provided to Genesis is detailed in **sections 3.1** and **3.2**.

**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 DUMML 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

The field audit was not based on a statistical sample due to the difficulty in checking lighting on motorways and state highways. I selected 144 lights where the checks could be conducted from the footpath, an over bridge or where it was safe to stop at the roadside.

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

The change management process to track changes and timeliness of database updates was evaluated.

##### Audit commentary

The database accuracy compared to the field survey is 100%. There are some errors within the data, as discussed below.

##### Lamp description and capacity accuracy

The database contains the following discrepancies:

- 14 records do not have a lamp make and model.
- 221 lamp wattages are blank
- 348 gear wattages are blank
- 8 gear wattages are incorrect

##### Location accuracy

The field audit did not identify any location discrepancies.

##### ICP number and owner accuracy

The database contains nine records with a blank ICP.

##### Change management process findings

The RAMM database is managed by NZTA. The streetlight contractors update the database using Pocket RAMM.

I conducted a walkthrough of the new connection process. The lights are recorded in RAMM when an “as built” plan is provided.

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 will be recorded if the monthly report process is based on a snapshot, not the historical information showing dates of changes.

##### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b)  From: 01-Aug-19 To: 20-Feb-20	A large number of discrepancies exist in the database.  Potential impact: High  Actual impact: Low  Audit history: None  Controls: None  Breach risk rating: 5		
Audit risk rating	Rationale for audit risk rating		
Low	Controls are not in place to identify this type of discrepancy.  The audit risk rating is low because this data is not used for submission. If this data was used for submission, the error would be high.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis will request all asset ICP information to be updated		01/06/2020	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis has established the provision of monthly information from NZTA Porirua's RAMM database. Genesis will be reviewing the information provided and report exceptions back to Capital Journey's for corrections to be made.		01/06/2020	

### 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

Genesis reconciles this DUML load using the CST profile and datalogger on/off times as shown in the table below.

ICP Number	Description	Registry profile	Submission profile	On hours based on
1001102038UN6D0	MASTER ICP PORIRUA CC TRANSIT SH1-PUKERUA BAY	CST	CST	Data logger
1001102039UNA95	MASTER ICP PORIRUA CC TRANSIT SH1	CST	CST	Data logger

Reconciliation occurs using the data contained in the PCC database. The NZTA database is not yet being used. The NZTA database contains a large number of blanks in the wattage fields, so I corrected these based on lamp description, and re-calculated what the submission should be for December 2019 based on the logger on times.

The table below shows a comparison between my calculation and the actual submission for December 2019.

ICP Number	Genesis kWh	Recalculated kWh	Difference	Potential annual difference
1001102038UN6D0	5,094	30,767	-25,673	-308,082
1001102039UNA95	18,537	10,068	8,469	101,627
<b>Total</b>	<b>23,631</b>	<b>40,836</b>	<b>17,205 (under submission)</b>	<b>206,454 (under submission)</b>

The database contains some inaccurate content, which is discussed in subsequent sections.

On 18 June 2019, the Electricity Authority issued a memo confirming that the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed; and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The database contains a “light install date” and a “lamp install date” but there is not a field for “liveness 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 will be recorded if the monthly report process is based on a snapshot, not the historical information showing dates of changes.

#### Audit outcome

Non-compliant

Non-compliance	Description	
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c)  From: 01-Aug-19 To: 20-Feb-20	Under submission of 206,454 kWh per annum due to the use of an inaccurate database.  Potential impact: High  Actual impact: High  Audit history: None  Controls: Weak  Breach risk rating: 9	
Audit risk rating	Rationale for audit risk rating	
<b>High</b>	The controls are rated as weak because the most current database is not being used.  The audit risk rating is high based on kWh variances detailed above.	
Actions taken to resolve the issue	Completion date	Remedial action status
Genesis have worked with NZTA to progress the information required to meet the DUML guidelines. For this to be achieved Genesis had to separate the assets from the PCC dataset and establish the relationship with the NZTA. The settlement process will be revised upon NZTA accepting that the monthly kWh's will be increasing based off the information held within RAMM.	01/06/2020	Investigating
Preventative actions taken to ensure no further issues will occur	Completion date	
Genesis has established the provision of monthly information from NZTA Porirua's RAMM database. Genesis will be reviewing the information provided and report exceptions back to Capital Journey's for corrections to be made.  Genesis has discussed that the new connection process should be reviewed and the Distributor, should not be allowing any new asset connections without the trader's acceptance.	01/06/2020	

## CONCLUSION

This is the first audit conducted of the NZTA database. The database is not yet being used for reconciliation purposes. Reconciliation occurs using the data contained in the Porirua CC database.

The table below shows a comparison between my submission calculation from the NZTA database and the actual submission for December 2019. There is a significant under submission due to the use of the PCC database.

ICP Number	Genesis kWh	Recalculated kWh	Difference	Potential annual difference
1001102038UN6D0	5,094	30,767	-25,673	-308,082
1001102039UNA95	18,537	10,068	8,469	101,627
<b>Total</b>	<b>23,631</b>	<b>40,836</b>	<b>17,205 (under submission)</b>	<b>206,454 (under submission)</b>

The database contains the following accuracy issues:

- 14 records do not have a lamp make and model,
- 221 lamp wattages are blank,
- 348 gear wattages are blank, and
- 8 gear wattages are incorrect.

The field audit of 144 lights found 100% accuracy, so if the errors above are remedied and a process is put in place to manage changes and newly connected lights, this database will be an accurate source of information for reconciliation.

## PARTICIPANT RESPONSE

Genesis will be revising the submission information and process based off the provision of information by NZTA Porirua.

Genesis will be advising NZTA Porirua of any exceptions found within the dataset to take the necessary actions to have corrected.

The continuation of working with NZTA as it makes database improvements on regional assets continues, but not without its difficulties in certain regions.