ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

WESTLAND DISTRICT COUNCIL AND TRUSTPOWER LIMITED

Prepared by: Rebecca Elliot

Date audit commenced: 26 March 2019

Date audit report completed: 13 May 2019

Audit report due date: 1 June 2019

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EXECUTIVE SUMMARY

This audit of the Westland District Council (WDC) 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.

The audit of WDC previously included NZTA lights but these are a separate customer and therefore the NZTA lights are recorded in a separate audit report.

The Arc GIS database used for submission is managed by ElectroNet, on behalf of Westpower. New connection, fault, and maintenance work is completed by ElectroNet, who update the GIS in the field using Arc GIS collector. ElectroNet provide a monthly report from the database to Trustpower.

The field audit found a small number of errors. The database accuracy was found to be within the +/-5% allowable threshold.

The field audit found one example of new streetlights being connected but not recorded in the database. I recommend that the change management processes be reviewed to ensure that changes are tracked. Overall the database is relatively static and there are no immediate plans for large scale LED upgrades.

Five non-compliances were identified, and one recommendation is made. The future risk rating of ten indicates that the next audit be completed in 12 months. I have considered this in conjunction with Trustpower's comments and 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 used to prepare submissions contains some inaccurate information.	Moderate	Low	2	Investigating
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	14 items of load have missing capacity and/or wattage information.	Moderate	Low	2	Investigating
All load recorded in database	2.5	11(2A) of Schedule 15.3	Five additional lights found in the field.	Moderate	Low	2	Investigating
Database accuracy	3.1	15.2 and 15.37B(b)	2 items of load with the incorrect ballast applied. 14 items of load have missing capacity and/or wattage information.	Moderate	Low	2	Investigating
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database used to prepare submissions contains some inaccurate information.	Moderate	Low	2	Investigating
Future Risk Rating						10	

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
Location of each item of load	2.3	Align items of load with a single street with uniform spelling of street names
Tracking of load change	2.6	Trustpower to review change management processes with Electronet to ensure changes are tracked.

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:

Rebecca Elliot

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Robbie Diederen	Reconciliation Analyst	Trustpower
Barry Harkerss	Commercial Account Manager	Trustpower
Cary Lancaster	GIS Administrator	ElectroNet
Danielle Sollitt	Asset Systems Cadet	ElectroNet

1.4. Hardware and Software

The Arc GIS SQL database used for the management of DUML is managed by ElectroNet.

The database back up is in accordance with standard industry procedures. Access to the database is restricted using a login and password.

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)
0000950050WPE41	Westland District Council – Hokitika town area	HKK0661	STL	401	39,142
0000950070WP314	Westland District Council – Rural area	HKK0661	STL	159	14,292
0000950071WPF51	Westland District Council	KUM0661	STL	28	2,044
0000950072WP391	Westland District Council	OTI0111	STL	1	160
			Total	**589**	**55,638**

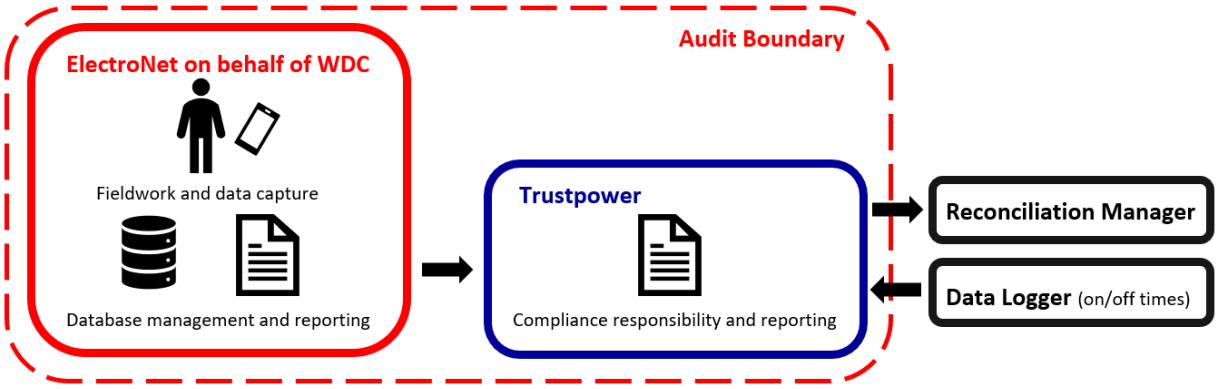
1.7. Authorisation Received

All information was provided directly by Trustpower and ElectroNet.

1.8. Scope of Audit

The Arc GIS database used for submission is managed by ElectroNet, on behalf of Westpower. New connection, fault, and maintenance work is completed by ElectroNet, who update the GIS in the field using Arc GIS collector. ElectroNet provide a monthly report from the database to Trustpower.

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.



A field audit of a statistical sample of 141 items of load was undertaken on 10-12 April 2019. The sample was selected from two strata:

- Urban
- Rural.

1.9. Summary of previous audit

The previous audit was completed in May 2018 by Tara Gannon of Veritek Limited. This audit was combined with NZTA Westland. Five non-compliances were identified, and no recommendations were made. The current status of the non-compliances is detailed below.

Table of Non-Compliance

Subject	Section	Clause	Non-Compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	The database used to prepare submissions contains some inaccurate information.	Still existing
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	17 items of load have missing capacity and/or wattage information.	Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	Festive lights are not recorded in the database.	Still existing but for different lights
Database accuracy	3.1	15.2 and 15.37B(b)	The database used to prepare submissions contains some inaccurate information.	Still existing

Subject	Section	Clause	Non-Compliance	Status
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database used to prepare submissions contains some inaccurate information.	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 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.

Audit commentary

Trustpower reconciles this DUML load using the STL profile. The on and off times are derived from data logger information.

I recalculated the submissions for March 2019 for the four ICPs associated with the WDC database using the data logger and database information. I confirmed that the calculation method was correct.

There is a small amount of inaccurate data within the ElectroNet database used to calculate submissions. This is recorded as non-compliance and discussed in **sections 2.4, 2.5** and **3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 07-May-18 To: 31-Mar-19	The database used to prepare submissions contains some inaccurate information. Potential impact: Low Actual impact: Low Audit history: Once previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time. The audit risk rating is low due to the small number of errors found in the field audit and the database is relatively static.

Actions taken to resolve the issue	Completion date	Remedial action status
Arranged a meeting on 6th June to discuss with ElectroNet	30 May	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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 an ICP is recorded for each item of load.

Audit commentary

All items of load have an ICP number 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 database was checked to confirm the location is recorded for all items of load.

Audit commentary

All items of load have a GPS location recorded, and most items of load also have a street address recorded. The naming protocol is very fractured, and I recommend that the address fields be reviewed to associate an item of load with a single street rather than the current range of physical address descriptions and street name variances. The GPS co-ordinates provide the detail for the specific location.

Description	Recommendation	Audited party comment	Remedial action
Location of each item of load	Align items of load with a single street with uniform spelling of street names.	To discuss with ElectroNet at meeting on 6th June	Investigating

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 lamp type and wattage capacity and included any ballast or gear wattage.

Audit commentary

The database records light type and total wattage, including ballast. The last audit indicated that ElectroNet were planning to split the total wattage into lamp and ballast wattage fields. This has not been progressed.

The database was checked and found that there are now 15 items of load with missing or unknown light type information and/or zero or blank lamp wattage (a reduction from the 17 found in the last audit). 13 items of load were the same items that were recorded in the last audit. . Two new items were found in this audit and these relate to permanent festive lights described as Xmas lights below. These are detailed in the table below:

Number	Location	Light Type	Wattage	X	Y
Missing Tag	Hokitika Sign	Hokitika Sign		1433345	5268395
Missing Tag	Hokitika Sign	Hokitika Sign		1433372	5268424
Missing Tag	Hokitika Sign	Hokitika Sign		1433347	5268386
Missing Tag	Hokitika Sign	Hokitika Sign		1433363	5268423
Missing Tag	Kumara Signage Western end	Kumara Signage Western end	150	1450685	5279333
Missing Tag	Kumara Township Signage Eastern End	Kumara Township Signage Eastern End	150	1451757	5277527
03988	Gibson Quay	Gibson Quay	8	1433127	5268273
Missing Tag	Town Centre Signage Hokitika	Town Centre Signage Hokitika		1433367	5268417
Missing Tag				1433041	5268614
Missing Tag	Clock Tower	Clock Tower		1433268	5268470
Missing Tag	Town Centre Signage Hokitika	Town Centre Signage Hokitika		1433357	5268391
Missing Tag	Town Centre Signage Hokitika	Town Centre Signage Hokitika		1433372	5268416
Missing Tag	Town Centre Signage Hokitika	Town Centre Signage Hokitika		1433357	5268393
xmas1	Weld Street	Weld Street	234	1433234	5268485
xmas3	Revell St	Revell St	234	1433086	5268582

ElectroNet were intending to visit each of these sites to confirm the description and capacity of these items and update the database but this has not been completed during the audit period.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c) and (d) of Schedule 15.3 From: 07-May-18 To: 31-Mar-19	15 items of load have missing capacity and/or wattage information. Potential impact: Low Actual impact: Low Audit history: Once previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate, because most items of load have capacity and wattage information recorded. The impact is assessed to be low because 15 items of load (2.3%) are affected.

Actions taken to resolve the issue	Completion date	Remedial action status
Have meeting with ElectroNet on 6th June to discuss		Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Alteration to DB to correct errors.		

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

A field audit of a statistical sample of 141 items of load was undertaken on 10-12 April 2019. The sample was selected from two strata:

- Urban
- Rural.

Audit commentary

The field audit findings are detailed in the table below.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Kaniere Rd (Hokitika)	22	24	+2		2x extra 75W LED pedestrian crossing lights outside Dairy Factory

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Park Street	2	2	+2		2x extra 70W HPS found in the field
Second Street	2	2		1	1x incorrect wattage 55W light recorded in the database but 2x 20W fluorescent found in the field
Airport Drive	9	10	+1	-	1x extra 70W HPS found in the field
Total	**141**	**146**	**5**	**1**	

I found five additional lights in the field than were recorded in the database, and one lamp wattage difference. The additional lights are recorded as non-compliance below.

The database accuracy is discussed in **section 3.1**.

The last audit noted that festive lights are used on Hokitika's main street and these are recorded in the database. Some of these are permanent and some are seasonal. The seasonal lights are updated to active from the date they are electrically connected and then made inactive when they are disconnected.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 07-May-18 To: 01-Apr-19	Five additional lights found in the field. Potential impact: Low Actual impact: Low Audit history: Once previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate as they are sufficient to ensure that all lights are recorded in the database most of the time. The audit risk rating is low due to the small number of additional lights found in the field audit and the database is relatively static.

Actions taken to resolve the issue	Completion date	Remedial action status
Have spoken to WDC and they are to notify TP when they are connected. The email is to contain the number and wattage they wish to add and then they will be added to the DB. Likewise when they want them removed they will notify TP via email	14th December 2018	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Check with WDC to confirm that is still in place	12th June	

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

Any changes that are made during any given month take effect from the beginning of that month. The information is available which would allow for the total load in kW to be retrospectively derived for any day. On 20 September 2012, the Authority sent a memo to retailers and auditors advising that tracking of load changes at a daily level was not required if the database contained an audit trail. I have interpreted this to mean that the provision of a copy of the report to Trustpower each month is sufficient to achieve compliance.

The database tracks load changes as required by this clause.

There have been no changes to the processes in place during the audit period. The Arc GIS database used for submission is managed by ElectroNet, on behalf of Westpower. New connection, fault, and maintenance work is completed by ElectroNet, who update the GIS in the field using Arc GIS collector. ElectroNet office staff validate the data and post it to the database after the field devices are synchronised to the main database. This process is described further in **section 2.7**.

Most new connections relate to network extensions, and new subdivisions are rare. When new subdivisions are created, Westpower ensure that the installation is compliant and provides approval for connection.

A process workflow in the Maximo system is used to manage all new connections and includes a step to update GIS information. Maximo tasks are normally allocated to a work group rather than individual, and key tasks are escalated within Maximo if not completed within specified timeframes. Tasks can be reassigned as necessary. Once the installation job is complete, a work task is created for the GIS team to check the Arc GIS database is up to date.

The process appears to be robust, but I note that the new pedestrian crossing lights on the road outside of the Dairy Factory on Kaniere Road were not recorded in the database suggesting the process is not being followed in all instances. I recommend that the processes in place are reviewed to ensure changes are tracked.

Description	Recommendation	Audited party comment	Remedial action
Tracking of load change	Trustpower to review change management processes with Electronet to ensure changes are tracked.	Have arrange a meeting with ElectroNet on 6th June to discuss alterations to DB	Investigating

Electronet completes periodic outage patrols. Faults and outages are also reported to WDC, who inform Electronet. When any field work required is completed, the database is updated if necessary.

Westland DC has no plans to roll out LED lights to replace the existing lights in the council area. LEDs are used to replace faulty lights where necessary and for new lamp connections.

ElectroNet advised there are no private lights in the Westland DC area.

As detailed in **section 2.5**, permanent festive lighting has been added to the database and the seasonal festive lights are added to the database when are connected and removed when they are disconnected.

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

ElectroNet demonstrated a complete audit trail of all additions and changes to the database information.

ElectroNet staff take a copy of the GIS database into the field on a device, and modify, add and delete data as required when tasks are completed. When the device is synchronised, the new records are inserted into the main database.

Staff in the office post and reconcile the data. This process involves:

- an automatic comparison between the original data in the device and the current data in the GIS, to determine whether changes to the main database have occurred since the device was last synchronised; if changes have occurred, an exception is created for manual investigation; and
- a manual check of the changed data to confirm it is correct and reasonable.

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	Westland DC region
Strata	The database contains items of load in WDC area. The processes for the management of all WDC items of load are the same. I created two strata: • Urban • Rural.
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 19 sub-units or 10% of the databases total wattage.
Total items of load	141 items of load were checked.

Wattages for all items of load were checked against the published standardised wattage tables produced by the Electricity Authority.

Audit commentary

The field data was 103.3% of the database data for the sample checked. This is within the required database accuracy of ±5%. The statistical sampling tool reported with 95% confidence the precision of the sample was 10.6%, and the true load in the field will be between 100.7% to 111.3% of the load recorded in the database. The sample is not precise enough to determine the database accuracy but indicates that the database is likely to be under reporting the total wattage but as the overall accuracy falls within the 5% threshold compliance is recorded.

The tool indicated that there is potentially 7,800 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool) of under submission. The statistical sampling tool reported with 95% confidence the possible impact will be between 1,600 and 26,900 kWh per annum of under submission.

The database records the total wattage for each item load. Wattages for all items of load were checked against the published standardised wattage tables produced by the Electricity Authority. As reported in the last audit two items of load have the incorrect ballast recorded -70W electronic ballast but the standard ballast has been applied, and as detailed in **section 2.4** there are 15 items of load with insufficient lamp description to determine the correct wattage (ten of these also have zero or a blank wattage recorded). This is an improvement from the last audit when a high proportion of lights had the incorrect ballast applied. The small number of remaining items is recorded as non-compliance below.

The last audit detailed items of load with duplicate streetlight numbers and address locations. Each of these has a unique GPS address and are separate items of load. Compliance is confirmed.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 07-May-18 To: 01-Apr-19	2 items of load with the incorrect ballast applied. 15 items of load have missing capacity and/or wattage information. Potential impact: Low Actual impact: Low Audit history: Once previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate as they are sufficient to ensure that all lights are recorded in the database most of the time. The audit risk rating is low due to the small number of errors found in the field audit and the database is relatively static.

Actions taken to resolve the issue	Completion date	Remedial action status
Have a meeting with ElectroNet on 6th June to discuss	30th May	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Once they are corrected then this should not happen again		

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 all ICPs have 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. The on and off times are derived from data logger information.

I recalculated the submissions for March 2019 for the four ICPs associated with the WDC database using the data logger and database information. I confirmed that the calculation method was correct.

There is a small amount of inaccurate data within the ElectroNet database used to calculate submissions. This is recorded as non-compliance and discussed in **sections 2.4, 2.5** and **3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 07-May-18 To: 31-Mar-19	The database used to prepare submissions contains some inaccurate information. Potential impact: Low Actual impact: Low Audit history: Once previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time. The audit risk rating is low due to the small number of errors found in the field audit and the database is relatively static.

Actions taken to resolve the issue	Completion date	Remedial action status
Have meeting with ElectroNet on 6th June to discuss	30th May	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	

CONCLUSION

The Arc GIS database used for submission is managed by ElectroNet, on behalf of Westpower. New connection, fault, and maintenance work is completed by ElectroNet, who update the GIS in the field using Arc GIS collector. ElectroNet provide a monthly report from the database to Trustpower.

The field audit found a small number of errors. The database accuracy was found to be within the +/-5% allowable threshold.

The field audit found one example of new streetlights being connected but not recorded in the database. I recommend that the change management processes be reviewed to ensure that changes are tracked. Overall the database is relatively static and there are no immediate plans for large scale LED upgrades.

Five non-compliances were identified, and one recommendation is made. The future risk rating of ten indicates that the next audit be completed in 12 months. I have considered this in conjunction with Trustpower's comments and I agree with this recommendation.

PARTICIPANT RESPONSE

Trustpower have reviewed this report and their comments are recorded in the body of the report. There were no further comments provided.