



2018 Major Electricity Company BFM and ELC Audit

Audit Report

Jemena

October 2018

CM-8318 (BFM)

CM-8315 (ELC)

Prepared by: Electrical Resource Providers for and on behalf of Energy Safe Victoria

Audit Report Summary:

Client:	Energy Safe Victoria (ESV)
Auditee Network:	Jemena
Audit No:	MEC BFM & ELC Audits – EOI 2018
Regulation:	Electricity Safety (Bushfire Mitigation) Regulations 2013 Electricity Safety (Electric Line Clearance) Regulations 2015
Audit Topics	MEC Line Condition MEC Electric Line Clearance
Audit Date	Wednesday 10 th to Friday 12 th October 2018 (Field Audits) Monday 1 st to Friday 19 th October 2018 (Desktop Review)
Audit Team	██████████ ERP Senior Technical and Audit Consultant ██████████ ERP Field Auditor (BFM) ██████████ ERP Field Auditor (ELC)
Sites Visited	Various Sites across Jemena’s Electrical Distribution network. Selected sites from following substations: Broadmeadows, Sunbury, Sydenham

Document Approval:

Signatories			
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ERP Operations Manager / Project Director	██████████	██████████	18 th December 2018

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Executive Summary

This report presents findings and recommendations for the 2018 Bushfire Mitigation (Line Condition) and Electric Line Clearance (Clearance to Code) Audits conducted by Electrical Resource Providers on Jemena on behalf of Energy Safe Victoria.

The scope of the 2018 Bushfire Mitigation and Electric Line Clearance Audits was limited to:

- A general desktop review of relevant elements of the nominated MECs Bushfire Mitigation Plan (BFMP) and Electric Line Clearance Management Plan (ELCMP); and
- Field auditing of a number of sites selected by ESV against the requirements of the Electricity Safety (Bushfire Mitigation) Regulations 2013 and Electricity Safety (Electric Line Clearance) Regulations 2015, in particular asset condition and clearance to code.

A desktop review of Jemena's Bushfire Mitigation Plan, ELCMP and BFM and ELC sample database information was conducted by Peter Garlick of ERP in October 2018 and field based audits were conducted by Cameron McQuillen (BFM) and Brett Lind (ELC) of ERP in conjunction with Jemena representatives between the 10th October 2018 and 12th October 2018.

Desktop Review – Key Findings:

The desktop review of BFM and ELC reference documents provided at the time of audit found Jemena to have detailed management procedures in place to complement both its Bushfire Mitigation and Electric Line Clearance Management Plans.

Database extracts for both BFM and ELC provided sufficient information for field auditors to validate recorded information against in-field asset assessments noting that data from separate spreadsheets was consolidated by the auditor to create a suitable sample.

A desktop assessment of an audit sample of 686 poles extracted from records of more than 22,000 sites indicated inspection cycles were as per Jemena's BFMP and defects recorded were assigned current priority codes.

A review of the complete database extract indicated Limited Life and Unserviceable poles generally had inspection dates and (or) completed notifications against them consistent with Jemena's BFM policies. There were a small number of Limited Life poles (3 of 145) with a latest recorded inspection date in April 2017 (greater than 12 months) and six Unserviceable poles with inspection dates prior to July 2018 appeared to be incomplete (based on location these appear to be LBRA).

A desktop review of over 22,500 ELC database extract records indicated all HBRA spans had been assessed within the last 12 months and the majority of LBRA spans had been inspected or were due for bi-annual inspection.

Each of the spans had a current Jemena priority code for vegetation assigned and contained relevant information relating to location, previous assessment and previous cutting activity. There were a small number of general data administration items recorded which are discussed in the body of the report.

The desktop audit did note there were over 900 HBRA spans with a latest recorded action code (PT30, PT180 and PT365) indicating, based on Jemena's priority code definitions, they would require action prior to 31st October 2018.

The desktop audit did highlight that Assessment Action Code "PT180" and "PT365" appear to have the same definition (or action requirement) in relation to HBRA. This may be the intention as the Auditor is aware that "PT180" was previously not recorded within the ELCMP or BFMP however was a code used by vegetation assessors.

Database extracts for both BFM and ELC, supplemented by electronic data provided by Jemena in the field, provided sufficient information for Field Auditors to validate recorded information against in-field asset and span assessments.

Field Audit – Bushfire Mitigation (Asset Condition):

Field audits were conducted on 158 assets across various feeders on the Jemena distribution network validating previously recorded location details, maintenance items and fit / fix recommendations at all sites.

Of the 206 previously recorded defects relating to the poles audited the Field Auditor agreed with the assessment, priority and fit / fix recommendation for each of the items (i.e. 100%).

Five additional defects not previously recorded were reported by the Field Auditor. It is likely that two of these defects were present during the previous inspection cycle or showing signs of deterioration (unacceptable EDOs on a concrete pole and a rusty HV tie) and three items could have deteriorated post the previous inspection (deteriorated insulation on LV junction box leads, a fungal fruiting body on a pole and a dislodged LV bushing cover).

Jemena have provided comments against 17 observations recorded.

- Six miscellaneous items observed as not completed have been referred to Maintenance Planners for assessment and notifications to be raised.
- Two outstanding defects have been coded for completion with future opportunistic maintenance.
- Three outstanding slack stays have been technically assessed as not required.
- Two POEL defects are being monitored via POEL management processes.
- Observations at four poles have been assessed as no further action required due to meeting current policy (2) and recoding of two Limited Life poles to P5 (feedback indicated the codes in the database related to other items and not the pole classification).

A recommendation is included below in relation to the finding of a small number of items listed as completed that were still present in the field. Ensuring works that have been issued and closed out are accurately managed (e.g. technically assessed or rectified) is critical to maintaining a high level of accuracy in relation to BFM works.

Positive feedback was received from the Field Auditor in relation to an observation conducted on one active asset inspector and the contribution of the Jemena representative.

In general the field audit findings indicate that inspection records and information relating to the general state of the assets audited reflects their condition. The field audit did identify an isolated number of additional items that require assessment and follow-up.

The audit has recorded six recommendations for follow-up in relation to the BFM audit. The recommendations are summarised below and discussed in detail in Section 2 of this report.

Recommendations – Bushfire Mitigation (Asset Condition):

The physical state of the assets.
<ul style="list-style-type: none"> • It is recommended that Jemena assess each of the additional maintenance items recorded and determine appropriate actions as per their maintenance policies and procedures. • It is recommended that Jemena complete its assessment of the items raised as observations and determine appropriate actions as per their maintenance policies and procedures.
MECs knowledge about the state of the system.
<ul style="list-style-type: none"> • It is recommended that Jemena consider using the findings where additional defects were observed to communicate and reinforce the additional defects observed with their asset inspection service provider as an opportunity to further enhance and maintain a high level of accuracy in defect identification e.g. incorrect EDO assembly, FFB on pole, deteriorated LV insulation on junction box. This recommendation is made on the basis of education and awareness.

- It is recommended that Jemena review the finding in relation to the six previously reported items listed as completed but observed in the field as outstanding. The review should consider whether the items have been technically assessed with no further action deemed required or have been issued for rectification and signed off as completed. The review outcomes should determine whether further investigation or corrective actions are required (in the context of the entire Jemena network given the audit findings relate to a very small overall sample).

Compliance with current Bushfire Mitigation Plan.

- It is recommended that Jemena confirm appropriate monitoring and action plans are in place to ensure the observed POEL defects are managed in accordance with its POEL management procedures (in particular the installation recorded with the severely leaning pole).
- As a general observation Jemena may wish to review the status of a small number of U/S poles identified during the desktop audit of data provided which appear to be beyond typical rectification dates. The poles appear to LBRA based on the addresses allocated in the database.

Findings in relation to the above recommendations including identified corrective actions should be reported to ESV.

Field Audit – Electric Line Clearance (Clearance to Code):

The Electric Line Clearance field audit assessed span clearances from vegetation at 285 sites across 7 feeders. 239 sites assessed were located in HBRA and 46 LBRA.

The field audit verified the span identification information was accurate for all sites audited and each of the records provided contained previous inspection date, cutting information (where applicable) and span coding details.

Based on Jemena's span code definition and the Field Auditor's applied span coding the assessment indicates currently recorded span codes for 236 spans were validated, or 82.8% of the sample.

Of the 49 spans where the auditors span code assessment differed from the latest recorded span code eight spans were assigned a code PT30 indicating vegetation was within the MCS and three spans were recoded PT180 from PT720. The remaining 38 spans were recoded less conservatively to either PT720 (36) or CC (2). 36 spans had recently been cut which indicates the data may not have been updated at the time of audit.

Six HBRA spans (2.5%) were observed with vegetation within the MCS and a further 46 HBRA spans were assigned a code "180" indicating they would require clearing prior to the upcoming bushfire season. With the exception of one span (A044664) all were allocated a current action code for completion by the commencement of the 2018/19 declared bushfire season.

Two LBRA spans (4,3%) were observed with vegetation within the MCS and a further two LBRA spans were assigned a code "180" indicating they require action to restore or remain compliant. These spans are current due for assessment and had previously recorded span codes of "720".

The desktop review of data and the subsequent field audit findings indicate Jemena is progressing well with its pre-summer HBRA assessment and cutting programs. Feedback from Jemena indicated LBRA assessments within the audit area were planned to commence shortly.

As an additional note to this statement the desktop audit identified over 900 HBRA spans requiring action within the full database sample which does indicate a sizeable workload to ensure vegetation remains compliant through the coming fire season.

As a general observation ELC activities appear to be achieving and maintaining clearance compliance with the Field Auditor's assigned code agreeing with the recorded cut code for over 97% of spans where a previous cut code was assigned in either 2017 or 2018. Observation of cutting at 35 sites also indicated desired cutting results had been achieved.

Positive feedback was received from the field auditor in relation to observations conducted on two active vegetation assessors and the

contribution of the Jemena representatives who assisted throughout the Field Audit.

Jemena's database information was in general validated as accurate, easy to follow and contained information consistent with the requirements of Jemena's ELCMP. Information within Jemena's database and observations conducted in the field indicate it is progressing well with its annual and pre-summer assessment program.

The audit has recorded four recommendations for follow-up in relation to the ELC audit. The recommendations are summarised below and discussed in detail in Section 3 of this report.

Recommendations – Electric Line Clearance (Clearance to Code):

The accuracy of inspection data and work recommendations.
<ul style="list-style-type: none"> It is recommended that Jemena review the 8 HBRA spans assigned a more conservative code than at their most recent 2018 assessment to determine if there are any particular trends or factors that require further corrective action to maintain the high level of accuracy of their VMS. As a general observation Jemena may consider reviewing the observation in relation to additional sag and sway clearance requirements and ensure its vegetation assessment processes are making adequate allowances for sag and sway requirements.
Vegetation clearance standards and compliance with the Code of Practice for electric line clearance.
<ul style="list-style-type: none"> It is recommended that Jemena review the spans identified as requiring action (e.g. field audit code PT30 or PT180) and ensure management plans are in place to ensure the spans are cleared to maintain the MCS requirements.
Vegetation management data reflects the status of field observations made at the time of the audit.
<ul style="list-style-type: none"> It is recommended that Jemena review the definitions for assessment codes (PT180 and PT365) to ensure the definitions clearly reflect the applicable intention for HBRA.

Findings in relation to the above recommendations including identified corrective actions should be reported to ESV.

1 Audit Overview

1.1 Audit Context

Energy Safe Victoria (ESV) is responsible for the safety and technical regulation of electricity, gas and pipelines in Victoria. The role and functions of ESV are specified by the Energy Safe Victoria Act 2005.

An element of this responsibility is to regularly audit compliance of the Victorian Major Electricity Companies (MECs) to the various regulatory requirements. This particular audit focusses on compliance with the Electricity Safety (Bushfire Mitigation) Regulations 2013 and Electricity Safety (Electric Line Clearance) Regulations 2015.

1.2 Audit Scope

The scope of the 2018 Pre-summer Bushfire Mitigation and Electric Line Clearance Audits is limited to:

- A desktop review of relevant elements of the nominated MECs Bushfire Mitigation Plan (BFMP) and Electric Line Clearance Management Plan (ELCMP); and
- Field auditing of a sample of sites, selected by ESV, against the requirements of the Electricity Safety (Bushfire Mitigation) Regulations 2013 and Electricity Safety (Electric Line Clearance) Regulations 2015.

The Bushfire Mitigation (BFM) audit will focus on:

- The physical state of the assets;
- The MEC's knowledge about the state of the system; and
- The MEC's compliance with their current BFM plan.

The Electric Line Clearance (ELC) audit will focus on:

- The accuracy of inspection data and work recommendations;
- Vegetation clearance standards and compliance with the Code of Practice for Electric Line Clearance; and
- Vegetation management data reflects the status of field observations made at the time of the audit.

This particular audit report relates to the Jemena electrical distribution network.

The key objectives of the audit include:

- A desktop review of Bushfire Mitigation Plan and Electric Line Clearance Plan expectations and associated data;
- Confirm asset and span inspections were completed as per the auditees plans;
- Validate the priority rating of both maintenance and line clearance items observed;
- Confirm that maintenance and/ or cutting activities were completed as per priority timeframes and work order expectations; and
- Validate the level of competency and understanding of field operatives engaged in BFM and ELC assessment and inspection activities.

1.3 Audit Duration

Audit information was provided to ERP between the 3rd and 8th October 2018.

Field auditing of the Jemena distribution network was conducted between 10th and 12th of October 2018. A total of 3 days field auditing of both BFM and ELC activities was completed.

Desktop review and analysis of field audit data in relation to the Jemena distribution network was conducted between 1st October 2018 and the 19th October 2018.

1.4 Audit Methodology

The audit of Jemena compliance in relation to the Electricity Safety (Bushfire Mitigation) Regulations 2013 and Electricity Safety (Electric Line

Clearance) Regulations 2015 was undertaken in accordance with the following methodology:

- Desktop review of Jemena BFMP and ELCMP and associated samples of asset inspection and electric line clearance database extracts;
- Field site audits across the Jemena distribution network accompanied by nominated Jemena distribution representatives;
- Field observations conducted on active asset and vegetation inspectors (where practical);
- Review of 2018 field audit data and submission of a draft audit report for review; and
- Submission of final audit report.

1.5 Audit Assessment Criteria, Findings and Recommendations

The audit report describes elements of the regulations pertaining to bushfire mitigation and electric line clearances as it relates to various asset management activities of the auditee including: asset inspection, vegetation assessment, data accuracy and completion of various works.

The audit report does not contain specific assessment criteria or grading's against each of the elements assessed but rather provides a synopsis of the desktop and field based audit observations.

The report is structured to provide:

- A summary of desktop and field based audit and assessment observations;
- Commentary in relation to the desktop and field based observations in relation to relevant regulations and the MECs own documented plans and strategies; and
- Where relevant, recommendations for follow-up or consideration with a focus on addressing identified issues or potential improvement opportunities.

1.6 Audit Limitations

The purpose of this report and the associated services performed by ERP, is to provide an audit of Jemena compliance with their submitted BFMP and ELCMP and the associated regulations as described within the above scope in accordance with the Terms and Conditions as described in ESVs document titled "Perform Audits of Major Electricity Companies Bushfire Mitigation (Asset Condition) and Electric Line Clearance (Clearance to Code)" reference: MEC BFM & ELC Audits – EOI 2018.

Field site auditing was limited to observations of a sample of sites from packages as determined by ESV, by undertaking physical, ground based observations (inclusive of "sound testing" of wooden poles).

Additional information was obtained from Jemena responsible officers and via conducting field observations on active asset and line clearance inspectors.

Database information audited was provided to ERP between the 3rd and 8th of October 2018 with the field audit being conducted between the 10th and 12th October 2018. It is noted that the following field audit observations in some cases may not be reflective of the current Jemena master asset and vegetation management databases if records contained within the sample have been recently updated.

It is noted that reporting of asset related defects on poles or spans outside the sites audited was outside of the scope of this audit although arrangements were made with Jemena should any of these issues be observed.

2 Audit Report – Bushfire Mitigation (Asset Condition)

2.1 Overview

As a requirement of the Electricity Safety Act 1998 Jemena is required to submit, for approval by ESV, a Bushfire Mitigation Plan (5-yearly). The bushfire mitigation plan, in part, describes the procedures in plan to manage the requirements as set out in the Electricity Safety (Bushfire Mitigation) Regulations 2013. At the date of the audit it was noted that the version of the plan sourced from Jemena’s website was Revision 1.0 of document JEN PL 0100 (Bushfire Mitigation Plan 2018-2023, 29/6/2018).

Section 2.7 of the BFMP describes the strategy used by Jemena to monitor asset condition.

The BFMP contains a procedure, BFM5, detailing the activities monitored via the Bushfire Mitigation Index (BMI) and the timeframes for completion of identified works.

The following provides an overview of the key aspects of the Jemena BFMP as they relate to the specific requirements of the BFM audit scope.

2.2 Bushfire Mitigation Inspection Cycles and Priority Coding

Jemena BFMP describes pole inspection cycles in attachment BFM18.

- HBRA assets are subject to a routine three year inspection cycle with no inspection interval to exceed 37 months.
- HBRA limited life poles that haven’t been replaced or staked are re-inspected within 12 months.
- LBRA assets are subject to a routine four year inspection cycle with no inspection interval to exceed 61 months.

ERP was provided with a copy of Jemena “Asset Inspection Manual” (JEN MA 0500, September 2018) which provided both summaries of maintenance codes allocated by asset inspectors and the corresponding

action required (AIM Section 4 to Section 14). The BFMP, attachment BFM15, describes the actions required for each of the codes recorded by the asset inspector i.e. rectification action and timeframe.

The AIM manual was utilised by the field auditor to validate information contained within the Jemena database extract provided, observations during the audit and additional records provide by the Jemena representative on a PDA.

The following figure (Table 2.1) provides an overview of the priority codes used by Jemena.

Priority Rating	
Items reported are recorded in a SAP notification and given a priority as defined in SAP, from 1 to 9. The asset inspection manual instructs asset inspectors to use the below priorities when raising notifications..	
Priority 1:	Requires immediate assessment and/or rectification within 24 hours.
Priority 3:	Requires assessment by planner or rectified within 12 weeks.
Priority 4:	Requires assessment by planner or rectified within six months
Priority 5:	Requires assessment by planner or rectified with 12 months.
Priority 9:	Recorded for opportunistic maintenance purposes and may not be addressed before the next inspection cycle.
The below list of priorities are not to be used by Asset Inspectors and is provided for completeness only.	
Priority 2:	Requires assessment and/or rectification within week.
Priority 6:	Requires assessment and/or rectification within two weeks.
Priority 7:	Requires assessment and/or rectification within four weeks.
Priority 8:	Requires assessment and/or rectification within eight weeks.
The Asset Inspection Manual assigns priority ratings to various types of defects or damage observed and, provides detailed advice to inspectors and maintenance planners. A priority rating may be reassessed following subsequent inspections.	
During inspections any item found to be defective or deteriorated should be assigned a priority rating in accordance with the Asset Inspection Manual.	

Table 2.1: Jemena Maintenance Priority Codes

2.3 Training and Competency of Asset Inspectors

Jemena’s BFMP and Asset Inspection Manual reference the training and competency requirements for personnel required to undertake inspection of assets on their network. In relation to asset inspectors there are appropriate references to ESV approved courses and the VESI Skills and Training matrix. Qualifications listed for Asset Inspectors are:

- 22109VIC - Certificate II in Asset Inspection (up to 30th June 2015);
- UET20612 - Certificate II in ESI – Asset Inspection (after 30th June 2015).

This is consistent with the Training Approval Statement issued by ESV on 20th May 2015.

2.4 BFM Database Extract (Desktop Review)

ERP was provided a database extract from Jemena containing asset details for four Zone Substations. The database extracts provided on 4th October 2018 was split contained data split across two separate workbooks:

- Workbook 1: Pole details for 21,464 poles; and
- Workbook 2: Maintenance notification records for just over 21,000 poles. This workbook contained over 105,000 lines of data.

Data from the two spreadsheets was matched to produce a suitable audit sample for field use.

Given the audit was restricted to 3 days it was agreed with ESV that ERP would focus on HBRA and fringe LBRA areas and hence records relating to Newport ZSS were excluded from the sampling. The remaining random sample was chosen from poles inspected in 2017 / 2018.

An initial sample of 686 poles was selected for the Field Auditor which was further reduced to 381 following a request from Jemena (see Table 2.2). The sample focussed primarily on fire areas, assets with recent inspection dates and a selection of poles on both public and private land.

A desktop assessment of the initial audit sample of 686 poles indicated:

- 454 assets were in HBRA and 232 assets were in LBRA.
- 808 defects were aligned to the 686 assets and each was allocated a priority code consistent with Jemena’s codes in table 2.1.
- Each of the assets within the audit sample had a recorded previous inspection date in 2017 or 2018.
- 142 of 145 limited life poles within the complete data sample had dates indicating they had been inspected within the previous 12 months. 3 L/L poles had previously recorded inspection dates of April 2017 (A072252, A073670, A073674). The notes provided indicated there was an outstanding notification against each pole.
- There were 6 unserviceable poles within the complete database which had previously recorded inspection dates prior to July 2018 (A023675, A024211, A043284, A058994, A089066, P33343). The poles appear to be in LBRA (Williamstown). 44 additional U/S poles had competed status recorded against them or were recent inspection cycles.

As a general observation Jemena may wish to review the status of a small number of U/S poles identified during the desktop audit of data provided which appear to be beyond typical rectification dates. The poles appear to LBRA based on the addresses allocated in the database.

MEC and Audit Reference:		Jemena (CM – 8318)	
Audit Sample:	Location:	Feeder:	Sample:
	Attwood, Campbellfield	BD07, BD08	40
	Sunbury, Diggers Rest, Plumpton, Hillside	SHM11, SHM14, SHM21	195
	Bulla, Clarkefield, Sunbury, Wildwood	SBY11, SBY12, SBY23, SBY24	146

Table 2.2: Jemena BFM Audit Sample Summary

In summary the information provided within the database contained sufficient details in relation to pole details, locations and inspection history. There was however limited information in relation to maintenance items, priorities and associated dates such as closeout dates and details.

2.5 Overview of Field Audit and Sites Assessed

Field audits commenced in Bulla on Wednesday 10th October 2018 and concluded in the Attwood area on Friday 12th October 2018. A total of 3 field auditing days were undertaken during this period. The Field Auditor was accompanied by Jemena representative [REDACTED] for the duration of the audit.

The Jemena representative provided additional information electronically in relation to the assets audited. The Field Auditor did advise that during the early stage of the audit there were some technical issues with the Jemena data however these were rectified as the audit progressed.

In preparation for the field audit a sample of 381 assets (498 recorded defects) was randomly selected and supplied to the Field Auditor and Jemena to assist with audit planning. 158 of these sites were audited.

Table 2.3 provides a summary of the poles attended and assessed during the field audit phase.

MEC and Audit Reference:		Jemena(CM – 8318)		
Field Auditor:		[REDACTED]		
Audit Dates:	Wednesday 10 th October 2018 to Friday 12 th October 2018			
Audit Sample:	Date:	Location:	Feeder:	Sample:
	10/12/2018	Bulla, Clarkefield, Wildwood	SBY11	49
	11/10/2018	Clarkefield, Sunbury	SBY11	22
		Diggers Rest, Sunbury	SHM11	29
12/10/2018	Attwood Bonnie Brook, Fraser Rise, Plumpton	BD07 SHM11, SHM14	20 38	
Total				158

Table 2.3: Jemena BFM Audit Summary – Sites Attended

The field audits were undertaken as a non-invasive visual inspection of poles from ground level using typical asset inspection equipment and techniques, including a pole mounted camera to validate pole top asset and crossarm assessment details as required. In addition to visual inspections of assets “sound testing” was undertaken on the majority of poles.

The field audit concentrated on validating pole information, previously recorded maintenance and defect items and recording additional items not contained within the database extract provided.

- A total of 158 assets were audited representing 41.5% of the random audit sample.
- 138 poles audited were in Fire (F) areas and 20 in Non-Fire (N) areas.
- 206 previously recorded defects were listed against the sample of poles audited in the field with 147 confirmed as completed.
- 130 poles assessed were sound tested. No issues were recorded by the Field Auditor at these sites.
- The poles audited were located on roadside easements and private property and spread across the Zone Substation feeders selected for audit.
- 22 additional defects or observations were recorded at 21 of the poles audited – these items are discussed further in the following sections of the report.

Site location and identification details were validated as accurate for each of the poles audited and each had an inspection tag affixed which matched with the previously recorded inspection date provide by Jemena.

Limited descriptions existed within the database extract provided in relation to previously recorded defect items and rectification actions which may have resulted in a number of observations being recorded where defects had been previously addressed as per Jemena maintenance requirements.

The following analysis is provided to further explain the overall findings in relation to recorded outcomes of the field assessment. Table 2.4 provides a numerical representation of the Field Auditor’s findings.

Feeder(s)	Poles Audited	Audit Aligned with Database (100%) or Rectified # Sites	Additional Defects / OBS # Sites	Additional Defects / OBS # Items
SBY11	71	62	9	10
SHM11, SHM14	67	57	10	10
BD07	20	18	2	2
Total	158	137	21	22

Table 2.4: Jemena BFM Audit Summary – Findings Summary

The Field Auditor’s findings agreed with the recorded database information for 137 (87%) of the poles assessed. The Field Auditor listed observations, additional defects or items for follow-up at the remaining 21 (13%) sites audited.

A summary, inclusive of additional defects / observations and photos was sent to Jemena on Thursday 18th October 2018 for review. Jemena have since provided feedback for each of the items raised and where appropriate this feedback will be referenced during the following analysis.

The field audit observed previously recorded defect items at the majority of sites were accurately recorded and (or) had been rectified. Rectification works included pole replacements, crossarm replacement, refitting and removal of hardware.

The Field Auditor noted that a small number of sites with outstanding notifications listed the defect against “DIST SUB”. At these sites if there were no obvious defects present it was assumed the defect related to high earth readings which were unable to be validated (and would not have been a part of the Asset Inspection process).

The field auditor recorded 22 additional defects or observations, based on the information at the time of audit, per the requirements of the Jemena asset inspection manual, at 21 sites.

Five defects not previously recorded included:

- 1 x P1 – Deteriorated insulation on LV fuse box leads (HBRA) *(Note: this item was reported to Jemena on 15/10/18 after review – it was unclear whether this was a P1 service insulation defect or a P4 LV cabling insulation defect per Jemena’s AIM).*
- 2 x P3 – Unacceptable EDOs on concrete pole, FFB on pole (HBRA)
- 1 x P4 – Rusty HV ties (HBRA)
- 1 x P5 – LV bushing cover not secure (HBRA)

15 observations for follow-up were recorded. These relate to defect items previously identified and noted as being completed and (or) beyond their priority completion date:

- 1 x P8 - Slack ground stay (HBRA)
- 8 x P4 – 2 x Slack ground stays, 3 x rusty ties, exposed earth, LV fuse arm deteriorated, fuse box cover not secured HBRA)
- 2 x P5 – Loose surge diverter cap, 2013 notification outstanding (detail unknown at time of field audit) (HBRA)
- 2 x P5 POEL – Deteriorated LV crossarm, leaning pole (HBRA)
- 2 x P9 – Loose LV insulator nut, deteriorated LV crossarm (LBRA)

Priorities assigned to two sites were flagged for follow-up and possible recording:

- 2 x Limited Life Poles – current codes indicate P9 and P3. Limited life poles expected to be coded P5. (HBRA)

Table 2.5 (next page) provides a summary of the additional defect items and observations recorded by the Field Auditor.

A summary, inclusive of additional defects, observations and photos was provided to Jemena on Thursday 18th October 2018 with Jemena providing feedback on the 24th and 25th October 2018.

Complete field audit records are attached as Appendix 3 to this report. Photographs of a selection of the additional items recorded by the field auditor are included with separate attachment as Appendix 3 to this report.

Equip #	Feeder	Fire Area	Pole Number	Noti #	Notification Date	Notification Status	Priority	Object type	Description	Additional Maintenance Items or Observations	Assessed Priority
10104714	BD0-007	N	A035050	10132269	18/11/2017	Completed	9	INSUL GRP	CNR HARRICKS LAVERY WSTMDWS LSE INS NUTS	NOT COMPLETED <i>Not reportable per AIM 8.62 (Less than one full not of thread but sufficient support to support insulator to next inspection).</i>	OBS (Policy)
10104875	BD0-007	N	A035051	10132283	21/11/2017	Completed	9	XARM	13 HARRICKS WESTMEADOWS XARM DECAY	NOT COMPLETED <i>Currently assigned P9 - to be completed with maintenance as required.</i>	OBS (P9)
10485825	SHM-014	F	A009980	10216185	19/01/2017	Completed, Printed	8	POLE SUPP	MELTON HWY PLUMPTON GUY SLACK	NOT COMPLETED <i>Previously assessed by Maintenance Planer as not requiring stays - no action.</i>	OBS (OK)
10144697	SHM-011	F	A004521	10203162	17/01/2017	Completed	2	DIST SUB	100 GLENCOE DR DIGGERS REST 3427 : Power	RUSTY HV TIES <i>P4 notification to be raised for rectification.</i>	P4 BFM
10145919	SHM-011	F	A008832	10262185	18/01/2017	Completed, Printed, Order Assigned	4	INSUL GRP	CNR WATSON BUCKLAND HWY RUSTY TIES	NOT COMPLETED <i>P4 notification to be raised for rectification.</i>	OBS (P4) BFM
10143758	SHM-011	F	A074740	10235443	18/01/2017	Completed, Printed	5	SURGE DIV	Watsons Rd Surge diverter loose cap	NOT COMPLETED <i>P4 notification to be raised for rectification.</i>	OBS (P4) BFM
10485764	SHM-014	F	A002253	10216183	1/02/2017	Completed, Printed, Order Assigned	4	POLE SUPP	MELTON HWY PLUMPTON GUY SLACK	SLACK GUY NOT COMPLETED <i>Previously assessed by Maintenance Planer as not requiring stays - no action.</i>	OBS (OK)
10485751	SHM-014	F	A002252	10216184	8/02/2017	Completed, Printed, Order Assigned	4	POLE SUPP	MELTON HWY PLUMPTON GUY SLACK&ARM ROT	GUY SLACK NOT COMPLETED <i>Previously assessed by Maintenance Planer as not requiring stays - no action.</i>	OBS (OK)
10485713	SHM-014	F	A002256	10216181	8/02/2017	Completed, Printed, Order Assigned	4	POLE	MELTON HWY PLUMPTON EARTH EXPOSED	NOT COMPLETED <i>Noted and defect will be scheduled for rectification.</i>	OBS (P4)

10144554	SHM-011	F	A008837	10262193	17/01/2017	Completed, Printed, Order Assigned	4	XARM	93 WATSON RD DIGGERS REST	LV FUSE XARM NOT COMPLETED <i>Notification does not relate to LV Fuse Arm – Jemena considering new AIM criteria for deteriorated non-load bearing LV fuse crossarms)</i>	OBS (Policy)
10146113	SHM-011	F	A008842	10262188	18/01/2017	Completed, Printed, Order Assigned	4	INSUL GRP	BUCKLAND HWY DIGGERS REST TIES	DETERIORATED INSULATION ON WIRING ENTERING JUNCTION BOX <i>Noted and notification for action ASAP will be raised.</i>	P1 BFM
10146103	SHM-011	F	A122982	10262187	18/01/2017	Completed, Printed, Order Assigned	4	INSUL GRP	BUCKLAND HWY DIGGERS REST RUSTY TIES	NOT COMPLETED <i>Rusty tie (P4) to be assessed by Maintenance Planner and rectified if required (possibly surface rust only).</i>	OBS (P4 Assess) BFM
10121101	SBY-011	F	A018290	10267946	17/01/2018	Printed, Outstanding	3	POLE	650 KONAGADERRA RD CLARKEFIELD 3430 : Ma	UNACCEPTABLE EDO'S ON CONCRETE POLE <i>Noted and defect will be scheduled for rectification.</i>	P3 BFM
10123338	SBY-011	F	A018283	10276803	17/01/2018	Completed, Printed, Order Assigned	4	INSUL GRP	KONAGADERRA RD CLARKEFIELD RUSTY TIE	RUSTY HV TIE / FFB ON POLE 400MM BELOW LV XARM (SPOKE TO K.FRASER) <i>Rusty tie (P4) to be assessed by Maintenance Planner and rectified if required (possibly surface rust only). FFB to be assessed - not present at previous inspection.</i>	OBS (P4 Assess) / P3 BFM x 2
10393074	SBY-011	F	A037915	10188885	8/02/2018	Completed, Printed, Order Assigned	4	INSUL GRP	OP94 OUTLOOK CR CLARKFIELD HV TIE RUST	LV BUSHING COVER NOT SECURE <i>Noted and defect will be scheduled for rectification.</i>	P5

10139767	SBY-011	F	P31993	10278116	27/02/2018	Completed	5	XARM	200FENTONHILL RD CLRKFLD POEL LXRM SPLIT	NOT COMPLETED / UNDERGROUND INSTALLED NOT YET CONNECTED <i>Being managed via POEL Process.</i>	OBS (POEL)
10127666	SBY-011	F	A037944	10189134	24/01/2018	Completed, Printed	9	POLE	182 FENTON HILL RD CLARKEFIELD	POLE IS LIMITED LIFE P5 <i>P9 notification related to possum guard not L/L pole - no action.</i>	OBS (OK)
10879658	SBY-011	F	P31873	10278118	27/02/2018	Completed	5	POLE	75 FENTON HILL RD CLRKFLD POEL POLE LEAN	POLE NOT STRAIGHTENED ON SEVERE LEAN <i>Being managed via POEL Process.</i>	OBS (POEL)
10123295	SBY-011	F	A016432	10209479	24/04/2018	Outstanding	5	DIST SUB	A016432 P3 SOUTHERN PLANTS RD SUNBURY	OUTSTANDING P5 1 YEAR (2013) <i>Outstanding notification relates to earth testing program not asset inspection i.e. slightly elevated earth reading.</i>	OBS (OK)
10121181	SBY-011	F	A016444	10196785	15/01/2018	Completed, Printed, Order Assigned	3	POLE	A016444 O/S 50 Emu Flats Rd HV Xarm	ON LIMITED LIFE CYCLE / SHOULD BE P5 <i>P3 notification related to HV crossarm (which has been actioned per Jemena maintenance requirements) not L/L pole - no action.</i>	OBS (OK)
10122860	SBY-011	F	A035256	10276801	11/01/2018	Completed, Printed, Order Assigned	4	POLE	710 WILDWOOD RD W/WOOD JBOX HANGING	JUNCTION BOX COVER NOT COMPLETELY SECURED <i>Noted and defect will be scheduled for rectification.</i>	OBS (P4)

Table 2.5: Jemena BFM Audit Summary – Additional Defects / Observations

Taking into consideration the type of defect or observation recorded and the time lapse since the previous inspection was conducted it is possible that two of the additional defects or conditions observed were either existing or showing signs of deterioration when the asset was previously inspected. These items relate to:

- 1 x P3 – Unacceptable EDO on concrete pole (last insp. 01/2018).

- 1 x P4 – Rusty HV tie (last insp. 01/2017).

The remaining three additional items recorded could have potentially occurred post the previous inspection, inclusive of:

- 1 x P1 – Deteriorated insulation on LV junction box leads (last insp. 01/2017).

- 1 x P3 – FFB on pole (last insp. 01/2018).
- 1 x P5 Dislodged LV bushing cover (last insp. 02/2018).

Priorities for each of the items were allocated in alignment with Jemena's Asset Inspection Manual and it is expected a review of each the items will be undertaken to determine an appropriate course of action in line with Jemena's maintenance management policies and procedures.

Based on these observations there is evidence to indicate that the asset inspection processes carried out on the Jemena network are in general providing a reliable knowledge base for the status of the assets audited.

It is recommended that Jemena assess each of the additional items recorded and determine appropriate actions as per their maintenance policies and procedures.

It is further recommended that Jemena consider using the findings where additional defects were observed to communicate and reinforce the additional defects observed with their asset inspection service provider as an opportunity to further enhance and maintain a high level of accuracy in defect identification.

Observations were recorded against 17 previously reported defects that were observed as still remaining in the field. The following summary is based on Jemena feedback.

Six previously recorded defects indicated in database information as completed were observed as outstanding:

- Rusty HV ties at three sites (P4) recorded as completed are to be assessed by Maintenance Planners and notifications for rectification raised as required or priority codes updated.
- Three miscellaneous defect items recorded as completed (exposed earth (P4), dislodged surge diverter cap (P5) and LV junction box cover not completely secure (P4) are to have notifications raised and be scheduled for rectification.

Jemena feedback for the remaining eleven miscellaneous observations recorded indicated that they have been technically assessed and no further action is required (5), assigned an opportunistic maintenance code for

future rectification (2), not reportable per current Jemena policy (1) or are being monitored via other Jemena asset management processes (3).

- Slack stays at three sites were not completed following assessment which determined they were not technically required.
- A deteriorated LV fuse arm was noted at one site (non-mechanical load bearing). Jemena have indicated they are currently reviewing their AIM guidance on these items.
- Two LBRA LV defects (Loose insulator nuts and deteriorated LV crossarm) were previously assessed and allocated a P9 code for completion as opportunistic maintenance.
- One outstanding P5 notification raised in 2013 (high earth reading) was noted. As this is not an activity that would be part of the Asset Inspection process no further action is required as part of this audit. Jemena are aware of the defect reported via earth testing programs.
- Outstanding defects on two POELs (leaning pole and split LV crossarm) are being managed per Jemena's POEL Defect Management processes.
- Recode observations recorded against 2 Limited Life poles were clarified as previous defects (a possum guard and a HV crossarm) which have been closed out i.e. the recorded code didn't relate to the pole.

These observations indicate that the asset inspection activity appears to be, in general, identifying defects and assigning maintenance codes as per Jemena's AIM. There were however outstanding defects observed at six sites that based on their currently assigned maintenance code (5 x P4, 1x P5) and their previous inspection dates would be considered overdue for rectification.

It is recommended that Jemena complete its assessment of the items raised as observations and determine appropriate actions as per their maintenance policies and procedures.

It is recommended that Jemena confirm appropriate monitoring and action plans are in place to ensure the observed POEL defects are managed in accordance with its POEL management procedures (in particular the installation recorded with the severely leaning pole.)

It is recommended that Jemena review the finding in relation to the six previous reported items listed as completed but observed in the field as outstanding. The review should consider whether the items have been technically assessed with no further action deemed required or have been issued for rectification and signed off as completed. The review outcomes should determine whether further investigation or corrective actions are required (in the context of the entire Jemena network given the audit findings relate to a very small overall sample).

The Field Auditor made a general comment that in his opinion, based on the sites audited, his observations and data presented, the inspection process appears in general to be being conducted to a high standard with previous items reported consistent with Jemena’s AIM.

2.6 Active Asset Inspector Observations

The field auditor completed observations on one active asset inspector as part of the recent field audit. The following asset inspectors were observed by the field auditor:

- Chris Bellingham

In the auditors opinion the asset inspector observed was very knowledgeable about the requirements of the Asset Inspection role, demonstrated a good work ethic and took pride in the work that they did.

The auditor reported that the asset inspector observed completed all tasks required at the asset being inspected, identified and recorded relevant information and had all relevant equipment to complete the tasks observed.

2.7 Summary Observations and Recommendations

Field audits were conducted on 158 assets across various feeders on the Jemena distribution network validating previously recorded location details, maintenance items and fit / fix recommendations at all sites.

The Field Auditor’s findings agreed with the recorded database information for 137 (87%) of the poles assessed. The Field Auditor listed 22 observations, additional defects or items for follow-up at the remaining 21 (13%) sites audited.

Of the 206 previously recorded defects relating to the poles audited the Field Auditor agreed with the assessment, priority and fit / fix recommendation for each of the items (i.e. 100%).

The field audit observed previously recorded defect items at the majority of sites were accurately recorded and (or) had been rectified. Rectification works included pole replacements, crossarm replacement, refitting and removal of hardware.

The audit assigned a code “P1” (1), “P3” (2), “P4” (1), “P5” (1) or code “OBS” (17) to 22 observations recorded through the BFM audit. It is expected that Jemena will assess and monitor the progression of these items per its internal defect management processes.

Table 2.6 provides a summary overview of the assets audited.

Feeder	Poles Audited	Audit Aligned with Database (100%) or Items Rectified	Additional Defects / Obs. # Sites	Additional / Outstanding Defects (BFM)	OBS / Query Policy or Priority
SBY11	71	62	9	5 (3)	5
SHM11, SHM14	67	57	10	6 (5)	4
BD07	20	18	2	0	2
Total	158	137	21	11 (8)	11

Table 2.6: Jemena BFM Audit Summary

In the above table the numbers in red indicate an item, based on Jemena’s AIM and its BMP, would be monitored via its BFM Index.

The above table is reflective of the field audit findings and feedback received from Jemena in relation to the status of a number of the observations recorded by the Field Auditor (see Table 2.4 and Table 2.5).

The Field Auditor noted that each of the assets visited had a pole inspection tag attached. Location details were validated for each of the sites visited.

In addition to visual inspection of assets the Field Audit team “sound tested” 130 of poles audited. There were no issues reported in relation to the sound testing undertaken.

In general the field audit findings indicate that inspection records and information relating to the general state of the assets audited reflects their condition. The field audit did identify an isolated number of additional items or previously reported items not rectified that require assessment and follow-up as discussed above.

The field results indicate that field inspection activities are completed as per the requirements of the Jemena BFMP and are generally effective in identifying defects and assigning priority ratings as per the requirements of Jemena’s Asset Inspection Manual.

The recommendations contained within the body of the report are summarised below under the following broad categories:

- The physical state of the assets.
- MEC’s knowledge about the state of the system.
- Compliance with current BFM plan.

The physical state of the assets.

In general the audit found that Jemena assets audited were in a serviceable condition reflective of the data provided at the time of audit, in particular in relation to previously reported BFM related items.

The audit also noted that a significant number of previously reported maintenance had been rectified or assets updated as part of ongoing project works.

- It is recommended that Jemena assess each of the additional items recorded and determine appropriate actions as per their maintenance policies and procedures.
- It is recommended that Jemena complete its assessment of the items raised as observations and determine appropriate actions as per their maintenance policies and procedures.

MECs knowledge about the state of the system.

The audit found in general that for BFM related maintenance items the systems and processes provide Jemena with a reliable knowledge of the state of their system.

The Field Auditor noted that each of the assets visited had a pole inspection tag attached. Location details were validated for each of the sites visited.

The Field Auditor did record five additional defect items in HBRA.

Previously recorded HBRA defect items listed as completed at six sites were observed as being outstanding and require follow-up.

- It is recommended that Jemena consider using the findings where additional defects were observed to communicate and reinforce the additional defects observed with their asset inspection service provider as an opportunity to further enhance and maintain a high level of accuracy in defect identification e.g. incorrect EDO assembly, FFB on pole, deteriorated LV insulation on junction box. This recommendation is made on the basis of education and awareness.
- It is recommended that Jemena review the finding in relation to the six previous reported items listed as completed but observed in the field as outstanding. The review should consider whether the items have been technically assessed with no further action deemed required or have been issued for rectification and signed off as completed. The review outcomes should determine whether further investigation or corrective actions are required (in the context of the entire Jemena network given the audit findings relate to a very small overall sample).

Compliance with current Bushfire Mitigation Plan.

The audit found that Jemena was managing its inspection cycles and asset inspection processes as per its current BFM plan – in terms of inspection cycles the field auditor confirmed the presence of latest inspection tags at the assets he audited.

The audit found in general that maintenance items recorded within Jemena's database aligned to current priority ratings and requirements. Defect items and rectification dates appeared, in general, to be being monitored and managed as per Jemena's BFMP and AIM.

The audit recorded an isolated number of maintenance defects (5) not recorded within the database information provided. It is likely that two of these items were present or showing signs of deterioration at the previous inspection whilst it was possible the remaining three items occurred post the previous inspection.

Evidence and observations indicated that six previously recorded defects listed as being completed were still present in the field. Recommendations for follow-up to determine the reasons for this are made above. The desktop audit also identified a small number of unserviceable poles (possibly LBRA based upon address) outstanding beyond their expected rectification dates.

Jemena feedback relating to POEL defects outstanding at two sites indicated they were being managed as part of Jemena's POEL management processes.

- It is recommended that Jemena confirm appropriate monitoring and action plans are in place to ensure the observed POEL defects are managed in accordance with its POEL management procedures (in particular the installation recorded with the severely leaning pole.)
- As a general observation Jemena may wish to review the status of a small number of U/S poles identified during the desktop audit of data provided which appear to be beyond typical rectification dates. The poles appear to LBRA based on the addresses allocated in the database.

Findings in relation to the above recommendations including identified corrective actions should be reported to ESV.

3 Audit Report – Electric Line Clearance

3.1 Overview

As a requirement of the Electricity Safety (Electric Line Clearance) Regulations 2015 [Clause 9, Management Plans] Jemena submitted its “Electric Line Clearance Management Plan” to ESV for review in March 2018. At the date of the audit it was noted that the version of the plan referenced was dated 29th June 2018, Version 1.1 (Document Number: JEN PL 0101).

The following provides an overview of the key aspects of Jemena ELCMP as they relate to the specific requirements of the ELC audit scope.

3.2 ELC Activity Cycles and Priority Coding

Jemena maintains clearance spaces surrounding distribution powerlines through cutting and pruning cycles with varying intervals according to location and anticipated regrowth rates. The maintenance intervals (ELCMP, Section 8.2.3) have the following ranges:

HBRA (Hazardous Bushfire Risk Areas)

- The implementation of a biannual program which consists of a “code cut” component which includes code assessing and cutting of HBRA spans in the early part of the year and a pre-summer inspection, cutting and removal program for the entire HBRA sample to be completed and maintained after the declared fire danger period or before the 1st November (whichever comes first).

LBRA (Low Bushfire Risk Areas)

- The implementation of a two-year cyclic program for the inspection, cutting or removal of trees (50% of the LBRA network annually). An inspection and cutting or removal of trees cycle is carried out on the other 50% of the LBRA network annually to action any unexpected growth. Essentially 100% of the LBRA network is assessed and/ or cut annually either as part of the “cyclic” or “maintenance” programs in place.

A summary of the span codes typically recorded during Jemena vegetation assessment activities is provided in Table 3.1 below.

Code	Definition	Action Required
PT1	For pre-summer auditing purposes means a span that has: <ul style="list-style-type: none"> • Vegetation is within the clearance space as defined in the Electricity Safety (Electric Line Clearance) Regulations 2015 and is in contact with the conductors, or uninsulated assets with the potential to become live. Or <ul style="list-style-type: none"> • Has been recently contacting the conductor due to sag or sway or environmental conditions, but is not physically in contact on the day of inspection. 	All code PT1's identified from beginning of the audit to 10 October: <ul style="list-style-type: none"> • To be cleared by 15 October; • All items identified after 10 October within five days of identification. Or Before a day of total fire ban.
PT30	For pre-summer auditing purposes means a span where: <ul style="list-style-type: none"> • Vegetation is within the clearance space as defined in the Electricity Safety (Electric Line Clearance) Regulations 2015 but is not in contact with open wire conductors or uninsulated assets. Or <ul style="list-style-type: none"> • Is in solid contact with a (C/S) or LVABC spans. 	To be cleared prior to 31 October or declaration if earlier.
PT180	Vegetation is outside the clearance space, but is 'highly likely' to encroach upon the required distance as defined in the Electricity Safety (Electric Line Clearance) Regulations 2015, prior to the end of the bushfire declaration period.	To be cleared or re-inspected prior to 31 October or declaration if earlier.
PT365	For pre-summer auditing purposes means a span where Vegetation is outside the clearance space, but is 'highly likely' to encroach upon the required distance as defined in the Electricity Safety (Electric Line Clearance) Regulations 2015, prior to the end of the bushfire declaration period.	To be cleared or re-inspected prior to 31 October or declaration if earlier.
PT720	Vegetation is outside the clearance space and will not encroach upon it before the next annual assessment.	Non-Action Code, no action required.
RE	For pre-summer auditing purposes means a span where: <ul style="list-style-type: none"> • Is outside the clearance space as defined in the Electricity Safety (Electric Line Clearance) Regulations 2015; and • Where that vegetation 'may', although there is some uncertainty, encroach upon the clearance space prior to the end of the bushfire declaration period. 	To be cleared or re-inspected prior to 18 February in the year after assessment.
Hazard Tree	For pre-summer auditing purposes means any tree outside of the clearance space that demonstrates an immediate threat to the line as a result of: <ul style="list-style-type: none"> • Weak connection to root systems (suckers); Being dead or dying trees; and • Major over-balance toward assets (ground lifting, poor root systems etc.). 	To be cleared prior. Targets are set for each tree based on the severity of identified defects.

Table 3.1: Jemena Vegetation Assessment Code Summary

An observation is that inspection codes “PT180” and “PT365” appear to have the same definition for HBRA i.e. they are both action codes for spans with vegetation “highly likely” to enter the clearance space prior to the end of the bushfire declaration period.

For the purposes of the field audit ERP has recorded a “PT365” code to spans where the Field Auditor believed that vegetation would remain clear of the MCS through to the next inspection cycle and “PT720” where it was assessed vegetation would most likely remain clear of the MCS beyond the next inspection cycle.

It is recommended that Jemena review the definitions for assessment codes to ensure the definitions clearly reflect the applicable intention for HBRA.

3.3 Training and Competency of Vegetation Assessors

Jemena’s ELCMP (Section 9.3) describes the training and competency requirements for vegetation assessors as:

- UET20312 Certificate II in ‘ESI - Powerline Vegetation Control’; and
- UETDRVC24A ‘Assess vegetation and recommend control measures in an ESI environment’ for local fieldwork (currently the national unit of competency recognised by the Victorian Electricity Supply Industry).

This is consistent with ESV requirements in relation to competencies required to actively assess trees within an ESI environment.

3.4 ELC Database Extract (Desktop Review)

Jemena provided ERP with a database sample containing span details for four Zone Substations. The database extract was provided on 3rd October 2018 and contained more than 22,500 records relating to spans and associated records within Jemena’s vegetation management system.

Through consultation with ESV assets relating to Newport Zone Substation were excluded from the field audit sample. A random sample of 556 spans for audit was extracted from the remaining Zone Substation data (see Table 3.3) focussing primarily on fire areas, LBRA on the fringes of HBRA areas,

a random selection of “feeders” and “suburbs” and a selection of spans on both public and private land.

MEC and Audit Reference:		Jemena (CM – 8315)	
Audit Sample:	Location:	Feeder:	Sample:
	Thomastown, Campbellfield	BD04	41
	Sunbury, Gisborne	SBY12, 31, 32, 33	280
	Diggers Rest, Hillside, Plumpton	SHM11, 14	235

Table 3.3: Jemena ELC Field Audit Selection Sample Summary

An analysis of the complete dataset of 22,517 spans identified the following:

- All HBRA spans had a latest recorded inspection date between May and September 2018.
- All LBRA spans had a latest recorded inspection date between January 2017 and September 2018 with the exception of one span (A137230) which has a date listed “4/01/0217” which appears to be a data input error.
- Each of the spans had a latest recorded span code (either inspection or cut) which aligned with Jemena’s ELCMP and vegetation management procedures.
- 920 HBRA spans have current span codes (PT30, PT180 or PT365) indicating they require action prior to 31st October 2018 per Jemena’s ELCMP commitment i.e. re-inspection or cutting. A large number of these spans had comments indicating letters of intent had been dropped at customer addresses indicating planned cutting works were being programmed.
- 998 records didn’t have a CAMMO number aligned however there was generally supporting comments to indicate the location and span description.
- Each span appeared to have sufficient information between GPS co-ordinates, address data, comments etc. to be positively identified in the field.

- Comments contained within the database extract provided additional information regarding the trees within spans inclusive of ORP responsibility.

The information provided within the database was in general easy to follow and contained sufficient details in relation to span details, locations, span coding, priorities and associated dates.

It is expected that Jemena will manage the identified workloads as per their vegetation clearance and bushfire mitigation programs to ensure vegetation requiring attention prior to the coming fire season. Monitoring of progress should be evident via Jemena’s Bushfire Mitigation Index and reporting obligations.

3.5 Overview of Field Audit and Spans Assessed

Field Audits commenced in the Thomastown area on Wednesday 10th October 2018 and concluded in the Gisborne area on Friday 12th October 2018. A total of 3 field auditing days were undertaken during this period. The Field Auditor was accompanied by Jemena representatives Neil McIntosh and Johann Leonardia during the field audit.

Jemena’s representatives provided additional information in relation to the assets audited and provided invaluable asset location information via Jemena’s electronic VMS system.

The field audits were undertaken as a visual inspection of spans and vegetation using typical vegetation inspection techniques and practices associated with ground based inspection.

Prior to the audit a selection of 556 spans was made to assist the field auditor with planning the audit program and ensuring wide coverage of the feeders selected for audit. Span location information, current span code and span compliance for each of these spans was captured during the field audit.

The following points highlight the key observations recorded during the field audit:

- 285 spans were audited during the three days (239 HBRA and 46 LBRA) representing 51.3% of the selected audit sample and 1.3% of the total database extract provided for audit.
- Site location information for validated for all spans audited and cross checked with electronic database information provided by Jemena.
- Spans audited had previous inspection dates recorded in 2017 (46 spans) and 2018 (239 spans).
- A total of 8 spans (HBRA x 6, LBRA x 2) were recorded with vegetation inside the clearance space.
- 46 HBRA and two LBRA spans were assigned code “PT180” indicating they would require cutting to remain outside the clearance space for the 2018 fire season or re-inspection.
- 56 spans were recoded during the field audit – the 44 of these spans are expected to remain compliant beyond the 2018 fire season including 33 spans which have recently been cut and recoded PT720.

Further analysis of the data is provided in following sections of this report.

Table 3.4 provides a summary of the number of spans attended and assessed during the field audit phase.

MEC and Audit Reference:		Jemena (CM – 8315)		
Field Auditor:		Brett Lind		
Audit Dates:	Wednesday 10 th October 2018 to Friday 12 th October 2018			
Audit Sample:	Date:	Location:	Feeder:	Sample:
	10/10/2018	Thomastown, Plumpton	BD01, SHM11, SHM14	121
	11/10/2018	Sunbury	SBY12, SBY31, SBY33	71
	12/10/2018	Gisborne	SBY32	93
Total				285

Table 3.4: Jemena ELC Field Audit Sample Summary

Appendix 4 contains a full set of the data recorded in the field during the audit.

Latest Recorded Assessment Code

The Field Auditor undertook an assessment of the latest recorded assessment code and taking into account the time lapse, evidence of growth and cutting activities and recorded an observation in relation to the latest recorded assessment code for the spans assessed.

- The Field Auditor's observations indicated that the latest recorded assessment code for 269 spans (94.4%) was most likely accurate at the time of assessment.
- One span coded PT365 was assigned a code PT180. Database notes indicate "rapid regrowth".
- Six spans coded PT720 were recoded PT365. Field audit notes for four of these spans indicate fast growing species.

Based on Jemena's span code definition and the Field Auditor's applied span coding the assessment indicates 276 spans were most likely accurately coded at the previous inspection, or 96.8% of the sample.

Of the remaining 9 spans where the Field Auditor recorded what he believed to be the most likely span code at the previous assessment based on his observations:

- Six spans coded PT180 were assigned a code PT30 indicating the Field Auditor believed the spans most likely contained vegetation within the MCS at their previous assessment. These spans were generally categorised as long spans requiring addition clearance to allow for sag and sway (supported by database comments).
- One span coded PT720 was assigned a code PT180. Field audit notes indicate the vegetation to be just outside the MCS at the time of audit.
- Two spans coded PT720 were assigned a less conservative span code of CC.

Each of the recoded spans where the Field Auditor recorded what he believed the span code would have been at the previous assessment was inspected during August or September 2018.

Acknowledging the above summary is a retrospective view comparing observations at different points in time and under different conditions the

observations, in general, indicate assessment and data recording processes provide a reliable data source for vegetation compliance requirements with few significant differences recorded.

Six spans listed as most likely PT30 at their previous assessment are discussed further in Section 3.6 of this report.

Latest Recorded Cut Code

The data recorded and analysed as part of this element of the audit aimed to validate the recorded "Latest Cut Code" for the span referenced against the field auditor's observation and current assessment of the span and associated assets in the field.

The field auditor's assessment considered the latest recorded cut code and compared it to the current span code taking into account observed clearance distance, time lapsed since cutting occurred and regrowth within the audited span.

This analysis focusses on spans where there was a latest cut code date recorded within 2017 / 2018 or 96 (34%) spans of the sample assessed.

- Six of the spans had a NC (No Cut) recorded against them hence there was no assessment made.
- The Field Auditor agreed, based on his observations, with the previously recorded cut code for 87 (97%) of the spans with a cut code recorded in 2017 / 2018.
- Of the remaining three spans which were coded C720 (each previously cut in mid-late 2017) the Field Auditor assigned codes of PT30, PT180 and PT365. The span coded PT30 (A055588) relates to a Cyprus Hedge where the vegetation appears to have been hedged to the line height with high up vegetation assessed as being within the MCS (and likely to have been at the time the previous cutting was undertaken).

It is difficult to make a definitive conclusion from the above findings given the variables involved and time lapse between cutting activity and audit. As a general observation ELC activities appear to be achieving and maintaining clearance compliance with the Field Auditor's assigned code agreeing with the recorded cut code for over 97% of spans where a previous cut code was assigned in either 2017 or 2018.

Latest Recorded Span Code

This analysis compares the “Latest Code” (span code) within the Jemena database compared to the Field Auditor’s current assessment of the span.

- The Field Auditor’s assessment of the current span code aligned with the recorded latest span code for 229 (80.4%) spans.
- One span was recoded PT180 which is currently coded PT365.
- Six spans were recoded PT365 which were all currently coded PT720. The majority had comments relating to fast growing species against them.

Based on Jemena’s span code definition and the Field Auditor’s applied span coding the assessment indicates currently recorded span codes for 236 spans were validated, or 82.8% of the sample.

Of the 49 spans where the auditors span code assessment differed from the latest recorded span code the following summary is provided:

- Eight spans were assigned a code PT30 indicating vegetation was within the MCS. These spans are discussed further in Section 3.6 of this report.
- Three spans were recoded PT180 which were currently coded PT720.
- 36 spans were recoded less conservatively to PT720. The majority had comments against them indicating they had recently been cut which is most likely a database update / timing issue.
- Two spans recoded CC were currently coded PT720.

Table 3.5 below provides an overview of these findings.

		Field Auditor Assessed Code						Total
		30	180	365	720	CC	PTM	
Database - Latest Span Code	C720	1	1		9			11
	CC					85		85
	PT180	6	44		34			84
	PT30				1			1
	PT365		1	9	1			11
	PT720	1	2	6	81	2		92
	PTM						1	1
	Total	8	48	15	126	87	1	285

Table 3.5: Current Recorded Span Code Alignment

Note:
 Where the Field Auditor’s span assessment aligned with Jemena code PT365 or PT720 the Field Auditors finding indicates the spans have currently been allocated a more conservative code by Jemena.
 For example Jemena’s PT720 indicates vegetation will remain clear until the next inspection while the field auditor applied a determination that PT720 indicated vegetation would remain clear beyond the next inspection cycle.

The Field Auditor observation indicates that 56 spans (30.2%) audited will require action prior to the coming fire season to either restore minimum clearance requirements or remain compliant:

- Records for 51 spans aligned with the Field Auditor’s observation.
- Records for 5 spans assigned an action code were currently recorded as “720” inclusive of 4 LBRA spans due for assessment.

It is recommended that Jemena review the 8 HBRA spans assigned a more conservative code than at their most recent 2018 assessment to determine if there are any particular trends or factors that require further corrective action to maintain the high level of accuracy of their VMS.

Note:
 Jemena correspondence received 25/10/18 indicated the span findings had been reviewed and discussions undertaken with its VMC to review and discuss the findings with their field assessors with a view to ensuring assessments of vegetation near the MCS were accurately recorded.
 It is further noted that with the exception of one span currently coded “720” the remaining HBRA spans (7) were currently allocated a 2018 action code of “PT180” or “PT365”.

3.6 Code Compliance Assessment

The current code compliance assessment of each of the spans audited provides a summary of the field auditors ground observation of the current vegetation clearance against the requirements of the Code of Practice

“Minimum Clearance Space” required taking into account the area Fire Rating, voltage, expected re-growth, conductor / asset type and span distances.

There were no council declared spans audited during the field audit. The field auditor didn’t record any line clearance issues relating to other responsible persons during the audit.

The Field Auditor observed six HBRA and two LBRA spans as containing vegetation within the minimum clearance space.

Table 3.6 provides a summary of the audit findings in relation to current span compliance. Photographs of the non-code compliant spans identified are attached in Appendix 4 and were provided to Jemena on 18th October 2018.

Fire Zone	Spans Audited	Vegetation Inside MCS	%	Span – DB Responsibility	SPAN – ORP Responsibility
HBRA	239	6	2.5%	6	-
LBRA	46	2	4.3%	2	-
Total	285	8	2.8%	8	-

Table 3.6: Current Span Code Compliance Summary

Of the 8 spans observed with vegetation within the MCS:

- Six HBRA spans were assigned a code PT180 at their most recent assessment which occurred during September 2018. The main factors appeared to relate to additional clearance being required for sag and sway (long spans) and fast regrowth. Each of the spans was assigned an action code and is expected to be cleared as per Jemena’s VMS cutting requirements.
- Two LBRA spans were assigned a code PT30 during the recent audit. Each had a latest assigned “720” code from previous assessment or cutting activities in mid to late 2017. The re-code may be as a result of faster regrowth than previously expected or miscoding post their previous action.

A further 48 spans were assigned a code PT180 by the Field Auditor. Of these spans:

- 44 were currently recorded as PT180 within the Jemena database.
- Two LBRA spans were recorded with “720” codes indicating faster regrowth may have occurred than previously anticipated.
- One HBRA span coded PT720 during September 2018 was recoded PT180 with vegetation assessed as just outside the MCS. This may indicate a miscode at the recent inspection.
- One HBRA span coded PT365 during September 2018 was recoded PT180. Comments in the database indicate fast regrowth and it is anticipated the span will require action earlier than previously anticipated.

The presence of HBRA spans with vegetation observed within the MCS appeared to primarily be related to additional clearance requirements for sag and sway and additional cutting required post hedging activity.

It is recommended that Jemena review the spans identified as requiring action (e.g. field audit code PT30 or PT180) and ensure management plans are in place to ensure the spans are cleared to maintain the MCS requirements.

As a general observation Jemena may consider reviewing the observation in relation to additional sag and sway clearance requirements and ensure its vegetation assessment processes are making adequate allowances for sag and sway requirements.

Table 3.7 provides a summarised list of the 8 spans observed as having vegetation within the minimum clearance space during the field audit and four spans coded PT180 (more conservatively than their latest assigned span code).

Table 3.7: Spans Observed with Vegetation Inside the MCS or Recoded with PT180

Feeder	Voltage	Fire Zone	Street #	Street Name	Suburb	Pole # (CAMMO)	Field Audit Date	Latest Assessed Date	Latest Assessed Code	Latest Cut Date	Latest Cut Code	Tree ID	Latest Span Code (based on JEN data)	Auditor Latest Assessed Code	GENERAL COMMENTS AND OBSERVATIONS
BD 04	HL	LBRA	opp 49-65	Trawalla Ave	Thomastown	A019180	10-Oct	4/07/2017	PT180	6/09/2017	C720	966322	C720	PT30	EUs on RR
BD 04	HV	LBRA	71	Trawalla Ave	Thomastown	A036498	10-Oct	4/07/2017	PT720	20/12/2016	C720	966325	PT720	PT30	Ash in clearance
SBY12	HV	HBRA	495	Racecourse Rd	Sunbury	A044624	11-Oct	4/09/2018	PT180	3/06/2015	C720	1010506	PT180	PT30	Requires 3.5
SBY32	HV	HBRA	19	Outawood Rise	Gisborne	A054903	12-Oct	13/09/2018	PT180	13/12/2012	C720	922495	PT180	PT30	Wattle @ 1.2m
SBY32	HV	HBRA	opp 206	Mt Gisborne Rd	Gisborne	A055577	12-Oct	11/09/2018	PT180	25/07/2017	C720	922501	PT180	PT30	Less than 1.5
SBY32	HV	HBRA	257	Mt Gisborne Rd	Gisborne	A055588	12-Oct	11/09/2018	PT180	6/10/2017	C720	922518	PT180	PT30	Cypress has been trimmed up to line height only, long span
SBY32	HV	HBRA	16	Short Rd	Gisborne	A055597	12-Oct	8/09/2018	PT180	30/08/2017	NC	922418	PT180	PT30	Span has been hedged, tower to finish high overhang
SBY32	HV	HBRA	82	Watersons Rd	Gisborne	A128496	12-Oct	13/09/2018	PT180	25/07/2017	C720	1052079	PT180	PT30	Requires more than 4m clearance
BD 04	HL	LBRA	89-91	Trawalla Ave	Thomastown	A036489	10-Oct	4/07/2017	PT720	20/12/2016	C720	966316	PT720	PT180	
BD 04	HL	LBRA	opp 37	Trawalla Ave	Thomastown	A037602	10-Oct	4/07/2017	PT180	6/09/2017	C720	966364	C720	PT180	
SBY12	HV	HBRA	15, 35	Devon Park Cl	Sunbury	A044664	11-Oct	3/09/2018	PT720	9/10/2012	C720	922870	PT720	PT180	Just out of clearance space
SBY32	HV	HBRA	11	Runnymede Ln	Gisborne	A055582	12-Oct	11/09/2018	PT365	25/07/2017	C720	1010449	PT365	PT180	

3.7 Active Vegetation Assessor Observations

Observations were conducted on two active vegetation assessors:

- [REDACTED] and
- [REDACTED]

The Field Auditor’s feedback indicates both assessments were completed as expected, relevant information was recorded and assessment outcomes were accurately completed. Additional information relating to the deteriorated state of an LV crossarm (A110531) was also recorded and communicated to Jemena.

No concerns were raised by the Field Auditor.

The field auditor was accompanied by Jemena representatives N [REDACTED] and [REDACTED] at various stages of the audit. The Field Auditor made comment that the Jemena representatives were well prepared for the audit, were very experienced and knowledgeable in relation to the vegetation assessment process and contributed positively throughout the audit.

3.8 Summary Observations and Recommendations

The Electric Line Clearance field audit assessed span clearances from vegetation at 285 sites across 7 feeders. 239 sites assessed were located in HBRA and 46 LBRA.

The Field Auditor assigned a code to 8 spans indicating vegetation was within the minimum clearance space which equates to 2.8% of the sample audited. Comparison with Jemena data indicated that 6 of these spans, all HBRA, were currently coded PT180 indicating vegetation was near the clearance space and they required action prior to the 2018 fire season.

The two remaining LBRA spans are currently due for assessment and were coded “720” in mid-late 2017.

In total the Field Auditor assigned or validated an existing recorded span code to 56 spans indicating vegetation would require action in “2018” to either restore or remain compliant. 51 of these spans were allocated a current action code within the Jemena database, one HBRA span was currently coded “720” and four LBRA spans are due for assessment.

A code “PT365” was assigned to a further 15 spans indicating the spans remain compliant until their next inspection. Jemena non-action coding (“720”) aligned to six of these spans. A current action code (“365”) was allocated to the remaining nine spans indicating a more conservative

assessment than the Field Auditor’s observations at the time of the field audit.

Based on Jemena’s span code definition and the Field Auditor’s applied span coding the assessment indicates currently recorded span codes for 236 spans were validated, or 82.8% of the sample.

Of the 49 spans where the auditors span code assessment differed from the latest recorded span code the following summary is provided:

- Eight spans were assigned a code PT30 indicating vegetation was within the MCS.
- Three spans were recoded PT180 which were currently coded PT720.
- 38 spans were recoded less conservatively to PT720 or CC. 35 spans had comments indicating they’d been recently cut.

As a general observation ELC activities appear to be achieving and maintaining clearance compliance with the Field Auditor’s assigned code agreeing with the recorded cut code for over 97% of spans where a previous cut code was assigned in either 2017 or 2018. Observation of cutting at 35 sites also indicated desired cutting results had been achieved.

The information provided within the database was in general easy to follow and contained sufficient details in relation to span details, locations, span coding, priorities and associated dates. The report contains some general observations in relation to data missing from some spans from within the total database extract supplied however this did not impact on the field audit.

The audit has made one administrative recommendation in relation to reviewing the span code definitions for HBRA – in particular for code PT180 and PT365 as they appear to be the same, or very similar, in definition. For the purpose of reviewing the data the audit has considered these two codes the same for HBRA.

Table 3.8 provides a summary of the field audit observations.

Feeder (s)	Spans Audited	Location Information Correct	Vegetation Assessed Inside MCS	Spans Coded “180” (Different to JEN Info.)
BD04	39	39	2 (LBRA)	2 (LBRA)
SBY12, SBY31, SBY32, SBY33	164	164	6 (HBRA)	2 (HBRA)
SHM11, SHM14	82	82	0	0
Total	285	285	8	4

Table 3.9: Jemena ELC Audit High Level Summary

The recommendations contained within the body of the report are summarised below under the following broad categories:

- The accuracy of inspection data and work recommendations.
- Vegetation clearance standards and compliance with the Code of Practice for electric line clearance.
- Vegetation management data reflects the status of field observations made at the time of the audit.

The accuracy of inspection data and work recommendations.
Jemena’s database information was in general validated as accurate, easy to follow and contained information consistent with the requirements of Jemena’s ELCMP.
It was the Field Auditor’s opinion that the latest recorded assessment code for 276 (96.8%) was most likely accurate at the time of assessment. The auditor recorded, based on his observation, what he believed was the most likely span assessment code for the remaining 9 (3.2%) of spans at the time of assessment.
<ul style="list-style-type: none"> • As a general observation Jemena may consider reviewing the observation in relation to additional sag and sway clearance requirements and ensure its vegetation assessment processes are making adequate allowances for sag and sway requirements.

There was evidence within the full dataset information provided, and the sample selected for audit, to indicate that assessment activity is a catalyst for cutting activity with a number of records previously assessed as either “PT365”, “PT180” or “PT30” having a completed compliant cut code assigned post their assessment date.

- It is recommended that Jemena review the 8 HBRA spans assigned a more conservative code than at their most recent 2018 assessment to determine if there are any particular trends or factors that require further corrective action to maintain the high level of accuracy of their VMS.

Vegetation clearance standards and compliance with the Code of Practice for electric line clearance.

The desktop review of data and the subsequent field audit findings indicate Jemena is progressing well with its pre-summer HBRA assessment and cutting programs. Feedback from Jemena also indicated LBRA assessments within the audit area were planned to commence shortly.

Comments contained within the Jemena database indicated where “Letters of Intent” had been provided to customers indicating upcoming cutting works were being scheduled. This is further evidence that the assessment process and recommendations is translating to scheduling and completion of cutting as required.

Six HBRA spans were observed with vegetation within the MCS and a further 46 HBRA spans were assigned a code “180” indicating they would require clearing prior to the upcoming bushfire season. With the exception of one span (A044664) all were allocated a current action code for completion by the commencement of the 2018/19 declared bushfire season.

Two LBRA spans were observed with vegetation within the MCS and a further two LBRA spans were assigned a code “180” indicating they require action to restore or remain compliant. These spans are current due for assessment and had previously recorded span codes of “720”.

- It is recommended that Jemena review the spans identified as requiring action (e.g. field audit code PT30 or PT180) and ensure management plans are in place to ensure the spans are cleared to maintain the MCS requirements.

Vegetation management data reflects the status of field observations made at the time of the audit.

The field audit verified the span identification information was accurate for all sites audited and each of the records provided contained previous inspection date, cutting information (where applicable) and span coding details.

Based on Jemena's span code definition and the Field Auditor's applied span coding the assessment indicates currently recorded span codes for 236 spans were validated, or 82.8% of the sample.

Of the 49 spans where the auditors span code assessment differed from the latest recorded span code eight spans were assigned a code PT30 indicating vegetation was within the MCS and three spans were recoded PY180 from PT720. The remaining 38 spans were recoded less conservatively to either PT720 (36) or CC (2). 36 spans had recently been cut which indicates the data may not have been updated at the time of audit.

A general observation made during the desktop audit and subsequent review of field data indicated that inspection codes “PT180” and “PT365” appear to have the same definition for HBRA i.e. they are both action codes for spans with vegetation “highly likely” to enter the clearance space prior to the end of the bushfire declaration period.

- It is recommended that Jemena review the definitions for assessment codes to ensure the definitions clearly reflect the applicable intention for HBRA.

The audit findings and observations indicate the Jemena VMS is in general reflective of the field observations made at the time of audit.

Findings in relation to the above recommendations including identified corrective actions should be reported to ESV.

4 Acknowledgement

Electrical Resource Providers would like to thank the Jemena Representatives who have assisted throughout this audit process by providing information, advice and their time to assist in a professional, productive and co-operative manner.

Particular thanks is forwarded to the following Jemena employees and representatives:

- [REDACTED] (for assisting with each day with the BFM field audits).
- [REDACTED] and [REDACTED] (for assisting with the ELC field audits).
- [REDACTED] (for assisting with audit preparations, follow-up and ensuring the required resources were available for the field audit to be efficiently executed).

5 Appendices

[Appendix 1: Key Documents and References](#)

[Appendix 2: Audit Plans](#)

[Appendix 3: BFM Field Audit Database and Photo's](#)

[Appendix 4: ELC Field Audit Database and Photo's](#)

[Appendix 5: Asset Inspector Checklist](#)

[Appendix 6: Vegetation Assessor Checklist](#)

Appendix 1: Key Documents and References

Document Title	Version	Version Date	Source
Electricity Safety (Bushfire Mitigation) Regulations 2013	4	1 May 2016	ESV Website link
Electricity Safety (Electric Line Clearance) Regulations 2015	1	28 June 2015	ESV Website link
Jemena Bushfire Mitigation Plan 2018-2023	1	29 June 2018	Jemena Website
Jemena Asset Inspection Manual	5	3 September 2018	ESV
Jemena Electric Line Clearance Management Plan	1.1	29 June 2018	Jemena Website
Jemena Asset Management Database extract	-	4 October 2018	Jemena
Jemena Vegetation Management System Database extract	-	3 October 2018	Jemena

Appendix 2: Audit Plans



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PROJECT AUDIT PLAN

PROJECT: AUDIT PLAN – BUSHFIRE MITIGATION (ASSET CONDITION) AUDIT
DATE: 12 September 2018

Item #	Description	Details														
1	Client Client Contact	Energy Safe Victoria [REDACTED] Team Leader – Safety Outcomes Assurance Ph. 0414 256 517														
2	Auditee Auditee Contact	Jemena Electricity Networks TBC														
3	Auditor/s	[REDACTED] – ERP (Operations Manager) – 0438 018 338 [REDACTED] - ERP (Field Auditor) - 0420 721 970														
4	Audit Objective and Scope	Assess the level of conformance of Jemena Electricity Networks BFM field activities with the requirements of the Electricity Safety (Bushfire Mitigation) Regulations 2013.														
5	Audit Criteria	BFM field activities with the requirements of the Electricity Safety (Bushfire Mitigation) Regulations 2013.														
6	Timeframes	<table border="1"> <tr> <td>Review Audit Data</td> <td>1 October 2018</td> </tr> <tr> <td>Submit Audit Plan to ESV & DB</td> <td>17 September 2018</td> </tr> <tr> <td>Confirm Audit Field Contact</td> <td>28 September 2018</td> </tr> <tr> <td>Commence Field Audit</td> <td>10 October 2018</td> </tr> <tr> <td>Complete Field Audit</td> <td>12 October 2018</td> </tr> <tr> <td>Interim Audit Results to ESV</td> <td>16 October 2018</td> </tr> <tr> <td>Interim Audit Results to DB</td> <td>19 October 2018</td> </tr> </table>	Review Audit Data	1 October 2018	Submit Audit Plan to ESV & DB	17 September 2018	Confirm Audit Field Contact	28 September 2018	Commence Field Audit	10 October 2018	Complete Field Audit	12 October 2018	Interim Audit Results to ESV	16 October 2018	Interim Audit Results to DB	19 October 2018
Review Audit Data	1 October 2018															
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Complete Field Audit	12 October 2018															
Interim Audit Results to ESV	16 October 2018															
Interim Audit Results to DB	19 October 2018															
7	Summary of relevant documentation	Electricity Safety (Bushfire Mitigation) Regulations 2013. Asset Inspection Manuals and database extract for Jemena Electricity Networks.														
8	Methodology	<ul style="list-style-type: none"> Desktop audit of ELCMP and Database Discussions with Responsible Officer/s (as required) Field audits against database contents (includes "sound test" of poles Field observation of a 2 x field inspector/ assessors 														

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PROJECT AUDIT PLAN

PROJECT: AUDIT PLAN – ELECTRIC LINE CLEARANCE ASSESSMENT
DATE: 12 September 2018

Item #	Description	Details														
1	Client Client Contact	Energy Safe Victoria [REDACTED] Team Leader – Safety Outcomes Assurance Ph. 0414 256 517														
2	Auditee Auditee Contact	Jemena Electricity Networks TBC														
3	Auditor/s	[REDACTED] – ERP (Operations Manager) – 0438 018 338 [REDACTED] – ERP (Field Auditor) – 0407 689 150														
4	Audit Objective and Scope	Assess the level of conformance of Jemena Electricity Networks ELCMP field activities with the requirements of Electricity Safety (Electric Line Clearance) Regulations 2015.														
5	Audit Criteria	Electricity Safety (Electric Line Clearance) Regulations 2015														
6	Timeframes	<table border="1"> <tr> <td>Review Audit Data</td> <td>1 October 2018</td> </tr> <tr> <td>Submit Audit Plan to ESV & DB</td> <td>17 September 2018</td> </tr> <tr> <td>Confirm Audit Field Contact</td> <td>28 September 2018</td> </tr> <tr> <td>Commence Field Audit</td> <td>10 October 2018</td> </tr> <tr> <td>Complete Field Audit</td> <td>12 October 2018</td> </tr> <tr> <td>Interim Audit Results to ESV</td> <td>16 October 2018</td> </tr> <tr> <td>Interim Audit Results to DB</td> <td>19 October 2018</td> </tr> </table>	Review Audit Data	1 October 2018	Submit Audit Plan to ESV & DB	17 September 2018	Confirm Audit Field Contact	28 September 2018	Commence Field Audit	10 October 2018	Complete Field Audit	12 October 2018	Interim Audit Results to ESV	16 October 2018	Interim Audit Results to DB	19 October 2018
Review Audit Data	1 October 2018															
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Interim Audit Results to ESV	16 October 2018															
Interim Audit Results to DB	19 October 2018															
7	Summary of relevant documentation	Electricity Safety (Electric Line Clearance) Regulations 2015. ELCMP and ELC Database extract for Jemena Electricity Networks.														
8	Methodology	<ul style="list-style-type: none"> Desktop audit of ELCMP and Database Discussions with Responsible Officer/s (as required) Field audits against database contents Field observation of a 2 x field inspector/ assessors 														

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[Appendix 3: BFM Field Audit Database and Photo's](#)

[Appendix 4: ELC Field Audit Database and Photo's](#)

Appendix 6: Vegetation Assessor Checklist

ELECTRIC LINE CLEARANCE INSPECTION QUALITY AUDIT CHECKLIST		2018 ESV ELECTRIC LINE CLEARANCE PROGRAM				
Date:	Time:	Location:				
DB:		Auditors:				
LIS/ Pole Reference:						
Electric Line Clearance Assessment Compliance		Compliance				Action / Comments
		N/A	Yes	Corr. Act.	Non Conf	
1	Is correct location verified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Is location description correct?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Is LIS/ Pole number fitted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Is correct voltage/ s recorded?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	Are MEC spans identified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6	Are Council spans identified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7	Are PELs identified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8	Has all vegetation within the effected span (including customer services) been identified and recorded?					
9	Is vegetation type correctly identified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	Is the assessed vegetation code correct?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11	Agree with Assessor on inspection findings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12	Are appropriate manuals and reference information available onsite?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13	Have any general pole or asset defects been identified and recorded?					
14	Other?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work Quality		Compliance				Action / Comments
		N/A	Yes	Corr. Act.	Non Conf	
15	Has the clearance between vegetation and electric lines been validated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16	Has all required information been recorded?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
17	Have appropriate customer notifications been carried out?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
General Comments:						

Work Party Members & Qualifications (Verified Onsite)	
Assessment Personnel	Qualifications/ Authorities
Definitions:	
N/A	Not Applicable.
Yes	The item was found to be compliant (correct).
Corr. Act.	Corrective Action, corrective action was required to be taken at the time of the Field Inspection.
Non Conf.	Non Conformance - does not meet the minimum standard.
Photo's (attach photographs of site inspected)	