Performance Audit & Asset Management System Review Report 2021 – EGL23

Audit & Review Report	Authorisation	Name	Position	Date
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Version	Description of Revision	Prepared By	Reviewed By	Date
0	Initial Draft	Nicole Davies Neema Premji	Nicole Davies	04/01/2022
1	Incorporate Tronox review	Nicole Davies Neema Premji	Nicole Davies	20/01/2022
2	Incorporate ERA review	Nicole Davies Neema Premji	Nicole Davies	17/02/2022
3	Incorporate ERA review and formatting changes	Nicole Davies Neema Premji	Nicole Davies	02/03/2022
4	Minor amendments	Nicole Davies Neema Premji	Nicole Davies	10/03/2022

GLOSSARY

AESCSF – Australian Energy Sector Cyber Security Framework

AEMO - Australian Energy Market Operator

AFE – Authorisation for Expenditure

AMP – Asset Management Plan

AMS – Asset Management System

BOP – Balance of Plant

CAPEX – Capital Expenditure

CBM – Condition Based Monitoring

CMMS – Computerised Maintenance Management System

DBNGP – Dampier to Bunbury Natural Gas Pipeline

ELT – Executive Leadership Team

EGL23 – The Generation Licence for Tronox Management Pty Ltd

ERA – Economic Regulation Authority

ETAC – Electricity Transfer Access Contract

FMEA – Failure Mode and Effects Analysis

GE – General Electric

GES – Geographe Environmental Services

GT – Gas Turbine

KCA - Coogee Kwinana Chlor-Alkali Plant

KMK – Kerr McGee Cogeneration (Cogen) Facility

KPP – Kwinana Pigment Plant (Tronox Kwinana)

MW – MegaWatt

OEM – Original Equipment Manufacturer

O&M – Operation and Maintenance

OPEX – Operational Expenditure

P&ID – Piping & Instrumentation Diagrams

RCA – Root Cause Analysis

RCM – Reliability Centred Maintenance

SCADA – Supervisory Control and Data Acquisition

SWIS – South West Interconnected System

TIWEST_COG1 – AEMO Facility name for the KMK Cogeneration Facility

WPN – Western Power Networks

1. EXECUTIVE SUMMARY

Tronox Holdings plc are a global company is listed on the New York Stock Exchange (NYSE). Tronox Holdings plc are the parent company of its fully owned subsidiary Tronox Management Pty Ltd. Tronox Management Pty Ltd is the owner of the KMK Cogeneration Facility, a frame-six gas turbine and heat recovery steam generator for the production of both electricity and steam. Tronox Management Pty Ltd is the holder of the Electricity Generation Licence (EGL23) issued by the ERA under the *Electricity Industry Act 2004*. For the purposes of this Audit and Review Report, Tronox Management Pty Ltd will be referred to as "Tronox", the KMK Cogeneration Facility will be referred to as KMK Cogeneration Facility, or Cogen Facility, and the Kwinana Pigment Plant, which the Cogen Facility provides with steam and electricity to produce titanium dioxide, will be referred to as KPP throughout this document.

Sections 13 and 14 of the *Electricity Industry Act 2004* require as a condition of every licence that the licensee must, not less than once in every period of 24 months (or any longer period that the Authority allows) calculated from the grant of the licence, provide the Authority with a performance audit and an asset management system review report by an independent expert acceptable to the Authority. Geographe Environmental Services (GES) has been approved by the Authority (Ref: D238624 Date: 17/9/21) to undertake the works subject to an audit and review plan approved by the Authority.

The previous 2016 audit and review period was 1 January 2013 to 31 Oct 2016. A 2016 Performance Audit & Asset Management Review Report was submitted to the ERA for review and published on their website. As a result of the Licensee's level of compliance the ERA decided to increase the period covered by this audit from 46 months to 60 months (Refer ERA Notice 07 June 2017). As such the current audit and review period is 1 November 2016 to 31 October 2021. There were no significant changes identified by the Audit Team or detailed by the Licensee regarding the electricity generation capabilities since the previous audit and review period.

1.1 Summary Performance Audit Findings

This is Licensee's third electricity generation licence performance audit with the objective to assess the Licensee's level of compliance with its licence conditions. This performance audit and asset management review was conducted in accordance with the 2019 Audit and Review Guidelines – Electricity and Gas Licences (the Guidelines) issued by the Economic Regulation Authority (ERA).

The 2016 Performance Audit Report identified two non-compliances, relating to obligations 105 and 124. These obligations were both identified as non-compliant in the current audit report (Refer table 4). It is the Auditor Team's opinion that the 2016 PAIP corrective actions developed were administrative controls, such as creating reminders and compliance processes (i.e., compliance calendar) and were ineffective in preventing future noncompliance (refer Table 12).

The current Performance Audit assessed 36 licence obligations applicable to the Generation Licence and is compared against 43 Licence obligations assessed in the previous 2016 Performance Audit Findings in the table 1 below.

TABLE 1 – Comparison of 2016 and 2021 Performance Audit Findings

AUDIT REPORT YEAR	Compliant			Non-Compliant	Not Rated[1]	OBLIGATION TOTAL
	A1	NP1[1]	B1	C2	NPNR	
2016	10			2	31	43
2021		9	1	2	24	36

FINDING - CONTROLS RATING, COMPLIANCE RATING

NPNR - Not performed – A controls rating was not required, Not rated – No activity took place during the audit period
A1 - Adequate controls – no improvement needed, Compliant
NP1 - Not performed – A controls rating was not required, Compliant
B1 - Generally adequate controls – improvement needed, Compliant
C2 - Inadequate controls – significant improvement required, Non-compliant – minor effect on third parties

[1] Auditors only assess controls for priority 1, 2, 3 or non-compliant obligations (refer section 4.2.1 Audit Guidelines)

The current audit report raised one recommendation to fully address the corrective actions in relation to the non-compliances and ensure ongoing compliance (refer Table 12 01/2021). The Audit Team considers the repeated non-compliances in relation to obligations 105 and 124 were attributable to ineffectiveness of administrative controls, limited monitoring of performance, reliance on tacit knowledge, poor change management processes, and failure to assign responsibility and accountability all of which affected the performance of the integrity of the licensee's annual compliance reporting to the ERA.

It is the assessment of the Audit Team that, in general, both the Licensee and Contractor were observed to have well established compliance cultures, good corporate governance practices, adequate records management processes and effective control environments in relation to Health, Safety and Environmental requirements. It was noted compliance was achieved with the majority of applicable generation licence obligations during the audit period. However, due to the repetitive occurrence of the non-compliant obligations (i.e., 105 and 124), aspects of control environment established by the Licensee, with respect to these obligations, were found to be inadequate and require significant improvement. Particularly controls in relation to the policies and procedures relating to the mitigation of inherent risks and monitoring of compliance requirements, as well as change management processes for key personnel and assignment of authority and responsibility.

A summary of the findings and recommendations arising from the current 2021 Performance Audit are detailed in table 12. Comprehensive performance audit findings and recommendations are included in Appendix 1.

1.2 Summary Asset Management System Review Findings

This is Licensee's third asset management system review with the objective to assess the effectiveness of its asset management system. This asset management review was conducted in accordance with the 2019 Audit and Review Guidelines – Electricity and Gas Licences (the Guidelines) issued by the Economic Regulation Authority (ERA).

The current and the previous asset management system reviews assessed 12 asset management processes (refer table 2) across 58 effectiveness criteria (refer table 16). In order to contextualise the difference between the 2016 and the 2021 AMS review's assessment of the overall asset management processes and a clear reduction in the effectiveness criterion. The findings of the 2016 asset management review have been compared against the findings of the 2021 asset management review findings in the table 2 below.

TABLE 2 – Comparison of 2016 and 2021 Asset Management Review Findings

AMS REVIEW REPORT YEAR	ASSET MANAGEMENT PROCESS											
	1. ASSET PLANNING	2. ASSET CREATION & AQUISITION	3. ASSET DISPOSAL	4. ENVIRONENTAL ANALYSIS	5. ASSET OPERATIONS	6. ASSET MAINTENANCE	7. A M INFORMATION SYSTEM	8. RISK MANAGEMENT	9. CONTINGENCY PLLANNING	10. FINANCIAL PLANNING	11. CAPITAL EXPENDITURE PLANNING	12. REVIEW OF AMS
2016	A1	B2	ANR	A1	A1	A1	A1	A1	A1	A1	ANR	A1
2021	B2	B1	A1	B3	B2	B2	B2	B3	C2	A1	A1	C3
OVERALL EFFECTIVENESS RATING	PROCESS AND POLICY RATING, PERFORMANCE RATING											

A1 - Adequately Defined, Performing Effectively
ANR - Adequate Controls, Not Rated as No Relevant Activity Took Place During the Audit Period
B1 - Requires Some improvement, Performing Effectively
B2 - Opportunity for Improvement, Improvement Required
C2 - Requires Substantial Improvement, Improvement Required
C3 - Requires Substantial Improvement, Corrective Action Required

The Audit Team based the overall effectiveness rating for each asset management processes on the combination of the ratings for each effectiveness criterion (refer Audit Guidelines, Section 5.1.7 Footnote [94]). As such, the Licensee's performance rating in relation to the overall assessment of the 12 asset management processes was found to be:

- "Performing Effectively" for 4 asset processes:
  - *asset creation and acquisition*
  - *asset disposal*
  - *financial planning; and*
  - *capital expenditure planning*
- "Improvement Required" for 4 asset processes:
  - *asset planning*
  - *asset operations*
  - *asset maintenance*
  - *asset management information systems*
- "Corrective Action Required" for 3 asset processes:
  - *environmental analysis**
  - *risk management**
  - *review of the AMS**
- There was 1 asset process where the adequacy of the Licensee's process and policy rating was found to "Require Substantial Improvement" and the Licensee's performance rating was found to have "Improvement Required":
  - *contingency planning**

The primary cause of the overall effectiveness rating for the asset management processes found to be deficient (see marked * above) was associated with the inadequate AMS management review in relation to the AMS functions delegated by Tronox to the Contractor. Additional causes of asset management processes linked to the AMS review deficiency related to the ineffective systemic risk management, and compliance processes as well as inadequate testing and development of long-term contingency plans. The Audit Team acknowledge the performance of the KMK Cogeneration Plant was satisfactory and achievement of contractual obligations by the Contractor was also observed.

The Audit Team noted that in relation to the Licensee's performance rating for the 58 effectiveness criterion applicable to the review (as defined by Table 23 of the Audit Guidelines), 36 were found to be performing effectively, 7 required some improvement and 15 required corrective action required. Additionally, there were 4 effectiveness criterion where the adequacy of the Licensee's processes and policy rating were found by the Audit Team to require substantial improvement.

In accordance with the Audit Guidelines (Section 5.1.8), the 5 recommendations made (refer Table 17) related to 19 out of the 58 effectiveness criterion and the deficiencies were primarily related to the;

- requirement for Tronox to also develop an AMP for the Cogen Plant,
- absence of a systemic risk-based approach to the asset management processes, including IT
- inadequate internal monitoring and compliance processes
- further development and implementation of contingency plans
- documentation of operational and maintenance controls
- testing of AMS backups
- a lack of management review of the AMS performance; and
- clear assignment of AMS responsibilities.

The 2016 Asset Management Review Report did not make any recommendations regarding the effectiveness of the asset management system in the previous review. The current asset management review made five recommendations in relation to the asset criterion deficiencies identified (refer Table 17) and identified a change in the assessment of the overall asset management processes and a reduction in the effectiveness criterion (refer Appendix 2).

It is the assessment of the Audit Team, in relation to the effectiveness of the Licensee's asset management system, that Tronox's (together with the Contractor's) processes and policies were in general adequate with some improvements required and that Tronox (together with the Contractor) was performing effectively with some improvement required in relation to each asset management process and criterion.

The Audit Team considers that the change in assessment of the effectiveness of the asset management system from the 2016 to the 2021 AMS Review may be in part attributable to COVID related impacts concerning resourcing, change in key personnel charged with the Generation Licence requirements and the primary focus for the use of systemic risk management on the Health, Safety and Environment functions of the organisation.

The recommendations made by the Audit Team align with "good electricity industry practice" or "good engineering and operating practices" and are aimed at further developing and improving the overall effectiveness of the AMS (Refer Tables 12 and 17).

1.3 Licensee's Obligations in Response to the Audit and Review

Following the submission of the audit and review report to the ERA, and as required by the Audit Guidelines (refer section 5.3), the licensee must submit a post-audit and post-review implementation plan to address the six recommendations made. The PAIP and PRIP must be a separate document and must be developed by the Licensee.

Opportunities for improvement identified that relate to the audit and review findings have been provided directly to the Licensee and have not been included in this document as required by the 2019 Audit and Review Guidelines – Electricity and Gas Licences section 5.1.8.

The period for this audit and review was 1 November 2016 to 31 October 2021, with the report originally due to be submitted to ERA on or before 03 January 2022. which was agreed to be extended by the ERA to 21 January 2022 to accommodate management review.

The Review was conducted in conjunction with the Performance Audit during December 2021 and included desktop review and one day audit on site to execute the review plan, interview sessions and report writing. In total the audit and review required 80 hours of each of the Audit Team member's time.

TABLE 3 List of Personnel Who Participated in the Audit & Review

ITEM	TITLE	COMPANY
1	Contracts Specialist	Tronox
2	Supply Chain Director	Tronox
3	Site Manager	[redacted]
4	Manager, Tech. & Improvement - Kwinana	Tronox
5	Senior Asset Improvement Engineer – T&I	Tronox
6	Asset Improvement Lead – T&I	Tronox
7	Architect – IT Security	Tronox
8	Technical Officer	[redacted]
9	Senior Operator/Maintainer – Mechanical	[redacted]
10	Senior Operator/Maintainer – Electrical	[redacted]

It is confirmed that the licensee facilitated the audit and review process by providing the audit team;

- Access to the facilities and business premises identified in the audit and review plan.
- Access to materials and information sources that the auditors needed to conduct the audit or review, including data, reports, records and any other relevant information that were available.
- Access to the relevant personnel at the KMK Cogeneration Facility visited.
- An introduction to persons, other than employees of the licensee, who are relevant to the audit and review, i.e. [redacted] as the O&M Contractor (Refer Table 3)

1.4 Asset Overview

The Kwinana Pigment Plant (inclusive of the Coogee Kwinana Chlor-Alkali Plant, KCA) is in Kwinana; approximately 43 kilometres south of Perth, Western Australia in Kwinana Beach. The KMK Cogeneration Facility is located on the KPP site, however, the operations are ring-fenced, and communication as required for operational and maintenance activities is undertaken between the KPP (Tronox, the Licensee) and the Cogen Facility ([redacted] the Contractor). The KMK Cogeneration Facility operates as a service arrangement with the KPP and KCA.

The Cogen Facility consists of a 42.1MW Frame 6 Gas Turbine (GT) and Heat Recovery Steam Generator (HRSG) that produces electricity and supplies steam to the KPP.

The Gas Turbine (GT) is capable of being operated in two modes:

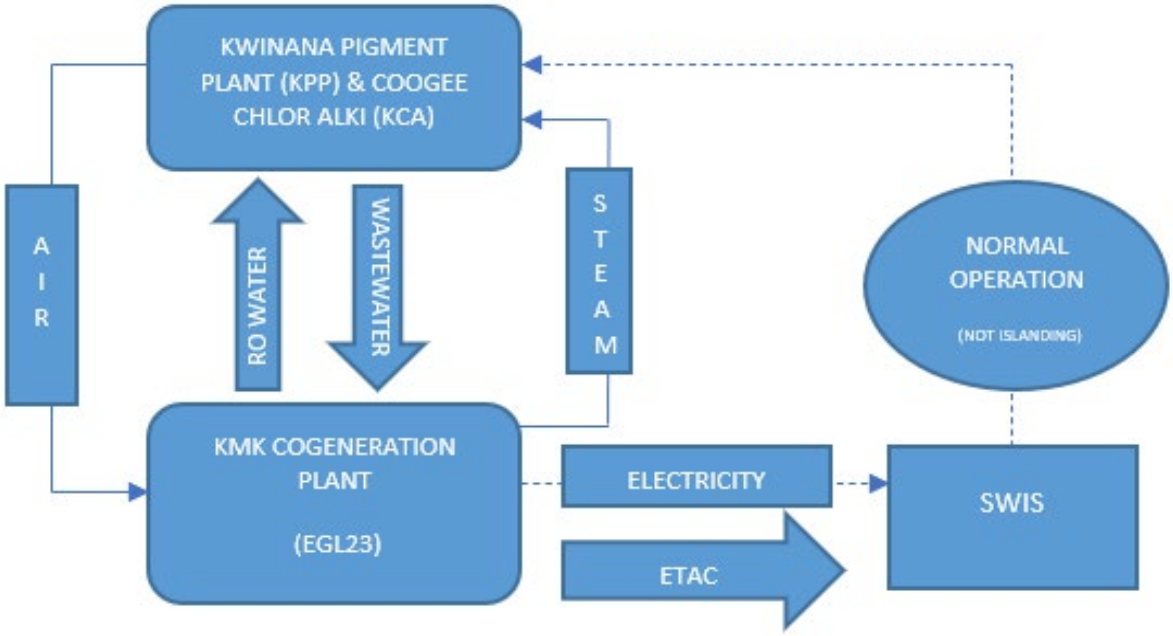
- Cogeneration Mode: The exhaust of the GT is directed into the HRSG. The HRSG converts the waste heat from the GT exhaust into process steam for Tronox and NOx suppression steam for the GT; and
- Open Cycle Mode: The GT exhaust is diverted directly to the atmosphere via the HRSG bypass damper. This operating mode is used whenever the HRSG is unavailable for service.

The KPP receives superheated steam from the KMK Cogeneration Facility and normally receives electrical power via the SWIS. However, when there is a risk of a power system interruption or there have been some incidents on the SWIS, the KPP can request AEMO portion off a part of the SWIS to create a Power Island consisting of the WPC, KMK and TiWest HV Substations to reduce the risk of exposure to KPP. When operating in Island configurations the KPP takes its power supply directly from the KMK Cogeneration Facility. There are specific operating circumstances for which islanding is permitted.

The KMK facility also participates in the Wholesale Electrical Market (WEM) with bid prices set by Tronox management. This enables the KMK facility to sit at the required electrical nomination for the steam demand but also be able to adjust, upwards, in the electrical output to take advantage of the fluctuations in the price of the WEM. [redacted] are the contracted supplier for Energy Management Services to the KMK Facility. The KMK Cogen personnel liaise with [redacted] to adjust the Tronox nominations for daily operations, islanding, planned and forced outages.

The supply of electricity to the quality required to be maintained by Tronox is covered by a Transmission Connection Agreement and ETAC between Tronox Management and Western Power as the Network Service Provider. The term of the ETAC was extended during the audit period. The KMK Cogeneration Facility is a net exporter of electricity, as part of the balancing market, to the South West Interconnected System (SWIS) via Energy Management Services provided. (illustrated in figure 1).

FIGURE 1 – KPP and KMK Co-generation Facility Relationship



Tronox's primary focus is the operation of the KPP, which is the processing of synthetic rutile through the Pigment Plant to be converted through the chloride process into titanium dioxide (TiO2) as reflected in their Business Plan, and they have entered into an O&M Agreement in 2009 with [redacted] to provide operational, maintenance and engineering services for the electricity and steam generation assets at the KMK Cogeneration Facility. [redacted] also project manage plant upgrades. Via the O&M Agreement Tronox Management have delegated a significant requirement of the AMS to [redacted] including the development of an Asset Management Plan. Requirements in relation to BOP Spares are also specified as part of the O&M Agreement. There are some shared security services provided by the KPP and [redacted] have an entrance that is also secured. As such, the asset management objectives and the operational and maintenance activities for the Cogen Facility reflect this approach. Tronox as the owner of the KMK Cogeneration Facility have full time representation on site facilitated through the Kwinana Pigment Plant Site Director and the Supply Chain Director.

The reliable operation of the Cogeneration Facility is acknowledged by management as critical to maintaining production levels at the Pigment Plant. Loss of the steam supply from the Cogen Facility could impact the production of the high steam grades of pigment. As such, Tronox are highly motivated to ensure the Pigment Plant is highly reliable and will invest in the upgrades and improvements necessary to assure ongoing reliability of the Cogen Facility.

2. AUDIT OPINION

We have undertaken a reasonable assurance engagement on Tronox's (the Licensee) compliance, in all material respects, with the Electricity Generation Licence (EGL23) (the Licence), and all applicable obligations from the Electricity Compliance Reporting Manual released June 2020, July 2018, July 2017, July 2016 (Licence Obligations) (together referred to as the "Licence Conditions") for the period from 1 November 2016 to 31 October 2021.

With respect to the Asset Management System Review period, we have undertaken a limited assurance engagement, however in general, we have reviewed asset management processes and criteria at a higher level of scrutiny due the nature of the observations and recommendations made in the report and the requirement by the Licensee to identify opportunities for improvement.

Qualified Audit Opinion

In our opinion in relation to the Performance Audit, based on the assessment of the Licence Conditions, there were minor deficiencies in Tronox's integrity of compliance management systems, assignment of management responsibilities and use of internal audit to monitor compliance, but there was reasonable assurance there were no deficiencies in the other systems and practices that we examined. We concluded that, except for these minor deficiencies, Tronox maintained its systems and practices during the period 1 November 2016 to 31 October 2021 in a manner that provided the reasonable assurance required by the Electricity Generation Licence (EGL23).

Based on the procedures performed and the evidence obtained, except for the effect of the matters relating to ensuring systemic risk-based approach to asset management (including contingency planning and IT security risks), improving internal monitoring and compliance processes, implementing management review of the AMS performance and assigning clear responsibilities, nothing has come to our attention that causes us to believe that the entity has not established an effective asset management system. In consideration of the AMS functions contractually performed on behalf of Tronox by the Contractor, and the exceptions detailed above, the Licensee's AMS was noted to be established in accordance with Table 23 of the Economic Regulation Authority's (ERA) 2019 Audit and Review Guidelines – Electricity and Gas Licences and as required by the Electricity Generation Licence (EGL23). The continued performance of the Cogeneration Facility supports this qualified opinion.

Basis for Qualified Opinion

With respect to the period 1 November 2016 to 31 October 2021, as a result of identified non-compliances or control deficiencies, Tronox did not comply with the Licence Conditions or ensure adequate asset management processes and effectiveness criteria as detailed below:

TABLE 4 - Summary of Audit Non-Compliances 2021

REF[1]	LICENCE OBLIGATION	NON-COMPLIANCE	RECOMMENDATION
105	***Electricity Industry Act 2004*** **- Licence Condition 4.2.1** A licensee must pay the prescribed licence fees to the ERA according to clauses 6, 7 and 8 of the *Economic Regulation Authority (Licensing Funding) Regulations 2014.*	As the Licensee did not have effective compliance processes and lacked awareness to the impact to late payment, Tronox did not pay the prescribed licence fees to the ERA in accordance with the obligations, for 50% of the 21 invoices received during the audit period relating to Standing Data Charges. The late payment of annual licence fee in 2021 was also made. All other prescribed payments were made in accordance with the *Economic Regulation Authority (Licensing Funding) Regulations 2014. The*	**01/2021 –** To ensure the licence obligation is embedded in the Licensee's processes and ongoing compliance with requirements the Licensee should: • Develop a Cogeneration Facility Compliance Manual and RACI matrix for required compliance tasks. The compliance manual should form the basis for an internal audit guideline to assess ongoing compliance and achieve continual improvement. • Ensure the obligation to pay Standing Data charges is incorporated in the Compliance Process. • Further review the effectiveness of the corrective actions implemented to ensure ongoing compliance processes in relation to payment of prescribed fees and embed into normal business practices. • Include the requirement as a routine in accounts or similar software, specific budgeting reference to ensure compliance is monitored and does not rely just on tacit knowledge. • Create an email rule to copy communication from the ERA accounts department to another individual • A review of personnel charged with the role and change management processes should be considered to ensure compliance task assigned to employees leaving the business are captured by new positions or reassigned as required
124	***Electricity Industry Act 2004*** **- Licence Condition 4.5.1** A licensee must provide the ERA, in the manner prescribed, with any information that the ERA requires in connection with its functions under the Electricity Industry Act.	During the audit period the Licensee submitted the Annual Compliance Report late 2016-2017 and the 2020-2021 reporting years. The Licensee made late payment of Standing Charges Data Invoices on 10 occasions and the late payment of the annual licence fee on 1 occasion. Submission of standing data charges was not able to be determined if compliant for the 2017 and 2020 reporting years and was non-compliant for 2018 and 2019. The Control Procedures in relation to the correct collection and handling of data that the Licensee supplies to ERA and/or compliance related activities were not adequate to ensure accurate and timely reporting of information to the ERA.	

[1] The licence obligation number allocated to the licence requirement in the Electricity or Gas Compliance Reporting Manual.

TABLE 5 - Summary of Asset Management Review Deficiencies 2021

REF[2]	ASSET MANAGEMENT PROCESS & EFFECTIVENESS CRITERA	CONTROLS DEFICIENCY	RECOMMENDATION
1.1	**ASSET PLANNING** Asset management plan covers the processes in this table	Although, [redacted] has developed an AMP, as contractually required by Tronox, Tronox has not developed its own AMP which completes and/or integrates with the Cogen Facility asset management processes. As such elements of the AMP were not documented such as implementation of a systemic risk-based approach to asset operations and maintenance and an effective monitoring and management review process.	• **02/2021 -** Tronox Management should: ○ *Develop an AMP* - Formally document their AMS in an AMP, where there is an overlap in function the Tronox AMP should refer to the [redacted] process and detail the internal audit and monitoring processes established by Tronox to verify the requirements of the AMS are effectively implemented. ○ *Internal Monitoring* - Establish a process for internal review of [redacted] AMS incorporating the AMP, the O&M Agreement to determine the assessment of the Asset Management processes and effectiveness criteria and verify the integrity of the reporting processes. ○ *Management Review* - Develop management review processes (i.e., internal audits) for the AMP and AMS to verify the effectiveness of the Contractors AMS and mitigate the Licensee's risk in compliance with its Generation Licence and the maintenance and operation of the Cogeneration Facility. ○ *Collaboratively undertake Risk Assessment* - Liaise with [redacted] to document risks, ensure they are intrinsic to the Cogeneration facility and linked to process/project improvements detailed in the AMP, incorporate risks in
1.3	Service levels are defined in the Asset Management Plan	Service levels were defined in the [redacted] AMP and O&M Service Agreement from 2017. There were comprehensive reporting and review requirements on a weekly and monthly basis, however there were no monitoring, processes to assess the effectiveness or accuracy of the reports or the adequacy of the actions, processes and policies employed by [redacted]	
1.8	Likelihood and consequences of asset failure are predicted	In the absence of the application of a formalised risk assessment process, a systemic approach to the way prediction of asset failure likelihood and consequences of the asset failure was not able to be determined from the AMP. [redacted] It was noted the AMP made reference to risk assessments being currently under review utilising Tronox Assessment Tool. This did not eventuate within the review period. The AMP also noted the Operational Strategy (i.e., 2021 AMP section 10.2) incorporated identification of hazards through risk assessments, inspections and audits carried out by [redacted] personnel. The use of risk assessment was not verified.	
1.9	Asset management plan is regularly reviewed and updated	The [redacted] AMP was reviewed annually and updated by the Contractor. However, Tronox did not undertake a critical management review process of the AMP against the requirements of the O&M Agreement or verify the integrity of the reporting process during the audit period. It was noted aspects of the AMP referred to obsolete processes.	

REF[2]	ASSET MANAGEMENT PROCESS & EFFECTIVENESS CRITERA	CONTROLS DEFICIENCY	RECOMMENDATION
4.1	**ENVIRONMENTAL ANALYSIS** Opportunities and threats in the asset management system environment are assessed	In respect to the Cogeneration Facility, Tronox and [redacted] had different risk appetites, risk tolerances and risk management objectives. As such separate processes to identify, address and treat the risk may not be the most effective way to ensure that opportunities and threats in the asset management system environment are assessed and mitigated. Additionally, a recommendation to integrate a full risk-based assessment of items of plant into the asset management plan was made by the external Auditor in the 2016 KMK Cogen Asset Management Plan Review and this was not actioned by the Contractor or Licensee during the review period	the AMP and risk appetites, tolerances and objectives are aligned. ○ *Align risks with improvement plans* - Document risks and ensure they are intrinsic to Cogeneration Facility and linked to process/project improvements by evaluating the KMK Outage Reports, Project Improvements, FMEA Reports, Audit Reports, Contingency Plans, etc and determine if all the risks are captured, and the treatment plans/control measures effectively executed. In effect, reverse engineering the risk register by linking the "incident database" to the risk register; and ○ *Further Develop Contingency Plans* - Develop long term contingency plans for the Cogen facility and ensure the contingency plans are tested and continual improvement processes applied where applicable. Identification of asset related risks that could result in a disruption to the continuity of the asset management should also be considered. • [redacted] should: ○ *Review AMP* - Review the AMP to ensure all sections of the document are updated and reflect the elements of the O&M that could reasonably be attributed to an AMP
5.2	**ASSET OPERATIONS** Risk management is applied to prioritise operations tasks	The application of systemic risk-based management to prioritise operational tasks so operational service levels could be consistently achieved was not evident. The Contractors AMP referenced that the Operational Strategy (i.e., 2021 AMP section 10.2) incorporated identification of hazards through risk assessments, inspections and audits carried out by [redacted] personnel. The use of risk assessment was not verified. Additionally, a recommendation to integrate a full risk-based assessment of items of plant into the asset management plan was made by the external Auditor in the 2016 KMK Cogen Asset Management Plan Review and this was not actioned by the Contractor during the review period.	
6.5	**ASSET MAINTENANCE** Risk management is applied to prioritise maintenance tasks	The explicit application of risk management to prioritise maintenance tasks was not evidenced. The AMP also noted the Maintenance Strategy (i.e., 2021 AMP section 10.3) was to continue to maintain the long-term integrity of the plant by controlling risk, identifying new risks and proposing cost-effective engineering solutions. The use of systemic risk assessment was not verified. Additionally, a recommendation to integrate a full risk-based assessment of items of plant into the asset management plan was made by the external Auditor in the 2016 KMK Cogen Asset Management Plan Review and this was not actioned by the Contractor during the review period.	

REF[2]	ASSET MANAGEMENT PROCESS & EFFECTIVENESS CRITERA	CONTROLS DEFICIENCY	RECOMMENDATION
8.1	**RISK MANAGEMENT** Risk management policies and procedures exist and are applied to minimise internal and external risks	Risk management systems were established by both parties, however, the Risk Registers looked at the incidents from different perspectives and they both had different risk appetites (i.e., different risk matrices and as such differing prescribed likelihood and consequences). Neither risk register was comprehensive in identifying all the Cogen Facility risks nor were they intrinsic to the risk management of the Cogen Facility risks.	such as IT and Cyber Security, disposal of obsolete equipment, risk management processes, plant change control processes, training, etc. ○ *Collaboratively undertake Risk Assessment* - Liaise with Tronox to document risks and ensure they are intrinsic to the Cogeneration facility and linked to process/project improvements, incorporate risks in the AMP and risk appetites, tolerances and objectives are aligned. ○ *Document Contingency Plans* - Incorporate Contingency Plans in the AMP; and ○ *Document operational and maintenance controls* - Formally document operational and maintenance processes where required i.e., in the absence of an existing process or control procedure
8.2	**RISK MANAGEMENT** Risks are documented in a risk register and treatment plans are implemented and monitored	Operational and maintenance risks were not clearly documented in the risk register provided. The risks were well known by the Contactor and managed as reflected by Cogen Facility Performance. However, the use of risk assessment as an intrinsic management tool was not undertaken. Risk assessment was not referenced in the Contractors AMP.	
9.1	**CONTINGENCY PLANNING** Contingency plans are documented understood and tested to confirm their operability and to cover higher risks	There was no evidence provided to verify the testing of contingency plans developed by Tronox. Long term contingency plans were not considered. [redacted] Contingency Plans were tested (i.e. monthly EDG test) but not documented in the AMP as contingency plans.	
12.1	**REVIEW OF AMS** A review process is in place to ensure the asset management plan and the asset management system described in it remain current	There was no critical review process of the AMP undertaken by Tronox other than acknowledgement the provision was as required by the O&M Agreement.	
12.2	**REVIEW OF AMS** Independent reviews (e.g. internal audit) are performed of the asset management system	During the review period there were no independent reviews performed of the AMS.	

REF[2]	ASSET MANAGEMENT PROCESS & EFFECTIVENESS CRITERA	CONTROLS DEFICIENCY	RECOMMENDATION
2.5	**ASSET CREATION AND ACQUISITION** Ongoing legal / environmental / safety obligations of the asset owner are assigned and understood	Compliance processes were not fully effective in relation to the obligations of EGL23 due to fragmentation of management responsibilities for the Cogeneration Facility assets over their life cycle. There were several instances where the obligations were not well assigned or understood and as such non-compliances occurred resulting in inaccurate and incomplete reporting information was provided to the ERA.	**03/2021 –** In order to address the asset management deficiencies identified in relation to the compliance: • Tronox Management should: o *Leadership and accountability* - Improve leadership and accountability through the establishment of an asset management committee or team and designate a role for an asset management champion with the existing responsibilities which span the full asset life cycle to provide effective leadership and accountability and ensure they have sufficient control over the asset management resources to drive the system forward. Undertake a review of the relevant personnel position descriptions to ensure adequate for responsible and accountabilities o *Develop Compliance Processes* - Develop a compliance manual and RACI matrix for the Cogeneration Facility. The Compliance manual would support the internal audit process (Refer Recommendation 01/2021). o *Undertake Training Needs Analysis* - Assess the training needs, resources required for the effective management of the Cogeneration Facility (including the requirements of the generation licence and the O&M Agreement)
4.3	**ENVIRONMENTAL ANALYSIS** Compliance with statutory and regulatory requirements	Compliance with the requirements of the generation licence was not well demonstrated with respect to awareness, authorities and communication of requirements.	
5.6	**ASSET OPERATIONS** Staff resources are adequate and staff receive training commensurate with their responsibilities.	Tronox staff training and awareness of responsibilities/compliance requirements of the generation licence obligations were not well demonstrated in some areas as noted by the root cause of non-compliances raised within this report relating primarily to the Control Environment. A leadership and accountability role to facilitate collaboration and ensure the effectiveness of the AMS was not established.	
7.7	**ASSET MANAGEMENT INFORMATION SYSTEM** Management reports appear adequate for the licensee to monitor licence obligations	There were no specific management reports prepared that detailed or monitored compliance with the generation licence requirements, other than the reporting prepared by the Contractor detailing the asset management activities in accordance with O&M Agreement. Compliance and monitoring processes (i.e., internal audit) were not established in relation to the generation licence obligations.	

REF[2]	ASSET MANAGEMENT PROCESS & EFFECTIVENESS CRITERA	CONTROLS DEFICIENCY	RECOMMENDATION
			○ *Include Legal Obligations compliance in management reports* – Develop management reports to communicate compliance with the generation licence requirements., Link the reports to monitoring processes (i.e., internal audit) to be established.
7.1	**ASSET MANAGEMENT INFORMATION SYSTEM** Adequate system documentation for users and IT operators	[redacted]	**04/2021 –** To ensure Tronox has established adequate system documentation for users and IT operators' consideration of the following is recommended: ○ Review the Australian Energy Sector Cyber Security Framework (AESCSF) and assessment of Tronox and [redacted] systems for suitability. (For specific detail refer to AEMO | AESCSF framework and resources). ○ Consider legislative requirements and Asset Management Information System requirements in the AMP, risk assessment and Tronox control procedures and policies. ○ [redacted] ○ Review the *Security Legislation Amendment (Critical Infrastructure) Act 2021* for gaps to compliance and use

REF[2]	ASSET MANAGEMENT PROCESS & EFFECTIVENESS CRITERA	CONTROLS DEFICIENCY	RECOMMENDATION
			requirements as a benchmark for IT management practices. o Assessment of [redacted] IT security process as required by the O&M Agreement and with consideration legislative and 2019 Audit and Review Guidelines – Electricity and Gas Licences requirements is recommended. o Subject to the determination of a potential exemption ensure critical infrastructure compliance and reporting requirements are adhered to.
7.5	**ASSET MANAGEMENT INFORMATION SYSTEM** Data backup procedures appear adequate, and backups are tested	[redacted]	**05/2021 –** [redacted]
7.8	**ASSET MANAGEMENT INFORMATION SYSTEM** Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organisation	[redacted] Site Manager and Tronox IT personnel interviewed confirmed that their systems had a high level of security measures to protect asset management data from external threats. [redacted]	**06/2021 –** [redacted]

[2] The reference number allocated to the Asset Management processes and effectiveness criteria in the 2019 Audit and Review Guidelines – Electricity and Gas Licences

Tronox's Responsibilities for Compliance with the "Licence Conditions"

Tronox is responsible for:

(a) Compliance with the Licence as evaluated against the conditions within the Licence & Asset Management Processes and Effectiveness Criteria, for the period 1 November 2016 to 31 October 2021
(b) Identifying risks that threaten the conditions within the Licence and AMS identified above being met
(c) Identifying suitable compliance requirements as specified by the conditions within the Licence and AMS
(d) Identifying, designing, and implementing controls to enable the conditions within the Licence and AMS to be met and to monitor ongoing compliance an ensure continual improvement.

Our Independence and Quality Control

We have complied with the independence and other relevant ethical requirements relating to assurance engagements, which a fundamentally based on confidentiality, integrity, objectivity, and independence, skills and competence. We applied quality management system controls as defined by ISO 9001 in undertaking this assurance engagement.

Assurance Practitioner's Responsibilities

Our responsibility is to express an opinion on Tronox's compliance, in all material respects, with the licence obligations as evaluated against its Licence Conditions and to determine based on the procedures performed Asset Management System Review for the period from 1 November 2016 to 31 October 2021. ASAE 3100 requires that we plan and perform our procedures of the Compliance Engagements to obtain a reasonable assurance about whether Tronox has complied, in all material respects, with the licence obligations as evaluated against its Licence Conditions and a limited assurance engagement about whether Tronox achieved the desired outcomes of the asset management processes and criteria for the period from 1 November 2016 to 31 October 2021.

Inherent Limitations

Assurance engagements are subject to inherent limitations, together with the internal control structure, it is possible that misstatement, error or non-compliance with the compliance requirements may occur and not be detected. A reasonable or limited assurance engagement relating to the current audit period does not indicate compliance for future audit periods.

3. PERFORMANCE AUDIT

3.1 Performance Audit Scope

The period for performance audit scope was the 1 November 2016 to 31 October 2021 and it was executed as defined in accordance with the Audit and Review Plan as a reasonable assurance compliance engagement as to whether Tronox has complied, in all material respects, with its Licence Conditions.

As detailed in Section 5.13 of the Audit & Review Guidelines (March 2019), in addition to the requirement to review annual compliance reports (refer obligation 124), a site audit was conducted on the 8th December 2021 and relevant personnel interviewed (refer table 3), documents assessed are referenced in Appendix 1 and further in Appendix 3. A detailed record or the activities performed, and the observations made in support of the audit findings are included in Appendix 1.

There were six exclusions, and these are detailed in section 3.4.

The audit encompassed an assessment of the following five key areas using a risk based approach (to ISO 31000:2018):

1. Process compliance: assessment of the effectiveness of systems and procedures
2. Outcome compliance: assessment of actual performance against the prescribed licence standards
3. Output compliance: assessment of records to indicate procedures are followed and controls are maintained
4. Integrity of reporting: assessment of the completeness and accuracy of the compliance and performance reports
5. Compliance with any individual licence conditions – the actual performance against the requirements imposed on the specific licensee by the ERA or specific matters raised by the ERA.

3.2 Performance Audit Objective

The Performance Audit and Review Plan was developed to conduct an audit of the effectiveness of measures taken by the licensee to meet the performance criteria specified in the Licence (refer Section 13(2) of the Electricity Act 2004). Performance criteria are defined within Condition 1 of the Licence as:

- The terms and conditions of the Licence
- Any other relevant matter in connection with the applicable legislation that the ERA determines should be part of the performance audit.

3.3 Performance Methodology

The methodology for the Audit was clearly defined in the Audit & Review Plan. In executing the audit and review plan the audit team followed the methodology defined by the Audit & Review Guidelines (March 2019). The audit methodology ensured a reasonable assurance as to whether the information relating to performance was free from material misstatement and examined and tested controls and activities in relation to the Generation Licence requirements for;

- completeness – whether all material events were recorded for the duration of the audit period
- accuracy - whether all material events were recorded and calculated accurately
- validity - whether all material events recorded actually occurred
- regulatory controls - whether all material events recorded complied with Operating Licence conditions
- internal controls – whether all material events recorded complied with internal control procedures (as defined in table 6).

TABLE 6 - Description of Internal Controls Assessed

Internal Controls	Description of Internal Controls
Control Environment	The licensee's management philosophy and operating style, organisational structure, assignment of authority and responsibilities, the use of internal audit, the use of information technology, training and the skills and experience of the relevant staff members.
Information System	The suitability of the licensee's information systems to record the information needed to comply with the licence, accuracy of data, security of data and documentation describing the information system.
Control Procedures	The presence of systems and procedures to monitor compliance with the licence and to detect or prevent instances of non-compliance or under-performance.
Compliance Attitude	The action taken by the licensee in response to any previous audit or review recommendations, and an assessment of the licensee's attitude towards compliance.
Outcome Compliance	The actual performance against standards prescribed in the licence throughout the audit or review period.

Specific focus was applied to the determination of the application of controls throughout the audit period as identified in the Licensee's risk assessment. Verification of the mitigated risks and the effectiveness of the controls was assessed.

The site audit and review were conducted in the Kwinana site office on the 8th December 2021. This audit and review report is an accurate representation of the audit team's findings and opinions. The Auditor Team confirm that the Licensee provided assistance to the Auditors, as required by Section 4.1 of the Audit Guidelines (2019).

A two-dimensional rating scale (refer Section 5.1.6.1 of the Audit Guidelines and Table 7 below) was used in the preparation of the Audit report to summarise the compliance rating for each licence condition. Each obligation was rated for both the adequacy of existing controls and the compliance with the relevant licence obligation.

TABLE 7 Audit Compliant and Control Rating Scales

Adequacy of Controls Rating		Compliance Rating	
Rating	**Description**	**Rating**	**Description**
A	Adequate controls – no improvement needed	1	Compliant
B	Generally adequate controls – improvement needed	2	Non-Compliant – minor impact on customers or third parties
C	Inadequate controls – significant improvement needed	3	Non-Compliant – moderate impact on customers or third parties
D	No controls evident	4	Non-Compliant – major impact on customers or third parties
NP	Not Performed	NR	Not rated – Determined Not Applicable during the audit period

Source: Table 6: 2019 Audit and Review Guidelines – Electricity and Gas Licences

3.4 Performance Audit Excluded Conditions

There were six Electricity Compliance Reporting Manual – June 2020 obligations for EGL23 that have been excluded from the audit because they are not applicable to Tronox. There are no Type 1 reporting requirements applicable to EGL23. Excluded compliance obligations were detailed in the Audit Plan. Deviations from the Audit and review plan are detailed in Section 2.6.

TABLE 8 Obligations Excluded from the Audit Report

REF*	JUSTIFICATION FOR EXCLUSION
120	Not Applicable – Individual performance standards have not been prescribed by the Authority.
401	Not Applicable – The Network Operator collects the energy data.
402	Not Applicable to Generators (Electricity Compliance Manual to be amended as advised by ERA)
405	Not Applicable – The network operator has access to their own tariff meters.
406	Not Applicable to Generators (Electricity Compliance Manual to be amended as advised by ERA)
435	Not Applicable to Generators (Electricity Compliance Manual to be amended as advised by ERA).

* Electricity Compliance Reporting Manual – June 2020

The Generation Licence compliance elements that were included in the scope of this audit are as defined in Table 9 and are further detailed in Appendix 1.

3.5 Performance Audit Summary of Findings

There are two non-compliances noted in relation to the performance audit. The non-compliances are recurrent throughout previous audit reports and have not been effectively mitigated. It is acknowledged these issues have a minor effect on customers or third parties and are administrative in nature. However, the Licensee has not assessed the control environment and the control procedures for effective assignment of authority and responsibilities, the use of internal audit and there was an absence of systems and procedures to monitor compliance or detect or prevent non-compliance. Subsequently issues were observed regarding the integrity of reporting with respect to the completeness and accuracy of the compliance and performance reports provided to the ERA.

TABLE 9 Performance Audit Compliance Summary

Compliance Obligation Reference No.	Licence Reference	Audit Priority	Adequacy of Controls Rating					Compliance Rating				
			A	B	C	D	NP	1	2	3	4	NR
SECTION 8: TYPE 1 REPORTING REQUIREMENTS												
THERE ARE NO TYPE 1 REPORTING REQUIREMENTS APPLICABLE TO EGL23												
SECTION 12: ELECTRICITY INDUSTRY ACT - LICENCE CONDITIONS AND OBLIGATIONS												
101	Electricity Industry Act section 13(1) Generation Licence, condition 5.3.1	4					NP	1				
102	Electricity Industry Act section 14(1)(a) Generation Licence, condition 5.1.1	5					NP	1				
103	Electricity Industry Act section 14(1)(b) Generation Licence, condition 5.1.2 and 5.1.3	4					NP					NR
104	Electricity Industry Act section 14(1)(c) Generation Licence, condition 5.1.4	4					NP	1				
105*	Electricity Industry Act section 17(1) Generation Licence, condition 4.2.1	3			C				2			
106	Electricity Industry Act section 31(3) Generation Licence, condition 4.1.1	3Δ		B				1				
107	Electricity Industry Act section 41(6) Generation Licence, condition 4.1.1	4					NP					NR
SECTION 13: ELECTRICITY LICENCES - LICENCE CONDITIONS AND OBLIGATIONS												
119	Electricity Industry Act section 11 Generation Licence, condition 4.3.1	4					NP	1				
121	Electricity Industry Act section 11 Generation Licence, condition 5.3.2	4					NP	1				
122	Electricity Industry Act section 11 Generation Licence, condition 5.1.5	4					NP	1				
123	Electricity Industry Act section 11 Generation Licence, condition 4.4.1	4					NP					NR
124*	Electricity Industry Act section 11 Generation Licence, condition 4.5.1	3		C					2			
125	Electricity Industry Act section 11 Generation Licence, condition 3.8.1 and 3.8.2	4					NP					NR
126	Electricity Industry Act section 11 Generation Licence, condition 3.7.1	4					NP	1				
SECTION 14: ELECTRICITY INDUSTRY METERING CODE - LICENCE CONDITIONS AND OBLIGATIONS												
324	Electricity Industry Metering Code Cl 3.3B Generation Licence, condition 4.1.1	4					NP					NR

Compliance Obligation Reference No.	Licence Reference	Audit Priority	Adequacy of Controls Rating					Compliance Rating				
			A	B	C	D	NP	1	2	3	4	NR
339	Electricity Industry Metering Code Cl 3.11(3) Generation Licence, condition 4.1.1	4					NP					NR
371	Electricity Industry Metering Code Cl 4.4(1) Generation Licence, condition 4.1.1	5					NP					NR
372	Electricity Industry Metering Code Cl 4.5(1) Generation Licence, condition 4.1.1	5					NP					NR
373	Electricity Industry Metering Code Cl 4.5(2) Generation Licence, condition 4.1.1	4					NP					NR
388	Electricity Industry Metering Code Cl 5.4(2) Generation Licence, condition 4.1.1	4					NP					NR
407	Electricity Industry Metering Code, Cl 5.19(2) Generation Licence, condition 4.1.1	5					NP					NR
408	Electricity Industry Metering Code, Cl 5.19(3) Generation Licence, condition 4.1.1	4					NP					NR
410	Electricity Industry Metering Code Cl 5.19(6) Generation Licence, condition 4.1.1	5					NP					NR
416	Electricity Industry Metering Code Cl 5.21(5) Generation Licence, condition 4.1.1	4					NP					NR
417	Electricity Industry Metering Code Cl 5.21(6) Generation Licence, condition 4.1.1	4					NP					NR
448	Electricity Industry Metering Code Cl 6.1(2) Generation Licence, condition 4.1.1	4					NP	1				
451	Electricity Industry Metering Code Cl 7.2(1) Generation Licence, condition 4.1.1	4					NP	1				
453	Electricity Industry Metering Code Cl 7.2(4) Generation Licence, condition 4.1.1	4					NP					NR
454	Electricity Industry Metering Code Cl 7.2(5) Generation Licence, condition 4.1.1	4					NP					NR
455	Electricity Industry Metering Code Cl 7.5 Generation Licence, condition 4.1.1	4					NP					NR
456	Electricity Industry Metering Code Cl 7.6(1) Generation Licence, condition 4.1.1	4					NP					NR
457	Electricity Industry Metering Code Cl 8.1(1) Generation Licence, condition 4.1.1	5					NP					NR
458	Electricity Industry Metering Code Cl 8.1(2) Generation Licence, condition 4.1.1	5					NP					NR
459	Electricity Industry Metering Code Cl 8.1(3) Generation Licence, condition 4.1.1	5					NP					NR
460	Electricity Industry Metering Code Cl 8.1(4) Generation Licence, condition 4.1.1	4					NP					NR
461	Electricity Industry Metering Code Cl 8.3(2) Generation Licence, condition 4.1.1	5					NP					NR

*Indicates obligation non-compliant in 2016 Audit and Review Report

Δ Indicates revised audit priority

As required by the Audit Guidelines Section 5.1.6.1, Table 10 lists the number of licence obligations that were given each combination of compliance and controls ratings. The table allows licensees and the ERA to confirm the Audit Team has rated all relevant licence obligations and provides a simple summary of the licensee's compliance during the audit period.

TABLE 10 Compliance and Controls Ratings Summary Table

		Compliance Rating					
		1	2	3	4	N/R	TOTAL
Controls Rating	A	-	-	-	-	-	-
	B	1	-	-	-	-	**1**
	C	-	2	-	-	-	**2**
	D	-	-	-	-	-	-
	N/P	9	-	-	-	24	**33**
	TOTAL	**10**	**2**	**-**	**-**	**24**	**36**

3.5.1 2016 Status & Licensee's Response to the Previous Audit Recommendations and Action Plans

The corrective actions in response to the previous performance audit report recommendations were administrative and related to creating reminders for compliance tasks detailed in the 2016 PAIP developed by the Licensee. The actions were generally ineffective in preventing the recurrence of non-compliance in relation to the obligations 105 and 124 during the current audit period.

TABLE 11 Recommendations Addressing Non-Compliances from the Previous Audit

A Resolved during current audit period				
Recommendation Reference (no./year)	**Licence Obligation Reference Number** **Controls and Compliance Rating** **Legislative Obligation** **Details of Inadequate Controls and/or Non-Compliance**	**Auditors' Recommendation**	**Date Resolved**	**Further Action Required (Yes/No/Not Applicable)** **Details of Further Action Required (Including Current Recommendation Reference, if Applicable)**
1/2016	• **105** • **C 2** • A licensee must pay the prescribed licence fees to the ERA according to clauses 6, 7 and 8 of the Economic Regulation Authority (Licensing Funding) Regulations 2014. • Licence fees were paid outside the required payment terms	• Improve controls for regulatory requirements • PAIP 2016 • Create reminder for responsible officer to pay EGL fees independent of receipt of invoice from ERA.	30/06/17	• Further Action Required • Ineffective Corrective Action. • Recurrent non-compliance. • Refer recommendation 01/2021
2/2016	• **124** • **C 2** • A licensee must provide the ERA, in the manner prescribed, with any information that the ERA requires in connection with its functions under the Electricity Industry Act • Late submission of Annual Compliance Report 2014-2016 reporting years.	• Improve controls for regulatory requirements • PAIP 2016 • Create reminder for responsible officer to commence report in time.	30/06/17	• Further Action Required • Ineffective Corrective Action. • Recurrent non-compliance. • Assessment was not provided on the failure to submit standing data by due date. • Refer recommendation 01/2021
B Unresolved at end of current audit period				
There were no previous audit recommendations that were unresolved at the end of the current audit period				

3.5.2 Summary of Findings and Recommendations from Current Audit

Performance Audit recommendations to address the existence of systems and procedures to monitor compliance, detect or prevent instances of non-compliance and evaluate the management philosophy and operating style, organisational structure, assignment of authority and responsibilities, the use of internal audit, the use of information technology and the skills and experience of key staff members are detailed in (refer Table 12 and further in Appendix 1).

TABLE 12 Recommendations for Current Audit Non-Compliances and Control Deficiencies

A Resolved during the current audit period			
Recommendation Reference (no./year)	**Controls and Compliance Rating**	**Date Resolved & Action Taken by the Licensee**	**Auditor's Comments**
Licence Obligation Reference Number	**Legislative Obligation**		
	Details of Inadequate Controls and/or Non-Compliance		
There were no current audit recommendations that were resolved during the current audit period			

B Unresolved during the current audit period

Recommendation Reference (no./year) Licence Obligation Reference Number	Controls and Compliance Rating Legislative Obligation Details of Inadequate Controls and/or Non-Compliance	Auditors' Recommendation	Action Taken by the Licensee
01/2021 **105** **124**	• **105 - A licensee must pay the prescribed licence fees to the ERA according to clauses 6, 7 and 8 of the Economic Regulation Authority (Licensing Funding) Regulations 2014.[C 2]** o Licence fees were paid outside the required payment terms The following non-compliance with Licence Obligations have also been addressed by recommendation 01/2021 (refer Appendix 1 for detail): • **124 - A licensee must provide the ERA, in the manner prescribed, with any information that the ERA requires in connection with its functions under the Electricity Industry Act [C 2]** o Late submission of Annual Compliance Report 2016-2017 and the 2020-2021 reporting years o Inaccurate and incomplete data reported to ERA o the late payment of Standing Charges Data Invoices on 10 occasions and the late payment of the annual licence fee on 1 occasion was noted during the audit period o Submission of standing data charges was not able to be determined if compliant for the 2017 and 2020 reporting years and was non-compliant for 2018 and 2019.	To ensure the licence obligation is embedded in the Licensee's processes and ongoing compliance with requirements the Licensee should: • Develop a Cogeneration Facility Compliance Manual and RACI matrix for required compliance tasks. The compliance manual should form the basis for an internal audit guideline to assess ongoing compliance and achieve continual improvement. • Ensure the obligation to pay Standing Data charges is incorporated in the Compliance Process. • Further review the effectiveness of the corrective actions implemented to ensure ongoing compliance processes in relation to payment of prescribed fees and embed into normal business practices. • Include the requirement as a routine in accounts or similar software, specific budgeting reference to ensure compliance is monitored and does not rely just on tacit knowledge. • Create an email rule to copy communication from the ERA accounts department to another individual • A review of personnel charged with the role and change management processes should be considered to ensure compliance task assigned to employees leaving the business are captured by new positions or reassigned as required	Refer 2021 PAIP

4. ASSET MANAGEMENT SYSTEM EFFECTIVENESS REVIEW

4.1 Asset Management Review Scope

The scope of the AMS review included an assessment of adequacy and effectiveness of the Cogen Facility's AMS by evaluating during the audit period 1st November 2016 to 31st October 2021 the following criteria;

1. Asset Planning
2. Asset Creation/Acquisition
3. Asset Disposal
4. Environmental Analysis
5. Asset Operations
6. Asset Maintenance
7. Asset Management Information System
8. Risk Management
9. Contingency Planning
10. Financial Planning
11. Capital Expenditure Planning
12. Review Of Asset Management System

The asset management review followed the ERA approved audit and review plan and used;

- a risk based approach to auditing using the risk evaluation model set out in ISO31000:2018
- an overall effectiveness rating for an asset management process, based on a combination of the process and policy adequacy rating and the performance rating,
- the format and content of the reviewer's report; and post- review plan as described in the Guidelines.
- the Asset Management System Review has been carried out as a 'limited assurance engagement'.

4.2 Asset Management Review Objective

The objective of the review was to examine the effectiveness of the processes used by the Tronox to deliver asset management, the information systems supporting asset management activities and the data and knowledge used to make decisions about asset management. These elements were examined from a life cycle perspective i.e., planning, construction, operation, maintenance, renewal, replacement and disposal using the guidelines developed by the Economic Regulation Authority

4.3 Methodology for Asset Management System Review

The audit methodology detailed in the Audit and Review Guidelines – Electricity and Gas Licences (March 2019) was used in the execution of the Asset Management System Review and was further detailed in the Audit Plan.

Asset Management System Effectiveness Rating

The Audit and Review Guidelines – Electricity and Gas Licences (March 2019) (section 5.1.6.2) states that the asset management review report must provide a table that summarises the auditor's assessment of both the process and policy definition rating and the performance rating for each key process in the licensee's asset management system using the scales described in Table 13 and Table 14. It is left to the judgement of the Audit Team to determine the most appropriate rating for each asset management process.

TABLE 13 Asset Management Process and Policy Definition Adequacy Ratings

RATING	DESCRIPTION	CRITERIA
A	Adequately defined	• Processes and policies are documented. • Processes and policies adequately document the required performance of the assets. • Processes and policies are subject to regular reviews and updated where necessary. • The asset management information system(s) are adequate in relation to the assets being managed.
B	Requires some improvement	• Processes and policies require improvement. • Processes and policies do not adequately document the required performance of the assets. • Reviews of processes and policies are not conducted regularly enough. • The asset management information system(s) requires minor improvements (taking into consideration the assets being managed).
C	Requires substantial improvement	• Processes and policies are incomplete and require substantial improvement. • Processes and policies do not document the required performance of the assets. • Reviews of processes and policies are considerably out of date. • The asset management information system(s) requires substantial improvements (taking into consideration the assets being managed)
D	Inadequate	• Processes and policies are not documented. • The asset management information system(s) is not fit for purpose (taking into consideration the assets being managed).

TABLE 14 Asset Management Performance Ratings

RATING	DESCRIPTION	CRITERIA
1	Performing effectively	• The performance of the process meets or exceeds the required levels of performance. • Process effectiveness is regularly assessed and corrective action taken where necessary.
2	Improvement required	• The performance of the process requires some improvement to meet the required level. • Process effectiveness reviews are not performed regularly enough. • Recommended process improvements are not implemented
3	Corrective action required	• The performance of the process requires substantial improvement to meet the required level. • Process effectiveness reviews are performed irregularly or not at all. • Recommended process improvements are not implemented
4	Serious action required	• Process is not performed or the performance is so poor the process is considered to be ineffective.

As stipulated in section 5.3 of the Audit and Review Guidelines – Electricity and Gas Licences (March 2019), the Audit Team noted that the Asset Management Review Post Implementation Plan does not form part of the Audit Opinion. The recommendations made from the current review that required post implementation plans are detailed in Table 17.

4.4 Asset Management Review Summary of Findings

The combined systems, processes, policies and procedures of the [redacted] and Tronox asset management system were evident to some degree but were ineffective with respect to some areas of the asset life cycle processes. The AMP developed by [redacted] was not considered appropriate for all asset management objectives of the all the life cycle processes. While the collective AMS met the requirements of the Audit and Review Guidelines – Electricity and Gas Licences (2019). There were several findings where the process and policy criteria required substantial improvement and the performance criteria required corrective action (refer Table 17).

Tronox does not have an asset management champion or team bridging the gaps and facilitating the collaboration of the AMS components with respect to the KMK Cogeneration Facility. The Tronox and [redacted] Life Cycle Planning processes could be more effective and benefit from the contributions of a cross-functional team of individuals with experience in managing and operating assets, setting and monitoring performance targets, conducting planning and programming activities, and mitigating risks. Mitigating risk with proven asset leadership systems with the goal to improve resiliency would enhance the asset management system for the KMK Cogeneration Facility.

Ideally, the asset management champion should have existing responsibilities which span the full asset life cycle to provide effective leadership and accountability and they should have sufficient control over the asset management resources to drive the system forward should be part of the asset management committee or “resource of expertise”. The Illustration of Asset-Life-Cycle Processes

below (refer Figure 3) depicts the overarching role and collaborative function that was not currently identified in the KMK Cogen Facility AMS.

Figure 2 - Illustration Asset Life-Cycle Processes

Source: Asset Management Accountability Framework, February 2016 (Victorian State Government)

As the Licensee has contractually delegated the responsibility of the AMP and aspects of the AMS to [redacted] as the Contractor, Tronox's AMS should complement the [redacted] AMS across all stages of the lifecycle, particularly the planning, acquisition and disposal stages. This is required as the [redacted] AMS does not apply to all stages of the asset lifecycle and focuses on requirements for the operation and maintenance stages, and their associated leadership and accountability arrangements (refer Figure 3). Accountable personnel within Tronox should monitor and review of [redacted] AMS requirements, and ensure they comply when undertaking their asset management responsibilities. There is currently a gap in this process for Tronox as there is not a critical review process of [redacted] AMS other than the contractual report requirements provided by [redacted] It is noted that the Cogeneration Facility has performed well during the audit period and [redacted] have established and implemented an effective AMS to achieve their contract objectives. Potential complacency as to the effectiveness and reliance of operations and maintenance processes of the Contractor are a risk to Tronox.

The main limitations noted with regards to the effectiveness of the AMS were;

1. Tronox has delegated the functions of the AMS as defined by the O&M Agreement to [redacted] However, there was not an internal audit process to established to verify the performance. For example, data recorded in the Cogen Facility annual availability spreadsheets (Refer doc ref.

2. KPIs were agreed in O&M Agreement V002 on 1 July 2017 prior to this [redacted] reporting as per O&M Agreement. [redacted] were responsible for reporting on the performance of the O&M Agreement criteria, as such systematic efforts to verify the indicators and specific monitoring of the performance-based contract were not critically assessed by Tronox Management.

3. Tronox has not developed an AMP specific to the KMK Cogen Facility for the asset management functions that they are responsible for, for example asset planning.

4. [redacted] Additionally, both parties have different risk appetites and assessments for consequences as they divergent in their Asset Management Objectives. [redacted] risk appetite is set by their Corporate Management Systems.

5. There was no established systemic risk-based approach to asset operations and maintenance and an effective monitoring and management review process.

6. [redacted]

7. The AMS for the KMK Cogen was noted to work in silos. Functional silos were not considered an intrinsic problem; the intention of the engagement of [redacted] was to provide specialized expertise. However, where the functional silos were not integrated lead to inefficiencies of the AMS, for example contingency planning. Collaborations, the establishment of joint deliverables, updating the accountability systems and verification of adequate training and resources were required.

8. Tronox does not have an asset management champion or team with responsibilities that span the full asset life cycle to provide effective leadership and accountability or sufficient control over the asset management resources to drive the system, bridge the gaps and facilitate the collaboration of the AMS components

As required by section 5.1.6.2 of the Audit & Review Guidelines (March 2019) Table 16 summarises the auditor's assessment of both the process and policy definition rating and the performance rating for each key process in the licensee's asset management system, using the scales described in Table 15 (refer Section 3.3, Methodology for Asset Management Review).

TABLE 15 Reference for Rating Scale Reviews - Process & Policy and Performance

Process And Policy Rating Scale		Performance Rating Scale	
Rating	Description	Rating	Description
A	Adequately defined	1	Performing effectively
B	Requires some improvement	2	Improvement required
C	Requires substantial improvement	3	Corrective action required
D	Inadequate	4	Serious action required
NR	Not rated	NR	Not rated

Source: Table 9 &10: 2019 Audit and Review Guidelines – Electricity and Gas Licences

The process and policy and asset management system adequacy ratings are summarised in Table 17.

TABLE 16 Asset Management System Effectiveness Summary

ASSET MANAGEMENT SYSTEM CRITERA	PROCESS & POLICY RATING	PERFORMANCE RATING
1. ASSET PLANNING	**B**	**2**
1.1 Asset management plan covers the processes in this table	C	3
1.2 Planning processes and objectives reflect the needs of all stakeholders and are integrated with business planning	B	1
1.3 Service levels are defined in the asset management plan	C	2
1.4 Non-asset options (e.g. demand management) are considered	A	1
1.5 Lifecycle costs of owning and operating assets are assessed	A	1
1.6 Funding options are evaluated	A	1
1.7 Costs are justified and cost drivers identified	A	1
1.8 Likelihood and consequences of asset failure are predicted	C	2
1.9 Asset management plan is regularly reviewed and updated	B	3
2. ASSET CREATION AND ACQUISITION	**B**	**1**
2.1 Full project evaluations are undertaken for new assets, including comparative assessment of non- asset options	A	1
2.2 Evaluations include all life-cycle costs	A	1
2.3 Projects reflect sound engineering and business decisions	A	1
2.4 Commissioning tests are documented and completed	B	1
2.5 Ongoing legal / environmental / safety obligations of the asset owner are assigned and understood	B	3
3. ASSET DISPOSAL	**A**	**1**
3.1 Under-utilised and under-performing assets are identified as part of a regular systematic review process	A	1
3.2 The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken	A	1
3.3 Disposal alternatives are evaluated	A	1
3.4 There is a replacement strategy for assets	A	1

ASSET MANAGEMENT SYSTEM CRITERA	PROCESS & POLICY RATING	PERFORMANCE RATING
4. ENVIRONMENTAL ANALYSIS	**B**	**3**
4.1 Opportunities and threats in the asset management system environment are assessed	B	3
4.2 Performance standards (availability of service Capacity, continuity, emergency response, etc.) are measured and achieved	A	1
4.3 Compliance with statutory and regulatory requirements	B	3
4.4 Service standard (customer service levels etc) are measured and achieved.	A	1
5. ASSET OPERATIONS	**B**	**2**
5.1 Operational policies and procedures are documented and linked to service levels required	B	1
5.2 Risk management is applied to prioritise operations tasks	C	3
5.3 Assets are documented in an asset register including asset type, location, material, plans of components and an assessment of assets' physical/ structural condition	B	2
5.4 Accounting data is documented for assets	A	1
5.5 Operational costs are measured and monitored	A	1
5.6 Staff resources are adequate and staff receive training commensurate with their responsibilities.	B	3
6. ASSET MAINTENANCE	**B**	**2**
6.1 Maintenance policies and procedures are documented and linked to service levels required	B	1
6.2 Regular inspections are undertaken of asset performance and condition	A	1
6.3 Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	B	1
6.4 Failures are analysed and operational / maintenance plans adjusted where necessary	A	1
6.5 Risk management is applied to prioritise maintenance tasks	C	3
6.6 Maintenance costs are measured and monitored	A	1
7. ASSET MANAGEMENT INFORMATION SYSTEM	**B**	**2**
7.1 Adequate system documentation for users and IT operators	C	3
7.2 Input controls include suitable verification and validation of data entered into the system	B	2
7.3 Security access controls appear adequate such as passwords	A	1
7.4 Physical security access controls appear adequate	B	1
7.5 Data backup procedures appear adequate and backups are tested	C	3
7.6 Computations for licensee performance reporting are accurate	A	1
7.7 Management reports appear adequate for the licensee to monitor licence obligations	C	2
7.8 Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organisation	C	3
8. RISK MANAGEMENT	**B**	**3**
8.1 Risk management policies and procedures exist and are applied to minimise internal and external risks	B	3

ASSET MANAGEMENT SYSTEM CRITERA	PROCESS & POLICY RATING	PERFORMANCE RATING
8.2 Risks are documented in a risk register and treatment plans are implemented and monitored	B	3
8.3 Probability and consequences of asset failure are regularly assessed	B	2
9. CONTINGENCY PLANNING	C	2
9.1 Contingency plans are documented understood and tested to confirm their operability and to cover higher	C	2
10. FINANCIAL PLANNING	A	1
10.1 The financial plan states the financial objectives and identifies strategies and actions to achieve those	A	1
10.2 The financial plan identifies the source of funds for capital expenditure and recurrent costs	A	1
10.3 The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	A	1
10.4 The financial plan provides firm predictions on income for the next five years and reasonable predictions beyond this period	A	1
10.5 The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	A	1
10.6 Large variances in actual/budget income and expenses are identified and corrective action taken where necessary	A	1
11. CAPITAL EXPENDITURE PLANNING	A	1
11.1 There is a capital expenditure plan covering works to be undertaken, actions proposed, responsibilities and dates	A	1
11.2 The capital expenditure plan provides reasons for capital expenditure and timing of expenditure	A	1
11.3 The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	A	1
11.4 There is an adequate process to ensure the capital expenditure plan is regularly updated and implemented	A	1
12. REVIEW OF AMS	C	3
12.1 A review process is in place to ensure the asset management plan and the asset management system described in it remain current	C	3
12.2 Independent reviews (e.g. internal audit) are performed of the asset management system	C	3

4.4.1 Asset Management Review Follow-Up from Previous Review Findings

There were no recommendations made from previous asset management review report, although an observation for improved controls for regulatory requirements was made in relation to ensuring ongoing processes for legal/environmental/safety obligations of the asset owner were assigned and understood. This was directly related to the non-compliances raised in relation to the generation licence and has again presented as an ineffective process with improvements required to ensure performance meets the required level (Refer to Table 1).

4.4.2 2021 Asset Management System Recommendations and Action Plans

Asset Management Review recommendations to improve both the adequacy of the licensee's processes and policies and remedy inadequate performance for each asset management process and effectiveness criterion are described in Table 17 and further in Appendix 2.

The recommendations made by the Auditors align with "good electricity industry practice" or "good engineering and operating practices" and primarily relate to the inadequacy of systems (for identification and monitoring of compliance) and lack organisational awareness of compliance requirements, the failure to apply systemic risk management processes to operational and maintenance activities, the absence of internal audit, skills of key personnel, and ensuring the key elements of leadership and accountability are applied to all stages of the asset management life cycle.

TABLE 17 Recommendations to Address Current Review Asset System Deficiencies

A Resolved during the current review period			
Recommendation Reference (no./year)	**Process and Policy Deficiency/ Performance Deficiency**	**Date resolved & action taken by the Licensee**	**Auditor's comments**
Asset Management Process Reference	**(Rating/Asset management process & effectiveness criterion/ Details of Deficiency)**		
There were no current review recommendations that were resolved during the current review period			

B Unresolved at end of the current review period

Recommendation Reference (no./year) Asset Management Process Reference	Process and Policy Deficiency/ Performance Deficiency (Rating/Asset management process & effectiveness criterion/ Details of Deficiency)	Auditor's Recommendation	Action taken by the Licensee by the end of the review period
02/2021 1.1 1.3 1.9 1.8 5.2 6.5 8.1 8.2 9.1 12.1 12.2	**1.1 - Asset management plan covers the processes table 23 of the Audit Guidelines [C 3]** • Tronox has not developed an Asset Management Plan specifically for the Cogeneration Facility. The Contractor's AMS and the supporting processes and documentation established by Tronox addressed to some degree the Audit Guideline requirements except for implementation of a systemic risk-based approach to asset operations and maintenance and an effective monitoring and management review process. The following asset management criteria deficiencies have also been addressed by recommendation 02/2021 (refer Appendix 2 for detail): **1.3 - Service levels are defined in the Asset Management Plan [C 2]** • There were no monitoring, processes to assess the effectiveness or accuracy of the reports or the adequacy of the actions, processes and policies employed by [redacted] **1.8 - Likelihood and consequences of asset failure are predicted [C 2]** • In the absence of the application of a formalised risk assessment process, a systemic approach to the way prediction of asset failure likelihood and consequences of the asset failure was not able to be determined from the AMP. **1.9 - Asset management plan is regularly reviewed and updated [B 3]** • The [redacted] AMP was reviewed annually and updated by the Contractor. However, Tronox did not undertake a critical management review process of the AMP against the requirements of the O&M Agreement or verify the integrity of the reporting process during the audit period. It was noted aspects of the AMP referred to obsolete processes.	Tronox Management should: ○ *Develop an AMP* - Formally document their AMS in an AMP, where there is an overlap in function the Tronox AMP should refer to the [redacted] process and detail the internal audit and monitoring processes established by Tronox to verify the requirements of the AMS are effectively implemented. ○ *Internal Monitoring* - Establish a process for internal review of [redacted] AMS incorporating the AMP, the O&M Agreement to determine the assessment of the Asset Management processes and effectiveness criteria and verify the integrity of the reporting processes. ○ *Management Review* - Develop management review processes (i.e., internal audits) for the AMP and AMS to verify the effectiveness of the Contractors AMS and mitigate the Licensee's risk in compliance with its Generation Licence and the maintenance and operation of the Cogeneration Facility. ○ *Collaboratively undertake Risk Assessment* - Liaise with [redacted] to document risks, ensure they are intrinsic to the Cogeneration facility and linked to process/project improvements detailed in the AMP, incorporate risks in the AMP and risk appetites, tolerances and objectives are aligned. ○ *Align risks with improvement plans* - Document risks and ensure they are intrinsic to Cogeneration Facility and linked to process/project improvements by evaluating the KMK Outage Reports, Project Improvements, FMEA Reports, Audit Reports,	Refer PRIP

4.1 - Opportunities and threats in the asset management system environment are assessed [B 3]

- In relation to the Cogeneration Facility Tronox and [redacted] had different risk appetites, risk tolerances and risk management objectives. As such separate processes to identify, address and treat the risk may not be the most effective way to ensure that opportunities and threats in the asset management system environment are assessed and mitigated. Additionally, a recommendation to integrate a full risk-based assessment of items of plant into the asset management plan was made by the external Auditor in the 2016 KMK Cogen Asset Management Plan Review and this was not actioned by the Contractor or Licensee during the review period

5.2 - Risk management is applied to prioritise operations tasks [C 3]

- The application of systemic risk-based management to prioritise operational tasks so operational service levels could be consistently achieved was not evident. The Contractors AMP referenced that the Operational Strategy (i.e., 2021 AMP section 10.2) incorporated identification of hazards through risk assessments, inspections and audits carried out by [redacted] personnel. The use of risk assessment was not verified. Additionally, a recommendation to integrate a full risk-based assessment of items of plant into the asset management plan was made by the external Auditor in the 2016 KMK Cogen Asset Management Plan Review and this was not actioned by the Contractor during the review period.

6.5 - Risk management is applied to prioritise maintenance tasks [C 3]

- The explicit application of risk management to prioritise maintenance tasks was not evidenced. The AMP also noted the Maintenance Strategy (i.e., 2021 AMP section 10.3) was to continue to maintain the long-term integrity of the plant by controlling risk, identifying new risks and proposing cost-effective engineering solutions. The use of systemic risk assessment was not verified. Additionally, a recommendation to integrate a full risk-based assessment of items of plant into the asset management plan was made by the external Auditor in the 2016 KMK Cogen Asset Management Plan Review and this was not actioned by the Contractor during the review period.

Contingency Plans, etc and determine if all the risks are captured, and the treatment plans/control measures effectively executed. In effect, reverse engineering the risk register by linking the “incident database” to the risk register; and

- *Further Develop Contingency Plans* - Develop long term contingency plans for the Cogen facility and ensure the contingency plans are tested and continual improvement processes applied where applicable. Identification of asset related risks that could result in a disruption to the continuity of the asset management should also be considered.

[redacted] should:

- *Review AMP* - Review the AMP to ensure all sections of the document are updated and reflect the elements of the O&M that could reasonably be attributed to an AMP such as IT and Cyber Security, disposal of obsolete equipment, risk management processes, plant change control processes, training, etc.
- *Collaboratively undertake Risk Assessment* - Liaise with Tronox to document risks and ensure they are intrinsic to the Cogeneration facility and linked to process/project improvements, incorporate risks in the AMP and risk appetites, tolerances and objectives are aligned.
- *Document Contingency Plans* - Incorporate Contingency Plans in the AMP; and
- *Document operational and maintenance controls* - Formally document operational and maintenance processes where required i.e., in the absence of an existing process or control procedure

	8.1 - Risk management policies and procedures exist and are applied to minimise internal and external risks [B 3] • Risk management systems were established by both parties, however, the Risk Registers looked at the incidents from different perspectives and they both had different risk appetites (i.e., different risk matrices and as such differing prescribed likelihood and consequences). Neither risk register was comprehensive in identifying all the Cogen Facility risks nor were they intrinsic to the risk management of the Cogen Facility risks. **8.2 - Risks are documented in a risk register and treatment plans are implemented and monitored [B 3]** • Operational and maintenance risks were not clearly documented in the risk register provided. The risks were well known by the Contactor and managed as reflected by Cogen Facility Performance. However, the use of risk assessment as an intrinsic management tool was not undertaken. Risk assessment was not referenced in the Contractors AMP. **9.1 - Contingency plans are documented understood and tested to confirm their operability and to cover higher risks [C 2]** • There was no evidence provided to verify the testing of contingency plans developed by Tronox. Long term contingency plans were not considered. [redacted] Contingency Plans were tested (i.e. monthly EDG test) but not documented in the AMP as contingency plans **12.1 - A review process is in place to ensure the asset management plan and the asset management system described in it remain current [C 3]** • There was no critical review process of the AMP undertaken by Tronox other than acknowledgement the provision was as required by the O&M Agreement. **12.2 - Independent reviews (e.g. internal audit) are performed of the asset management system [C 3]** • During the review period there were no independent reviews performed of the AMS.		
03/2021 **2.5** **4.3** **5.6** **7.7**	**2.5 - Ongoing legal / environmental / safety obligations of the asset owner are assigned and understood [B 3]** • Compliance processes were not fully effective in relation to the obligations of EGL23 due to fragmentation of management responsibilities for the Cogeneration Facility assets over their life cycle. There were several instances where the obligations were not well assigned or understood and as such non-compliances occurred	In order to address the asset management deficiencies identified in relation to the compliance: • Tronox Management should: o *Leadership and accountability* - Improve leadership and accountability through the establishment of an asset management committee or team and	Refer PRIP

	resulting in inaccurate and incomplete reporting information was provided to the ERA. Clear leadership and accountability was not well demonstrated. The following asset management criteria deficiencies have also been addressed by recommendation 03/2021 (refer Appendix 2 for detail): **4.3 - Compliance with statutory and regulatory requirements [B 3]** • Compliance with the requirements of the generation licence was not well demonstrated with respect to awareness, authorities and communication of requirements. **5.6 - Staff resources are adequate and staff receive training commensurate with their responsibilities. [B 3]** • Tronox staff training and awareness of responsibilities/compliance requirements of the generation licence obligations were not well demonstrated in some areas as noted by the root cause of non-compliances raised within this report relating primarily to the Control Environment. A leadership and accountability role to facilitate collaboration and ensure the effectiveness of the AMS was not established **7.7 - Management reports appear adequate for the licensee to monitor licence obligations [C 2]** • There were no specific management reports prepared that detailed or monitored compliance with the generation licence requirements, other than the reporting prepared by the Contractor detailing the asset management activities in accordance with O&M Agreement. Compliance and monitoring processes (i.e., internal audit) were not established in relation to the generation licence obligations.	designate a role for an asset management champion with the existing responsibilities which span the full asset life cycle to provide effective leadership and accountability and ensure they have sufficient control over the asset management resources to drive the system forward. Undertake a review of the relevant personnel position descriptions to ensure adequate for responsible and accountabilities ○ *Develop Compliance Processes* - Develop a compliance manual and RACI matrix for the Cogeneration Facility. The Compliance manual would support the internal audit process (Refer Recommendation 01/2021). ○ *Undertake Training Needs Analysis* - Assess the training needs, resources required for the effective management of the Cogeneration Facility (including the requirements of the generation licence and the O&M Agreement) ○ *Include Legal Obligations compliance in management reports* – Develop management reports to communicate compliance with the generation licence requirements., Link the reports to monitoring processes (i.e., internal audit) to be established.	
04/2021 **7.1**	**7.1 - Adequate system documentation for users and IT operators [C 3]** • [redacted]	To ensure Tronox has established adequate system documentation for users and IT operators' consideration of the following is recommended: ○ Review the Australian Energy Sector Cyber Security Framework (AESCSF) and assessment of Tronox and [redacted] systems for suitability. (For specific detail refer to AEMO | AESCSF framework and resources).	Refer PRIP

		○ Consider legislative requirements and Asset Management Information System requirements in the AMP, risk assessment and Tronox control procedures and policies. ○ [redacted] ○ Review the *Security Legislation Amendment (Critical Infrastructure) Act 2021* for gaps to compliance and use requirements as a benchmark for IT management practices. ○ Assessment of [redacted] IT security process as required by the O&M Agreement and with consideration legislative and 2019 Audit and Review Guidelines – Electricity and Gas Licences requirements is recommended. ○ Subject to the determination of a potential exemption ensure critical infrastructure compliance and reporting requirements are adhered to.	
05/2021 **7.5**	**7.5 - Data backup procedures appear adequate and backups are tested [C 3]** • [redacted]	[redacted]	Refer PRIP
06/2021 **7.8**	**7.8 - Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organization [C 3]** • [redacted]e Manager and Tronox IT personnel interviewed confirmed that their systems had a high level of security measures to protect asset management data from external threats. [redacted]	[redacted]	Refer PRIP

5. DEVIATION FROM THE AUDIT AND REVIEW PLAN

As required by section 5.1.4 of the Audit and Review Guidelines – 2019, Audit Team must identify any licence obligations or effectiveness criteria that were assessed after the approval of the audit and review plan by the ERA, as 'not applicable' or if the auditor has revised the audit priority for one or more licence obligations, the auditor must identify this in the report.

There were two deviations not from the Audit and Review Plan for EGL23 in relation to the;

1. Performance Audit - licence obligation 106:
   - The audit priority was revised from 5 to 3 due to ineffective risk assessment and consideration of findings in the AMS Review refer Sections 7, 8 & 9 of Appendix 2. The amendment to the audit priority for 106 has been detailed in Appendix 1.

2. Asset Management Review - Asset Management Process 4 - Asset Planning relating to effectiveness criteria reference 1.4:
   - It was noted the effectiveness criteria relating to ensuring non-asset options are considered had been rated in error as priority 4 instead of priority 5. This amendment to the review priority was made in Appendix 2.

APPENDIX 1- TRONOX MANAGEMENT PERFORMANCE AUDIT

DECEMBER 2021

TABLE 18 Performance Audit

12. Electricity Industry Act – Licence conditions and obligations				
No.	**AUDIT REPORT EVIDENCE/ /VERIFICATION/FINDING/ACTION**			
101 Type [2]	**OBLIGATION*: Generation Licence, condition 5.3.1 / Electricity Industry Act, section 13(1)*** **A licensee must provide the ERA with a performance audit conducted by an independent expert acceptable to the ERA, not less than once every 24 months.**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **1**
	Finding –. This was the third Audit conducted by an independent auditor for the current licensee since the licence was granted on 24 December 2010. The requirement for the audit was monitored by the Licensee's Contracts Department as the ERA nominated personnel for the generation licence. Additionally, it was raised in email communications and correspondence with the Secretariat. The audit confirmed the previous Performance Audit report was provided to the ERA in May 2017 for the audit period of 46 months from 1 January 2013 to 31 October 2016. **Documents/Evidence** – Site Interviews, 15, 69, 70-75 **Observations:** • Licensee used manually tracked compliance with requirements and actioned communication from the ERA. • Various communication between licensee and the Authority • Audit & Review Plan developed and approved in accordance with Audit Guidelines • Previous Audit Period 1 January 2013 to 31 October 2016 Report was provided and the report dated 19/5/2017 and published on the Authority's Website. • ERA Notice published 7/6/2017 and increased the audit and review period from 46 months to 60 months. • Current Audit Period 1 November 2016 to 31 October 2021. • GES was appointed with the Authority's approval to undertake the audit for the period on 17 September 2021 (Authority Document Ref: D238624).			
	Recommendation: • Nil		**Action:** • Nil	
102 Type [NR]	**OBLIGATION*: Generation Licence, condition 5.1.1 / Electricity Industry Act, section 14(1)(a)*** **A licensee must provide for an asset management system**	**Audit Priority** **5**	**Controls Rating:** **NP**	**Compliance Rating:** **1**
	Finding – The licensee provided for, developed and implemented an Asset Management System for the Cogeneration Facility. The Asset Management System (AMS) criteria were collectively covered by the systems and processes of both Tronox and [redacted] has contractually delegated the responsibility of developing the Asset Management Plan (AMP) which was updated provided annually to Tronox throughout the audit period. The AMS (including the MEX maintenance planning system) and AMP documentation addressed the asset management processes and effectiveness criteria detailed in the 2019 Audit and Review Guidelines – Electricity and Gas Licences (refer Table 23), except for systemic risk management			

	being applied to prioritise operational and maintenance tasks and review of the AMS. It was noted that the Cogen Facility performed well for the duration of the audit period. Further detail in relation to the assessment of the controls procedures and control environment has been detailed in Appendix 2. **Documents/Evidence** – Site Interviews, 4,5, 15, 69, 70-75 **Observations:** • The Licensee and the Contractors AMS addresses the requirements in the Audit Guidelines, with the exception of risk management being applied to prioritise operational and maintenance tasks and monitoring i.e. audit and review • Definition of responsibilities in relation to AMS defined by the O&M Agreement			
	Recommendation: • Nil		**Action:** • Nil	
103 Type [2]	**OBLIGATION:** ***Generation Licence, condition 5.1.2 and 5.1.3 / Electricity Industry Act, section 14(1)(b)*** **A licensee must notify details of the asset management system and any substantial changes to it to the ERA.**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	Finding – The Licensee advised that there has been no requirement for Tronox to notify the ERA during the audit period details of the asset management system and any substantial changes. **Documents/Evidence** – Site Interviews **Observations:** • Nil			
	Recommendation: • Nil		**Action:** • Nil	

104 Type [2]	**OBLIGATION:** ***Generation Licence, condition 5.1.4 / Electricity Industry Act, section 14(1)(c)*** **A licensee must provide the ERA with a report by an independent expert about the effectiveness of its asset management system every 24 months, or such longer period as determined by the ERA**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **1**
	Finding –. This was the third Review conducted by an independent auditor for the current licensee since the licence was granted on 24 December 2010. The requirement for the review was monitored by the Licensee's Contracts Department as the ERA nominated personnel for the generation licence. Additionally, it was raised in email communications and correspondence with the Secretariat. The audit confirmed the previous AMS Review report was provided to the ERA in May 2017 for the audit period of 46 months from 1 January 2013 to 31 October 2016. **Documents/Evidence** – Site Interviews, 15, 69, 70-75 **Observations:** • Licensee used manually tracked compliance with requirements and actioned communication from the ERA. • Various communication between licensee and the Authority • Audit & Review Plan developed and approved in accordance with Audit Guidelines • Previous Review Period 1 January 2013 to 31 October 2016 Report was provided and the report dated 19/5/2017 and published on the Authority's Website. • ERA Notice published 7/6/2017 and increased the audit and review period from 46 months to 60 months. • Current Review Period 1 November 2016 to 31 October 2021. • GES was appointed with the Authority's approval to undertake the review for the period on 17 September 2021 (Authority Document Ref: D238624).			
	Recommendation: • Nil		**Action:** • Nil	
105** Type [2]	**OBLIGATION:** ***Generation Licence, condition 4.2.1/ Economic Regulation Authority (Licensing Funding) Regulations 2014*** **A licensee must pay the prescribed licence fees to the ERA according to clauses 6, 7 and 8 of the Economic Regulation Authority (Licensing Funding) Regulations 2014.**	**Audit Priority** **3**	**Controls Rating:** **C**	**Compliance Rating:** **2**
	Finding – The Licensee has not paid the prescribed licence fees to the ERA in a timely manner as required by clauses 6, 7 and 8 of the *Economic Regulation Authority (Licensing Funding) Regulations 2014* throughout the audit period. Approximately 50% of the invoices due were paid outside their payment terms for Standing Data Charges. There were 5 annual license fees due for payment during the audit period and one of these was paid outside the terms of the licence requirements (i.e., greater than 30 days after the anniversary of grant of licence). It was noted that the 2017-2021 Annual Compliance Report omitted the late payment of Standing Charge Data Invoice from the reports. The 2020-2021 Annual Compliance Report omitted the late payment of the Annual Licence Fee.			

It is noted that the previous two audit reports raised a non-compliance in relation this obligation. The PAIP required the action to be completed by 30 June 2017 for reminder to be created for responsible officer to pay EGL fees independent of receipt of invoice from ERA. This would not be effective for standing data invoices which are prepared quarterly and amounts subject to change.

Documents/Evidence – Site Interviews, 4,5, 15, 69, 70-75

Observations:

- Obligation 105 has been a non-compliance raised in all previous Performance Audits.
- Payment of licensee fees is the responsibility of Tronox as the Licensee and as such is not referred to in the AMP.
- Compliance Monitoring processes were not evidenced.
- Standing Data Charge Invoices were paid late on 11 of the 21 invoices issued throughout the audit period. Of the 10 invoices paid on time, 6 were paid exactly on the due date.
- License had not established effective compliance processes and lacked awareness to the impact to late payment.

During the Audit period (1 November 2016 to 31 October 2021) the annual licence charge for EGL23 paid;

LICENCE PERIOD	ERA INVOICE REF	DATE PAID	DUE DATE*	COMPLIANT	COMMENTS
24 January 2017 to 23 January 2018	ERA100927	9/01/2017	23rd January 2017	YES	Note: Invoice Date 9/12/2016
24 January 2018 to 23 January 2019	ERA101394	10/01/2018	23rd January 2018	YES	Note: Invoice Date 11/12/2017
24 January 2019 to 23 January 2020	ERA101776	10/01/2019	23rd January 2019	YES	Note: Invoice Date 11/12/2018
24 January 2020 to 23 January 2021	ERA102281	9/01/2020	23rd January 2020	YES	Note: Invoice Date 10/12/2019
24 January 2021 to 23 January 2022	ERA1000166	23/01/2021	23rd January 2021	NO	Note: Invoice Date 24/12/2020

*Cl 6(3)(a) payable to the Authority within one month after the day on which the licence was granted i.e. 23 January annually

Recommendation:

01/2021 – To ensure the licence obligation is embedded in the Licensee's processes and ongoing compliance with requirements the Licensee should:

- Develop a Cogeneration Facility Compliance Manual and RACI matrix for required compliance tasks. The compliance manual should form the basis for an internal audit guideline to assess ongoing compliance and achieve continual improvement.

Action:

- Refer Post Audit Implementation Plan

	• Ensure the obligation to pay Standing Data charges is incorporated in the Compliance Process. • Further review the effectiveness of the corrective actions implemented to ensure ongoing compliance processes in relation to payment of prescribed fees and embed into normal business practices. • Include the requirement as a routine in accounts or similar software, specific budgeting reference to ensure compliance is monitored and does not rely just on tacit knowledge. • Create an email rule to copy communication from the ERA accounts department to another individual • A review of personnel charged with the role and change management processes should be considered to ensure compliance task assigned to employees leaving the business are captured by new positions or reassigned as required			
106 Type [NR]	**OBLIGATION:** ***Generation Licence, condition 4.1.1 / Electricity Industry Act, section 31(3)*** **A licensee must take reasonable steps to minimise the extent, or duration, of any interruption, suspension or restriction of the supply of electricity due to an accident, emergency, potential danger or other unavoidable cause.**	**Audit Priority** **5**	**Controls Rating:** **B**	**Compliance Rating:** **1**
	Finding – The Licensee and its contractor had undertaken separate risk assessment processes, which were primarily focused on HSE issues. Two operational risks applicable to the Cogen Facility were included in the Tronox risk register however both Tronox and [redacted] had different risk appetites. Licensee had taken significant measures to ensure the plant performance both contractually and operationally. Well established accident and emergency procedures were developed and implemented. Membership of KIC, KIMA and GT Forums were also noted. **Evidence** – Site Interviews, 16-28, 30, 35, 38, 44, 82, 83, 97, 98, 99 **Observations:** • [redacted] has contractual incentives to ensure availability of the KMK Cogeneration Facility. • [redacted] achieved KPIs • Limited impact experienced from Covid-19 driven supply chain issues. • Asset failure risks were covered by [redacted] • Critical spares readily available on site or planned in the AMP. [redacted] continues to monitor availability of spares and purchase accordingly to meet future demand • Tronox members of Kwinana Industries Council (KIC), Kwinana Industries Mutual Aid (KIMA) • [redacted] have Membership for GT Users Forum, certified management systems, installation of EDG • KMK Cogen Facility was configured to complete a Black Start, however, this was noted to be for the KMK Cogen itself and was not planned to be utilised by WPC/AEMO as a System restart participant. • Islanding of KMK Cogen in the event of extreme weather • Development of Cogen Contingency Plan was recently undertaken by Tronox • [redacted] AMP does not reference contingency planning, although critical spares and monthly EDG testing encompassed within the Appendices of the AMP • Emergency Response and Business Continuity Processes			

- Risk Reports were undertaken by insurers
- Effective application of the risk registers was not observed. Inconsistency with ratings and limited follow up of corrective actions of control processes.
- Consideration of cyber risks was not included in the risk registers.
- Licensee had significant processes in place for health and safety risks (i.e., Emergency Response, KIMA, KIC etc), however it could be expanded to reflect more fully operational, maintenance risk, cyber risk and development and testing of the contingency plans.
- Specific detail of deficiencies detailed in Section 7 – Asset Management Information System, Section 8 – Risk Management and 9 – Contingency Planning of the AMS Review

REASON FOR VARIATION TO AUDIT PRIORITY	CONSEQUENCE	LIKELIHOOD	INHERENT RISK RATING	CONTROL ASSESSMENT	REVISED AUDIT PRIORITY
Audit Priority Revised from 5 to 3 due to ineffective risk assessment and consideration of findings in the AMS Review refer Sections 7, 8 & 9 of Appendix 2.	MODERATE	PROBABLE	MEDIUM	WEAK	3

Recommendation:

- Nil

Action:

- Nil

13 Electricity Licences – Licence Conditions and Obligations

119 Type [2]	**OBLIGATION:** ***Generation Licence, condition 4.3.1 / Electricity Industry Act, section 11*** **A licensee and any related body corporate must maintain accounting records that comply with the Australian Accounting Standards Board Standards or equivalent International Accounting Standards.**	**Audit Priority**	**Controls Rating:**	**Compliance Rating:**
		4	**NP**	**1**

Finding – The Tronox Holdings plc annual reports detailed compliance with accounting standards - comply with Australian Accounting Standards Board (AASB) requirements. Licensee had robust control processes established to ensure compliance with this requirement, as per the Boards financial responsibilities.

Evidence – Site Interviews, 67, 81

Observations:

- Tronox Holdings plc audited financial statements FY2016-2021
- The Tronox annual report included declaration by the financial auditor
- The Tronox financial accounts referred to compliance with the appropriate accounting standards (International Financial Reporting Standards and US Generally Accepted Accounting Principles adopted by the US Securities and Exchange Commission.)

	Recommendation: • Nil		**Action:** • Nil	
121 Type [2]	**OBLIGATION: Generation Licence, condition 5.3.2 / Electricity Industry Act, section 11** **A licensee must comply, and require its auditor to comply, with the ERA's standard audit guidelines for a performance audit**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **1**
	Finding – The Licensee engaged the Auditor in accordance with the Economic Regulation Authority's 2019 Audit and Review Guidelines. **Documents/Evidence** – ERA and Licensee communication, 69-75 **Observations:** • Copies of communications received from the Authority relating to audit requirements were sent by Licensee through to Auditor to convey requirements specifically the undertaking of audits in compliance with the Audit & Review Guidelines: Electricity Gas and Water Licences.			
	Recommendation: • Nil		**Action:** • Nil	
122 Type [2]	**OBLIGATION: Generation Licence, condition 5.1.5 / Electricity Industry Act, section 11** **A licensee must comply, and must require the licensee's expert to comply, with the relevant aspects of the ERA's standard audit guidelines for an asset management system review**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **1**
	Finding – The Licensee engaged the Auditor in accordance with the Economic Regulation Authority's 2019 Audit and Review Guidelines. **Documents/Evidence** – ERA and Licensee communication, 69-75 **Observations:** • Copies of communications received from the Authority relating to audit requirements were sent by Licensee through to Auditor to convey requirements specifically the undertaking of audits in compliance with the Audit & Review Guidelines: Electricity Gas and Water Licences.			
	Recommendation: • Nil		**Action:** • Nil	

123 Type [2]	**OBLIGATION: Generation Licence, condition 4.4.1 / Electricity Industry Act, section 11** **In the manner prescribed, a licensee must notify the ERA, if it is under external administration or if there is a significant change in the circumstances that the licence was granted which may affect the licensee's ability to meet its obligations.**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	Finding – The Licensee was not required to notify the ERA if it is under external administration or if there is a significant change in the circumstances that the licence was granted which may affect the licensee's ability to meet its obligations. **Documents/Evidence** – Site Interviews **Observations –** • Nil			
	Recommendation: • Nil		**Action:** • Nil	
124 Type [2]	**OBLIGATION: Generation Licence, condition 4.5.1 / Electricity Industry Act, section 11** **A licensee must provide the ERA, in the manner prescribed, with any information that the ERA requires in connection with its functions under the Electricity Industry Act.**	**Audit Priority** **3**	**Controls Rating:** **C**	**Compliance Rating:** **2**
	Finding – During the Audit Period the Licensee did not provide the Authority with all information as required in connection with its functions under the Act, notably the late submission of the Annual Compliance Report for the 2016-2017 and the 2020-2021 reporting years, the late payment of Standing Charges Data Invoices on 8 occasions and the late payment of the annual licence fee on 1 occasion. Submission of standing data charges was not able to be determined if compliant for the 2017 and 2020 reporting years and was non-compliant for 2018 and 2019. Repetitive non-compliances were observed as raised in previous audit periods. Additionally, during the current audit period, the integrity of the compliance reporting was poor with respect to the completeness and accuracy of the compliance reports provided to the ERA, refer to the table below. The Annual Compliance Reports were required to be submitted by the 31st August annually and compliance was noted for all years except 2020-2021 report. All previous reports submitted in time demonstrated effectiveness of the corrective actions arising from the 2016 PAIP. Analysis as to the reason for late submission of the 2021 Report and the accountability will be addressed as part of the PAIP by the licensee as will the repetitive late payment of standing charges data invoices. **Evidence** – Annual Compliance Reports 2017-2021, email communications from ERA, 69-75 **Observations:** • It was noted Tronox administrative controls implemented to ensure submission of Annual Compliance Reports and the payment of annual fees have been effective since 2018 with the exception of the 2017 & 2021 years			

- It was noted the Licensee inaccurately include a breach of WEM Market Rules in the Non-Compliance Report.
- The Licensee did not provide compliance processes for review during the audit. Inclusion in a calendar were indicated by the Licensee and prompts from the ERA were relied upon.
- It was noted that although outside the scope of the audit for reporting there were two non-compliances in relation to late payment of standing data charges and the late submission of the 2021 Annual Compliance Report (submitted on 8/9/2021) that will require to be reported in the 2022 Annual Compliance Report
- The licensee inaccurately included a breach of WEM rules in the annual compliance report for 2021.The generation licence does not cover compliance the Market Rules, which is administered by AEMO and enforced by the ERA's energy markets compliance team.
- The integrity of the compliance reporting was poor with respect to the completeness and accuracy of the compliance reports provided to the ERA. The personnel preparing the reports were not fully aware of the requirements.

REPORTING PERIOD	DATE SUBMITTED*	ON-TIME	REF	NON-COMPLIANCE REPORTED/OMITTED	NON-COMPLIANCE INCURRED
1 July 2016 to 30 June 2017	11/10/2017	NO	124	NON-COMPLIANCE REPORTED: Late report 2015-2016 year. Reassignment of responsibility was noted as the corrective action. NON-COMPLIANCE OMITTED: Obligation 105 - Failed to report to 2 late payment standing charge data invoice. (Note: Total could be inaccurate as invoices due 1/7/16-30/12/16 not provided for review as outside the audit scope). Undetermined if standing charge data submitted on time in 2016.	1. submission of standing charge data due 30/9/2017 submission in a timely manner was not determined for 2017. Records were not available for review. 2. late payment of 2 standing charge data invoices.
1 July 2017 to 30 June 2018	22/8/2018	YES	124	NON-COMPLIANCE REPORTED: Late report 2016-2017 year. Again the reassignment of responsibility was noted as the corrective action. NON-COMPLIANCE OMITTED: Obligation 105 - Failed to report to 1 late payment standing charge data invoice. Undetermined if standing charge data submitted on time in 2017.	1. submission of standing charge data due 30/9/2018 submitted 11/10/2018 2. late payment of 1 standing charge data invoice.
1 July 2018 to 30 June 2019	19/8/2019	YES	124	NON-COMPLIANCE REPORTED: Late submission** of standing charge data for 2018 (note: submitted	1. submission of standing charge data due 30/9/2019 was submitted late 24/10/2019.

					11/10/2018). Corrective actions noted to amend calendar reminder and earlier due dates. NON-COMPLIANCE OMITTED: Obligation 105 - Failed to report to 3 late payment standing charge data invoices.	2. late payment of 3 standing charge data invoice.
	1 July 2019 to 30 June 2020	19/7/2020	YES	124	NON-COMPLIANCE REPORTED: Late submission** of standing charge data for 2019 (note: submitted 24/10/2019. This was incorrectly reported as late for 2020). Corrective actions noted to amend calendar reminder and earlier due dates. NON-COMPLIANCE OMITTED: Obligation 105 - Failed to report to 2 late payment standing charge data invoices.	1. submission of standing charge data due 30/9/2020 submission in a timely manner was not determined for 2020. Records were not available for review. 2. late payment of 2 standing charge data invoice.
	1 July 2020 to 30 June 2021	8/9/2021	NO	Nil	NON-COMPLIANCE REPORTED: Nil reported. NON-COMPLIANCE OMITTED: Obligation 105 - Failed to report to 1 late payment annual licence fee. Undetermined if standing charge data for 2020 submitted on time	1. submission of standing charge data due 30/9/2021 and was submitted 28/9/2021. 2. 1 late payment annual licence fee. 3. the Licensee inaccurately included a breach of WEM Market Rules in the Non-Compliance Report.

* Compliance Report due 31 August annually ** Standing charge data due 30 September annually

	Recommendation: Refer to recommendation 01/2021 **01/2021 –** To ensure the licence obligation is embedded in the Licensee's processes and ongoing compliance with requirements the Licensee should: • Develop a Cogeneration Facility Compliance Manual and RACI matrix for required compliance tasks. The compliance manual should form the basis for an internal audit guideline to assess ongoing compliance and achieve continual improvement. • Ensure the obligation to pay Standing Data charges is incorporated in the Compliance Process. • Further review the effectiveness of the corrective actions implemented to ensure ongoing compliance processes in relation to payment of prescribed fees and embed into normal business practices. • Include the requirement as a routine in accounts or similar software, specific budgeting reference to ensure compliance is monitored and does not rely just on tacit knowledge. • Create an email rule to copy communication from the ERA accounts department to another individual • A review of personnel charged with the role and change management processes should be considered to ensure compliance task assigned to employees leaving the business are captured by new positions or reassigned as required		**Action:** • Refer Post Audit Implementation Plan	
125 Type [2]	**OBLIGATION: Generation Licence, condition 3.8.1 and 3.8.2 / Electricity Industry Act, section 11** **A licensee must publish any information as directed by the ERA to publish, within the timeframes specified.**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	Finding – The ERA did not direct the Licensee to publish any information within the audit period. **Evidence** – Review of ERA website, 69-75 **Observations:** • Nil			
	Recommendation: • Nil		**Action:** • Nil	
126 Type [2]	**OBLIGATION: Generation Licence, condition 3.7.1 / Electricity Industry Act, section 11** ***All notices must be in writing, unless otherwise specified.***	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **1**
	Finding – During the audit period the Licensee maintained records of communication with the Authority, primarily via mail or email communication. All responses were in writing and specific notices in relation to the Generation Licence were reviewed as part of the audit.			

	Evidence – Communications with ERA, Site Interviews **Observations:** • Examples of communications provided refer Appendix 3 e.g.69-75			
	Recommendation: • Nil		**Action:** • Nil	
15 Electricity Industry Metering Code – Licence Conditions and Obligations				
324 Type [2]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 3.3B** **If a user is aware of bi-directional electricity flows at a metering point that was not previously subject to a bi-directional flows or any changes in a customer's or user's circumstances in a metering point that will result in bi-directional flows, the user must notify the network operator within 2 business days.**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	Finding – Meters at the Tronox Cogeneration Facility were subject to bi-directional flows. There was no change with respect to bi-directional flows during the audit period. The Licensee continued to import power from Synergy as required. **Evidence** –Site Interviews, ETAC **Observations:** • Nil			
	Recommendation: • Nil		**Action:** • Nil	

339 Type [NR]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 3.11(3)** **A Code participant who becomes aware of an outage or malfunction of a metering installation must advise the network operator as soon as practicable**.	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	Finding – WPN had primary responsibility for the management and monitoring of meters. There were no outages or malfunctions identified during the audit period. Operations management monitored usage through production calculations and could generally identify an error. **Evidence** – Site Interviews, ETAC **Observations:** • Nil.			
	Recommendation: • Nil		**Action:** • Nil	
371 Type [NR]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 4.4(1)** **If there is a discrepancy between energy data held in a metering installation and in the metering database, the affected Code participants and the network operator must liaise to determine the most appropriate way to resolve the discrepancy.**	**Audit Priority** **5**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	Finding – There were no discrepancies between energy data held in metering installation and in the metering database. As such compliance with this requirement cannot be made. **Evidence** – Site Interviews, ETAC **Observations:** • Nil			
	Recommendation: • Nil		**Action:** • Nil	
372	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 4.5(1)**	**Audit Priority**	**Controls Rating:**	**Compliance Rating:**

Type [NR]	**A Code participant must not knowingly permit the registry to be materially inaccurate.**	**5**	**NP**	**NR**
	Finding – The Licensee did not maintain any standing data or energy data in relation to the metering installations captured under the Metering Code. These activities were managed by the Network Operator and were outside the control of the Licensee. The Network operator maintained sole responsibility for the management of standing data within the registry and/or metering database of these obligations for the period 1 November 2016 to 31 October 2021; • Maintenance and operation of the meters • Energy Data maintained in the metering database • Standing Data in the metering registry • All obligations defined in the Metering Code and the Wholesale Electricity Market Rules. **Evidence** – Site Interviews, ETAC **Observations:** • Nil			
	Recommendation: • Nil		**Action:** • Nil	
373 Type [NR]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 4.5(2)** **Subject to subclause 5.19(6), if a Code participant, other than a network operator, becomes aware of a change to, or inaccuracy in, an item of standing data in the registry, then it must notify the network operator and provide details of the change or inaccuracy within the timeframes prescribed.**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	As per finding against obligation 372			
	Recommendation: • Nil		**Action:** • Nil	
388 Type	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 5.4(2)** **A user must, when reasonably requested by a network operator, assist the network operator to comply with the network operator's obligation under subclause 5.4(1).**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**

[2]	**Finding** – The network operator did not requested the assistance of the Licensee with respect to their metering installation during the audit period. Note: The Licensee has no access to the secured Western Power meters. **Evidence** – Site Interviews, site visit **Observations:** • Nil			
	Recommendation: • Nil		**Action:** • Nil	
407 Type [2]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 5.19(2)** **A user must, to the extent that it is able, collect and maintain a record of the prescribed information in relation to the site of each connection point with which the user is associated.**	**Audit Priority** **5**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	Finding – The Licensee had no meters and all metering obligations were undertaken by Western Power. The only connection point was with Western Power, as such there was no requirement to collect and maintain records of the prescribe information, being site, address or customer attributes. **Evidence** – Site Interviews, site visit **Observations:** • Nil			
	Recommendation: • Nil		**Action:** • Nil	
408 Type	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 5.19(3)** **Subject to subclauses 5.19(3A) and 5.19(6), the user must, within 1 business day after becoming aware of any change in an attribute described in subclause 5.19(2), notify the network operator of the change.**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**

[2]	**Finding** – Tronox Management as an electricity generator has not become aware of any change in attribute including address of the site, NMI of each connection point, customer name, customer address. **Evidence** – Site Interviews, site visit **Observations:** • 5.19(3A) and 5.19(6) specifically relate to Retail Licences with respect the Code of Conduct for Small Use Customers and the Metering Code Model* Service Level Agreement (SLA) • Tronox is a user with an *access contract*			
	Recommendation: • Nil		**Action:** • Nil	
410 Type [NR]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 5.19(6)** **The user must use reasonable endeavours to ensure that it does not notify the network operator of a change in an attribute described in subclause 5.19(2) that results from the provision of standing data by the network operator to the user**	**Audit Priority** **5**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	Finding – During the audit period there was no provision of standing data by the network operator to the user that resulted in the user notifying the network operator of a change in attributes. **Evidence** – Site Interviews, site visit **Observations:** • Nil			
	Recommendation: • Nil		**Action:** • Nil	
416	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 5.21(5)**	**Audit Priority**	**Controls Rating:**	**Compliance Rating:**

Type [2]	**A Code participant must not request a test or audit under subclause 5.21(1) unless the Code participant is a user and the test or audit relates to a time or times at which the user was the current user or the Code participant is the IMO.**	**4**	**NP**	**NR**
	Finding – No tests were requested during the audit period 1 November 2016 to 31 October 2021 **Evidence** – Site Interviews, site visit **Observations:** • Nil			
	Recommendation: • Nil		**Action:** • Nil	
417 Type [2]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 5.21(6)** **A Code participant must not make a request under subclause 5.21(1) that is inconsistent with any access arrangement or agreement.**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	As per finding against obligation 416			
	Recommendation: • Nil		**Action:** • Nil	
448 Type [2]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 6.1(2)** **A user must, in relation to a network on which it has an access contract, comply with the rules, procedures, agreements and criteria prescribed.**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **1**
	Finding – The Licensee had an ETAC and has complied with the communication rules, metrology procedures, model service level agreement (to the extent to which it applies to Tronox and Western Power) and mandatory link criteria prescribed. Tronox had an ETAC with Western Power which outlines the obligations of both parties in relation to metering equipment and activities. The metering obligations applicable to Tronox under the ETAC were limited to maintaining relevant communications with Western Power and to provide any required access to its premises. **Evidence** – Site Interviews			

	Observations: • Evidence of compliance with this requirement provided and confirmed in discussions with management. • A draft Generator Operating Protocol has been developed between the Licensee and Western Power • Noted that the draft Generator Operating Protocol has been accepted and drafting was to be being finalised - refer minutes from WP fortnightly meeting 12/8/21.			
	Recommendation: • Nil		**Action:** • Nil	
451 Type [NR]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 7.2(1)** **Code participants must use reasonable endeavours to ensure that they can send and receive a notice by post, facsimile and electronic communication and must notify the network operator of a telephone number for voice communication in connection with the Code.**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **1**
	Finding – The Tronox site had well established communication processes such as a main telephone line, mobile telephone coverage, remote system monitoring, and wireless internet access. Further operating arrangements defined in the ETAC with Western Power and the Western Power Portal ensure these obligations are met. During the audit period there were no communication issues arising. **Evidence** – Site Interviews, site visit **Observations:** • Internet was available			
	Recommendation: • Nil		**Action:** • Nil	
453 Type [2]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 7.2(4)** **If requested by a network operator with whom it has entered into an access contract, the Code participant must notify its contact details to a network operator within 3 business days after the request.**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	Finding – During the period 1 November 2016 to 31 October 2021 the network operator did not request the licensee to provide its contact details. There were no changes made to Licensee's contact details. **Evidence** – Site Interviews, ETAC			

	Observations: • Nil			
	Recommendation: • Nil		**Action:** • Nil	
454 Type [2]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 7.2(5)** **A Code participant must notify any affected network operator of any change to the contact details it notified to the network operator under subclause 7.2(4) at least 3 business days before the change takes effect.**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	Finding – There were no changes in contact details for the Licensee during the audit period 1 November 2016 to 31 October 2021. **Evidence** – Site Interviews, ETAC **Observations:** • Nil			
	Recommendation: • Nil		**Action:** • Nil	
455 Type [2]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 7.5** **A Code participant must subject to subclauses 5.17A and 7.6 not disclose, or permit the disclosure of, confidential information provided to it under or in connection with the Code and may only use or reproduce confidential information for the purpose for which it was disclosed or another purpose contemplated by the Code**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	Finding – During the period 1 November 2016 to 31 October 2021 the Licensee was not required to disclose or permit the disclosure of confidential information in connection to the Code. **Evidence** – Site Interviews **Observations:** • **Nil**			

	Recommendation: • Nil		**Action:** • Nil	
456 Type [2]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 7.6(1)** **A Code participant must disclose or permit the disclosure of confidential information that is required to be disclosed by the Code.**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	As per finding against obligation 455			
	Recommendation: • Nil		**Action:** • Nil	
457 Type [NR]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 8.1(1)** **If any dispute arises between any Code participants then (subject to subclause 8.2(3)) representatives of disputing parties must meet within 5 business days after a notice given by a disputing party to the other disputing parties and attempt to resolve the dispute by negotiations in good faith.**	**Audit Priority** **5**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	Finding – There were no disputes arising during the audit period with Western Power or any other applicable *Code Participants*. **Evidence** – Site Interviews **Observations:** • Nil			
	Recommendation: • Nil		**Action:** • Nil	
458 Type [NR]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 8.1(2)** **If a dispute is not resolved within 10 business days after the dispute is referred to representative negotiations, the disputing parties must refer the dispute to a senior management officer of each disputing party who must meet and attempt to resolve the dispute by negotiations in good faith.**	**Audit Priority** **5**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	As per finding against obligation 457			

	Recommendation: • Nil		**Action:** • Nil	
459 Type [NR]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 8.1(3)** **If the dispute is not resolved within 10 business days after the dispute is referred to senior management negotiations, the disputing parties must refer the dispute to the senior executive officer of each disputing party who must meet and attempt to resolve the dispute by negotiations in good faith.**	**Audit Priority** **5**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	As per finding against obligation 457			
	Recommendation: • Nil		**Action:** • Nil	
460 Type [NR]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 8.1(4)** **If the dispute is resolved by representative negotiations, senior management negotiations or CEO negotiations, the disputing parties must prepare a written and signed record of the resolution and adhere to the resolution.**	**Audit Priority** **4**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	As per finding against obligation 457			
	Recommendation: • Nil		**Action:** • Nil	
461 Type [NR]	**OBLIGATION: Generation Licence, condition 4.1.1 / Electricity Industry Metering Code, clause 8.3(2)** **The disputing parties must at all times conduct themselves in a manner which is directed towards achieving the objective in subclause 8.3(1).**	**Audit Priority** **5**	**Controls Rating:** **NP**	**Compliance Rating:** **NR**
	As per finding against obligation 457			
	Recommendation: • Nil		**Action:** • Nil	

Note:

NP - not possible to provide a controls rating because no activity has taken place to exercise the obligation during the audit period

NR - Not applicable to audit period and as such compliance was not assessed

APPENDIX 2 – COGEN FACILITY ASSET MANAGEMENT REVIEW

DECEMBER 2021

TABLE 19 Audit Review Ratings and Recommendations

1. ASSET PLANNING	OVERALL EFFECTIVENESS RATING	
□ Assess the adequacy of the asset planning process □ Assess the adequacy of the asset management plan □ Assess whether the asset management plan is up-to-date and implemented in practice □ Assess whether the asset management plan clearly assigns responsibilities and whether these have been applied in practice **Key Process** – *Asset planning strategies focuses on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).* **Outcome** – *Asset planning is integrated into operational or business plans, providing a framework for existing and new assets to be effectively utilised and their service optimised.*	**PROCESS & POLICY RATING*** **B**	**PERFORMANCE RATING** **2**

No.	2021 REVIEW REPORT EVIDENCE/ /VERIFICATION/FINDING/ACTION			
1.1	**OBLIGATION: Asset management plan covers the processes in this table**	**Review Priority** **5**	**P&P* Rating:** **C**	**Performance Rating:** **3**

Findings – Although, [redacted] has developed an AMP, as contractually required by Tronox, Tronox has not developed its own AMP which completes and/or integrates with the Cogen Facility asset management processes. As such elements of the AMP were not documented such as implementation of a systemic risk-based approach to asset operations and maintenance and an effective monitoring and management review process.

The [redacted] AMP has covered the Operation and Maintenance activities of the Cogen and was submitted annually to Tronox during the audit and review period. Although Tronox did not have a formal AMP, the Contractor's AMS and the supporting processes and documentation established by Tronox addressed to some degree the Audit Guideline requirements except for those as described previously.

There were several improvements and corrective actions identified during the review and as such a deficiency has been identified in relation the asset management plan, primarily the application of a systemic risk management process to O&M tasks and the absence of monitoring and management review by Tronox of the Contractors AMS. It was noted the Cogen Facility performed well throughout the audit and review period.

Documents/Evidence – 4,6,12,7,9,10,38,40,76

Observations:

- Tronox has not developed an Asset Management Plan specifically for the Cogeneration Facility.
- Tronox has developed a Business Plan but it did not reflect the Cogen Facility or its strategic relevance.
- The Asset Management processes were driven by [redacted] with consideration of the operation requirements of the KPP.
- Tronox held the Generation Licence not [redacted]

	• Between the annual [redacted] AMP and operational systems and control procedures and the associated documents maintained by Tronox, the Licensee addressed to some level all requirements of the Asset management processes and effectiveness criteria in the Audit Guidelines • All the [redacted] AMPs applicable for the audit and review period were provided for review. • The AMP and the O&M agreement clearly delineated the roles, responsibilities and business relationship between Tronox and [redacted] • Tronox has contractually assigned the responsibility of the development and implementation of an Asset Management Plan to [redacted] via the O&M Agreement. • The [redacted] AMP's were revised annually as specified by the contract requirements. Evidence of the process was demonstrated since 2011. • It was noted that Tronox management team did not routinely critically review the [redacted] AMP in its entirety or against the contractual obligations when submitted. • Tronox had not established a process to review whether the Planned Maintenance and Inspection as specified in the O&M Agreement was being undertaken as required. • Risk management, contingency planning, asset disposal, IT security systems and backup were not fully incorporated in [redacted] AMP. It was noted these were contractually required or implied. The Criticality Assessment (i.e., risk management) was excluded from the AMP from 2017-2021 and it was noted that risk assessments were currently under review utilising Tronox Assessment Tool. This did not eventuate within the review period. • It was noted the Cogen facility performed well, with generally higher than expected GT Annual Availability and Steam Annual Availability, throughout the audit and review period. The Contractor's AMS for the operation and maintenance activities were well established, although not always formally documented. For example, qualitative risk prioritisation was utilised for operations and maintenance activities. The Contractor did have a risk register primarily for HSE risks and generic strategic risks such as loss of key personnel but risks specific to the Cogen facility were not maintained in a risk register. • The O&M Agreement did not specify that the [redacted] AMP cover all processes in Table 23 of the 2019 Audit and Review Guidelines – Electricity and Gas Licences or be developed in accordance with ISO 55000 series, as such Tronox systems were required to be reviewed to ensure the balance of asset management functions were undertaken. For example, Tronox site risk register was provided for review. The Contractor did not have a specific risk register for the Cogen Facility. • The Tronox site risk register was maintained in an excel spreadsheet contained in excess of 550 risks (primarily HSE) it was cumbersome to review, incomplete in some criteria, limited reference to follow up actions and was inconsistent in application of risk methodology, for example #1108 risk with fatality as impact was rated major, where matrix required catastrophic. • The Risk Registers of both Tronox and [redacted] looked at the incidents from different perspectives and they both had different risk appetites (i.e. different risk matrices and as such differing prescribed likelihood and consequences). • It was noted that Tronox had identified areas of improvement with respect to Asset Management and had recently created a role for Asset Management within the Engineering Department. • It was noted that [redacted] AMP was reviewed and updated, however, included reference to obsolete standards and previous AMP years. Additionally, reference to Appendices that were not included (i.e. 2020 & 2021 AMP reference to C4, C5, C6). • The [redacted] AMP did not address change management processes, however, they were contractually obligated to and the process was verified although not documented. • A Technical Review of Asset Management Plan for the Tronox Kwinana Cogen Facility was undertaken by a third party on 13/6/21 (Note: outside the scope of the review period.) Some recommendations made within the report were noted to have been implemented, for example, adding risk rankings/distributions to items of plant described in the condition assessment registers. However, the recommendation to integrate a full risk-based assessment of items of plant into the asset management plan has not been undertaken. • Verification of a link to operational or maintenance events resulting in the development of Improvement Projects within the AMP was noted in some circumstances. However, with reference to N2005 - Forced Outage Report - DCS Power Supply Failure and HRSG Diverter Fault, 09 August 2020 - GT Crank Motor Circuit Breaker Trip Root Cause Analysis (RCA) noted:

	○ In order to address the Multiple GT restart start failures due to crank motor circuit breaker tripping on closure, a recommendation was made to purchase a spare ABB circuit breaker retrofit kit to replace the current circuit breaker and protection relay with the latest Emax2 version. A quote was received from ABB for a replacement Emax2 circuit breaker & retrofit kit. Lead time was 10-12 weeks so it could be supplied and installed for the Nov 2020 planned outage. A review of Appendix C3: Full List of Recommended Gas Turbine Critical Spares 2021 for the following AMP 2021 did not reflect this RCA improvement plan. The process to accept or document the outcome of Outage Report or Improvement Project suggestions was not well demonstrated.	
	Recommendation: **02/2021 –** Tronox Management should: ○ *Develop an AMP* - Formally document their AMS in an AMP, where there is an overlap in function the Tronox AMP should refer to the [redacted] process and detail the internal audit and monitoring processes established by Tronox to verify the requirements of the AMS are effectively implemented. ○ *Internal Monitoring* - Establish a process for internal review of [redacted] AMS incorporating the AMP, the O&M Agreement to determine the assessment of the Asset Management processes and effectiveness criteria and verify the integrity of the reporting processes. ○ *Management Review* - Develop management review processes (i.e., internal audits) for the AMP and AMS to verify the effectiveness of the Contractors AMS and mitigate the Licensee's risk in compliance with its Generation Licence and the maintenance and operation of the Cogeneration Facility. ○ *Collaboratively undertake Risk Assessment* - Liaise with [redacted] to document risks, ensure they are intrinsic to the Cogeneration facility and linked to process/project improvements detailed in the AMP, incorporate risks in the AMP and risk appetites, tolerances and objectives are aligned. ○ *Align risks with improvement plans* - Document risks and ensure they are intrinsic to Cogeneration Facility and linked to process/project improvements by evaluating the KMK Outage Reports, Project Improvements, FMEA Reports, Audit Reports, Contingency Plans, etc and determine if all the risks are captured, and the treatment plans/control measures effectively executed. In effect, reverse engineering the risk register by linking the "incident database" to the risk register; and ○ *Further Develop Contingency Plans* - Develop long term contingency plans for the Cogen facility and ensure the contingency plans are tested and continual improvement processes applied where applicable. Identification of asset related risks that could result in a disruption to the continuity of the asset management should also be considered. [redacted] should: ○ *Review AMP* - Review the AMP to ensure all sections of the document are updated and reflect the elements of the O&M that could reasonably be attributed to an AMP such as IT and Cyber Security, disposal of obsolete equipment, risk management processes, plant change control processes, training, etc. ○ *Collaboratively undertake Risk Assessment* - Liaise with Tronox to document risks and ensure they are intrinsic to the Cogeneration facility and linked to process/project improvements, incorporate risks in the AMP and risk appetites, tolerances and objectives are aligned. ○	**Action:** • Refer Post Review Implementation Plan

1.2	**OBLIGATION: Planning processes and objectives reflect the needs of all stakeholders and are integrated with business planning**	**Review Priority** **4**	**P&P* Rating:** **B**	**Performance Rating:** **1**
	Findings – Asset Planning was incorporated into operational and business planning processes. There was comprehensive engagement with stakeholders from the operations on the ground to the Board level. The Asset Planning was primarily driven by the energy production requirements of the Kwinana Pigment Plant. **Documents/Evidence** – 4,6,12,9,10,38,46,57,76,79 and Site Interview with Engineering Cogen personnel. **Observations:** • Stakeholders including [redacted] ERA, [redacted] KPP and AEMO were all included and consulted in the development of the AMP and Asset Maintenance Schedule. • Tronox, [redacted] and GE (OEM of GTs) identified OPEX and CAPEX projects as part of the planning process. • The Tronox Contingency Plan: Cogeneration Facility Report and the [redacted] Risk Report highlighted the importance of the Cogeneration Facility to KPP. • Consultation was evidenced in the decision to upgrade the Cogeneration Facility following a feasibility and an extensive operational review process by the Engineering Department. • It was noted that the submission of the Contractor's AMP was not always within the timeframe specified by the O&M contract which could potentially impact budgeting and planning processes for Tronox and compromise the AMS objectives. Monitoring of this obligation as recommended in 1.1 would address this issue.			
	Recommendation: • **None**		**Action:** • Nil	
1.3	**OBLIGATION: Service levels are defined in the Asset Management Plan**	**Review Priority** **4**	**P&P* Rating:** **C**	**Performance Rating:** **2**
	Findings – Service levels were defined in the [redacted] AMP and O&M Service Agreement from 2017. There were comprehensive reporting and review requirements on a weekly and monthly basis, however, there were no monitoring, processes to assess the effectiveness or accuracy of the reports or the adequacy of the actions, processes and policies employed by [redacted] It was noted that Plant Availability provided a good indication of the effectiveness or the asset management systems but was not quantitively assessed other than by the KPI Scorecard introduced in October 2017. **Documents/Evidence** 4,6,12,38,40,76 Site Interview and MEX viewing **Observations:** • [redacted] O&M Agreement applicable to audit period; - MK2001 V000 23 November 2014 (services started 1 October 2014) to 30 June 2016 (Note outside scope but O&M terms original carried forward) - MK2001 V001 1/7/2016 -30/6/2017 12 months - MK2001 V002 1/7/2017 30/6/2020, KPIs agreed (Schedule 4 of the Contract) and included in variation			

- MK2001 V003 1/11/2021 to 31/10/2024

- Service levels, Key Performance Indicators, were well defined in the O&M Service Agreement from 2017 (ref MK2004-Variation 002) and reported on in monthly reports.
- Noted for the 2018 and 2019 years the KPIs were well achieved following the agreement of KPIs. (i.e., Forced Outage hours: 2018 -125.35, 2019 -136.7 compared to 2016 and 2017 – 982.2 and 267.8 respectively)
- Tronox are contracted with [redacted] to provide Energy Management Services inclusive of selling energy generated from the KMK facility and the associated services.
- O&M Operator had service level obligations to Tronox around plant availability and generation performance that were specified in the O&M Agreements and subsequently the AMP.
- The [redacted] AMP was implemented in practice and effective asset management strategies were attributed to the high level of availability achieved throughout the audit period, although certain sections of the report were outdated and contained obsolete references.
- It was noted that the O&M Contract had expired on 30 June 2020 during the audit and review period and the Contractor was engaged on 6 monthly extensions. The O&M Agreement – MK2004-Variation 003 commenced on 1 November 2021 within the audit and review period.

Recommendation: As per recommendation 02/2021 (Specifically - *Internal Monitoring)*.

Action:
- Refer Post Review Implementation Plan.

1.4	**OBLIGATION: Non-asset options (e.g. demand management) are considered**	**Review Priority** 4	**P&P* Rating:** A	**Performance Rating:** 1

Findings – The Cogen Facilities primary focus for operation and maintenance was on generation of steam for the KPP. The Licensee considered alternatives to the operation of the Cogen Facility but discounted the options after completion of an internal cost benefit analysis.

Documents/Evidence – 6,12,14,15,39,40,51,57,58,76

Observations:
- Both Licensee and the O&M Contractor examined opportunities for continuous improvement of the Cogen facility's operation and maintenance.
- Comprehensive processes were established for asset planning were evidenced and responsibilities were well defined.
- The [redacted] Risk Report and AMPs reinforced the need to monitor operation of the Cogen facility and work closely with Tronox to optimize its operational capacity and extending life of the Cogen facility.

REASON FOR VARIATION TO AUDIT PRIORITY	CONSEQUENCE	LIKELIHOOD	INHERENT RISK RATING	CONTROL ASSESSMENT	REVISED REVIEW PRIORITY
Review Priority amended from 4 to 5 to correct an error in the Audit and Review Plan.	**Minor**	**Unlikely**	**Low**	**Moderate**	**5**

	Recommendation: • None		**Action:** • Nil	
1.5	**OBLIGATION: Lifecycle costs of owning and operating assets are assessed**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – Tronox purchased the Cogen Facility from Synergy. Tronox in conjunction with the O&M Contractor carried out financial analyses based on maintenance history, in determining the extension of the life of the Cogen facility. The operating and maintenance costs were reported by the Contractor weekly, monthly, annually and projected until 2026. **Documents/Evidence** – 6,12,15,40,57,76,80 **Observations:** • O&M had comprehensive maintenance schedules. Contractors carried the maintenance and operating costs using supporting OPEX and CAPEX processes. • Maintenance contracts ensured the equipment was kept in good operating condition i.e., performance and availability incentives defined. • Monthly reports monitored the O&M costs and annual reports on a yearly basis. • To ensure availability and reliability of the Cogen facility Cogen Rotor replacement (in 2018), Cogen spare refurbishment (in 2019 and 2020), Cogen Replacement Motor (in 2021) was carried out. • Substantial Outage of the Cogen GT Rotor was scheduled in 2022 with CAPEX projects programmed to 2026.			
	Recommendation: • None		**Action:** • Nil	
1.6	**OBLIGATION: Funding options are evaluated**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings –Tronox in consultation with its O&M Contractor and OEM GE defined the CAPEX requirements. Tronox outlined the process by which CAPEX was approved and set out the financial justification model and process by which any new assets were to be evaluated. The justification was presented to Tronox Holdings and the final decision was made by the Board. **Documents/Evidence** – 6,12,38,40,57,58,78 and Site Interviews **Observations:** • The AMP was reviewed and updated accordingly to reflect current OPEX and CAPEX processes as required by Tronox Holdings.			

	• Annual financial audited statements and notes provided transparency to the funding within Tronox Holdings • Tronox had in place a very comprehensive Authority for Expenditure, Project Initiation and Guidelines in place.			
	Recommendation: • **None**		**Action:** • Nil	
1.7	**OBLIGATION: Costs are justified and cost drivers identified**	**Review Priority 4**	**P&P* Rating: A**	**Performance Rating: 1**
	Findings – Costs were well identified and justified by the Licensee and the Contractor, where applicable. Costs and cost drivers were monitored vigilantly and Tronox reported through to the Board. **Documents/Evidence** – 6,12,9,10,38,40,45,51,57,11,35,84, 100 and Site Interviews **Observations:** • Both Tronox and the Contractor monitored costs through monthly meetings and annual reports. • Tronox was audited annually against annual projections as per O&M agreement and audited to the Board. • Kwinana reviewed CoGen O&M costs plus any additional costs congruent with the contract on a monthly basis under specific cost centres. This gets reviewed as a specific agenda slide for the site review pack (Refer Cogen costs spreadsheet provided).			
	Recommendation: • None		**Action:** • Nil	
1.8	**OBLIGATION: Likelihood and consequences of asset failure are predicted**	**Review Priority 4**	**P&P* Rating: C**	**Performance Rating: 2**
	Findings – The risk of asset failures as determined by [redacted] were identified, included in weekly, monthly and annual reports as well as other investigative processes such as the KMK Outage Reports. These were thoroughly investigated by the Contractor. Any asset failures were routinely recorded in MEX. The performance of the Cogen Facility was evidence to the successful prediction and preventative maintenance practices employed by the Contractor. As recommended in an external review of the KMK Cogen Asset Management Plan (2016), the AMP contained condition assessment of assets which incorporated a qualitative Criticality Assessment (Implemented in the 2016 AMP. Noted the methodology was not defined within the AMP) in the Appendices (i.e., refer 2021 AMP Appendix B1-B5). The likelihood and consequences were not predicted as part of a systemic risk assessment process.			

The intention of this effectiveness criteria was to ensure Asset Criticality Assessment was a systematic process that identified the criticality of assets based on the consequence and likelihood of failure of an asset to perform its function. Therefore, setting a foundation to understand the criticality of the Cogen assets based on risk versus cost, and enable [redacted] in consultation with Tronox to effectively prioritise and make the right asset management decisions that focus on the most critical asset. [redacted] Tronox was at risk of making the decisions in relation to the Cogeneration Facility that do not achieve the asset management objectives of the organisation. This concern has been noted within Tronox with the decision to undertake major upgrade of the KMK Cogen Plan versus the decommissioning of the asset and further acknowledge by the external risk report in 12/4/2021 by [redacted] which determined the reliable operation of the Cogeneration Facility was critical to maintaining production levels at the pigment plant.

However, a deficiency was raised in relation to process effectiveness reviews not being performed regularly, or not at all by Tronox or [redacted] There were inconsistencies noted with respect to information contained in the Improvement Projects of the Contractors AMPs and the Asset Condition Assessments contained in the Appendices of the AMP. In the absence of the application of a formalised risk assessment process, a systemic approach to the way prediction of asset failure likelihood and consequences of the asset failure was not able to be determined from the AMP. [redacted] It was noted the AMP made reference to risk assessments being currently under review utilising Tronox Assessment Tool. This did not eventuate within the review period. The AMP also noted the Operational Strategy (i.e., 2021 AMP section 10.2) incorporated identification of hazards through risk assessments, inspections and audits carried out by [redacted] personnel. The use of risk assessment was not verified.

Documents/Evidence –6,12,15,22,23,24,25,26,27,28,35,38,40,42,57,77,84,97,98 and MEX

Observations:

- Tronox with [redacted] investigated asset failures, for example replacement of rotable spares as part of the Gas Turbine Hot gas path inspection and vibration on the Cooler Fans. CAPEX was approved and the project was completed during 2020 and 2021.
- The Contractor was incentivised to ensure availability via the O&M Agreement.
- O&M contractor continued to meet performance targets as established in their contracts
- COVID-19 had minimum impact on the April May 2021 outage. Additional controls were put in place.
- Availability of spares were well monitored.
- Where required FMEA analysis were undertaken and was also incorporated the Strategic Maintenance Plan, although it did not include a risk assessment process.
- The likelihood and consequences were not predicted as part of a systemic or formalised risk assessment process.
- Condition assessment of assets were included in the Contractors AMP, however, issues relating to the effectiveness, application, verification the asset management plan was up-to-date in all sections and implemented in practice was queried as inconsistencies and anomalies were noted. For example, 2021 AMP detailed an Improvement Project for the Gas Turbine Rotor Replacement 2021/2022, Appendix B4 - Condition Assessment Gas Turbine 2021_rev 0 did not refer to the replacement of the rotor in the planned 2022 outage and a review of previous AMPs Condition Assessments for the Gas Turbine did not reflect a change in the criticality or condition assessment commensurate with the risk and replacement project.

	Recommendation: As per recommendation 02/2021 (Specifically - *Collaboratively undertake Risk Assessment)*.		**Action:** • Refer Post Review Implementation Plan	
1.9	**OBLIGATION: Asset management plan is regularly reviewed and updated**	**Review Priority** **4**	**P&P* Rating:** **B**	**Performance Rating:** **3**
	Findings – The [redacted] AMP was reviewed annually and updated by the Contractor. However, Tronox did not undertake a critical management review process of the AMP against the requirements of the O&M Agreement or verify the integrity of the reporting process during the audit period. It was noted aspects of the AMP referred to obsolete processes. **Documents/Evidence** – 6, 12, 40 **Observations**: • AMP scheduled to be reviewed every year as per the O&M contract • Sections of the AMP were out of date and referred to obsolete processes or documentation, for example AMP 2020-2021; ➢ Appendix C4 - GE Shared Critical Spares Agreement Part List 2021 ➢ Appendix C5 - Recommended T3000 Critical Spares 2021 ➢ Appendix C6 - Criticality Assessments 2021 • External third-party review of the KMK Cogen Asset Management Plan conducted during the previous review period. Not within the scope of this audit and review.			
	Recommendation: As per recommendation 02/2021 (Specifically - *Internal Monitoring* & *Review AMP)*.		**Action:** • Refer Post Review Implementation Plan	

2. ASSET CREATION AND ACQUISITION □ Assess the adequacy of policies and procedures covering the creation and acquisition of assets □ Select a sample of asset creations/ acquisitions over the review period and confirm adequate procedures have been followed and actual costs are as predicted **Key Process** – *Asset creation/acquisition is the provision or improvement of assets.* **Outcome** – *The asset acquisition framework is economic, efficient and cost-effective; it reduces demand for new assets, lowers service costs and improves service delivery.*			OVERALL EFFECTIVENESS RATING PROCESS & POLICY RATING* B	 PERFORMANCE RATING 1
No.	**2021 REVIEW REPORT EVIDENCE/ /VERIFICATION/FINDING/ACTION**			
2.1	**OBLIGATION: Full project evaluations are undertaken for new assets, including comparative assessment of non-asset options**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – Tronox with [redacted] determined full financial and engineering justifications of all CAPEX and OPEX projects, including refurbishment and disposal. This was monitored on an annual basis. **Documents/Evidence** –6,12,11,15,38,40,45,49,50,58,76,77,78,80 and Site Interviews. **Observations:** • Tronox and [redacted] had established a full project evaluation financial model and which was presented to the Board. • Evidenced in the justification to extend the life of the Cogen Facility.			
	Recommendation: • None		**Action:** • Nil	
2.2	**OBLIGATION: Evaluations include all life-cycle costs**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – Tronox had a comprehensive CAPEX and AFE in place that clearly considered full life cycle costs of any asset. This included OPEX, spares and refurbishments. **Documents/Evidence** –. 6,12,11,15,38,40,45,49,50,58,76,77,78,80 and Site Interviews			

	Observations: • All CAPEX and AFE requests with full justification and financial analysis were presented to Executive Management and Board for approval. • Processes verified to monitor life cycle costs, including capital (CAPEX), operations, maintenance and support (OPEX) and the major risk element of the business interruption. • It was noted during the audit period, a Risk Report on the Cogeneration Plan undertaken by [redacted] (21/4/21) • It was noted that the Tronox Contingency Plan: Cogeneration Facility first drafted on 28/8/2020 and reviewed 4/2/21 preceded the Risk Report by [redacted]			
	Recommendation: • None		**Action:** • Nil	
2.3	**OBLIGATION: Projects reflect sound engineering and business decisions**	**Review Priority 4**	**P&P* Rating: A**	**Performance Rating: 1**
	Findings – [redacted] as an O&M contractor demonstrated sound engineering basis for proposing Projects. Tronox was responsible for including business and risk aspects into the evaluation of projects as part of the CAPEX and AFE process to the Board. Tronox applied sound engineering and business decision to major projects developed for the Cogen Facility i.e. plant life extension. **Documents/Evidence** –6,12,13,14,15,35,38,40,45,49,50,51,57,58,76,77,78 **Observations:** • [redacted] via its AMP and annual Contract reviewed and reported process proposal for Improvement Projects that were ranked High medium and low priority for the next 5 years. • Tronox undertook a significant engineering and cost-benefit analysis for the extension of the Cogeneration Facility.			
	Recommendation: • None		**Action:** • Nil	
2.4	**OBLIGATION: Commissioning tests are documented and completed**	**Review Priority 4**	**P&P* Rating: B**	**Performance Rating: 1**
	Findings – Asset documentation and test plans were linked to individual assets in MEX where they had been updated (i.e. following maintenance). The Contractor indicated that the project to update the asset documentation in MEX was ongoing.			

	Documents/Evidence – 52 and MEX (viewed on sites) **Observations:** • Original P&ID (Piping & Instrumentation Diagrams), which detailed the interconnection of process equipment and the instrumentation used to control the process, were available on site. • The Contractor had undertaken a significant amount of work to improve the records and information included in MEX. The project was noted to be incomplete and was ongoing and was to be progressed as the plant components required maintenance.			
	Recommendation: • **None**		**Action:** • Nil	
2.5	**OBLIGATION: Ongoing legal / environmental / safety obligations of the asset owner are assigned and understood**	**Review Priority** **4**	**P&P* Rating:** **B**	**Performance Rating:** **3**
	Findings – The O&M Agreement and Asset Management Plan addressed legal obligations, and these were reflected in procedures and comprehensive reporting by the Contractor. The Licensee and O&M Contractor were aware of legal/environmental and safety obligations and proactively managed these requirements. Tronox had contractually assigned the environmental licencing and compliance with applicable safety legislation to [redacted] for the Cogeneration Facility. Tronox was responsible for Environmental and Safety Compliance of the Kwinana Pigment Plant. Both Tronox and [redacted] as independent organisations had well established compliance cultures. However, compliance processes were not fully effective in relation to the obligations of EGL23 due to fragmentation of management responsibilities for the Cogeneration Facility assets over their life cycle. There were several instances where the obligations were not well assigned or understood and as such non-compliances occurred resulting in inaccurate and incomplete reporting information was provided to the ERA. Tronox as the asset owner did not well demonstrate leadership and accountability with respect to all the obligations of EGL23 (Refer to summary non-compliances Table 4). **Documents/Evidence** – 6,12,9,10,15,6,17,18,19,20,21,22,23,24,25,26,38,40,58,78,93, and site interviews. **Observations:** • Tronox had identified this organisational improvement opportunity and had newly created asset management role within Tronox Engineering Department. • Weekly meeting and monthly meetings also addressed this obligation • HSE audits are carried out internally by [redacted] annually and followed through. Outcomes were recorded on-site risk register specific to the HSE impacts (viewed on-site) and presented to Tronox in monthly reports. • [redacted] maintained accreditation to ISO 14001, ISO 9001 and AS/NZS 4801 and ISO 45001. • [redacted] were responsible for the safety and environmental aspects of the operations including the licensing, reporting functions and compliance with regulatory and other requirements.			

	• [redacted] sought an extension of the environmental licence to align with the submission of annual application to the Australian Energy Market Operator for Certified Reserve Capacity for the 2022-2023 capacity year. The application, however, had to be submitted before August 2020 and include an environmental licence which covers the period to the end of 2023 (Noted: L7353/1996/10 was due to expire 23 January 2023 and AEMO considered Environmental Approvals when determining Certified Reserve Capacity for a facility). An extension was provided but could only be given for the period ending 22/01/2024 and not as requested by [redacted] be aligned with AEMO requirements as licenses must be issued in 12 month increments to align with annual licence fees. The renewal of the environmental licence will fall within the next audit period.	
	Recommendation: **03/2021** – In order to address the asset management deficiencies identified in relation to the compliance: • Tronox Management should: ○ *Leadership and accountability* - Improve leadership and accountability through the establishment of an asset management committee or team and designate a role for an asset management champion with the existing responsibilities which span the full asset life cycle to provide effective leadership and accountability and ensure they have sufficient control over the asset management resources to drive the system forward. Undertake a review of the relevant personnel position descriptions to ensure adequate for responsible and accountabilities ○ *Develop Compliance Processes* - Develop a compliance manual and RACI matrix for the Cogeneration Facility. The Compliance manual would support the internal audit process. (Refer recommendation 01/2021) ○ *Undertake Training Needs Analysis* - Assess the training needs, resources required for the effective management of the Cogeneration Facility (including the requirements of the generation licence and the O&M Agreement) ○ *Include Generation Licence compliance in management reports* – Develop management reports to communicate compliance with the generation licence requirements., Link the reports to monitoring processes (i.e., internal audit) to be established.	**Action:** • Refer Post Review Implementation Plan.

3. ASSET DISPOSAL □ Assess the adequacy of policies and procedures covering the identification of under-performing assets, disposal of assets and replacement strategy □ Determine whether a regular review of the performance of assets is undertaken □ Select a sample of disposals over the review period and confirm adequate procedures have been followed **Key Process** – *Asset disposal is the consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets.* **Outcome** – *The asset management framework minimises holdings of surplus and underperforming assets and lowers service costs. The cost-benefits of disposal options are evaluated.*	OVERALL EFFECTIVENESS RATING	
	PROCESS & POLICY RATING*	**PERFORMANCE RATING**
	A	**1**

No.	2021 REVIEW REPORT EVIDENCE/ /VERIFICATION/FINDING/ACTION			
3.1	**OBLIGATION: Under-utilised and under-performing assets are identified as part of a regular systematic review process**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – Systematic review of the Cogen facility reported weekly and monthly regarding its performance. If assets under performed, it was recorded in MEX and incident investigated and remedial action implemented. **Documents/Evidence** – 6,12,11,13,15,18,22,27,35,40,49,50,57,76,77,80, MEX and site Interviews. **Observations:** • The auditors were advised, there was no asset disposal by Tronox relating to the Cogen facility during the audit period. • [redacted] primarily carried out refurbishment of the assets and also utilized the Gas Turbine Users Forum. • Provision in the O&M Agreement for the management of obsolete equipment.			
	Recommendation: • None		**Action:** • Nil	

3.2	**OBLIGATION: The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken**	**Review Priority 4**	**P&P* Rating: A**	**Performance Rating: 1**
	Findings – Monthly reports documented performance and actions. Faulty equipment was either replaced or maintenance actions undertaken such as refurbishment. Tronox had established asset disposal processes. **Documents/Evidence** –6,12,11,13,15,18,22,24,25, 27,35,40,49,50,57,76,77,80, MEX and site Interviews **Observations:** • O&M Contractor reported on a weekly and monthly basis. All under performances / utilisations were discussed in detail and corrective actions taken. These were monitored on an on-going daily basis • As a function of the O&M Agreement period [redacted] scheduled, implemented and investigated all inspection reports, and subsequently identified and proposed asset improvement projects as part of the annual AMP development that provided options of component(s) disposal (that was either recycled/scrapped) or refurbishment, utilizing engineering and technical expertise.			
	Recommendation: • None		**Action:** • Nil	
3.3	**OBLIGATION: Disposal alternatives are evaluated**	**Review Priority 4**	**P&P* Rating: A**	**Performance Rating: 1**
	Findings – Tronox considered alternative sources for the steam production but rejected it and was now focussed on securing and extending life of Cogen facility. Contractor was contractually incentivised to repair and refurbish to reduced operating and maintenance costs. **Documents/Evidence** – 6,12,11,13,15,18,22,24,25, 27,35,40,49,50,57,76,77,80, MEX and site Interviews. **Observations:** • Consumables and spares were observed while on site. • [redacted] (during the site visit) confirmed that they consider alternatives to asset disposal, that was upgrading, recycling or refurbishment as extension to the life of asset and component(s), for example refurbishment of Cogen rotor parts and spares.			

	Recommendation: • **None**			**Action:** • Nil
3.4	**OBLIGATION: There is a replacement strategy for assets**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – Tronox and [redacted] on an annual basis planned for replacement of individual assets as identified from operational and maintenance reports. This was projected to 2026 and was on a rolling 5-year plan. **Documents/Evidence** – 6,12,15,24,35,38,40,57, 84 and site interviews **Observations:** • Comprehensive maintenance schedules developed by [redacted] • Tronox had in place Cogen capital List values asset plan. • [redacted] as Independent Service provider was responsible for consumable spares, and replaced assets as agreed to with Tronox.			
	Recommendation: • None			**Action:** • Nil

4. ENVIRONMENTAL ANALYSIS	OVERALL EFFECTIVENESS RATING	
□ Review achievement of performance and service standards over the review period □ Investigate any statutory or regulatory breaches and assess corrective action taken □ Review the adequacy of reporting and monitoring tools **Key Process** – *Environmental analysis examines the asset management system environment and assesses all external factors affecting the asset management system.* **Outcome** – *The asset management system regularly assesses external opportunities and threats and identifies corrective action to maintain performance requirements.*	**PROCESS & POLICY RATING***	**PERFORMANCE RATING**
	B	**3**

No.	2021 REVIEW REPORT EVIDENCE/ /VERIFICATION/FINDING/ACTION			
4.1	**OBLIGATION: Opportunities and threats in the asset management system environment are assessed**	**Review Priority** **4**	**P&P* Rating:** **B**	**Performance Rating:** **3**

Findings – [redacted] with the sole responsibility for the Asset Management processes have established, AMSs, an AMP, compliance process, procedures for risk mitigation and presentation of risk analysis. HSE risk were well captured in a risk management framework. These were presented annually to Tronox, and improvement projects were undertaken as agreed by both parties. Tronox relied heavily on weekly and monthly reports prepared by [redacted] to monitor any changes in the Contractor's asset management systems and did not routinely review the adequacy of reporting and monitoring tools. A KPI scorecard was implemented as part of the O&M Agreement renewal in 2017.

However, Tronox and [redacted] had different risk appetites, risk tolerances and risk management objectives. As such separate processes to identify, address and treat the risk may not be the most effective way to ensure that opportunities and threats in the asset management system environment are assessed and mitigated. Additionally, a recommendation to integrate a full risk-based assessment of items of plant into the asset management plan was made by the external Auditor in the 2016 KMK Cogen Asset Management Plan Review and this was not actioned by the Contractor or Licensee during the review period

Documents/Evidence – 6,12,22,23,24,38,40,57,58,76,77

Observations:

- O&M contracts are well defined and implemented, however, they were not well monitored or reviewed for adequacy of reporting.
- Both Parties appeared to have good relations with stakeholders
- Clean renewable generation

	• O&M Agreement required GEOP • Sections of the AMP were out of date, missing and referred to obsolete processes or documentation, for example AMP 2020-2021; ➢ Appendix C4 - GE Shared Critical Spares Agreement Part List 2021 ➢ Appendix C5 - Recommended T3000 Critical Spares 2021 ➢ Appendix C6 - Criticality Assessments 2021 • Sound management and response to equipment failures by O&M Contractors. • [redacted] has accreditation, both at Corporate and Site levels, to ISO 9901:2015 "Quality management Systems"; ISO 14001:2015 "Environmental Management System"; AS/NZS 4801 and ISO 45001:2018 "Occupational Health and Safety Management System. • The plant could island from the SWIS if there was a threat to the Cogen operation. • [redacted] have an emergency diesel generator for backup power supply • [redacted] undertook a Risk Report (12/03/2021) and made several specific technical improvements. The inclusion of these recommendations would be captured in the next audit and review period and within the 2022 AMP. The Licensee indicated programs initiated to work on the recommendations including the Asst Management specialist role recently created. • External audit programs utilised by [redacted] have been limited due to COVID and are undertaken from the Contractors perspective. The A&M Contractual incentives and the KPIs align the risk appetites to some degree but the parties are inherently different organisations with specific corporate processes. • Liaison with both parties for the development of a jointly collaborated risk register to document risks and ensure they are intrinsic to the Cogeneration facility and linked to process/project improvements, incorporated in the AMP and risk appetites, tolerances and objectives are aligned would be beneficial. • [redacted] processes manual and paper-based which limited the correlation and objective assessment of trends. Whereas Tronox used an excel spreadsheet and InControl system which were not consistently utilised and the excel spreadsheet only contained 2 Cogen specific risks out of 450 risks both of which were not solely focussed on operational risks or failure to meet management objectives. • The Contractors tacit knowledge was noted to be an invisible line item in the budgets and a significant area of risk the Licensee. • Tronox has in place a Site specific "Special Risk Plan" in conjunction with FESA.			
	Recommendation: Refer to recommendation 02/2021 (Specifically - *Collaboratively undertake Risk Assessment)*.		**Action:** • Refer to Post Review Implementation Plan	
4.2	**OBLIGATION: Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – Performance standards were defined by KPIs and were monitored and reported in O&M monthly reports by [redacted] KPI Scorecard addressed the availability of service, capacity, continuity, emergency response criteria. [redacted] achieved KPIs as evidenced by the KPI Annual Availability spreadsheet. **Documents/Evidence** – 6,12,38,11,16,17,18,19,20,21,22,23,24,26,27,28,57,35,40,44,78,97 and Site Interviews.			

	Observations: • Tronox and [redacted] had in place plans and systems to ensure performance standards are measured, monitored and any disruptions to the continuity of performance minimised. • A KPI scorecard implemented as part of the O&M Agreement renewal in 2017. • Prior to the development of the Scorecard that limited KPIs were defined in the O&M Agreement. • Tronox had in place its own incident reporting system, primarily InControl – INX Incident reporting.			
	Recommendation: • None		**Action:** • Nil	
4.3	**OBLIGATION: Compliance with statutory and regulatory requirements**	**Review Priority** **4**	**P&P* Rating:** **B**	**Performance Rating:** **3**
	Findings – Compliance with statutory and regulatory requirements was monitored and reported throughout [redacted] and Tronox with regards to HSE obligations. Compliance with the requirements of the generation licence was not well demonstrated with respect to awareness, authorities and communication of requirements. For example, failure to identify the non-compliant obligations in the Annual Compliance Report (refer obligation 124). **Documents/Evidence** 6,12,38,15,16,17,18,19,20,21,22,23,77,90 **Observations:** • Specific compliance reports were not prepared in accordance with regulatory requirements (refer to the findings for obligation 124). • AMP was used primarily to monitor statutory and regulatory compliances. • Good stakeholder relations with customers and regulatory authorities.			
	Recommendation: Refer to recommendation 03/2021 (Specifically *Develop Compliance Processes)*		**Action:** • Refer Post Review Implementation Plan.	

4.4	**OBLIGATION: Service standard (customer service levels etc.) are measured and achieved.**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – SCADA system recorded performance, as does WPC, no major issues were identified. Customer services levels were well defined and met by the Licensee as a scheduled generator, Contractual and performance criteria were met or exceeded. Customer service levels were measured and achieved and documented in the monthly reports and annual reports to Tronox. **Documents/Evidence** – 6,11,12,23,38,40,57,99 **Observations:** • Customers have raised no issues or concerns • Service levels were well defined in the contracts and reported on in monthly reports • Tronox are contracted with [redacted] to provide Energy Management Services inclusive of selling energy generated from the KMK facility and the associated services. • [redacted] O&M Operator had service level obligations to Tronox around plant availability and generation performance that were specified in the O&M Agreements. • Cost-benefit analysis for the extension of the plant life was reliant on revenue returns for the justification of expenditure. Meeting the customer service levels was considered as part of this process.			
	Recommendation: • **None**		**Action:** • Nil	

5. ASSET OPERATIONS	OVERALL EFFECTIVENESS RATING	
□ Assess the adequacy of policies and procedures covering operations functions □ Assess the adequacy of staff resourcing and training □ Confirm the policies and procedures have been followed during the review period by examining the asset register, observing operational procedures, analysing costs, etc. □ Assess the significance of exceptions identified and whether adequate corrective action has been taken **Key Process** – *Asset operations is the day-to-day running of assets (where the asset is used for its intended purpose).* **Outcome** – *The asset operation plans adequately document the processes and knowledge of staff in the operation of assets so service levels can be consistently achieved.*	**PROCESS & POLICY RATING***	**PERFORMANCE RATING**
	B	**2**

No.	2021 REVIEW REPORT EVIDENCE/ /VERIFICATION/FINDING/ACTION			
5.1	**OBLIGATION: Operational policies and procedures are documented and linked to service levels required**	**Review Priority** **4**	**P&P* Rating:** **B**	**Performance Rating:** **1**
	Findings – Operational policies and procedures for Cogen facility were documented (primarily as per manufacturers specifications and in accordance with commissioning documentation and operating manuals), in hardcopy, easily accessed and referenced by [redacted] Confirmation that the policies and procedures were followed was verified during the interview with the Contractor through a sample assessment of the asset register (i.e., MEX) Cross-referencing of operational procedures, analysis of costs, and where applicable verification of the criteria in the O&M Agreement or the AMP (i.e., Condition assessment of assets included in the Appendices B1-5) supported the operational strategies. [redacted] used KMK Outage reports, reporting processes and internal audits to document and communicate significant outages or operational events identified and detail proposed corrective action. It was noted the use of internal audit has been reduced due to constraints of COVID. **Documents/Evidence** – 6,7,9,10,12,20,21,22,23,33 (viewed on site), 38, 40, 97 **Observations:** • [redacted] collaborated with the GT Forum, have access to corporate resources and used internal audits • The requirement of maintaining and documenting operational policies are linked to the O&M agreement KPIs. • Original P&ID (Piping & Instrumentation Diagrams), which detailed the interconnection of process equipment and the instrumentation used to control the process, were available on site.			

	• No formalised risk identification process had been implemented. The effective performance of the KMK Cogen Facility was notably attributable to the reliance on the operational manuals, limited operational procedures, information systems, tacit knowledge, skills, expertise, GT Forum, as well as learned information from past events or shared industry knowledge. • [redacted]			
	Recommendation: • None		**Action:** • Refer to Post Review Implementation Plan	
5.2	**OBLIGATION: Risk management is applied to prioritise operations tasks**	**Review Priority** **4**	**P&P* Rating:** **C**	**Performance Rating:** **3**
	Findings – [redacted] has established a qualitative, defensible, proven process for the prioritization of operational tasks and identified areas of concern critical in the continued successful operation of the KMK Cogeneration Facility. These were detailed in the annual AMP (i.e., 2021 AMP Section 3). The projects to address Areas of Concern were broken into the following categories: severe asset condition, obsolete equipment, statutory compliance and health safety and environment. [redacted] Operational Inspections were confirmed, and plant operational logs were noted to record significant issues relating to the operation of individual plant items or equipment, operational problems encountered, times and duration of operation, communication with external activities and decisions made with regards to operating the plant. This information fed into the reporting processes and was used as part of the KMK Outage Reports prepared by the Contractor. The number of audits carried out by [redacted] personnel was limited due to COVID and travel and resourcing issues. While the achievement of performance standards by the Contractor was noted, the procedures for analysis and review of operational performance were largely not documented (i.e., no evidence of the methodology undertaken risk prioritisation of corrective actions/improvement projects) [redacted] Capturing of the operational performance data was automated and maintained by the Contractor. However, the trending and analysis by [redacted] was done manually through KMK Outage reports (no use of priority, risk assessment was evident in the RCA) and provided to Tronox for review. If deemed appropriate, then Tronox would enter into InControl for further analysis (the capability of risk assessment was not always undertaken) accepted improvements would either form part of the next years AMP or CAPEX/OPEX process. The asset management information systems would benefit from substantial improvements (taking into consideration the extensive assets being managed). Upgrading the analysis to a software platform (e.g., requiring Tronox to use the InControl system to report incident) would assist both parties in collaborating for analysing the issues, trending (although some trending was available to [redacted] from SCADA data), applying the same risk appetite to the outcomes, linking the event into the risk matrix and ensuring continual improvement of operational controls. It would also reduce the time demand on Tronox whose primary focus was the KPP. There was a risk to Tronox by having analytical and review capabilities limited including the assessment of effectiveness corrective actions [redacted] Reverse engineering a risk register jointly based upon the operational criteria and maintenance events would partly alleviate some of the risk by accurately recording operational and maintenance tasks and risks and aligning them with operational controls, corrective actions.			

The non-compliance was raised in relation to the absence of explicit application of risk management to prioritise operational tasks so operational service levels could be consistently achieved. The AMP also noted the Operational Strategy (i.e., 2021 AMP section 10.2) incorporated identification of hazards through risk assessments, inspections and audits carried out by [redacted] personnel. The use of risk assessment was not verified. Additionally, a recommendation to integrate a full risk-based assessment of items of plant into the asset management plan was made by the external Auditor in the 2016 KMK Cogen Asset Management Plan Review and this was not actioned by the Contractor during the review period.

Documents/Evidence – 6,7,9,10,12,20,21,22,23,33 (viewed on site),38,40,97. Viewed the Operational Control system on site.

Observations:

- [redacted] were the sole operators of the Cogen facility and as such had qualitative risk management practices in place and applied these, notably via the operational alarms.
- The SCADA exported operational reports and [redacted] carried out prioritised operational tasks. They also engaged with Tronox in event of any risk to steam production to the KPP.
- Operations and maintenance requirements were at times subject to change by Tronox, if needed for production, and [redacted] adjusted maintenance and operational tasks to meet these requirements.
- Risk management was applied and demonstrated at the operational, maintenance and management levels and was primarily based on the operational experience of the Contractor's operational history and long-serving O&M personnel with sound knowledge of plant performance and maintenance requirements.
- The 2021 AMP noted the use of Failure Mode and Effects Analysis (FMEA) for qualitative assessment in relation to GT Turbine critical spares. Historically, the Cogen Facility did not hold GT spares.
- Strategic Maintenance Plan contain in the AMP (i.e., 2021 AMP Appendix A4) included s FMEA Worksheet but also did not include risk analysis.
- Risk management, contingency planning, asset disposal, IT security systems and backup were not fully incorporated in [redacted] AMP. [redacted] The Criticality Assessment (i.e., risk management) was excluded from the AMP from 2017-2021 and it was noted that risk assessments were currently under review utilising Tronox Assessment Tool. This did not eventuate within the review period.
- It was noted the Cogen facility performed well, with generally higher than expected GT Annual Availability and Steam Annual Availability, throughout the audit and review period. The Contractor's AMS for the operation and maintenance activities were well established, although not always formally documented. For example, qualitative risk prioritisation was utilised for operations and maintenance activities. The Contractor did have a risk register primarily for HSE risks and generic strategic risks such as loss of key personnel but risks specific to the Cogen facility were not formally assessed or maintained in a risk register.
- It was observed that the 2016 KMK Cogen Asset Management Plan Review recommended improvements to the asset management plan which included the integration of a full risk-based assessment of items of plant into the asset management plan to support: the development of contingency plans for critical items of plant; confirm critical spares; add risk ratings to condition assessment registers of assets; drive frequency of inspection test plans and assist in the priority of assessment for improvement projects. Some of these tasks were noted to have been undertaken such as the contingency plan development and the risk (criticality) rating for condition assessments, however, they were based on the outcome of full risk-based assessment and recommended.

Recommendation: Refer to recommendation 02/2021 (Specifically - *Collaboratively undertake Risk Assessment)*	**Action:**

			• Refer to Post Review Implementation Plan	
5.3	**OBLIGATION: Assets are documented in an asset register including asset type, location, material, plans of components, and an assessment of assets' physical/structural condition**	**Review Priority 4**	**P&P* Rating: B**	**Performance Rating: 2**
	Findings –The Licensee's documented Asset Register was financially focused, recorded all the financial information, location and asset type. It also included procedures for the addition of new assets and the retirement of any assets. The CMMS: MEX system, detailed asset components, include an assessment of the assets physical/structural condition and location. These were also referenced in the AMP, although were noted to not always consistently updated reflect condition following plant change. **Documents/Evidence** – 6,12,15,24, and MEX **Observations:** • Financial Register kept in Tronox Financial System • [redacted] included in MEX and in its AMP the Condition Assessment of the assets. • The Contractor had undertaken a significant amount of work to improve the records and information included in MEX. The project was ongoing, and updates progressed as the plant components required maintenance. • It was not determined if there was an inventory of OT and IT assets that were important to the Cogen Facility (e.g., SCADA set points, customer information, financial data)			
	Recommendation: • None		**Action:** • Nil	
5.4	**OBLIGATION: Accounting data is documented for assets**	**Review Priority 4**	**P&P* Rating: A**	**Performance Rating: 1**
	Findings – Assets were well documented in the accounts and financial reports summarised weekly and monthly. Quarterly reports to Boards. **Documents/Evidence** – 6,12,14,15,35,38,39,40,51,57,58,78 **Observations:** • Financial information was well recorded by Tronox and reported to ELT and Board • Annual audited accounts and accompanying notes detailed accounting information and explanations.			

	Recommendation: • **None**		**Action:** • Nil	
5.5	**OBLIGATION: Operational costs are measured and monitored**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – Operational costs were measured, recorded, monitored and reported on a weekly and monthly basis. Annual Contact review reports were also presented to Tronox as part of O&M. **Documents/Evidence** – 6,12,14,15,35,38,39,40,51,57,58,78 **Observations:** • O&M costs were incorporated in the O&M Contracts • Unscheduled O&M costs were monitored and reported in monthly and annual reports • Small workforce required for operational and maintenance purposes. • Most operational reporting by [redacted] was in performance terms rather than dollars. • Financials were reported and budgeted in financial reports and audited annually.			
	Recommendation: • **None**		**Action:** • Nil	
5.6	**OBLIGATION: Staff resources are adequate, and staff receive training commensurate with their responsibilities**	**Review Priority** **4**	**P&P* Rating:** **B**	**Performance Rating:** **3**
	Findings – [redacted] employees were competent and familiar with the operations and plant requirements. Training and resourcing considerations were evident with respect to operation and maintenance activities. Contractor training records were reviewed and are referenced below. However, Tronox staff training and awareness of responsibilities/compliance requirements of the generation licence obligations were not well demonstrated in some areas as noted by the root cause of non-compliances raised within this report relating primarily to the Control Environment. A leadership and accountability role to facilitate collaboration and ensure the effectiveness of the AMS was not established. (Refer to Figure 1 Overview of Non-Compliances in Relation to Deficiencies in Internal Controls/Processes). Tronox do not perform audits on the Contractor against the O&M agreement and the Contracts Department were not skilled in Asset Management to undertake the work but are responsible for the generation licence requirements. It was noted that previously an external resource was engaged (outside the review period) to provide a review of the KMK Cogeneration Facility asset management plan generated by [redacted] however, this was not against O&M Agreement specifications. The focus of the review was the assessment of the AMP in ensuring [redacted] AMS met the requirements of providing steam and electricity to the KPP (i.e., Tronox's goals for the co-generation plant) not specifically the generation licence or the satisfaction of the O&M Agreement obligations.			

It was acknowledged that Tronox had recently identified the need for an asset management role and has appointed a member of the Engineering Department to focus on asset management for the KPP. Confirmation of the extension of this role to the Cogen was not confirmed. To ensure successful asset management practices with respect to the Cogen Facility, Tronox needs to establish positions with dedicated asset management skill sets and ensure they find a way to engage with the day-to-day maintenance and operating activities [redacted] without creating a silo mentality, where asset management considered something done "over there" with no real connection to the actual workings of the Tronox. It was the opinion of the audit team that if this silo culture was not addressed, then the asset management functions will be under-resourced and disconnected from the remainder of the organisation.

Documents/Evidence – 6,12,15,22,23,38,53,54.

Observations:

- Training register clearly monitored individual training records and refreshers.
- O&M Agreements stated training needs required for [redacted]
- [redacted] managed its resourcing requirements as per their O&M contracts and had access to staff globally for additional knowledge. Additionally, [redacted] had a strong relationship with GE regarding the Gas Turbines.
- Tronox did not provide staff to [redacted]
- Toolbox talks were presented and minuted by [redacted] to its staff.
  [redacted] training included e-learning and face to face training.
- It was noted that compliance requirements for EGL23 are responsibility of the Contracts Department. It was understood task was historically undertaken by the Engineering Department.
- Position descriptions were not reviewed of personnel responsible for compliance requirements of the generation licence.

Recommendation: Refer recommendation 03/2021 (Specifically *Undertake Training Needs Analysis)*	**Action:** • Nil

6. ASSET MAINTENANCE			OVERALL EFFECTIVENESS RATING	
□ Assess the adequacy of policies and procedures covering maintenance functions □ Confirm the policies and procedures have been followed during the review period by examining maintenance schedules, analysing costs, etc. □ Assess the significance of exceptions identified and whether adequate corrective action has been taken **Key Process** – *Asset maintenance is the upkeep of assets.* **Outcome** – *The asset maintenance plans cover the scheduling and resourcing of the maintenance tasks so work can be done on time and on cost.*			PROCESS & POLICY RATING* **B**	PERFORMANCE RATING **2**
No.	**2021 REVIEW REPORT EVIDENCE/ /VERIFICATION/FINDING/ACTION**			
6.1	**OBLIGATION: Maintenance policies and procedures are documented and linked to service levels required**	**Review Priority** **4**	**P&P* Rating:** **B**	**Performance Rating:** **1**
	Findings – Maintenance policies and procedures were well documented, Comprehensive weekly, monthly and annual reports were provided to Tronox. Confirmation that the policies and procedures were followed was verified during the interview with the Contractor through the assessment of MEX records for maintenance tasks against in the O&M Agreement maintenance requirements. KMK Outage reports documented and assessed the significance of anomalies identified and detailed proposed changes to maintenance or preventative monitoring programs. The historical plant performance and achievement of service levels supported the effectiveness of the Contractors maintenance strategy. Continual improvement of maintenance systems in order to optimise plant operations and application of proactive approach in identifying possible areas of risk with plant and equipment installed at the KMK Facility was noted in the AMP (Refer 2010 AMP section 10.3). However, risk management was not formally applied to the asset maintenance processes of the Contractor. Maintenance policies and procedures were driven by the service levels defined by Tronox and the requirements of the KPP. **Documents/Evidence** – 6,11,12,13,14,15,22,23,24,35,38,40,49,50,77,78,83,84,95 and MEX **Observations:** • O&M contractor utilised its experience and had strong working relationships with the GT OEM, General Electrics. The Contractor had the support of reputable OEM suppliers to ensure comprehensive maintenance procedures and practices were place. Also engaged with the Gas Turbine User Forum twice yearly. • Maintenance was continuous and aimed at keeping plant as reliable as possible (subject to normal fan cooler turbine generator lifecycle performance.) • [redacted] utilised MEX for services orders, cost tacking and Human Resource requirements. • It was noted the contractor had established good processes for control of maintenance documentation.			

	• Maintenance strategy was primarily based around fixed interval, time-based regimes derived from the manufacturers recommendations and [redacted] maintenance experience and Condition Based Maintenance (CBM). These were all recorded in MEX or monitored via the SCADA. • It was noted the AMP referred to one of the objectives of the maintenance being to continue to maintain the long-term integrity of the plant by controlling risk, identifying new risks and proposing cost-effective engineering solutions. No formalised risk identification process had been implemented other than the reliance on the MEX, OEM Manuals, limited maintenance procedures, tacit knowledge, skills, expertise and learned information from past events or shared industry knowledge. • [redacted]			
	Recommendation: • **Nil**		**Action:** • Nil	
6.2	**OBLIGATION: Regular inspections are undertaken of asset performance and condition**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – The Contractor has established maintenance inspections and procedures; these were well documented and undertaken within the time frames. These were all presented on an annual basis to Tronox as part of the O&M requirements and reported in annual Contract reviews. Asset performance was monitored with SCADA and reported upon in weekly and monthly reports. Asset condition was monitored, and any required improvement projects were captured in the AMP development process. **Documents/Evidence** – 6,11,12,13,14,15,22,23,24,35,38,40,49,50,77,78,83,84,95, site interviews and MEX **Observations:** • Regular on-site inspections and continuous condition and performance monitoring ensure performance. • Maintenance activities rescheduled to maximise generation capacity. • Maintenance schedules for inspections have been scheduled to 2024 • The Contractor applied preventive and predictive maintenance (proactive maintenance) and work to prevent breakdown, reduce wear, improve efficiency, and extend the life of asset component			
	Recommendation: • None		**Action:** • Nil	

6.3	**OBLIGATION: Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule**	**Review Priority** **4**	**P&P* Rating:** **B**	**Performance Rating:** **1**
	Findings – Maintenance was well documented and processes for the continuous review of maintenance practices were established. Maintenance activities were reported weekly, monthly to Tronox incorporating future maintenance activities and resources. Maintenance work orders generated by MEX were well monitored and overdue tasks followed through. [redacted] had one long-time planner for the Cogen Facility maintenance activities. **Documents/Evidence** 6,11,12,13,14,15,22,23,24,35,38,40,49,50,77,78,83,84,95, site interviews and MEX **Observations:** • Monthly meetings held between Tronox on-site of O&M contractor. • Detailed maintenance schedules developed annually and reviewed on an on-going basis. • MEX was utilised for maintenance planning • Resourcing for planning tasks by the Contractor required review to ensure succession planning and adequate resources available for the upcoming major outages.			
	Recommendation: • **None**		**Action:** • Nil	
6.4	**OBLIGATION: Failures are analysed, and operational/maintenance plans adjusted where necessary**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – Failures are recorded instantly and investigated by [redacted] and reported to Tronox. Corrective actions are investigated and taken promptly. Monthly Reports contained detailed history of failures and amendments to operational and maintenance plans. Contract review and outage reports also detail when assets rectified and any adjustments to operational or maintenance plans into the future. **Documents/Evidence** – 3 (Viewed on site) 6,7,9,10,11,12,13,14,15,20,21,22,23,24,33, 35,38,39,40,49,50,77,78,83,84,95, site interviews and MEX **Observations:** • [redacted] uses MEX to record failures and carry out root cause analysis. This was then analysed by [redacted] and findings reported to Tronox. • [redacted] also carries out Health, Safety, Environmental and Quality Audits annually. • Scheduled works aligned with Tronox KPP production requirements. • Tronox has access through VPN one-way tunnel (read only from the Engineering Department) to get operations report of the Cogen facility.			

	Recommendation: • None		**Action:** • Nil	
6.5	**OBLIGATION: Risk management is applied to prioritise maintenance tasks**	**Review Priority** **4**	**P&P* Rating:** **C**	**Performance Rating:** **3**

Findings – [redacted] has established a defensible and proven process for the prioritization of maintenance tasks and the Maintenance Plan was detailed in the annual AMP (i.e., 2021 AMP Appendix C 3). The maintenance objectives were to build on the preventative and routine maintenance programs outlined by the equipment manufacturers and outlined in the O & M contract framework. [redacted] As such, risk management processes for the prioritisation of maintenance tasks could be applied subjectively MEX either through a priority basis and/or timeline basis as per equipment manufacture guidelines or Contractors O&M experience and tacit knowledge.

However, the explicit application of risk management to prioritise maintenance tasks was not evidenced. The AMP also noted the Maintenance Strategy (i.e., 2021 AMP section 10.3) was to continue to maintain the long-term integrity of the plant by controlling risk, identifying new risks and proposing cost-effective engineering solutions. The use of risk assessment was not verified. Additionally, a recommendation to integrate a full risk-based assessment of items of plant into the asset management plan was made by the external Auditor in the 2016 KMK Cogen Asset Management Plan Review and this was not actioned by the Contractor during the review period.

Documents/Evidence – 3 (Viewed on site) 6,7,9,10,11,12,13,14,15,20,21,22,23,24,33, 35,38,39,40,49,50,77,78,83,84,95, site interviews and MEX

Observations:

- The MEX maintenance system used by [redacted] on site had the functionality to prioritise the maintenance tasks utilising priority tags of Level1: legislation/HSE; Level 2: Scheduled or Level 3: outage. It was understood that generally, the default setting was used
- A time priority function was used for each work order which was categorised as on-line, off-line or outage.
- Defect work orders were assessed by operations and maintenance utilising past history and experience.
- Unplanned outages were utilised to optimise maintenance tasks.
- [redacted] Report recommended at minimum, continuous vibration monitors should be installed on the reduction and accessory gearboxes.
- The planned outage periods, as recommended by the OEM, are normally based around 8000 running hours between inspections, this was extended to 24,000 hours with the successful installation of the Extender Hardware and the T-Fire upgrade projects that were completed in 2014.
- Risk management was applied and demonstrated at the operational, maintenance and management levels and was primarily based on the operational experience of the Contractor's operational history and long-serving O&M personnel with sound knowledge of plant performance and maintenance requirements.
- The 2021 AMP noted the use of Failure Mode and Effects Analysis (FMEA) for qualitative assessment in relation to GT Turbine critical spares. Historically, the Cogen Facility did not hold GT spares.

	• Risk management, contingency planning, asset disposal, IT security systems and backup were not fully incorporated in [redacted] AMP. [redacted] The Criticality Assessment (i.e., risk management) was excluded from the AMP from 2017-2021 and it was noted that risk assessments were currently under review utilising Tronox Assessment Tool. This did not eventuate within the review period. • It was noted the Cogen facility performed well, with generally higher than expected GT Annual Availability and Steam Annual Availability, throughout the audit and review period. The Contractor's AMS for the maintenance activities were well established and based on equipment manufacturers specifications and outlined in the O & M contract framework. Qualitative risk prioritisation was utilised for maintenance activities. The Contractor did have a risk register primarily for HSE risks and generic strategic risks such as loss of key personnel but risks specific to the maintenance of the Cogen facility were not formally assessed or maintained in a risk register. • It was observed that the 2016 KMK Cogen Asset Management Plan Review recommended improvements to the asset management plan which included the integration of a full risk-based assessment of items of plant into the asset management plan to support: the development of contingency plans for critical items of plant; confirm critical spares; add risk ratings to condition assessment registers of assets; drive frequency of inspection test plans and assist in the priority of assessment for improvement projects. Some of these tasks were noted to have been undertaken such as the contingency plan development and the risk (criticality) rating for condition assessments, however, they were based on the outcome of full risk-based assessment and recommended.			
	Recommendation: As per recommendation 02/2021 (Specifically - *Collaboratively undertake Risk Assessment)*.		**Action:** • Nil	
6.6	**OBLIGATION: Maintenance costs are measured and monitored**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – Maintenance costs were measured, recorded, monitored and reported on a monthly basis. **Documents/Evidence** –6,11,12,14,15,38,39,40,51,57,58,78,84 and MEX **Observations:** • O&M costs were incorporated in the O&M Contracts • Unscheduled O&M costs were monitored and reported in monthly and annual reports • Small workforce required for operational and maintenance purposes. • Most maintenance reporting by [redacted] was in performance terms rather than dollars. • Financials were reported and budgeted in financial reports and audited annually, O&M costs were incorporated in the O&M Contracts • Maintenance costs and budgets were recorded monthly for first 12 months with an additional year forecast. CAPEX strategies extended to three years. • All outages, planned and unplanned, were managed with the Computerised Maintenance Management System (CMMS), which retained a history of work orders, including spares used, man-hours expended, condition monitoring and appropriate close-out information.			

	Recommendation: • **None**	**Action:** • Nil

7. ASSET MANAGEMENT INFORMATION SYSTEM	OVERALL EFFECTIVENESS RATING	
	PROCESS & POLICY RATING*	PERFORMANCE RATING
□ Assess the adequacy of policies and procedures covering the general control and security of the computer systems used to provide management information on compliance with service standards / licence obligations □ Confirm management reports on service standards / licence obligations are reviewed and substantial exceptions to service standards / licence obligations are promptly followed up and implemented **Key Process** – *An asset management information system is a combination of processes, data and software supporting the asset management functions.* **Outcome** – *The asset management information system provides authorised, complete and accurate information for the day-to-day running of the asset management system. The focus of the review is the accuracy of performance information used by the licensee to monitor and report on service standards.*	**B**	**2**

No.	2021 REVIEW REPORT EVIDENCE/ /VERIFICATION/FINDING/ACTION			
7.1	**OBLIGATION: Adequate system documentation for users and IT operators**	**Review Priority** 4	**P&P* Rating:** C	**Performance Rating:** 3

Findings – The O&M Contractors advised the audit team that they had detailed and well understood IT systems in place. Documentation sighted included IT Policy, IT Acceptable Use Guidelines, IT Password Guideline and the Access Management Guidelines. Limited information was provided by Tronox (i.e., Information Technology Instructions Manual) in relation to IT Systems, however IT personnel were interviewed and confirmed the processes and documentation were adequate.

[redacted] At the time of the review, Tronox Management and IT Personnel were not aware of the Australian Energy Sector Cyber Security Framework (AESCSF) published on the AEMO website or the draft *Security Legislation Amendment (Critical Infrastructure) Act 2021* requirements for critical electricity assets (note the *Act* was assented to 2 December 2021).

It was the Auditor's opinion that both Tronox and [redacted] could benefit by implementing updated cybersecurity measures. Review the resources provided on the AEMO website to increase their accountability, including cybersecurity risk management practices such as asset management (inclusive of annual reviews of risk-based assessments), training, perimeter and physical security, and incident response and recovery.

Documents/Evidence – 6,12,31

Observations:

- O&M staff were conversant with systems in place and refresher training and e-learning was scheduled in a timely manner.
- SCADA was automated
- Reporting detailing system data and performance was well prepared, brief with adequate information.
- IT documents were easily accessible on the intranet site for [redacted]
- Tronox presented a "Security Incident Management Plan" which was viewed on site.
- Tronox IT department did not wish to provide documentation for security reasons but confirmed suitability and processes.
- During the site visit for the audit and review confirmation was not verified of the [redacted] IT Security exceptions register [redacted]
- [redacted]
- [redacted]
- It was noted Tronox Holdings 2020 Sustainability Report referred to "Project newTRON" which was a multi-year digital transformation program aimed at improving efficiency, safety, reliability, IT capabilities and cybersecurity across all of Tronox Holdings operations. Verification of awareness to this program was not determined at the site level.
- It was noted that currently Tronox was considered a critical electricity asset under the *Security Legislation Amendment (Critical Infrastructure) Act 2021* as Asset Definition Rules "include electricity generators (including batteries and other storage) that have a nameplate generation capacity greater than or equal to 30 megawatts and connected to a wholesale electricity market."
- Tronox Management was noted to be the responsible entity (as per section 5 of the *Security Legislation Amendment (Critical Infrastructure) Act 2021*) as they are the body licensed to operate the critical infrastructure asset.
- It was understood that following the site audit and review visit the licensee has participated in a consultation process facilitated by the Department of Home Affairs as to the legislative requirements and were seeking the potential exemption of Tronox as a critical electricity asset.

Recommendation:

04/2021 – To ensure Tronox has established adequate system documentation for users and IT operators' consideration of the following is recommended:

- Review the Australian Energy Sector Cyber Security Framework (AESCSF) and assessment of Tronox and [redacted] systems for suitability. (For specific detail refer to AEMO | AESCSF framework and resources).
- Consider legislative requirements and Asset Management Information System requirements in the AMP, risk assessment and Tronox control procedures and policies.
- [redacted]
- Review the *Security Legislation Amendment (Critical Infrastructure) Act 2021* for gaps to compliance and use requirements as a benchmark for IT management practices.

Action:

- Review Post Review Implementation Plan

	• Assessment of [redacted] IT security process as required by the O&M Agreement and with consideration legislative and 2019 Audit and Review Guidelines – Electricity and Gas Licences requirements is recommended. • Subject to the determination of a potential exemption ensure critical infrastructure compliance and reporting requirements are adhered to.			
7.2	**OBLIGATION: Input controls include suitable verification and validation of data entered into the system**	**Review Priority** **4**	**P&P* Rating:** **B**	**Performance Rating:** **2**
	Findings – In relation to the KMK Cogeneration Facility data entry, acquisition and system reporting by [redacted] was generally automated. [redacted] generated reports from the data to include in AMP and other reporting documents to Tronox. **Documents/Evidence** 6,12,14,15,31,40, 100 and MEX **Observations:** • Reporting based on outputs from SCADA systems • O&M statistical reports automated and produced by MEX. • The protection relays provided electrical protection functions, local control intelligence, monitoring abilities and communications to the SCADA System. • Verification and validation of data done by [redacted] Tronox reviewed outcome in reports provided by the Contractor. • The Contractor advised Tronox requirements for any adjustment/changes which were considered by Tronox (primarily from a budget related perspective) and adjusted by [redacted] as it was a contractual requirement for [redacted] to generate the AMP document and supply the AMP to Tronox • It was understood most considerations from Tronox were budget related for Projects in relation to the 5 year plan • [redacted] have been contracted under an O&M agreement to undertake the data management related activities of the AMS. Tronox input was focussed on cost impact of changes and the technical impact was not generally considered it was reliant on the expertise of [redacted] as the operators of the plant.			
	Recommendation: • **None**		**Action:** • Nil	
7.3	**OBLIGATION: Security access controls appear adequate, such as passwords**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**

	Findings – Security controls appeared adequate for both [redacted] and Tronox and were confirmed by both Parties representatives. **Documents/Evidence** – 6,12,31,96 and Site Interview **Observations:** • Firewall and password protections were in place • Demonstrated effective resilience analysis (i.e., phishing tests) • Tronox only provided read only access to the operations of the plant via VPN. • Tronox had a two-point authentication process for IT users. • Cogen Facility could be islanded from IT interface.			
	Recommendation: • None		**Action:** • Nil	
7.4	**OBLIGATION: Physical security access controls appear adequate**	**Review Priority** **4**	**P&P* Rating:** **B**	**Performance Rating:** **1**
	Findings – Access was restricted and locked when unattended. Security gate and induction processes established. Limitation of access to site dependent on COVID vaccine status was required by [redacted] but not Tronox. Inconsistency in policy for access to site was noted as currently being reviewed by Tronox. **Documents/Evidence** – 6,12,38 and Site visit **Observations:** • Entry to site was gate controlled. • Contractors were routinely present • Comprehensive induction training on site entry. • The MEX server was locked in a separate office and the SCADA server was in a secured switch room. • Auditors requested to provide evidence of COVID vaccine was requested by site personnel for [redacted] but not the Tronox security (currently being reviewed)			

	Recommendation: • **None**		**Action:** • Nil	
7.5	**OBLIGATION: Data backup procedures appear adequate, and backups are tested**	**Review Priority** **4**	**P&P* Rating:** **C**	**Performance Rating:** **3**
	Findings – [redacted] **Documents/Evidence** [redacted] **Observations:** • [redacted]			
	Recommendation: **05/2021** – [redacted]		**Action:** • Nil	
7.6	**OBLIGATION: Computations for licensee performance reporting are accurate**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – Computations for licensee performance reporting were proven. No AMS deficiencies in relation to computations for performance reporting were recorded during the review period. **Documents/Evidence** 6,12,38,58,40 and site interviews **Observations:** • O&M contractor provides licensee with performance reporting as per O&M contract.			

	• O&M Contractor held the Environmental License for the site • O&M undertook HSE audits annually and as part of their accreditation. • SCADA monthly reports from [redacted] were discussed at monthly meetings. • KMK Annual availability spreadsheet, KPI Scorecard and performance reporting criteria collated by [redacted] daily and utilised for weekly, monthly accounts and annual reports.			
	Recommendation: • **None**			**Action:** • Nil
7.7	**OBLIGATION: Management reports appear adequate for the licensee to monitor licence obligations**	**Review Priority** **4**	**P&P* Rating:** **C**	**Performance Rating:** **2**
	Findings – The Contractor had established adequate reporting with monthly contractor and ELT reports for management. Exception reports were alarmed and investigated via SCADA and given priority by the O&M contractor. Additionally, the Contractor prepared reports detailing the asset management activities in accordance with O&M Agreement. However, Tronox did not prepare any specific management reports that detailed or monitored the compliance with the generation licence requirements. Compliance and monitoring processes (i.e., internal audit) were not established in relation to the generation licence obligations. **Documents/Evidence** – 6,12,38,58,40 and site interviews **Observations:** • Mainly based on SCADA. • Reports are primarily performance focussed. • Monthly reports to ELT and quarterly to Board did not contain reference to monitoring of generation licence requirements. • In additions company reports include annually audited statements to Board by external auditors • Tronox has implemented newly ESG Sustainability reporting across its sites.			
	Recommendation: As per recommendation 03/2021 (Specifically *Leadership and accountability and Develop Compliance Processes)*			**Action:** • Refer Post Review Implementation Plan

7.8	**OBLIGATION: Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organisation**	**Review Priority** **4**	**P&P* Rating:** **C**	**Performance Rating:** **3**
	Findings – [redacted] Site Manager and Tronox IT personnel interviewed confirmed that their systems had a high level of security measures to protect asset management data from external threats. [redacted] **Documents/Evidence** – 6,12,38,58,40 and site interviews **Observations:** • Firewalls were in place to prevent external access to computers • Cogen Facility can also be islanded. • Test and trial phishing emails were undertaken. • [redacted] • [redacted] • It was noted that the [redacted] and the external review of the KMK Cogen Asset Management Plan Review did not include IT requirements in their scope.			
	Recommendation: **06/2021 –** [redacted]		**Action:** • Nil	

8. RISK MANAGEMENT □ Assess whether the risks that most affect the management and performance of the assets have been identified □ Assess the adequacy of policies and procedures covering risk management □ Assess whether the risk management policies and procedures have been applied in practice □ Assess the adequacy of staff understanding and training on risk management **Key Process** – *Risk management involves the identification of risks and their management within an acceptable level of risk.* **Outcome** – *The risk management framework effectively manages the risk that the licensee does not maintain effective service standards*			OVERALL EFFECTIVENESS RATING	
			PROCESS & POLICY RATING*	PERFORMANCE RATING
			B	**3**
No.	**2021 REVIEW REPORT EVIDENCE/ /VERIFICATION/FINDING/ACTION**			
8.1	**OBLIGATION: Risk management policies and procedures exist and are applied to minimise internal and external risks**	**Review Priority** **4**	**P&P* Rating:** **B**	**Performance Rating:** **3**
	Findings – Risk management policies and procedures were established by the Licensee and Contractor. Risk management systems were established by both parties. The Risk Registers looked at the incidents from different perspectives and they both had different risk appetites (i.e., different risk matrices and as such differing prescribed likelihood and consequences). Neither risk register was comprehensive in identifying all the Cogen Facility risks nor were they intrinsic to the risk management of the Cogen Facility risks. **Documents/Evidence** – 6,12,14,20,22,77,24,25,27,28,35,38,83 and Site Interviews **Observations:** • Potentially the suggested leadership and accountability role could facilitate this process • Risk management processes were established but not clearly applied by all parties. Licensee focussed on risks associated with potential incidents which was recorded in "InControl" Cogen Incidents. O&M Contractor focussed on HSE risks in a risk register (viewed on site) and operational risks were managed manually via the KMK outage reports, FMEA process, and AMP improvement projects. • Operational risks were captured by O&M Contractor in maintenance schedules, monthly reports, AMPs and reported to Tronox. Operational risks were also captured in Preventative Maintenance Schedules. Parties then discussed mitigation measures and subsequently implemented measures as deemed appropriate. • Tronox did not critically review the [redacted] risk register. • Tronox did not critically review the site risk register for adequacy in the mitigation of risk or its effectiveness in the management of the risk within an acceptable level. This was evident by a number of generic site risks having notations to mitigate and no tangible link to the implementation of the corrective action plan. • Staff training for both [redacted] and Tronox to ensure understanding and training on risk management was not evidenced			

	• [redacted] Risk report undertaken 12/4/21 provided reference to risk mitigation strategies and the subsequent development of project improvements or corrective actions as not formally applied by either party.			
	Recommendation: As per recommendation 02/2021 (Specifically - *Collaboratively undertake Risk Assessment).*		**Action:** • Refer Post Review Implementation Plan	
8.2	**OBLIGATION: Risks are documented in a risk register and treatment plans are implemented and monitored**	**Review Priority** **4**	**P&P* Rating:** **B**	**Performance Rating:** **3**
	Findings – The organisations risks were documented in a Risk Register, which focussed primarily on HSEQ risks. It was maintained by Tronox, and examples of treatment plans were detailed on site during interviews. There were some economic impact risks identified that were site wide and applied to the Cogen Facility (see observations below), however, these were not comprehensive did not reflect operational incidents and KMK Outage reports by [redacted] and the intrinsic use of a risk register to document Cogen Facility risks was not evident and the formalised consideration and development of treatment plans was not well demonstrated. The monitoring and assessment of the effectiveness of the risk treatment plans was not demonstrated. It was noted that Licensee and O&M Contractor effectively used their respective risk systems to identify and mitigate risks. The link between the risk identified and the actions/treatment plans taken (or the decision process to consider whether an action plan was required) to mitigate them was not clear. For example, Cogen Trip and loss of steam to the dry header trip was reported on 10/8/2020. No link to action plan however development of the contingency plan was undertaken shortly after. Consideration of the InControl Cogen Incident in the development of the Contingency Plan was not known. Operational and maintenance risks were not clearly documented in the risk register provided. The risks were well known by the Contactor and managed as reflected by Cogen Facility Performance. However, the use of risk assessment as an intrinsic management tool was not undertaken. Risk assessment was not referenced in the Contractors AMP. The levels of effort, formality and documentation of the risk assessment was not commensurate with the level of risk, for example 965- IT Systems Failure was rated as medium and does not consider the AESCSF program for cyber security. IT staff were not aware of the program or pending changes to legislation i.e. Security Legislation Amendment (Critical Infrastructure Bill 2020). **Documents/Evidence** – 6,11,12,15,16,24,25,27,28,40,83,84 and Site Interviews. O&M Contractor Risk Register viewed on site. **Observations:** • Gas Turbines backed by reputable global manufacturers with extensive experience. • Operational Risks are reported monthly and corrective actions implemented by [redacted] refer KMK Outage Reports and monthly reports • [redacted]k Report made several recommendation not clear which recommendations have been acted upon. • No significant safety incidents were experienced in relation to the Cogeneration facility. • [redacted] focussed on HSE risks and implementation from their internal audits			

	• The Tronox Risk register was provided in a PDF format and was 37 pages in length. It focussed primarily on safety and environmental risks and the link to processes used for implementation of corrective actions was not clear, Application of the risks identified in the register was not evident • [redacted] documented O&M risk's manually (on paper not in database) and concentrated on HSEQ, operational asset failures and CAPEX and OPEX upgrade i.e., KMK Outage reports, for example Forced Outage Report – N1801 HRSG Trip 7/6/2018. Corrective actions required the operational knowledge of employees, operational process procedure change and the recommended engineering change was implemented as evidenced in the KMK DCS Engineering Change Management register, line item 42018. Implemented in annual outage in Nov 2018 • Limited ability to trend information and collate similar incident to review the effectiveness of the corrective actions. • Economic risks documented in the risk register provided included. o 950 - Critical spare availability – Controls: Critical Spare Identification & proactive management; spare transformer; -mitigate- not clear what link to treatment plan. Date of risk added was not recorded [H] o 959 - Supply interruption from a single source supplier- Controls; Ongoing single source supplier management plans including identification of alternate supplier or workarounds -mitigate- not clear what link to treatment plan. Date of risk added was not recorded [VH] o 960 - Loss of key personnel - Controls; Succession planning; Job Descriptions; Change Management Policy – accept – Global HR Policy development and implementation [H] o 961 - Production below forecast requirements – Controls; Operational Excellence to improve uptime; improved maintenance to reduce downtime; refer to monthly OE meeting an APAC – accept – [H]-risk considered not relevant to current environment changed from mitigate to accept in 2020 o 965 - IT Systems Failure – Controls; not listed- mitigate – Reference to IT Improvement plan [M] – risk reduction not clear and risk appears low? o 994 – Emissions Intensive Trade Exposed Activity – Controls; Apply for exemption certificate- accept – [M] o InContol used to record production incidents noted there were no incidents records for 2018. Note trip reported by [redacted] on 7/6/2018. Not clear if contingency communicated to [redacted] or managed in a procedural change. Outcome not well documented.			
	Recommendation: As per recommendation 02/2021 (Specifically - *Collaboratively undertake Risk Assessment)*.		**Action:** • Refer Post Review Implementation Plan	
8.3	**OBLIGATION: Probability and consequences of asset failure are regularly assessed**	**Review Priority** **4**	**P&P* Rating:** **B**	**Performance Rating:** **2**
	Findings – Licensee and O&M Contractor have established annual internal audits, development of AMP and regular O&M reports to document and assess asset failures. Potential asset failures modes were identified in maintenance schedules annually (included in the AMP) and corrective action taken as agreed by both parties. MEX has the ability to apply priority rating to maintenance tasks, but this was not routinely used. Operational knowledge, experience and plant familiarity primarily lead the direction of any asset failure assessment and improvement program incorporated in the Contactors AMP. Risk registers were reviewed annually by Tronox but were not intrinsically part of the asset failure prevention process. **Documents/Evidence** – 6,11,12,15,16,24,25,27,28,35,38,40,49,50,83,84 and Site Interviews.			

	Observations: • Risk registers were reviewed annually by Tronox but were not intrinsically part of the asset failure prevention process. • HSEQ risks were updated as incidents occurred and/or potential risks were identified. • Critical spares were identified on the risk register provided (ref 950) and well sourced and accessible. • COVID 19 did not interrupt the supply chain of spares during the audit period. • [redacted]atment plans were provided in the KMK outage reports. OPEX/CAPEX projects were identified and budgeted for through the Monthly and annual contract reports. • Internal audits were also scheduled and evidenced, for example annual HSE audits by O&M Contractor • Tronox conducted an independent external Risk Review on the Cogen Facility. This was primarily linked to KPP production loss due to loss of steam generated by Cogen facility. Tronox currently following up with the recommendations made by [redacted]	
	Recommendation: • **None**	**Action:** • Nil

9. CONTINGENCY PLANNING	OVERALL EFFECTIVENESS RATING	
Determine whether contingency plans have been developed and are current Determine whether contingency plans have been tested. If so, review the results to confirm any improvements identified have been implemented. **Key Process** – *Contingency plans document the steps to deal with the unexpected failure of an asset.* **Outcome** – *Contingency plans have been developed and tested to minimise any major disruptions to service standards.*	**PROCESS & POLICY RATING***	**PERFORMANCE RATING**
	C	**2**

No.	2021 REVIEW REPORT EVIDENCE/ /VERIFICATION/FINDING/ACTION			
9.1	**OBLIGATION: Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks**	**Review Priority** **4**	**P&P* Rating:** **C**	**Performance Rating:** **2**
	Findings – Contingency Plans were developed by Tronox in August 2020 for emergencies and reinstatement of plant. Prior to this period there were no documented Contingency Plans. The development of the Contingency Plans was not formally linked to a risk assessment process. There was no evidence provided to verify the testing of contingency plans (refer TP-RISK-017). Long term contingency plans were not considered. Risk to the KPP has been partly mitigated by the installation of an Emergency Diesel Generator (EDG). [redacted] undertook monthly testing of the backup diesel generator, but these contingency plans were not referenced specifically in the AMP. Noted that critical spares were referenced in AMP in the Appendices C4-C6 but not included in the AMP 2020-2021. An inspection report generated from MEX referenced the testing schedule for the EDG. **Documents/Evidence** – 6,12,10,11,13,14,15,16,17,18,19,20,21,22,23,24,25,26,31,38,44,77,84,96,97 and site interviews **Observations:** • Contingency plans were documented and understood for <4hrs, <10 days, >10 days contingency events • The [redacted] report recommended that the Tronox Contingency Plan be improved to consider impacts to the business in the event of a long-term superheated steam outage. • Critical parts well identified, accessible and monitored, and included a criticality assessment. • Business Continuity and Operational contingency plans were reviewed and in case of Tronox it was by an external party. • [redacted]d an on-site a emergency diesel generator that was tested regularly as a backup for steam generation for the KPP. • The Emergency Diesel Generator is provided onsite for an emergency supply of electricity in the event of a total power outage. The EDG is utilised to supply electricity to the control room to allow for a restart of the Gas Turbine Generator. • The [redacted] referred to the monthly testing of emergency the diesel generator in their AMP (refer AMP 2021 Appendix 3)			

	• The process for the communication of the Contingency Plan to [redacted] was not confirmed. • Tronox has in place a Site specific "Special Risk Plan" in conjunction with FESA. • Formalised ranking of risks to identify the requirement for the development of contingency plans was not evident.	
	Recommendation: As per recommendation 02/2021 (Specifically - *Collaboratively undertake Risk Assessment and Further Develop and Document Contingency Plans).*	**Action:** • Refer Post Review Implementation Plan

10. FINANCIAL PLANNING	OVERALL EFFECTIVENESS RATING	
	PROCESS & POLICY RATING*	PERFORMANCE RATING
□ Obtain a copy of the financial planning, budgeting and reporting process and assess its effectiveness □ Obtain a copy of the current financial plan (including budget/actual) and assess whether the process is followed **Key Process** – *Financial brings together the financial elements of the service delivery to ensure its financial viability over the long term.* **Outcome** – *The financial plan is reliable and provides for the long-term financial viability of the services.*	**A**	**1**

No.	2021 REVIEW REPORT EVIDENCE/ /VERIFICATION/FINDING/ACTION			
10.1	**OBLIGATION: The financial plan states the financial objectives and identifies strategies and actions to achieve those**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**

Findings – Licensee had established mature financial planning, budgeting and reporting processes. CAPEX and OPEX budgets for the Cogen facility were reviewed.

Documents/Evidence – 6,12,38,9,10,39,40,51,57,58,76,78 and Site Interviews

Observations:

- Confidential information but performance to date has proved satisfactory.
- Financial plans were prepared each year and set budgets for future cash flow.
- Tronox on an annual basis develops an overall Kwinana Business Plan with the Cogen facility part of that financial plan.
- Annually Financial data provided with annual CAPEX and OPEX budgets.
- Financial reports prepared by [redacted] are primarily operational focused with Tronox preparing monthly financial reports for ELT and a quarterly basis for the Board. The Cogen facility was presented as an overall cost center with breakdown of fuel and income.

Recommendation:	Action:
• **None**	• Nil

10.2	**OBLIGATION: The financial plan identifies the source of funds for capital expenditure and recurrent costs**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – The O&M Contractor on an annual basis provided to Tronox annual OPEX with strategic CAPEX for additional three years. Tronox prepared the financial expenditure request to Board for approval. The Cogen facility was fully funded by Tronox Holdings. **Documents/Evidence** – 6,12,38,9,10,39,40,51,57,58,76,78 and Site Interviews **Observations:** • Financial plans and financial audited reports detail funding sources. • Funding was determined and approved by the Parent Company. • As of the date of audit CAPEX was approved for to 2026.			
	Recommendation: • None		**Action:** • Nil	
10.3	**OBLIGATION: The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – The financial plan provided for the OPEAX and CAPEX to 2026. P&L and Balance reported annually and audited by independent third party. Financial details included revenue, OPEX, CAPEX and EBITA. **Documents/Evidence** – – 6,12,14,38,39,40,51,57,58,76,78 and Site Interviews **Observations:** • Confirmed by Licensee that the financial plan budgeted annually on rolling 5-year basis. • Annual Financial Reports audited and prepared by independent third party. • Audited reports were issued on unqualified basis.			

	Recommendation: • None		**Action:** • Nil	
10.4	**OBLIGATION: The financial plan provides firm predictions on income for the next five years and reasonable predictions beyond this period**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – P&L and Balance reported annually and budget forecast. Detailed Financial projections were undertaken by the licensee to 2026 on a rolling 5-year basis. **Documents/Evidence** – 6,12,14,38,39,40,51,57,58,76,78 and Site Interviews **Observations:** • Financial plan clearly outlined the Revenue, OPEX and CAPEX			
	Recommendation: • None		**Action:** • Nil	
10.5	**OBLIGATION: The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – Financial planning has been undertaken by the licensee, including all costs associated with operating and maintaining the assets to 2026. **Documents/Evidence** – 6,12,14,15,38,39,40,51,57,58,76,78 and Site Interviews **Observations:** • Comprehensive financial monitoring and reporting • O&M contract clearly defined the cost responsibilities of the O&M contractor and those of Tronox. • Tronox was responsible for meeting CAPEX and spares requirements. Subsequently Tronox made allowance for certain CAPEX expenditure. Any large CAPEX was justified on a case-by-case basis to the Board for approval.			
	Recommendation: • **None**		**Action:** • Nil	

10.6	**OBLIGATION: Large variances in actual/budget income and expenses are identified and corrective action taken where necessary**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – Financials identified variances and comparisons with previous year of budgets. **Documents/Evidence** –6,12,14,15,38,39,40,51,57,58,76,78 and Site Interviews **Observations:** • Monthly and annual reviews of the budget were carried out between Tronox and [redacted] and corrective actions implemented. Evidenced from ongoing previous OPEX and CAPEX projects.			
	Recommendation: • None		**Action:** • Nil	

11. CAPITAL EXPENDITURE PLANNING	OVERALL EFFECTIVENESS RATING	
□ Understand the capital expenditure planning process and assess its effectiveness □ Obtain a copy of the capital expenditure plan for the current year and assess whether the process is being followed **Key Process** – *The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure for these works over the next five or more years. Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10 years, preferably longer. Projections over the next five years would usually be based on firm estimates.* **Outcome** – *The capital expenditure plan provides reliable forward estimates of capital expenditure and asset disposal income. Reasons for the decisions and for the evaluation of alternatives and options are documented.*	**PROCESS & POLICY RATING***	**PERFORMANCE RATING**
	A	**1**

No.	2021 REVIEW REPORT EVIDENCE/ /VERIFICATION/FINDING/ACTION			
11.1	**OBLIGATION: There is a capital expenditure plan covering works to be undertaken, actions proposed, responsibilities and dates**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – During the review period the O&M Contractor and the Licensee identified CAPEX projects to 2026. **Documents/Evidence** – 6,11,12,14,15,38,39,40,51,57,58,78 and Site Interviews **Observations:** • Financial projections were carried out to 2026. • Tronox projected CAPEX on an annual basis as part of its budget process • For CY22 Tronox identified major CAPEX expenditure associated with a 28-day outage.			
	Recommendation: • **None**		**Action:** • Nil	
11.2	**OBLIGATION: The capital expenditure plan provides reasons for capital expenditure and timing of expenditure**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**

	Findings – The Financial Plan focussed on the OPEX and CAPEX. CAPEX projects for previous 4 years were completed with forecast CAPEX projects planning underway. **Documents/Evidence** – 6,11,12,14,15,38,39,40,45,49,50,51,57,58,78 and Site Interviews **Observations:** • O&M contractor proposed capital expenditure to ensure performance of the Cogen facility. • All CAPEX was the responsibility of Tronox. CAPEX projects were proposed as a business case to ELT which was put to the Board for approval.			
	Recommendation: • **None**		**Action:** • Nil	
11.3	**OBLIGATION: The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**
	Findings – All CAPEX and OPEX was in line with the assets financial plan to 2026 and with the Contractors AMP. **Documents/Evidence** – 6,11,12,14,15,24,38,39,40,51,57,58,76,78,84 and Site Interviews **Observations:** • O&M Contractor reviewed AMPs annually and provided a three-year strategic CAPEX Improvement projects listing for consideration by Tronox. • CAPEX financial budgets were justified by Tronox ELT to Board for approval.			
	Recommendation: • **None**		**Action:** • Nil	
11.4	**OBLIGATION: There is an adequate process to ensure the capital expenditure plan is regularly updated and implemented**	**Review Priority** **4**	**P&P* Rating:** **A**	**Performance Rating:** **1**

	Findings – Tronox's capital expenditure processes were very detailed and very comprehensive. Linked in with the capital expenditure process included project management guidelines. **Documents/Evidence** 6,11,12,14,15,24,38,39,40,51,57,58,76,78,84 and Site Interviews **Observations:** • The Licensee demonstrated CAPEX expenditure to 2026 with significant expenditure in CY22. (Commercial in Confidence)	
	Recommendation: • **None**	**Action:** • Nil

12. REVIEW OF AMS			OVERALL EFFECTIVENESS RATING	
□ Determine when the asset management plan was last updated and assess whether any substantial changes have occurred □ Determine whether any independent reviews have been performed. If so, review the results and action taken □ Consider the need to update the asset management plan based on the results of this review □ Determine when the asset management system was last reviewed. **Key Process** – *The asset management system is regularly reviewed and updated.* **Outcome** – *The asset management system is regularly reviewed and updated.*			PROCESS & POLICY RATING* **C**	PERFORMANCE RATING **3**
No.	**2021 REVIEW REPORT EVIDENCE/ /VERIFICATION/FINDING/ACTION**			
12.1	**OBLIGATION: A review process is in place to ensure the asset management plan and the asset management system described in it remain current**	**Review Priority** **4**	**P&P* Rating:** **C**	**Performance Rating:** **3**
	Findings The contractor reviewed their AMS and AMP annually. This review was carried out by the O&M Contractor as part of the O&M Agreement. There was no critical review process of the AMP undertaken by Tronox other than acknowledgement the provision was as required by the O&M Agreement. **Documents/Evidence** – 6,12,16,38,40. **Observations:** • O&M Contractor reviewed its AMP annually and submitted to Licensee for approval as per the O&M Agreement. • The licensee confirmed the review process was not technical and was meeting the contract requirements only • Generally, the AMP review was completed on time and was monitored through monthly meetings • The O&M Contractor was required to review the AMP annually.			
	Recommendation: Refer recommendation 02/2021 (Specifically *Management Review*)		**Action:** • Refer Post Review Implementation Plan	

12.2	**OBLIGATION: Independent reviews (e.g., internal audit) are performed of the asset management system**	**Review Priority** **4**	**P&P* Rating:** **C**	**Performance Rating:** **3**
	Findings – During the review period there were no independent reviews performed of the AMS. Limited internal audits on operational aspects of the Cogen Facility have been carried out by the Licensee. However, although the AMS was not independently reviewed, it was noted some reviews were undertaken on aspects of the AMS and were specific in scope, for example potential loss of steam to KPP. **Documents/Evidence** – 6,12,24,38,40 **Observations:** • The Licensee has not carried out critical reviews of the AMP on an annual basis. Reviews were high level and primarily considered whether the AMP was submitted annually not critically assessment of the AMP itself. • The Contractor carried out annual review of the AMP. • Outside the scope of the review period, the Licensee commissioned a Third-Party review of [redacted] AMP and AMS of the O&M Contractor (13 January 2016) .			
	Recommendation: Refer recommendation 02/2021 (Specifically *Management Review)*		**Action:** • Refer Post Review Implementation Plan	

APPENDIX 3 – AUDIT & REVIEW DOCUMENT LISTING

Documents Reviewed

TABLE 20 Documents Reviewed and Assessment of Effectiveness

NUMBER	DOCUMENT ASSESSMENT Current, Reviewed, implementation verified Requires some review, implementation not fully verified Requires review, document obsolete or not implemented	ASSET PLANNING	ASSET CREATION & AQUISITION	ASSET DISPOSAL	ENVIRONENTAL ANALYSIS	ASSET OPERATIONS	ASSET MAINTENANCE	A M INFORMATION SYSTEM	RISK MANAGEMENT	CONTINGENCY PLLANNING	FINANCIAL PLANNING	CAPITAL EXPENDITURE PLANNING	REVIEW OF AMS	PERFORMANCE AUDIT
1	Licensee Asset Management Policy													
2	Contractor Asset Management Policy													
3	Licensee Asset Management System													
4	Contractor Asset Management System													
5	Licensee Asset Management Plan													
6	Contractor Asset Management Plan													
7	Operational Schematic													
8	Schematic of the Contracts supporting Licensee													
9	Licensee Organisational Structure													
10	Contractor Organisational Structure													
11	Contractor Annual Maintenance Schedule													
12	Licensee Annual Maintenance Schedule													
13	Description of Licensee Maintenance System													
14	Description of Contractor Maintenance System													
15	Electricity Generation License													
16	Licensee Emergency Response Plan													
17	Contractor Emergency Response Plan													
18	Licensee Environment Compliance Plan													
19	Contractor Environment Compliance Plan													
20	Licensee Health and Safety Plan													
21	Contractor Health and Safety Plan													
22	Licensee Workplace Health & Safety System													
23	Contractor Workplace Health & Safety System													
24	Licensee Site Risk Register													
25	Contractor Site Risk Register													
26	MOU with FESA etc													
27	Licensee Risk Management Procedure													
28	Contractor Risk Management Procedure													
29	Licensee Computer & Information Management Plan													
30	Licensee Cyber Security													
31	Contractor Cyber Security													

DOCUMENT ASSESSMENT	
	Current, Reviewed, implementation verified
	Requires some review, implementation not fully verified
	Requires review, document obsolete or not implemented

NUMBER		ASSET PLANNING	ASSET CREATION & AQUISITION	ASSET DISPOSAL	ENVIRONENTAL ANALYSIS	ASSET OPERATIONS	ASSET MAINTENANCE	A M INFORMATION SYSTEM	RISK MANAGEMENT	CONTINGENCY PLLANNING	FINANCIAL PLANNING	CAPITAL EXPENDITURE PLANNING	REVIEW OF AMS	PERFORMANCE AUDIT
32	Licensee Standard Operating Procedure Listing													
33	Contractor Standard Operating Procedure Listing													
34	Asset Management Agreement with Contractor – Applicable to Audit Period													
35	Licensee Outage Management Procedure													
36	PPA													
37	Overview of internal/external reporting processes													
38	O&M Agreement													
39	Licensee Management Reports – Applicable to Audit Period													
40	Asset Management Agreement Operational Reports – Applicable to Audit Period													
41	Western Power Operating Protocol													
42	Licensee Monthly/Weekly/Daily Meeting Minutes													
43	Contractor Monthly/Weekly/Daily Meeting Minutes													
44	Licensee Business Continuity Plan													
45	Licensee Procurement procedure													
46	ETAC (Western Power)													
47	Licensee – Asset Register (Including Financial/Physical Asset) Note: may be separate processes													
48	Leases													
49	Plant Modification Process													
50	Change Management													
51	Licensee Budget – Applicable to Audit Period													
52	Practical Completion Documentation (if applicable)													
53	Training Register													
54	Competency & Awareness Processes													
55	Compliance Schedule/Register													
57	OPEX&CAPEX Process													
58	Company Reports													
67	Financial Statements (Audited) – Applicable to Audit Period													
68	Board Reports													
69	ERA Correspondence – Applicable to Audit Period													
70	ERA Compliance Reporting													

NUMBER	DOCUMENT ASSESSMENT Current, Reviewed, implementation verified Requires some review, implementation not fully verified Requires review, document obsolete or not implemented	ASSET PLANNING	ASSET CREATION & AQUISITION	ASSET DISPOSAL	ENVIRONENTAL ANALYSIS	ASSET OPERATIONS	ASSET MAINTENANCE	A M INFORMATION SYSTEM	RISK MANAGEMENT	CONTINGENCY PLLANNING	FINANCIAL PLANNING	CAPITAL EXPENDITURE PLANNING	REVIEW OF AMS	PERFORMANCE AUDIT
71	ERA Generation Annual License Payment – Applicable to Audit Period													
72	ERA Compliance Report – Applicable to Audit Period													
73	ERA Standing Charges License Invoices & Payments – Applicable to Audit Period													
74	ERA Letter - Commencement of EGL23 performance audit and asset management system review													
75	ERA Letter - Approval of auditor – EGL23 performance audit and asset management system review													
76	Licensee Business Plan													
77	Licensee Policy manual													
78	Delegation of Authority													
79	Stakeholder Communication Processes/Policy													
80	Lifecycle Costing – If not included in the asset management plan													
81	Budget Approval Processes													
82	Condition Monitoring Processes													
83	Preventative Maintenance													
84	Critical Spares													
93	Other Regulatory Licenses													
94	Other Regulatory Reports													
95	Maintenance Checklists													
96	Data Backup Procedures													
97	Licensee Operational Contingency Plans													
98	Contractor Operational Contingency Plans													
99	Dispute Resolution Processes													
100	Cogen Costs													