



IXOM

Department of Planning and Environment

2018 Annual Report

Prepared by: Joe Nguyen

Date: January 2019


Revision: 1.0

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1 Title Block

Table 1: Annual Review title block

Name of operation	Ixom Botany ChlorAlkali Plant
Name of operator	Ixom Operations Pty Ltd
Development consent / project approval #	DA35/98
Name of holder of development consent / project approval	Ixom Operations Pty Ltd
Annual Review Start Date	1 December 2017
Annual Review End Date	30 November 2018
<p>I, Ian Parker certify that this audit report is a true and accurate record of the compliance status of Ixom Botany ChlorAlkali Plant for the period 1 December 2017 – 30 November 2018 and that I am authorised to make this statement on behalf of Ixom Operations Pty Ltd.</p> <p><i>Note.</i></p> <p>a) <i>The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</i></p> <p>b) <i>The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).</i></p>	
Name of Authorising reporting officer	Ian Parker
Title of Authorised Reporting Officer	Botany CAP Operations Lead
Signature of Authorised Reporting Officer	
Date	31/01/2019

2 Statement of Compliance

The following tables detail the compliance status of the Ixom Botany ChlorAlkali plant against relevant approvals and licences.

Table 2: Statement of Compliance

Were all conditions of the approvals complied with	
DA 35/98	Yes
EPL 20547	Yes

Table 3: Non-compliances

Relevant Approval	Condition Number	Condition Description (summary)	Compliance status	Comment	Where addressed in Annual Review
DA 35/98	-	Fully Compliant	-	-	-
EPL 20547	-	Fully Compliant	-	-	-

Table 4: Compliance Risk Level

Risk level	Colour code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> potential for serious environmental consequences, but is unlikely to occur; or potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> potential for moderate environmental consequences, but is unlikely to occur; or potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

3 Introduction

3.1 Site Overview

The site is located on Beauchamp Road, Matraville, within the Botany Industrial Park (BIP). Site details are summarised in Table 5.

Table 5: Site Details

Address	16-20 Beauchamp Road, Matraville, NSW
Industrial Complex	Botany Industrial Park (BIP)
Local Government Authority	City of Sydney
Site Area	BIP – 70 hectares Site – 23 hectares
Locality Map	Appendix A
Site Plan	Appendix A
Current Use	Botany ChlorAlkali Plant
Lot No	Part of Lot 104 DP 1192400
Site Owner	Orica Limited owns approximately 40% of land at the BIP, including the area specific to this EMP

The facility manufactures chlorine and caustic soda from the electrolysis of salt. Hydrogen is produced as a by-product. The four main products produced are sodium hypochlorite (referred to as 'Hypo'), hydrochloric acid, caustic soda and ferric chloride.

The chlorine produced on site is used in the manufacture of hydrochloric acid, hypo and ferric chloride, with these downstream processes being collectively referred to as product plants. All chlorine produced at Ixom Botany ChlorAlkali facility is consumed in the product plants.

The plant can produce 31,200 tonnes per annum (TPA) following the 19.6 kilo Amps (KA) per annum uprate, assuming 95% uptime. All chlorine is reacted to produce the following product range:

- HCl (~35,000 TPA)
- Hypo (~55,000 kLA)
- Ferric chloride (~21,200 TPA)
- Sodium hydroxide (Caustic ~36,000 TPA as 50%) (co-product of chlorine manufacturing process).

3.2 Key Contacts for Environmental Management

Table 6: Environmental Contacts for Ixom Botany ChlorAlkali Plant

Name	Position	Contact Details
Ian Parker	IXOM CAP Operations Lead	02 9352 2254 0400 686 047 ian.parker2@ixom.com
Joe Nguyen	Ixom Botany Systems & Compliance Specialist	02 9352 2123 0422 403 901 joe.nguyen@ixom.com
Lauren Sibigroth	BIP Environmental Advisor	02 8336 1339 lauren.sibigroth@qenos.com

4 Approvals

The following approvals are currently held or operated under by the Ixom Botany ChlorAlkali Plant:

Table 7: Current Approvals and Licences

Approval No.	Date last varied	Details of any changes made during reporting period
DA 35/98	10-09-2012	No change
EPL 20547	03-07-2017	No change
MHF 10358-01	11-02-2014	No change
DG 35/03500 (held by Botany Industrial Park)	30-07-2017	No change

5 Operations Summary

5.1 Current Reporting Period

The period covered by this report saw a slight decrease in output compared to the previous year and slightly lower than forecast. The plant achieved an uptime rate of approximately 92% which indicates consistent operation throughout the year.

Truck movements (figures reported below include both inwards and outwards movements – ie one truck entering the facility to load then exiting is counted as two truck movements), the number of truck movements have slightly decreased in 2018 as with slightly lower in production in the 2018 reporting period. Table 8 and Figure 1 show a summary of key metrics for the facility over this reporting period compared to previous years.

Table 8: Production Metrics Summary

Reporting Requirement	Limit	Previous reporting period (2017 actual)	This reporting period (2018 actual)	Next reporting period (forecast)
Traffic movements into and out of site	N/A	22,648	21,848	22,250
Hours spent by loaded chlorine road tankers on site	N/A	0	0	0
Production (100% caustic)	N/A	30,347	28,312	29,500

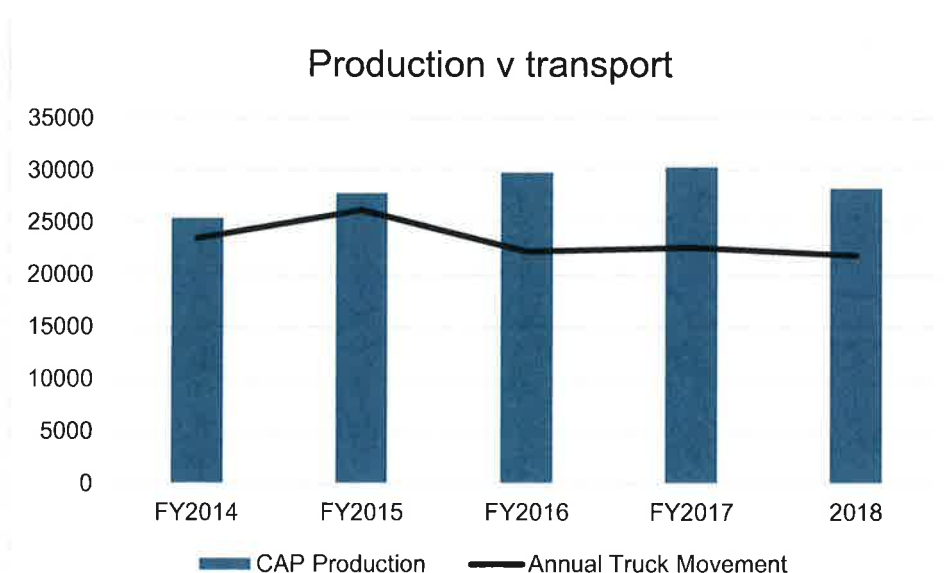


Figure 1: Truck Movements vs Production

Note: Financial year (FY) data provided in Figure 1 is for the October to September period each year. However data for 2018 is for reporting period from December 2017 to November 2018.

5.2 Next Reporting Period

Continued steady operation is forecasted for the next reporting period. Currently a project to supply smaller packaging 200L drum and 1000L ICB is being implemented, completion is planned for September/ October 2019.

6 Actions Required from Previous Annual Review

Table 9 details actions which have been undertaken during the reporting period, in response to feedback on the previous Annual Review.

Table 9: Actions required from previous Annual Review

Action required from previous Annual Review	Requested by	Action taken by the Operator	Where discussed in Annual Review
No actions requested or required			

7 Environmental Performance

Table 10 details the key environmental performance parameters for the Ixom Botany ChlorAlkali Plant.

Table 10: Environmental Performance

Aspect	Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented/proposed management actions
Noise	Day – 65 LAeq Evening – 55 LAeq Night - 50 LAeq (Limits from EPL 20547, Section L4.2)	Compliant. Noise monitoring was undertaken by Stephenson Environmental Management Australia during the reporting period. There were 3 out of 12 sampling occasions where the results were slightly higher than 50 db (A). Readings were 50.3, 51.0 and 50.1 for the month of May, June and July 2018 respectively.	Based on the report comments the results were dominated by sources not related to site operations, including distant road traffic, gas flow release, an electric hum, container movements at docks and terminals in Baker Street and reversing beepers. Some fruit bat noise was also present	No action required
Air quality	There are 3 licenced discharge points at the Ixom Botany ChlorAlkali plant: Point 1 (Figure 2) Hypochlorite Backing Tower. Discharge limit = 200mg/m ³ Chlorine, Monitored Continuously Point 2 Absorption Tail Tower. Discharge limit = 30mg/m ³ Hydrogen Chloride. Measured quarterly Point 3 (Figure 3) Emergency Chlorine Vent. No discharge limit in EPL, statutory limit from Schedule 4 of the POEO act of 200mg/m ³ used for reference. Monitored Continuously	Compliant. Air quality data is reported on the Ixom website each month and is included in Appendix B of this report.	Results are consistent with that of previous years. See graphs below. Monitoring results for Point 2 have been consistently below monitoring thresholds, and therefore have not been graphed.	No action required
Water	See Section 8 of this report			
Biodiversity	The EIS identified that there was no expected impact on Biodiversity from the operation of	No impact	None identified	No action required

	the Ixom Botany ChlorAlkali Plant			
Heritage	The EIS identified that there was no expected impact on Aboriginal, Natural or Urban Heritage items, relics or places from the operation of the Ixom Botany ChlorAlkali Plant	No impact	None identified	No action required
Flora and Fauna	The EIS indicated that no flora or fauna were expected to be directly affected by the operation of the Ixom Botany ChlorAlkali Plant	No impact	None identified	No action required
Amenity	<p>The premises and operations shall be conducted in such a manner as not to interfere with, or materially affect, the amenity of the neighbourhood by reason of noise, vibration, smell, fumes, vapour, steam, soot, ash, dust, waste water, waste products, grit, oil, or otherwise.</p> <p>The occupier of the premises shall not cause, permit, or allow the emission of any odorous air impurity from the development such that it can be detected outside the property boundaries by its odour.</p> <p>(DA 35/98 conditions 37 and 38)</p>	<p>Compliant.</p> <p>There were no instances of material harm affecting the amenity of the neighbourhood by reason of noise, vibration, smell, fumes, vapour, steam, soot, ash, dust or waste products.</p> <p>There were no reports of odorous material from the development detected outside the property boundaries.</p> <p>There were no community complaints received in the reporting period related to the Ixom Botany ChlorAlkali Plant or its operation.</p>	None identified	No action required



Air Monitoring Data - Point 1

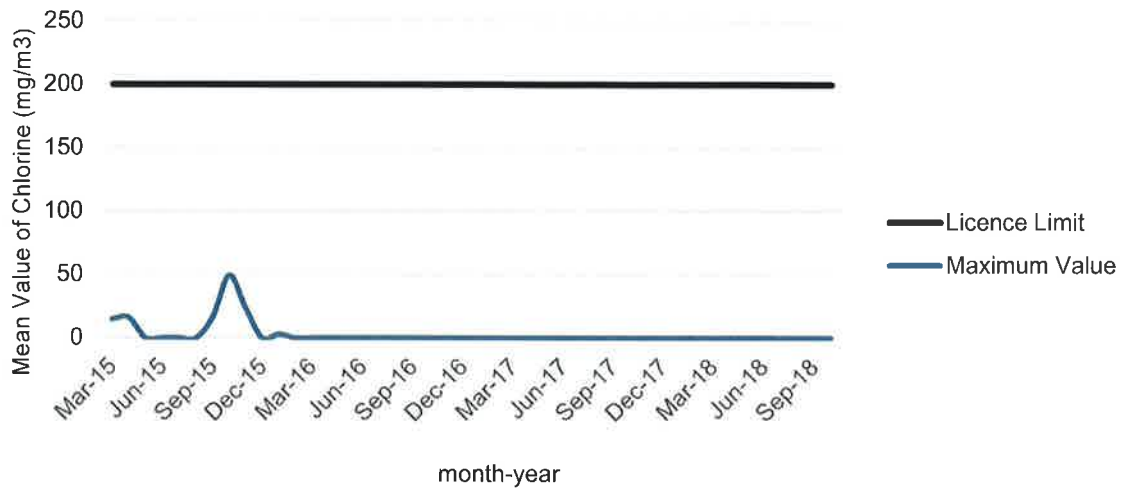


Figure 2: Point 1 Air Monitoring Data March 2015 - November 2018

Air Monitoring Data - Point 3

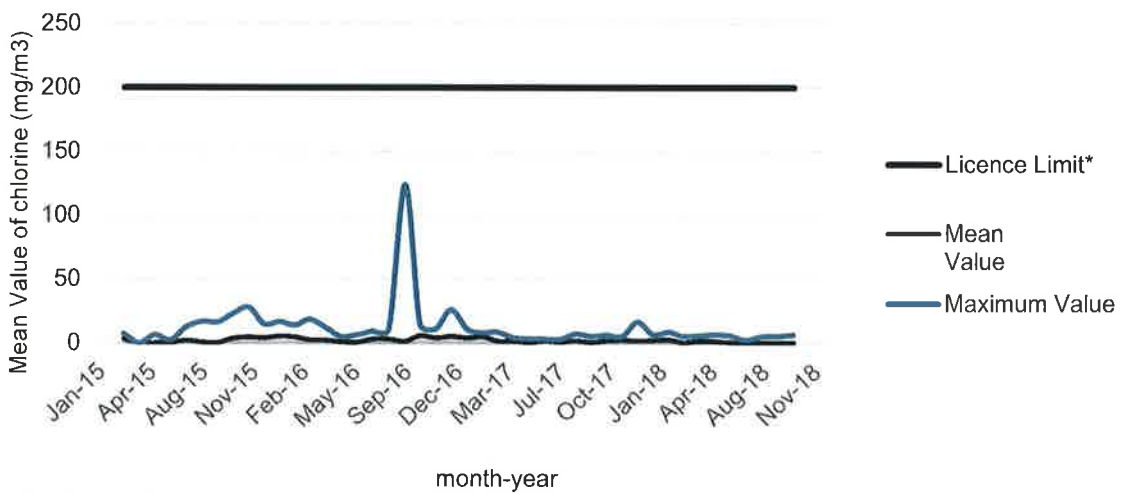


Figure 3: Point 3 Air Monitoring Data March 2015 - November 2018

* Statute limit as per Schedule 4 of POEO (Clean Air) Regulation

7.1 Continuous Improvement

The Ixom Botany site has implemented a continuous improvement (CI) program. Each financial year a Safety, Health, Environment and Quality (SHEQ) improvement plan is developed, listing the improvement initiatives for the year.

Table 11 lists the continuous improvement projects which were implemented during the 2017-18 reporting period.

Table 11: Continuous Improvement Projects Implemented in 2017-18

Project	Impact	Completion Date
Reduction in brine purge	Reduced plant effluent volume	On-going
Implement a stormwater monitoring program (BIP)	To quantify current stormwater characteristics and develop an improvement plan	Ongoing
Direct acid effluent to acid treatment	Improved pH control on effluent	Complete
Update asbestos management survey	Safety Management	Survey/ Plan Issued Jan 2018. Complete
Using the continuous improvement process, look for ways to reduce effluent	Process improvement	Ongoing
Replace stormwater lines	Improved lining	Ongoing
Replace effluent transfer lines to trade-waste pit		To be reviewed
Cooling tower blowdown reduction	Reduce Effluent	Complete
Control valve installed to control effluent from sulphuric acid bund to EP6 - tradewaste discharge	This project has been superseded by the new effluent line that transports sulphuric acid bund water to acid effluent for pH adjustment	Complete

Projects which have been included in the FY2018 SHEQ plan are detailed in Section 13 of this report.

8 Water Management

Potable water is supplied to the Ixom Botany site through the BIP Site Utilities. Water usage for the reporting period is shown in Table 12.

The potable water consumption was slightly lower than previous period due to slightly lower production overall throughout the year.

Table 12: Water Usage

	Previous Reporting Period (Dec 2016 – Nov 2017)	Current Reporting Period (Dec 2017 – Nov 2018)
Potable Water Consumed (kL)	36,496	32,547
Recycled Water Consumed (kL)	175,929	167,838
Water Incorporated in Product (kL)	136,163	129,684
Effluent Discharged to BIP Trade-Waste System (kL)	65,141	64,235

The Site Stormwater and Effluent System are managed by BIP Site Utilities.

Effluent from the Ixom ChlorAlkali Plant is collected and processed in one of two automated effluent treatment tanks. These tanks each accumulate the plant effluent then dose acid or caustic into the tanks to control the pH to a consistent and acceptable level. When the target pH is achieved, the tanks are discharged to the EP6 effluent collection pit where flow and pH are continuously measured and recorded. The effluent then joins the other effluent streams from the other facilities at the Botany Industrial Park and flows to the Site Utilities effluent system. In this facility, the effluent is monitored and the pH adjusted where required to achieve permissible effluent standards before discharge from site.

The stormwater from the facility is collected through clearly labelled stormwater drains and flows to the Site Utilities stormwater system. The stormwater is continuously monitored for flow and pH. If the pH of the stormwater exceeds the permissible limits, the stormwater is automatically diverted to the Site Utilities effluent system where it is further treated through a pH adjustment in order to meet the required specifications prior to discharge.

Over the 2017-18 period the Ixom Botany ChlorAlkali plant has implemented two key environmental improvement initiatives: Further reducing the Brine Purge through implementation of improved process control by an increase in allowable concentration limits of chlorate in brine and reducing cooling tower blowdown by optimising feed water to cooling tower.

Figure 5 shows the impact that these, along with other improvement projects have had on the overall effluent volume discharged from the site over the 2015 to 2018 period.

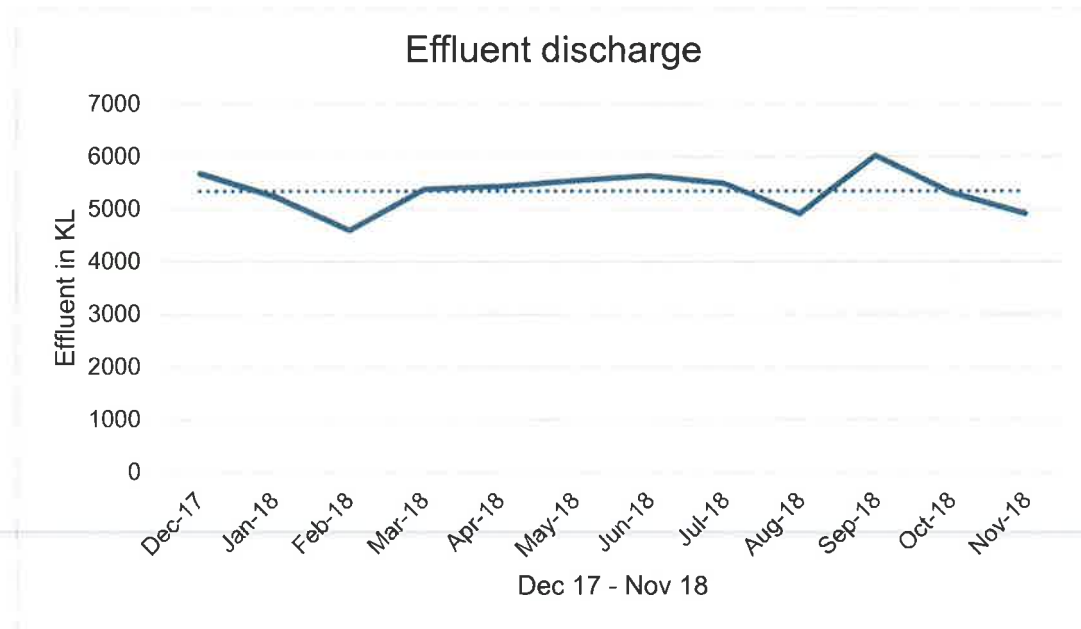


Figure 4: Effluent Discharged from Ixom Botany ChlorAlkali Plant

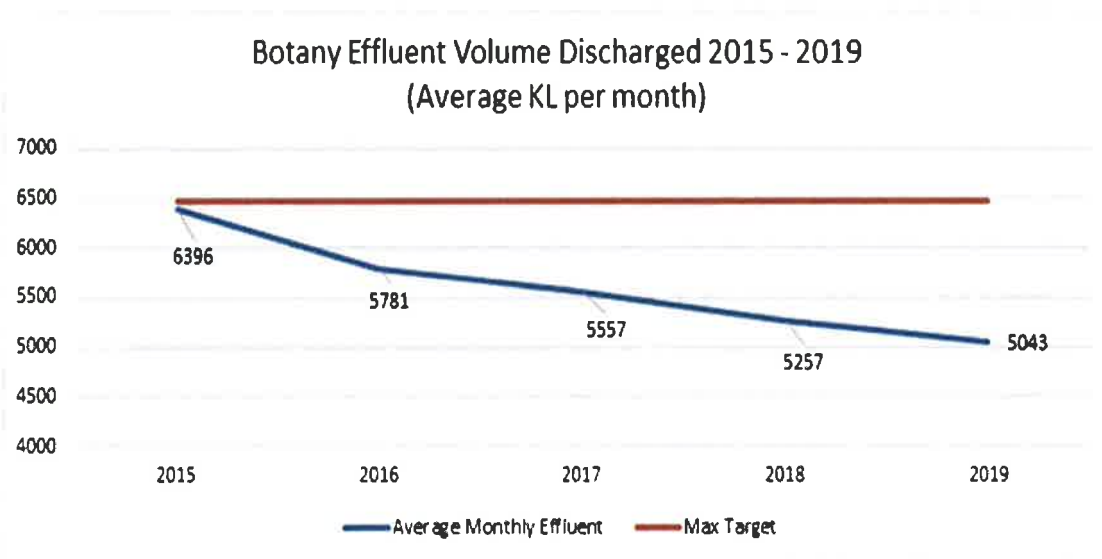


Figure 5: Year on year decrease in effluent discharged from site

9 Rehabilitation

There have been no rehabilitation activities undertaken at the Ixom Botany ChlorAlkali Plant during the reporting period.

10 Community

The Botany Industrial Park (BIP) maintains an up to date website for the public that provides the following information:

- Minutes of the BIP Community Consultative Committee (BIPCC)
- Community Hotline
- Contacts for Regulators
- Items of interest including updates where appropriate. Currently information on PFAs is being shared.
- Commitments to Safety

Ixom maintains an up to date public website that provides the following information:

- Information about the Botany Chloralkali plant
- Details of Licence conditions
- Contact details for more information on the facility
- Map of licensed discharge points
- Results of monthly air quality monitoring
- Safety Management system
- Emergency Response including PIRMP
- Actions for the public to take in the event of an emergency
- Pollution Notification Process

There were three BIPCC meetings held throughout the reporting period, on 28 March 2018, 25 July 2018, 10 December 2018. Ixom representatives were involved in the meetings.

There were no public complaints recorded against Ixom via the community hotline during the reporting period.

11 Independent Audits

11.1 Independent Compliance Audit (ICA)

In April 2016, Ixom received a letter from the NSW Department of Planning and Environment (DP&E), requesting an Independent Compliance Audit (ICA) of the CAP at Botany which would be in lieu of the Independent Environmental Audit (IEA) triggered by the Development Consent DA 35/98 Condition 24, as well in lieu of resubmission of the Annual Report ended November 2015.

The period of the ICA was defined to be from 26 January 2013 (the end of the previous IEA period) to 29 November 2016 (the first day of the site visit of this ICA). This work was undertaken by WSP/Parsons Brinckerhoff, after approval by the DP&E on 18 October 2016. Whilst the report was completed and the findings were all completed.

The next IEA is due to be completed in December 2019.

11.1.1 Summary of Findings

During the Audit a total of 266 approval and licence conditions and commitments were assessed, resulting in seven non-compliances. Five of these non-compliances were listed as “administrative” (i.e. non-compliance does not impact on performance), with the remaining two non-compliances being assessed and ranked as “low” risk.

There were no “high” or “medium” rated risks identified in the audit.

All action items from the 2016 Independent Compliance Audit have been completed.

11.2 Hazard Audit

The last Hazard Audit was conducted on 6 – 8 March 2018. The report was issued on 11 May 2018, and was undertaken by an independent approved third party Planager against the requirements of HIPAP No5 – Hazard Audit Department of Planning 2011.

The next Hazard Audit is due to be completed in June 2021.

11.2.1 Summary of Hazard Audit Findings

The Audit found that there was demonstration of a '*clear commitment to maintaining plant operations in terms of formal risk management performance*' through the '*use of several programs for risk management and continuous safety improvement initiatives.*'

There were 12 recommendations resulted from the Audit, 10 prioritised as "Medium" and 2 prioritised as Opportunities for Improvement. The status of these recommendations is detailed in table below.

Table 13: Status of Hazard Audit Recommendations

Recommendation	Priority	Status (as at January 2019)
Large number of nuisance alarms on SCADA screen - continue to improve alarm management (e.g. through the already existing quarterly alarm management reviews)	Medium	Ongoing. Reviewed at daily operations meeting and during quarterly safety systems meeting.
Review of Work Instructions for Dechlorination CAP and Products Plant as it is not up-to-date.	Medium	Complete. Work instruction has been updated.
Second copy of all major training assessment sheets to be kept separately (e.g. digitally) for ease of access and safeguarding.	Medium	Complete
Ensure new control of change system on Velocity allows defined approvers to easily add additional persons for screening / approval if they so deem necessary.	Medium	Complete. The change system coordinator (who is a Technical Lead) has options to assign more relevant approver if deem necessary.
Caustic dump valve appears to have been removed from the major maintenance overhaul schedule (on T32). Ensure that the caustic dump valve is included for overhaul as a critical valve. (Note that this is not the same test as that carried out by the operators, exercising of this valve, which should be retained).	Medium	The Caustic dump valve is in maintenance schedule. It was checked on 5/2/18 and next due for service is 4/2/19. Complete
Resolve issue with the three overdue instrument calibrations (TSHH7622 / TSHH7743 / TY7623) which were scheduled for September 2017 (6 months overdue at time of audit.	Medium	Ongoing. Work Order put into maintenance system
Improve management of Isolation sheets for jobs that have not been completed. Currently these are within a blue Process Isolation Sheet Folder, which does not seem to be managed	Medium	Complete. Isolation sheet folder updated and now actively managed.
Improve management of faulty fire equipment (repairs). Comments on inspection sheets for some equipment were repeated several times (e.g. by Site Safety).	Medium	System is being implemented to flag repetitive faults. Personnel are being formally trained to carry out inspection and testing.
Ensure the hardcopies of the ERP are the latest version.	Medium	Complete

Make the ERP hardcopy easier to handle in an emergency. The current copies are voluminous with no dividers.	Medium	Complete
Allow for independent / 3rd party review of critical procedures (/work instruction) For example by other shift / Ops Lead / other site).	Low	Complete
Operators should become more used to accessing procedures online via the DMS. Passwords expire if not used.	Low	Hard copy of critical procedures available. Operators temporarily without access are in the process or being re-instated.



12 Incidents and Non-Compliances during the Reporting Period

During the reporting period there were no incidents or non-compliances against the conditions of any relevant permit, license or approval for the Ixom Botany ChlorAlkali Plant.

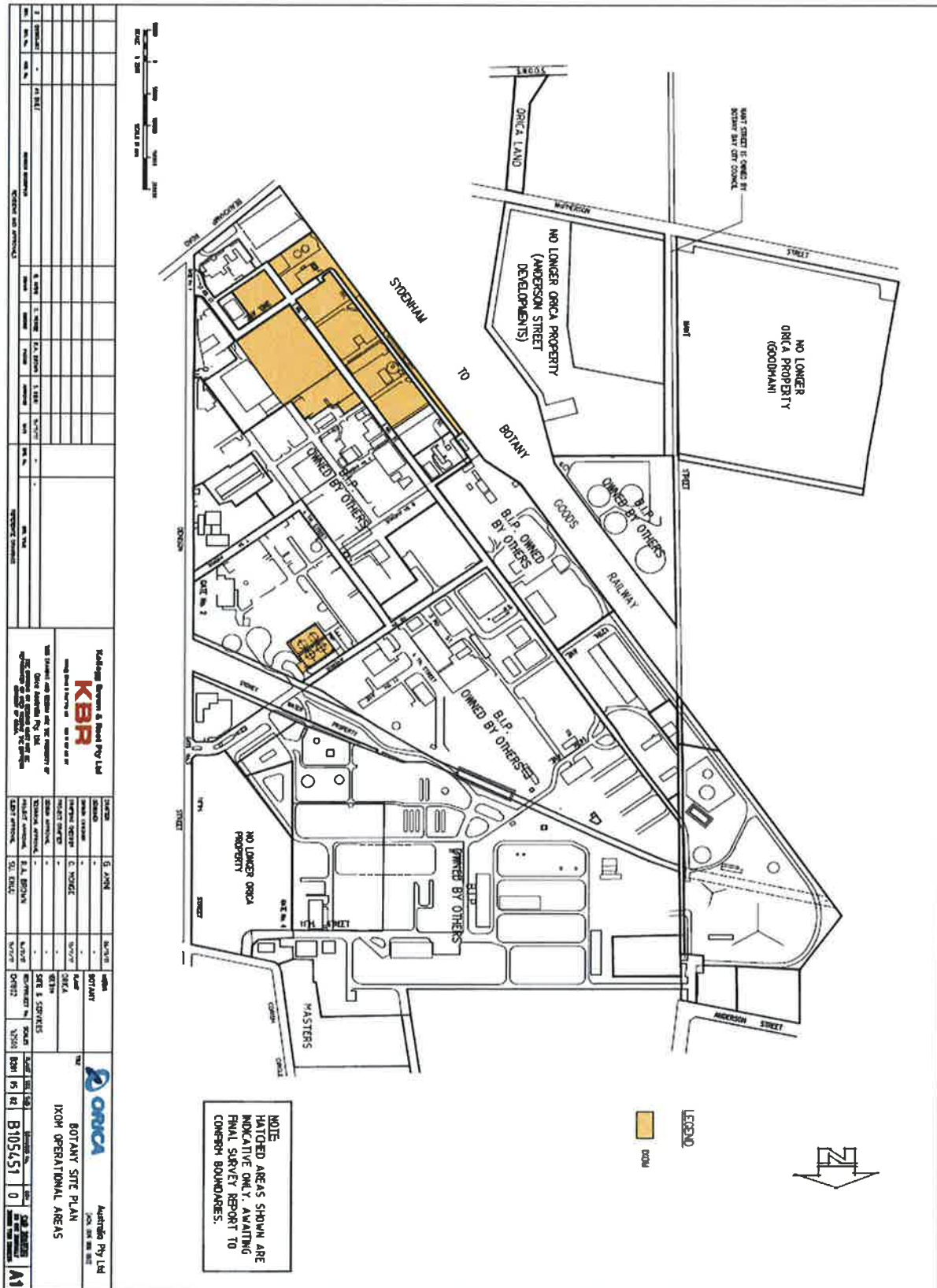
13 Activities to be completed in the next Reporting Period

Each year, the Ixom sites develop and agree on a Safety, Health, Environment and Quality (SHEQ) plan. This plan is communicated to all employees. The following table details activities that are scheduled to be completed during the December 2018 - November 2019 reporting period. Further environmental initiatives are also included in Table 11 in Section 7.1 of this report.

Table 9: Activities (incl. Continuous Improvement identified in 2018/2019 SHEQ plan)

Activity Detail	Impact	Scheduled Completion Date
Implement dosing pumps for finer adjustment of pH adjustment in the acid and alkaline effluent tanks	Reduction in the use of chemicals for dosing and better control of effluent treatment before releasing to EP6 and site effluent	1/12/2019
Plan to use recycled water from GTP in products cooling tower	Will reduce water usage in products cooling tower by running the tower at a higher number of cycles (with the addition of recycled GTP water) and hence reduce blowdown.	1/6/2020
Introduce more reliable method for priming lixator pumps	This will reduce the quantity of brine purged during start up activities and also minimise the amount of time operators need to be exposed to high noise area.	1/6/2019
Optimise the use of H2 on site <ul style="list-style-type: none"> - Install device to analyse more accurately the mass flow of H2 to the HCl unit in order to run at reduced excess - Optimise the low pressure control vent to reduce venting of H2 	Maximise production and reduce wasted H2	01/12/2019

Appendix A – Site Map





Appendix B - Air Monitoring Data

Historical data is available through the Ixom website: <https://www.ixom.com/being-responsible/environmental-monitoring-data/botany>
