



2023 ANNUAL REPORT


FOR THE QENOS ALKATUFF PLANT

BOTANY

DA2181 & DA35/97



Annual Review Title Block

Name of Operation	Alkatuff Plant
Name of Operator	Qenos Pty Ltd
ABN	62 054 196 771
Company Address	Botany Industrial Park 16-20 Beauchamp Rd, Matraville New South Wales 2036 Australia
Development Consent #	DA2181 Original plant development & DA35/97 Plant capacity uprate development
EPA Licence #	10000
Annual Review start date	1 st August 2022
Annual Review end date	31st July 2023
<p>I, Peter Grosskopf, certify that this Annual Report is a true and accurate record of the compliance status of Qenos Alkatuff plant for the period 1st August 2022 to 31st July 2023 and that I am authorised to make this statement on behalf of Qenos Pty Ltd.</p> <p>Notes:</p> <p>a) The Annual Review is an environmental audit for the purpose 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; and</p> <p>b) 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).</p>	
Name of Authorised Reporting Officer	Peter Grosskopf
Title of Authorised Reporting Officer	Senior Risk Engineer
Signature of Authorised Reporting Officer	
Date	31 August 2023

Executive Summary

The Qenos Alkatuff plant commenced operation in 1992 with a nameplate manufacturing capacity of 86,000 tonnes of linear low density polyethylene under the development consent DA2181. In November 1997, a development consent DA35/97, was granted for the modification of plant to raise the plant manufacturing capacity to 125,000 tonnes of polyethylene. The upgrade development consent included a modification to the development approved on 6th March 2000 to allow the manufacture of high density polyethylene. In August 2012, a modification to the existing development consents was granted, under Section 75W of the Environmental Planning and Assessment Act 1979, for the construction and operation of a hydrogen trailer unloading bay. This modification altered the annual report reporting period to 1st August to 31st July inclusive. The 2012/2013 annual report covered the period of transition. The 2014 annual report represented the first 12 month period under the new reporting period. This 2023 annual report is the tenth annual report on this 12 month reporting period.

In response to the 2015 Annual Report submission the Department of Planning and Environment Compliance Team requested additional information in all future Annual Reports. These additional requirements were addressed in part. In response to the 2018 Annual Report submission the Compliance Team made a further request for additional information to be provided in all future Annual Reports. The 2019 Report addressed these additional requests and were generally accepted by the Department Compliance Team. This 2023 Report maintains this format and content.

All conditions of consent have been addressed. It should be noted that many Consent Conditions are controlled under Environment Protection Licence (EPL) 10000, issued by the NSW EPA, and compliance is reported accordingly to EPA. There was one smoking flare incident (EPL Exceedances) associated with the Alkatuff plant in late October 2022. The Pollution Reduction Plan to address the smoking flare is incorporated in the EPL. Rectification of the flare was completed during a planned maintenance shutdown in November 2022. Smokeless flare operation was planned, tested and confirmed on the 23rd November 2022. A subsequent unplanned elevated flaring occurred when the site was shutdown due the upstream Olefines plant cooling tower collapse. Again, the flare achieved smokeless operation.

Given the extended outage of the site associated with the collapse of the Olefines cooling tower, a request was made to the Department to defer the eighth triennial hazard audit to 2025, originally scheduled for 2023. A one year extension was granted to end 2024.

The traffic movements associated with the facility continue to remain below the figures projected in the Environmental Impact Statement (EIS) for the upgraded plant.

Introduction

The Qenos Alkatuff plant has two primary sets of Consent Conditions relating to:

- Original plant development DA2181 (determined 5th September 1989); and
- Plant upgrade development DA35/97 (determined 20th November 1997)

In addition, modifications to the approved development consents have altered and added certain consent conditions. These modifications are referred to as:

- DA35/97 MOD1 (modified 6th March 2000) – alteration of the scope of works and production of high density polyethylene associated with the plant upgrade
- DA2181 MOD1 & DA35/97 MOD2 (modified 28th August 2012) – installation and operation of the hydrogen trailer unloading bay (hydrogen is a raw material to the process, an alternative supplier was required to be found requiring the construction of on-site unloading facilities)

In the 2002 Annual Report a reporting structure for both sets of Consent Conditions was submitted to the Department. In a letter referencing the 2002 Annual Report¹, the Department indicated support for the approach taken and recommended that future annual reports for the Alkatuff Plant apply this reporting structure. Following the 2015 and 2018 Annual Report submissions the Department Compliance Team requested additional information be provided including a change in report format². **The 2023 report follows the 2019 report content and format.**

Report structure is as follows:

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¹ Ref: R96/00241 letter dated 7/4/03 Scott Jeffries Senior Environmental Planning Officer

² Letter dated 16/10/18 Chris Mathieson

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The principal reporting method for the report remains, as in previous years, by exception only.

The reporting period of the original annual reports was 1st November to 31st October inclusive based on the anniversary of the upgrade DA35/97 consent (11th November 1997). The latest modification to the development consent was granted on 28th August 2012 requiring a revised annual **reporting period of 1st August to 31st July**.

Overview of Operations

Project Background

The Alkatuff plant commenced operations in August 1992 under DA2181. The Alkatuff Plant employs Unipol™ Low Pressure, Fluidised Bed Technology. The Unipol™ process is licensed from Univation (formerly known, at the time of the original development consent, as Union Carbide Corporation (UCC)). The Unipol™ process, compared to conventional polyethylene plants, is a 'low pressure' process characterised by relatively small inventories of gaseous hydrocarbons and very low inventories of liquid hydrocarbons. There are over 100 reactor lines in 25 countries producing polyethylene or under construction using the Unipol™ Process.

Process Description

The Alkatuff plant manufactures polyethylene products known as Linear Low Density polyethylene (LLDPE) and High Density polyethylene (HDPE), using a fluidised bed reaction system. The polymerisation reaction takes place in a fluidised bed reactor into which the ethylene (supplied by pipeline from Qenos upstream ethane cracker plant "Olefines"), hydrogen, isohexane (an induced condensing agent (ICA) added to assist with the removal of the heat of polymerisation), catalyst activator and catalyst are injected. The reaction takes place at a moderate temperature (around 100°C) and pressure (up to 2400kPag). A recycle gas flow is used to cool the reactor and is maintained by a single stage centrifugal recycle gas compressor, provided with an elaborate labyrinth seal to protect against recycle gas leakage. The overall reaction and cycle gas system pressure is modulated by the control of the incoming ethylene feed rate. The reaction rate is controlled by catalyst addition rate.

Polyethylene resin is produced. This is purged with nitrogen to remove residual hydrocarbons (minimising volatile hydrocarbon emissions), extruded and cut up to form granules which are stored and loaded into road tankers for bulk delivery to customers. The plant is equipped with a ground flare for continuous vents and an elevated flare for larger event based loads (e.g. rapid depressurisation of the reactor).

Facility Location

The Alkatuff plant is located on the Botany Industrial Park (BIP) site in the suburb of Banksmeadow in the Bayside Council. The relative position of the BIP in relation to surrounding land uses is provided below in Figure 1 with Figure 2 providing a zoomed in view of the Alkatuff plant position in relation to the BIP.

Note 1: Source of Land Use Maps: Bayside Council website
[Bayside Council IntraMaps](#)

Note 2: The BIP falls under the Three Port SEPP planning instrument.

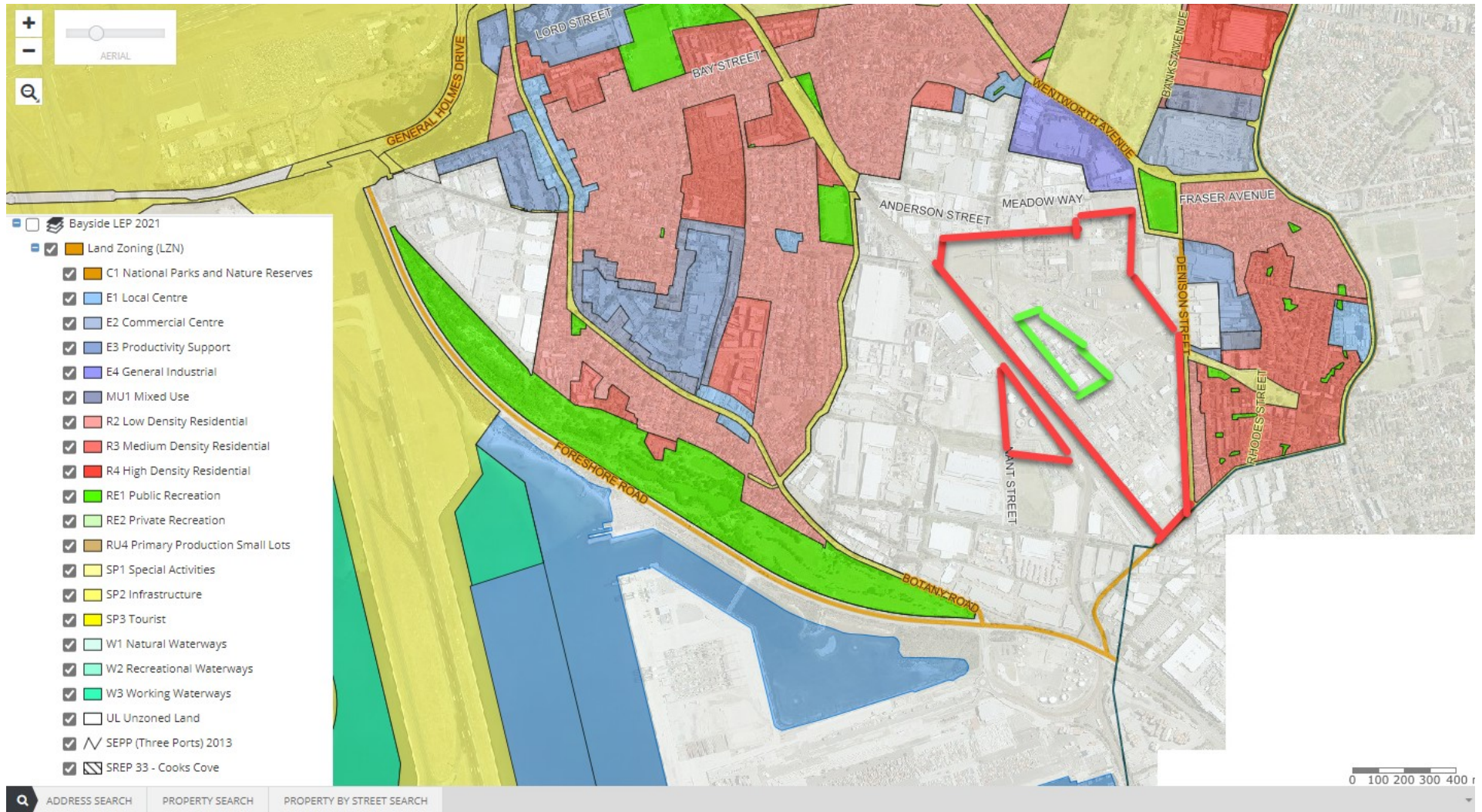


Figure 1: Botany Industrial Park site (red outline) with surrounding land uses

Note: Alkatuff plant shown with green outline

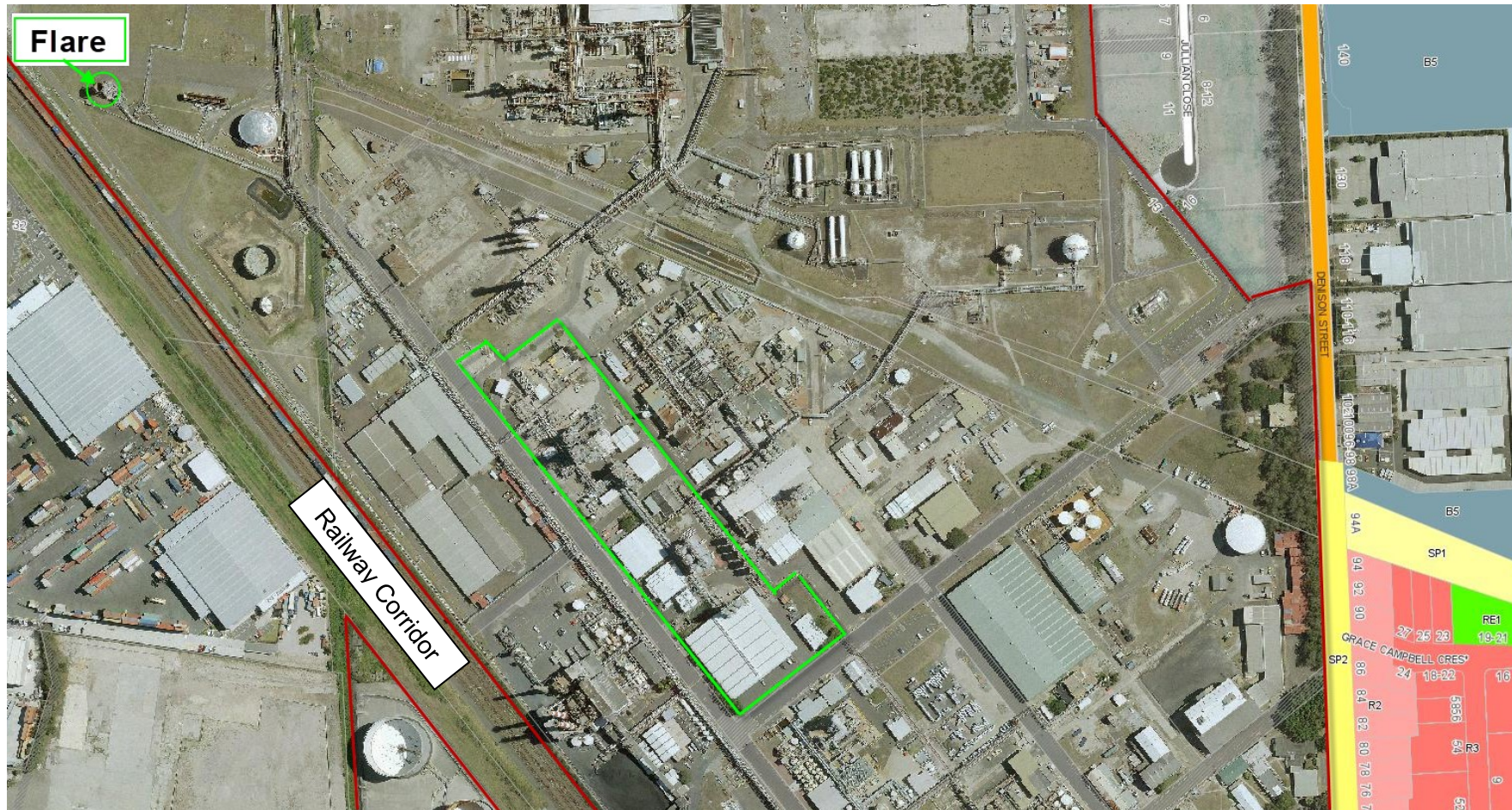


Figure 2: Alkatuff plant (green outline) in relation to the BIP (zoomed in)

Operational Disturbance Footprint and Offset Areas

The Alkatuff plant is well away from residential areas (>500m to the east), the closest industrial neighbour is the goods line railway corridor (~150m to the west). The Alkatuff flare is located in a remote area of the site away from process plants and other infrastructure. Nearest residential neighbourhood is ~430m to the west of the flare. The elevated flare tips are ~23m above ground level.

Environmental Management Arrangements

Qenos manages its environmental obligations as part of its integrated Safety Health and Environment Management System (named *FORUS*). FORUS has 22 SHE Operating Practices (SHEOPs) with a dedicated SHEOP for the protection of the environment (*SHEOP 6.5 Environmental Management*). Responsibility for Safety Health and Environmental (SHE) performance is addressed through:

- Line Management - starts with the Operations Manager who has final accountability for the performance outcomes of the operating plant through to plant managers, engineers, maintenance and operations personnel; as well as
- FORUS Management Oversight – includes a Sponsor, Administrator and plant Link person for each SHEOP.

The table below lists the key personnel responsible for monitoring and managing environmental performance and compliance.

Title	Incumbent	Notes
Polythene Operations Manager	Brian O'Connell	Line accountability for SHE performance of the Alkatuff and Alkathene polymer plants
Alkatuff Production Manager	Garry MacGregor	Manages day to day operations and SHE performance
Qenos Environment Advisor & SHEOP 6.5 Sponsor / Administrator	Richard Benson	Manages EPA Licence for Qenos and provides technical advice to Qenos operations on environmental performance and compliance matters

Description of Operations for the Reporting Period

Actions arising from Previous Annual Report

The table below provides a summary of Actions arising from Previous Report and their status.

Action Arising	Status
Next Triennial Hazard Audit	Deferred to 2024 calendar year

Production

The Alkatuff plant produced **63.5** kilotonne of polyethylene which includes a range of high and linear low density grade products. Refer to the following appendices to **Appendix A: Production Summary** for production details. Production is significantly lower than nameplate capacity (125kt) primarily due to loss of feedstock associated with the upstream Olefines plant cooling tower collapse.

Compliance to Consent Conditions

All Consent Conditions have been met. Refer to **Appendix B: Conditions of Consent Compliance Table** for details.

Environmental Performance

This analysis focusses on the environmental footprint and impact on community of the plant for the areas as identified in the original Environmental Impact Statement (EIS) and subsequent Statements of Environmental Effects (SEE) as well as any ongoing requirements identified in the Conditions of Consent. These areas include:

- Storm Water
- Trade Waste/Effluent
- Air Emissions
- Boundary Noise
- Waste Management
- Traffic/Truck Movements
- Public Amenity

Refer to **Appendix C: Environmental Performance** for details of this environmental assessment.

Note: In line with EPA legislated requirements *Protection of the Environment Operations (General) Amendment (PFAS Firefighting Foam) Regulation 2021* the Alkatuff firefighting foam stocks *have been changed over* to a fluorine free alternative supplied by Chubb: Respondol 3-3 ATF.

Record of Complaints

The table below provides a summary of all Complaints received concerning this development in the reporting period.

Date	Nature of Complaint	Status/Resolution
-	Nil Complaints Received	N/A

Exceedances of Environmental Protection Licence

Genos submits a detailed Annual Return as required under its Environment Protection Licence (EPL 10000) to NSW EPA for its Botany operations which includes this development. It is not

the intention of this annual report to duplicate the detail that is already provided in that report. The table below provides a summary of all EPL Exceedances associated with this development. In relation to smoky flare operation a Pollution Reduction Program (PRP) was established (EPA Licence Variation 1585822 during 2019 annual reporting period). The EPA Licence Variation was subsequently revised (1612459 issued 11-Nov-2021) – refer to **Appendix E: EPA Licence Variation**

Date	Nature of EPL Exceedance	Status/Resolution
30/10/22 Qenos Ref: Incident 403322	Smoky flare following shutdown and depressurisation of the reactor to flare in preparation for the planned maintenance outage during which the flare would be repaired.	As per the established PRP [<i>U1 Optimisation of Alkatuff Flare Operation</i>] burners were replaced to ensure clean combustion of higher calorific gas mixtures as well as modifications to steam supply. Smokeless combustion has been demonstrated since repairs & modifications completed.

The revised Pollution Reduction Plan due date of 30-Dec-2022 was met, an evaluation period of 12 months is required to demonstrate compliance. In light of the extended site outage due to the Olefines cooling tower collapse this evaluation period may need to be extended in consultation with EPA.

Environmental Monitoring Data Over Life of Project

The Consent Conditions only call for ongoing environmental monitoring of traffic volumes. Bulk load efficiency remains high and the number of traffic movements per day has remained well under EIS traffic movement figures associated with the upgrade approval. The details of these traffic volumes is provided in **Appendix D: Record of Traffic Movements**.

Monitoring of noise, fugitive emissions, emissions to atmosphere (NOx) and discharges to stormwater are managed under the broader Qenos EPL (which includes all of the Qenos operating plants on the BIP not just the Alkatuff development). The discharge of process effluent is a more complex five party Trade Waste Agreement (TWA) involving the four BIP operating companies Ixom, Indorama, Orica and Qenos with Sydney Water. The Alkatuff plant, which is the subject of this Annual Report, is a relatively small contributor to the Qenos EPL and the BIP TWA.

Appendix A: Production Summary

Material	Approved Limit (specify source)	Previous Reporting Period (actual)	This Reporting Period (actual)	Next Reporting Period (forecast)
Polyethylene	125,000 tonnes (DA35/97)	117,457 tonnes	63,449 tonnes	125,000 tonnes

Appendix B: Conditions of Consent Compliance Table

Development Application DA2181

The status of compliance to the Consent Conditions relating to the original development for the construction and operation of the Alkatuff plant are listed in Table 1. Additions or alterations to consent conditions associated with DA2181 MOD1 are designated with superscript “MOD1+” (new condition) or “MOD1~” (altered condition).

Unique ID Consent Condition #	Compliance Requirement	Development Phase	Monitoring Methodology	Evidence and Comments
1	Pre-Construction Studies a) Organisational and safety construction procedures; b) HAZOP study; c) Hazard analysis and risk assessment of detail design; d) Fire safety study; and e) Transport management plan; and f) Local council consultation on transport arrangements	Pre-Construction	N/A	Condition satisfied, consent condition does not specify any ongoing requirements
2 ^{MOD1~}	Pre-Commissioning Studies a) Emergency response plan; b) Comprehensive safety monitoring program; and c) Comprehensive organisational and safety commissioning procedures	Pre-Commissioning	N/A	Condition satisfied, consent condition does not specify any ongoing requirements.
3 ^{MOD1~}	Triennial Hazard Audit in accordance with HIPAP 5 <i>Hazard Audit Guidelines</i>	Post Commissioning	Scheduling of Triennial hazard audits as well as the stewardship of audit recommendations are managed under Qenos SMS element <i>SHEOP6.6 Regulatory Compliance</i> .	Refer to Upgrade DA35/97 Condition of Consent #6 Hazard Audit.

Unique ID Consent Condition #	Compliance Requirement	Development Phase	Monitoring Methodology	Evidence and Comments
4	Site Studies (all) Update the hazard analysis and risk assessment for the entire site as well as update the site fire safety study	Pre-Startup	N/A	Condition satisfied, consent condition does not specify any ongoing requirements.
5	C3 Splitter impact assessment on hexene tanker unloading bay	Pre-Construction	N/A	Condition satisfied, consent condition does not specify any ongoing requirements.
6	Compliance	Pre-Startup	N/A	Compliance Report was submitted and accepted prior to plant commencing operation. Consent condition does not specify any ongoing requirements.
7	Annual Report on Implementation and Effectiveness of Conditions	Ongoing	Annual Report submission to DoP&E and Bayside Council	This Annual Report is submitted to comply with this consent condition.
8	Development to be conducted in accordance with EIS and supplementary reports	Pre-Startup	N/A	Development was built, commissioned and operated in accordance with the EIS and supplementary reports.
9	EPA (formerly SPCC) Approvals & Licences	Pre-Startup	Managed under EPA Licence 10000	Licence was obtained and plant continues to operate under a site wide EPA Licence.
10	Regulatory Compliance – generalised requirement to satisfy all relevant regulatory requirements	Ongoing	Managed under Qenos SMS element <i>SHEOP 6.6 Regulatory Compliance</i>	Development needs to satisfy a number of statutory regulations including, but not limited to, Work Health and Safety Regulations (including Chapter 9 Major Hazard Facilities)
11	Statutory approval of stormwater collection & disposal	Pre-Startup	Managed under EPA Licence 10000	Condition satisfied, ongoing management is under EPA Licence

Unique ID Consent Condition #	Compliance Requirement	Development Phase	Monitoring Methodology	Evidence and Comments
12	Liquid Waste	Pre-Startup	N/A	Condition satisfied – refer to Upgrade DA35/97 Condition of Consent #10 Waste Management Strategy.
13	Solid Waste	Pre-Startup	N/A	Condition satisfied – refer to Upgrade DA35/97 Condition of Consent #10 Waste Management Strategy.
14	Particulate Management Plan	Pre-Startup	Managed by operational team housekeeping audits. Polyethylene spillages or losses of containment are cleaned up immediately. In event of polyethylene dust emissions bag house filters would be checked and replaced. Resin and pellet handling areas are inside plant first flush stormwater catchment to ensure they do not leave site.	Condition satisfied, consent condition does not specify any ongoing requirements. Note: A detailed study was completed following plant commissioning which confirmed the plant design met the particulate emissions standards set out in the original plant EIS.
15	Recycling Study	12months of Construction Commencement	N/A	Condition satisfied, consent condition does not specify any ongoing requirements.
16 ^{MOD1~}	Annual Report	Ongoing	Annual submission managed under Qenos SMS element <i>SHEOP 6.6 Regulatory Compliance</i>	Condition satisfied by this report – refer to Upgrade DA35/97 Condition of Consent #21 Annual Report.
17	Public Amenity - premises and operations to not adversely affect neighbourhood amenity	Ongoing	Refer to EPA reporting guidelines	Condition satisfied – managed under EPA EPL 10000
18	Acoustical engineer's report into acoustical controls to be employed in plant design	Pre-Commissioning	Noise is monitored for the whole site at the site boundary to detect changes or deterioration of acoustical controls	Condition satisfied, consent condition does not specify any ongoing requirements.

Unique ID Consent Condition #	Compliance Requirement	Development Phase	Monitoring Methodology	Evidence and Comments
19	Air quality & pollution control engineer's report into pollution controls to be employed in plant design	Pre-Commissioning	EPL Annual Return includes Load Based Limits (LBL) for NOx, Volatile Organic Compounds, Particulates (from combustion) and Benzene (Olefines plant). LBL does not involve ongoing monitoring requirement with most quantities determined by an agreed load calculation protocol.	Condition satisfied, consent condition does not specify any ongoing requirements. Note: One exception to LBL determination involving measurement is the Leak Detection and Repair (LDAR) program. However, LDAR for fugitive emissions is a minor contributor to the total LBL emissions.
20	Vehicle loading & unloading wholly within premises	Ongoing	Site is large and readily satisfies this requirement – no specific monitoring program required	Condition satisfied
21	Civil Aviation Authority approval of structures above 15.2m	Pre-Construction	Applies to new or modified structures above 15.2m, managed as part of SMS element <i>SHEOP 7.1 Management of Change</i> process	Condition satisfied, all approvals were applied for and granted
22	Landscaping plan	Pre- Building Application Determination	Landscaping was completed to the agreed plan at the time. Maintenance of landscaping is part of BIP grounds maintenance contract and the performance metrics contained therein.	Condition satisfied with ongoing maintenance of landscaping.
23	Landscaping Maintenance Bond	Pre- BA Determination	N/A	Condition satisfied, bond was lodged, period of four years expired.
24	Landscaping masonry retaining edges	Pre-Commissioning	N/A	Condition satisfied
25	Containment of plant spillage	Pre-Construction	N/A	Condition satisfied

Unique ID Consent Condition #	Compliance Requirement	Development Phase	Monitoring Methodology	Evidence and Comments
26	General statement regarding the obligation to obtain any other approvals necessary	Ongoing	Managed under Qenos SMS element <i>SHEOP 6.6 Regulatory Compliance</i>	Condition satisfied
27 ^{MOD1+}	Staged and Combined Submission of Plans	Ongoing	Managed under Qenos SMS element <i>SHEOP 6.6 Regulatory Compliance</i>	Condition satisfied

Table 1: DA2181 Conditions of Consent Compliance Table

Development Application DA35/97

The upgrade Conditions of Consent were issued on 25/11/97. The status of compliance to the Consent Conditions, relating to the upgraded Alkatuff plant, is listed in Table 2. Additions or alterations to consent conditions associated with DA35/97 MOD1 (granted 6/3/2000) are designated with superscript “MOD1+” (new condition) or “MOD1~” (altered condition). Additions or alterations to consent conditions associated with DA35/97 MOD2 (granted 28/8/2012) are designated with superscript “MOD2+” (new condition) or “MOD2~” (altered condition).

Unique ID Consent Condition #	Compliance Requirement	Development Phase	Monitoring Methodology	Evidence and Comments
1 ^{MOD1~MOD2} ~	Development to be conducted in accordance with EIS and supplementary environmental statements associated with consent modifications	Pre-Startup	N/A	Development was built, commissioned and operated in accordance with the EIS and supplementary environmental statements.
2 ^{MOD2~}	Pre-Construction Studies a) Fire Safety Study; b) HAZOP Study; c) Final Hazard Analysis; and d) Construction Safety Study	Pre-Construction	N/A	Condition satisfied, consent condition does not specify any ongoing requirements
3	Pre-Commissioning Studies a) Emergency Response Plan; and b) Safety Management System	Pre-Commissioning	SafeWork NSW WHS Regulations (Major Hazard Facilities) provide ongoing oversight of the ERP and SMS	Condition satisfied, consent condition does not specify any ongoing requirements
4 ^{MOD2~}	Compliance Report – report on conditions 2, 3 & 7	Pre-Start Up	N/A	Condition satisfied
5	Incident Report – report any actual or potential incident with significant offsite impact on people or biophysical environment	Ongoing	Qenos External Reporting procedures managed under <i>SHEOP 9.1 Incident Reporting Analysis and Follow Up</i>	There were no incidents or potential incidents with actual or potential significant off-site impacts on people or biophysical environment during the report period for the Alkatuff plant. <i>Note: The Olefines Cooling Tower collapse that occurred on the morning of 28th February 2023 was deemed by SafeWork and the emergency services as presenting a potential hazard that may</i>

Unique ID Consent Condition #	Compliance Requirement	Development Phase	Monitoring Methodology	Evidence and Comments
				<i>impact on the adjacent Air Liquide site (specifically hydrogen trailers). During the emergency response, emergency services cordoned off and evacuated certain offsite areas.</i>
6 ^{MOD2~}	Triennial Hazard Audit in accordance with HIPAP 5 <i>Hazard Audit Guidelines</i>	Ongoing	Scheduling of Triennial hazard audits as well as the stewardship of audit recommendations are managed under Qenos SMS element <i>SHEOP6.6 Regulatory Compliance.</i>	2020 Hazard Audit completed with four recommendations. All Hazard Audit recommendations completed. Next Hazard Audit has been deferred to 2024 due to the extended site outage.
7	Further Requirements arising from Conditions 2 to 6	Ongoing	Managed under Qenos SMS element <i>SHEOP 6.6 Regulatory Compliance</i>	There are no outstanding follow-up items.
8 ^{MOD2+}	Traffic Management Plan & Vehicle Restrictions (hydrogen trailer maximum length)	Pre-Commissioning	Managed under Qenos SMS element <i>SHEOP 8.1a Third Party Services: Distribution</i>	Condition satisfied. Traffic Management Plan identifies preferred routes for heavy vehicles and contracts with distribution service providers enforce use of these routes. Modified condition included a hydrogen trailer length restriction; hydrogen trailer bay currently mothballed.
9	Environmental Management Plan	Pre-Construction	N/A	Condition satisfied. There is a standing procedure across the BIP to manage legacy contamination and disposal of spoil which requires sign off by the BIP environmental officer.
10 ^{MOD2+}	Waste Management Strategy	Pre-Commissioning	All wastes are managed in accordance with EPA guidelines and as outlined in the WMS submitted.	There are no outstanding waste issues.

Unique ID Consent Condition #	Compliance Requirement	Development Phase	Monitoring Methodology	Evidence and Comments
11	Sydney Airports Corporation Approvals for elevated structures and construction cranes	Pre-Construction	Managed under Qenos SMS element <i>SHEOP 7.1 Management of Change</i> process	Condition satisfied, all approvals were applied for and granted
12	Impact on Amenity of Neighbourhood	Ongoing	Condition managed by EPL 10000.	Qenos submits an Annual Return to EPA titled "Compliance Certificate for Licence 10000 for Period Ending 15 th October".
13	Emission of Odours	Ongoing	Condition managed by EPL 10000.	This documents all non-compliances and complaints for the Qenos plants operating on the BIP.
14	Storage of Materials to be on site	Ongoing	N/A	Site is large, condition is readily complied with.
15	Location of Work to be carried out on site	Ongoing	N/A	Site is large, condition is readily complied with.
16	Colour Scheme	Pre-Construction	N/A	Condition satisfied
17	Noise emissions (not to exceed residential boundary limits)	Ongoing	Condition managed by EPL 10000.	Condition satisfied. EPL Annual Return includes details of monthly noise monitoring at the BIP site boundary. Annual compliance has been achieved.
18	Noise emissions (not to exceed industrial boundary limits)	Ongoing	Condition managed by EPL 10000.	Condition satisfied. EPL Annual Return includes details of monthly noise monitoring at the BIP site boundary. Annual compliance has been achieved.
19 ^{MOD1-}	Noise emissions (noise attenuation measures)	Ongoing	Noise attenuation measures are identified and required to be maintained or if modified done so under Qenos SMS element <i>SHEOP 7.1 Management of Change</i>	Condition satisfied

Unique ID Consent Condition #	Compliance Requirement	Development Phase	Monitoring Methodology	Evidence and Comments
20 ^{MOD2+}	Construction Restrictions to limit vibration effects (“augured piling”)	Construction	N/A	Condition satisfied
21 ^{MOD2-}	Annual Report of the implementation and effectiveness of consent conditions and record of traffic movements	Ongoing	Annual submission managed under Qenos SMS element <i>SHEOP 6.6 Regulatory Compliance</i>	This report is submitted to comply with this consent condition. Refer to Appendix D: Record of Traffic Movements .
21A ^{MOD2+}	Construction Environmental Management Plan	Pre-Construction	N/A	Condition satisfied
21B ^{MOD2+}	Staged and Combined Submission of Plans	Ongoing	Managed under Qenos SMS element <i>SHEOP 6.6 Regulatory Compliance</i>	Condition satisfied
22	Disputes in Conditions	Ongoing	Managed under Qenos SMS element <i>SHEOP 6.6 Regulatory Compliance</i>	Qenos does not have, nor is aware of, any disputes in the conditions.

Table 2: DA35/97 Conditions of Consent Compliance Table

Appendix C: Environmental Performance

Environmental Aspect	Approval Criteria; Requirements in the Management Plan; Relevant predictions in the EA	Summary of Monitoring Results in the Previous Reporting Period	Summary of Monitoring Results in this Reporting Period	Improvement Measures to be Implemented
Stormwater	Storm water has been managed in accordance with environmental regulations. The Conditions of Consent provide a general condition not to affect the amenity of the neighbourhood as well as management of polyethylene particulates and floss.	There were no complaints received nor reports required to be made, during the previous reporting period, to EPA relating to the storm water operations of this development.	There have been no complaints received nor reports required to be made, during the reporting period, to EPA relating to the storm water operations of this development.	Storm water management ensures that potential spills of solid polymer pellets, particle fines, liquid hydrocarbons or oil are captured by a first flush storm water pit with weirs and separators. There are currently no improvement items identified nor plans in place.
Plant Effluent (Trade Waste Agreement)	Plant effluent has been managed in accordance with the Trade Waste Agreement with Sydney Water. Effluent leaves the site via the 14 th Avenue Trade Waste discharge point where it is received by the Malabar Sewerage Treatment Works. There are no additional, ongoing, effluent/trade waste management requirements under the Conditions of Consent.	Effluent is sent to a diversion basin in the event that effluent is outside Trade Waste licence limits. There were no complaints received nor reports required to be made, during the previous reporting period, to Sydney Water relating to the effluent operations from this development.	Effluent is sent to a diversion basin in the event that effluent is outside Trade Waste licence limits. There have been no complaints received nor reports required to be made, during the reporting period, to Sydney Water relating to the effluent operations from this development.	Potential effluent risk exposures are primarily large hydrocarbon and oil spills to drain. The plant is well protected by a collection pit and effluent treatment system including oil separation. The 14 th Ave Trade Waste discharge point receives effluent flows from a number of plants. The nature and volume of effluent from the Alkatuff plant is small relative to other plants. The total effluent stream is continuously monitored and alarmed. There are currently no improvement items identified nor plans in place.
Air Emissions	Emissions to air have been managed in accordance	Reported emissions levels associated with this	There were no noteworthy changes in reported	Emissions to air, for this development, are primarily

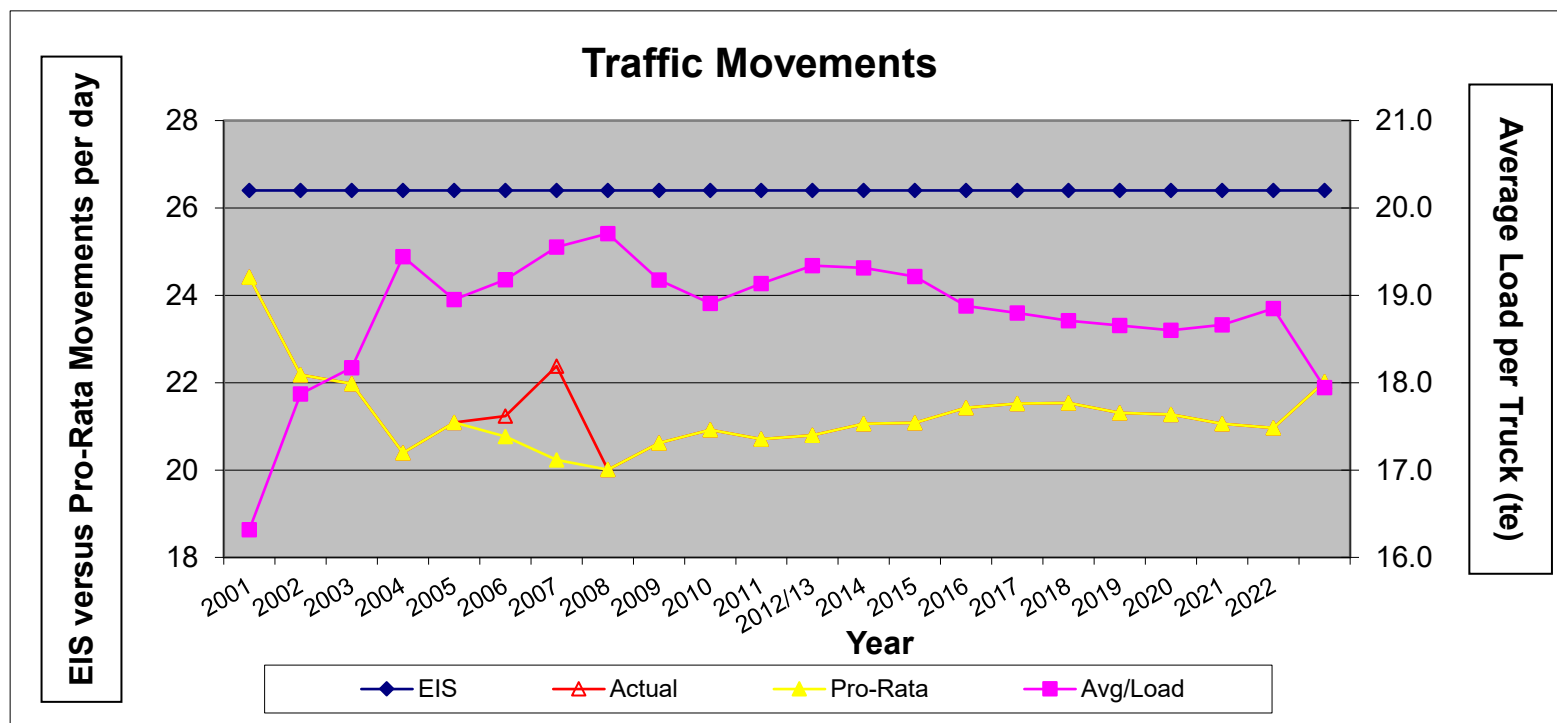
Environmental Aspect	Approval Criteria; Requirements in the Management Plan; Relevant predictions in the EA	Summary of Monitoring Results in the Previous Reporting Period	Summary of Monitoring Results in this Reporting Period	Improvement Measures to be Implemented
	with EPA licence and environmental regulations. The Conditions of Consent provide a general condition not to affect the amenity of the neighbourhood as well as emissions of odour or odorous air impurities.	development were comparable with previous years. There have been no complaints received nor reports required to be made, during the previous reporting period, to EPA relating to the air emissions from this development. There were no LBL exceedances for this development.	emissions levels associated with this development as compared with previous years. There have been no complaints received nor reports required to be made, during the reporting period, to EPA relating to the air emissions from this development. There were no LBL exceedances for this development. There was a smoking flare event on the 26/7/19 which exceeded the EPL.	concerned with fugitive emissions (e.g. tank breathing, mechanical seals and valve glands); release of unburnt hydrocarbons; products of combustion (NOx, soot and fine particulates). Emissions are monitored and calculated as part of the EPA load base licensing regime. To address the Alkatuff flare smoking operation a Pollution Reduction Plan (PRP) was added to the EPL on 18/10/19 (EPA Licence Variation 1585822) this was further revised on 11/11/21 – refer to Appendix E: EPA Licence Variation 1612459 Extract for further details.
Noise Level at the Boundary	Noise emissions have been managed in accordance with EPA licence and environmental regulations. The Conditions of Consent provide a general condition not to affect the amenity of the neighbourhood as well as specific noise limits at the boundary. The Consent Condition boundary noise level limits	Noise monitoring was conducted monthly for the Botany Industrial Park (BIP) site. There were no noteworthy changes in reported noise emission levels compared with previous years associated with this development. There have been no complaints received nor reports required to be made, during the reporting	Noise monitoring was conducted monthly for the Botany Industrial Park (BIP) site. There were no noteworthy changes in reported noise emission levels compared with previous years associated with this development. There have been no complaints received nor reports required to be made, during the reporting	All new equipment must be reviewed against the company engineering standards regarding both occupational and boundary noise levels. There are currently no specific improvement items identified nor plans in place to reduce noise emissions.

Environmental Aspect	Approval Criteria; Requirements in the Management Plan; Relevant predictions in the EA	Summary of Monitoring Results in the Previous Reporting Period	Summary of Monitoring Results in this Reporting Period	Improvement Measures to be Implemented
	have been superseded by stricter EPA Pollution Reduction Programs over the life of the development.	period, to EPA relating to the noise emissions from this development.	period, to EPA relating to the noise emissions from this development.	
Waste Management	The generation of wastes and their appropriate disposal was the subject of Consent Conditions issued as part of the plant capacity upgrade development (DA35/97). All wastes are disposed of in accordance with EPA requirements.	There have been no complaints received nor reports required to be made, during the previous reporting period, to EPA relating to waste management associated with this development.	There have been no complaints received nor reports required to be made, during the reporting period, to EPA relating to waste management associated with this development.	The wastes that were generated in the early years of operation were the subject of the upgrade development consent. The comprehensive Waste Management Strategy developed and implemented during the upgrade development cleared all waste stockpiles as well as minimised the generation of wastes and increased recycling of polymer waste. Reliable plant operations continue to support low waste generation outcomes. There are currently no specific improvement items identified nor plans in place to reduce waste generation.
Traffic Management	The Conditions of Consent define specific reporting requirements in relation to traffic specifically truck movements.	The detailed report, provided in Appendix D: Record of Traffic Movements provides the historical performance of truck movements since the commencement of operations in Aug 1992.	Refer to detailed report is provided in Appendix D: Record of Traffic Movements .	The volume of trucks is a function of production output, container type, product bulk density and fill efficiency. There is a strong economic driver to minimise truck movements so the fill efficiency of each load is monitored and recorded.

Environmental Aspect	Approval Criteria; Requirements in the Management Plan; Relevant predictions in the EA	Summary of Monitoring Results in the Previous Reporting Period	Summary of Monitoring Results in this Reporting Period	Improvement Measures to be Implemented
				There are currently no specific improvement items identified nor plans in place to reduce truck movements or more specifically the truck fill efficiency other than the day to day monitoring and troubleshooting.
Public Amenity	The Conditions of Consent provide a general condition not to affect the amenity of the neighbourhood.	There were no community complaints received during the previous reporting period related to this development.	There were no community complaints received during the reporting period related to this development.	The operation of the elevated flare has in the past caused concern to the community even though its operation provides a safety function. This is addressed by notifying the EPA Environment Line, two Local Area Police Commands, Fire & Rescue NSW Command Centre, commercial and industrial neighbours as well as local schools (during school hours), whenever the elevated flare is operated. The Qenos and BIP websites and Qenos FaceBook page also contains information on the elevated flare purpose and operation.
Special Note: PFAS Firefighting Foams	Legislation introduced in 2021 under the NSW POEO Act 1997 places restrictions on the purchase and on-going use of fire-fighting foams containing PFAS (concern for the potential environmental and human health impact of PFAS (PerFluoroAlkyl and PolyFluoroAlkyl Substances). Under the <i>Protection of the Environment Operations (General) Amendment (PFAS Firefighting Foam) Regulation 2021</i> , from the 26 September 2022 it is an offence to discharge PFAS fire-fighting foam for the purposes of fire-fighting, training or demonstration. Qenos has migrated the Alkatuff plant PFAS fire-fighting foam supplies across to fluorine free foam, Respondol ATF 3-3.			

Appendix D: Record of Traffic Movements

The following data is provided regarding traffic movements associated with delivery of raw materials and distribution of finished products. From the data it can be seen that both the *actual* and *pro-rata* traffic movements are well below the projected upgrade EIS movements. As with previous years, a trend line has been provided to show the positive impact of bulk distribution efficiency of finished goods. The **average finished product load of 17.9te** is not as good as recent previous years largely affected by the significant outage. Average finished product per load is a function of a number of factors including: grade mix/pellet cut (affects bulk density), number of product changes and associated part containers, container size and safe filling volumes. Strong commercial reasons including availability of containers maintain focus to maximise the fill efficiency of containers.



In previous years, production from the plant had reached nameplate capacity hence the red trend line was added to reflect actual movements (as these were above the pro-rata figure for 2006 and 2007 only). **The 2023 plant throughput of 63.5kt** was well below nameplate capacity of 125kt due primarily to loss of feedstock associated with Olefines Cooling Tower collapse; other factors affecting throughput include grade mix, operational issues and planned maintenance outage (flare repairs). The delivery of hydrogen trailers, as per approved modified consent, commenced 20th

December 2012. The contract with Coregas for trailer supply of hydrogen came to an end in December 2017. Hydrogen supply has returned to pipeline supply from an Air Liquide facility which is located adjacent to the Botany Industrial Park. Whilst the hydrogen trailer movements represented a modest 2 movements per week the return to pipeline supply represents a further reduction in traffic movements. Bulk load efficiency remains high and the number of traffic movements per day has remained well under EIS traffic movement figures associated with the upgrade approval.

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Raw materials	482	416	351	346	480	471	449	337	349
Finished Goods	6806	6379	4801	5266	6444	6665	7071	5630	5567
Total movements	7288	6795	5152	5612	6924	7136	7520	5967	5916
Actual movements per day	21.7	20.2	15.3	16.7	20.6	21.2 Δ	22.4 Δ	17.8	17.6
Pro Rata movements per day	24.4	22.2	22.0	20.4	21.1	20.6	20.2	20.0	20.6
EIS movements per day	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4
	2010	2011	2012/3	2014	2015	2016	2017	2018	2019
Raw materials	408	391	730	436	536	504	510	470	426
Finished Goods	6456	6012	9029	4665	6016	5790	5843	5650	6207
Total movements	6864	6403	9759	5101	6552	6294	6353	6120	6633
Actual movements per day	20.4	19.1	16.6	15.2	19.5	18.7	18.9	18.2	19.7
Pro Rata movements per day	20.9	20.7	20.8	21.1	21.1	21.4	21.5	21.5	21.3
EIS movements per day	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4
	2020	2021	2022	2023	2024	2025	2026	2027	2028
Raw materials	397	349	387	219					
Finished Goods	6234	6189	6231	3536					
Total movements	6631	6538	6618	3755					
Actual movements per day	19.7	19.5	19.7	11.2					
Pro Rata movements per day	21.3	21.1	21.0	22.0					
EIS movements per day	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4

Explanation of Terms:

Raw Materials – number of movements associated with raw materials

Finished Goods – number of movements associated with finished goods

Total movements – sum of raw material movements and finished goods movements

Actual movements per day – actual plant data, normalised for 7 day per week, 48 weeks per annum operation

Pro Rata movements per day – actual plant data pro-rata at production of 125ktpa, normalised for 7 day per week, 48 weeks per annum operation

EIS movements per day – movements stated in EIS and used as basis of comparison at production of 125ktpa (nameplate)

Notes:

- Data is based on actual movements in a 12 month period (2014 Annual Report = start of August of previous year to end of July of current year inclusive).
- Data represents the movements of trucks into the site (one way)

Appendix E: EPA Licence Variation 1612459 Extract (Extract pages. 19, 20 of 25)

Section 55 Protection of the Environment Operations Act 1997

Environment Protection Licence



Licence - 10000

Stormwater Improvement	Continuous improvement program for stormwater management. The licensee must submit a report with each annual return outlining the achievements during the reporting period and proposals for next reporting period.	13-December-2008
Fugitive Emissions - Continuous Improvement	Continuous improvement program of fugitive emissions management. The licensee must submit a report with each annual return detailing sources of fugitive emissions, programs implemented and progress made towards improved environmental management of the site.	13-December-2008
Assessment Of Best Practice For Benzene Storage	Coat storage tanks and/or install domed tanks to replace F353 and F339 to achieve improved environmental management of the site.	19-February-2013
Reducing VOC emissions	One of the major PRP project elements was successfully implemented.	19-February-2013
Olefins Plant Main Process Effluent Pit Cover Implementation Program	Olefins Plant Main Process Effluent Pits Seal Replacement	08-December-2016

8 Pollution Studies and Reduction Programs

U1 Optimisation of Alkatuff Flare Operation

U1.1 The purpose of this PRP is to ensure that the Alkatuff Flare is designed, constructed, operated and maintained in a manner that:

- minimises air emissions during the operation of the flare.
- minimises visible emissions from the flare and ensures visible smoke emissions do not occur for a period exceeding 5 minutes per flaring event.

U1.2 The licensee must complete a review of the current performance status of Alkatuff Flare. The review must include, as a minimum:

- A survey of current flare status, including:
 - All operating parameters
 - Flare process monitoring data
 - Flare design specifications
 - Flare operating procedures
 - Causes of flare smoking incidents
- Assessment of the capability of the existing flare to operate to design conditions.
- Assessment of the capability of the existing flare design to:
 - minimise air emissions during the operation of the flare.
 - minimise visible emissions from the flare and ensures visible smoke emissions do not occur for a period exceeding 5 minutes per flaring event.
- Proposed adjustments of flare operating conditions, for immediate implementation to the Alkatuff Flare, to minimise visible emissions caused by the operation of the flare.
- Propose maintenance, modification and/or replacement options for the Alkatuff Flare to ensure that the purpose of the PRP (U1.1) is achieved.
- Based on (e), above, propose a preferred mitigation option and timeline for implementation.



Environment Protection Licence

Licence - 10000

U1.3 The licensee must provide a report of the review which addresses U1.1 and U1.2 to the Director -Sydney Industry, EPA at metro.regulation@epa.nsw.gov.au by 5pm 31 December 2019.

U1.4 Following receipt and consideration of the EPA's comments on the report required under U1.3, the licensee will implement, by 30 December 2022, the preferred mitigation option to ensure the Alkatuff Flare is designed, constructed, operated and maintained in a manner that:

- i) minimises air emissions during the operation of the flare.
- ii) minimises visible emissions from the flare and ensures visible smoke emissions do not occur for a period exceeding 5 minutes per flaring event.

U1.5 The licensee must complete a review of the operating conditions of the Alkatuff Flare over 12 months, capturing a minimum of two rounds of AlkaMax production, following the implementation of the preferred mitigation option and provide a report to the Director - Sydney Industry, EPA at ReqOps.MetroRegulation@epa.nsw.gov.au by 5pm 30 March 2024. This report must include, as a minimum:

- a) A survey of the overhauled flare status, including:
 - i) All operating parameters
 - ii) Flare process monitoring data
 - iii) Flare design specifications
 - iv) Flare operating procedures
- b) Evaluation of potential flare smoking during AlkaMax production
- c) Procedures and controls to mitigate potential flare smoking events
- d) A log of all flare smoking events including an analysis of cause, evaluation of impacts and actions taken to control smoking event
- e) Assessment of the capability of the existing flare design to:
 - i) minimise air emissions during the operation of the flare
 - ii) minimise visible emissions from the flare and ensures visible smoke emissions do not occur for a period exceeding 5 minutes per flaring event.

Appendix F: Status of 2020 Hazard Audit Recommendations

Botany Industrial Park
16-20 Beauchamp Road, Matraville
Sydney NSW 2036 Australia

Title: Hazard Audit (Dec 2020) Alkatuff Action Plan
Owner: Anna Hasn
Revision: 3 Date: 31 August 2022

Item No.	Hazard Audit Recommendation	Action Taken	Responsibility	Completion Date	Status
1	Provide controls to prevent people inadvertently using the redundant but corroded platform on the southern top-loader. Include this platform as well as the adjacent northern platform on the redundant equipment register	Equipment is on the <i>Redundant Equipment Register</i> subject to periodic integrity inspections along with improved signage and chains to prevent usage. Refer to OFI TUF006931: Address The Risk Of Redundant Top Loading Equipment At Alkatuff <i>Refer to picture below table</i>	Anna Hasn	30/07/2022	Completed
2	Include in the appropriate procedure the requirement to pump-out the spill pit for the hexene unloading area as it was observed to have a significant quantity of water and hence a corresponding loss of containment capacity	Update procedure to change from periodic observation and pump-out to connecting the pump-out to the task of unloading the road tanker.	Nanda Kumar	30/06/2021	Completed
3	Confirm that the ICA pump discharge piping (corrosion observed) is included in the preventative maintenance system	Provide documentation demonstrating that ICA pump discharge piping is included in the corrosion control program.	Jason Porter	13/11/2020	Completed

Item No.	Hazard Audit Recommendation	Action Taken	Responsibility	Completion Date	Status
4	Ensure that the control room SDS manual is kept up-to-date as some of the SDS's were observed to be more than five years old	Develop periodic review schedule to trigger update of physical SDS copies in sync with the electronic database. During the audit, the electronic copies were observed to be in date. Only the paper copies were more than five years old.	Tien Pham	30/06/2021	Completed

