



**Botany Repack Facility
Environmental Assessment
DA 35/98 Modification 5**

**Ixom Operations Pty Ltd
Block A, Botany Industrial Park,
16-20 Beauchamp Rd, Matraville**

Rev	Status	Comment	Prepared	Checked	Approved	Date
A	Preliminary Environmental Assessment	Block M	Julian Ardas (PlanCom)	Mark Jarvis (Ixom)	Mark Jarvis (Ixom)	18-11-16
B	Draft Environmental Assessment	Block A	Mark Jarvis (Ixom)	Julian Ardas (PlanCom)	Mark Jarvis (Ixom)	22-12-17
C	Draft Environmental Assessment	Capture DP&E Comments	Mark Jarvis (Ixom)	Mark Jarvis (Ixom)	Mark Jarvis (Ixom)	16-04-18
0	Formally Submitted Environmental Assessment	Capture DP&E Comments	Mark Jarvis (Ixom)	Mark Jarvis (Ixom)	Mark Jarvis (Ixom)	27-06-18

Executive Summary

Ixom manufactures chemicals at the Botany Industrial Park (BIP) Chlor-Alkali Plant (CAP), which are sold in bulk and distributed via tanker. Most end use customers do not have sufficient demand or storage to justify bulk deliveries, and purchase these chemicals from repackers. These repackers procure in bulk from Ixom, and then parcel into smaller containers such as Intermediate Bulk Containers (IBCs), and sell to the marketplace.

It is proposed to construct a new Repack Facility at the Botany CAP. This would enable repacking hydrochloric acid (HCl), liquid caustic soda (caustic, sodium hydroxide, NaOH) and sodium hypochlorite (hypo, NaOCl) into 1,000L IBCs and 200L drums.

This Environmental Assessment (EA) has been prepared for the Botany Repack Facility on Block A at Botany Industrial Park, 16-20 Beauchamp Rd, Matraville. The EA considers the environmental impacts associated with the proposal, in accordance with Section 75W of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The Proposal is considered consistent with all relevant planning and environmental legislation, it addresses the Secretary's Environmental Assessment Requirements (SEARs) and is consistent with the previous Development Application (DA) consent 35/98.

The facility would facilitate several benefits to the wider community:

- Bringing these repacking operations in house in lieu of being undertaken by external third party providers enables Ixom to have full control of repacking Class 8 Dangerous Goods. Ixom would manage environmental risks by leveraging off extensive expertise and experience. This has lower environmental risk than third-party providers who handle small volumes of many chemicals, with different characteristics
- Chemicals would be despatched in smaller volume packages and trucks, reducing the consequence of an unlikely off-site spill
- The facility would eliminate one off-site truck movement for each unit of chemical repacked, by removing one destination (i.e. the incumbent repackers) from the supply chain. This reduces the overall operational impact and risk on NSW roads
- The facility creates jobs. It would employ 2-3 additional long term full time equivalent personnel dedicated exclusively to the new manufacturing facility in NSW's challenging manufacturing industry
- The facility would also require long term maintenance, administration and management support personnel, and encourage ongoing employment through continued use of the CAP
- The facility provides short term local employment during construction; and
- The facility would be a long term profitable operation that pays taxes to the Australian federal government.

Minor administrative amendments only would be required to Ixom licences, consents and conditions.

The facility would result in only negligible possible environmental impacts. Each impact can be effectively controlled and confined to the new site.

Ixom has lodged this EA under Section 75W of the EP&A Act. Ixom requests Department of Planning and Environment (DP&E) to assess and provide consent for Ixom to construct this proposed modification.

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1. Introduction

1.1. Intention of this EA Document

This EA has been prepared for the Botany Repack Facility on Block A at Botany Industrial Park, 16-20 Beauchamp Rd, Matraville.

The EA considers the environmental impacts associated with the proposal in accordance with Section 75W of the EP&A Act.

The EA is based on a review of relevant environmental and planning legislation, analysis of past approvals for the site, an assessment of the predicted environmental impacts of the modification and capturing the DP&E's SEARs.

The intention of this EA is to:

- Describe the existing site and its surrounding context
- Present the project need, its justification and alternatives considered
- Identify and evaluate all matters affecting or likely to affect the environment
- Consider the relevant statutory framework as required under Section 75W of the EP&A Act and other relevant legislation
- Consider and respond to matters raised by DP&E in the SEARs for DA35/98 Modification 5
- Consult with external stakeholders including the Environment Protection Authority (EPA), SafeWork NSW (SWNSW) and Bayside City Council (BCC)
- Consult with BIP Class A Stakeholders including the land owner Orica, the BIP Community Liaison Committee and BIP Operations Managers
- Assess the environmental impacts of the proposal; and
- Develop environmental management and mitigation measures to minimise potential environmental impacts identified for the proposed modification.

The above points are addressed in the following key sections:

- Section 1 – Introduction to the proposal
- Section 2 – Site location and context
- Section 3 – Statutory legislation
- Section 4 – Stakeholder engagement and responses to date
- Section 5 – Project need, justification and alternatives
- Section 6 – Description of the modification
- Section 7 – Environmental assessment of the key environmental issues
- Section 8 – Recommendation; and
- Section 9 – Appendices.

1.2. Existing Ixom Botany CAP – Overview

Ixom's Botany ChlorAlkali Plant was formerly owned by Orica Australia Pty Ltd (Orica), until Orica divested its industrials chemicals businesses to Ixom in 2015. Ixom Operations Pty Ltd and Orica Ltd are each a party to a lease over land identified as New Lots 1, 2, 3, 4, and 7, otherwise known as the 'Chemicals Plant Area', located at Botany, New South Wales.

Ixom manufactures various chemicals at the CAP. These chemicals are sold in bulk and distributed via tanker to customers in New South Wales and across Australia.

1.3. Existing Ixom Botany CAP – Process Description

The CAP is an integrated complex of plants producing chlorine-based products from electrolysis of natural sea salt. Ixom's four main products are sodium hypochlorite, hydrochloric acid, caustic soda and ferric chloride.

Hydrogen is produced as a by-product. The plant is based on modern mercury-free membrane technology with capacity of 90 tonnes per day of chlorine.

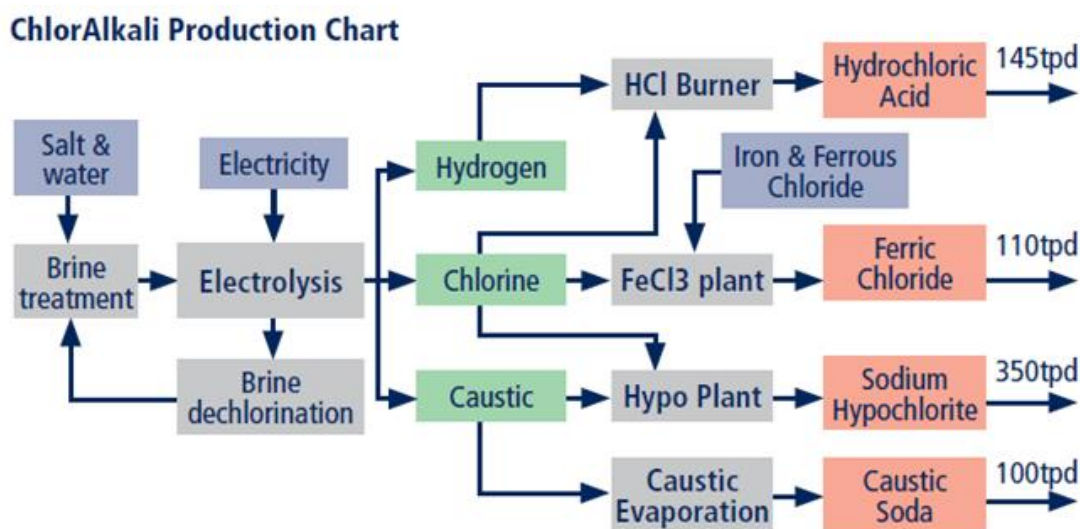
The chlorine produced on site is used in the manufacture of hydrochloric acid, sodium hypochlorite and ferric chloride, with these downstream processes being collectively referred to as product plants. All chlorine produced at the CAP is consumed in the product plants.

The facility stores chlorine drums and cylinders filled in Laverton, Victoria, for distribution.

Ferrous chloride (also known as pickle liquor), recycled from steel pickling bi-products, is stored on site for use by Sydney Water in waste water treatment and handling.

Figure 1.1 provides an overview of the CAP and typical approximate product plant process flows.

Figure 1.1 Chlor-Alkali Production Chart



The CAP consists of the following main process areas:

- Brine treatment/purification
- Brine electrolysis
- Caustic evaporation
- Chlorine cooling, drying and compression
- Hydrogen compression
- Effluent treatment; and
- Emergency chlorine scrubber.

The product plants comprise of the following:

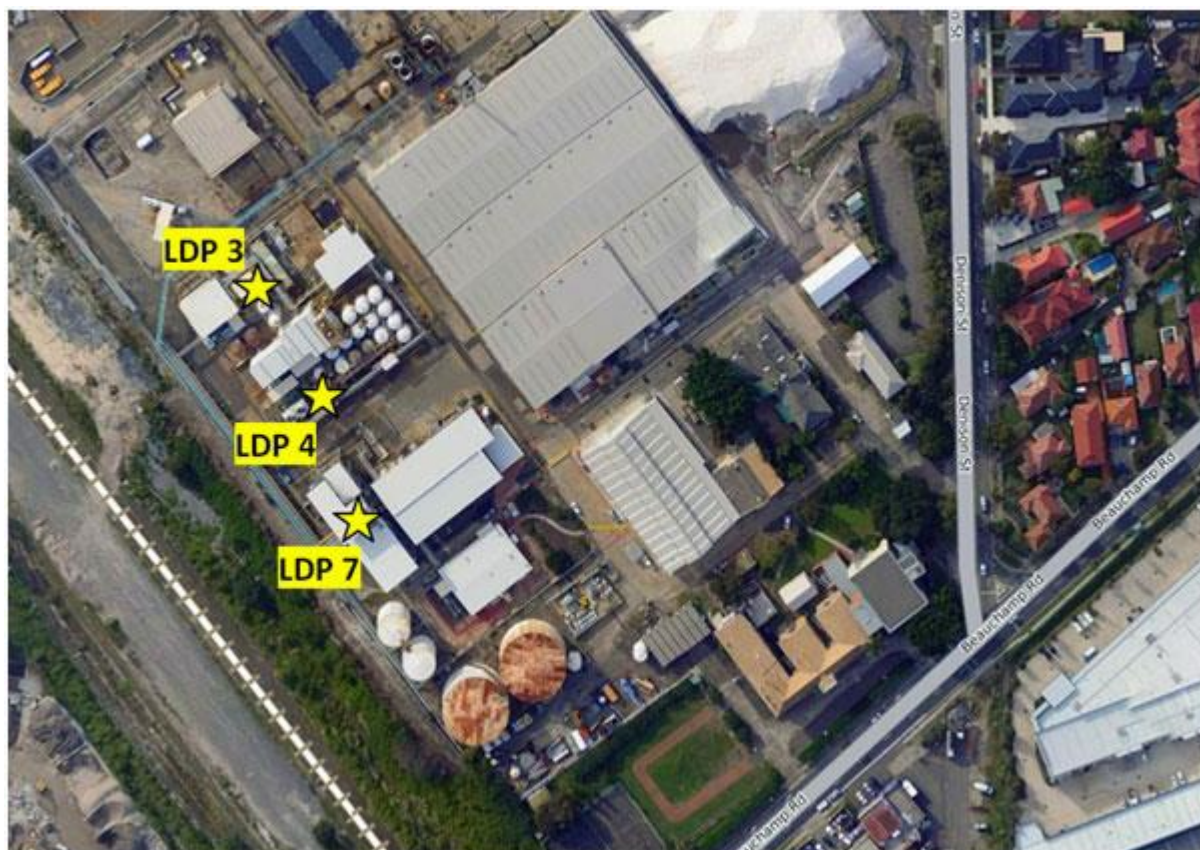
- Hydrochloric acid production
- Sodium hypochlorite production; and
- Ferric chloride production.

For further details please refer to Appendix 3 – Existing CAP Description.

1.4. Existing Ixom Botany CAP – Licensed Discharge Points

The CAP has three discharge points on Environment Protection Licence (EPL) 20547. These are the sodium hypochlorite backing tower located at the sodium hypochlorite plant, the absorption tail tower located at the hydrochloric acid plant, and the emergency chlorine scrubber, as shown in Figure 1.2.

Figure 1.2 Licence Discharge Points



These licensed discharge points are described below:

- Sodium hypochlorite Backing Tower - LDP 3: The backing tower is the end of the line emergency scrubber for the hypo and ferric plants. Its main duty is to remove the remainder of chlorine at the outlet of the hypo plant. It is designed to scrub the chlorine to less than 1 part per million, even during plant upset conditions
- Tail Tower – LDP 4: The tail tower is used to dissolve any unabsorbed gases coming from the synthesis tower. By the time the gases reach atmosphere any remaining HCl fumes will have been dissolved in the demineralised water; and
- Emergency chlorine scrubber – LDP 7: The emergency chlorine scrubber is installed to remove any remaining chlorine from the gas stream before being vented to atmosphere, or if a chlorine plant process upset occurs requiring absorption of all chlorine produced. The tower absorbs the gases vented to control the pressure in the chlorine distribution system.

1.5. Existing Ixom Botany CAP – Major Hazard Facility

Ixom's continuous operations at the Botany site have been deemed to be a Major Hazard Facility (MHF) and as such, Ixom is required to satisfy the requirements of the NSW Work Health and Safety (WHS) Regulation, 2011, notably Chapter 9 relating to MHF. This enables the facility to be registered and approved to operate.

Ixom has prepared and submitted a safety report that forms part of the application for registration. It provides a written presentation of technical, management and operational information about the hazards and risks that may lead to a major accident and the control of these hazards and risks.

Ixom has implemented Safety, Health and Environmental (SH&E) management systems, processes, procedures and practices that have been developed are fit for purpose and verified by audits. The control measures adopted for the major incident scenarios are appropriate for controlling the hazards and for maintaining the risk of major incidents at as low as reasonably practicable levels.

Continuous safe operation of the facilities is ensured by the SH&E management system. This provides a comprehensive and integrated management system for all aspects of control measures and is based on Ixom SH&E standards and model procedures.

1.6. Existing Ixom Botany CAP – Planning Context

Ixom's CAP operates in accordance with development consent DA No 35/98, originally granted to Orica by the Minister for Urban Affairs and Planning on 6 November 1998 under the Unamended Environmental Planning and Assessment Act 1979, and State Environmental Planning Policy (SEPP) No 34 – Major Employment Generating Industrial Development. The content can be found in Appendix 9 – Existing DA 35/98 Conditions of Consent.

The executive summary of the original '*Environmental Impact Statement for Replacement of Chlor-Alkali Plant*' dated 25 June 1998 provides an outline of activities generally completed under the original consent. These can be found in Appendix 9 – Existing DA 35/98 Conditions of Consent.

Table 1.1 below summarises the approved consent to date.

Table 1.1 DA35/98 Consent Summary

Determination Date	Modification	Description
06 / 11 / 1998	Original DA35/98 Consent	Installation of replacement CAP to produce 35,000 tonnes per annum gaseous chlorine
06 / 06 / 2006	Modification 2	Demolish the decommissioned CAP buildings at BIP
29 / 09 / 2009	Modification 3	Relocate sodium hypochlorite plant
10 / 09 / 2012	Modification 4	Replacement of caustic tanks

Previous modifications to the CAP have been approved as modifications to the existing consent to DA 35/98. Although Part 3A was repealed by the Environmental Planning and Assessment Amendment (Part 3A Repeal) Act 2011, Section 75W continues to be the applicable modification provision for DA 35/98.

The project is a transitional Part 3A project under Schedule 2 of the Planning and Environmental Assessment (Savings, Transitional and Other Provisions) Regulation 2017. This states that provisions in the repealed Part 3A, such as section 75W, continue to apply to and in respect of a transitional Part 3A project. DP&E has confirmed that 75W is the appropriate pathway for this proposal.

1.7. Existing Ixom Botany CAP – DA 35/98 Conditions of Consent

Please refer to the latest modification determined on 6th August 2015 (Schedules 1, 2, and 3) in Appendix 9 – Existing DA 35/98 Conditions of Consent.

Schedule 4 remains unchanged from the original Consent Determination 35/98.

Details showing how the proposal addresses the requirements in the Conditions of Consent is also captured in Tables 5.2 and 5.3.

2. Site Location

2.1. Site Selection

The proposed site location is Block A, Lot 1101, otherwise referred to as Lot 1, of Deposited Plan 1039919, within BIP manufacturing complex.

This is within the southern part of the Ixom lease area on the BIP, as shown on Figures 2.3, 2.4 and 2.5.

Ixom holds a lease over the proposed site, from the land owner, Orica.

The street address is 16-20 Beauchamp Rd, Matraville in Bayside City Council.

BIP Block A was selected as the location for the Botany Repack Facility due to:

- the facility is located within BIP, which is a requirement given proximity to where chemicals to be repacked are manufactured
- the facility is located entirely within the Ixom lease from Orica
- the land parcel is not currently used for any key operational activity
- relatively flat land, which minimises earthworks and associated risks and issues around disturbed soil
- compared to other BIP land parcels, Block A has a relatively low potential for contaminated land environmental impacts
- the land parcel layout and footprint is sufficient to store 400 full IBCs, which meets the project functional requirements
- the facility would be manned. Block A provides the necessary buffer distance from Huntsman Chemicals, which significantly reduces the risk of an ethylene oxide explosion causing harm to Botany Repack personnel
- the land parcel is close to some (not all) existing amenities, services and tie-in points, which maximises operational efficiencies; and
- relatively low ambient background noise, which minimises impact on operators manning this facility.

Photos and further details showing current conditions of the proposed site are shown in Appendix 4 – Existing Site Features and in Figures 2.1 and 2.2 below:

Figure 2.1 Site Context – Site Photo from North



Figure 2.2 Site Context – Site Photo from South



2.2. Site Details

A location plan showing the site context of the proposed development is shown in Figures 2.3, 2.4 and 2.5.

Figure 2.3 Site Context – Lot Number

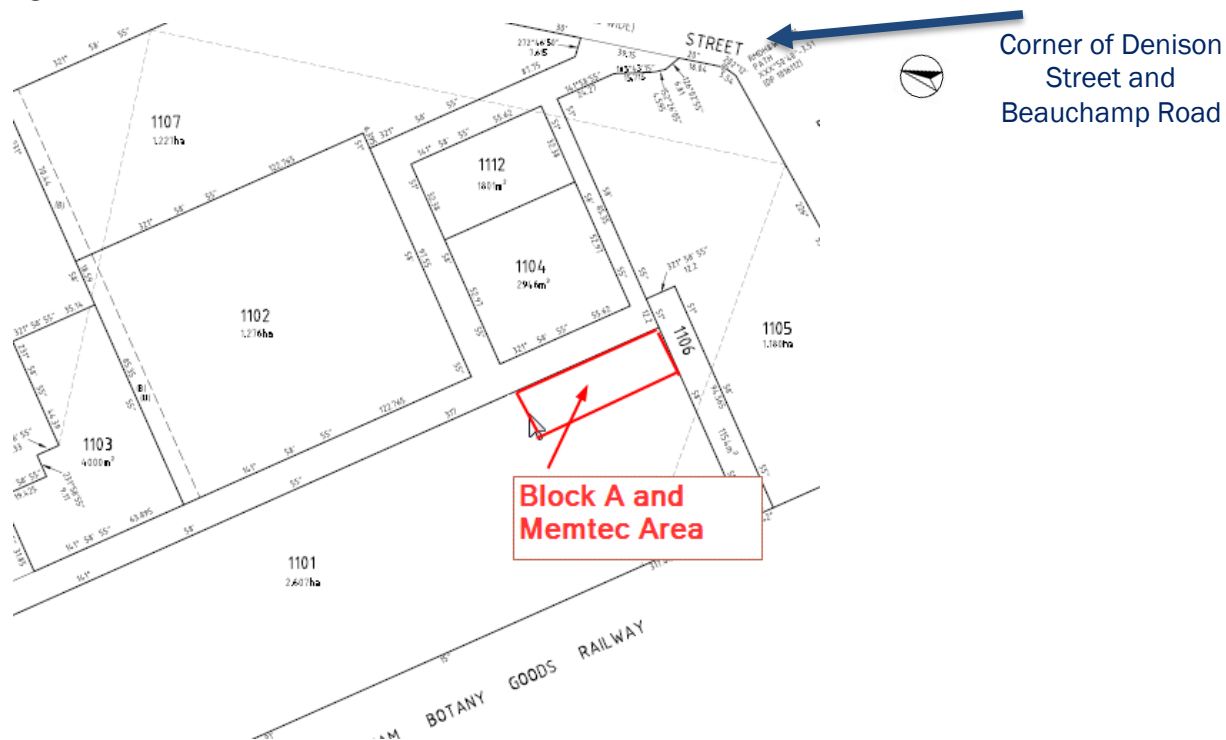


Figure 2.4 Site Context – Planning Scheme



Figure 2.5 Site Context – Site Footprint



2.3. Area Surrounding Site

The proposed site in Figure 2.4 is surrounded by the following existing development:

- The nearest BIP site boundaries are Denison St to the east a minimum of 130m away and the goods rail easement to the west around 120m away. The nearest neighbouring non-Ixm plant is Huntsman around 200m north
- To the north is Ixm's CAP and new salt storage area. Further north are industrial warehouses and premises situated within the BIP, including the Qenos manufacturing facilities and Huntsman surfactant manufacturing facilities
- To the east is Ixm's workshop area and administration building. Further east are industrial warehouses and other premises situated within the BIP, including Huntsman surfactant manufacturing facilities and Orica operations. Detached single and two storey residential properties fronting onto Denison Street are further to the east, the closest situated approximately 150 metres from the nearest operations on Block A
- To the south is (across Beauchamp Road) are commercial premises, the closest of which include Hatfield J Motor Engineers, Garry's Auto Services, Matraville Spare Parts and Auto Wreckers. These commercial premises are located approximately 120 metres from the nearest operations on Block A; and
- To the west is the CAP and Ixm's Control Room, vacant land and a freight rail line (owned by Patrick Port Logistics) to Port Botany.

3. Statutory Legislation

This section provides a summary of the planning context of the modification proposal. It includes consideration of the relevant provisions of the EP&A Act, the Environmental Planning Instruments applying to it and other approval requirements.

The following environmental legislation and planning instruments are relevant to the proposal:

- Environmental Planning and Assessment Act 1979 (EP&A Act)
- Protection of the Environment Operations Act 1997 (POEO Act)
- State Environmental Planning Policy (Major Development) 2005
- State Environmental Planning Policy No. 33 – Hazardous and Offensive Development; and
- State Environmental Planning Policy No. 55 – Remediation of Land.

3.1. Environmental Planning and Assessment Act 1979

DA No. 35/98 was granted development consent on 6 November 1998 under the Unamended Environmental Planning and Assessment Act 1979, and State Environmental Planning Policy No 34 – Major Employment Generating Industrial Development (SEPP 34), as shown in Table 1.1. Although the CAP was originally assessed as a development application, under clause 8J (8) of the Environmental Planning and Assessment Regulation 2000, this development consent is a Part 3A approval.

The project is a transitional Part 3A project under Schedule 2 of the Planning and Environmental Assessment (Savings, Transitional and Other Provisions) Regulation 2017. This states that provisions in the repealed Part 3A, such as section 75W, continue to apply to and in respect of a 'transitional Part 3A project'.

Section 7 discusses the environmental impacts of this proposed modification. This modification would have only negligible possible environmental consequences beyond those envisaged in the original EA. The Proposal is considered consistent with the previous approval (DA No. 35/98) and should be assessed as a Section 75W modification.

An assessment of this modification and how it considers planning controls for the site is provided below.

3.2. Protection of the Environment Operations Act 1997

Operations on site are licensed under the *Protection of the Environment Operations Act 1997* (POEO Act). The POEO Act requires EPLs for scheduled activities, including chemical production and storage, and waste storage, disposal and processing.

EPL 20547 found in Appendix 8 – Statutory Licences covers Ixom's activities in the BIP.

A review of EPL 20547 indicates that this modification would not require a licence amendment to modify the location of monitoring/discharge points and areas or discharge limits and operating conditions set under the EPL, given no increase in the scale of chemical production levels. The words '*chemical repacking*', or similar are likely to be added to EPL 20547 as a scheduled activity. The premises location map may also need to be updated, as outlined in Table 3.2.

Should any alteration to the EPL be required, this would be undertaken following completion of this modification, in consultation with EPA.

3.3. SEPP – Major Development 2005

The site is located within the state significant site known as the Three Ports Site, and is zoned 'IN1 – General Industrial' under Part 20 of Schedule 3 of the State Environmental Planning Policy (Major Development) 2005 (the Major Development SEPP). These zoning controls do not apply to transitional Part 3A projects (Schedule 3, Part 20, cl 6).

While these controls do not apply to this modification, the modification is considered to comply with the zone objectives in Table 3.1 below.

Table 3.1 IN1 – General Industrial: Zone Objectives

Objective	How the modification satisfies the objective
<i>To provide a wide range of industrial and warehouse land uses</i>	Block A is not currently used for any industrial or warehousing activity. The Proposal would enable the installation of a new repacking and loading equipment compliant with relevant safety regulations and standards, and facilitate continued use of industrial land for the production at the CAP.
<i>To encourage employment opportunities</i>	The facility creates jobs. It would employ 2-3 additional long term full time equivalent personnel dedicated exclusively to the new manufacturing facility in NSW's challenging manufacturing industry. The facility would also require long term maintenance, administration and management support personnel. The facility provides short term local contractors and suppliers during construction. This is estimated to be approximately 8 full time equivalents, expressed as a proportion over a full year.
<i>To minimise any adverse effect of industry on other land uses</i>	The Proposal would not increase risks for adverse environmental impacts on surrounding land uses in the local area.
<i>To facilitate and encourage port related industries that will contribute to the growth and diversification of trade through the port</i>	The Proposal would enable Ixom to consider packaging chemicals suitable for future export via the adjacent port.
<i>To enable development for the purposes of retailing or commercial offices only where it is associated with, and ancillary to, port related activities or ancillary to industrial use of the same land</i>	This objective is not applicable to the proposal.
<i>To encourage ecologically sustainable development</i>	Bringing these repacking operations in house in lieu of external third party providers also enables Ixom to better manage the risks of handling Class 8 goods on site. The facility would remove one location out of the supply chain, which reduces one truck movement for each quantity of chemical produced, which is a more sustainable solution.

In summary, the modification is consistent with the provisions of the Major Development SEPP.

3.4. SEPP – No. 33 Hazardous and Offensive Development

The State Environmental Planning Policy No. 33 – Hazardous and Offensive Development provides for a system of hazard and risk assessment for potentially hazardous industry. A Preliminary Hazard Analysis (PHA) may be required under this policy and its accompanying guidelines, including Hazardous and Offensive Development Application Guidelines.

Applying SEPP 33 (p 12) indicates a PHA may be required for a modification where:

- *the modification [is] considered potentially hazardous or potentially offensive in [its] own right, or*
- *the proposed modification [is] not potentially hazardous in [of itself], but interact[s] with the existing facility in such a way that cumulative hazards (or offence) from the existing facility may be significantly increased.*

Ixom subsequently engaged Sherpa Consulting Pty Ltd (Sherpa), who has undertaken extensive work and aware of the history at BIP, to:

- *assess the proposal against State Environmental Planning Policy 33 – Hazardous and Offensive Development (SEPP 33) to determine whether the works are ‘potentially hazardous’*
- *complete a PHA including comparison with the DP&E HIPAP 4 risk criteria*
- *assess the effect of the proposal on the cumulative BIP risk (as reported in BIP QRA, 2012); and*
- *assess the effect on the risk due to Dangerous Goods (DG) transport along Denison St.*

The PHA capturing the above is captured in Appendix 5 – Preliminary Hazard Analysis Report.

Consequence modelling showed no offsite fatality risk for worst case releases, hence no effect on the cumulative offsite individual fatality risk contour or societal risk from the CAP or BIP QRA 2012.

The only identified incidents with potential offsite effects (toxic injury / irritation only) were inadvertent mixing of sodium hypochlorite and hydrochloric acid, forming chlorine. However, the frequency of these events was assessed as below the HIPAP4 risk criteria, so the Repack Facility would comply with all offsite risk criteria. Please also refer to Sections 6.5, 7.13 and Appendix 5.

The PHA demonstrated limited offsite consequence potential and very low offsite risk, as below:

- *the proposal results in no significant offsite risk impacts*
- *the proposal complies with the risk criteria given in HIPAP 4*
- *the proposal has no significant impact on the cumulative offsite risk from CAP or overall BIP; and*
- *the proposal would have no impact on the cumulative DG transport risk along Denison St.*

The study makes no specific additional recommendations and does not propose any additional controls to those already included in the proposal.

3.5. SEPP – No. 55 Remediation of Land

The Proposal requires consideration around the remediation of contaminated land under State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55).

The proposed site on Block A has already been remediated to address contamination from previous site operations.

A human health and environmental risk assessment was completed by Environmental Risk Sciences Pty Ltd (enRiskS), who has undertaken extensive work and aware of the history at BIP. This report in Appendix 6 concluded *‘there is no requirement to modify the proposed development plans or include any additional risk management measures’*, which validated that the Block A is suitable for the proposed use. Please also refer to Section 7.8.

3.6. Ixom Licences & Conditions to be Modified

Ixom licences and other external document conditions considered for modification are captured in Table 3.2 below:

Table 3.2 Ixom Licences & Conditions Considered to be Modified

Licence / Statutory Approvals	Proposed Update(s)
Existing DA 35 / 98 Consent Condition 1, Schedule 2	Proposed additional words: <i>‘Modification application DA35/98 Mod 5, in relation to repacking and despatch of chemicals in smaller packages’.</i>
Environment Protection Licence (20547)	Update to: • add <i>‘Repacking chemicals’</i> as a scheduled activity; • change Ixom Operations Pty Ltd address to <i>‘Level 8, 1 Nicholson Street East Melbourne VIC 3002’</i>; and • update premises location map. Ixom would not amend any further changes due to additional storage not exceeding the maximum trigger in Ixom’s Licence.
Botany Site Manifest Register	Update to include details of the new Botany Repack Facility.
Major Hazard Facility – Safety Case	Update to include details of the new Botany Repack Facility. This may include a demonstration that the likelihood and hence risk associated with mixing of incompatibles and toxic release scenarios is reduced so far as reasonably practicable.
Major Hazard Facility – DG Licence	No update required, as no change or addition to Schedule 15 quantities.
Environmentally Hazardous Chemicals Act (1985) Licence	No update required due to: • the project would handle Class 8 goods only; and • this licence is an Orica licence, not an Ixom licence.
Sydney Water Corporation Consent No. 489	No update required, as the low maximum daily discharge poses no issue on effluent system.

4. Stakeholder Engagement

External stakeholder engagement undertaken to date is captured in Appendix 7 – Stakeholder Engagement Correspondence, and summarised below.

4.1. Department of Planning and Environment

Table 4.1 below shows communications undertaken with DP&E hitherto.

Table 4.1 DP&E Communications

Date	Correspondence
18 / 11 / 16	Planning consultant PlanCom developed the original Botany Repack Facility Preliminary EA, proposed to be located on BIP Block M. Ixom issued this Preliminary EA to DP&E (revision A)
22 / 12 / 16	DP&E issued the original Block M SEARs to Ixom
08 / 11 / 17	Ixom issued a suite of documents to DP&E advising of the proposed change in location from BIP Block M to BIP Block A, to substantially reduce safety and environmental risks
11/ 12 / 17	DP&E issued the updated Block A SEARs to Ixom, as shown in Appendix 1 – SEARs (DA35/98 Modification 5)
27 / 06 / 18	Ixom formally lodged this Final EA to DP&E.

Table 4.2 below identifies the SEARs and where they are addressed in this EA.

Table 4.2 EA References Addressing DP&E's SEARs Requirements

DA35/98 Modification 5 Requirement	EA section(s) where addressed
<i>Details of the existing operations on the site, including;</i>	1.3, 1.4, 1.5,
- <i>Existing and approved operations/facilities, including any statutory approvals that apply to these;</i>	1.6, 1.7, 3.6, Appendix 3, Appendix 8
- <i>A summary of the existing conditions of consent that would be relevant to the proposal;</i>	3.6, 5.4, Appendix 9
- <i>A summary of the existing environmental management and monitoring regime;</i>	1.4, Appendix 8 (EPL 20547)
<i>Description of the modification including plans of any proposed works</i>	6, Appendix 2
<i>Need and justification for the proposal</i>	5
<i>Identification of conditions to be modified</i>	3.6

DA35/98 Modification 5 Requirement	EA section(s) where addressed
<i>Other approvals; Identification of any proposed variations to other licences and approvals including the current Environment Protection Licence and the Environmentally Hazardous Chemicals Act (1985) Licence</i>	3.6, Appendix 8
<i>Identification of the potential environmental impacts of the modification – including a more detailed assessment of the key issues identified below:</i> <i>Hazards and Risks, including:</i> <i>1. preliminary screening carried out in accordance with SEPP No. 33 – Hazardous and Offensive Development and Applying SEPP 33 (DoP, 2011), with a clear indication of class (including the subsidiary risk), quantity, package size, and location of all Dangerous Goods and hazardous materials associated with the proposed modification</i> <i>2. should the preliminary risk screening indication that the proposed modification is ‘potentially hazardous’ a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis (DoP, 2011), and Multi-Level Risk Assessment (DoP, 2011). The PHA must:</i> <i>- identify the hazards associated with the proposed modification to determine the potential for off-site impacts</i> <i>- estimate the risks from the proposed modification and the cumulative risks from the existing facility and the proposed modification</i> <i>- demonstrate that the proposed modification complies with the criteria set out in Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning and</i> <i>- demonstrate that the proposed modification does not increase the cumulative risk of the BIP to unacceptable levels</i> <i>3. evaluate the impacts (if any) from the modification on the overall risks from transport of Dangerous Goods on Denison Street.</i>	3.4, 7.1, 7.2 3.4, 7.1, Appendix 5 7.1, 7.2, Appendix 5
<i>Air Quality – including details of any emissions and control measures</i>	7.4
<i>Traffic and Transport – including details of traffic types, volumes and haul routes and details of internal road layout, and parking</i>	7.2, Appendix 2 (Drawings PGA01, 2)
<i>Stormwater – proposed stormwater management and onsite bunding</i>	7.5, 6.2, 6.3, 6.5, 7.11, 7.12
<i>Construction and Operational Noise – potential operational and construction noise impact including details of noise mitigation and monitoring (if necessary)</i>	7.6
<i>The Department strongly recommends you consult with other relevant government agencies and the community in preparing the EA including, but not limited to SafeWork NSW, Bayside City Council, the Environment Protection Authority and community groups associated with the BIP.</i>	0 Appendix 7

4.2. Environment Protection Authority NSW

Table 4.3 below shows communications undertaken with EPA hitherto.

Table 4.3 EPA Communications

Date	Correspondence
23 / 11 / 17	Ixom met with EPA on BIP Block A for a preliminary discussion.
08 / 12 / 17	Ixom provided written notification EPA of the proposed works. This included an email summarising the project and attached drawings.
14 / 12 / 17	EPA provided written preliminary response to the proposed works. EPA's letter is captured in Appendix 7 – Stakeholder Engagement Correspondence.
01 / 02 / 18	Ixom issued the Draft EA to EPA (revision B).

Table 4.4 below shows how the EA addresses EPA's preliminary requirements.

Table 4.4 EA References Addressing EPA NSW's Preliminary Requirements

EPA Requirement	EA section(s) where issue has been addressed
<i>air emissions and odour management</i>	7.4
<i>soil and stormwater management including sediment controls during the construction phase</i>	7.5, 7.14
<i>consideration of whether the development would disturb any potentially contaminated soil/material on the Botany Industrial Park site</i>	0, 7.1, 7.8 Appendix 6
<i>noise management</i>	7.6
<i>waste management</i>	6.9, 7.8, 7.10
<i>appropriate classification, storage and handling of hazardous material and dangerous goods</i>	6.2, 6.3, 6.5, 7.11, 7.12
<i>incident risks and contingency practices</i>	7.1, 7.13
<i>consideration of the need to vary Ixom's current Environment Protection Licence</i>	3.2, 3.6, Appendix 7

4.3. SafeWork NSW

Table 4.5 below shows communications undertaken with SWNSW hitherto.

Table 4.5 SafeWork NSW Communications

Date	Correspondence
05 / 12 / 17	Ixom provided written notification to SWNSW of the proposed works.
23 / 01 / 18	SWNSW provided written preliminary response to the proposed works. This email is captured in Appendix 7 – Stakeholder Engagement Correspondence.

Table 4.6 below shows how the EA addresses SWNSW’s preliminary requirements.

Table 4.6 EA References Addressing SWNSW’s Preliminary Requirements

SWNSW Comment	EA section(s) where issue has been addressed
<i>The PHA states “It is also noted that as the CAP is an MHF, an update to Safety Case will be required to cover the Repack Facility which would include a demonstration that the likelihood hence risk associated with mixing of incompatibles and toxic release scenarios is reduced SFARP and may further reduce the estimated frequency.” Could you please provide the approach you plan to assess and ensure risk (including cumulative on-site risk) of the proposed changes is reduced SFARP.</i>	Sections 3.4, 6.2, 6.3, 6.5, 7.13, Drawing P&ID in Appendix 2 Appendix 5.
<i>including the approach to a risk based decision on the piping materials and any reference to external standards if used.</i>	6.7, 6.8, 6.9

4.4. Orica

Many *informal* communications between Ixom and the landowner Orica have occurred.

Table 4.7 below shows *formal* communications only undertaken with the land owner, Orica hitherto.

Table 4.7 Orica Communications

Date	Correspondence
07 / 12 / 17	Ixom issued a suite of documents to Orica advising of the project. This included a formal request for Orica's consent to proceed with the works and political donations disclosure statement.
16 / 04 / 18	Ixom issued the Draft EA to Orica (revision C).
08 / 05 / 18	Orica issued a letter providing preliminary response to the proposed works. This provided Ixom with landowner's consent to proceed with the modification request, subject to confirmation of approval from third parties. Orica's letter is captured in Appendix 7.
30 / 05 / 18	Orica provided Ixom with consent to disclose the enRiskS report 'Review Risk Issues for Potential Placement of Repack Facility on Block A, FCAP', found in Appendix 6. This enabled and permitted this DA35/98 Modification 5 EA to be formally lodged with DP&E.

As Orica is a Class A Stakeholder, please refer to Section 4.7 for additional correspondence.

Table 4.8 below shows how the EA addresses Orica's preliminary requirements.

Table 4.8 EA References Addressing Orica's Preliminary Requirements

Orica Comment	EA section(s) where issue has been addressed
<i>Orica anticipates that the Department of Planning and Environment will assess compliance of the proposed building envelope to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 - Part 5A - Division 2 – Subdivision 4 and 5.</i>	Noted
<i>As the shed fronts 2nd Street, which is a major BIP road as well as a future site arterial, development should be consistent with other recent plant developments on site. The main issue is not having a footpath or sufficient setback for pedestrian safety.</i>	Section 7.3 Drawing PGA02 in Appendix 2.
<i>If permission for zero setback is granted by the relevant authorities, Orica requests Ixom seek and obtain owner consent of 2nd Street (BIP Pty Ltd) that the building is specifically exempt from setback, and amend detailed building design drawings allowing for the south-eastern corner of the building to be chamfered by a minimum of 3m.</i>	Following receipt of feedback from the relevant authorities, this will be actioned as required.
<i>Orica anticipates that Bayside Council will assess the visual impact of the shed from Beauchamp Road and require the shed colour to complement the heritage listed Administration building and surrounding structures, likely to differ from the proposed choice of 'Eucalyptus Green'.</i>	7.7

4.5. Bayside City Council

Table 4.9 below shows communications undertaken with Bayside City Council (BCC) hitherto.

Table 4.9 Bayside City Council Communications

Date	Correspondence
06 / 12 / 17	Ixom provided written notification to BCC of the proposed works.
08 / 12 / 17	Ixom provided additional supporting documentation to BCC.
25 / 01 / 18	Ixom emailed BCC requesting a response status update.
02 / 02 / 18	Ixom emailed BCC requesting a response status update.
07 / 02 / 18	Ixom emailed BCC requesting a response status update.
15 / 02 / 18	Ixom discussed response status with BCC.
15 / 02 / 17	Ixom resent written notification to BCC of the proposed works.
21 / 02 / 18	Ixom emailed BCC requesting a response status update.
23 / 02 / 18	BCC emailed ' <i>I am reviewing the material tomorrow and we have an internal meeting to discuss next week</i> '.
01 / 03 / 18	Ixom emailed BCC requesting a response status update.
08 / 03 / 18	Ixom discussed response status with BCC.
08 / 03 / 18	Ixom emailed BCC requesting a response status update.
08 / 03 / 18	BCC verbally agreed to issue their response by week ending 23rd March.
08 / 03 / 18	Ixom emailed BCC confirming the agreement to receive comments by 23 March.
19 / 03 / 18	Ixom emailed BCC requesting confirmation of comments by 23 March.
27 / 03 / 18	Ixom rung BCC requesting a call back providing a response status update.
27 / 03 / 18	Ixom emailed BCC requesting a response status update.
12 / 04 / 18	Ixom emailed BCC requesting a response status update.
02 / 05 / 18	Ixom emailed BCC advising the EA will be submitted to DP&E without receiving any BCC feedback.
07 / 05 / 18	BCC provided written preliminary response to the proposed works. BCC's email is captured in Appendix 7 – Stakeholder Engagement Correspondence.

Table 4.10 below shows how the EA addresses BCC's preliminary requirements.

Table 4.10 EA References Addressing Bayside City Council's Preliminary Requirements

BCC Requirement	EA section(s) where addressed
<i>Our main concern is the assessment of the planning risk in relation to the Denison Street Risk Study, and while the individual vehicle sizes/loads may be reducing, the increase in vehicle movements will result in a net increase of transportation of chemicals.</i>	7.1, 7.2
<i>The BIP and especially the former chlor-alkali plant has considerable contamination in soil and groundwater that is regulated by the NSW EPA. The Draft EIA notes that a Human Health and Environment Risk Assessment (HHERA) has been completed by enRiskS in December 2017 that validated Block A is suitable for the proposed use. It noted that the "earthworks design builds up, not down. It adopts a suspended slab constructed on piles, rather than undertaking bulk excavations. Screw piles have been specified that ensures soil stays in the ground, rather than being augered to the surface. This eliminates the risk of bringing potentially contaminated soil to the surface during piling". This report was not provided to council.</i>	0, Table 4.7 7.1, 7.8, 7.9, Appendix 6
<i>Minimal further information regarding environmental management was provided. I note that a Construction Environmental Management Plan (CEMP) will be prepared which will capture the environmental and human health risks.</i>	6.9, 7.4, 7.5, 7.6, 7.8, 7.9, 7.10, 7.14, Appendix 6
<i>The EPA has requested detailed information regarding environmental management, including contamination land. I concur with these requirements.</i>	0, 6.9, 7.1, 7.4, 7.6, 7.8, 7.9, 7.10, 7.12, 7.14 Appendix 6

4.6. BIP – Community Consultative Committee

Table 4.11 below shows communications undertaken with the BIP Community Consultative Committee (CCC) hitherto.

Table 4.11 BIP Community Consultative Committee Communications

Date	Correspondence
29 / 11 / 17	Ixom notified the BIP CCC regarding the proposed works. For further details including meeting attendees, organisations / personnel and minutes distribution list, please refer to the minutes in Appendix 7 – Stakeholder Engagement Correspondence.

No additional requirements have been received from attendees at the BIP CCC hitherto. Consequently, no further information has been provided in this EA addressing any CCC requirements.

4.7. BIP – Class A Stakeholders

The existing BIP Development Application consent requires notifying ‘*Class A Shareholders of the Special Purposes Company*’. This includes operators on the BIP facility, i.e. Air Liquide, Huntsman Chemicals, Orica and Qenos.

Table 4.12 below shows communications undertaken with Class A Shareholders hitherto.

Table 4.12 BIP Class A Stakeholder Communications

Date	Correspondence
20 / 12 / 17	Ixom provided written notification to BIP Class A Stakeholders of the proposed works.
21 / 12 / 17	Qenos provided written preliminary response to the proposed works. Qenos’ email is captured in Appendix 7 – Stakeholder Engagement Correspondence.
28 / 12 / 17	Qenos provided written preliminary response to the proposed works. Qenos’ email is captured in Appendix 7 – Stakeholder Engagement Correspondence.
08 / 01 / 18	Qenos provided written preliminary response to the proposed works. Qenos’ email is captured in Appendix 7 – Stakeholder Engagement Correspondence.
06 / 02 / 18	Air Liquide provided written preliminary response to the proposed works. Air Liquide’s email is captured in Appendix 7 – Stakeholder Engagement Correspondence.
07 / 02 / 18	Huntsman provided written preliminary response to the proposed works. Huntsman Chemicals’ email is captured in Appendix 7 – Stakeholder Engagement Correspondence.

This proposal was also communicated at the BIP Operations Managers’ Meeting in February 2018 and June 2018.

As Orica is also the land owner, please refer to Section 4.4 for additional information.

Table 4.13 below shows how the EA addresses Class A Stakeholders' requirements.

Table 4.13 EA References Addressing Class A Stakeholders' Requirements

Class A Stakeholder Requirement	EA section(s) where issue has been addressed
<i>Qenos (21 Dec 17):</i> <i>You mentioned the effluent load would be small at only 3 kl per day and that all effluent would collect in separate alkali and acid effluent systems. Will this then flow into the existing Ixom effluent treatment pits or will it be an independent system. Irrespective there must be pH control on the system.</i> <i>IP1 and IP2 stormwater outlets are choke points. All the stormwater off the roof of the facility is to be either piped out to Beauchamp Road or into a containment pit for slow release into the site stormwater system.</i> <i>Due to the limited pumping capacity at 8th Ave effluent we need to know the expected flow of effluent due to stormwater runoff because in large storms the effluent starts lapping at the bund walls. We must be design all new facilities so that stormwater runoff is collected and drained in a control manner into the effluent system.</i> <i>It's worth checking but I doubt a 17m truck will make the turn from 1st Ave into 2nd street.</i>	6.9, 7.5, 7.10 7.5 – Operations Impacts, Drawing PGA02 in Appendix 2. 7.5 – Operations Impacts, Drawing PGA02 in Appendix 2. 6.5
<i>Qenos (28 Dec 17):</i> <i>please ensure any effluent discharge from you package plant is treated to within Sydney Water trade waste limits (pH: 7-10) at all times.</i>	6.9
<i>Qenos (8 Jan 18):</i> <i>As a matter of process, significant operational changes must be formally detailed in a BIP Modification which is circulated to all BIP Operations Managers for comment and sign-off. The information you have provided is typically what we would expect to see in a BIP Modification. This process does not need to be completed before your submission to DP&E, but must be completed prior to construction.</i>	7.14
<i>Air Liquide (6 Feb 18):</i> <i>I have no comment to make regarding this proposal. As an associate member to the BIP, we are not involved in activities extending beyond our 2 compound limits.</i>	NA
<i>Huntsman Chemicals (7 Feb 18):</i> <i>No issues from my side.</i>	NA

4.8. Other External Stakeholders

As detailed in Section 6.9, the project would divert pH controlled washdown water and any small spills to be treated in BIP effluent treatment system. Separate lines would be provided for acid and alkali. BIP has a consent to discharge industrial trade waste water, No 489. This Sydney Water Corporation consent No. 489 is captured in Appendix 8 – Statutory Licences. Effluent discharge modelling undertaken by Ixom for the proposed repack facility operations indicate daily peak load during summer of up to 3 kL only, which would pose no issue for total effluent discharge into Sydney Water's sewer system.

As detailed in Section 7.2, due to the risk reduction in operational traffic impacts on NSW roads, and negligible change in traffic levels more locally on Denison Street (both light passenger vehicles and Class 8 DGs), a formal traffic study and or risk assessment would clearly not provide any additional value, and this was consequently not completed. DP&E has advised that following lodgement of the EA, DP&E shall notify Roads and Maritime of the proposed modification request.

Impacts of the proposal would be minor or negligible and would be effectively managed and confined to within the BIP. Except for stakeholders discussed above, no additional stakeholders would be directly impacted by the proposed works nor is there likely to be any public interest in the proposal. Ixom's intention is not to engage with any additional stakeholders over and above those listed in Sections 4.1 to 4.7 above.

5. Project Need, Justification and Options

5.1. Project Need

Ixom manufactures chemicals at the CAP which are sold in bulk and distributed via tanker. Most end use customers do not have sufficient demand or storage to justify bulk deliveries, and purchase these chemicals from repackers. These repackers procure in bulk from Ixom, and then parcel into smaller containers, and sell to the marketplace.

It is proposed to plan, engineer, procure, construction manage and commission a new Repack Facility at the Botany CAP. Drawing PFD01 shows the overall process flow diagram, and further technical details are in the Process and Instrumentation Diagrams, in Appendix 2.

This facility would enable packaging sodium hypochlorite, sodium hydroxide and hydrochloric acid into 1,000L IBCs and 200L drums, as shown in Table 5.1 below:

Table 5.1 Repacked Products

Raw Material	Strength (w/w)	Source	Produce Name	Packaging
Sodium hypochlorite	13%	CAP Product Tanks	Sodium hypochlorite-13	1,000L IBC 200L Drum
Caustic	50%	CAP Product Tanks	LCS-48 Resolv46	1,000L IBC 200L Drum
Hydrochloric acid	33%	CAP Product Tanks	Hydrochloric acid	1,000L IBC 200L Drum

The following capabilities would be built into the facility:

- Packing of concentrated sodium hypochlorite
- Packing of concentrated sodium hydroxide
- Packing of concentrated hydrochloric acid
- Packing into 1,000L IBCs and 200 L drums
- Storage of empty and full IBCs and drums; and
- Unloading / loading of trucks.

Each of the chemicals to be re-packed is currently produced and stored at BIP. There would be no dilution / blending / mixing of products. No new chemical products would be stored on site. There would be no new storage tanks.

Two personnel would initially operate the facility each day, and one product only would be produced on any one day. The total maximum initial capacity of the system would be ~40 IBCs per day. This is higher than the forecast future short term peak season summer load of 37 IBCs per day.

Actual production is expected to be significantly lower than capacity.

5.2. Justification

The proposal provides Ixom and the wider community with several benefits including:

- Bringing repacking operations in house in lieu of being undertaken by external third party providers enables Ixom to have full control of repacking Class 8 DGs. Ixom would manage environmental risks by leveraging off extensive expertise and experience. This has lower environmental risk than smaller third-party providers who handle small volumes of many chemicals, with different characteristics, and may not have the same level of processes and systems in place
- Chemicals would be despatched in smaller volume packages and trucks, reducing the consequence of an unlikely off-site spill
- The facility would eliminate one off-site truck movement for each unit of chemical repacked, by removing one destination (i.e. the incumbent repackers) from the supply chain. This reduces the overall operational impact and risk on NSW roads
- The facility creates jobs. It would employ 2-3 additional long term full time equivalent personnel dedicated exclusively to the new manufacturing facility in NSW's challenging manufacturing industry
- The facility would require long term maintenance, administration and management support personnel, and encourage ongoing employment through continued use of the CAP
- Short term employment of local contractors and suppliers during construction; and
- The facility would be a long term profitable operation that pays taxes to the Australian government.

As detailed in Section 7, there are no environmental impacts that cannot be effectively managed and controlled within the BIP site.

5.3. Options

Repack Chemical Options

A range of undiluted chemicals, diluted chemicals and various chemical blends were considered for inclusion in the original project. The quantities sold and commercial viability of these options ranged greatly. Ixom's approach is to initially include chemicals of high volumes and profitability, namely the three products listed in Table 5.1 only.

The facility has been designed to allow future augmentation to allow:

- dilution of chemicals using a 10kL dilution make-up tank in each makeup bay; and
- repacking three additional DG chemicals (i.e. future total of six).

If required in future, these possible future works would be undertaken as a separate DA modification.

Site Location Options

The nearby Block M was originally selected in 2016. This site was subsequently excluded predominantly due to insufficient buffer distance from Huntsman Chemicals, and the associated ethylene oxide explosion risk causing harm to personnel on the manned Botany Repack site.

Other BIP sites were considered, however Block A was selected, as described in Section 2.1.

5.4. Modification Scope Vis-à-vis Original Consent

The scope of the preferred option in Table 5.2 below summarises how this modification satisfies the original and current consent conditions. Consents are included in Appendix 9.

Table 5.2 Preferred Option Modification Scope – Confirmation this is Consistent with Current Approval Consent

Scope	Preferred Option	Satisfies Consent?	How Does the Modification Differ from the Current Approval Consent
Site	Botany CAP – Block A	Yes	The proposed Block A site is completely contained within BIP, as shown in Appendix 9 (Original Consent, Schedule 3, Attachment A).
Operating Area Footprint	Total area <1,300m ²	Yes	The Block A site was previously a fully operating area included within the original CAP. Reverting this block back to an operating area is consistent with the original consent. The overall Botany Repack site footprint of <1,300m² is negligible compared to Ixom's overall CAP site foot print.
Change in Processes	Repack chemicals into smaller packages	No	The original consent was developed and approved on the basis that bulk chemicals produced would be despatched in bulk tankers only – it makes no reference to any repacking process. Proposed additional words to existing Condition 1, Schedule 2: 'Modification application DA35/98 Mod 5, in relation to repacking and despatch of chemicals in smaller packages'.

Scope	Preferred Option	Satisfies Consent?	How Does the Modification Differ from the Current Approval Consent
Change in Outputs	IBCs and drums	No	The original consent was developed and approved on the basis that bulk chemicals produced would be despatched in bulk tankers only – it makes no reference to the products listed in Table 5.1 being repacked into smaller 1,000L IBCs and or 200L drums. Additional words to existing Condition 1, Schedule 2, consistent with the proposed words in ‘Change in Processes’ immediately above.
Class 8 DGs Goods Stored and Handled on Site	Sodium Hypochlorite, liquid caustic soda, hydrochloric acid	Yes	Each of these three chemicals to be stored on the Repack site are chemicals already produced and stored in the CAP, consistent with the original consent DA35/98, DP Lot 1 DP 608153, Schedule 4. Note that no new storage tanks would be included – the only additional storage would be repacked chemicals stored in relocatable IBCs and drums.
Truck Specifications	Chemicals would typically be despatched onto rigid trucks up to 11m in total length. Longer trucks may occasionally be used.	Yes	There is no limitation in the current consent conditions for types of truck to access the facility. The 11m rigid trucks do not differ from the current conditions of consent, and are significantly smaller than B-double tankers currently used on site.

Scope	Preferred Option	Satisfies Consent?	How Does the Modification Differ from the Current Approval Consent
Truck Movements	In future, it is possible that up to an additional ~50 trucks per annum may enter the site, as described in Table 7.1.	Yes	The overall impact on truck movements on the site is negligible. There is no limitation provide in the current consent conditions for truck movements. The additional trucks do not differ from the current conditions of consent.
Staff Numbers	2-3 additional full time equivalent employees.	Yes	Overall impact on staff numbers is negligible. Overall CAP staff numbers will remain significantly less than the 'Approximately 660 employees who work on the Orica site' included in the original Environmental Impact Assessment. The additional staff do not differ from the current conditions of consent.
Operation Hours	Typically manned during business hours only, approximately 7am to 4pm Monday to Friday. Occasional Saturday work may be required in summer peak times.	Yes	The original consent is for a continuously operating facility. The proposed operating hours do not differ from the current conditions of consent.

Table 5.3 below provides a summary of the existing conditions of consent relevant to the proposal, and how the proposed modification satisfies these requirements.

Table 5.3 Existing DA 35/98 Conditions of Consent Requirements

Clause	Requirement	EA section(s) demonstrating where these requirements have been addressed
S2 Cl.7	<i>The Special Purpose Company (SPC) shall ensure internal pedestrian and vehicular access to all lots in the BIP.</i>	Sections 6.5, 7.2, 7.3 and drawings PGA01 and PGA02 in Appendix 2
S2 Cl.8	<i>Adequate car parking and vehicle manoeuvring areas shall be provided for each new lot created, to the satisfaction of the Council.</i>	Section 6.5, 7.2, 'Traffic – Operational Impacts - Parking' and drawings PGA01 and PGA02 in Appendix 2. Section 4.5, Appendix 7
S3 Cl.4(a)(i)	<i>The SPC shall maintain an updated Quantitative Risk Assessment for the BIP. This Risk Assessment shall be updated if there is a change at the BIP, which will significantly change the results of the Risk Assessment.</i>	Sections 3.4, 7.1, 7.4 Appendix 5 – Preliminary Hazard Analysis Report
S3 Cl.6	<i>The SPC shall ensure appropriate management in place for that part of the stormwater system that is common to all parties within the subject land and provide relevant information to the EPA upon request.</i>	Table 4.13, Section 7.5 Section 4.2, Appendix 7
S3 Cl.7(a), (b)	<i>Approval of Development proposals</i> <i>The SPC shall ensure that there is a procedure in place for the internal review by all Class A Shareholders of the SPC of any Development Application, Part 4A certificate or any application to modify any consent, approval or certificate prior to lodgement of such an application with the relevant consent authority or certifying authority.</i> <i>The SPC shall ensure that adequate consideration of the application has been given with regard to the integrated operations of the site.</i>	Section 4.7 Appendix 7 Section 7.14

Clause	Requirement	EA section(s) demonstrating where these requirements have been addressed
S3 Cl.8	<i>The SPC shall ensure that the common site services and infrastructure are maintained to a standard agreed by the Class A Shareholders.</i>	Section 4.7, Appendix 7. Common site services below are considered: • stormwater (7.5) • effluent treatment (6.9, 7.5, 7.11, 7.12) • vehicle access (6.5, 7.2, 7.3 and drawings PGA01 and PGA02 in Appendix 2); and • amenities (6.10).
S3 Cl.9	<i>The SPC shall maintain a Community Consultative Committee, which shall meet regularly. The Committee shall include at least two representatives from the SPC as well as positions to be occupied by four community representatives and Council, should it wish to participate. The SPC shall provide regular information and environmental performance results of the BIP to the Committee.</i>	Section 4.6 Appendix 7
S4 Cl 16	<i>Parking shall be provided within the lot on which the plant is located, for all vehicles associated with the operation and construction of the proposed development. This shall include vehicles transporting equipment, materials, contractors and workers. Under no circumstances shall vehicles transporting equipment or materials queue or park in the neighbouring streets.</i>	Section 7.2
S4 Cl 29	<i>All construction activities, likely to generate perceivable noise outside the boundaries of the lot on which the plant is located shall be restricted to the hours of 7am to 6pm Monday to Friday and 7am to 1pm Saturday, unless otherwise agreed to in writing by the EPA.</i>	Section 7.6
S4 Cl 32	<i>The Applicant must ensure that the noise emission from the operation of all plant and equipment shall not give rise to a sound pressure level that exceeds La10 65dB(A).</i>	Section 7.6

6. Description of Modification

6.1. Site Layout

The site layout shown in PGA02 in Appendix 2 – Proposed Development Drawings included the following design considerations:

- Truck access into and out of the site
- Maximising full IBC storage capacity
- Segregation of acid and alkali chemicals, including 5 metre separation between incompatible storages
- Compliance with AS 3780
- Minimising pipe run lengths
- Minimising the risk of vehicle collision with pedestrians
- Simplifying forklift movements; and
- Easy access for truck loading / unloading.

6.2. Product Makeup Bays

Civil works would be constructed for six makeup bays, as shown in PGA02 in Appendix 2 – Proposed Development Drawings. Three makeup bays would be fitted out: one for sodium hypochlorite, one for caustic and one for hydrochloric acid.

Each of these three fitted out bays would include:

- One makeup bay filling arm with control panel, i.e. three filling arms
- Capacity for 4 IBCs to be filled from each filling arm (note up to 6 IBCs could be stored in each bay)
- Bunded area to capture spills, leaks, washwater, meeting AS3780
- Sump with liner and high level switch
- Waste transfer sump pump and above ground piping to transfer waste to the alkali or acid waste discharge pipeline, to the existing CAP Effluent Plant
- PLC alarmed safety shower with green fluoro light (a shower would also be installed in the truck loading area), i.e. total of four showers
- Small hose reel for general wash down and cleaning of minor spillage
- Floor protection to prevent mechanical damage from IBCs and or chemical damage (i.e. epoxy coating) from corrosive materials
- The filling approach for both IBCs and 200L drums is to use a variable speed drive controlled pump and combined mass and volumetric flowmeter, which shall effectively control chemical flows into the containers. One set of pre-configured controls will be to fill a 1000L IBC, and another set of preconfigured controls would be to fill a 200L drum.

- Other additional controls to minimise the likelihood and consequence of an overfill event include an independent overfill protection system would also be included using a separate high level switch, which would automatically and promptly shut down filling, prior to any overflow occurring. An operator would also be standing by during the fill. Further details are available in the Process and Instrumentation Diagrams, found in in Appendix 2
- Note the maximum volume of any tank stored in the product makeup bays or any part of the proposed facility as part of this development application would be 1 kL only; and
- The three makeup bays that would not be fitted out (i.e. bays for future augmentation) would not be equipped with any of the above equipment or instrumentation. The only works to be undertaken in these three bays are sumps and sump liners.

Hydrochloric acid vapours displaced during filling would be scrubbed, measured and vented to atmosphere. For further details please refer to Section 7.4.

A 200mm elevated walkway area above the makeup bay floor would be provided between the alkali makeup bays and the acid makeup bays. This provides personnel separation from forklift and bunded area, whilst also meeting the AS 3780 incompatible mixing 5 metre segregation requirements. This area shall be epoxy coated.

This area would be undercover, bunded with the above controls to prevent loss of containment.

6.3. Final Product IBC Storage

Separate bunded areas would be provided for acid and alkali storage, noting all incompatible chemicals would be segregated by greater than 5 metres.

The site layout in enclosed plan PGA02 in Appendix 2 – Proposed Development Drawings shows footprint for 130 alkali IBCs and 70 acid IBCs. Full IBCs would be stacked up to two high, or a total of up to 400 full IBCs. This is a total increase in storage capacity of up to 400kL.

Alkali drums would only be stored in the alkali IBC storage area, and acid drums would only be stored in the acid IBC storage area.

The facility would typically despatch goods soon after being repacked – it would not be a storage warehouse. The facility would typically only store a small fraction of the maximum possible 400 full IBC capacity. This area would be undercover, bunded with controls to prevent loss of containment.

Empty IBCs can be stacked 3 high (i.e. ~600 IBCs). The quantity of drums vis-à-vis IBCs would be very low. Full and empty plastic 200L drums would be stacked on pallets up to a maximum of 2 drums high.

Note the maximum volume of any tank stored in the final product IBC storage would be 1 kL only.

It is unlikely additional storage would ever be required to store empty IBCs. If this does occur, Site Operations would manage this short-term event on a case by case basis.

Please also refer to Sections 7.11 and 7.12.

6.4. IBC Transport

IBCs would be transported between the makeup bays, IBC storage areas and the truck loading area using a new standard triple-stack forklift.

Forklift routes are shown in PGA02 in Appendix 2 – Proposed Development Drawings.

Consistent with other forklifts on BIP, the forklift would be powered by LPG bottles. Bottles would be stored in the existing Ixom CAP LPG bottles storage area, located on the corner of 2nd Street and 4th Avenue.

6.5. Final Product Truck Loading

A designated area would be provided for loading and unloading of packaged goods to and from trucks. A single combined truck loading bay would be provided for acid and alkali deliveries (not on same truck). A risk assessment was carried out that confirmed the proposed controls are effective in managing the risk of incompatible chemical mixing. Please also refer to Sections 3.4, 7.13 and Appendix 5.

The Botany Repack design basis is to handle rigid trucks up to 11m in total length, capable of holding 11 IBCs. Truck modelling shows articulated vehicles up to ~17m should be able to access the facility, however the required design basis is 11m only. Note that a 16m articulated vehicle has successfully traversed the proposed route in Drawing PGA01 in Appendix 2, which includes making the turn from 1st Avenue into 2nd Street.

This final truck loading area would be undercover, bunded with controls to prevent loss of containment.

6.6. Building Structure

Existing pipe bridges would be used to hold transfer site services, and an existing pipe bridge would be extended to a new repack facility building, as shown in:

- Drawing PGA02 in Appendix 2; and
- ‘Botany Repack Facility Tie In Points & Pipe Bridge’ site plan in Appendix 4.

The entire facility would be covered by two connected shed super-structures, forming a single L-shaped building (overall dimensions 61m x 26m x up to 7.6m high), as shown in drawing PGA03 in Appendix 2 – Proposed Development Drawings. Please also refer to Section 7.7 for building visual impact details.

This would be partially open to provide safe, easy truck and forklift access. Roof clearance to the truck loading bay would allow a 4.6m high truck (i.e. max height allowed on NSW roads) to enter. Roof clearance to the remainder of the buildings would allow a triple stack forklift to operate and stack IBCs 3 units high.

Good ventilation would be provided using louver vents, open walls, roller door, whirly birds and large industrial pedestal fans. Fume extraction mechanical ventilation would be provided for hydrochloric acid, but not sodium hypochlorite or caustic. Please also refer to Section 7.4.

Stormwater collected from the shed roof would be discharged to a flow balance tank, followed by the local stormwater system. Please also refer to Section 7.5.

The existing hydrant on Block A would be retained, plus an additional fire hydrant and fire hose. An automatic fire suppression system would not be provided.

Internal shed lighting would be provided, however there would be no additional external lighting.

6.7. New Pipelines – Raw Material Supply

New pumps and pipelines would be installed to transfer sodium hypochlorite, sodium hydroxide and hydrochloric acid from the existing CAP plant to the new Repack Facility, using the existing site pipe bridge, as shown in Appendix 4 – Existing Features *'AUS16-23 – Aerial Photo Showing Tie In Points & Pipe Bridge'*.

Pipe materials of construction will generally be consistent with the current CAP *'Project Specification for Pipe'*. Where any deviation from this specification is proposed, a formal risk assessment would be undertaken, and the *'Project Specification for Pipe'* document would be updated as required, prior to implementation.

The site pipe bridge would be extended ~50m to Block A, as shown in the *'Botany Repack Facility Tie In Points & Pipe Bridge'* site plan in Appendix 4.

The Repack facility shall have no storage tank for raw chemicals. IBCs shall be filled directly from the CAP.

6.8. New Pipelines – Water Services Supply

New pipelines would be installed to transfer process water (for washing), town water (for safety showers) and firewater (for fire hydrant and fire hose). These would be from tie in points within the existing CAP plant to the new Repack Facility, using the existing site pipe bridge, as shown in the *'Botany Repack Facility Tie In Points & Pipe Bridge'* site plan in Appendix 4.

The current CAP *'Project Specification for Pipe'* specifies water pipes to be constructed with stainless steel and does not permit water pipes to be made from high density polyethylene, as typically required in contemporary engineering specifications. Where any deviation from this specification is proposed, a formal risk assessment would be undertaken, and the *'Project Specification for Pipe'* document would be updated as required, prior to implementation.

6.9. New Pipelines – Waste Discharge

The existing CAP Effluent Plant has automated treatment tanks for alkaline, acid effluent and chlorine destruction, with pH control. Effluent generated in the Repack Facility would be pumped and piped to the CAP Effluent Plant. An acid return pipe and a separate alkali return pipe would be installed.

Pipe materials of construction would be consistent with the current CAP *'Project Specification for Pipe'*. Where any deviation from this specification is proposed, a formal risk assessment would be undertaken, and the *'Project Specification for Pipe'* document would be updated if required, prior to implementation.

The design basis is to transfer small spills and minor wash-downs. In the highly unlikely event of a major incident such as an IBC loss of containment with a bund, this would be managed separately.

Total effluent discharged from BIP wastewater system permit is approximately 140 kL/h. Discharge from the Ixom site is 8 kL/h. A maximum increase of up to 3kL per day from the new facility during short term peak periods has no substantive impact on the site effluent system.

The maximum chlorine concentration discharged to the existing CAP Effluent Plant would be the specified BIP limit of 50 parts per million.

The eastern wall of the shed superstructure is not cladded. On wet, windy days a small amount of rainwater may collect in the truck loading area, which would be pumped to the CAP Effluent Plant for treatment.

6.10. Amenities

Due to Block A's proximity to other services, operators would use the existing office and amenities located in the adjacent Control Room Building.

All laboratory work would be undertaken at the main CAP product testing laboratory.

6.11. Possible Future Augmentation

The facility has been designed to allow future augmentation of:

- dilution of chemicals using 10kL dilution make-up tanks; and
- repacking three additional chemicals (i.e. future total of up to six chemicals).

These future possible works are not included in this proposed modification.

7. Environmental Assessment

7.1. Summary of Key Environmental Assessment Investigations

Preliminary Hazard Analysis Report

Ixom engaged risk consultant Sherpa to:

- assess the proposal against State Environmental Planning Policy 33 – Hazardous and Offensive Development (SEPP 33) to determine whether the works are ‘potentially hazardous’
- complete a PHA including comparison with the DP&E HIPAP 4 risk criteria
- assess the effect of the proposal on the cumulative BIP risk (as reported in BIP QRA, 2012); and
- assess the effect on the risk due to DG transport along Denison St.

Sherpa’s report dated 10th May 2018 in Appendix 5 concluded that *‘Based on the hazard analysis which demonstrates limited potential for offsite consequence, hence very low offsite risk, it is concluded that:*

- *there are no significant offsite risk impacts from the Repack Facility proposal and the proposal complies with the risk criteria given in HIPAP 4*
- *the proposal will have no significant impact on the cumulative offsite risk from the CAP or the overall BIP*
- *the proposal will have no impact on the cumulative DG transport risk along Denison St; and*
- *No specific recommendations are made from the study.’*

Please also refer to Sections 3.4 and 7.13.

Contaminated Soil / Material / Land Management

Ixom engaged environmental consultant enRiskS to undertake a review of risk issues relevant to the potential construction/placement of buildings on Block A of the former CAP.

The enRiskS report dated 29th May 2018 in Appendix 6 concluded that:

- *The proposed construction of a repackaging facility on Block A has been evaluated, in relation to potential human health risk issues. Based on the available information on the proposed development, and information on the residual levels of mercury that remain in soil in the areas where the building is proposed, no risk issues of concern have been identified for human health for future workers in the buildings, intrusive maintenance works (including those undertaking excavations for building footings) and intrusive construction workers.*
- *A revised, area/project specific RBC of 893 mg/kg has adopted for mercury in soil. This is protective of exposures by workers within the proposed building, in outdoor areas and undertaking intrusive works, and is also protective of the migration of mercury from soil to groundwater. On this basis there is no requirement to modify the proposed development plans or include any additional risk management measures. A construction management plan should include contingencies to address any unexpected contamination (>893 mg/kg) that may be encountered.*

Please also refer to Sections 0 and 7.8.

7.2. Traffic, Transport and General Vehicle Access

Traffic - Construction Impacts

The construction period of the new works is expected to be approximately six months only.

As the project is small, with a total footprint of less than 1,300 m² only, the volume of additional vehicles would be low. It is estimated that an average total of approximately two additional trucks would enter / exit the site during the construction period each week. Some weeks would have zero trucks and others, for example during the earthworks / concrete pouring phase, may have up to approximately five trucks per week.

All construction trucks would enter and exit the site via Denison Street, as shown in drawing PGA01.

Temporary truck parking and an equipment laydown area would be provided on the Block A site. It would also be provided in the nearby vacant Block M, or the immediately adjacent new salt pad area, when available. After the civil works are complete, mechanical equipment delivery truck parking would be provided in the new unloading bay.

There would typically be approximately four construction workers on site each day, requiring approximately four standard vehicle movements to / from the site each working day. Sufficient car parking space is available on-site in the nearby main BIP car park adjacent to the Control Room Building for this worker traffic. Workers would enter and exit the carpark via Beauchamp Road. On the day of the concrete pour, up to approximately 15 workers would be on site.

To further mitigate any risk of these construction worker vehicles and trucks impacting the existing road network at Denison Street and Beauchamp Road, the following additional initiatives would be implemented:

- construction workers to start prior to the morning peak (i.e. approximately 7am)
- construction workers to finish prior to the afternoon peak (i.e. approximately 3pm)
- construction workers to enter the car park via Beauchamp Road, not Denison Street
- during the short earthworks phase, truck movements to and from site may be staggered, to minimise impacts on intersection performance; and
- trucks would not queue up on Denison Street to enter BIP.

A traffic management plan incorporating proposed mitigation measures would be incorporated into the CEMP.

During the construction phase the project would have negligible impact on congestion on the adjacent roads, particularly during peak times.

Traffic – Operational Impacts - Vehicle Assessment Based on SEPP 33 (Sherpa)

Ixom engaged Sherpa to assess the proposal against State Environmental Planning Policy 33 – Hazardous and Offensive Development (SEPP 33), to determine whether the works are ‘*potentially hazardous*’.

Sherpa undertook a Preliminary Hazard Analysis, as detailed in Appendix 5, which included an assessment of the effect of the proposal on the risk due to DG transport along Denison St.

This report states ‘*The Repack Facility will not significantly change the total volume of chemicals produced on the Ixom site. Some product that is now exported in bulk tankers will be exported as smaller volume packaged product instead. There will be minimal net change in Class 8 vehicle movements compared to the current CAP Class 8 transport hence the SEPP 33 DG transport screening thresholds are not exceeded.*

There is also an existing Dangerous Goods Transport QRA for Denison Street. Class 8 materials do not contribute quantitatively to the DG transport risk so there will be no impact on the Denison Street Dangerous Goods transport risk QRA from the Botany Repack project.’

Vehicle numbers from the Repack Facility (as a standalone project) are compared against the SEPP 33 transport screening thresholds, as shown in Table 7.1 below.

Table 7.1 SEPP 33 Transport screening thresholds

Class	Cumulative Annual	Peak Weekly	Comments
SEPP 33 Transport Screening threshold Class 8 (all Packing Groups)	>500	>30	SEPP 33 Vehicle Movement Screening Threshold Minimum quantity per load is 2 tonnes (bulk), 5 tonnes (packaged), consequently empty IBCs are not counted as being returned.
Net change compared to total current Class 8 loaded vehicle movements from BIP CAP	<50	<10	The Repack project would not materially change the Class 8 truck numbers for the CAP. Some product that is now exported in bulk tankers would be exported as packaged product instead, so SEPP 33 thresholds are not exceeded. NOTE: The peak weekly figure is based on short term peak summer load as these are seasonal products, winter peak net change would be far lower.

Denison St DG Transport QRA (Sherpa)

As reported in an existing DG Transport QRA for Denison St (Scott Lister), vehicle movements of up to approximately 7000 loaded bulk Class 8 trucks per year are identified in Denison St, mostly from the BIP.

As this report specifies Class 8 materials do not contribute quantitatively to the DG transport risk, there would be no impact on the Denison St DG transport risk QRA results.

As the net change is well below the SEPP 33 transport screening thresholds, a transport route analysis is not required.

For further details please refer to Sherpa’s Preliminary Hazard Analysis in Appendix 5 – Preliminary Hazard Analysis Report.

Traffic - Operational Impacts – General

Chemicals would be despatched in smaller volume packages (1,000 L and 200 L) and smaller trucks (up to 11 IBCs), rather than bulk tankers, which reduces the operation impacts and consequence of an unlikely off-site spill.

The Botany Repack Facility would eliminate one off-site truck movement for each unit of chemical repacked, by removing one destination (i.e. the incumbent repackers) from the supply chain. This significantly reduces the overall operational impact and risk on the wider NSW roads.

As outlined in Table 7.1, there will be negligible net change in Class 8 vehicle movements on Denison Street, compared to the current CAP Class 8 transport. This ultimate increase at future maximum capacity is expected to be less than 50 trucks per year. This is significantly less than the estimated 7,000 loaded bulk Class 8 trucks per year exiting BIP onto Denison Street. It may take many years for the Repack Facility to reach full production - in early years the annual increase is expected to be negligible. Note that during extreme short-term summer peak periods, the increase in truck movements may be up to about 10 per week.

The facility would be manned during business hours only, with 7am to 4pm Monday to Friday anticipated. Vehicles would only enter the site during these times. Trucks entering BIP from Denison Street would do so from either the north or the south. Trucks exiting BIP into Denison Street would do so towards either the north or the south. Please also refer to the route shown in PGA01 in Appendix 2 – Proposed Development Drawings.

The Repack Facility would initially employ two additional full time employees, working normal business hours. Personnel would park in the BIP Beauchamp Road car park. This will increase light vehicle movements to BIP by approximately 500 per annum. This increase of passenger vehicle traffic would be more than offset by the significant reduction in vehicle movements from very significant reductions in numbers of CAP personnel in recent years, including reductions during the Ixom Botany CAP May 2018 re-structure.

Due to the risk reduction in operational traffic impacts on NSW roads, and negligible change in traffic levels more locally on Denison Street (both light passenger vehicles and Class 8 DGs), and the SEPP 33 transport screening thresholds are not exceeded, a formal traffic study and or risk assessment would clearly not provide any additional value, and this was consequently not completed.

Traffic - Operational Impacts - Parking

Significant surplus personnel parking is currently available in the main car park near the Administration Building, off Beauchamp Road, as partly shown in Figure 7.1.

Botany Repack personnel (initially 2 full time equivalents) would utilise this parking located, less than 100m from Block A. Additional personnel parking would not be provided.

A dedicated undercover truck loading bay would be provided for truck parking and manoeuvring. This is sized for rigid trucks up to 11m total length would despatch goods.

No vehicles would queue to enter the BIP site or the Block A site, and no vehicles would park in neighbouring streets.

7.3. Personnel Access

Operational Impacts

The existing internal pedestrian access route from the Administration Building to the Ixom Control Room Building would be modified. This existing path across 2nd Street and the garden bed would be relocated. The new clearly defined pedestrian footpath route shown in enclosed drawing PGA02 proceeds north up the east side of 2nd Street, and then turns left into 2nd Avenue.

This pedestrian route is near the new Repack Facility, and the path would pass the Block A truck despatch route. Pedestrian accident controls include:

- The shed truck loading area would be open (not cladded) to ensure no viewing obstructions, and promote safe truck and forklift access
- Armco road barriers at appropriate locations to physically demarcate pedestrians from truck and forklift areas
- Boom gates swinging horizontally outwards across the pedestrian route during truck egress ; and
- The above route would be clearly signposted and include tiger stripe paint.

As detailed in Section 6.10, personnel would use the existing office, amenities and laboratory located in the adjacent Control Room Building. This would be accessed directly from the Repack Facility. Pedestrians would not enter via the forklift / truck operating areas.

Construction Impacts

During construction, the new pedestrian route discussed in 'Operational Impacts' above would be implemented, providing a new dedicated pedestrian route to the existing Control Room Building.

The site shall also be ring fenced with safety tape and sign posted to ensure non-construction personnel do not enter the site.

To further control the risk of personnel accessing an open trench, after trenches are confirmed as not having services in the immediate vicinity, and witnessed by Ixom, these trenches would be promptly backfilled and compacted. Any trenches or pot holes that would be left open for more than 24 hours shall be barricaded, signposted, and covered.

7.4. Air Emissions and Odour Management

Operations Impacts – Hydrochloric Acid

As IBCs are being filled, air that was stored in the IBC is displaced and discharged from the IBC.

Due to HCl being a fuming material, vapours generated from the displacement of air during the filling of IBCs would be collected in pipework, and passed through a new small scrubber. This scrubber works by passing the HCl vapour through demineralised water, the same process discussed in Section 1.4. An extraction system would be provided for the hydrochloric acid filling station ducted to this scrubber.

This scrubber would filter any HCl vapours, prior to transfer through a stack, and atmospheric discharge, immediately above the top of the shed roof.

A HCl sensor would be placed on the stack outlet, with results monitored / alarmed in the main CAP control room, consistent with other HCl detectors on BIP.

This HCl analyser would record analogue signals back to the Digital Control System (DCS), confirming zero HCl emissions and or emissions meeting EPL 20547 requirements. In the extremely unlikely event of high HCl detected, a local and DCS alarm would occur, automatically promptly shutting down the entire Repack Facility, prior to exceeding any licence criterion.

There is no potential HCl emissions scenario that has been identified that would result in an air pollution incident that would involve any material harm to the environment. In the highly unlikely event that HCl emissions in the HCl scrubber stack are recorded at a level requiring notification to the EPA, all Botany Repack operations would immediately cease. Ixom would follow the 'Pollution Incident Notification' found in Appendix 3. Ixom would also follow the 'Botany CAP Pollution Incident Response Management Plan'. This may require Botany CAP Operations team to notify and or report the incident to the regulator(s) specified in these procedures.

Operations Impacts – Sodium Hypochlorite

Two ground level chlorine detectors would be installed. In the highly unlikely event of a sodium hypochlorite loss of containment, or incompatible chemical mixing event, these would alarm locally and in the DCS, and automatically promptly shut down the entire Repack Facility.

Detectors would be on the programmed maintenance schedule, to ensure accurate calibration.

Liquid caustic is not a fuming material, so additional air controls for this chemical are not required.

No odorous emissions are ever anticipated outside the Botany Repack Facility.

Operations Impacts – Consequence Modelling

A risk assessment workshop was conducted on the potential for inadvertently mixing incompatible chemicals, and potentially causing a chlorine air emission.

The most credible scenario resulting in an air emission that could impact any area outside the immediate Repack Facility boundary is a chlorine release from mixing of incompatible chemicals.

This scenario would be only if the loading bay sump contained fluid which had not been emptied prior to the loading of a truck. If an IBC containing an incompatible material suffered a loss of containment in the loading bay, this could result in the liberation of chlorine from the mixing of hydrochloric acid and sodium hypochlorite in the loading bay sump.

The following design controls would be adopted in the loading bay:

- Forklift driver and or the truck driver would check sump is empty prior to IBCs (and 200L drums) being loaded onto truck. No truck loading can occur if liquid is observed in the sump (other than the very small sump pot used to keep instruments wet)
- Truck loading bay sump level switch (with local alarm). No truck loading would occur during a sump high level alarm
- Truck loading bay sump pH probe (with local and PLC alarm). No truck loading would occur during a sump high pH alarm, or a sump low pH alarm
- Truck loading bay sump conductivity meter (with local and PLC alarm). No truck loading would occur during a high conductivity alarm
- To ensure no residual incompatible chemical remains in the sump pot, a water supply with a rinsing spray ball would be supplied to the sump. This would enable the sump to be washed down as required
- Standard operating procedures would include many quality procedural controls such as pH probe calibration, suitably trained operators, appropriate labelling of IBCs, testing and certification of IBCs prior to filling, ensuring valves and caps are shut, etc
- Each IBC storage area (i.e. areas where IBCs are kept prior to being moved to the truck loading bay) drains to a sump that contains a high-level switch. A leaking IBC in the storage area would be identified prior to being moved into the loading bay
- A power outage that turns off the level / pH / conductivity instruments would result in a local alarm - instruments would be de-energised in fail safe, creating local alarm. No truck loading would occur during a power outage
- Each truck would hold acids or alkalis, not incompatible chemicals
- Mitigation control: Flatbed trucks would be used only – not tankers. The maximum volume of a single container being loaded is 1 kL only
- Mitigation control: Truck loading bay sump chlorine detector, with local and PLC alarm. In the extraordinarily unlikely event of a chlorine leak, Repack & CAP operators would be immediately aware of the need to evacuate the area; and
- A relocatable segregation wall between the loading bay and the alkali storage area prevents damage to the alkali IBCs from a forklift carrying an acid IBC.

The existing operational Environmental Management Plan would be updated to include these controls.

An extract from Sherpa's Preliminary Hazard Report dated 10th May 2018 in Appendix 5 is: *'Consequence modelling undertaken by shows no offsite fatality risk for worst case releases associated with the Repack Facility, hence there will be no effect on the cumulative offsite individual fatality risk contour or societal risk from either the CAP or the BIP QRA 2012. The only identified incidents with potential offsite effects (toxic injury / irritation only) were inadvertent mixing of hypo and acid forming chlorine. However, the frequency of these events was assessed as below the HIPAP4 risk criteria, so the Repack Facility will comply with all offsite risk criteria.'* From above, this BIP QRA shall not be updated.

Construction Impacts

Earthworks would be minimal. Where required, water sprays would be implemented to control dust.

During commissioning using chemicals, the controls outlined in 'Operations Impacts' above would be adopted.

7.5. Stormwater Management

Operations Impacts

Stormwater would be managed in accordance with the existing BIP site stormwater management protocol.

The facility would be covered in a new 'L-shaped' shed superstructure. One shed would be 29.0m x 25.6m, and the other would be 31.8m x 16.5m, as shown in the enclosed drawing PGA03. All stormwater collected on this roof (<1,300 m²) would be collected in two downpipes (225 mm).

An above ground flow balance tank (i.e. rainwater tank) would be installed to prevent surging, for slow release into the site stormwater system. The expected stormwater flow during a large storm would be estimated during the final detailed design, allowing stormwater runoff to be collected and drawing in a controlled manner into the effluent system. This would be communicated to the BIP Operations Managers prior to installation. The final stormwater connection is an existing stormwater pit near the corner of 2nd Street and 2nd Avenue, as shown in drawing PGA02.

Diverting this clean rainwater to the existing BIP stormwater system would nominally increase stormwater runoff collected in the BIP stormwater system.

This stormwater system would be fully enclosed, where chemical and stormwater cross contamination with the Repack Facility cannot occur.

The shed would be partially cladded. Any rainwater inside the bunded facility during an extreme windy wet weather event would be collected in the existing acid / alkali bunds.

Any bund sump that may collect stormwater (or chemical) would not be discharged to stormwater. Sumps would include electrical conductivity and or pH monitoring to determine whether the contained liquid is due to a normal windy rainwater event, or a chemical spill. Rainwater collected in sumps would be pumped to the BIP Effluent Treatment Plant.

Construction Impacts

Earthworks volumes are low. However, soil erosion and sedimentation would still be controlled during the construction phase through diversion of natural drainage away from excavations, silt barriers at appropriate locations, sandbags and or temporary drain diversions.

7.6. Noise Management

Operational Impacts

EPL 20547 Section L4 specifies noise limit requirements, as detailed in Appendix 8.

The proposed operations does not include any plant, equipment or activities that would have the potential to exceed these noise limit criteria specified in the EPL.

The only operational noise that could have the risk of generating any material increase in noise level would be forklifts reversing. Ixom would purchase a forklift with a lower frequency reversing 'squawking' or a similar control, in lieu of higher frequency 'beeping'.

All operations would be undertaken in a purpose built shed which further mitigates impact. As the shed is partially cladded for safety considerations, fully enclosing the shed to mitigate any operational noise from say forklifts reversing is not practicable (see Sections 7.2 and 7.3).

No other equipment or operations are expected to generate any noticeable noise.

A simple noise monitoring survey would be undertaken by Ixom after commissioning to validate compliance with EPL 20547.

Block A has relatively low existing ambient background noise, which minimises impact on operators manning this facility.

Construction Impacts

Construction works are not expected to generate any appreciable additional noise on site. Noise impacts are anticipated to be manageable on site through the application of standard noise mitigation measures including:

- The works are not expected to encounter any significant demolition or similar activities creating significant noise or vibration
- The only construction noise that could have the risk of generating any material increase in noise level would be cutting and demolishing of existing structures. If these do occur, the extent and duration of these noise-intensive activities would be minimised as far as reasonably practicable
- Works would be undertaken within the 'day' defined in Ixom's EPA Licence 20547. This would typically be during standard day time construction hours of 7am - 3pm Monday to Friday. It is unlikely that Saturday work would be required, but if so this would be within the 8am - 1pm Saturdays as required in EPL 20547. No work would occur on Sundays, public holidays, or nights
- Suitably skilled contractors would be engaged who use equipment in good repair and condition, turn off engines when not in use, keep noise to a minimum etc
- Construction would typically involve low volumes of small sized additional traffic only, as detailed in Section 7.2, and not create any noticeable traffic noise; and
- It is noted that background noise is already heavily influenced by road traffic noise from the surrounding road network and industrial activities occurring within the BIP.

The implementation of these mitigation measures ensures no unreasonable adverse noise impacts on surrounding receivers outside BIP.

A simple noise monitoring survey would be undertaken by Ixom during construction to validate compliance with EPL 20547.

7.7. Visual Impact Management

The cladded shed walls would be partly visible from outside the BIP on Beauchamp Road, as shown in Figure 7.1 below:

Figure 7.1 Visual Impact from outside BIP – Beauchamp Road



Some of the CAP can currently be viewed from Beauchamp Road, and would become hidden by the shed. The building would be overshadowed by the existing adjacent caustic tanks (see top left of Figure 7.1) and other industrial structures, and would not detrimentally impact the overall visual amenity from outside BIP. Some may consider the shed more aesthetically pleasing than the current view.

The shed would be cladded with pale eucalypt green Colorbond. BlueScope Steel believes pale green eucalypt '*captures the essence of Australian flora*'. This colour was selected as it is consistent with other structures on BIP, is consistent with other recent large Ixom projects, and is the most popular and common colour with this type of installation.

The colour would be consistent with the shed Ixom built for Orica's Deer Park Groundwater Treatment Plant in Melbourne in 2016, as shown in Figure 7.2 below:

Figure 7.2 Shed Colour



All new plant and equipment would be contained within this purpose built shed, that matches existing BIP buildings within the industrial site and surrounds. No equipment or operational activities could be viewed from outside BIP. This would mitigate any visual impacts outside BIP.

The facility would replace the unsightly 'Memtec Area' (see Figure 2.2) which would improve the visual amenity of the immediate area within BIP. Note a small (approximately 200m²) garden bed would be removed.

As no new lighting would be installed outside the building, there would be no impact on overnight background lighting lux levels. No additional direct or indirect light could be viewed from the site boundary.

7.8. Contaminated Soil / Material / Land Management

The proposed Block A site has an extensive history of industrial use, and has been remediated by Orica.

To manage the risk of encountering contaminated soil the following controls would be implemented:

- Ixom has engaged environmental consultant enRiskS, who specialise in this issue and has undertaken extensive work at BIP. enRiskS issued a report '*Review of Risk Issues for Potential Placement of Repack Facility on Block A, FCAP*'. Report conclusions are captured in Section 7.1 and the full report can be found in Appendix 6.
- Ixom has engaged extensively with the site owner, Orica to fully understand the site history and ensure appropriate use of the land.
- The design has a net export of approximately 30m³ only of fill. This ensures most material currently on the Block A site remains on the Block A site. This excess ~30m³ would be relocated to nearby Block M. This minimises the risk of General / Classified Waste material export from site.
- Should contaminated material is encountered over 893 mg/kg that cannot be reused on BIP, Ixom would reconvene with the site owner to form an alternate plan. Following agreement between Orica and Ixom of such plan, this would also require EPA approval.
- The earthworks design builds up, no down. It adopts a suspended slab constructed on piles, rather than undertaking only bulk excavations. Please refer to drawing PGA04 in Appendix 2. This eliminates most bulk earthworks. Although this introduces significant additional earthworks and piling costs, this approach significantly reduces excavated material volumes, reducing the risk of encountering contaminated material.
- 4m deep screw piles have been specified to enable soil to stay in the ground, in lieu of being augered to the surface. This minimises the risk of bringing potentially contaminated material to the surface during piling.
- The concrete surface and other hardstand surfaces in the 'Memtec' area would generally remain in place. Material would generally be relocated from the Block A garden bed and used to build up on top of the concreted Memtec area. This avoids removal of the large slabs of concrete, asphalt and soil from the 'Memtec' area, reducing the risk of encountering contaminated material in this 'Memtec' area.
- Buried concrete structures are currently located in the Block A garden bed area. Many years ago, this area was covered with clean soil to form this new garden bed area. After this soil is relocated to the 'Memtec' area, this will expose the original concrete structures. Some of these concrete structures will remain in place, and some will be removed. Where practicable, concrete will remain in place.
- The CEMP would include a program for monitoring atmospheric mercury concentrations during earthworks, and identifying and managing other contamination such as asbestos. In the unlikely event mercury concentration in the soil greater than 893 mg/kg be encountered, particularly under the existing garden bed area, works in the immediate area would stop, and further assessment and approval would occur, prior to re-commencement.

7.9. Groundwater Management

The Block A and surrounding sites have been extensively excavated in the past. Based on anecdotal evidence from engineers with a long history of the site, none of these works has ever encountered any groundwater that needed to be dewatered.

The Block A geotechnical report commissioned in 2017 validates these experiences.

Small volumes of pooling may occur under foot, which would quickly seep away through the sandy earth. There is no risk of excavation works intercepting any large volumes of shallow groundwater within the 'Botany Sands'. However, the CEMP shall specify the required steps in this unlikely event, including:

- Prior to commencing excavations consideration whether heavy rain is forecast
- Dewatering procedure; and
- Disposal procedure, which may include transport to and treatment at the existing BIP effluent treatment plant.

Please also refer to Section 0.

7.10. Waste Management

Operations Impacts

The project would divert washdown water and any small spills to be treated in BIP effluent treatment plant, as detailed in Section 6.9.

Incidental volumes of acidic scrubber wastewater generated would be periodically pumped to and treated at the existing CAP effluent treatment plant.

This would pose no issue for total effluent discharge into Sydney Water's sewer system.

No other operational waste is expected.

Construction Impacts

The Block A site currently contains many existing small services and infrastructure that would be removed or relocated, as detailed in Appendix 4 – Existing Site Features. Any demolition and waste management removal would be relatively minor only.

All construction waste would be inspected prior to being removed from site.

Ixom shall ensure site housekeeping standards are maintained to a high level. General demolition construction waste would typically be temporarily stored neatly on site until removal. It may be stored in covered skip bins prior to being removed by a licensed waste contractor for offsite disposal.

During process commissioning activities, small amounts of liquid waste and washwater would be produced. Wherever practicable, these wastes would be reused within the process. If not possible, these wastes would be transported to and treated in the BIP effluent treatment plant.

There would not be any noticeable impact on wastewater discharged during construction. Works would be undertaken in accordance with the Sydney Water Consent to Discharge Industrial Trade Wastewater, found in Appendix 8 – Statutory Licences.

7.11. Classification, Storage and Handling of Dangerous Goods

The facility would store and handle Class 8 DGs currently produced on BIP only. No other classified DG or hazardous materials would be stored within the facility.

The facility complies with all relevant work health and safety regulations and guidelines, particularly:

- AS 3780 Storage and Handling of Corrosive Substances
- NSW EPA Bunding Guidelines; and
- Storage and Handling of Dangerous Goods: Code of Practice (WorkCover 2005).

7.12. Chemical Spills – Risk Management

In the unlikely event of a chemical spill, there would be no receiving environment impact due to:

- Separate concrete bunded areas would be provided for acid and alkali storage
- A dedicated bunded truck loading area
- All bunding would be hydrostatically tested with water prior to operation
- Dedicated forklift routes have been provided where IBC storage is not permitted
- All incompatible chemicals would be segregated by >5m
- All bunds would contain an impervious epoxy coated concrete bund sump
- Sumps would include an internal dual contained liner (i.e. a sump within a sump)
- All new chemical pipework would be installed above ground, over a non-permeable surface
- Various instrumentation and alarms to promptly alert and control any spill; and
- The facility would be operated and maintained by suitably experienced and trained personnel, supported by extensive Ixom BIP management systems.

Please also refer to Sections 6.2, 6.3 and 6.5.

7.13. Hazards, Incident Risks and Contingency Practices

The facility would be integrated with the current and comprehensive suite of BIP environmental, operational, risk management and contingency plans.

The greatest new hazard identified during operations is a chlorine release from incompatible chemical mixing, as outlined in Section 6.5. A significant number of controls have been included to effectively manage this risk.

Please refer to Section 7.3 Personnel Access for further information around the controls to manage pedestrian access risks near the new facility.

Please refer to Section 7.4 and Appendix 5 – Preliminary Hazard Analysis Report, which concluded that *'consequence modelling showed no offsite fatality risk for worst case releases'*.

7.14. Site Construction Management

Plant Modification Approval Management of Change

Ixom's plant modification Management of Change (MoC) process will be adopted prior to commencement of works. Ixom's MoC process is based on the original Orica MoC process, which is also consistent with the BIP MoC process. Following Ixom's completion of the MoC, Ixom shall circulate this to BIP Class A Stakeholders for comment, prior to proceeding with the works.

The project shall include two separate MoCs:

- Site preparation works (i.e. proofing existing services, removal of existing assets and relocation of existing operational services); and
- Construction of new works.

Construction Environment Management Plan

Before commencement of ground excavations and construction of new works, Ixom shall prepare a CEMP. This shall include relevant details of construction methodology and key mitigation measures, including those captured in this EA.

Block A has a significant number of buried services. Due consideration shall be given to controlling the risk of impacting any live service. A 1.5m deep discovery trench will be excavated around the entire site prior to construction, using a combination of mechanical (small blunt bladed mud bucket type, with full time spotter) and manual excavation. Manual excavation would be limited to the inspected area with known and expected existing services. When an unexpected pipe or service is uncovered, work in the immediate vicinity would stop until investigated and a solution identified.

The CEMP would designate an Ixom Project Engineer based full time on site to monitor implementation of these mitigation measures and ensure that there are not any adverse impacts to the environment during construction.

8. Recommendation

The proposal to construct a new Botany Repack Facility located on Block A of the Botany Industrial Park, Matraville is consistent with all relevant planning and environmental legislation, it addresses the SEARs, and is consistent with the previous development consent (DA No 35/98).

The facility would provide several benefits, yet would result in only negligible possible environmental impacts that can all be effectively controlled and confined to the new site only, as described in Section 7.

Minor administrative amendments only are required to Ixom licences and conditions, as described in Table 3.2.

Ixom has lodged this EA under Section 75W of the EP&A Act. Ixom requests DP&E to assess and provide consent to this proposed modification. Ixom would then promptly proceed to construct the facility as proposed.

9. Appendices

9.1. Appendix 1 – SEARs (DA35/98 Modification 5)

Mr Mark Jarvis
Senior Project Manager - Water Treatment Systems
Ixom Pty Ltd
Level 10, 1 Nicholson Street
East Melbourne VIC 3002

OBJ16/11729
DA 35/98 MOD 5

Dear Mr Jarvis

**Chlor-Alkali Plant, Matraville
Secretary's Environmental Assessment Requirements (SEARs)
DA 35/98 MOD 5**

I refer to your email dated 8 November 2017, seeking an extension to the Secretary's Environmental Assessment Requirements (SEARs) issued by the Department on 22 December 2016. These SEARs were for the preparation of an Environmental Assessment (EA) supporting a modification request to the Minister's consent for the Chlor-Alkali Plant (DA 35/98). This request would be assessed under section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The Department understands the modification request proposes the construction of a packaging facility to enable the site to package selected chemicals into 200 litre drums, and 1,000 litre Intermediate Bulk Containers (IBCs). It is noted this proposal has been revised slightly since the Department's original letter, with the packaging facility having been relocated from Block M to Block A at the site.

In conjunction with the Department's original letter, you must ensure that the EA supporting the modification request includes the following:

- **Details of the existing operations on the site**, including:
 - existing and approved operations/facilities, including any statutory approvals that apply to these
 - a summary of the existing conditions of consent that would be relevant to the proposal
 - a summary of the existing environmental management and monitoring regime
- **Description of the modification** including plans of any proposed works
- **Need and justification for the modification**
- **Identification of conditions to be modified**
- **Other approvals** – identification of any proposed variations to other licences and approvals including the current Environment Protection Licence and *Environmentally Hazardous Chemicals Act (1985)* Licence
- **Identification of the potential environmental impacts of the modification** – including a more detailed assessment of the key issues identified below
- **Hazards and Risks**, including:
 1. a preliminary risk screening carried out in accordance with *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* and Applying SEPP 33 (DoP, 2011), with a clear indication of class (including the subsidiary risk), quantity, package size, and location of all dangerous goods and hazardous materials associated with the proposed modification
 2. should the preliminary risk screening indicate that the proposed modification is "potentially

hazardous", a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis (DoP, 2011), and Multi-Level Risk Assessment (DoP, 2011). The PHA must:

- identify the hazards associated with the proposed modification to determine the potential for off-site impacts
 - estimate the risks from the proposed modification and the cumulative risks from the existing facility and the proposed modification
 - demonstrate that the proposed modification complies with the criteria set out in Hazardous Industry Planning Advisory Paper No 4 - Risk Criteria for Land Use Safety Planning and
 - demonstrate that the proposed modification does not increase the cumulative risk of the Botany Industry Park (BIP) to unacceptable levels
3. evaluate the impacts (if any) from the modification on the overall risks from transport of Dangerous Goods on Denison Street
- **Air Quality** – including details of any emissions and control measures
 - **Traffic and Transport** - including details of traffic types, volumes and haul routes and details of internal road layout, and parking
 - **Stormwater** - proposed stormwater management and onsite bunding and
 - **Construction and Operational Noise** - potential operational and construction noise impacts including details of noise mitigation and monitoring (if necessary).

The Department strongly recommends you consult with other relevant government agencies and the community in preparing the EA including, but not limited to, Safework NSW, Bayside Council, the Environment Protection Authority and community groups associated with the BIP.

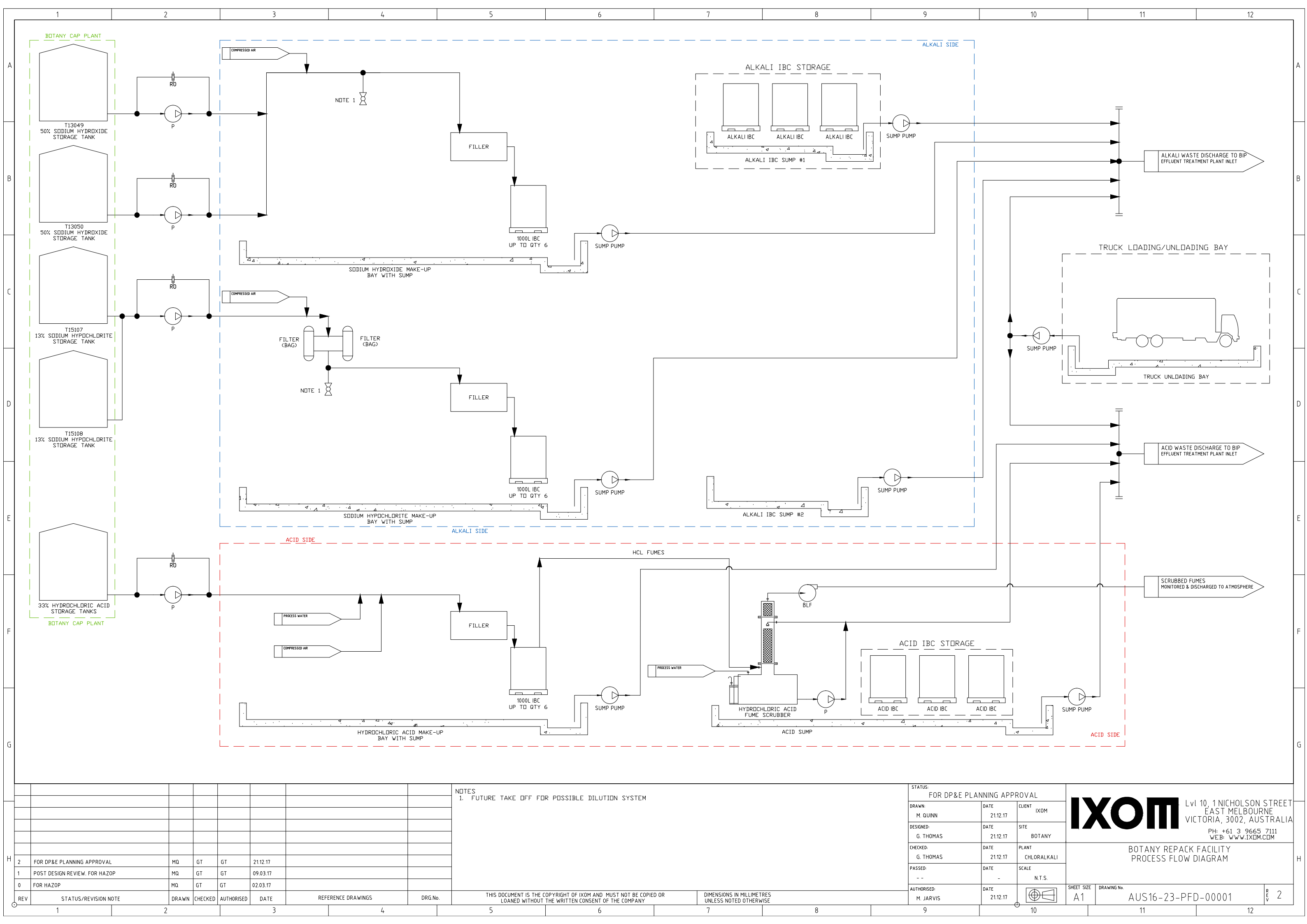
Following lodgement of the modification request, the Department will advise you of the applicable fee (under Division 1A, Part 15 of the *Environmental Planning and Assessment Regulation 2000*).

Should you have any further enquiries, please contact Melissa Prochazka, Planning Services, at the Department on the details above.

Yours sincerely


Chris Ritchie 11/12/17
Director
Industry Assessments
as delegate of the Secretary

9.2. Appendix 2 – Proposed Development Drawings



NOTES
1. FUTURE TAKE OFF FOR POSSIBLE DILUTION SYSTEM

STATUS: FOR DP&E PLANNING APPROVAL			
DRAWN: M. QUINN	DATE 21.12.17	CLIENT IXOM	
DESIGNED: G. THOMAS	DATE 21.12.17	SITE BOTANY	
CHECKED: G. THOMAS	DATE 21.12.17	PLANT CHLORALKALI	
PASSED: --	DATE -	SCALE N.T.S.	
AUTHORISED: M. JARVIS	DATE 21.12.17		

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BOTANY REPACK FACILITY
PROCESS FLOW DIAGRAM

SHEET SIZE
A1

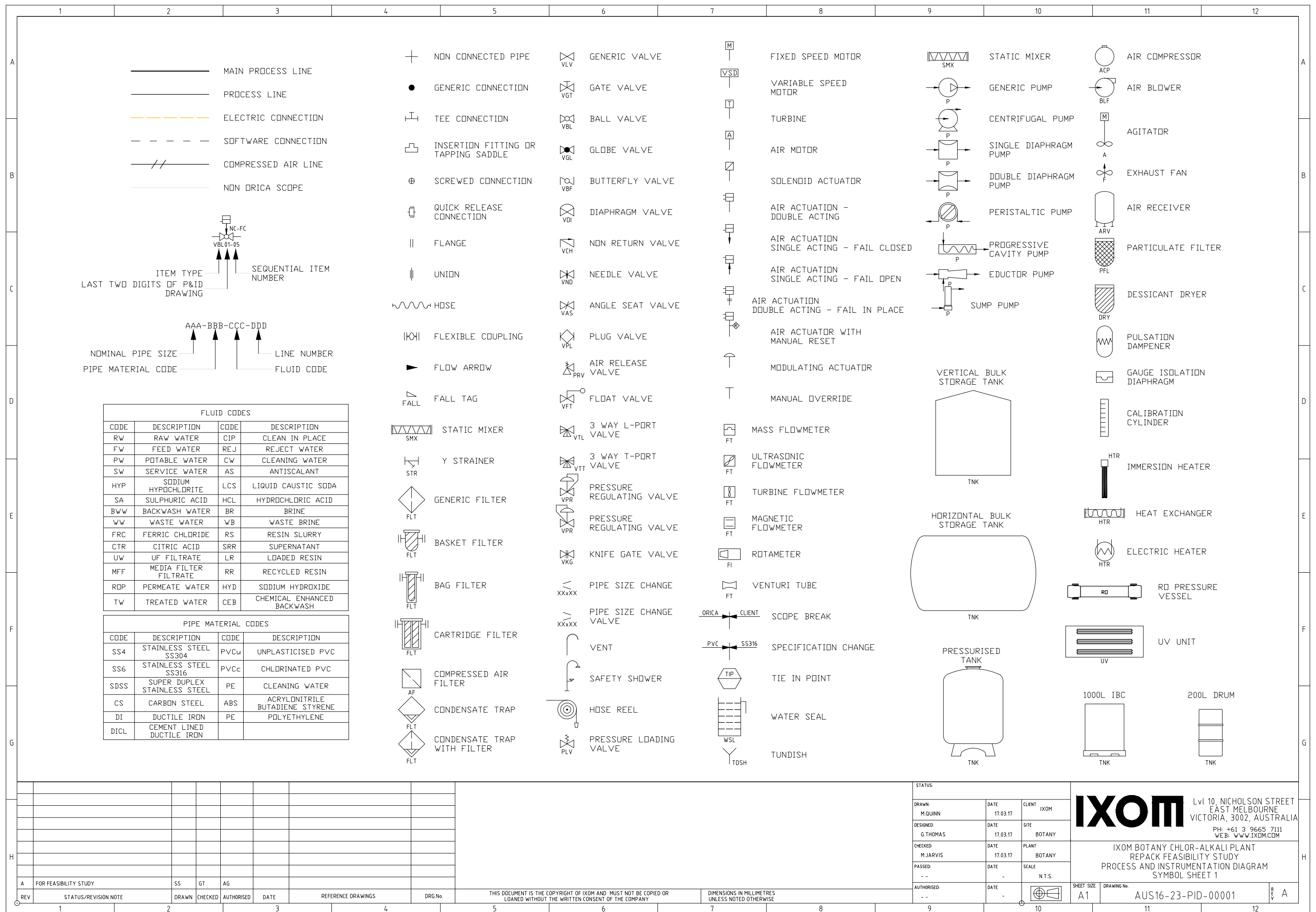
DRAWING No.
AUS16-23-PFD-00001

REV
2

REV	STATUS/REVISION NOTE	DRAWN	CHECKED	AUTHORISED	DATE	REFERENCE DRAWINGS	DRG.No.
2	FOR DP&E PLANNING APPROVAL	MQ	GT	GT	21.12.17		
1	POST DESIGN REVIEW. FOR HAZOP	MQ	GT	GT	09.03.17		
0	FOR HAZOP	MQ	GT	GT	02.03.17		

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INSTRUMENTATION
IDENTIFICATION TABLE

ORDER OF SUFFIXES WHEN MORE THAN ONE IS USED IS I R C Q S Z A H L

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		STATUS		
C				CONTROL	CLOSED
D	DENSITY	DIFFERENTIAL			
E	ALL ELECTRICAL VARIABLES		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	GAUGING POSITION OR LENGTH		GLASS, VIEWING DEVICE		
H	HAND (MANUALLY INITIATED) OPERATED				HIGH (RUNNING)
I	UNCLASSIFIED		INDICATE		
J	POWER				
K	TIME, TIME PROGRAMME			CONTROL STATION	BARRIER
L	LEVEL		LIGHT		LOW (STOPPED)
M	MOISTURE OR HUMIDITY				
N					
O	OPERATOR		ORIFICE, RESTRICTION		OPEN
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE TOTALISE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH/SOLENOID	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER (UNSPECIFIED CORRECTING UNIT)	
W	WEIGHT, FORCE, TORQUE		WELL		
X	ON-OFF				
Y				RELAY, COMPUTE, CONVERT	
Z	POSITION			EMERGENCY OR SAFETY ACTING	

EXAMPLES

INSTRUMENTATION SYMBOL AND TAG EXAMPLES	
SYMBOL	SYMBOL AND TAG EXPLAINED
	"XV" DENOTES AN ON/OFF VALVE. THE SYMBOL SHOWS IT'S A SINGLE ACTING FAIL CLOSED N/O PNEUMATIC BUTTERFLY VALVE. WHETHER IT'S A BUTTERFLY OR A BALL VALVE, THE TAG IS STILL "XV". "SV" DENOTES SOLENOID VALVE. "DC" NEXT TO PLC DENOTES OPEN/CLOSED END OF TRAVEL LIMIT SWITCH SIGNAL.
	"FCV" DENOTES A FLOW CONTOL VALVE. THE SYMBOL SHOWS IT'S A SINGLE ACTING FAIL CLOSED N/O PNEUMATIC BUTTERFLY VALVE. WHETHER IT'S A BUTTERFLY OR A BALL VALVE, THE TAG IS STILL "FCV". "VC" DENOTE I/P CONVERTER. 4-20mA DENOTES PLC I/O.
	"PI" DENOTES IT'S A PRESSURE INDICATOR (I.E. A PRESSURE GAUGE).
	"AE" DENOTES AN ANALYTICAL ELEMENT (I.E. A SENSOR/PROBE) "pH" DENOTES THE ELEMENT MEASURES pH. "AIT" DENOTES AN ANALYTICAL INDICATING TRANSMITTER.
	WHERE AN ELEMENT IS ALSO A TRANSMITTER, IT'S COMMON TO SHOW THE INSTRUMENTATION AS ONLY A TRANSMITTER. "PT" DENOTES A PRESSURE TRANSMITTER.
	PLC/SCADA IS SHOWN AS A BOX. THE SETPOINTS OF ALARM ARE SHOWN OUTSIDE THE BOX. THE EXAMPLE SHOWS AN INDICATING, RECORDING LEVEL ALARM WITH 4 ALARM SETPOINTS
	IF ONE FIELD INSTRUMENT HAS MULTIPLE PROBES OR TRANSMITTERS, EACH MEASUREMENT PARAMETER SHALL BE SHOWN IN A BOX, WHICH REPRESENTS THE ONE FIELD INSTRUMENT

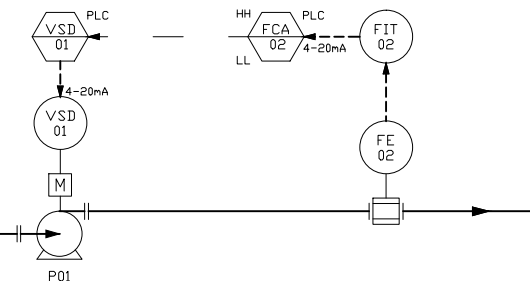
ON THIS PROJECT :		CONVENTIONAL DISCRETE INSTRUMENT	CONFIGURABLE FUNCTION WITH SHARED DISPLAY (eg. IN DCS)	PROGRAMMABLE FUNCTION (eg. NOT IN DCS)
LOCATION	OPERATOR ACCESS			
CENTRAL (eg. CONTROL ROOM)	YES			
	NO			
LOCAL PANEL (NOTE 4)	YES			
	NO			
FIELD	IF APPLICABLE			

- SEPARATE TRIP OR INTERLOCK SYSTEM, INCLUDING HIGH SECURITY SYSTEMS. MAY BE HARDWIRED OR PROGRAMMABLE. SHOW TRIP No. IF APPROPRIATE.
- TRIP OR INTERLOCK FUNCTION CARRIED OUT BY DCS SHOW TRIP No. IF APPROPRIATE.
- SEPARATE PROGRAMMABLE SEQUENCE OR CONTROL WITH OR WITHOUT DISPLAY. eg. PLC
- SEQUENCE CONTROL CARRIED OUT BY DCS. SHOW SEQUENCE No. IF APPROPRIATE.

OTHER INSTRUMENTATION SYMBOLS		
SYMBOL	TAG	DESCRIPTION
	LA	VISUAL ALARM
	LA	AUDIBLE ALARM

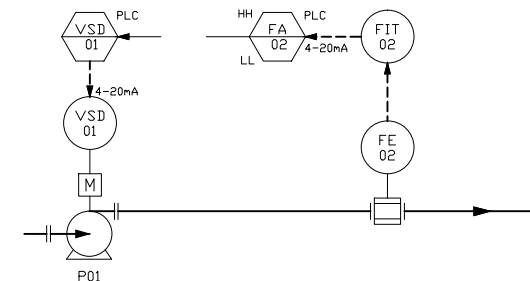
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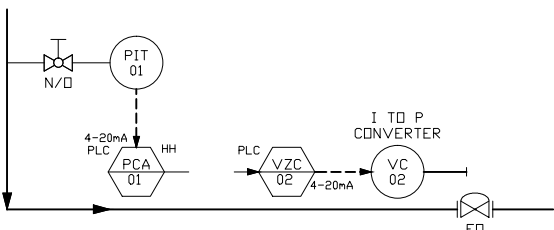


- P01 IS A VSD CONTROLLED PUMP.
- FIT01 IS A FLOW INDICATING TRANSMITTER AND IT CONTROLS VSD01.
- LOW/LOW & HIGH/HIGH ALARMS ARE MEASURED FROM FIT02.
- DIAGRAM DOESN'T SHOW WHAT THE LOW/LOW OR/HIGH/HIGH ALARMS DO. SEE CONTROL PHILOSOPHY OR FUNCTION SPECIFICATION DESCRIPTION FOR DETAILS.

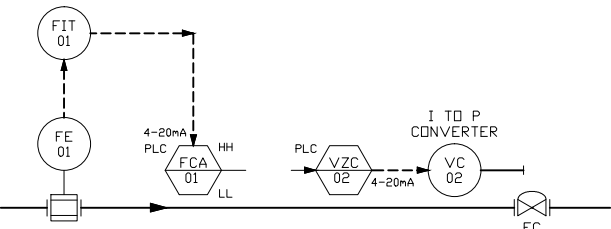
INTERLOCKS



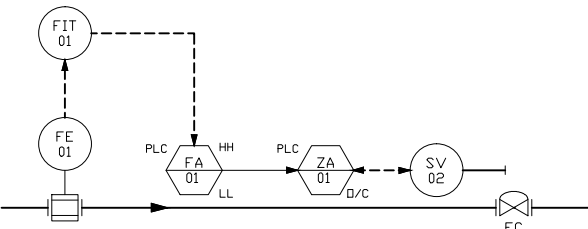
- P01 IS A VSD CONTROLLED PUMP.
- FIT01 IS A FLOW INDICATING TRANSMITTER.
- LOW/LOW & HIGH/HIGH ALARMS ARE MEASURED FROM FIT02.
- DIAGRAM DOESN'T SHOW WHAT THE LOW/LOW OR/HIGH/HIGH ALARMS DO. SEE CONTROL PHILOSOPHY OR FUNCTION SPECIFICATION DESCRIPTION FOR DETAILS.



- PCV02 IS A PRESSURE CONTROLLING VALVE.
- PCV02 FAILS OPEN.
- VC02 IS THE POSITIONER ON PCV02.
- VC02 ONLY ACCEPTS A 4-20 mA INPUT.
- PIT01 PRESSURE INDICATING TRANSMITTER CONTROLS PRESSURE CONTROLLING VALVE POSITIONER.
- A HIGH/HIGH ALARM IS MEASURED FROM PIT01.
- DIAGRAM DOESN'T SHOW WHAT THE LOW/LOW OR/HIGH/HIGH ALARMS DO. SEE CONTROL PHILOSOPHY OR FUNCTION SPECIFICATION DESCRIPTION FOR DETAILS.

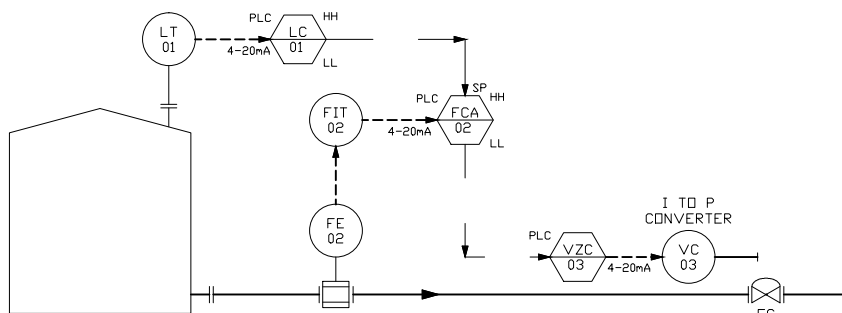


- FCV02 IS A FLOW CONTROLLING VALVE.
- FCV02 FAILS CLOSED.
- VC02 IS THE POSITIONER ON FCV02.
- VC02 ONLY ACCEPTS A 4-20 mA INPUT.
- FIT01 PRESSURE INDICATING TRANSMITTER CONTROLS FLOW CONTROLLING VALVE POSITIONER.
- LOW/LOW & HIGH/HIGH ALARMS ARE MEASURED FROM FIT01.
- DIAGRAM DOESN'T SHOW WHAT THE LOW/LOW OR/HIGH/HIGH ALARMS DO. SEE CONTROL PHILOSOPHY OR FUNCTION SPECIFICATION DESCRIPTION FOR DETAILS.

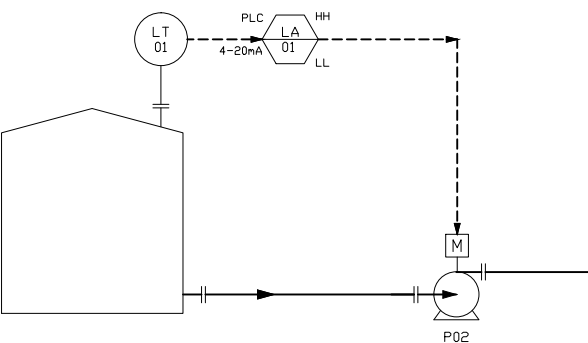


- XV02 IS AN AUTO ON/OFF VALVE.
- XV02 FAILS CLOSED.
- SV02 IS THE SOLENOID VALVE ON XV02.
- OPEN/CLOSED END OF TRAVELS LIMIT ON XV02.
- FIT01 IS A FLOW INDICATING TRANSMITTER.
- LOW/LOW & HIGH/HIGH ALARMS ARE MEASURED FROM FIT01.
- DIAGRAM DOESN'T SHOW WHAT THE LOW/LOW OR/HIGH/HIGH ALARMS DO. SEE CONTROL PHILOSOPHY OR FUNCTION SPECIFICATION DESCRIPTION FOR DETAILS.

CASCADE CONTROL



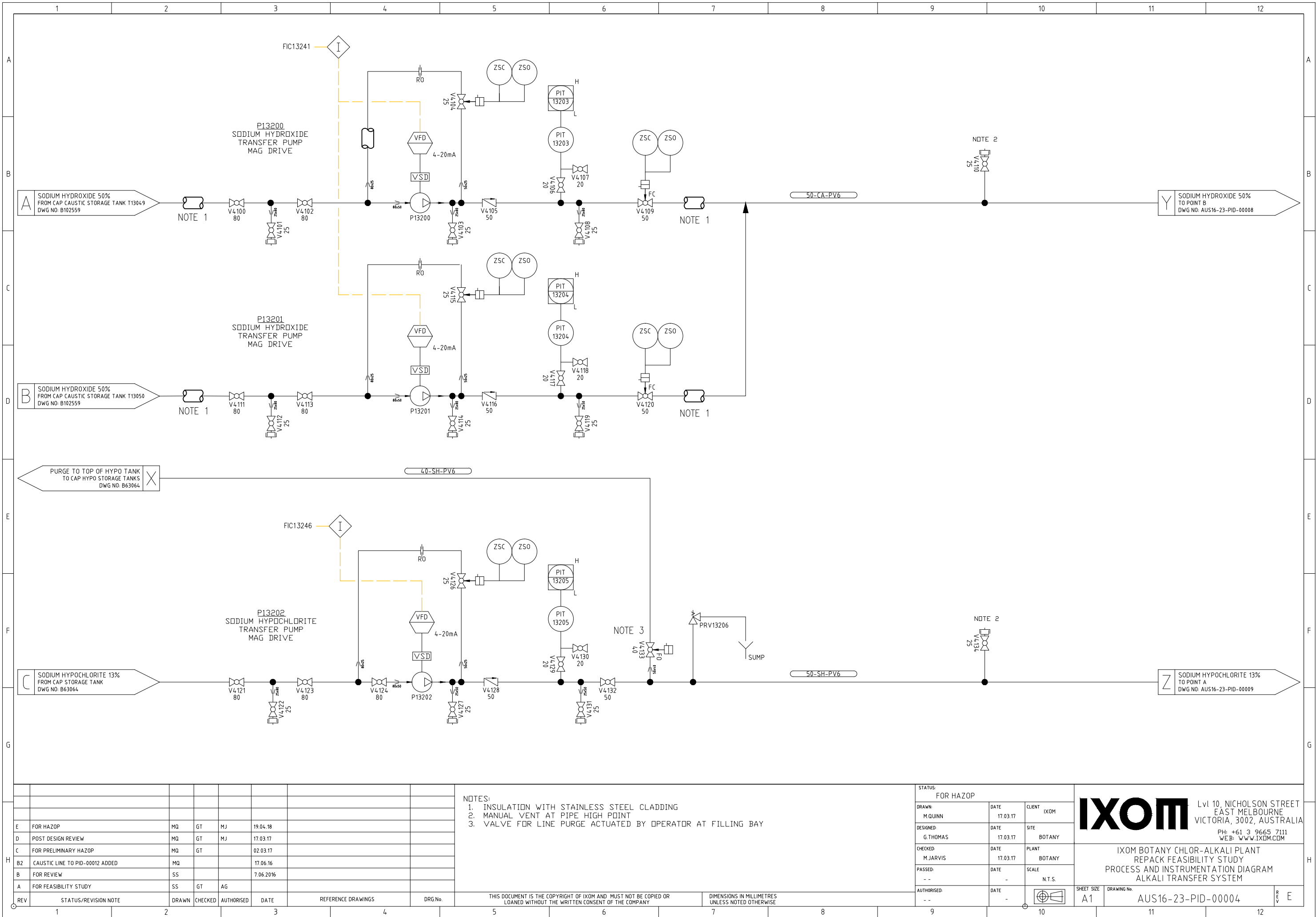
- LT01 IS A LEVEL TRANSMITTER.
- LT01 IS THE PRIMARY SIGNAL OF A TWO SIGNAL CASCADE CONTROL.
- FIT02 IS THE SECONDARY SIGNAL OF A TWO SIGNAL CASCADE CONTROL.
- VC02 IS THE POSITIONER ON FCV02.
- FCV02 IS A CASCADE CONTROL VALVE.
- FIT01 IS A FLOW INDICATING TRANSMITTER CONTROLS FLOW CONTROLLING VALVE POSITIONER.
- LOW/LOW & HIGH/HIGH ALARMS ARE MEASURED FROM FIT02.
- LOW/LOW & HIGH/HIGH ALARMS ARE MEASURED FROM LT01.
- DIAGRAM DOESN'T SHOW WHAT THE LOW/LOW OR/HIGH/HIGH ALARMS DO. SEE CONTROL PHILOSOPHY OR FUNCTION SPECIFICATION DESCRIPTION FOR DETAILS.

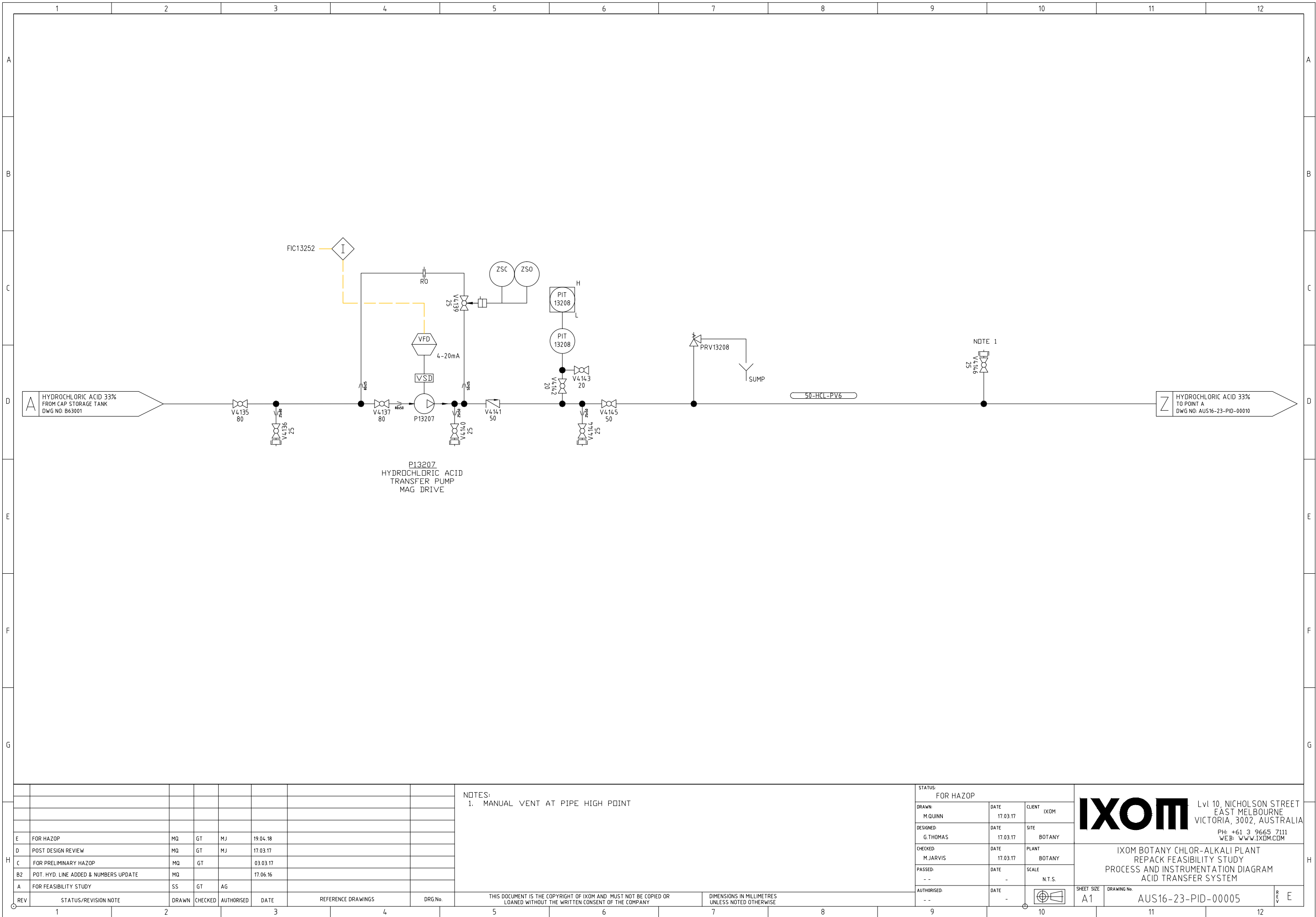


- LT01 IS A LEVEL TRANSMITTER.
- P02 IS A SINGLE SPEED PUMP.
- LOW/LOW & HIGH/HIGH ALARMS ARE MEASURED FROM LT01.
- DIAGRAM DOESN'T SHOW WHAT THE LOW/LOW OR/HIGH/HIGH ALARMS DO. SEE CONTROL PHILOSOPHY OR FUNCTION SPECIFICATION DESCRIPTION FOR DETAILS.

REV	STATUS/REVISION NOTE	DRAWN	CHECKED	AUTHORISED	DATE	REFERENCE DRAWINGS	DRG No.
A	FOR FEASIBILITY STUDY	SS	GT	AG			

STATUS:			IXOM Lvl 10, NICHOLSON STREET EAST MELBOURNE VICTORIA, 3002, AUSTRALIA PH: +61 3 9665 7111 WEB: WWW.IXOM.COM IXOM BOTANY CHLOR-ALKALI PLANT REPACK FEASIBILITY STUDY PROCESS AND INSTRUMENTATION DIAGRAM SYMBOL SHEET 3			SHEET SIZE A1	DRAWING No. AUS16-23-PID-00003	REV A
DRAWN:	M QUINN	DATE	17.03.17	CLIENT	IXOM			
DESIGNED:	G THOMAS	DATE	17.03.17	SITE	BOTANY			
CHECKED:	M JARVIS	DATE	17.03.17	PLANT	BOTANY			
PASSED:	--	DATE	-	SCALE	N.T.S.			
AUTHORISED:	--	DATE	-					





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NO LONGER USED

								STATUS: FOR HAZOP			IXOM Lvl 10, NICHOLSON STREET EAST MELBOURNE VICTORIA, 3002, AUSTRALIA PH: +61 3 9665 7111 WEB: WWW.IXOM.COM IXOM BOTANY CHLOR-ALKALI PLANT REPACK FEASIBILITY STUDY PROCESS AND INSTRUMENTATION DIAGRAM SODIUM HYDROXIDE DILUTION SYSTEM		REV E				
E	FOR HAZOP	MQ	GT	MJ	19.04.18			DRAWN:	M QUINN	DATE				17.03.17	CLIENT	IXOM	
D	POST DESIGN REVIEW	MQ	GT	MJ	17.03.17			DESIGNED:	G THOMAS	DATE				17.03.17	SITE	BOTANY	
B3	GENERAL UPDATE	MQ			20.06.16			CHECKED:	M JARVIS	DATE				17.03.17	PLANT	BOTANY	
B2	HYPO FEED TO TNK06-01 ADDED & NUMBERS UPDATE	MQ			17.06.16			PASSED:	--	DATE				-	SCALE	N.T.S.	
A	FOR FEASIBILITY STUDY	SS	GT	AG				AUTHORISED:	--	DATE	-			SHEET SIZE	A1	DRAWING No.	AUS16-23-PID-00006
REV	STATUS/REVISION NOTE	DRAWN	CHECKED	AUTHORISED	DATE	REFERENCE DRAWINGS	DRG No.	THIS DOCUMENT IS THE COPYRIGHT OF IXOM AND MUST NOT BE COPIED OR LOANED WITHOUT THE WRITTEN CONSENT OF THE COMPANY			DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE						

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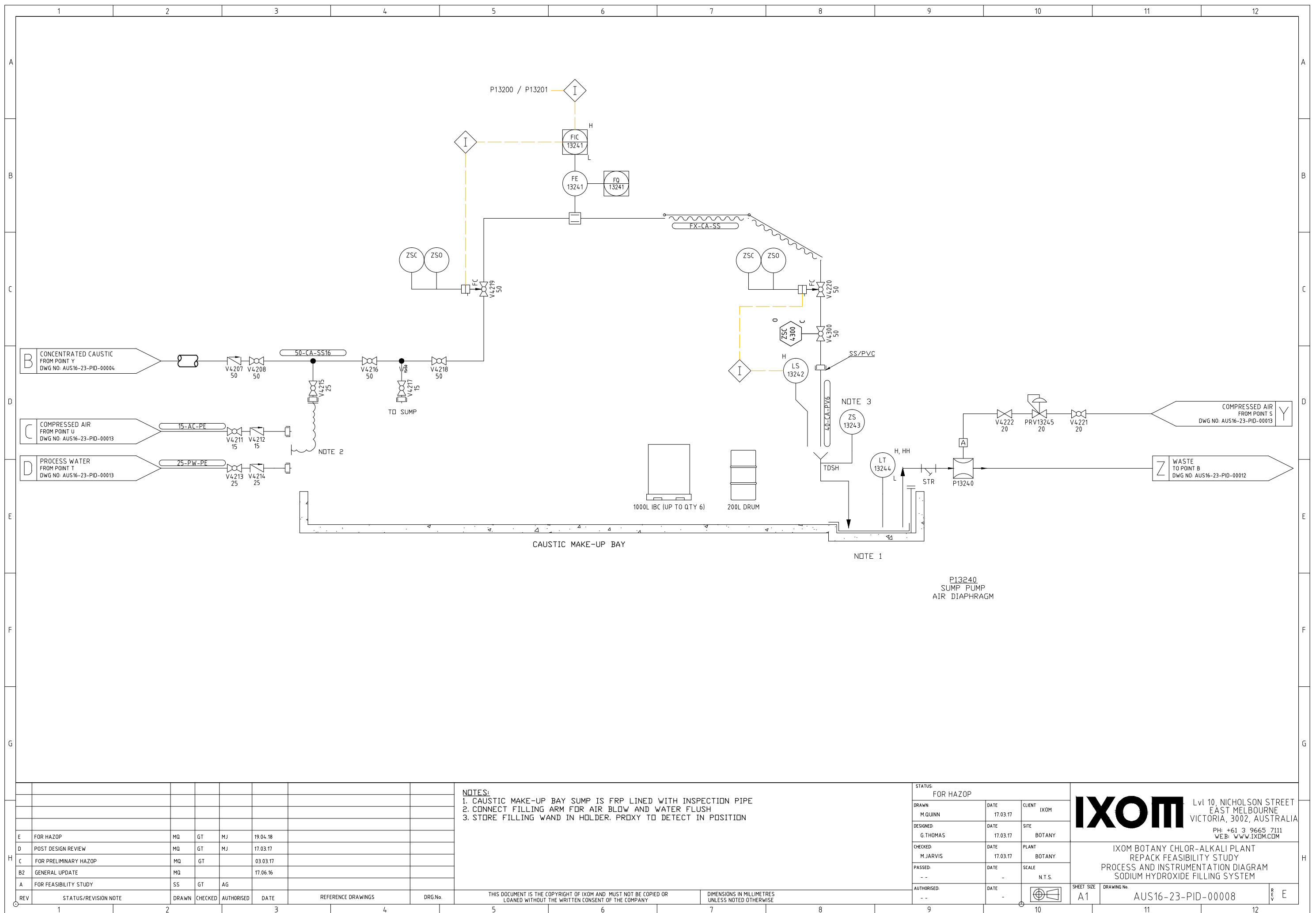
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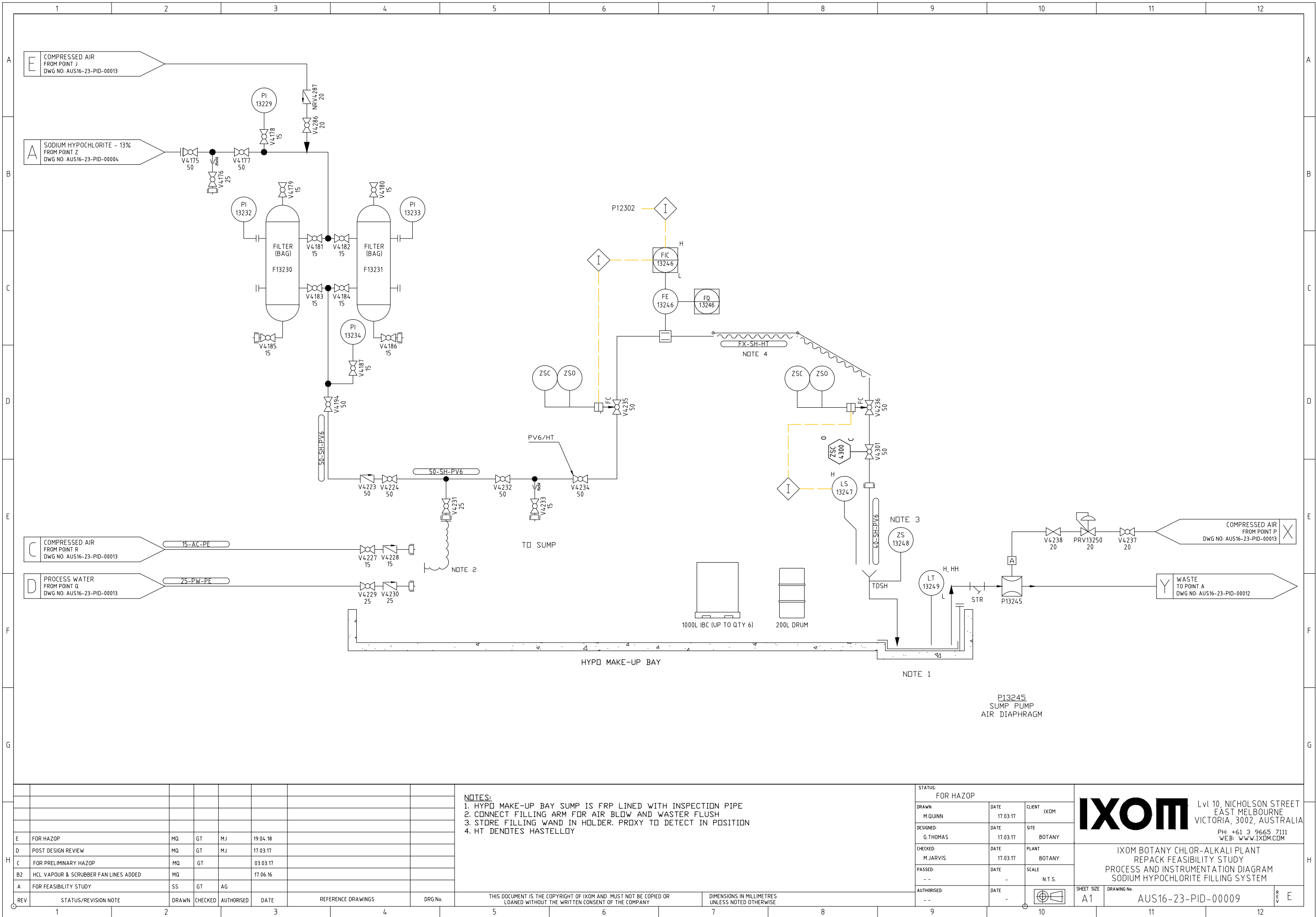
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- NOTES:
- 1. HYPO MAKE-UP BAY SUMP IS FRP LINED WITH INSPECTION PIPE
 - 2. CONNECT FILLING ARM FOR AIR BLOW AND WASTER FLUSH
 - 3. STORE FILLING WAND IN HOLDER. PROXY TO DETECT IN POSITION
 - 4. HT DENOTES HASTELLOY

REV	STATUS/REVISION NOTE	DRAWN	CHECKED	AUTHORISED	DATE	REFERENCE DRAWINGS	DRG No.
E	FOR HAZOP	MQ	GT	MJ	19.04.18		
D	POST DESIGN REVIEW	MQ	GT	MJ	17.03.17		
C	FOR PRELIMINARY HAZOP	MQ	GT		03.03.17		
B2	HCL VAPOUR & SCRUBBER FAN LINES ADDED	MQ			17.06.16		
A	FOR FEASIBILITY STUDY	SS	GT	AG			

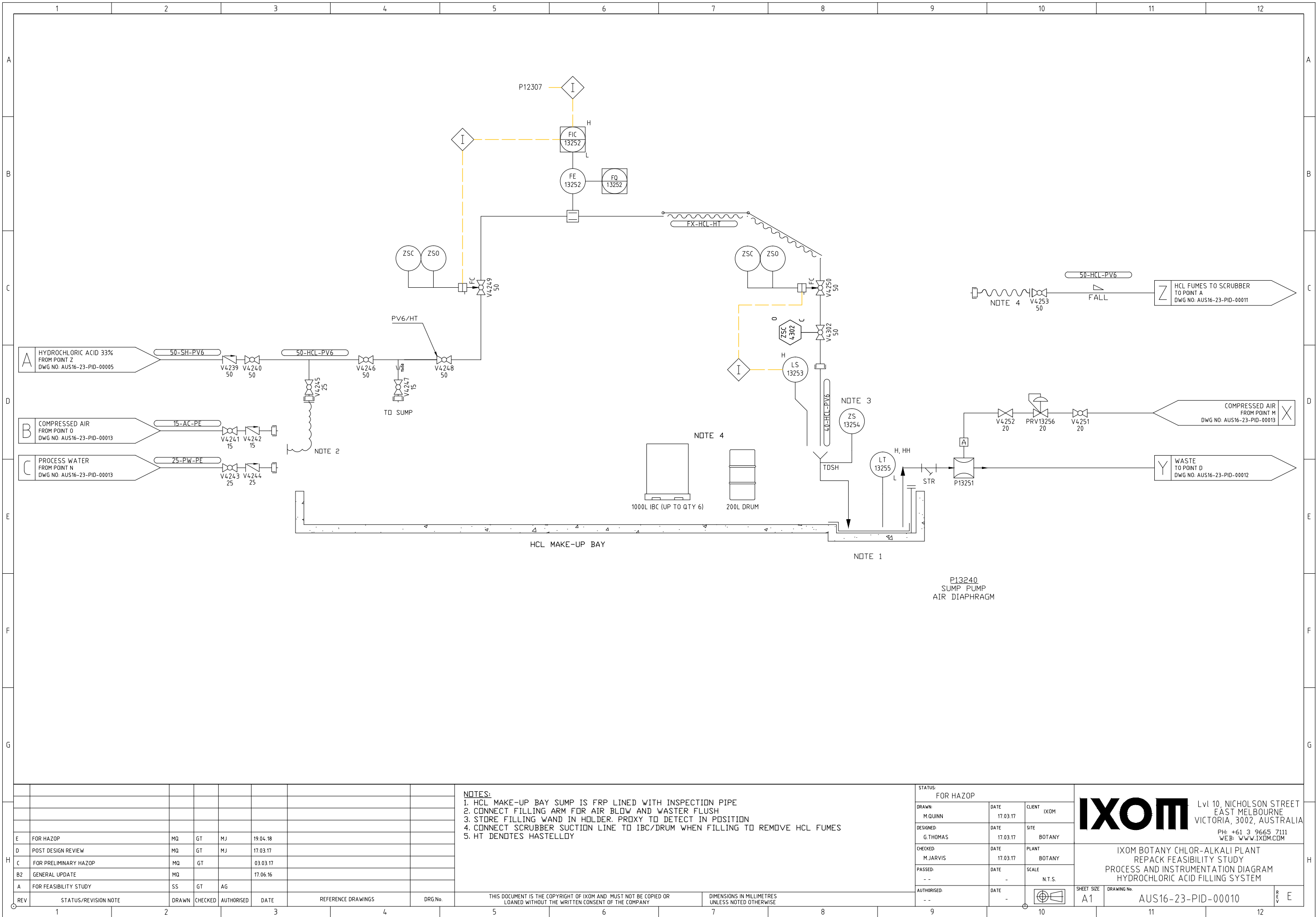
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DESIGNED:	DATE:	SITE:
G THOMAS	17.03.17	BOTANY
CHECKED:	DATE:	PLANT:
M JARVIS	17.03.17	BOTANY
PASSED:	DATE:	SCALE:
--	-	N.T.S.
AUTHORISED:	DATE:	
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IXOM BOTANY CHLOR-ALKALI PLANT
REPACK FEASIBILITY STUDY
PROCESS AND INSTRUMENTATION DIAGRAM
SODIUM HYPOCHLORITE FILLING SYSTEM

SHEET SIZE: A1
DRAWING No: AUS16-23-PID-00009
REV: E



NOTES:

1. HCL MAKE-UP BAY SUMP IS FRP LINED WITH INSPECTION PIPE
2. CONNECT FILLING ARM FOR AIR BLOW AND WASTER FLUSH
3. STORE FILLING WAND IN HOLDER. PROXY TO DETECT IN POSITION
4. CONNECT SCRUBBER SUCTION LINE TO IBC/DRUM WHEN FILLING TO REMOVE HCL FUMES
5. HT DENOTES HASTELLOY

STATUS:

FOR HAZOP

DRAWN:	DATE	CLIENT
M QUINN	17.03.17	IXOM
DESIGNED:	DATE	SITE
G THOMAS	17.03.17	BOTANY
CHECKED:	DATE	PLANT
M JARVIS	17.03.17	BOTANY
PASSED:	DATE	SCALE
--	-	N.T.S.
AUTHORISED:	DATE	
--	-	



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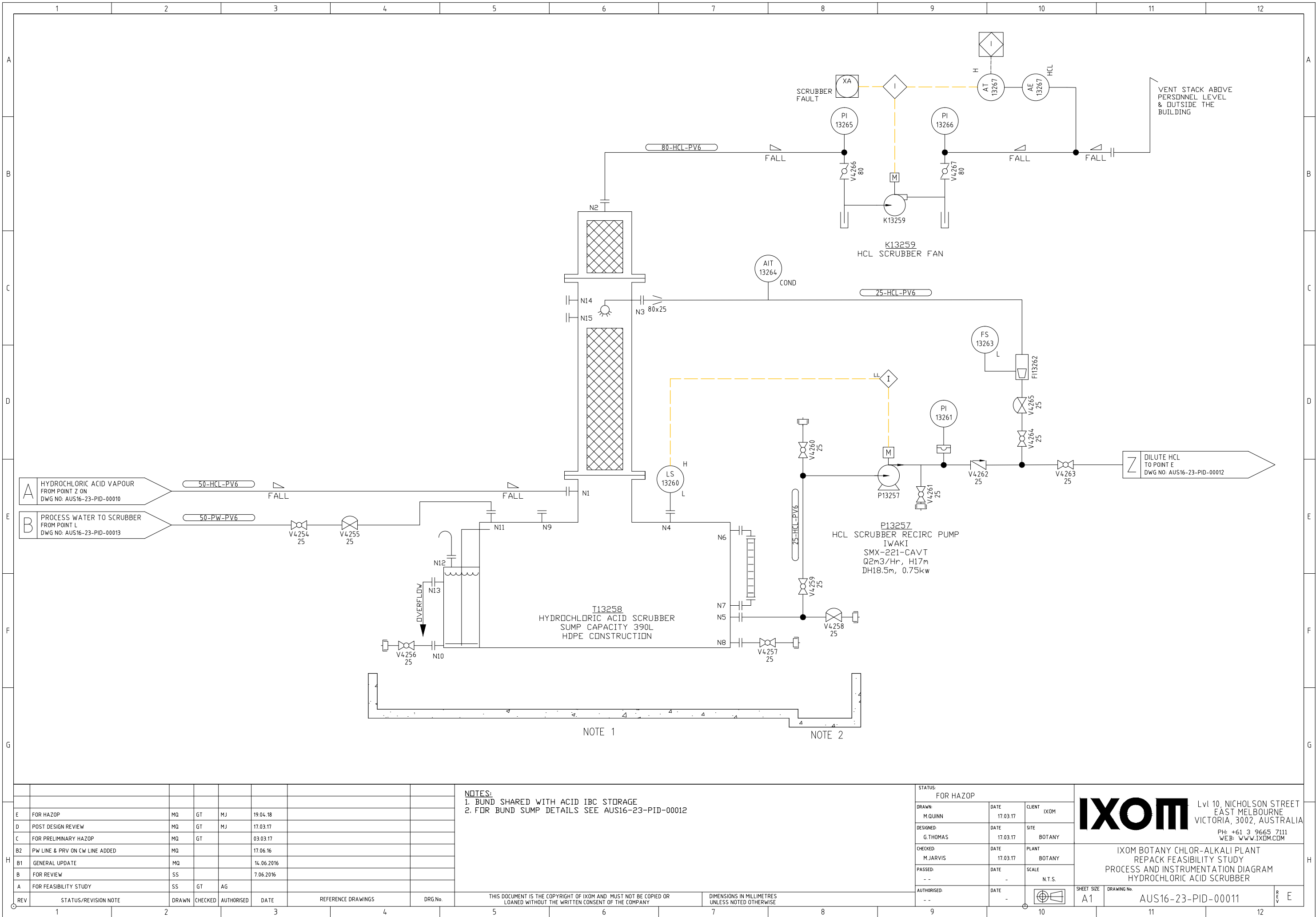
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REPACK FEASIBILITY STUDY
PROCESS AND INSTRUMENTATION DIAGRAM
HYDROCHLORIC ACID FILLING SYSTEM

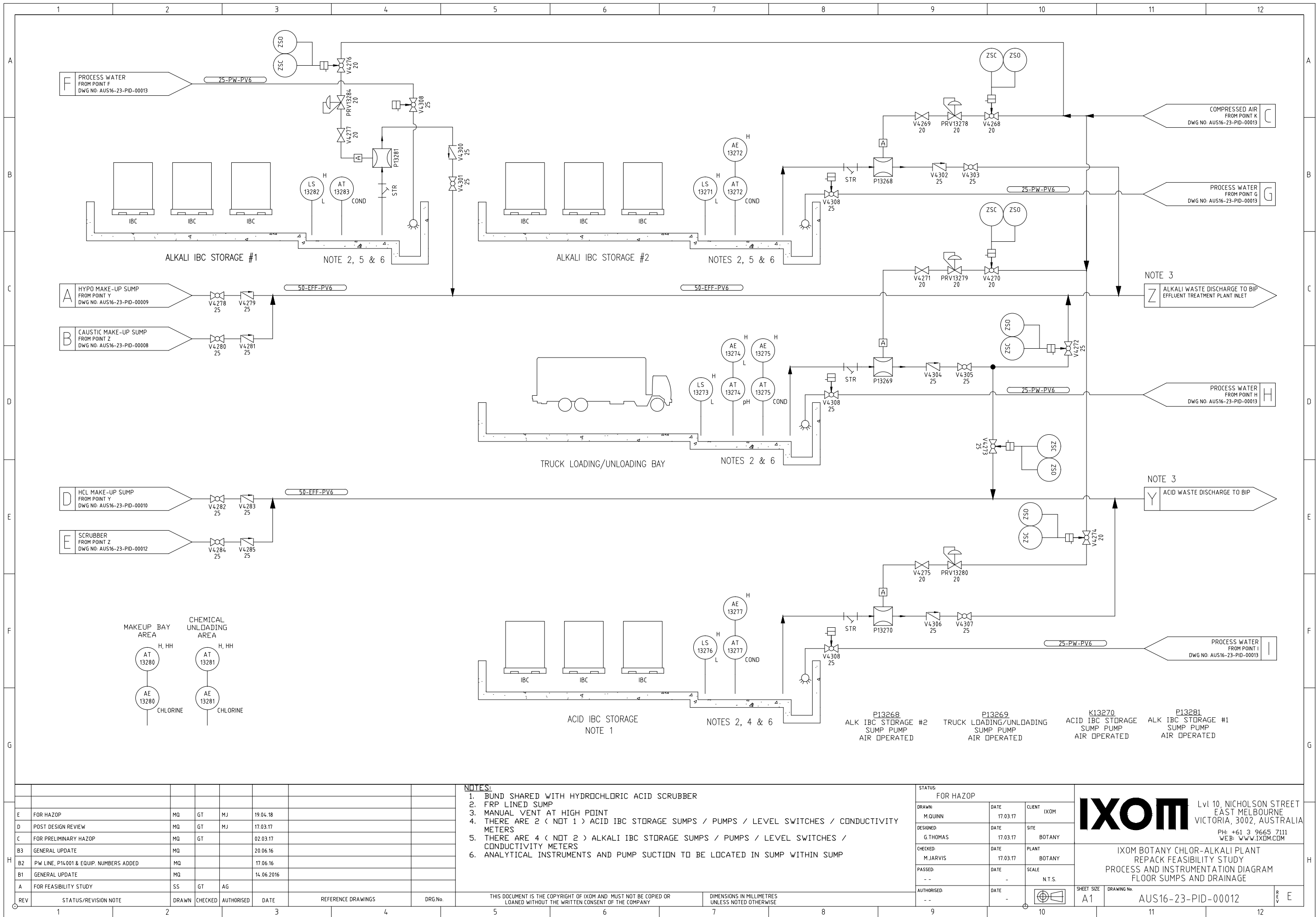
SHEET SIZE
A1

DRAWING No.

AUS16-23-PID-00010

REV
E





NOTES:

1. BUND SHARED WITH HYDROCHLORIC ACID SCRUBBER
2. FRP LINED SUMP
3. MANUAL VENT AT HIGH POINT
4. THERE ARE 2 (NOT 1) ACID IBC STORAGE SUMPS / PUMPS / LEVEL SWITCHES / CONDUCTIVITY METERS
5. THERE ARE 4 (NOT 2) ALKALI IBC STORAGE SUMPS / PUMPS / LEVEL SWITCHES / CONDUCTIVITY METERS
6. ANALYTICAL INSTRUMENTS AND PUMP SUCTION TO BE LOCATED IN SUMP WITHIN SUMP

STATUS:

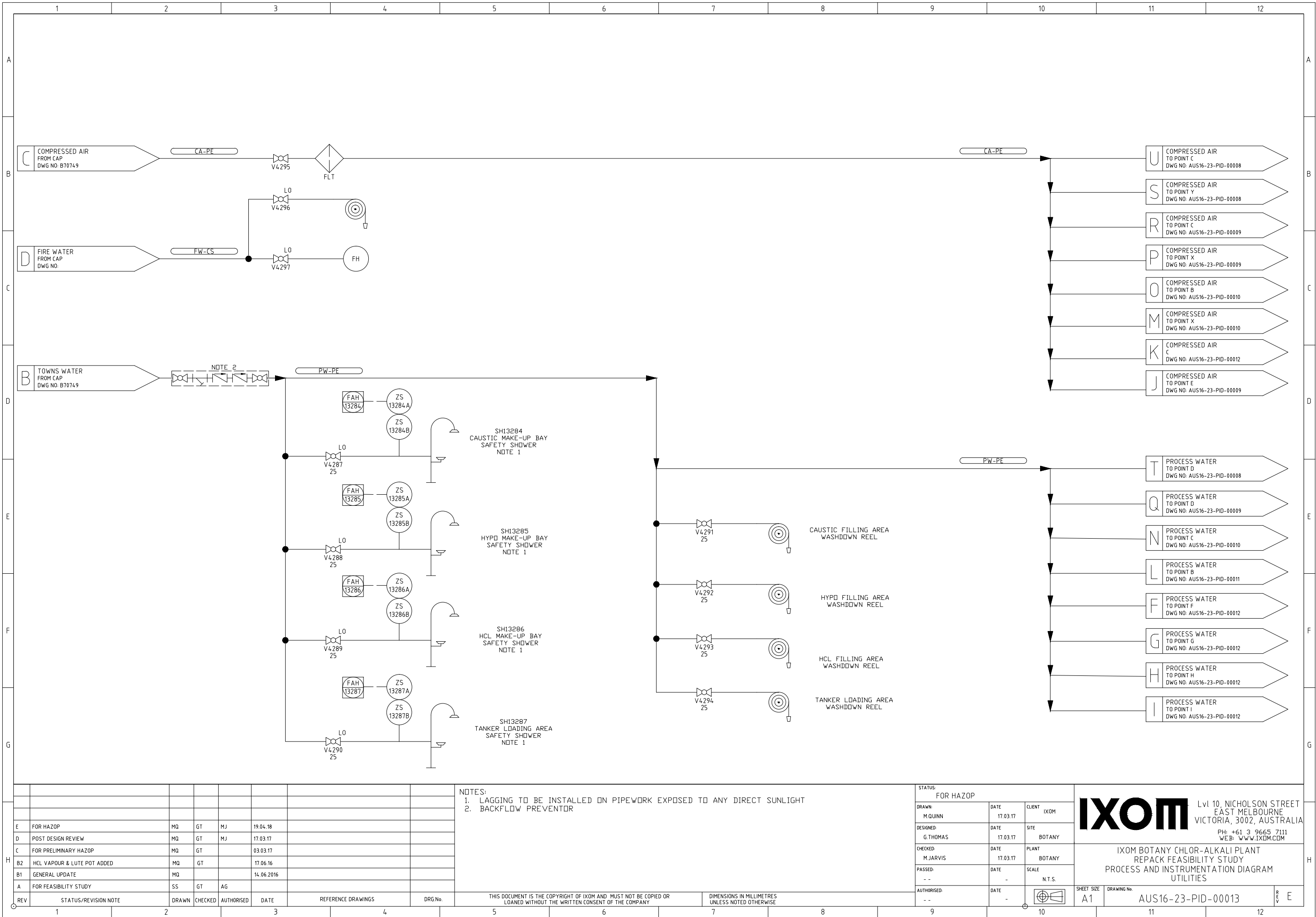
FOR HAZOP

DRAWN:	DATE:	CLIENT:
M QUINN	17.03.17	IXOM
DESIGNED:	DATE:	SITE:
G THOMAS	17.03.17	BOTANY
CHECKED:	DATE:	PLANT:
M JARVIS	17.03.17	BOTANY
PASSED:	DATE:	SCALE:
--	-	N.T.S.
AUTHORISED:	DATE:	
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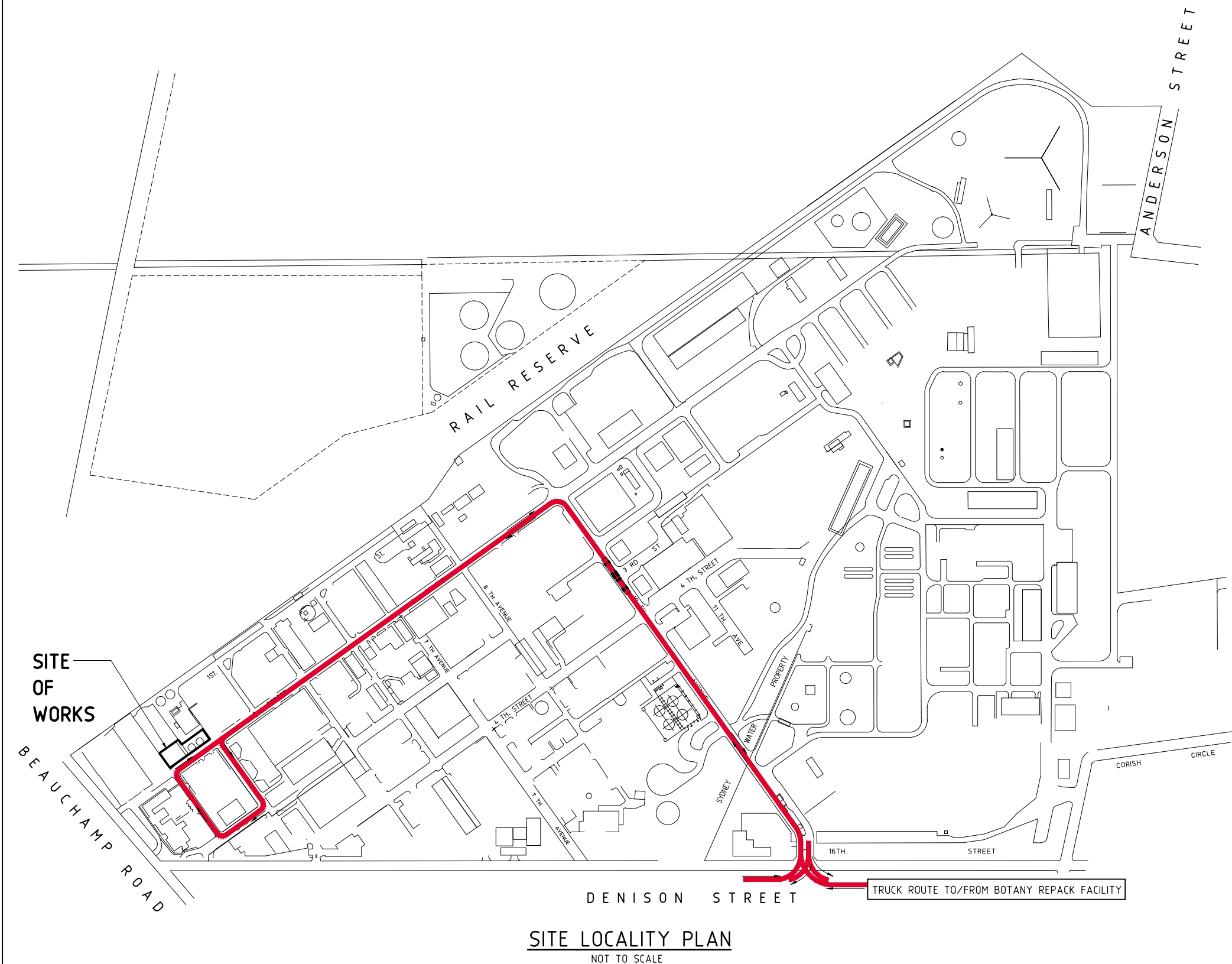
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WEB: WWW.IXOM.COM

IXOM BOTANY CHLOR-ALKALI PLANT
REPACK FEASIBILITY STUDY
PROCESS AND INSTRUMENTATION DIAGRAM
FLOOR SUMPS AND DRAINAGE

SHEET SIZE: A1
DRAWING No: AUS16-23-PID-00012
REV: E



MANUFACTURING BUILDING, BOTANY BAY SITE
BOTANY REPACK
FOR:- IXOM



DRAWING INDEX

GENERAL ARRANGEMENTS:-	
PGA01	NOTES & DRAWING INDEX
PGA02	SITE LAYOUT PLAN
PGA03	ROOF PLAN AND ELEVATIONS

STRUCTURAL:-

PS01	STRUCTURAL NOTES
PS02	FLOOR SLAB AND FOOTING PLAN
PS03	SLAB AND FOOTING SECTIONS

PRELIMINARY ONLY
NOT FOR CONSTRUCTION

No	DESCRIPTION	DATE	BY
D	TRUCK ROUTE ADDED	06.12.17	J.McG.
C	REISSUED FOR COMMENT	23.03.17	J.McG.
B	ISSUED FOR COMMENT	17.03.17	J.McG.
A			J.McG.
REVISIONS			

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COMMENCING ANY WORK OR SHOP DRAWINGS

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43 Wantirna Road, Ringwood, Victoria, Australia 3134
A.B.N. 12 130 395595

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IXOM 1 NICHOLSON STREET
EAST MELBOURNE

CLIENT

MANUFACTURING BUILDING
BOTANY BAY SITE
BOTANY REPACK

PROJECT
GENERAL NOTES
AND DRAWING INDEX

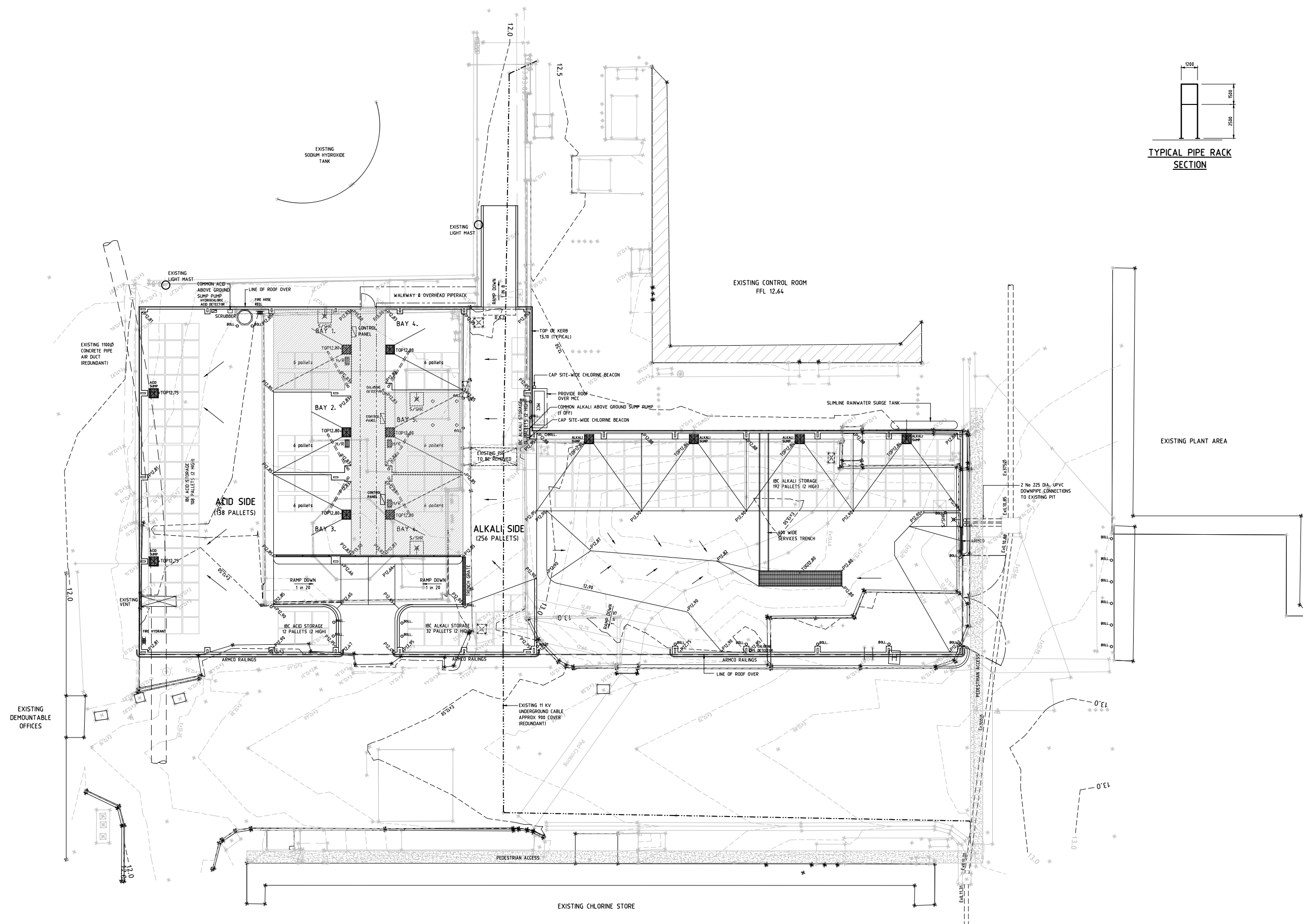
	JOB NUMBER	16/085		
	SCALE	1:1 (A1 PLOT)		
	JULY'14 DATE	K.B. DRAWN	J.McG. DESIGNED	 CHECKED

AUS16-23/PGA01
DRAWING NUMBER

D
REV

REFER TO DRAWING 16085 - PS01 FOR SLAB STRUCTURAL
DETAILS AND SECTIONS

BAY 1 - HYDROCHLORIC ACID
BAY 2 - FUTURE ACID
BAY 3 - FUTURE ACID
BAY 4 - FUTURE ALKALI
BAY 5 - CAUSTIC
BAY 6 - SODIUM HYPOCHLORITE



PRELIMINARY ONLY
NOT FOR CONSTRUCTION

J	DP&E ENVIRONMENTAL ASSESSMENT	09.05.18	J.McC
H	REISSUED FOR CLIENT COMMENT	03.04.17	J.McC
G	REISSUED FOR COMMENT	24.03.17	J.McC
F	REISSUED FOR COMMENT	23.03.17	J.McC
E	ISSUED FOR COMMENT	17.03.17	J.McC
D	ISSUED FOR INFORMATION	14.02.17	J.McC
C	ISSUED FOR INFORMATION	31.01.17	J.McC
B	TRUCK TURNING REVISED	25.01.17	J.McC
A	ISSUED FOR COMMENT	XXX	J.McC
No	DESCRIPTION	DATE	BY
REVISIONS			

ALL DIMENSIONS TO BE CHECKED ON THE JOB BEFORE
COMMENCING ANY WORK OR SHOP DRAWINGS



Tel 613 9870 3022
Fax 613 9870 2827
Email dnm@dnmconsulting.com
Web www.dnmconsulting.com

DNM JOB No 16/085

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1 NICHOLSON STREET
EAST MELBOURNE

CLIENT

MANUFACTURING BUILDING
BOTANY BAY SITE
BOTANY REPACK

PROJECT

GENERAL ARRANGEMENT SITE LAYOUT PLAN

TITLE



	JOB NUMBER		AUS16-23	
	SCALE		1:150 (A1 PLOT)	
FEB.2017	K.B.	J.McG.		
DATE	DRAWN	DESIGNED	CHECKED	

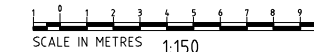
AUS16-23/PGA02

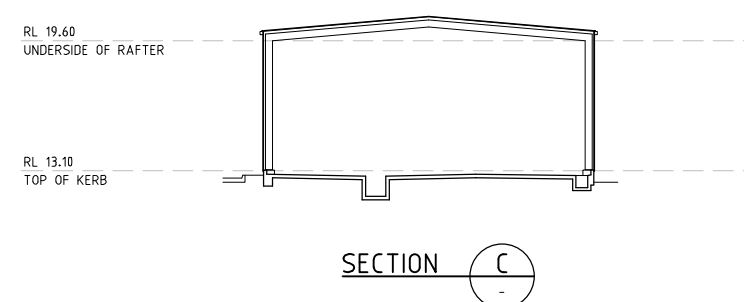
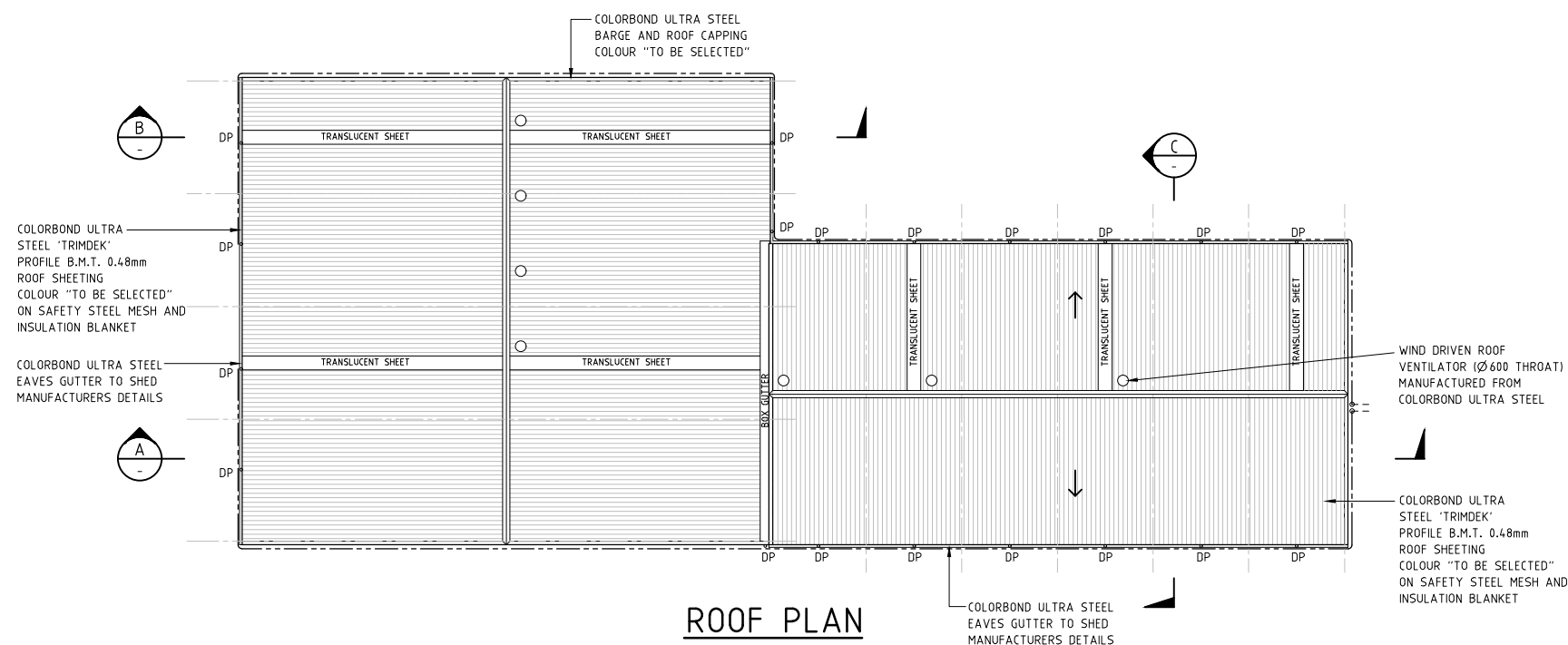
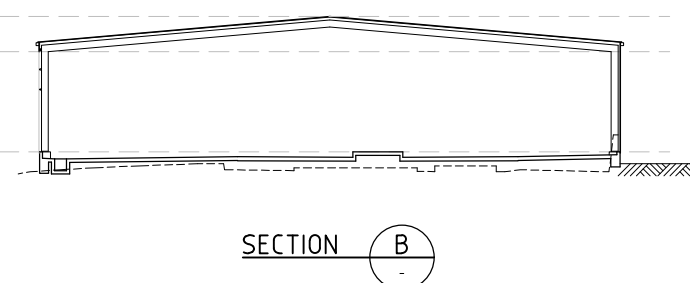
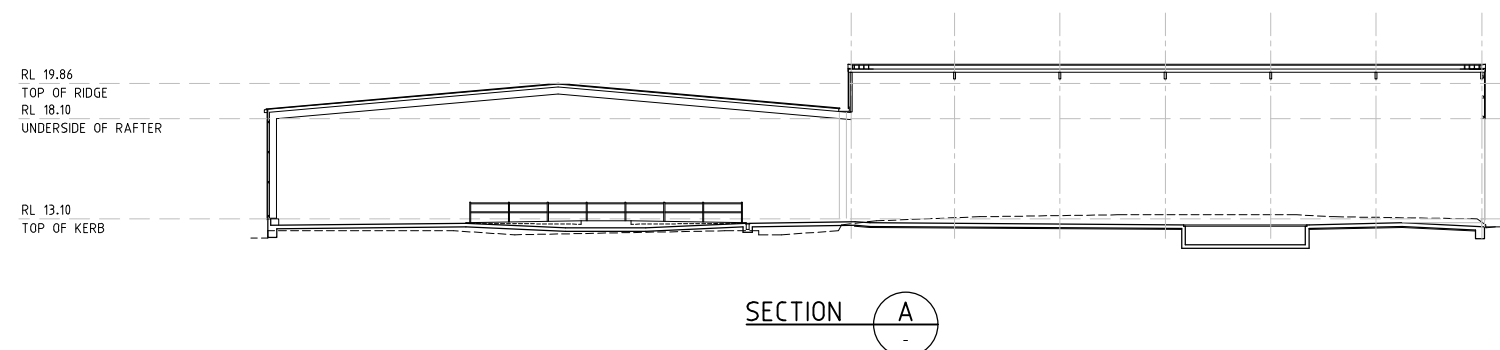
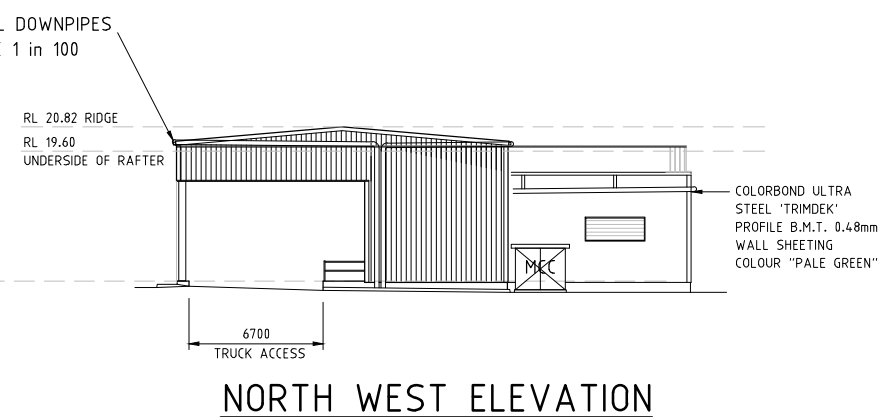
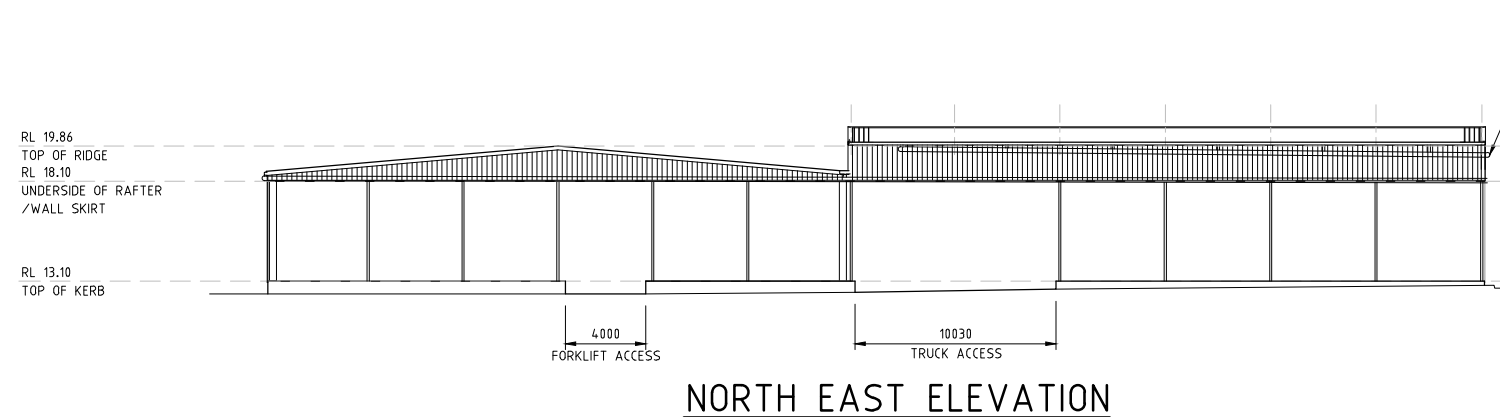
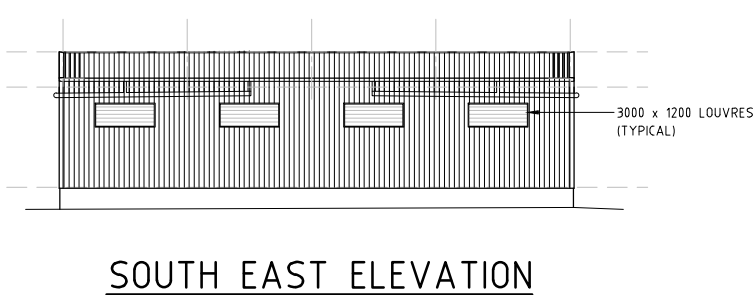
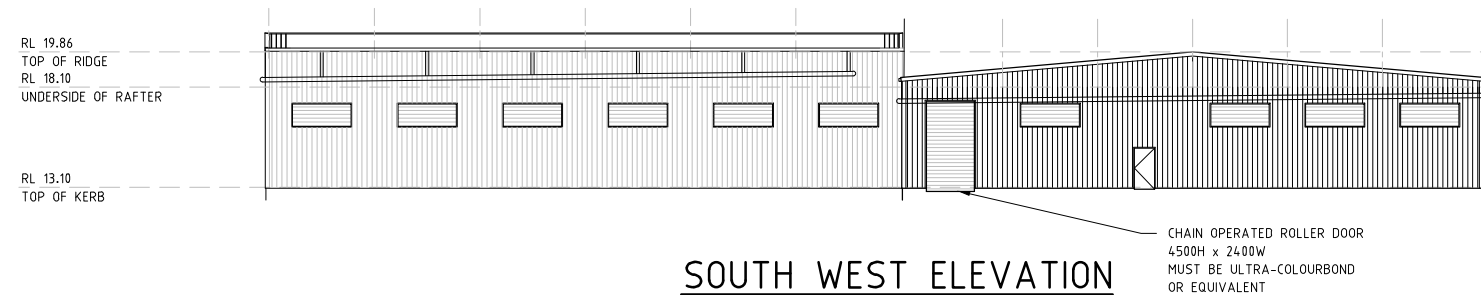
DRAWING NUMBER

REV

SITE LAYOUT PLAN

NOTE:-
PERSPEX SPLASH GUARDS ARE TO BE INSTALLED TO INSIDE WALLS TO 2000 HIGH ON CLAD WALLS ADJACENT TO CONCRETE BUNDS, AS PART OF SHED CONSTRUCTION CONTRACT.
FUTURE POSSIBLE TANKS ARE OUTSIDE THE SCOPE OF DA35/98 MOD5.





PRELIMINARY ONLY
NOT FOR CONSTRUCTION

E	REISSUED FOR COMMENT	10.05.18	J.McG
D	REISSUED FOR COMMENT	08.05.18	J.McG
C	REISSUED FOR COMMENT	24.03.17	J.McG
B	REISSUED FOR COMMENT	23.03.17	J.McG
A	ISSUED FOR COMMENT	17.03.17	J.McG

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1 NICHOLSON STREET
EAST MELBOURNE

CLIENT

MANUFACTURING BUILDING
BOTANY BAY SITE
BOTANY REPACK

PROJECT

GENERAL ARRANGEMENT

ROOF PLAN AND ELEVATIONS

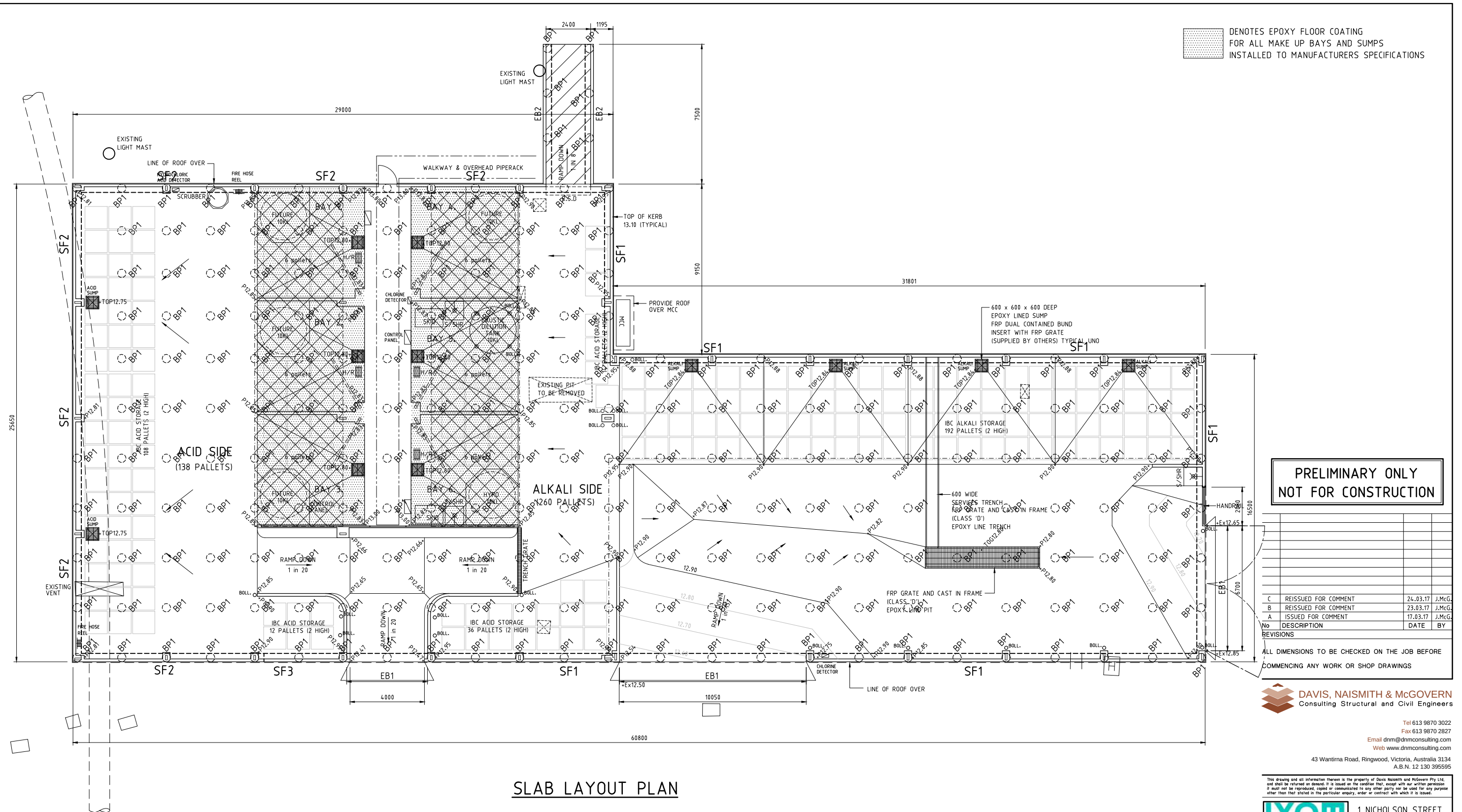
TITLE



JOB NUMBER		16/085	
SCALE		1:200 (A1 PLOT)	
JULY'14	K.B.	J.McG.	
DATE	DRAWN	DESIGNED	CHECKED

AUS16-23/PGA03
DRAWING NUMBER

E
RFV



PRELIMINARY ONLY
NOT FOR CONSTRUCTION

C	REISSUED FOR COMMENT	24.03.17	J.McG.
B	REISSUED FOR COMMENT	23.03.17	J.McG.
A	ISSUED FOR COMMENT	17.03.17	J.McG.
No	DESCRIPTION	DATE	BY

ALL DIMENSIONS TO BE CHECKED ON THE JOB BEFORE
COMMENCING ANY WORK OR SHOP DRAWINGS



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1 NICHOLSON STREET
EAST MELBOURNE

CLIENT

MANUFACTURING BUILDING
BOTANY BAY SITE
BOTANY REPACK

PROJECT

GENERAL ARRANGEMENT
FLOOR SLAB PROFILE PLAN

TITLE



JOB NUMBER		16/085	
SCALE		1:100 (A1 PLOT)	
JULY'14	K.B.	J.McG.	
DATE	DRAWN	DESIGNED	CHECKED

AUS16-23/PGA04
DRAWING NUMBER

C

9.3. Appendix 3 – Existing CAP Description

Ixom Botany ChlorAlkali Plant (CAP)

The ChlorAlkali Plant (CAP) produces chlorine and caustic soda using water, salt and electricity.

Hydrogen is a by-product of this process. The CAP consists of following main process areas:

- **Brine Treatment/Purification**
- **Brine Electrolysis**
- **Caustic Evaporation**
- **Chlorine Cooling, Drying and Compression**
- **Hydrogen Compression**
- **Effluent Treatment**
- **Emergency Chlorine Scrubber**

Brine Treatment/Purification

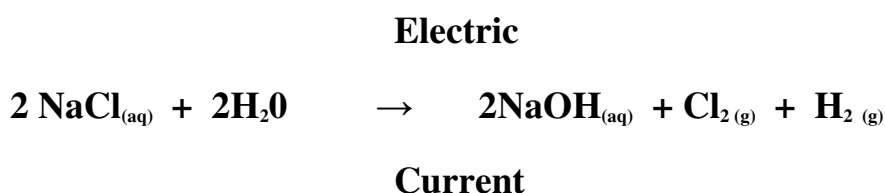
Raw salt, stored on site, is dissolved in heated water in the lixator (pit where salt and water are mixed to make brine). Very high purity brine is necessary for the electrolysis process to protect the membranes. Impurities present in the salt, particularly calcium and magnesium compounds, are removed by chemical precipitation and filtration. Final purification is carried out in ion exchange columns.

Brine Electrolysis

An electric current is passed through the brine solution with electrolysis taking place in bipolar membrane electrolyzers, in series. Brine is circulated on one side of the membrane and caustic soda circulated on the other side. Chlorine gas is generated on the brine side and hydrogen gas generated on the caustic side.

Part of the weak brine is de-chlorinated and returned to the lixator in the brine treatment area where salt is added to increase the strength.

The reaction in the electrolyzers involving the electrolytic separation of sodium chloride is as follows:



Caustic Evaporation

The majority of the caustic soda removed from the electrolyzers is concentrated to 50%w/w for sale.

The remainder of the caustic soda at 32%w/w concentration is used within the plant for brine and water treatment, and for absorbing chlorine. Caustic is also diluted to 16% w/w for manufacturing of sodium hypochlorite.

Chlorine Cooling, Drying and Compression

The wet chlorine gas produced in the electrolyzers is cooled, dried, compressed and used on site in the manufacturing of hydrochloric acid, sodium hypochlorite and ferric chloride.

All chlorine produced on site is consumed on site in the product plants.

The principal sections of the chlorine handling system are cooling, drying, compression and sulphuric acid handling.

Cooling

Chlorine cooling is achieved via passing wet chlorine gas through a shell and tube heat exchanger. As chlorine temperature decreases, moisture in the form of water vapour in wet gas condenses out. Dependent upon operational temperatures and production rates, the cooling medium is either site cooling water or a combination of this and chilled water supplied from a refrigeration unit.

Drying

The drying system removes any moisture remaining in chlorine gas from the chlorine cooler. This system consists of two packed towers operating in series, primary and secondary. In these towers chlorine gas is contacted with sulphuric acid in counter current flow where moisture present in the gas stream is transferred to the sulphuric acid liquid stream.

Compression

The chlorine compressor receives dry chlorine gas from the drying system and compresses the gas for use in the downstream products plants. The compressor is a rotary liquid ring compressor, which uses sulphuric acid as the sealing liquid.

Sulphuric Acid Handling

The sulphuric acid handling system includes strong sulphuric acid supply and weak sulphuric acid disposal. The strong sulphuric acid tank supplies strong sulphuric acid for the chlorine drying towers and the chlorine compressor. Weak sulphuric acid from the drying towers is pumped to storage.

Liquid chlorine, manufactured at the Laverton plant in Melbourne, Victoria, is stored on site in 920 kg chlorine drums and 70 kg cylinders for distribution into local markets.

Hydrogen Compression

The hydrogen produced in the electrolyzers is cooled, compressed to approximately 50 kPag and then used for hydrochloric acid production. Surplus hydrogen is vented through a stack to the atmosphere.

Effluent Treatment

Alkaline Effluent System

Effluent from alkaline process area catchments drains to trenches which channel effluent to the alkaline effluent sump. From here, alkaline effluent is transferred to the alkaline effluent tank where it is mixed and neutralised using HCl and NaOH to achieve a pH in the range of 6.5 and 10.5.

As these neutralisation reactions have the potential to liberate chlorine gas under certain conditions, the alkaline effluent tank is operated under light suction, venting to the emergency chlorine scrubber (ECS) where any chlorine gas present is removed.

Treated alkaline effluent is discharged to the site effluent system.

Acidic Effluent System

The acid effluent system is quite similar to the alkaline effluent system discussed above. Effluent from acid process areas drains to the acid effluent trench, then to the acid effluent pit from where it is pumped to the acid effluent tank.

The acid effluent tank is used to mix and neutralise effluent using HCl and NaOH to achieve a pH in the range of 6.5 and 10.5. Treated acid effluent is discharged to the site effluent system.

Emergency Chlorine Scrubber (ECS) System

The emergency chlorine scrubber (ECS) uses extraction fans to collect gas from all the chlorine-containing plant vents. The gas is then scrubbed with caustic soda to remove chlorine producing sodium hypochlorite. The reaction is as follows:



The ECS is a safety critical system designed to accommodate chlorine surges during plant upsets for 10 minutes minimum of full chlorine production. All vents containing chlorine pass to the ECS system. The concentration of chlorine in the exit gas from the ECS is monitored and alarmed.

Electrical power to the circulation pumps and extraction fans is backed up by emergency power from a stand-by emergency diesel generator. A nitrogen ejector that does not require power for operation further backs up the fans. A caustic gravity head tank that does not require power for its operation, further backs up the caustic pumps.

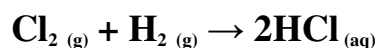
Ixom Botany CAP - Product Plants

- Hydrochloric Acid Production
- Sodium Hypochlorite Production
- Ferric Chloride Production

Hydrochloric Acid Production

The hydrochloric acid plant manufactures 33%w/w acid. The hydrogen produced during chlorine manufacturing is used for synthesis of hydrochloric acid.

Hydrochloric acid is produced by burning hydrogen and chlorine to form hydrogen chloride, which is immediately absorbed in water. The reaction in the burner is:



The hydrogen flow to the burner is 20% above stoichiometric requirements to ensure that all the chlorine is reacted. Excess hydrogen is vented to the atmosphere.

Hydrochloric acid is stored in 8 x 100 m³ capacity tanks prior to dispatch in bulk liquid road tankers with primary end users being the steel and food industries.

Sodium Hypochlorite Production

The current sodium hypochlorite plant was commissioned in August 2010, replacing the previous plant which was nearing end of life with a modern continuous production process.

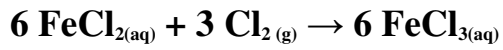
The reaction is as follows:



The main use of sodium hypochlorite is in bacteriological control applications such as swimming pool water quality control.

Ferric Chloride Production

In addition to chlorine, the ferric chloride production process requires elemental iron. The reactions are as follows:



Iron and chlorine can be partially substituted with ferrous chloride (known as pickle liquor) produced as a by-product in steel manufacturing. The main end user of ferric chloride is Sydney Water with ferric chloride being used in waste water treatment and handling.

Pollution Incident Notification

PURPOSE

This procedure was prepared having regard to the amendments in the *Protection of the Environment Legislation Amendment Act 2011* (Act) that commenced on 6 February 2012. It will be updated as further amendments are commenced. Model Procedure BG-06: Incident Management and Corrective Action require that measures be implemented to notify external authorities of certain incidents. In addition, regulators such as WorkCover, Office of Environment and Heritage, Ministry of Health, and Department of Planning and Infrastructure require notification in the event of incidents which meet their defined criteria.

This procedure details when notification of regulators is required, the timeframe for notification and who is responsible for the notification.

Note: Please keep a detailed file note of all notifications in accordance with the document titled “**Checklist and Record of Regulator Notification**”.

Environmental Incident Notification Procedure

Incident Occurs	Notify Following Regulator	Reporting Responsibility (Order of Priority)
Pollution Incident which causes or threatens Material Harm to the Environment You must notify when a "pollution incident" occurs, which causes or threatens "material harm" to the environment IMMEDIATELY. This means promptly and without delay. First, you should verify that the incident is a “pollution incident” in accordance with the definitions below. Secondly, if it is a pollution incident, you should determine whether it is causing or threatening “material harm” to the environment. Refer to the definitions set out below to make these determinations. If it is a pollution incident that is causing or threatening “material harm” to the environment you must notify the pollution incident immediately in accordance with this procedure. If it does not cause or threaten material harm, you do not need to notify the regulators. You may however need to notify	If the incident presents an immediate threat to human health or property, IMMEDIATELY call 000. Fire and Rescue NSW, the NSW Police and the NSW Ambulance Service are the first responders, responsible for controlling and containing incidents. If the incident does not require an initial combat agency, IMMEDIATELY notify the relevant authorities in the following order and in accordance with the document titled “Checklist and Record of Regulator Notification”: IMMEDIATE means promptly without delay. Where the site does not need assistance to manage the incident, you should advise that to the regulators during your initial notification. Where you have not determined that the pollution incident has caused or threatened material harm, (eg you are awaiting analysis of stormwater discharge), but you are notifying out of a matter of caution, you should also advise the regulators of this. <u>Order of Notification</u>	Who Must Notify the Regulators The Botany Site Manager/Legacy Operations Manager must notify the Regulators in accordance with this procedure. The Site Manager/Legacy Operations Manager may delegate this function to other site personnel trained in this procedure. See Delegates below for each of the three IXOM Botany Facilities. Botany Chlor-Alkali Facility • Steven Barclay, Site Manager: 9352 2118 / 0447216265 • Ian Parker, Production Engineer,: 9352 2254 / 0400686047 • Vesna Zivanavich,, Maintenance Lead: 9352 2102, 0429065328 • Amit Vyas, Technical Lead: 9352 2279 / 0409067804 GTP

Incident Occurs	Notify Following Regulator	Reporting Responsibility (Order of Priority)
it separately under your licence (for example in the site's annual return)	1 The EPA on 131 555 2 The Ministry of Health Randwick on 1300 066 055 / 9382 2222 (after hours). Ask for Public Health Nurse on call. 3 The WorkCover Authority on 13 10 50 4 Bayside Council, Karim Elazar 0412455068/95621520 5 Fire and Rescue NSW on 1300 729 579 (if 000 not called first for Immediate Threat Incidents) Written notification to be provided within 7 days.	- Steven Barclay, Site Manager: 9352 2118 / 0409067804 - Amit Vyas, GTP Technical Lead: 9352 2279 / 0409067804 - Mrinmoy Das, GTP Operations Lead: 9352 2287 / 0401692426 - Geoff Fairey, Responsible Mechanical Engineer 9352 2044 / 0412 254 579
HOWEVER where action could be immediately taken to prevent immediate danger or further harm to people and/or the environment you should ensure that action is being taken to avoid or minimise immediate danger or further harm before you notify the Regulators.		HCB Waste Stores - Colin Wiley, Site Manager: 9352 2285 / 0411 023 881 - Domenic Cappelli, GTP Lead: 9352 2287 / 0405 317 972
What is a "pollution incident"? A "pollution incident" occurs when there is, or is likely to be, a leak, spill or other escape or deposit of a substance, which results in, or is likely to result in: - water pollution, - air pollution; or - land pollution. A "pollution incident" is not an incident that only involves the emission of noise. See definitions below. What is "material harm" to the environment? Harm to the environment is material if it: - involves actual or potential harm to the health or safety of people or ecosystems that is not trivial, either offsite or onsite; or		Internal Notification All employees have a duty to notify IXOM of an incident. In the first instance employees witnessing the incident shall contact Site Manager/Legacy Operations Manager. They should speak directly to these people, in order of preference, and NOT merely leave a phone message. The call out list above should be used for each facility. If personnel on the list above can not be contacted see additional staff below Botany Chlor-Alkali Facility Ian Parker, Production Engineer: 9352 2254 / 0400686047

2. results in actual or potential loss or property damage exceeding \$10,000, either off-site or on-site. To estimate “loss” you should include the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment This will generally include the costs associated with sampling, investigation and waste disposal. It does not necessarily include the cost of equipment repair, but may if the equipment repair is necessary to prevent or mitigate harm to the environment. Therefore there may be situations where “material harm to the environment” in the ordinary meaning has not occurred, but because the cost of clean up and prevention exceeds \$10,000, it falls within the statutory definition and must be reported immediately. Exceptions: Do not need to notify where: • all relevant authorities are already aware of the incident; • the incident is an ordinary result of action required to be taken to comply with an environment protection licence, or an environment protection notice; or • the incident involved only the emission of odour (however if the odour is associated with a substance that threatens material harm to the environment, this will need reporting). • The incident involved only the emission of noise.	A record of notification must be kept in the SHERMIS report. The notification should include, where possible: (a) the time, date, nature, duration and location of the incident; (b) the location of the place where pollution is occurring or is likely to occur; (c) the nature, the estimated quantity or volume and the concentration of any pollutants involved; (d) the circumstances in which the incident occurred (including the cause of the incident, if known); and (e) the action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution. The obligation to notify is continuous, so if any of the above information becomes known after the initial notification is made, that information must also be notified immediately in accordance with the above procedure. It may be possible to obtain the agreement of regulators not directly involved in the incident response and management to omit them from further notifications – however unless you obtain their agreement you should continue to provide them with updated information as required under the legislation. It is important to provide succinct factual information which will assist the response agencies to understand the nature of the incident and the hazards involved. You should be truthful and clearly state the facts as known at that time. You should not speculate as this will not assist the response agencies in responding to the incident. Note: Any incident or near incident with actual or potential significant off-site impacts on people or the biophysical environment needs to be reported to the	GTP • David Reed, Day Coordinator: 9352 2282 / 0414 379 362 HCB Waste Stores • Tony Jordan, HCB Logistics Coordinator: 9352 2373 / 0411 261 379 If the employee who becomes aware of the incident cannot notify any these people, the employee must notify the regulators directly in accordance with the above steps. This is a duty that the employee has under the legislation. Therefore all personnel that may become aware of an environmental incident and require regulatory notification shall use the Checklist and Record of Regulator Notification. .
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Incident Occurs	Notify Following Regulator	Reporting Responsibility (Order of Priority)
	NSW Department of Planning and Infrastructure within 24 hours. NSW Department of Planning and Infrastructure Sydney East Region: 9228 6333	
Water Pollution means: - the discharge of any matter, whether solid, liquid or gaseous, so that the physical, chemical or biological condition of the waters is changed; - the discharge of any refuse, litter, debris or other matter, whether solid or liquid or gaseous, that changes the condition of the waters or is likely to make the waters unclean, noxious, poisonous or impure, detrimental to the health, safety, welfare or property of persons, undrinkable for farm animals, poisonous or harmful to aquatic life, animals, birds or fish in or around the waters or unsuitable for use in irrigation, or obstructs or interferes with, or is likely to obstruct or interfere with persons in the exercise or enjoyment of any right in relation to the waters; or - the discharge of any solid, liquid or gas that does not comply with the requirements of the Environment Protection Licence; including: - placing any solid, liquid or gas in a position where it can be discharged into a waterway; or - placing any solid, liquid or gas into the dry bed of any waters or into any drain, channel or gutter designed to receive or pass water, if it would have polluted those waters had it been placed in them.		

Incident Occurs	Notify Following Regulator	Reporting Responsibility (Order of Priority)
Air pollution means: the emission into the air of any air impurity (which includes smoke, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, mists, odours and radioactive substances).		
Land pollution means: introducing into or onto land, any matter, whether solid, liquid or gas that causes or is likely to cause degradation of the land and actual or potential harm to the health or safety of people, animals, terrestrial life or ecosystems, or actual or potential loss or property damage, that is not trivial.		
Site based examples of incidents that would not generally require reporting: Spill from tank into containment system so that there is not potential for water, air or land pollution and no material harm is caused. Under MHF, there may be requirements to notify WorkCover of a loss of primary containment. Odour that does not threaten material harm.		

Checklist and Record of Regulator Notification

This checklist and record of Regulator Notification is to be used in conjunction with the document titled “**Environmental Incident Notification Procedure**”

Follow and complete this document when you have determined that the incident requires **immediate** notification in accordance with “**Environmental Incident Notification Procedure**”. The completed document will act as a written record of the notification.

NOTE: You will be required to provide follow up written report within 7 days of the reporting the incident.

REMEMBER: IMMEDIATE MEANS PROMPTLY AND WITHOUT DELAY.

The *Protection of the Environment Operations Act 1997* (the “Act”) sets out the information that is required to be provided to the regulators, if known. If this information becomes known after the initial notification, you will need to telephone each regulator again and provide them with further updates. You must also keep a record of the further updates.

Incidents presenting an immediate threat to human health or property must be notified IMMEDIATELY to emergency services - call 000. You should do this as soon as it is safe to do so. Fire and Rescue NSW, the NSW Police and the NSW Ambulance Service are the first responders, responsible for controlling and containing incidents. The information that must be provided, if known at the time of notification is listed on page 2. The person responsible for notifying the regulators should complete the table on page 2 prior to telephoning the regulators. There is a continuous obligation to notify this information. Where you become aware of the required information after the initial notification, you must immediately notify the regulators of the further information in accordance with the procedure.

Keep the information factual, as speculation will not assist the response agencies.

If the person completing the table on page 2 is required to attend to immediate incident response, the task of telephoning the regulator should be delegated. The delegate can then relay the completed information on page 2 to the Regulator. The table commencing on page 3 must be completed at the time of notification.

NAME OF IXOM PERSONNEL COMPLETING INFORMATION TABLE.....

Information that must be notified, if known, under the POEO Act	Complete Details for Initial Notification Here	Complete relevant information here, if not known at the time of initial notification – for subsequent notification
The time, date, nature, duration and location of the incident		
The location of the place where pollution is occurring or is likely to occur		
The nature, the estimated quantity or volume and the concentration of any pollutants involved		
The circumstances in which the incident occurred (including the cause of the incident, if known)		
The action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution		

In addition to this required information, the following information may be useful to the regulators:

Does IXOM require assistance of a particular regulator or group of regulators to immediately respond to the incident? Who and advise accordingly?	
---	--

Is IXOM notifying only out of caution in the event that actual or threatened material harm subsequently becomes apparent?	
---	--

Name of NOTIFIER.....

EMERGENCY SERVICES – CONTACT FIRST ONLY IF THERE IS AN IMMEDIATE THREAT TO PEOPLE OR PROPERTY, OTHERWISE SKIP THIS SECTION TO NEXT PAGE

Regulator	Emergency Services	Subsequent Notifications – Information Updates
Telephone Number	000	
IXOM Notifier		
Time, date of notification		
Individual from regulator taking the call		
Other information conveyed or requested by regulator. List Here		
Has regulator directed IXOM take certain action, provide information or contact other stakeholders? List here		
Regulator	EPA	Subsequent Notifications – Information Updates
Telephone Number	131 555	
IXOM Notifier		
Time, date of notification		
Individual from regulator taking the call		
Other information conveyed or requested by regulator. List Here		
Has regulator directed IXOM take certain action, provide information or contact other stakeholders? List here		

Regulator	Ministry of Health via local Public Health Unit	Subsequent Notifications – Information Updates
Telephone Number	Randwick Public Health Unit: 1300 066 055 After hours: 9382 2222 , ask for Public Health Nurse on call	
IXOM Notifier		
Time, date of notification		
Individual from regulator taking the call		
Other information conveyed or requested by regulator. List Here		
Has regulator directed IXOM take certain action, provide information or contact other stakeholders? List here		
Regulator	The WorkCover Authority	Subsequent Notifications – Information Updates
Telephone Number	13 10 50	
IXOM Notifier		
Time, date of notification		
Individual from regulator taking the call		
Other information conveyed or requested by regulator. List Here		
Has regulator directed IXOM take certain action, provide information or contact other stakeholders? List here		
Regulator	Bayside Council	Subsequent Notifications – Information Updates
Telephone Number	<i>Karim Elazar, Team Leader: 95621520</i> After hours: 0412455068	
IXOM Notifier		
Time, date of notification		
Individual from regulator taking the call		

Other information conveyed or requested by regulator. List Here		
Has regulator directed IXOM take certain action, provide information or contact other stakeholders? List here		
Regulator	Fire and Rescue NSW	Subsequent Notifications – Information Updates
Telephone Number	1300 729 579	
IXOM Notifier		
Time, date of notification		
Individual from regulator taking the call		
Other information conveyed or requested by regulator. List Here		
Has regulator directed IXOM take certain action, provide information or contact other stakeholders? List here		

9.4. Appendix 4 – Existing Site Features

AUS16-23 – Botany Repack Facility Tie In Points & Pipe Bridge



AUS16-23 – Botany Repack Facility Tie In Points & Pipe Bridge

Tie In Point	Process Fluid	Location
1	Stormwater Connection	Below ground pit near corner of 2 nd Street & 2 nd Avenue
2	Firewater Supply	Existing hydrant near corner of 2 nd Street & 2 nd Avenue
3	General Plant Air Supply	Between Block A & Memtec Area
4	Instrument Air Supply	Main Pipe Rack – Near Control Room
5	Process Water Supply	Main Pipe Rack – Near Control Room
6	Town Water Supply	Main Pipe Rack – West of Caustic Tanks
7	Hydrochloric Acid Supply	Hydrochloric Acid Tanks
8	Sodium Hypochlorite Supply	Sodium Hypochlorite Tanks
9	Caustic Supply (1 of 2)	Caustic Tank T13049
10	Caustic Supply (2 of 2)	Caustic Tank T13050
11	Alkali Waste – Return	CAP Effluent Treatment Plant Inlet
12	Acid Waste – Return	CAP Effluent Treatment Plant Inlet

AUS16-23 – Botany Block A Site Photos & General Feature Notes Showing Equipment to be Removed or Relocated by Civil Contractor

Photos taken 16th December 2016, document produced 24th March 2017



Red arrows represent views in photos below



Photo 1 – Looking south-west towards existing Control Room, from north corner of Block A. Fire equipment and Ixom signage to be reinstated by civil contractor. Armco and pivoting gate to be removed by civil contractor.



Photo 2 – Looking south from the north corner of Block A.



Photo 3- Looking south-east down 2nd Street. Block A on right.



Photo 4 – Looking north-east towards new Salt Pad, from north corner of Block A. This area to be used for empty IBC storage. No modifications required to this area. Possible temporary laydown area for civil contractor.



Photo 5 – Looking north, towards the new Salt Pad, from Block A.



Photo 6 – Looking north-west up Block A. Pump panel & conduits to be relocated by civil contractor.



Photo 7 – Looking north-east, from Block A east boundary. Pump panel and conduits to be relocated by civil contractor.



Photo 8 - Looking north-west, from road in Block A. Garden bed, soil, kerb, dwarf wall to be removed by civil contractor.



Photo 9 – Looking north-east, from west boundary of Repack site. Both pits to be removed by civil contractor.



Photo 10 – Looking west, from road in Block A. Safety barrier, kerb and concrete dwarf wall to be removed by civil contractor. Pipe rack and conduits to be relocated and reinstated by civil contractor after shed is installed.



Photo 11 – Looking south, from road in Block A. Pit to be removed.



Photo 12 – Looking north, from road in Block A. Pit to be removed by civil contractor. Pipe rack and conduits to be relocated by civil contractor.



Photo 13 – Looking north-west, from south-east Corner of Repack site. ‘Ixpath’ garden to be removed by civil contractor. Light pole is outside Block A boundary and is to remain in place.



Photo 14 – Looking south-west, from southeast corner of Repack site.



Photo 15 – Looking north, from south boundary of proposed Repack site. Underground air ventilation duct to be built up to new finished floor level (or removed) by civil contractor, TBC.



Photo 16 – Looking north-west, from west boundary of proposed Repack site. IBCs in Memtec storage area to be removed by others prior to commencement of civil works. 11kVA transformer to be relocated onto an existing plinth located elsewhere at BIP by others, prior to commencement of works. All other equipment in area to be removed by civil contractor. Bund wall to be removed by civil contractor. Green fencing to be removed by civil contractor and placed in BIP storage (TBC).



Photo 17 – Looking south-east into Memtec IBC storage area.



Photo 18 – Looking east into Memtec IBC storage area. Conduits to be removed by civil contractor.



Photo 19 – Looking south-east, from north-west corner of Block A. Existing control room at right. Storage container on left to be relocated by others prior to commencement of works.



Photo 20 - Looking south-west. New MCC to be located at left. Existing control room at right.



Photo 21 – Looking south-west into Orica operated land, from south boundary of proposed Repack site. This land is not included in Ixom's current lease.



Photo 25 – Looking west across to Block A.

9.5. Appendix 5 – Preliminary Hazard Analysis Report (Sherpa)

PROPOSED BOTANY REPACK PROJECT

BOTANY CHLORALKALI PLANT

PRELIMINARY HAZARD ANALYSIS

IXOM OPERATIONS PTY LTD

PREPARED FOR: Mark Jarvis, IXOM
Project Manager

DOCUMENT NO: 21071-RP-002
REVISION: 3
DATE: 10-May-2018

DOCUMENT REVISION RECORD

Rev	Date	Description	Prepared	Checked	Approved	Method of issue
A	17-Nov-17	Issued to Client for comments	J Polich	G Peach	G Peach	Email PDF
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1	21-Dec-17	Minor changes to vehicle numbers in Table 4.2.	J Polich	G Peach	G Peach	Email PDF
2	16-Feb-18	Minor updates in Section 3.2 and Section 5 to address DPE comments on draft EA.	J Polich	G Peach	G Peach	Email PDF
3	10-May-18	Minor updates in Section 3 and Section 5 to make consistent with EA.	J Polich	G Peach	G Peach	Email PDF

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Title: Proposed Botany Repack Project Botany Chloralkali Plant Preliminary Hazard Analysis	QA verified: R Bush
	Date: 10-May-2018

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ABBREVIATIONS

BIP	Botany Industrial Park
CAP	Chloralkali Plant
Cl ₂	Chlorine
DG	Dangerous Goods
HCl	Hydrochloric Acid
HIPAP	Hazardous Industry Planning Advisory Paper
IBC	Intermediate Bulk Container
MHF	Major Hazards Facility
NaOCl	Sodium hypochlorite (hypo)
NaOH	Sodium hydroxide (caustic soda)
PG	Packing Group
QRA	Quantitative Risk Assessment
SEARs	NSW DPE Secretary's Environmental Assessment Requirements
SFARP	So Far As Reasonably Practicable
VSD	Variable Speed Drive

1. SUMMARY

Background

Ixom Operations Pty Ltd (Ixom) proposes to install and commission a down-packing facility (referred to as the Botany Repack Facility in this report) at their Botany Chloralkali Plant (CAP). The facility will package existing CAP Class 8 products including hydrochloric acid (HCl), sodium hydroxide solution (NaOH or caustic soda) and sodium hypochlorite solution (NaClO or hypo) into 1000L intermediate bulk containers (IBCs) and 200L drums.

The Botany Repack project requires a modification to the development consent for the existing CAP. The NSW DPE Secretary's Environmental Assessment Requirements (SEARs, (DA35/98 MOD5) included a requirement for hazard and risk analysis. Ixom retained Sherpa to undertake the hazard and risk assessment of the proposed Botany Repack Facility.

Scope, objectives and methodology

As required by the SEARs, the analysis covers:

- An assessment of the proposal against State Environmental Planning Policy 33 – Hazardous and Offensive Development (SEPP33) to determine whether the development is 'potentially hazardous'.
- A preliminary hazard analysis (PHA) as identified from the SEPP33 review which included comparison with the DPE HIPAP 4 risk criteria.
- An assessment of the effect of the proposal on the cumulative BIP risk (as reported in publicly available BIP QRA, 2012 (Ref 1)).
- An assessment of the effect of the proposal on the risk due to Dangerous Goods (DG) transport along Denison St.

To determine whether the proposed development is potentially hazardous, the risk screening process in the DPE's *Applying SEPP 33* guideline was used. The screening threshold for storage of Class 8 materials was exceeded hence the project was assessed as 'potentially hazardous' and a preliminary hazard analysis (PHA) was therefore required.

The PHA was prepared as a Level 2 assessment in accordance with NSW DPE guidelines, Hazardous Industry Planning Advisory Paper (HIPAP) 6 *Hazard Analysis and Multi-Level Risk Assessment*.

Sufficient quantitative analysis was undertaken to identify the events with the potential to have an offsite impact. This was then used to determine whether the project will have potential offsite risk levels exceeding the HIPAP 4 criteria, or else affect the cumulative risk as presented in the BIP 2012 QRA.

Results

The consequence modelling showed that there would be no offsite fatality risk for worst case releases associated with the Repack Facility, hence there will be no effect on the cumulative offsite individual fatality risk contour or societal risk from either the CAP or the BIP QRA 2012.

The only identified incidents with potential offsite effects (toxic injury / irritation only) were inadvertent mixing of hypo and acid forming chlorine. However the frequency of these events was assessed as below the HIPAP 4 risk criteria, so the Repack Facility will comply with all offsite risk criteria.

DG transport

The Repack Facility will not significantly change the total volume of chemicals produced on the Ixom site. Some product that is now exported in bulk tankers will be exported as smaller volume packaged product instead. There will be minimal net change in Class 8 vehicle movements compared to the current CAP Class 8 transport hence the SEPP33 DG transport screening thresholds are not exceeded.

There is also an existing Dangerous Goods (DG) Transport QRA for Denison St (Ref 3). Class 8 materials do not contribute quantitatively to the DG transport risk so there will be no impact on the Denison St DG transport risk QRA from the Botany Repack project.

Conclusions

Based on the hazard analysis which demonstrates limited potential for offsite consequence, hence very low offsite risk, it is concluded that:

- there are no significant offsite risk impacts from the Repack Facility proposal and the proposal complies with the risk criteria given in HIPAP 4.
- the proposal will have no significant impact on the cumulative offsite risk from the CAP or the overall BIP.
- the proposal will have no impact on the cumulative DG transport risk along Denison St.

No specific recommendations are made from the study.

2. INTRODUCTION

2.1. Background

Ixom Operations Pty Ltd (Ixom) manufactures a number of chemicals at its Chloralkali Plant (the CAP) and associated Products Plants. These include hydrochloric acid (HCl), sodium hydroxide solution (NaOH or caustic soda) and sodium hypochlorite solution (NaClO or hypo).

The chemicals manufactured at the CAP are currently sold in bulk and distributed via road tanker. Ixom proposes to install and commission a down-packing facility at the Botany CAP to package these chemicals into 1000L intermediate bulk containers (IBCs) and 200L drums. This is referred to as the Botany Repack Project.

The CAP is located on the Botany Industrial Park (BIP) and is a Major Hazard Facility (MHF). Apart from the Ixom CAP and Product Plants, other operating MHFs on the BIP include the Huntsman Surfactants Facility and the Qenos Olefines, Alkathene and Alkatuff plants.

2.2. Requirement for study

The Botany Repack project requires a modification to the development consent (DA35/98) for the CAP. Ixom has received the NSW DPE Secretary's Environmental Assessment Requirements (SEARs) (DA 35/98 MOD 5) for the Botany Repack project. This includes specific requirements for risk assessment as reproduced below:

- **Hazards and Risks**, including:
 1. a preliminary risk screening carried out in accordance with *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* and Applying SEPP 33 (DoP, 2011), with a clear indication of class (including the subsidiary risk), quantity, package size, and location of all dangerous goods and hazardous materials associated with the proposed modification.
 2. should the preliminary risk screening indicate that the proposed modification is “potentially hazardous”, a Preliminary Hazard Analysis (PHA) must be prepared in accordance with *Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis* (DoP, 2011), and *Multi-Level Risk Assessment* (DoP, 2011). The PHA must:
 - identify the hazards associated with the proposed modification to determine the potential for off-site impacts;
 - estimate the risks from the proposed modification and the cumulative risks from the existing facility and the proposed modification;
 - demonstrate that the proposed modification complies with the criteria set out in *Hazardous Industry Planning Advisory Paper No 4 - Risk Criteria for Land Use Safety Planning*; and
 - demonstrate that the proposed modification does not increase the cumulative risk of the Botany Industry Park (BIP) to unacceptable levels;
 3. evaluate the impacts (if any) from the modification on the overall risks from transport of Dangerous Goods on Denison Street.

2.3. Objective of study

Ixom has requested that Sherpa undertake the hazard and risk assessment of the proposed Botany Repack Facility to address the Hazards and Risk requirements of the SEARs.

2.4. Scope

This report covers the

- Handling of corrosive chemicals and associated pumps and piping.
- Filling of IBCs / drums with chemicals.
- Storage of IBCs.

The report includes:

- An assessment of the proposal against State Environmental Planning Policy 33 – Hazardous and Offensive Development (SEPP33) to determine whether the development is 'potentially hazardous'.
- Hazard analysis requirements as identified from the SEPP33 review.
- An assessment of the effect of the proposal on the cumulative BIP risk.
- An assessment of the effect of the proposal on the risk due to Dangerous Goods (DG) transport along Denison St.

2.5. Existing risk assessments

A publicly available cumulative quantitative risk assessment (QRA) study for all facilities on the BIP (including the Ixom CAP) was prepared by Sherpa Consulting Pty Ltd (Sherpa) in 2012 (Ref 1). In addition, a QRA specific to the CAP was most recently prepared in 2017 by Sherpa (Ref 2). (This is not publicly available but CAP QRA updates are periodically submitted by Ixom to DPE as a Condition of Consent requirement for the CAP).

There have been very few changes at the CAP since the 2012 BIP QRA was prepared hence the relative risk contribution from the CAP (2017) to the overall BIP cumulative risk will remain similar to that presented in the 2012 BIP QRA.

There is also an existing publicly available Dangerous Goods (DG) Transport QRA for Denison St and associated QRA Addendum (Ref 3) which includes DG traffic from or to the BIP.

2.6. Limitations

The study assesses the effects of potential accident scenarios with immediate risk of injury or fatality.

The study does not cover:

- Long term or continuous emissions with potential environmental impacts.
- Occupational, health and safety issues that may arise from routine plant operations.

2.7. Exclusions

Overall update of the 2017 CAP QRA or 2012 BIP QRA report is excluded from this study.

The project is not assessed to determine whether it is 'potentially offensive' under SEPP33. The CAP already operates under an Environmental Protection Licence (EPL) with associated conditions, and these would apply or be modified as required to suit the Botany Repack Facility.

3. PROJECT DESCRIPTION

3.1. Location

The proposed location for the Botany Repack Facility is on land referred to as 'Block A', which is part of BIP Lot 1101. This is within the southern part of the Ixom lease area on the BIP as shown on Figure 3.1 and is adjacent to Ixom's existing CAP.

The nearest BIP site boundaries are Denison St to the east a minimum of 130m away and the goods rail easement to the west around 120m away. The nearest neighbouring (non-Ixom) plant is Huntsman around 200m north of the proposed location.

3.2. Process description

Chemicals handled are acids (HCl) and alkalis (caustic and hypo). The process description has been summarised from the project Scope Statement (Ref 4).

The proposed Repack Facility layout and storage quantities is shown in Figure 3.2. Facilities will be largely within a new warehouse building.

Each chemical is currently produced and stored at BIP. No new chemical products will be stored or handled at the Repack Facility.

3.2.1. Raw materials

New pumps and pipelines will be installed to transfer sodium hypochlorite, caustic and hydrochloric acid from the existing CAP plant to the new Repack Facility, filling directly into IBCs.

The Repack Facility will have no storage tanks for raw chemicals¹. There will be no dilution / blending / mixing of products.

3.2.2. Filling products

Six IBC makeup/loading zones will be provided, 3 x acid and 3 x alkali with separate bunding and drainage.

Each bay has a bunded area to capture spills, leaks and washwater, and a sump with liner and high level switch.

Three of these makeup bays would be initially be fitted out: one for sodium hypochlorite, one for caustic and one for hydrochloric acid. Three of the makeup bays would not be initially fitted out but would be available for future augmentation.

¹ Note: The facility has been designed to allow future augmentation to occur, eg Figure 3.2 shows provision for future bays that will not be fitted out. This is for layout planning purposes only and is not covered in the present development application.

Each of the three fitted out bays would include one makeup bay filling arm with control panel. Each has capacity for 4 IBCs to be filled from each filling arm. Each bay can store up to 6 IBCs.

The filling approach for both IBCs and 200L drums is to use a Variable Speed Drive (VSD) controlled pump and combined mass and volumetric flowmeter, to control chemical flows into the containers. One set of pre-configured controls will be to fill a 1000L IBC, and another set of preconfigured controls will be to fill a 200L drum. Other controls to minimise the likelihood and consequence of an overfill event include an independent overfill protection system using a separate high level switch, which would automatically shut down filling prior to any overflow occurring.

An operator would also be present during the fill and could manually shutdown the process. Any spill that occurs (should the multiple safeguards fail) will be contained in the bunded area.

3.2.3. Storage

The site layout in Figure 3.2 shows the facility footprint which will accommodate up to 130 alkali IBCs and 70 acid IBCs, a total of 200 spaces. Full IBCs can be stacked 2 high (i.e. ~400 IBCs). Additional storage areas are provided for empty IBCs and drums.

The acid and alkali areas will be separated and have separate drainage systems. Chlorine detection will be provided in the drainage pit.

Figure 3.1: Proposed Location on BIP

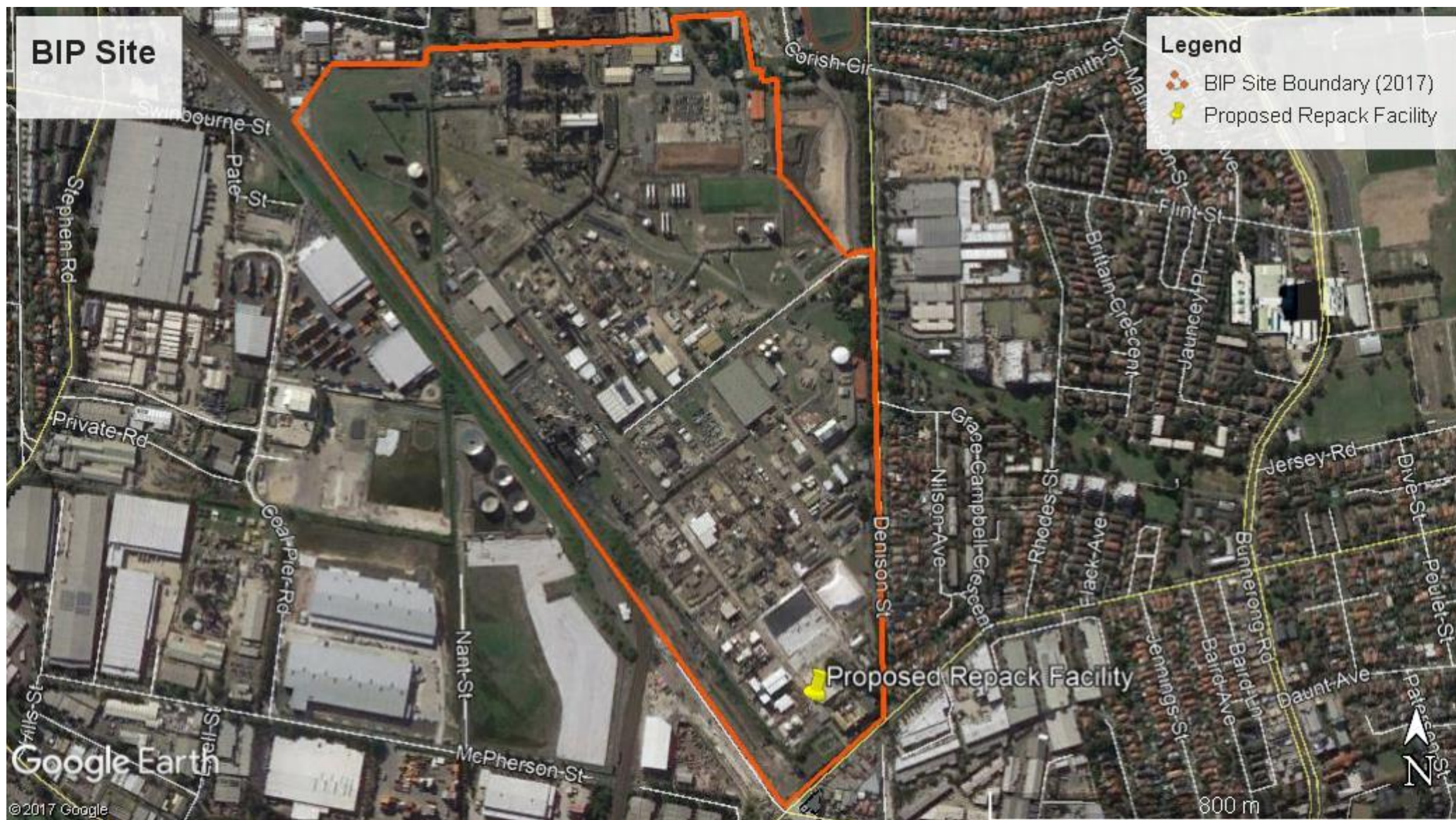
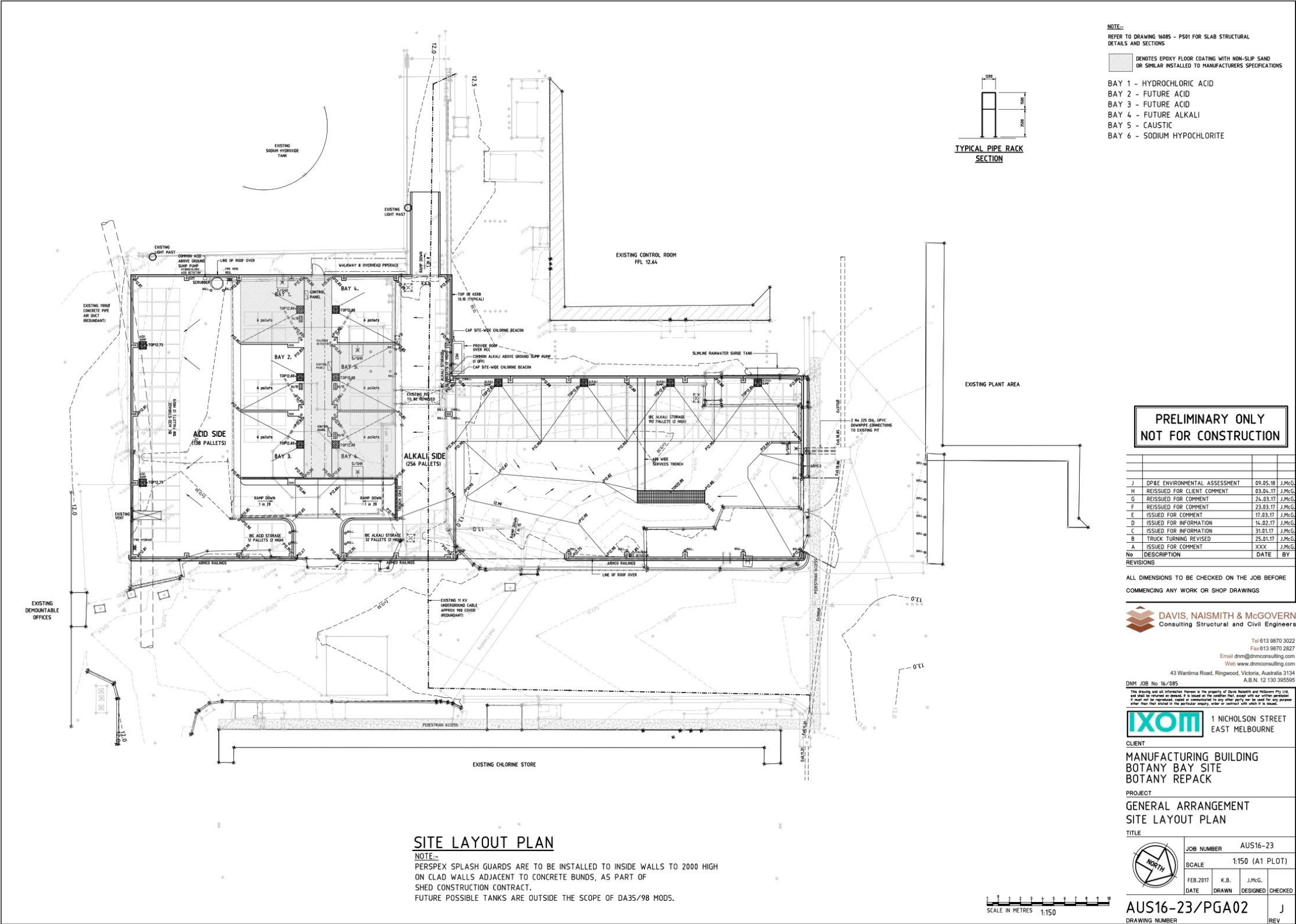


Figure 3.2: Proposed Repack Plant Layout



4. SEPP33 SCREENING

4.1. Potentially hazardous development

SEPP 33 defines potentially hazardous industry as follows:

'Potentially hazardous industry' means a development for the purposes of an industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:

- (a) to human health, life or property; or
- (b) to the biophysical environment, and:

includes a hazardous industry and a hazardous storage establishment.

To determine whether a proposed development is potentially hazardous, the risk screening process in the DPE's *Applying SEPP 33* guideline (Ref 5) considers the type and quantity of hazardous materials to be stored on the site and the distance of the storage area to the nearest site boundary, as well as the expected number of transport movements. If the defined screening thresholds are exceeded, the development proposal is classified as 'potentially hazardous' industry and must undergo a Preliminary Hazard Assessment (PHA).

'Hazardous materials' are defined within the *Applying SEPP 33* guideline as substances that fall within the classification of the Australian Dangerous Goods Code (ADGC), i.e. have a Dangerous Goods (DG) classification.

4.2. DG storage

The location and storage quantities of DGs is shown in Figure 3.2 and quantities summarised and compared against the relevant screening thresholds in Table 4.1. As the screening thresholds are exceeded, the development is 'potentially hazardous' and a PHA is required. The PHA has been undertaken and is reported in Section 5 of this report.

Table 4.1: SEPP33 Storage screening thresholds

Material	UN number	DG class / Packing Group	Total quantity	Comments
Hydrochloric acid (33% solution)	1789	8 PG II	Up to 140 m ³	Acid Storage: up to 140 full x 1kL IBCs (stacked 2 high)
Caustic soda (up to 50% sodium hydroxide solution)	1824	8 PG II	Up to 260 m ³	Alkalis (in total) Storage: up to 260 full x 1kL IBCs (stacked 2 high)
Sodium hypochlorite (12.5%)	1791	8 PG II		
TOTAL		8 PG II	Up to 400 m³	
SEPP33 threshold Class 8			25 tonnes	From Table 3 Ref 5
Assessment			Exceeded	PHA is required

4.3. Transport

4.3.1. Class 8 vehicle movements

The Repack Facility will not significantly change the total volume of chemicals produced on the Ixom site. Up to 40kL of packaged Class 8 chemicals per day would be despatched onto IBC trucks (which is currently despatched by bulk tanker). The facility will handle rigid trucks up to 11m in total length, capable of holding up to 11 IBCs.

- Demand for these products is seasonal, with summer demand higher than winter demand.
- At full production the Repack Facility could produce up to 40kL of chemical, repacked into 40 IBCs per working day, five days per week.
- It would unload up to ~4 trucks of empty IBCs per working day and load up to ~4 trucks of full IBCs per working day. These replace some of the current bulk Class 8 tankers with Class 8 packaged product truck movements.
- At normal production, truck movements are forecast to be significantly lower than above.

For completeness the net change in vehicle numbers from the Repack project are compared against the SEPP33 transport screening thresholds as shown in Table 4.2.

The net change is well below the SEPP33 transport screening thresholds so a transport route analysis is not required.

Table 4.2: SEPP33 Transport screening thresholds

Class	Cumulative Annual Vehicle movements (Note 1)	Peak Weekly	Comments
SEPP33 Transport Screening threshold Class 8 (all Packing Groups)	>500	>30	SEPP33 Vehicle Movement Screening Threshold (from Table 2, Ref 5). Minimum quantity per load is 2 tonnes (bulk), 5 tonnes (packaged) so don't count empties being returned
Net change compared to total current Class 8 loaded vehicle movements from BIP CAP	<50	<10	The Repack project will not materially change the Class 8 truck numbers for the CAP. Some product that is now exported in bulk tankers will be exported as packaged product instead, so SEPP 33 thresholds are not exceeded. NOTE: The peak weekly figure is based on peak summer load as these are seasonal products, winter peak will be far lower.
Notes: 1. This is laden vehicles, quantities as bulk or packaged product, an as per comments column does not include empty vehicles			

4.3.2. Denison St DG transport QRA

As reported in an existing Dangerous Goods (DG) Transport QRA for Denison St (Scott Lister, Ref 3), vehicle movements of up to approximately 7000 loaded bulk Class 8 trucks per year are identified in Denison St (mostly from the BIP).

However as per the Scott Lister report (Ref 3), Class 8 materials do not contribute quantitatively to the DG transport risk so there will be no impact on the Denison St DG transport risk QRA results from the Botany Repack project.

5. PRELIMINARY HAZARD ANALYSIS

5.1. Overview

The preliminary hazard analysis was prepared following the methodology given in the NSW DPE guidelines, Hazardous Industry Planning Advisory Paper (HIPAP) 6 *Hazard Analysis* (Ref 6) and *Multi-Level Risk Assessment* (Ref 7).

The steps include:

- Identification of hazards and description of potential incident scenarios.
- Analysis of the consequences of these incidents.
- Assessment of frequency for events with potential offsite impact, and comparison of risk levels with relevant risk criteria in HIPAP 4 (Ref 8) as shown in Table 5.1.

As suggested in the Multi-Level Risk Assessment guidelines, the consequence and risk analysis can be carried out either qualitatively or quantitatively, or using a combination of techniques.

For this study, sufficient quantitative analysis was undertaken to identify the events with the potential to have an offsite impact. This was then used to determine whether the project will have potential offsite risk levels exceeding the HIPAP 4 criteria, or else affect the cumulative risk as presented in the BIP 2012 QRA (Ref 1). This approach is known as a Level 2 risk assessment.

Table 5.1: HIPAP 4 risk criteria

Description	Risk Criteria (per year)
Individual Fatality Risk	
Fatality risk to sensitive uses, including hospitals, schools, aged care	0.5×10^{-6}
Fatality risk to residential and hotels	1×10^{-6}
Fatality risk to commercial areas, including offices, retail centres, warehouses	5×10^{-6}
Fatality risk to sporting complexes and active open spaces	10×10^{-6}
Fatality risk to contained within the boundary of an industrial site	50×10^{-6}
Injury / Irritation	
Toxic Injury - Toxic concentrations in residential areas should not exceed a level which would be seriously injurious to sensitive members of the community following a relatively short period of exposure at a maximum frequency of 10 in a million per year	10×10^{-6}
Toxic Irritation - Toxic concentrations in residential areas should not cause irritation to eyes, or throat, coughing or other acute physiological responses in sensitive members of the community over a maximum frequency of 50 in a million per year	50×10^{-6}

5.2. Hazard identification

The proposal does not introduce any new hazardous materials to the Ixom facility. Hazardous materials at the Repack Facility with potential to cause offsite effects are:

- Hydrochloric acid is an aqueous liquid that evolves toxic irritating fumes of hydrogen chloride from tank vents or when spilled. Hydrochloric Acid is already stored in bulk at the CAP and filled into road tankers.
- Sodium hypochlorite is a corrosive that will evolve chlorine gas (toxic and irritant) if mixed with acids (eg hydrochloric acid or sulfuric acid). Sodium hypochlorite is currently stored in bulk at the CAP and filled into road tankers.

Caustic is corrosive and has potential to cause injury to workers or environmental harm but does not present an offsite safety risk.

Potential hazardous incidents are summarised in Table 5.2.

5.3. Consequence assessment

To determine if there is potential for offsite effects representative consequence modelling was undertaken.

5.3.1. Vulnerability

As required by HIPAP 4 criteria, a range of acute toxic effects including irritation, serious injury or fatality due to a toxic gas release should be considered in the hazard analysis and risk compared to criteria.

As per the most recent CAP QRA from 2017 (Ref 2), fatality risk was assessed using probit equations (shown in Table 5.3 and Table 5.4) and toxic injury / irritation using Acute Emergency Guideline Levels (AEGLs) published by the US EPA. The AEGLs were chosen as:

- current guidance on selection of acute toxic exposure guidelines for emergency planning purposes is to use AEGLs as first preference where available (Ref 9). Therefore the same approach has been adopted in the risk assessment.
- AEGLs are available for a range of exposure durations from 10 minutes to 8 hours. The AEGL (10 minute) value was selected as it most closely reflects the HIPAP 4 toxic injury / irritation assessment criteria of “*a relatively short period of exposure*”.

5.3.2. Dispersion from HCl spills

Similarly, to the approach taken in the CAP and BIP QRAs, dispersion of hydrogen chloride vapour from an aqueous acid pool was modelled as follows:

- Pool evaporation model was used to estimate HCl vapour evolution rates based on acid vapour pressure and typical wind speeds

- The neutral gas pool source term dispersion model in TNO Effects 9 was used to predict the distance to 1% fatality endpoints from the probit and AEGL 2 and 3 levels representing toxic irritation / injury respectively.

The largest spill size is 1000L (IBC capacity). The maximum predicted unconstrained spreading size for a 1000L spill is an 8m pool diameter. Drainage and kerbing design in the IBC filling area constrain pool spreading to less than this.

A range of dispersion results is shown in Table 5.3. These results show that there are no offsite fatality or injury effects. Irritation (AEGL2 level) effects may be experienced for a limited area (around 40-50m) outside the Denison St site boundary (which is around 130m away at the nearest point) for the largest pool size and under low wind speeds only.

5.3.3. Chlorine dispersion

As per the HAZID in Table 5.2, the scenarios identified for mixing of hypo with acid and chlorine release would involve small quantities of material hence result in small quantities of chlorine with localised effects.

There is approximately 120kg of Cl_2 available for release if the contents of 1 IBC (1000L) of 12.5% hypo solution is acidified with sufficient HCl to release all chlorine. This is regarded as an upper limit scenario as it would require simultaneous loss of containment of both chemicals. (A larger amount is not credible in a 'wrong fill into container scenario' as there would be only a partial volume of incompatible material left in a container).

Dispersion results for 120kg release and a smaller 40kg release of Cl_2 are shown in Table 5.4. These results show that there are no offsite fatality effects. However irritation and injury effects may be experienced outside the BIP site boundary.

5.4. Frequency and risk assessment

The only identified incidents with potential offsite effects (toxic injury / irritation only) were inadvertent mixing of hypo and acid.

The toxic injury / irritation risk criteria given in HIPAP 4 (applicable to residential areas only, ie Denison St to the east) are 10×10^{-6} per year and 50×10^{-6} per year respectively.

The total predicted frequency from the CAP QRA (Ref 2) for these types of events (mixing of incompatible material) for systems with similar levels of safeguarding but far larger inventories is approximately 1×10^{-4} per year (which includes potential mixing in returned bulk tankers).

An estimated frequency for this incident to occur at the Repack Facility was developed using a conservative Layer of Protection Analysis approach and is summarised in Table 5.5 which predicts a similar frequency (of the order of 10^{-4} per year) to the existing CAP QRA scenarios.

Once wind directional effects and probability of occurrence of windspeed / stability conditions are factored in, the risk of exceeding an injury or irritation level at the BIP boundary in a particular direction is approximately two orders of magnitude lower than the base frequency, ie the risk at any location is below 1×10^{-5} per year. Therefore the HIPAP 4 injury / irritation risk criteria will not be exceeded offsite.

It is also noted that as the CAP is an MHF, an update to Safety Case will be required to cover the Repack Facility which would include a demonstration that the likelihood hence risk associated with mixing of incompatibles and toxic release scenarios is reduced SFARP and may further reduce the estimated frequency.

5.5. Effect on BIP QRA

The consequence modelling shows that there would be no offsite fatality risk for worst case releases associated with the Repack Facility, hence there will be no effect on the cumulative offsite individual fatality risk contours or societal risk in the BIP or CAP QRAs.

Under some circumstances (low windspeeds and stable atmospheric condition, worst case releases) there is potential for offsite irritation or injury effects to occur beyond the site boundary. Based on the safeguards identified in Table 5.2 and the frequency estimated from similar incidents from the 2017 CAP QRA, these are very low frequency events.

The existing toxic injury / irritation risk contours for the BIP (reproduced in APPENDIX A) extend at least 200m from the BIP and include toxic injury scenarios with larger effect distances. Hence, there will be no noticeable change in the injury or irritation risk contours from the identified worst case Repack Facility scenarios.

5.6. Escalation to / from the repack facility

All identified incidents within the Repack Facility are liquid spills with no fire or explosion potential. Hence there are no incidents within the Repack Facility that could result in escalation to other neighbouring facilities.

There are other plants at the BIP that have a potential fire and explosion risk. An explosion may result in damage to the Repack facilities. However as per the BIP 2012 escalation risk contours the proposed location is outside the relevant risk contour. In any case the scenarios would be very similar to those already considered and escalation risk is not significant.

5.7. Risk to biophysical environment

The main concern relating to environmental risk from accident events is generally with effects on whole systems or populations. HIPAP 4 provides the following qualitative guidance for assessment of environmental risk due to accident events:

- *Industrial developments should not be sited in proximity to sensitive natural environmental areas where the effects (consequences) of the more likely accidental*

emission may threaten the long-term viability of the ecosystem or any species within it.

- *Industrial developments should not be sited in proximity to sensitive natural environmental areas where the likelihood (probability) of impacts that may threaten the long-term viability of the ecosystem or any species within it is not substantially lower than the background level of threat to the ecosystem.*

Chemicals on the plant are corrosive but have no long term environmental impacts. Quantities are smaller than those already handled at the CAP. Containment and bunding is provided for the all Repack Facility areas handling chemicals. The overall BIP also has effluent containment with pH monitoring and a diversion basin.

The risk of an escape of a corrosive chemical from the Repack Facility to the surrounding environment is therefore regarded as extremely low.

5.8. Conclusions

Based on the hazard analysis which demonstrates limited potential for offsite consequence impacts, it is concluded that:

- there are no significant offsite risk impacts from the Repack Facility proposal and the facility complies with the risk criteria given in HIPAP 4.
- the proposal will have no impact on the cumulative offsite risk from the CAP or the overall BIP.
- the proposal will have no impact on the cumulative DG transport risk along Denison St.

Table 5.2: Hazard Identification

Rev	Date	Description	Prepared	Checked	Comments								
A	31/07/2016	Draft for comment	J Polich	n/a									
0	17/11/2017	Final Issue	J Polich	M Jarvis	Removal of day tank storage from project scope								
1	21/12/2017	Final Issue	J Polich	M Jarvis	Minor updates to cover additional instruments in sumps as per Botany Repack Project Risk Assessment by IXOM								
2	10/05/2018	Final Issue	J Polich	M Jarvis	Updated to include independent high level shutdown switch in HAZID 1								

HAZID No	Area	Activity / Operation	Material	Hazardous Event	Causes	Consequence	Comments re Frequency (site experience - takes into account control measures)	Control Measures / Safeguards (try to formulate these in terms of barriers)			Carried forward for analysis (qual or quant) in QRA?	Comments	Rev
						Description		Prevention	Detection	Protection / Mitigation			
1	Proposed Repack Facility	Drum and IBC filling	HCl (33% aqueous)	Release of hydrochloric acid	Failure of IBC filling arm , piping leaks	Evolution of hydrogen chloride gas from the acid spill	Very unlikely	Material of construction suited to acid service	Attended operation and shutdown by operator	Drainage design to limit spill size	Yes	Consequence of 1000L spill	0
										Automated batch filling - would limit max spill to 1000L as would cut out at batch setpoint			
										HCl extraction at filling point and diversion of fumes to scrubber exhausting above scrubber roofline			
					Overfill of IBC / drum, eg operator selects wrong batch size	Evolution of hydrogen chloride gas from the acid spill	Extremely unlikely	VSD filling to slow down rate towards end of volume to avoid overshoot. Batch fill auto cutoff off - preprogrammed setpoint for drums and IBCs. Independent high level switch will shutdown fill if high level occurs (ie prior to package overfill)	Attended operation and shutdown by operator	Bunded area / Drainage design to limit spill size	Yes	Consequence of 1000L spill	0
2	Proposed Repack Facility	Drum and IBC filling	HCl (33% aqueous)	HCl fumes when filling IBCs	Displacement of vapour from IBC when filling	Operator exposure Emission of fumes from building	Unlikely		Attended operation and shutdown by operator	HCl extraction at filling point and diversion of fumes to scrubber exhausting above scrubber roofline	No	Ground level impacts offsite from fumes not credible -air quality only	0
3	Proposed Repack Facility	Drum and IBC filling	Cl2	Release of chlorine due to mixing of acid and hypo when filling packages	Returned package with material remaining	Evolution of chlorine gas from mixture	Unlikely	Wash out procedures and washout station for returned containers Segregation of clean / returned containers	Attended operation and shutdown by operator (Cl2 highly odourous)		Yes	Consequence of acidifying 200 - 1000L of hypo (40 -100 kg Cl2 equivalent)	0
4	Proposed Repack Facility	Drainage system	Cl2	Release of chlorine due to mixing of acid and hypo in drainage system, sumps or bunds	Spill not cleaned up	Evolution of chlorine gas from mixture	Very Unlikely	Spill clean up procedures Dedicated drainage systems for acid that are separated from hypo	pH and conductivity probes in truck sump High level switches and alarm in truck loading area sump and IBC storage area sumps Cl2 detector and alarm in drainage pits Cl2 detectors around plant area		No	Similar but smaller scale than scenario above.	1
5	Proposed Repack Facility	IBC Storage area	HCl (33% aqueous)	Release of hydrochloric acid	Failure of IBC eg impact, forklift tine penetration , stack collapse	Evolution of hydrogen chloride gas from the acid spill	Very unlikely	UN compliant IBCs Maximum stack height is 2 high Speed limitation on forklifts		Drainage design to limit spill size	Yes	Consequence of 1000L spill	0

Table 5.3: HCl Dispersion Results

TNO Effects 9.0.23							
Neutral gas dispersion, F1.5 and D5, continuous release at mass flow rate of source, 600 s averaging time, 1.5 m receiver height							
Probit (HCl) = -35.76 + 3.69(c t)				(Purple Book equation)			
				Distance (m) to...			
				Probit 10 min	Probit 15 min	AEGL-3 10min	AEGL-2 10min
Pool diam (m)	Pool area (m2)	Windspeed (m/s)	Evap Rate (kg/s)	3334 ppm	2223 ppm	620 ppm	100 ppm
2	3	1.5	0.00149	not reached	not reached	not reached	not reached
		5	0.00381	not reached	not reached	not reached	not reached
5	20	1.5	0.00884	not reached	not reached	not reached	98
		5	0.0226	not reached	not reached	not reached	32
8	50	1.5	0.0213	not reached	not reached	43	181
		5	0.0544	not reached	not reached	15	57

Table 5.4: Cl₂ Dispersion Results

TNO Effects 9.0.19				
Dense gas dispersion, F1.5 and D5, instantaneous, 600 s averaging time, 1.5 m receiver height				
Probit (Cl ₂) = -4.86+0.5ln(c ^{2.75} t)			(Purple Book equation)	
		Distance (m) to...		
		Probit 1% fatality	AEGL-3 10min	AEGL-2 10min
Windspeed (m/s)	Mass (kg)	(c ⁿ t = 3471162 ppm ^{2.75} min)	50 ppm	2.8 ppm
F1.5	100	51	423	1300
D5	100	31	284	657
F1.5	40	40	275	972
D5	40	22	196	571

Table 5.5: Frequency Estimate

Scenario	Initiating Event Frequency (per year)	Comments	Layer of protection	Proability of failure	Reference	Frequency (per year)
1. Spill from IBC ,failure to clean up and subsequent spill of incompatible material	1	Estimated - no specific data but could happen as IBCs handled with forklifts etc - assume 1 / year	Spill cleanup procedures	0.003	HEART (Restore or shift a system to original or new state following procedures with some checking)	3.00E-06
			Incompatible product mistakenly brought into area where spill remains	0.1	Estimate (human error)	
			Second spill occurs directly contacting first spill either in drain or hardstand	0.01	Estimate	
2. Top fill incompatible material to returned partially full IBC	10	Assume that IBCs can be returned with > 40kg a few times per year	Washout procedures not completed	0.003	HEART (Restore or shift a system to original or new state following procedures with some checking)	3.00E-04
			Returned partially full IBC stored in wrong area	0.1	Estimate (human error)	
			Attended filling -IBC - operator fails to stop filling on Cl2 odour detection	0.1	Estimate (human error)	
Total						3.03E-04

APPENDIX A. TOXIC INJURY AND IRRITATION RISK CONTOURS (FROM BIP QRA 2012)

Extract from Ref 1:

FIGURE 9.6: INJURY RISK – TOXIC GAS (ERPG3)



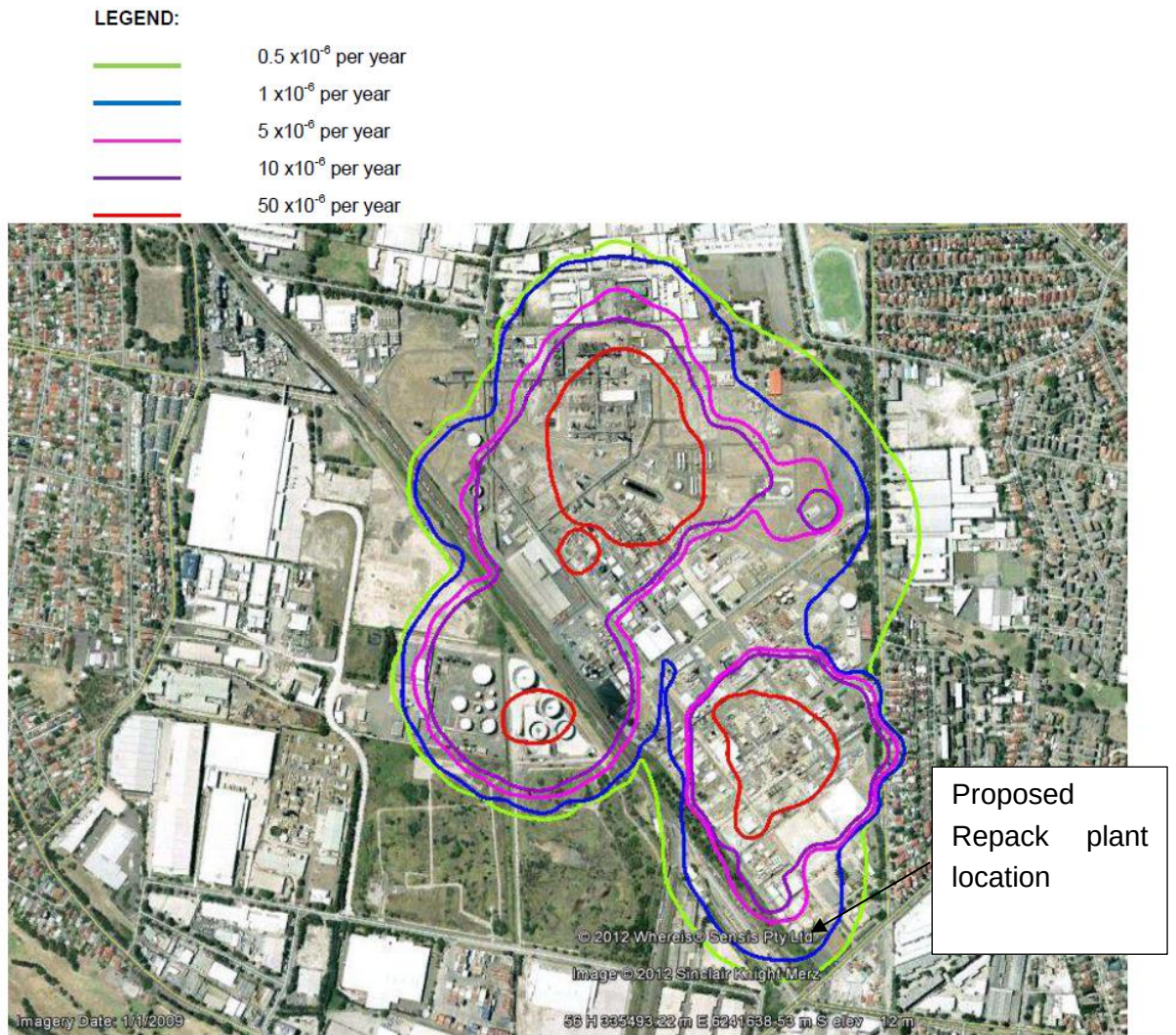
FIGURE 9.7: IRRITATION RISK – TOXIC GAS (ERPG2)



APPENDIX B. FATALITY RISK CONTOUR (FROM BIP QRA)

Extract from Ref 1:

FIGURE 9.1: CUMULATIVE BIP INDIVIDUAL FATALITY RISK



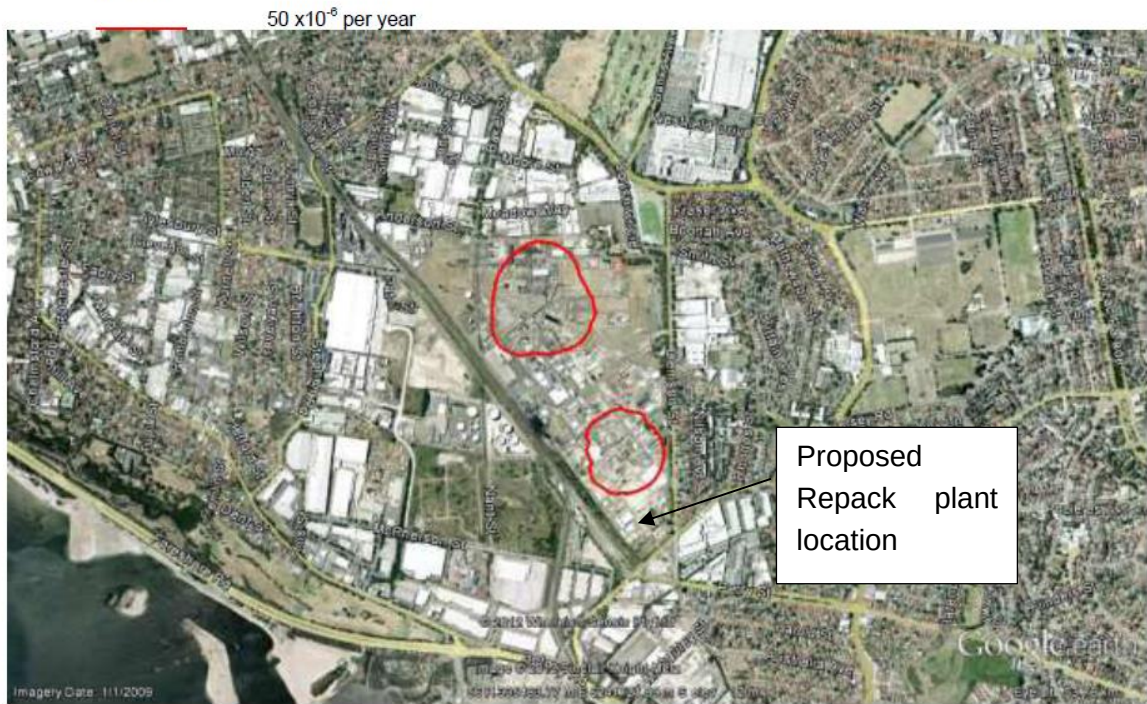
© Google Earth

APPENDIX C. RISK OF EXCEEDING 14KPA CONTOUR (FROM BIP QRA)

Extract from Ref 1:

FIGURE 9.5: PROPERTY DAMAGE – OVERPRESSURE 14KPA

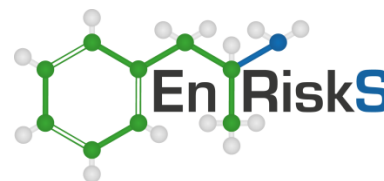
LEGEND:



APPENDIX D. REFERENCES

- 1 Sherpa Consulting Pty Ltd (25 September 2012) *Quantitative Risk Assessment Summary Report Botany Industrial Park* Doc no: 20613-001 Rev 1.
- 2 Sherpa Consulting Pty Ltd (9 Oct 2017) *Quantitative Risk Assessment Report Chloralkali Facility Orica, Botany Industrial Park* Doc no: 21103-RP-001 Rev 0
- 3 Scott Lister, *Dangerous Goods Transport QRA, Denison St, Hillsdale* Rev 3 Issued: 12 February, 2015 and associated *Addendum* issued May 2015 see:
<http://www.botanybay.nsw.gov.au/files/sharedassets/public/documents/council-amp-committees/business-papers/development-agenda/attachment-4-5-17-development-agenda-04-march-2015.pdf>
- 4 Ixom Operations (Nov 2017) AUS16-23 - *Botany Repacking Facility Scope Statement Revision 1*
- 5 NSW Government Planning, (Jan 2011) *Hazardous and Offensive Development Application Guidelines – Applying SEPP 33*
- 6 NSW Department of Planning and Environment (2011) *Hazardous Industry Planning Advisory Paper (HIPAP) No 6 Hazard Analysis*
- 7 NSW Department of Planning and Environment (2011) *Multi-Level Risk Assessment*
- 8 NSW Department of Planning and Environment (2011): *Hazardous Industry Planning Advisory Paper No.4: Risk Criteria for Land Use Safety Planning*
- 9 Issued by the Metropolitan Fire and Emergency Services Board (May 2011) *A Best Practice Approach to Shelter-in-Place for Victoria*

9.6. Appendix 6 – Review of Risk Issues – Overview (enRiskS)



29 May 2018

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Review of Risk Issues for Potential Placement of Repack Facility on Block A, FCAP

1.0 Introduction

Environmental Risk Sciences Pty Ltd (enRiskS) has been engaged by Ixom to undertake a review of risk issues relevant to the potential construction/placement of buildings on Block A of the Former Chloralkali Plant (FCAP). Block A has been remediated in accordance with the Remediation Action Plan (RAP) prepared by Golder (2012). The RAP adopted risk based criteria established in the FCAP Human Health and Environmental Risk Assessment (FCAP HHERA), completed by URS in 2008 (and updated by enRiskS in 2013).

The FCAP HHERA determined the following Risk Based Criteria (RBC):

- Mercury in soil assuming no buildings are constructed = 200 mg/kg
- Mercury in soil assuming industrial buildings are permitted = 90 mg/kg

For the remediation of Block A, the RBC of 200 mg/kg, relevant to open space use, was adopted.

The Site Audit Statement completed for Block A concluded that the site was suitable as an open area on an industrial site. The long-term site environmental management plan states that no enclosed buildings can be erected on Block A without a human health and environmental risk assessment.

Ixom is proposing to construct a partially clad building on Block A for the Repack Facility, which is proposed to be constructed using a suspended slab, above the existing slab and asphalt wherever practical, and screw piles.

This letter has been prepared to specifically address risk issues associated with residual impacts of mercury in soil relevant to the proposed construction of industrial buildings on some areas of Block A. This review has not evaluated or considered any other issues related to the proposed development, specifically the storage and handling of dangerous goods or the location of such facilities in relation to other hazardous processes/facilities on the Botany Industrial Site. In addition, this letter has not addressed any ecological risk issues or issues related to the off-site disposal (i.e. off the BIP) of excavated soil from the site.

This letter has been prepared with reference to the following documents:

- Golder 2012, Remediation Action Plan, Block A and M, Former Chloralkali Plant, Botany Industrial Park.
- Golder 2013, Remediation Validation Report, Block A and M, Former Chloralkali Plant, Botany Industrial Park.
- URS 2008, Human Health and Environmental Risk Assessment, Former Chloralkali Plant, Botany Industrial Park.
- enRiskS 2013, Former Chloralkali Plant, Human Health and Environmental Risk Assessment – 2013.

2.0 Proposed Development of Block A

Information provided by Ixom in relation to the proposed development on Block A is as follows:

- The development is to comprise a packaged goods storage building in the north-west portion of the Block A. This building will be a partially cladded large shed, approximately 8 m roof height, with 5 m to the underside of the wall skirt, constructed on a 0.18 m thick slab. Trucks will be able to drive up to this building for loading/unloading.
- The building will also house up to 400 IBCs storing sodium hypochlorite, caustic and hydrochloric acid.

This proposed building is illustrated on **Figure 1**. Further details on the design of the packaged goods storage building are included in **Attachment A**.

3.0 Remediation Criteria and Issues of Potential Concern

The remediation criteria adopted for Block A were derived in the FCAP HHRA completed by URS (2008). This HHRA was updated by enRiskS in 2013. The criteria developed in these documents was the lowest value relevant to the protection of human health and the environment, for open space and areas where buildings may be constructed.

For the protection of the environment a RBC of 893 mg/kg was derived (enRiskS 2013). This is based on the protection of groundwater. The criteria adopted for remediation of Block A (200 mg/kg) was well below this criteria and hence environmental risk issues do not require any further consideration.

Where no buildings were present the RBC of 200 mg/kg was derived. This criterion was based on the protection of adult workers on the site, who may come into direct contact with soil and be exposed through incidental ingestion, dermal contact, inhalation of dust and the inhalation of volatile elemental mercury outdoors. These exposures are assumed to occur for 10 hours per day, every workday (240 days per year) for a working lifetime (30 years).

The assessment also considered exposures that may occur during intrusive works that may be undertaken for installing or maintaining services. This scenario can also be considered for workers constructing footings or building foundations. The same exposure pathways were addressed for intrusive workers for works to a depth of 1 m where a worker is in an excavation for 10 hours per day (noting the RBC remain valid for excavations to 1.5 m depth), however it was assumed that the amount of soil invested was higher, more skin got dirty each day, but less time was spent in contact with the soil (i.e. short duration activities, not every working day for a working lifetime). Risks posed to workers involved in intrusive works were lower than for long-term workers. Hence the RBC of 200 mg/kg was protective of both long-term workers outdoors and intrusive workers, including those undertaking construction activities.

Where the criteria of 200 mg/kg is met, there will be no risk issues of concern for workers on the site who may come into direct contact with soil on the site, or workers undertaking intrusive works during maintenance or construction. Based on the information provided on the proposed intrusive works on the site the RBC will be conservative for these workers as workers will not spend 10 hours per day in any excavations. Footings to 4 m depth will be installed using screw piles, where the existing soil remains in the ground. Block A has been remediated to meet this criterion (refer to **Section 4** for further discussion) hence no risk issues related to direct contact exposures, inhalation exposures outdoors or exposures during intrusive works are relevant to the proposed use of the site.

Where a building may be constructed a RBC of 90 mg/kg was derived (URS 2008 and enRiskS 2013). This RBC includes the same exposure pathways outlined above for long-term workers on the site. However, the migration of elemental mercury vapours into a building was also considered. The building considered in the derivation of the criteria is assumed to be similar to an office building, which is enclosed and poorly ventilated, with a 0.15 m thick slab, 3m high ceiling and the potential for multiple levels/floors, where

pressure driven vapour intrusion can occur. In addition, it is assumed that a worker may spend 10 hours per day in the building. Such a building scenario is highly conservative for the proposed building as this building is large and well ventilated¹, have an 8m high ceiling, thicker slab (a minimum of 0.180m) and no potential for pressure driven vapour intrusion to occur (as the building has large roller doors that are open).

Revised RBC

As the RBC for addressing vapour inhalation exposures indoors is overly conservative for the proposed building, the RBC has been revised. This has involved modifying the modelling of elemental mercury vapours that may migrate from soil to indoor air, where the building is constructed as proposed. All other aspects related to the toxicity of mercury vapour remain as presented enRiskS (2013) has been adopted. **Table 1** presents a summary of the building parameters adopted in the revised vapour model.

Table 1: Summary of building parameters considered in revised RBC (indoor air)

Parameter	Value adopted	Basis
Depth to soil impacts	0.01 m	Assumes mercury impacts in surface soil beneath building – parameter unchanged from enRiskS 2013 (not model is not sensitive to this parameter, so VI remains unchanged based on 0.01 m and 0.5m depth)
Type of soil beneath building	Sand/fill	Adopted soil properties for sand/fill relevant to the site, as presented by enRiskS 2013
Size of building	1268.5 m ²	Based on building plans
Internal height	6.5 m	Assumed average height (8m max with 5m at walls)
Slab thickness	0.18 m	Minimum slab thickness as per plans
Air exchange rate indoors	2 per hour	Likely to be higher, however the value adopted by enRiskS (2013) adopted
Fraction of gaps and cracks	0.1%	Default value applicable to new buildings (USEPA 2004)
Advection or pressure driven vapour intrusion	Negligible	Relevant for proposed building design
Worker exposure parameters		
Time spent indoors	10 hours per day	Assumed long workshift – unchanged from enRiskS (2013)
Exposure frequency	240 days per year	Work days per year, and working lifetime as per NEPM (NEPC 1999 amended 2013) – unchanged from enRiskS (2013)
Exposure duration	30 years	

Attachment B presents the modelling undertaken for the assessment of vapour inhalation exposures. Based on the above assumptions, the RBC for elemental mercury in soil is considered to be “not limiting” as there are no vapour inhalation risks where elemental mercury is present at levels at, and 10 times (or more) higher than, the saturated soil concentrations (i.e. the soil concentration that results in a saturated/maximum vapour phase concentration in the subsurface).

The above means that vapour inhalation exposures within the proposed building is not a limiting pathway for the proposed use of the site. These RBC have been derived on the basis of the following assumptions.

For this area RBC have also been derived to address incidental exposure outdoors, including direct contact with soil, and exposures that may occur during excavations. **Table 2** presents a summary of the assumptions adopted.

¹ The building will be naturally ventilated, with the design incorporating the following:

- The entire length of the north-east wall, where trucks are entering for loading is open
- Part of the north-west wall where trucks are existing is open
- The cladded walls will include ventilation louvres
- The roof has whirly birds installed along the shed roof

Table 2: Summary of building parameters considered in revised RBC (outdoor areas and intrusive works)

Parameter	Value adopted	Basis
Depth to soil impacts	0.5 m	Average depth of soil impacts assumed in outdoor areas
Type of soil	Sand/fill	Adopted soil properties for sand/fill relevant to the site, as presented by enRiskS 2013
Area outdoors	10 m x 10 m	Outdoor area assumed to be affecting ambient concentrations
Length of excavation	10 m	Assumed length through impacted soil
Depth of excavation	1 m	Assumed
Breathing/mixing height	2 m	Default/typical value for mixing zones for outdoor areas
Windspeed	4.9 m/s	Average 9am and 3pm winds from Sydney Airport
Windspeed in excavations	0.5 m/s	10% of outdoor windspeed
Body weight	78 kg	Average body weight for adults as per enHealth (2012) – unchanged from enRiskS (2013)
Worker exposure parameters		
Time spent outdoors	1 hours per day	Assumed for area, where most of workday is indoors (note this is much lower than in the original assessment which assumed a worker may be outdoors for 10 hours per day)
Soil ingestion rate	25 mg/day	Default value for commercial/industrial land use as per NEPM (2013) – unchanged from enRiskS (2013)
Surface area dirty	1120 cm ²	Assumes hands are dirty each day – unchanged from enRiskS (2013)
Soil adherence factor	0.51 mg/cm ²	Default value as per enHealth (2012) – unchanged from enRiskS (2013)
Fraction of day exposed	0.5	Assumes hands remain dirty for 12 hours each day – unchanged from enRiskS (2013)
Exposure frequency	240 days per year	Work days per year, and working lifetime as per NEPM (NEPC 1999 amended 2013) – unchanged from enRiskS (2013)
Exposure duration	30 years	
Intrusive worker exposure parameters		
Time spent in excavations	8 hours per day	Assumed, consistent with NEPM (2013)
Soil ingestion rate	330 mg/day	Value for intrusive works – unchanged from enRiskS (2013)
Surface area dirty	3300 cm ²	Value for intrusive/construction activities – unchanged from enRiskS (2013)
Soil adherence factor	0.51 mg/cm ²	Default value as per enHealth (2012) – unchanged from enRiskS (2013)
Fraction of day exposed	0.5	Assumes hands remain dirty for 12 hours each day – unchanged from enRiskS (2013)
Exposure frequency	10 days per year	Assumed duration of intrusive works - – unchanged from enRiskS (2013)
Exposure duration	5 years	

Attachment C presents the modelling undertaken for the above scenarios.

It is noted that the toxicity reference values adopted are consistent with those adopted by enRiskS (2013). There is no information available that would suggest that the products proposed to be stored or handled in the Repack facility would interact either antagonistically or synergistically with mercury vapour.

The RBC derived, based on the above is 6000 mg/kg. This is determined by risks posed to workers involved in intrusive works. This RBC relates to the proposed use of Block A.

In relation to addressing all risk issues relevant to the long term use of the site, the criteria relevant to the protection of groundwater, namely 893 mg/kg is lower than the RBC relevant to the protection of human health and should be adopted as the overall RBC for the site.

4.0 Contamination Remaining Beneath Block A

Investigations undertaken prior to remediation included the sampling of soil from a number of locations within Block A (as shown in **Figure 2**, from URS). This included 5 sample locations (SIA2, SIA3, SIA4, SIA5 and WMC03) that would be below the proposed building. Mercury concentrations in these samples ranged from <0.1 to 38.4 mg/kg. The maximum concentration reported was from depth, 8-8.5 m bgs (m below ground surface).

Remedial works were completed in a small portion of Block A, as shown on **Figures 3 and 4**. Following completion of these works validation samples were collected. Validation data for the remediated area (at locations shown in **Figure 4**) are presented by Golder (2013).

Validation data for this area showed concentrations of mercury below the remedial criteria of 200 mg/kg. Two samples exceeded this value (GAVS115 & GAVS116) however these sample areas were further remediated and no longer remain on the site (Golder 2013).

Validation works also included the further sampling of soil from areas outside of the remediation area, but within Block A (Golder 2013, refer to **Figure 3**). This included soil samples from 3 locations that would be beneath the proposed building. Concentrations of mercury at these locations were in the range 0.79 to 52.5 mg/kg. No elemental mercury was identified at any of these sample locations.

Data relevant to the presence of mercury in the area of the proposed building, post remediation is presented in **Table 2**.

Table 2: Summary of Post-Remediation Mercury Concentrations for Block A

Location of Sample	Sample Position (Wall / Base)	Sample Depth (mbgs)	Mercury Concentration (mg/kg)
Validation of remediation works			
GAVS101	Wall	0.3-0.4	13
GAVS102	Wall	0.7-0.8	<5
GAVS103	Wall	0.3-0.4	<5
GAVS104	Wall	0.7-0.8	<5
GAVS105	Wall	0.3-0.4	<5
GAVS106	Wall	0.7-0.8	5.1
GAVS107	Wall	0.3-0.4	110
GAVS108	Wall	0.5-0.6	17
GAVS109	Wall	0.2-0.3	14
GAVS110	Wall	0.7-0.8	29
GAVS111	Wall	0.4-0.5	69
GAVS112	Wall	0.7-0.8	174
GAVS113	Wall	0.4-0.5	143
GAVS114	Wall	0.7-0.8	29
GAVS117	Wall	0.4-0.5	139
GAVS118	Wall	0.7-0.8	69
GAVS119	Wall	0.4-0.5	21
GAVS120	Wall	0.7-0.8	<5
GAVS121	Base	#	<5
GAVS122	Base	#	67
GAVS123	Base	#	12
GAVS124	Base	#	25
Outside of remediation area, beneath or in vicinity of proposed building			
SIA2	Soil bore	0.0-0.1	13.3
		0.9-1.0	3.8
SIA3	Soil bore	0.0-0.1	0.5
		0.9-1.0	<0.1
SIA4	Soil bore	0.0-0.1	0.4
		0.9-1.0	1.5
SIA5	Soil bore	0.0-0.1	0.4
		0.9-1.0	<0.1

Location of Sample	Sample Position (Wall / Base)	Sample Depth (mbgs)	Mercury Concentration (mg/kg)
MWC03	Monitoring well	5.0-5.5 8.0-8.5	0.5 38.4
A_TP01	Test pit	NA	52.5
A_TP02	Test pit	NA	34.6
A_TP03	Test pit	NA	10.1
A_TP05	Test pit	NA	0.79

Notes for Table 2

refer to **Figure 4** for the elevation of the base of the excavation

NA Sample depth not specified

All remaining concentrations of mercury within Block A are below 893 mg/kg, the limiting RBC relevant to all exposures that may occur within Block A (including within buildings). On this basis there are no risk issues of concern associated with the presence of mercury contamination that may remain in the subsurface in Block A relevant to the proposed development.

Any additional soil samples that may be collected from Block A should be compared with the RBC of 893 mg/kg, when determining if these materials are suitable to remain on Block A. Exceedance of the RBC is expected to require further assessment (and potential treatment) for offsite disposal to a suitable landfill.

5.0 Conclusions

The proposed construction of a repackaging facility on Block A has been evaluated, in relation to potential human health risk issues. Based on the available information on the proposed development, and information on the residual levels of mercury that remain in soil in the areas where the building is proposed, no risk issues of concern have been identified for human health for future workers in the buildings, intrusive maintenance works (including those undertaking excavations for building footings) and intrusive construction workers.

A revised, area/project specific RBC of 893 mg/kg has adopted for mercury in soil. This is protective of exposures by workers within the proposed building, in outdoor areas and undertaking intrusive works, and is also protective of the migration of mercury from soil to groundwater.

On this basis there is no requirement to modify the proposed development plans or include any additional risk management measures.

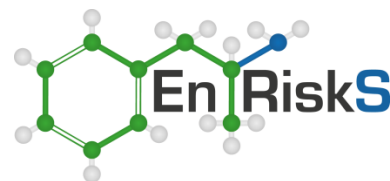
It should be noted that a construction management plan should include contingencies to address any unexpected contamination (>893 mg/kg) that may be encountered.

6.0 Limitations

Environmental Risk Sciences has prepared this report for the use of Ixom and the Contaminated Site Auditor in accordance with the usual care and thoroughness of the consulting profession. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report.

It is prepared in accordance with the scope of work and for the purpose outlined in this report.

The methodology adopted and sources of information used are outlined in this report. Environmental Risk Sciences has made no independent verification of this information beyond the agreed scope of works and assumes no responsibility for any inaccuracies or omissions. No indications were found that information contained in the reports provided for use in this assessment was false.



This report was prepared from November 2017 to May 2018 and is based on the information provided and reviewed at that time. Environmental Risk Sciences disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

Please contact Jackie on (02) 9614 0297 or 0425 206 295 if you require any additional information in relation to the above.

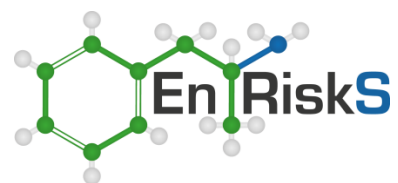
Yours sincerely,

Dr Jackie Wright (Fellow ACTRA)
Director/Principal
Environmental Risk Sciences Pty Ltd

References

NEPC 1999 amended 2013, Schedule B7, Guideline on Health-Based Investigation Levels, National Environment Protection (Assessment of Site Contamination) Measure, National Environment Protection Council. <<http://scew.gov.au/nepms/assessment-site-contamination>>.

USEPA 2004, User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings, United States Environmental Protection Agency. Washington.



Figures

Sample ID	MWC07_03-00-05.15	MWC07_12-00-12.30
Depth	3.0-5.15	12.0-12.3
Date Sampled	3/05/2006	3/05/2006
Mercury (mg/kg)	<0.1	1
Visible Mercury	-	-

Sample ID	SIA2 0.0_0.1	SIA2 0.9_1.0
Depth	0.0-0.1	0.9-1.0
Date Sampled	4/07/2007	4/07/2007
Mercury (mg/kg)	13.3	38
Visible Mercury	Not Identified	Not Identified

Sample ID	MWC03_05-00-05.50	MWC03_08-00-08.25
Depth	5.0-5.5	8.0-8.25
Date Sampled	21/05/2006	2/05/2006
Mercury (mg/kg)	0.5	38.4
Visible Mercury	-	-

Sample ID	MWC06_03-00-03-50
Depth	3.0-3.5
Date Sampled	9/05/2006
Mercury (mg/kg)	7.4
Visible Mercury	-

Sample ID	SIA3 0.0_0.1	SIA3 0.9_1.0
Depth	0.0-0.1	0.9-1.0
Date Sampled	4/07/2007	4/07/2007
Mercury (mg/kg)	0.5	<0.1
Visible Mercury	Not Identified	Not Identified

Sample ID	SIA5 0.0_0.1	SIA5 0.9_1.0
Depth	0.0-0.1	0.9-1.0
Date Sampled	4/07/2007	4/07/2007
Mercury (mg/kg)	0.4	<0.1
Visible Mercury	Not Identified	Not Identified

Sample ID	SIA4 0.0_0.1	SIA4 0.9_1.0
Depth	0.0-0.1	0.9-1.0
Date Sampled	4/07/2007	4/07/2007
Mercury (mg/kg)	0.4	1.5
Visible Mercury	Not Identified	Not Identified

Sample ID	MWC08_03-00-03-50
Depth	3.0-3.5
Date Sampled	8/05/2006
Mercury (mg/kg)	<0.1
Visible Mercury	-

Sample ID	SIA6 0.0_0.1	SIA6 0.9_1.0	QC100
Depth	0.0-0.1	0.9-1.0	0.9-1.0
Date Sampled	4/07/2007	4/07/2007	4/07/2007
Mercury (mg/kg)	0.5	<0.1	<0.1
Visible Mercury	Not Identified	Not Identified	Not Identified

Sample ID	SIA1 0.0_0.1	SIA1 0.9_1.0
Depth	0.0-0.1	0.9-1.0
Date Sampled	4/07/2007	4/07/2007
Mercury (mg/kg)	<0.1	<0.1
Visible Mercury	Not Identified	Not Identified

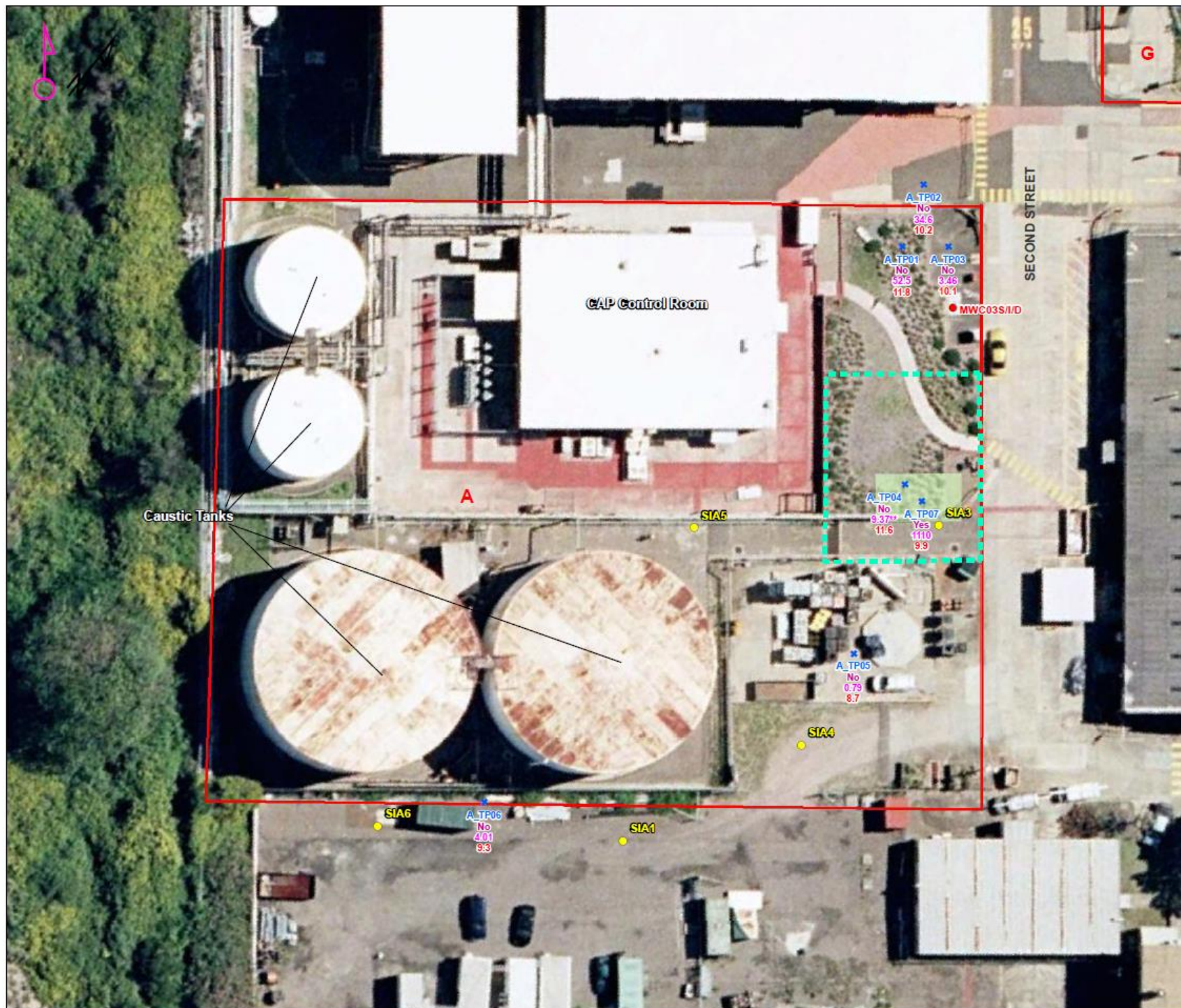
Legend:

- SIA1 Soil Investigation Location
- MWC07 Monitoring Well Location
- Area Where Visual Elemental Mercury Was Noted During Current Investigation

1000 - Exceeds the National Environment Protection Council 1999 Health-based Investigation Levels - Commercial/Industrial for Mercury (75 mg/kg)
- - Not Analysed
Identified - Visible elemental mercury identified at the sample location

Drawn: AJW Approved: DRAFT Date: 31/07/2007
 Job No: 43217688 File: 43217688-003.wor
 Client: ORICA AUSTRALIA PTY LTD
 Project: ADDITIONAL SOIL SAMPLING IN THE FORMER CHLOR-ALKALI PLANT
 Title: SOIL INVESTIGATION BLOCK A
 Figure: 2

URS



REMEDIALATION VALIDATION REPORT BLOCK A AND M

ORICA AUSTRALIA PTY LTD

REMEDIALATION ACTION PLAN – PROPOSED EXTENT OF REMEDIALATION – BLOCK A



LEGEND

- + Test Pit Locations
- Previous Soil Investigation Location (URS, 2006)
- Previous Soil Assessment Location (URS, 2007)
- Existing Monitoring Well
- Remediation Area
- Proposed Excavation Area
- Former Chlor Alkali Plant Block Boundaries
- YES/NO** Elemental Mercury Identified in the Soil
- 0.92 Mercury Concentration (mg/kg)
- 9.5 pH Value
- ↗ Plant North

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1. Aerial imagery sourced from Google Earth 2010
2. Base plan derived from URS Final Report, Report Title: Remedial Action Plan Former Chlor Alkali Plant, Orica Botany, NSW dated 28 July 2010.

0 2.5 5 10 15 20 metres

SCALE (at A3) 1:400

DATUM GDA 94, PROJECTION MGA Zone 56

PROJECT: 117623084
DATE: 5/12/2013
DRAWN: FA
CHECKED: GB

FIGURE 3





REMEDIATION VALIDATION REPORT – BLOCK A AND M

ORICA AUSTRALIA PTY LTD

BLOCK A – FINAL EXCAVATION EXTENT AND VALIDATION SAMPLE POINT LOCATIONS



LEGEND

- Proposed Excavation Area (RAP, Golder, 2012)
- Remediation Area
- Excavation Area (identified in RVP as being "the site", subject to Site Audit)
- Concrete Footing (monolith)
- Former Chlor Alkali Plant Block Boundaries
- Wall Validation Sampling Location below RAC (Golder, 2013)
- Base Validation Sampling Location below RAC (Golder, 2013)
- Validation Sampling Location Excavated (Golder, 2013)
- Excavation Elevation(mAHD) (Golder, 2013)
- Plant North

COPYRIGHT

1. Aerial Photography Copyright NearMap Pty Ltd. Image dated 2013.08.09. Sourced with permission from Nearmap on 2013.08.28. Image intended for indicative purposes only. More information can be found here: <http://www.nearmap.com/>
2. Inset map data copyright MapInfo Australia Pty Ltd
3. Base plan derived from UR3 Final Report. Report Title: Remediation Action Plan Former ChlorAlkali Plant, Orica Botany, NSW dated 28 July 2010.

0 0.5 1 2 3 4 metres

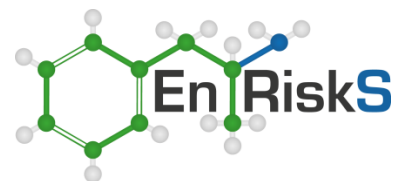
SCALE (at A3) 1:80

DATUM GDA 94, PROJECTION MGA Zone 56

PROJECT: 117623084
DATE: 5/12/2013
DRAWN: FA
CHECKED: GB

Figure 4





Attachment A Development plans

REFER TO DRAWING 16085 - PS01 FOR SLAB STRUCTURAL
DETAILS AND SECTIONS

BAY 1 - HYDROCHLORIC ACID
BAY 2 - FUTURE ACID
BAY 3 - FUTURE ACID
BAY 4 - FUTURE ALKALI
BAY 5 - CAUSTIC
BAY 6 - SODIUM HYPOCHLORITE



NOTE:-
PERSPEX SPLASH GUARDS ARE TO BE INSTALLED TO INSIDE WALLS TO 2000 HIGH ON CLAD WALLS ADJACENT TO CONCRETE BUNDS, AS PART OF SHED CONSTRUCTION CONTRACT.
FUTURE POSSIBLE TANKS ARE OUTSIDE THE SCOPE OF DA35/98 MOD5.

J	DP&E ENVIRONMENTAL ASSESSMENT	09.05.18	J.McG	
H	REISSUED FOR CLIENT COMMENT	03.04.17	J.McG	
G	REISSUED FOR COMMENT	24.03.17	J.McG	
F	REISSUED FOR COMMENT	23.03.17	J.McG	
E	ISSUED FOR COMMENT	17.03.17	J.McG	
D	ISSUED FOR INFORMATION	14.02.17	J.McG	
C	ISSUED FOR INFORMATION	31.01.17	J.McG	
B	TRUCK TURNING REVISED	25.01.17	J.McG	
A	ISSUED FOR COMMENT	XXX	J.McG	
No	DESCRIPTION	DATE	BY	

ALL DIMENSIONS TO BE CHECKED ON THE JOB BEFORE
COMMENCING ANY WORK OR SHOP DRAWINGS



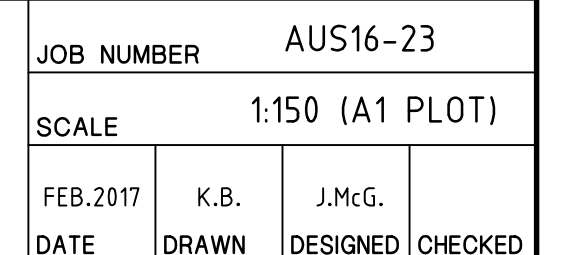
DNM JOB No 16/085

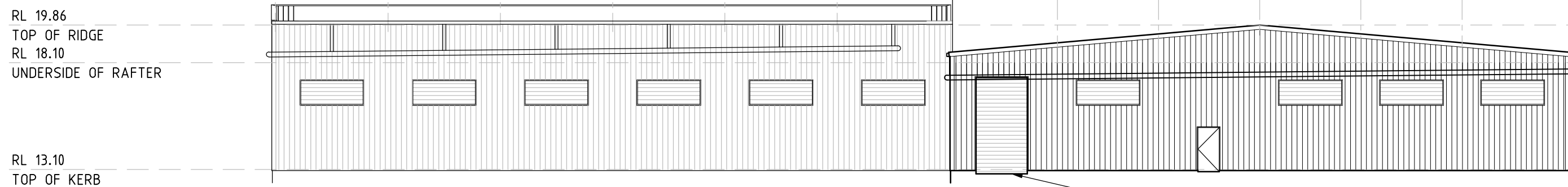


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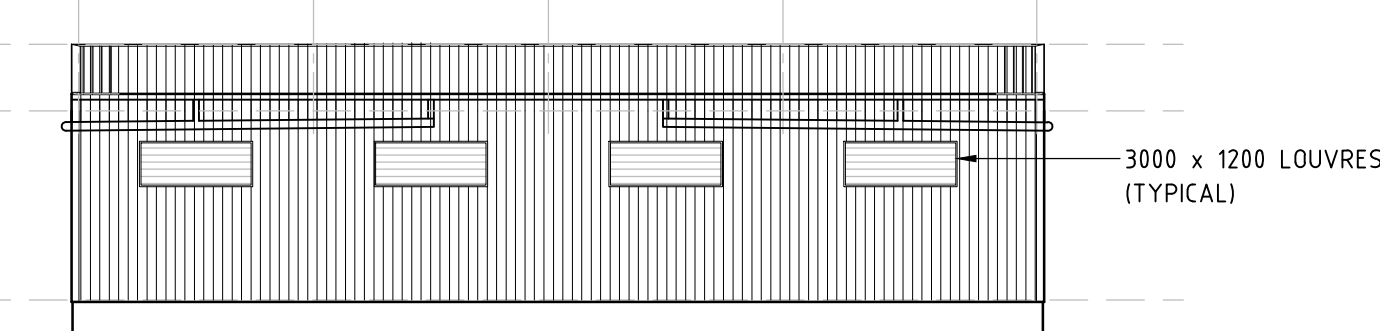
PROJECT

TITLE

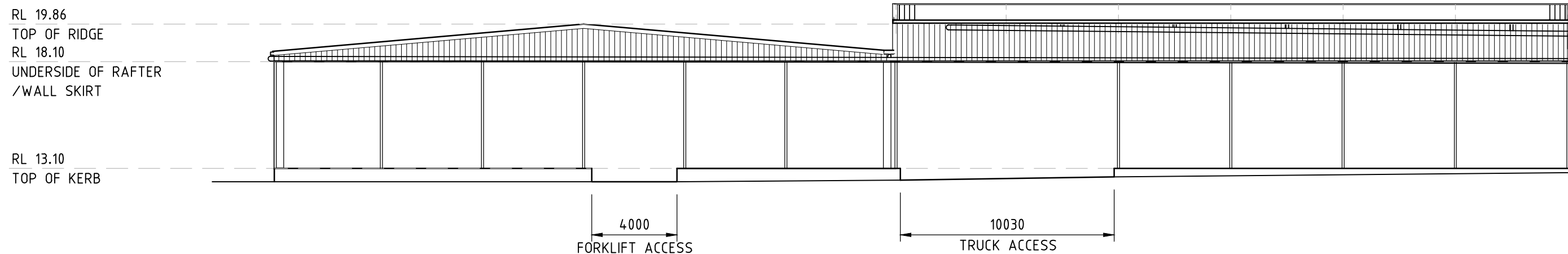




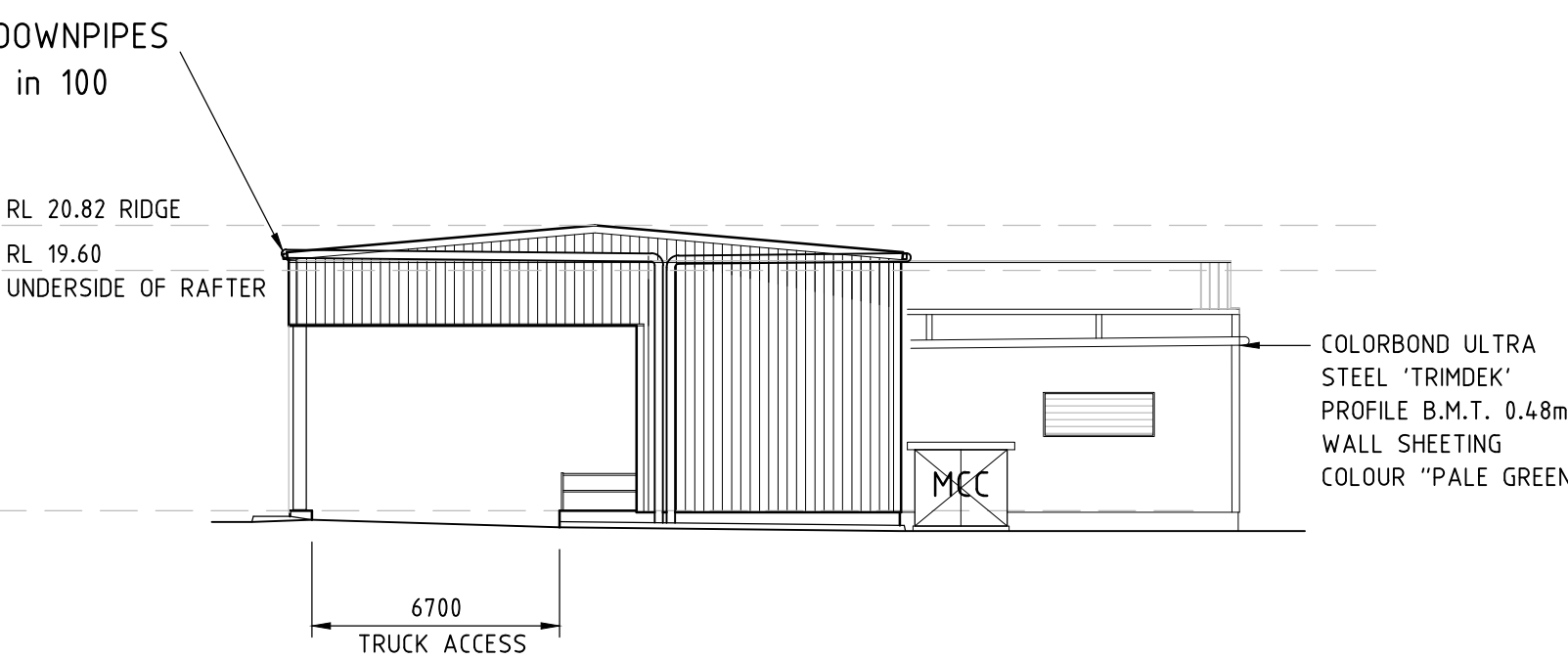
SOUTH WEST ELEVATION



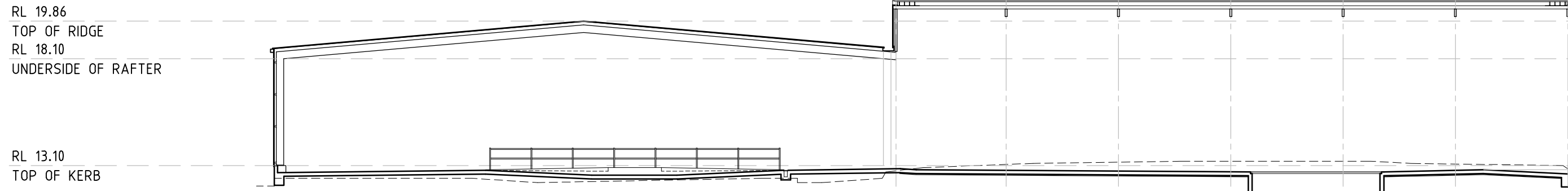
SOUTH EAST ELEVATION



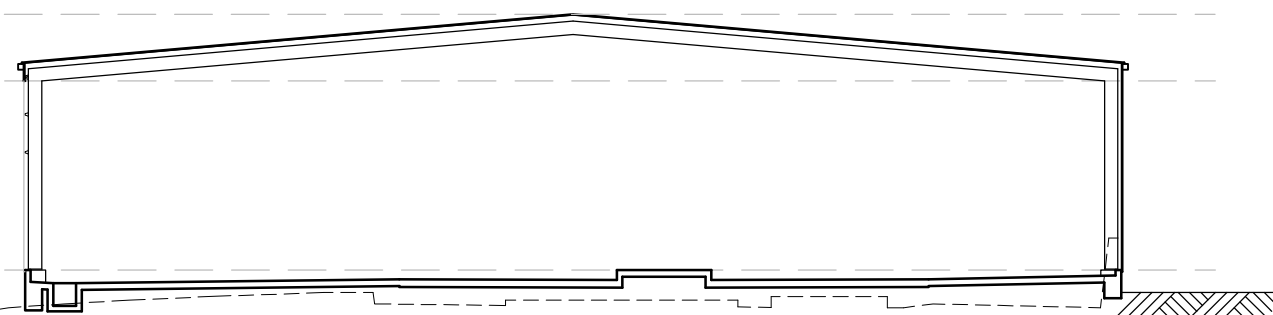
NORTH EAST ELEVATION



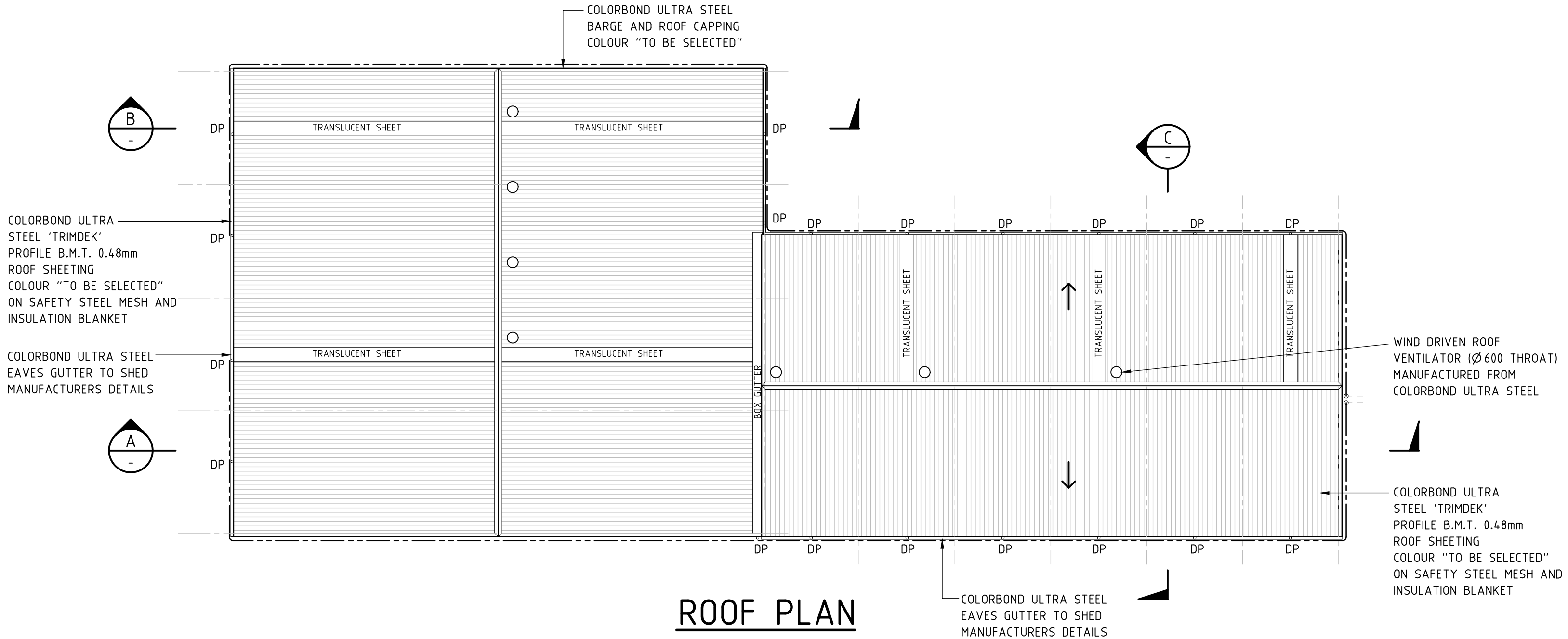
NORTH WEST ELEVATION



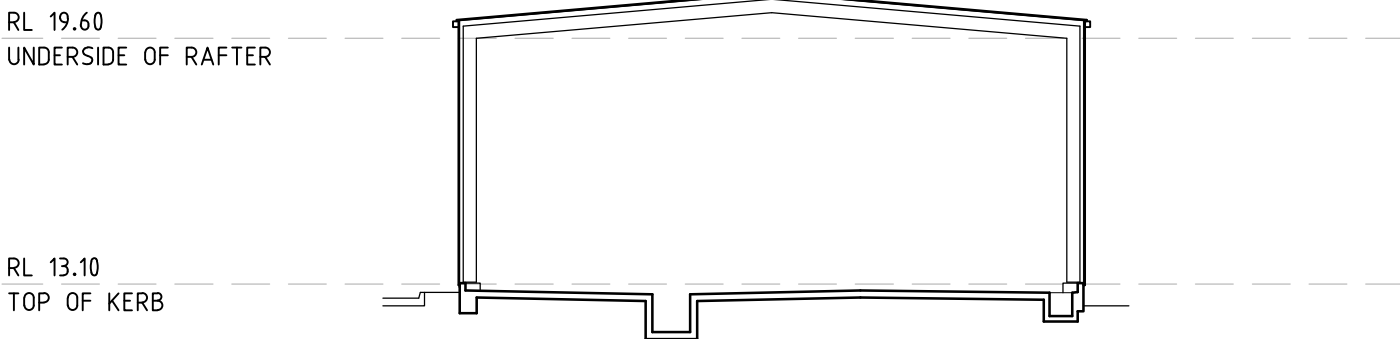
SECTION A



SECTION B



ROOF PLAN



SECTION C

PRELIMINARY ONLY
NOT FOR CONSTRUCTION

No	DESCRIPTION	DATE	BY
E	REISSUED FOR COMMENT	10.05.18	J.McG.
D	REISSUED FOR COMMENT	08.05.18	J.McG.
C	REISSUED FOR COMMENT	24.03.17	J.McG.
B	REISSUED FOR COMMENT	23.03.17	J.McG.
A	ISSUED FOR COMMENT	17.03.17	J.McG.

ALL DIMENSIONS TO BE CHECKED ON THE JOB BEFORE
COMMENCING ANY WORK OR SHOP DRAWINGS

DAVIS, NAISMITH & MCGOVERN
Consulting Structural and Civil Engineers

Tel 613 9870 3022
Fax 613 9870 2827
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Web www.dnmconsulting.com
43 Wantirna Road, Ringwood, Victoria, Australia 3134
A.B.N. 12 130 395595

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1 NICHOLSON STREET
EAST MELBOURNE

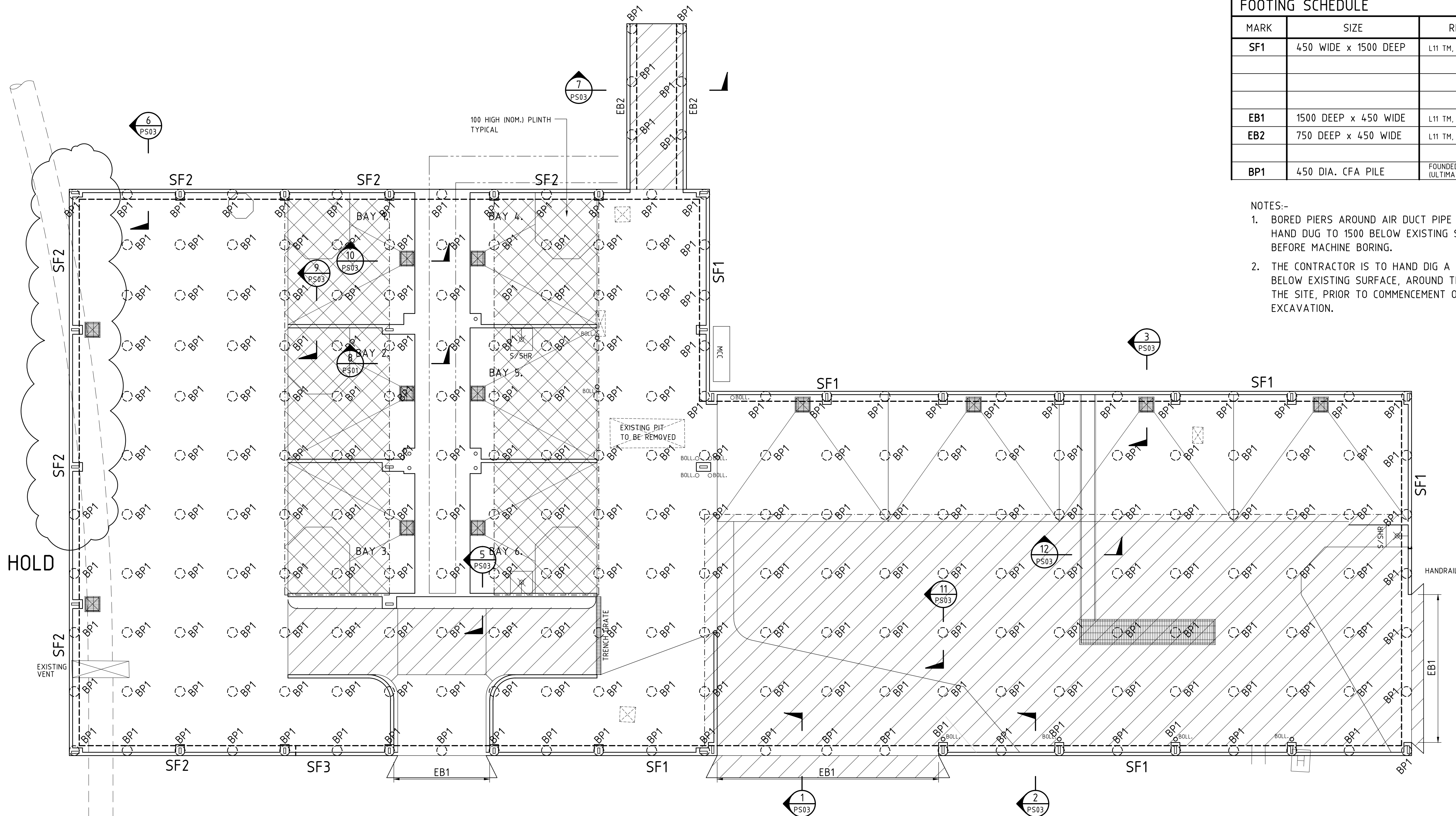
MANUFACTURING BUILDING
BOTANY BAY SITE
BOTANY REPACK

GENERAL ARRANGEMENT
ROOF PLAN AND ELEVATIONS

JULY'14 DATE	K.B. DRAWN	J.McG. DESIGNED	
16/085			
1:200 (A1 PLOT)			

AUS16-23/PGA03
DRAWING NUMBER

E
REV



FOOTING SCHEDULE			
MARK	SIZE	REINFORCEMENT	REMARKS
SF1	450 WIDE x 1500 DEEP	L11 TM, BOTTOM (4 MAIN BARS)	-
EB1	1500 DEEP x 450 WIDE	L11 TM, BOTTOM (4 MAIN BARS)	-
EB2	750 DEEP x 450 WIDE	L11 TM, BOTTOM (4 MAIN BARS)	-
BP1	450 DIA. CFA PILE	FOUNDED ON 5000KPa (ULTIMATE) BEARING MATERIAL	3000 MINIMUM LENGTH

- NOTES:-
- BORED PIERS AROUND AIR DUCT PIPE ARE TO BE HAND DUG TO 1500 BELOW EXISTING SURFACE BEFORE MACHINE BORING.
 - THE CONTRACTOR IS TO HAND DIG A TRENCH TO 1500 DEEP BELOW EXISTING SURFACE, AROUND THE FULL PERIMETER OF THE SITE, PRIOR TO COMMENCEMENT OF ANY MECHANICAL EXCAVATION.

PRELIMINARY ONLY
NOT FOR CONSTRUCTION

B	REISSUED FOR COMMENT	23.03.17	J.McG.
A	ISSUED FOR COMMENT	17.03.17	J.McG.
No	DESCRIPTION	DATE	BY

REVISIONS

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DAVIS, NAISMITH & McGOVERN
Consulting Structural and Civil Engineers

Tel 613 9870 3022
Fax 613 9870 2827
Email dnm@dnmconsulting.com
Web www.dnmconsulting.com

43 Wantirna Road, Ringwood, Victoria, Australia 3134
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IXOM 1 NICHOLSON STREET
EAST MELBOURNE

CLIENT
**MANUFACTURING BUILDING
BOTANY BLOCK -**

PROJECT
**STRUCTURAL
SLAB AND FOOTING PLAN**

JULY '14 DATE	K.B. DRAWN	J.McG. DESIGNED	CHECKED

AUS16-23/PS02
DRAWING NUMBER

B
REV

SLAB AND FOOTING PLAN

REFER TO DRAWING GA04 FOR FINISHED FLOOR LEVELS AND SETOUT DIMENSIONS

NOTES:-

- CONCRETE FLOOR SLAB HAS NOT BEEN DESIGNED TO BE ACID RESISTANT, LEAKED ACIDS WILL DAMAGE FLOOR.
- FLOOR SLAB DESIGNED FOR THE FOLLOWING LOADS
 - 3.5T POINT LOAD ON 200mm x 200mm BEARING PAD @ 1200 CENTRES, BOTH WAYS.
 - 2.0T SWL FORKLIFT LOAD (4.6 TONNE MAX. AXLE LOAD) WITH PNEUMATIC TYRES
 - 30kPa MAXIMUM PRESSURE FROM TANKS
- ALL REINFORCEMENT TO BE EARTHED

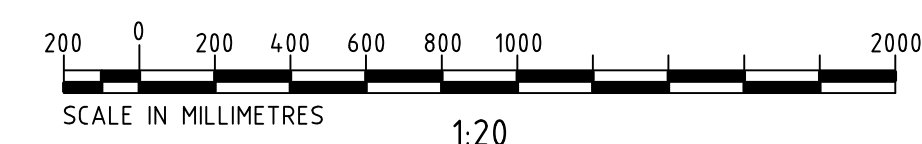
FOOTPATH SLAB:-
100mm THICK R.C. SLAB
SL72 MESH, TOP
ON 100mm THICK COMPACTED CRUSHED ROCK
RULED JOINTS @ 1500 MAX. CTS.
GRADE S25 CONCRETE

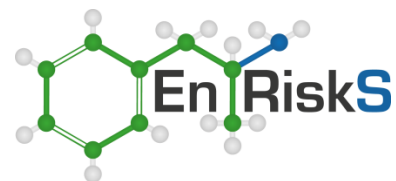
FLOOR SLAB UNLESS NOTED OTHERWISE:-

180mm THICK R.C. SLAB
N16-200 BOTHWAYS, TOP
N12-200 BOTHWAYS, BOTTOM
ON 2 LAYERS OF 0.2mm POLYTHENE MEMBRANE
(300 MIN. JOINT OVERLAP AND TAPED)
AND 50mm SAND BED
GRADE S40 CONCRETE
F'cf @ 90 DAYS=5.2 MPa, 650 MICROSTRAIN

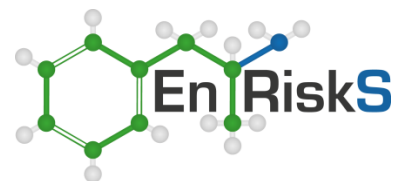
180mm THICK R.C. SLAB
N12-200 BOTHWAYS, TOP AND BOTTOM
ON 2 LAYERS OF 0.2mm POLYTHENE MEMBRANE
(300 MIN. JOINT OVERLAP AND TAPED)
AND 50mm SAND BED
GRADE S40 CONCRETE
F'cf @ 90 DAYS=5.2 MPa, 650 MICROSTRAIN

200mm THICK R.C. SLAB
N16-200 BOTHWAYS, TOP
N12-200 BOTHWAYS, BOTTOM
ON 2 LAYERS OF 0.2mm POLYTHENE MEMBRANE
(300 MIN. JOINT OVERLAP AND TAPED)
AND 50mm SAND BED
GRADE S40 CONCRETE
F'cf @ 90 DAYS=5.2 MPa, 650 MICROSTRAIN





**Attachment B Vapour modelling for revised RBC – vapour inhalation
indoors (proposed building)**



VAPOUR PARTITIONING, EMISSION AND AIR DISPERSION MODEL FOR CONTAMINATED SOIL & GROUNDWATER SOURCES
Using Johnson & Ettinger Model (USEPA 2003) for VI and ASTM (2002) for Outdoors and Excavations

Calculated Air Concentrations - Revised RBC for Block A: Proposed building

Site Specific Physical Input Parameters	Units	Abbrev.	Value	Comments
Top Layer (unsaturated zone)				Sand/Fill
Depth to soil Impacts	[m]	sg1	0.5	Mercury impacted soil near surface
Moisture Content	[ml/g]	mocon	0.08	Default for sand Friebel & Nadebaum (2011)
Fraction of Organic Carbon	-	foc	0.002	Typical value measured in FCAP soil
Soil Bulk Density	[g/ml]	rhob	1.625	Default for sand, Friebel & Nadebaum (2011)
Density of Solids	[g/ml]	sd	2.65	default
Total Soil Porosity	[ml/ml]	theta	0.39	Calculated (1 - (rhob/sd))
Volumetric Water Content	[ml/ml]	wacon	0.130	Calculated (mocon*rhob)
Volumetric Air Content	[ml/ml]	acon	0.257	Calculated (theta-wacon)

Receptor Specific Input Parameters	Units	Abbrev.	Value	Comments
Building Characteristics				
Depth of Basement	[m]	basement	0	Slab on grade
Area of Emission - Building Area	[m ²]	emarea	1268.5	Calculated based on building dimensions
Proportion of site above contaminated soil	--		1	Conservative estimate from review of data
Foundation/wall thickness	[m]	fthick	0.18	Minimum slab thickness
Height of Room	[m]	boxh	6.5	Average roof height
Hourly Volume Exchange of Fresh Air	[exch/hr]	exchanges	2	Minimum exchange rate as per BCA
Fraction of Cracks in Walls and foundation	-	cracks	0.001	Default Value for type of building, USEPA 2004
Qbuilding	[cm ³ /s]	Qb	4580694.4	Calculated, USEPA 2004
Is advective vapour flow significant?	-	Adv	no	Based on building type/assumptions adopted
Qsoil	[cm ³ /s]	Qs	0.0	Negligible
Acrack	[cm ²]	Ac	12685	Calculated from building area and crack ratio, USEPA 2004
Volumetric Water Content in foundation/wall cracks	[ml/ml]	fwacon	0.12	Default Value
Volumetric Air Content in foundation/wall cracks	[ml/ml]	facon	0.260	Default Value

Outdoor Air Characteristics				
Depth of Excavation	[m]	exdepth	1.0	Assumed for most excavations likely to be undertaken
Length of Contaminated Area	[m]	length	10	Assumed area outdoors contributing to outdoor concentration
Width of Contaminated Area	[m]	width	10	Assumed area outdoors contributing to outdoor concentration
Length of Excavation	[m]	exlength	10	Assumed for excavation
Wind Speed Outdoors	[m/s]	wspd	4.9	Average 9am and 3pm winds from Sydney Airport
Wind Speed in Excavation	[m/s]	exwspd	0.5	Assumed to be 10% of outdoor windspeed
Height of Outdoor Mixing Zone	[m]	outboxh	2	Default Value relevant for outdoors and excavations

Chemical Specific Parameters	Water Solubility (mg/L)	Koc (cm ³ /g)	MW (g/mol)	Air Diffusion Coefficient (cm ² /s)	Water Diffusion Coefficient (cm ² /s)	Vapour Pressure (mmHg)	Henry's Law Constant (unitless)
Mercury (as elemental)	0.06	3155000	200.2	0.0307	6.3E-06	0.00196	0.352

Note: Physical/chemical properties obtained from RAIS website (2017)

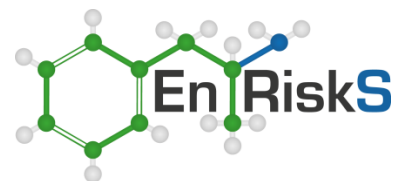
Vapour Transport Calculations	Deff Layer 1 (cm ² /s)	Effective Diffusion Soil to Surface (cm ² /s)	Deff Foundations and Cracks (cm ² /s)	Deff Capillary Fringe (cm ² /s)	Total Effective Diffusion (GW to surface) (cm ² /s)	Total Effective Diffusion (GW to excavation) (cm ² /s)
Mercury (as elemental)	2.21E-3	2.21E-3		2.30E-3	6.56E-6	2.24E-4

Modelled Air Concentrations from Soil Source (based on Soil Criteria)

Phase Partitioning Results	Soil Concentration (mg/kg)	Modelled Vapour Phase Concentration (g/cm ³)	Saturated Vapour Concentration (g/cm ³)	Saturated Soil Concentration (mg/kg)	Free Phase Mole Fraction (mol/mol)	Concentration above Free Phase (g/cm ³)	Vapour Phase Concentration Adopted (g/cm ³)
Mercury (as elemental)	6000	3.3E-07	2.2E-08	379	0	0.0E+00	3.3E-07

Value 10 times higher than saturated soil concentration

Calculated Air Concentrations	Vapour Phase Concentration at Source	Vapour Phase Concentration at Source (mg/m ³)	JE Attenuation Coefficient (unitless)	Indoor Air Concentration (mg/m ³)	Outdoor Air Concentration (mg/m ³)	Excavation Air Concentration (mg/m ³)
Mercury (as elemental)	3.3E+05	335	3.5E-07	1.2E-04	1.5E-04	7.4E-03

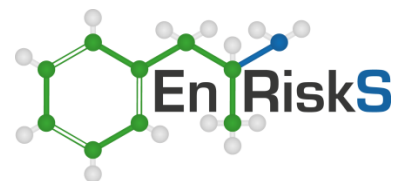


Inhalation of Vapour Phase Mercury from Soil Source - FCAP

$$InhalationExposureConc_V = C_a \cdot \frac{ET \cdot FI \cdot EF \cdot ED}{AT} \quad (mg/m^3)$$

Parameters Relevant to Quantification of Exposure by Adult Workers - Indoors (Block A)		
Exposure Time Indoors (ET, hr/day)	10	Assume long work shift in future industrial area
Fraction Inhaled from Contaminated Source (FI, unitless)	1	Assume all areas affected by impacts in soil
Exposure Frequency (EF, days/yr)	240	Workdays each year
Exposure Duration (ED, years)	30	Duration of exposure as per NEPM 1999 and enHealth 2012
Averaging Time - NonThreshold (Atc, hours)	613200	USEPA 2009
Averaging Time - Threshold (Atn, hours)	262800	USEPA 2009

Key Chemical	Toxicity Data				Concentration	Daily Exposure		Calculated Risk		
	Inhalation Unit Risk	Chronic TC air	Background Intake (% Chronic TC)	Chronic TC Allowable for Assessment (TC-Background)	in Indoor Air (Ca)	Inhalation Exposure Concentration - NonThreshold	Inhalation Exposure Concentration - Threshold	Non-Threshold Risk	% Total Risk	Chronic Hazard Quotient
	(mg/m ³) ⁻¹	(mg/m ³)		(mg/m ³)	(mg/m ³)	(mg/m ³)	(mg/m ³)	(unitless)		(unitless)
Mercury (as elemental) - Soil Source		2.0E-04	10%	1.8E-04	1.2E-04	1.4E-05	3.2E-05	--		0.18



Attachment C Risk modelling for revised RBC – outdoors and intrusive workers

9.7. Appendix 7 – Stakeholder Engagement Correspondence

Mark Jarvis

From: Mark Jarvis
Sent: Friday, 8 December 2017 12:05 PM
To: 'larissa.borysko@epa.nsw.gov.au'
Cc: Steven Barclay; ben.lim@orica.com
Subject: RE: AUS16-23 - Botany Repack Project Notification - EPA NSW
Attachments: AUS16-23 - PGA01-D.PDF; AUS16-23 - PGA02-G.PDF; AUS16-23 - PGA03-C.PDF; AUS16-23 - PFD-Rev1.pdf; AUS16-23 - Preliminary Hazard Analysis Report.pdf; AUS16-23 - Block A Site Photos & General Feature Notes.pdf; Signed FINAL SEARs Chlor Alkali MOD 5.pdf; EPA Licence - EPL20547.pdf

Hi Larissa

As discussed this morning, Ixom manufactures a number of chemicals at its Botany ChlorAlkali Plant (CAP). These chemicals are sold in bulk and distributed via tanker to the third party customer repack facilities, who repack into smaller Intermediate Bulk Containers (IBCs) and 200L drums. Ixom proposes to construct a new Botany Repack Facility located on the Botany Industrial Park (BIP).

Environmental benefits of Ixom bringing these repacking operations in house are :

- Eliminates one off-site truck movement (from the current third party repacking facility to the final customer)
- Ixom has full control of repacking Class 8 Dangerous Goods, allowing Ixom manage environmental risks by leveraging off extensive expertise and experience. This has lower environmental risk that third party providers who handle small volumes of many chemicals with different characteristics.
- The facility would also create two additional full time equivalent long-term employees, one part-time long term contractor, and temporary employment of local construction labour.

The Botany Repack Facility would be sited on Lot 1101 known as 'Block A' and the 'Memtec Area', located outside the Ixom Botany Control Room building, as shown in the enclosed drawing PGA01. Please also refer to the attached Botany Block A Site Photos.

Larissa, at full production the Repack Facility would have capacity to produce up to a total of 40kL of chemicals, repacked into 40 IBCs per working day, five days per week. During normal operation production would be substantially less. This new facility would repack 13% sodium hypochlorite, 50% liquid caustic and 33% hydrochloric acid. Each chemical is currently produced and stored at BIP. There are no new chemical products.

Each of these three products would be repacked into smaller 1,000L IBCs and possibly 200L drums. There are no new storage tanks.

The site layout in enclosed plan PGA02 shows footprint for 130 alkali IBCs and 70 acid IBCs. Full IBCs would be stacked up to two high, or a total of up to 400 full IBCs. The facility meets AS3780 and NSW EPA Bunding Guidelines, noting all incompatible chemicals would be segregated by >5m.

The facility would be enclosed in a new partially cladded shed superstructure (61m x 26m x 8m high), as shown in the enclosed drawing PGA03. This would be partially open to provide good ventilation.

A dedicated undercover truck loading bay sized for an 11m rigid truck would despatch alkalis and acids (not on the same truck).

Chemicals currently despatched in high capacity road tankers would be repacked and despatched in smaller 11m rigid trucks. Trucks would carry up to 11 lower risk 1,000L IBCs, i.e. maximum total truck capacity of 11kL. During future peak summer demand there would be up to approximately four net additional truck movements on Denison Street during business hours each working day. During normal demand there would be approximately two net additional truck movements. Again, this net increase is due to the replacement of large tankers with smaller capacity rigid vehicles.

The facility has been designed to allow future augmentation for :

- dilution of chemicals using 10kL dilution make-up tanks ; and
- repacking three additional chemicals produced at BIP (i.e. future total of up to six chemicals).

Enclosed drawing PFD01 shows the overall draft process flow diagram, including future possible dilution systems.

The facility would typically have two operators present, five days per week from 8am – 4pm. Personnel would use existing amenities in the adjacent control room and administration buildings.

Additional environmental considerations are below :

- Block A has an extensive history of industrial use, which is being closely considered and part of the of the design and construction methodology.
- Construction would typically be approximately Monday to Friday 6am to 4pm and involve low volumes of additional traffic only. There is not expected to be any noticeable additional noise during construction.
- The largest operations noise risk is forklifts reversing. Ixom is considering purchasing a forklift with a reversing 'squawking' in lieu of 'beeping'. All operations would be undertaken in a purpose built shed which further mitigates impact. No other equipment or operations is expected to generate any noticeable noise on site.
- The facility would not be visible from outside the BIP. The facility would be constructed within a purpose built Colorbond shed that matches existing BIP buildings. This would mitigate any visual impacts within BIP.
- Hydrochloric acid vapours displaced during filling would be collected, scrubbed and vented to atmosphere. A HCl sensor would be placed on the stack outlet, with results monitored / alarmed in the main CAP control room, consistent with other HCl detectors on BIP.
- New pumps and small bore pipes would transfer sodium hypochlorite, caustic and hydrochloric acid from the existing CAP plant to the new Repack Facility. All pipework (excluding some stormwater and firewater pipes) is above ground.
- A garden bed with approximate footprint 200m² would be sealed, which marginally increases stormwater runoff.
- The only operational waste would be dilute water from washing down the top of IBCs / drums after filling. This would collect in separate alkali and acid effluent systems, and piped separately to the existing BIP Effluent Plant. Daily peak load during summer of up is forecast to be approximately 3.4kL. Volumes during normal operations would be substantially less.
- The facility will be integrated with the current BIP site utilising the Ixom's incumbent robust and proven environmental, operational and risk management plans.

Ixom engaged Sherpa to undertake a Preliminary Hazard Analysis, as attached. This November 2017 report concluded :

- *there are no significant offsite risk impacts from the Repack Facility proposal and the facility complies with the risk criteria given in HIPAP 4*
- *the proposal will have no impact on the cumulative offsite risk from the CAP or the overall BIP ; and*
- *the proposal will have no impact on the cumulative DG transport risk along Denison St.*

Ixom licences and other external documents to be considered are :

- It is understood Ixom would not be required to amend Ixom Botany's *Environment Protection Licence 20547* requirements, as attached, due to additional storage is not likely to exceed the maximum trigger in the Licence. However the words '*repacking of chemicals*' or similar may need to be added
- It is understood Ixom would not be required to amend the *Environmentally Hazardous Chemicals Act Licence*, due to the Repack Project would handle Class 8 goods only
- Ixom is not required to amend the *MHF Licence*, due to there being not change or addition to the Schedule 15 quantities
- Ixom would update the *MHF Safety Case* to include details of the new Botany Repack Facility
- Ixom would update Ixom's *Botany Site Manifest Register* ; and
- Ixom would update the bow tie diagrams and include in Ixom's BIP cumulative risk.

Ixom submitted a Preliminary Environmental Assessment Report to Department of Planning and Environment (DP&E) requesting the Secretary's Environmental Assessment Requirements. As this PEA was for Block M, not Block A, many of the items are no longer applicable. Larissa, although you have requested this PEA, this has not been attached, to avoid confusion.

DP&E has issued the attached SEARs to Ixom, noting DP&E has confirmed these are also applicable for Block A. Ixom will issue the draft Environmental Assessment Report to DP&E prior to Christmas.

Larissa, it would be wonderful if you could please review this email and the attached suite of enclosed information and provide EPA's preliminary comments at your earliest convenience.

If EPA requires Ixom to submit a formal letter, or a particular EPA pathway approval form, or similar, it would be great if you could please let me know, and Ixom will then make this an urgent priority.

Thanks so much Larissa, and will talk again when you're ready.

Mark Jarvis
Senior Project Manager - Water Treatment Systems



Level 10, 1 Nicholson Street, East Melbourne, 3002
M: 0407 336 005
mark.jarvis@ixom.com | www.ixom.com



From: Mark Jarvis
Sent: Tuesday, 5 December 2017 1:51 PM
To: 'larissa.borysko@epa.nsw.gov.au' <larissa.borysko@epa.nsw.gov.au>
Cc: Steven Barclay <steven.barclay@ixom.com>
Subject: AUS16-23 - Botany Repack Project Notification Letter - EPA NSW

Hi Larissa

Ixom's Botany Site Manager Steven Barclay has provided me with your contact details.

Larissa, I'm just following up on a couple of voicemails left on your land line. When you have a few minutes it would be great if you could please give me a call to discuss Ixom's proposed Botany Repack Project.

Am hoping to obtain some clarity from your good self on how you would like Ixom to formally notify EPA of this proposal. Is there an EPA Pathway Application Form or similar required, or would you prefer a more traditional letter outlining the proposal ?

Thanks so much Larissa, and will talk when you're ready.

Mark Jarvis
Senior Project Manager - Water Treatment Systems



Level 10, 1 Nicholson Street, East Melbourne, 3002
M: 0407 336 005
mark.jarvis@ixom.com | www.ixom.com



Mark Jarvis

From: Larissa Borysko <Larissa.Borysko@epa.nsw.gov.au>
Sent: Thursday, 14 December 2017 4:14 PM
To: Mark Jarvis
Cc: Steven Barclay; ben.lim@orica.com; Erin Barker
Subject: Metropolitan Branch - Sydney Industry Section - letter of preliminary consultation Botany Repack project - Ixom - EPL 20547 - 14/12/17
Attachments: Metropolitan Branch - Sydney Industry Section - letter of preliminary consultation Botany Repack project - Ixom - EPL 20547 - 14 12 17.PDF

Good afternoon Mark,

Please find attached a letter of preliminary consultation regarding the repack project at Ixom Botany Industrial Park.

Feel free to call if you would like to discuss further.

Kind regards,

Larissa Borysko

Regional Operations Officer - Sydney Industry

Metropolitan Branch, NSW Environment Protection Authority

+61 2 9995 6843

larissa.borysko@epa.nsw.gov.au www.epa.nsw.gov.au [@EPA_NSW](https://twitter.com/EPA_NSW)

Report pollution and environmental incidents 131 555 (NSW only) or +61 2 9995 5555



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DOC17/626043

Ixom Operations Pty Ltd
16 – 20 Beauchamp Road
MATRAVILLE NSW 2036

Attention: Mark Jarvis

Dear Mr Jarvis

Re: Preliminary consultation for Botany Repack Project – Ixom ChlorAlkali Plant, Matraville DA 35/98 MOD 5

The Environment Protection Authority (EPA) refers to your email dated 8 December 2017 regarding a proposal to construct a packaging facility at the Ixom Botany ChlorAlkali Plant (Ref: DA 35/98 MOD 5).

The EPA understands Ixom Operations Pty Ltd (Ixom) requested Secretary's Environmental Assessment Requirements (SEARs) from the Department of Planning and Environment (DPE) for the preparation of an Environmental Assessment (EA) to support the proposal.

SEARs were issued on 22 December 2016 and recommended Ixom consult with other relevant government agencies and the community in the preparation of the EA. The EPA did not receive a request to provide input into the development of the SEARs and has not been provided with the preliminary EA. However, based on the limited information provided by Ixom to date, the EPA offers the following comments:

The EPA recommends that the EA includes comprehensive consideration of the following for both the construction and operation phase of the proposed development:

- air emissions and odour management;
- soil and stormwater management including sediment controls during the construction phase;
- consideration of whether the development would disturb any potentially contaminated soil/material on the Botany Industrial Park site;
- noise management;
- waste management;
- appropriate classification, storage and handling of hazardous material and dangerous goods;
- incident risks and contingency practices;
- consideration of the need to vary Ixom's current Environment Protection Licence.

The comments provided by the EPA in this letter are to be considered as preliminary and are based on initial consultation with Ixom. The EPA expects to be given the opportunity by DPE to provide more comprehensive comments on the proposal once the EA is submitted.

If you have any enquiries about the comments provided in this letter please contact Larissa Borysko on 02 9995 6843.

Sincerely



14/12/17

Erin Barker
Unit Head – Sydney Industry
Environment Protection Authority

Mark Jarvis

From: Kenneth Bowles
Sent: Friday, 8 December 2017 9:42 AM
To: Mark Jarvis; Steven Barclay
Subject: FW: Ixom Botany - Additional Facility
Attachments: AUS16-23 - Botany Repack - Scope Statement - Rev 1.pdf; AUS16-23 - Botany Repack Facility - SafeWork NSW Notification Letter (Issued 5 Dec 17).pdf; AUS16-23 - DP&E Sears - Mod 5.pdf; AUS16-23 - PFD-Rev1.pdf; AUS16-23 - PGA01-C.PDF; AUS16-23 - PGA02-G.PDF; AUS16-23 - PGA03-C.PDF; AUS16-23 - Preliminary Hazard Analysis Report.pdf

Hi Mark

Below is the email which has been sent to SWNSW.

Regards

Ken Bowles
Snr SH&E Advisor - Manufacturing



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From: Kenneth Bowles
Sent: Tuesday, 5 December 2017 1:08 PM
To: David Coote <david.coote@safework.nsw.gov.au>; 'mhf@safework.nsw.gov.au' <mhf@safework.nsw.gov.au>
Subject: Ixom Botany - Additional Facility

Hi David

Please find attached information regarding a proposed addition to our facility at Matraville. Which includes a cover letter and associated attachment referenced in that letter.

Regards

Ken Bowles
Snr SH&E Advisor - Manufacturing



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5th December 2017

David Coote
Senior Safety Analysis
SafeWork NSW
Level 1, 2 Burbank Place
Baulkham Hills NSW 2153

Sent by email – david.coote@safework.nsw.gov.au

Dear David

Botany Repack Facility Project Notification

The intention of this letter is to advise SafeWork NSW and obtain feedback regarding the proposed construction by Ixom of a new Botany Repack Facility to be located on a section of the Botany Industrial Park (BIP).

This new facility would be sited on 'Block A' and the adjacent 'Memtec Area', located outside the Ixom Botany Control Room building, as shown in the enclosed drawing PGA01 and in Figure 1 below.

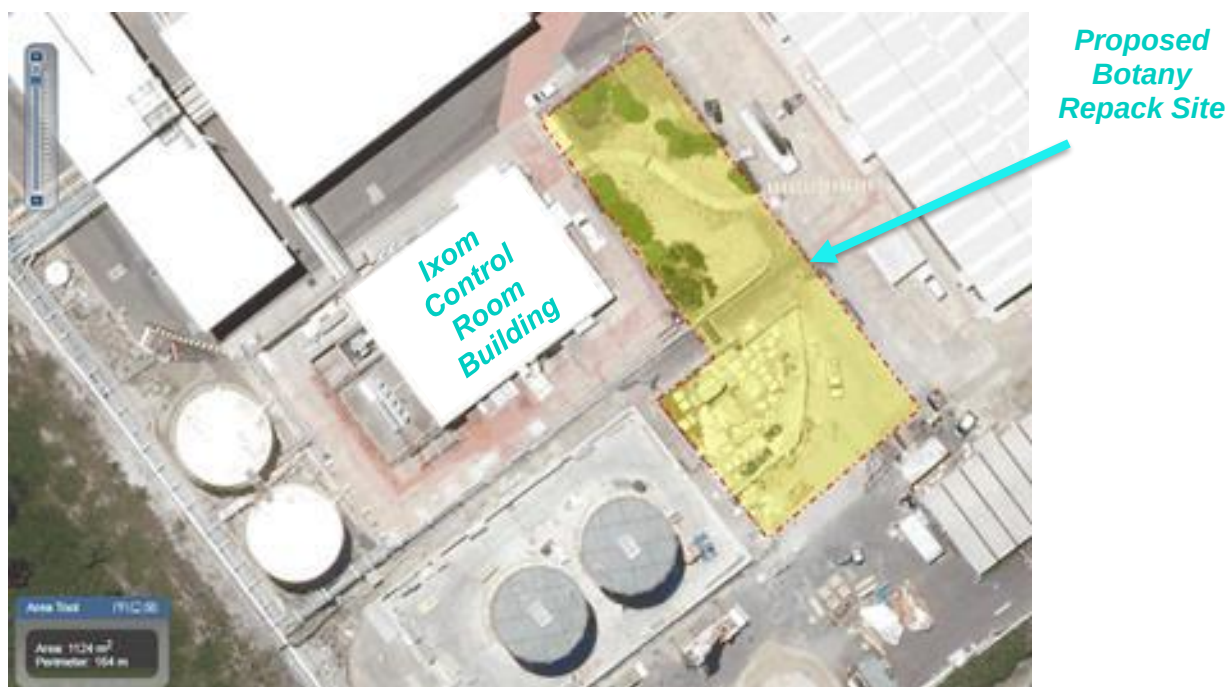


Figure 1 : Botany Repack Facility Selected Site

Project Scope

The new Botany Repack Facility would be used for repacking 13% sodium hypochlorite, 50% liquid caustic and 33% hydrochloric acid. Each chemical is currently produced and stored at BIP and there would be no dilution / blending / mixing of products. No new chemical products would be stored on site.

Each of these three products would be repacked into smaller 1,000L intermediate bulk containers (IBCs) and possibly 200L drums. There are no new storage tanks.

The site layout in enclosed plan PGA02 shows footprint for 130 alkali IBCs and 70 acid IBCs, or a total of 200 spaces. Full IBCs would be stacked up to two high. This is a capacity of 260 alkali IBCs and 140 acid IBCs, or a total of up to 400 full IBCs. The facility meets AS3780 and NSW EPA Bunding Guidelines.

Hydrochloric acid vapours displaced during filling would be scrubbed and vented to atmosphere.

A truck loading bay sized for an 11m rigid truck would despatch alkalis and acids (not on same truck). A risk assessment workshop confirmed the risk level is acceptable and can be managed effectively with the proposed control measures.

The facility would be enclosed in a new shed superstructure (61m x 26m x 8m high), as shown in the enclosed drawing PGA03. Existing pipe bridges would be used to hold transfer site services, and an existing pipe bridge would be extended to the new repack facility.

The facility has also been designed to allow future augmentation of :

- a. dilution of chemicals using 10kL dilution make-up tanks ; and
- b. repacking three additional chemicals (i.e. future total of up to six chemicals).

Enclosed drawing PFD01 shows the overall draft process flow diagram, including these future possible dilution systems.

Preliminary Hazard Analysis (PHA)

The Department of Planning and Environment (DPE) has issued the enclosed Secretary's Environmental Assessment Requirements (SEARs). Ixom subsequently engaged Sherpa to :

- a. assess the proposal against State Environmental Planning Policy 33 – Hazardous and Offensive Development (SEPP33) to determine whether the works are '*potentially hazardous*'
- b. complete a PHA including comparison with the DPE HIPAP 4 risk criteria
- c. assess the effect of the proposal on the cumulative BIP risk (as reported in BIP QRA, 2012) ; and
- d. assess the effect on the risk due to Dangerous Goods (DG) transport along Denison St.

Please find the enclosed Preliminary Hazard Analysis Report, 27th November 2017 capturing the above.

Consequence modelling showed no offsite fatality risk for worst case releases, hence no effect on the cumulative offsite individual fatality risk contour or societal risk from the CAP or BIP QRA 2012.

The only identified incidents with potential offsite effects (toxic injury / irritation only) were inadvertent mixing of sodium hypochlorite and acid, forming chlorine. However, the frequency of these events was assessed as below the HIPAP4 risk criteria, so the Repack Facility would comply with all offsite risk criteria.

The hazard analysis demonstrated limited offsite consequence potential and very low offsite risk, as below:

- a. the proposal results in no significant offsite risk impacts
- b. the proposal complies with the risk criteria given in HIPAP 4
- c. the proposal has no significant impact on the cumulative offsite risk from CAP or overall BIP ; and
- d. the proposal would have no impact on the cumulative DG transport risk along Denison St.

The study makes no specific recommendations or proposes any additional controls.

Bringing these repacking operations in house in lieu of external third party providers also enables Ixom to better manage the risks of handling Class 8 goods on site, and eliminates one off-site truck movement.

Ixom Licences

Ixom licences and other external documents to be considered are :

- a. Ixom would update the bow tie diagrams and include in Ixom's BIP cumulative risk assessment
- b. Ixom would not amend the *MHF Licence* due to no change or addition in Schedule 15 quantities
- c. Ixom would update the *MHF Safety Case* to include details of the new Botany Repack Facility
- d. Ixom would update Ixom's *Botany Site Manifest Register*
- e. Ixom would not amend Ixom Botany's *Environment Projection Licence*, due to additional storage not exceeding the maximum trigger in Ixom's Licence ; and
- f. Ixom would not amend the *Environmentally Hazardous Chemicals Act Licence*, due to the Repack Project would handle Class 8 goods only.

Next Steps

Ixom has submitted a Preliminary Environmental Assessment Report to the Department of Planning and Environment (DP&E) requesting the Secretary's Environmental Assessment Requirements. DP&E has issued these requirements to Ixom, including minimum external stakeholder engagement obligations. Ixom is scheduled to issue the draft Environmental Assessment Report to DP&E within the next 21 days.

David, it would be appreciated if you could please review this letter and the supporting enclosed files and provide comment at your earliest convenience.

If you require further information please do not hesitate to contact Ixom's Botany Repack Project Manager Mark Jarvis on 0407 336 005, or myself at any time.

Yours sincerely

Ken Bowles



**Senior SHEC Advisor - Manufacturing
Ixom Operations Pty Ltd**

Encl.

Mark Jarvis

From: Coote, David <David.Coote@safework.nsw.gov.au>
Sent: Tuesday, 23 January 2018 1:48 PM
To: Mark Jarvis
Cc: Bourne, Alex; Reilly, Melanee; Kenneth Bowles
Subject: RE: Ixom Botany - Additional Facility

Security Classification:UNCLASSIFIED

Hi Mark,

Thank you for providing the information to us.

As discussed over the phone today - I have had an initial look at it, and will have a more detailed look when we are asked to comment on the final information submitted to the DP&E.

Comments at this stage are:

1. The PHA states "It is also noted that as the CAP is an MHF, an update to Safety Case will be required to cover the Repack Facility which would include a demonstration that the likelihood hence risk associated with mixing of incompatibles and toxic release scenarios is reduced SFARP and may further reduce the estimated frequency." Could you please provide the approach you plan to assess and ensure risk (including cumulative on-site risk) of the proposed changes is reduced SFARP, including the approach to a risk based decision on the piping materials and any reference to external standards if used.
2. We acknowledge receipt of your email updating the Process Diagram, removing the dilution facilities.

In terms of what we discussed over the phone:

3. With respect to any advice SWNSW could offer on digging (trenching to find services) I have spoken to my manager and the best way to proceed is for you to call 131050 and ask for "construction" and ask them for advice.
There is also an online resource <http://www.safework.nsw.gov.au/health-and-safety/safety-topics-a-z/excavation-work> that may help.
4. For any advice from SWNSW on the risk of mercury exposure (or other chemicals) could you please contact Mahinda Seneviratne (Mahinda.Seneviratne@safework.nsw.gov.au) Ph +61 2 8867 2732.

Thanks also for the email on the contact you have had with the EPA – I have forwarded to Alex (cc'd) our EPA interagency MHF staff member.

After we receive the information submitted to DPE, and have had a chance to read, I think it would be worthwhile to discuss with you prior to providing comments to DP&E.

Regards,
David

David Coote

Senior Safety Analyst | Hazardous Chemical Services | Work Health & Safety Division
SafeWork NSW
Level 1, 2 Burbank Place, Baulkham Hills NSW 2153
T 02 8867 2816 E David.Coote@safework.nsw.gov.au

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From: Kenneth Bowles [mailto:ken.bowles@ixom.com]

Sent: Tuesday, 5 December 2017 1:08 PM

To: Coote, David <David.Coote@safework.nsw.gov.au>; MHF <mhf@safework.nsw.gov.au>

Subject: Ixom Botany - Additional Facility

Hi David

Please find attached information regarding a proposed addition to our facility at Matraville. Which includes a cover letter and associated attachment referenced in that letter.

Regards

Ken Bowles

Snr SH&E Advisor - Manufacturing



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2 May 2018

Attention: Mr M Jarvis
Senior Project Manager - Water Treatment Systems
Level 10, 1 Nicholson Street,
East Melbourne VIC 3002

Dear Mark,

Re: Proposed Ixom Repack Facility – Botany Industrial Park, NSW

Thank you for your correspondence and information shared with Orica regarding the proposed facility at BIP including letter of 15 Nov 2017 through to final EA in your email 16 April 2018. We have completed our review of the final EA and are able to give our consent to the proposal, subject to confirmation of approval from third parties and other conditions as set out below.

Orica wish to highlight two concerns with the current proposal's design detail and would appreciate further clarity and amendment to your proposal following Ixom consultation with the relevant authorities:

1. Orica anticipates that the Department of Planning and Environment will assess compliance of the proposed building envelope to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 – Part 5A – Division 2 – Subdivision 4 and 5. As the shed fronts 2nd Street, which is a major BIP road as well as a future site arterial, development should be consistent with other recent plant developments on site. The main issue is not having a footpath or sufficient setback for pedestrian safety.

If permission for zero setback is granted by the relevant authorities, Orica requests Ixom:

- seek and obtain owner consent of 2nd Street (BIP Pty Ltd) that the building is specifically exempt from setback, and
 - amend detailed building design drawings allowing for the south-eastern corner of the building to be chamfered by a minimum of 3m.
2. Orica anticipates that Bayside Council will assess the visual impact of the shed from Beauchamp Road and require the shed colour to complement the heritage listed Administration building and surrounding structures, likely to differ from the proposed choice of 'Eucalyptus Green'.

We appreciate the level of consultation with this project and look forward to working closely with Ixom during the life of the project.

Yours Sincerely,



Kevin Sonnemann
Senior Property Manager
Orica Australia Pty Ltd

Mark Jarvis

From: Mark Jarvis
Sent: Friday, 8 December 2017 9:03 AM
To: 'christopher.mackey@bayside.nsw.gov.au'
Cc: Steven Barclay
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council
Attachments: AUS16-23 - PGA01-D.pdf; form_political_donations_disclosure_minister_or_dg.pdf

Hi Chris

A couple of additional pieces of information I should have included on Wednesday's email are below :

1. Please find the attached BIP Site Map showing truck routes to and from the proposed Repack Facility ; and
2. The attached Department of Planning political donations disclosure statement states '*A separate Disclosure Statement Template is available for disclosures to councils*'. Chris, if Bayside requires Ixom to populate an additional disclosure statement for Bayside, or any other council specific documents, it would be great if you could please send through this template.

Kind regards

Mark Jarvis
Senior Project Manager - Water Treatment Systems



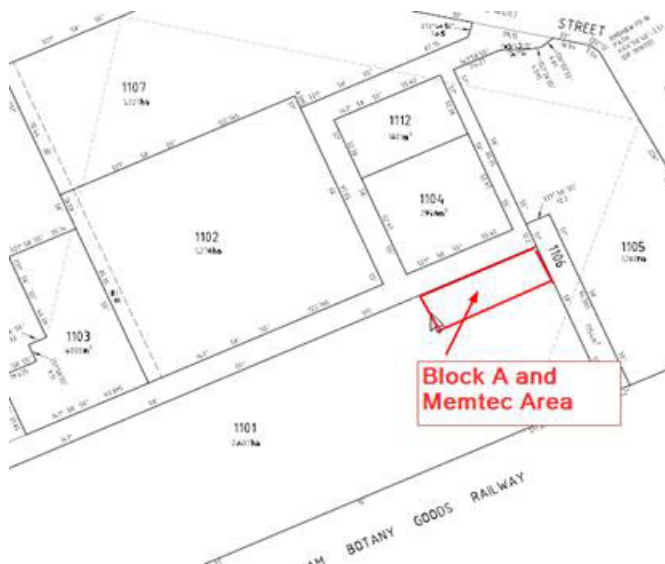
Level 10, 1 Nicholson Street, East Melbourne, 3002
M: 0407 336 005
mark.jarvis@ixom.com | www.ixom.com



From: Mark Jarvis
Sent: Wednesday, 6 December 2017 12:38 PM
To: 'christopher.mackey@bayside.nsw.gov.au' <christopher.mackey@bayside.nsw.gov.au>
Cc: Steven Barclay <steven.barclay@ixom.com>
Subject: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Chris

As discussed this morning, Ixom is proposing to construct a new Botany Repack Facility located on the Botany Industrial Park. This would be sited on Lot 1101 '*Block A*' and the adjacent '*Memtec Area*', located outside the Ixom Botany Control Room building, as shown in the enclosed drawing PGA01 and below. Please also refer to the attached Botany Block A Site Photos.



Chris, the new facility would repack 13% sodium hypochlorite, 50% liquid caustic and 33% hydrochloric acid. Each chemical is currently produced and stored at BIP. There are no new chemical products.

Each of these three products would be repacked into smaller 1,000L intermediate bulk containers (IBCs) and possibly 200L drums. There are no new storage tanks.

The site layout in enclosed plan PGA02 shows footprint for 130 alkali IBCs and 70 acid IBCs. Full IBCs would be stacked up to two high. This is a capacity of 260 alkali IBCs and 140 acid IBCs, or a total of up to 400 full IBCs. The facility meets AS3780 and NSW EPA Bunding Guidelines.

A loading bay sized for rigid trucks up to a total length of 11m would despatch goods.

The facility would be enclosed in a new partially cladded shed superstructure (61m x 26m x 8m high), as shown in the enclosed drawing PGA03.

The facility has also been designed to allow future augmentation for :

- dilution of chemicals using 10kL dilution make-up tanks ; and
- repacking three additional chemicals produced at BIP (i.e. future total of up to six chemicals).

Enclosed drawing PFD01 shows the overall draft process flow diagram, including future possible dilution systems.

Bringing these repacking operations in house in lieu of being undertaken by external third party providers enables Ixom to better manage the risks of handling Class 8 Dangerous Goods on site. It also eliminates one off-site truck movement.

Chemicals currently despatched in high capacity road tankers would be replaced by smaller 11m rigid trucks. Trucks would carry up to 11 lower risk 1,000L IBCs, i.e. maximum total truck capacity of 11kL. During future peak summer demand there would be up to approximately four net additional truck movements on Denison Street during business hours each working day. During normal demand there would be approximately two net additional truck movements. Again, this net increase is due to the replacement of large tankers with smaller capacity rigid vehicles.

Ixom engaged Sherpa to undertake a Preliminary Hazard Analysis, as attached. This November 2017 report concluded :

- *there are no significant offsite risk impacts from the Repack Facility proposal and the facility complies with the risk criteria given in HIPAP 4*
- *the proposal will have no impact on the cumulative offsite risk from the CAP or the overall BIP ; and*
- *the proposal will have no impact on the cumulative DG transport risk along Denison St.*

Ixom has submitted a Preliminary Environmental Assessment Report to Department of Planning and Environment (DP&E) requesting the Secretary's Environmental Assessment Requirements. DP&E has issued these requirements to Ixom, including minimum external stakeholder engagement obligations. Ixom is scheduled to issue the draft Environmental Assessment Report to DP&E within the next 21 days.

Chris, it would be wonderful if you could please review the attached suite of enclosed information at your earliest convenience.

If Bayside Council requires Ixom to submit a formal letter, or a particular Council pathway approval form, or similar, it would be great if you could please let me know, and Ixom will then make this an urgent priority.

Thanks so much Chris, and will talk again when you're ready.

Mark Jarvis
Senior Project Manager - Water Treatment Systems



Level 10, 1 Nicholson Street, East Melbourne, 3002

M: 0407 336 005

mark.jarvis@ixom.com | www.ixom.com



Mark Jarvis

From: Josh Ford <Josh.Ford@bayside.nsw.gov.au>
Sent: Monday, 7 May 2018 12:59 PM
To: Mark Jarvis
Cc: Alexandra Vandine; Clare Harley; Lincoln Lawler; 'melissa.prochazka@planning.nsw.gov.au'; Howard Taylor; Judith Betts
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Apologies Mark, I forgot to attach these comments from our Environmental Scientist that I referred to in my earlier email:

An application has been lodged to plan, engineer, procure, construct and commission a new Repack Facility on Block A at the Botany Chlor-Alkali Plant (CAP) located at the Botany Industrial Plan (BIP). This would enable packaging of sodium hypochlorite, sodium hydroxide and hydrochloric acid into 1000L IBC's and 200L drums rather than large bulk tanker deliveries that are repackaged at other facilities. No new storage tanks are to be constructed.

IXOM manufactures various chemicals at the CAP including sodium hypochlorite, hydrochloric acid, caustic soda and ferric chloride. The CAP has capacity to produce 90 tonnes of chlorine per day. All chlorine produced at the CAP is consumed in the product plants onsite for hydrochloric acid, sodium hypochlorite and ferric chloride. The plant is considered a Major Hazard Facility (MHF) and is required to satisfy WHS Regulation 2011, notably chapter 9 relating to MHF. Manufacturing operations are licensed under the POEO Act, EPL 20547 by the EPA.

The BIP and especially the former chlor-alkali plant has considerable contamination in soil and groundwater that is regulated by the NSW EPA. The Draft EIA notes that a Human Health and Environment Risk Assessment (HHERA) has been completed by EnRisks in December 2017 that validated Block A is suitable for the proposed use. It noted that the "earthworks design builds up, not down. It adopts a suspended slab constructed on piles, rather than undertaking bulk excavations. Screw piles have been specified that ensures soil stays in the ground, rather than being augered to the surface. This eliminates the risk of bringing potentially contaminated soil to the surface during piling". This report was not provided to council.

Minimal further information regarding environmental management was provided. I note that a Construction Environmental Management Plan (CEMP) will be prepared which will capture the environmental and human health risks. The EPA has requested detailed information regarding environmental management, including contamination land. I concur with these requirements.

The EPA has requested detailed information regarding environmental management, including contamination land. I concur with these requirements.

Regards, Josh.



Josh Ford Coordinator Statutory Planning
444-446 Princes Highway, Rockdale NSW 2216
T 02 9562 1634 **M** 0439 648 041
E josh.ford@bayside.nsw.gov.au **W** www.bayside.nsw.gov.au

From: Josh Ford
Sent: Monday, 7 May 2018 11:24 AM
To: 'Mark Jarvis'

Cc: Alexandra Vandine; Clare Harley; Lincoln Lawler; 'melissa.prochazka@planning.nsw.gov.au'; Howard Taylor
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Mark. As discussed earlier on the phone, I will contact Melissa Prochazka of DPE, to let her know that we will need to undertake a Planning Risk Assessment when we are consulted on the EA. Our main concern is the assessment of the planning risk in relation to the Denison Street Risk Study, and while the individual vehicle sizes/loads may be reducing, the increase in vehicle movements will result in a net increase of transportation of chemicals. As long as we have an opportunity to assess this risk (and being mindful of the attached *preliminary* comments to date from our Environmental Scientist), we are comfortable with providing a formal response when the EA is provided to us for comment.

Regards, Josh.



Josh Ford Coordinator Statutory Planning
444-446 Princes Highway, Rockdale NSW 2216
T 02 9562 1634 **M** 0439 648 041
E josh.ford@bayside.nsw.gov.au **W** www.bayside.nsw.gov.au

From: Mark Jarvis [<mailto:mark.jarvis@ixom.com>]
Sent: Friday, 4 May 2018 4:29 PM
To: Josh Ford
Cc: Alexandra Vandine; Clare Harley; Lincoln Lawler
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Josh

Thanks kindly for your email.

Have just left a message with Lynn in your office – it would be great if you could give me a call.

Josh, the intention is to formally submit the Environmental Assessment to DP&E mid-next week (i.e. during the week commencing 7th May).

If any feedback is received from Council prior to lodgement, this response will be captured in the submission. We will also endeavour to integrate these comments into the EA, wherever possible.

Thanks Josh, and will hopefully talk on Monday.

Mark Jarvis
Senior Project Manager - Water Treatment Systems



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M: 0407 336 005
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From: Josh Ford [<mailto:Josh.Ford@bayside.nsw.gov.au>]
Sent: Thursday, 3 May 2018 10:32 AM
To: Mark Jarvis <mark.jarvis@ixom.com>
Cc: Alexandra Vandine <Alexandra.Vandine@bayside.nsw.gov.au>; Clare Harley <Clare.Harley@bayside.nsw.gov.au>; Lincoln Lawler <Lincoln.Lawler@bayside.nsw.gov.au>
Subject: FW: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Mark.

I refer to your email below, received by Lincoln Lawler of Council.

One of my staff that were organising comments to get back to you actually finished up on Friday. I understand Matt had compiled some comments from technical officers within Council and was organising a peer review of Planning Risk Assessment to determine any risk impacts from the modification.

What is your actual timeframe, so I can organise a deadline for our comments to you?

Regards, Josh.



Josh Ford Coordinator Statutory Planning
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T 02 9562 1634 **M** 0439 648 041
E josh.ford@bayside.nsw.gov.au **W** www.bayside.nsw.gov.au

From: Mark Jarvis [<mailto:mark.jarvis@ixom.com>]
Sent: Wednesday, 2 May 2018 12:52 PM
To: Lincoln Lawler <Lincoln.Lawler@bayside.nsw.gov.au>
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Lincoln

Since 6th December 2017 unfortunately I have received zero feedback from Bayside City Council regarding Ixom's proposed Botany Repack Project.

Lincoln, I am sure you and your team must be very busy.

Unfortunately I am therefore unable to capture any Council feedback in the submission to DP&E.

Lincoln, the Environmental Assessment will be formally submitted to DP&E later this month.

DP&E will then formally notify Council in due course.

regards

Mark Jarvis
Senior Project Manager - Water Treatment Systems



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mark.jarvis@ixom.com | www.ixom.com



From: Mark Jarvis
Sent: Thursday, 12 April 2018 3:46 PM
To: 'Lincoln Lawler' <Lincoln.Lawler@bayside.nsw.gov.au>
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Lincoln

I'll call your office again next week for an update on this one.

regards

Mark Jarvis
Senior Project Manager - Water Treatment Systems



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M: 0407 336 005
mark.jarvis@ixom.com | www.ixom.com



From: Mark Jarvis
Sent: Tuesday, 27 March 2018 2:47 PM
To: 'Lincoln Lawler' <Lincoln.Lawler@bayside.nsw.gov.au>
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Lincoln

Have just left a message with Helen in your office.

Am sure you are very, very busy.

Lincoln, it would be much appreciated if you could please give me a call to advise on the status of Bayside City Council's response.

If there are any new items, it would be great to receive clarity on these ASAP, so they can be specifically addressed in the submission to DP&E, if necessary.

Thank-you Lincoln, and looking forward to discussing soon.

Mark Jarvis
Senior Project Manager - Water Treatment Systems



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mark.jarvis@ixom.com | www.ixom.com



From: Mark Jarvis
Sent: Monday, 19 March 2018 7:42 AM
To: 'Lincoln Lawler' <Lincoln.Lawler@bayside.nsw.gov.au>
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Lincoln

Just checking in Lincoln – are you and your team are still on schedule to respond by the end of this week ?

Thanks kindly

Mark Jarvis
Senior Project Manager - Water Treatment Systems



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mark.jarvis@ixom.com | www.ixom.com



From: Mark Jarvis
Sent: Thursday, 8 March 2018 11:13 AM
To: 'Lincoln Lawler' <Lincoln.Lawler@bayside.nsw.gov.au>
Cc: 'christopher.mackey@bayside.nsw.gov.au' <christopher.mackey@bayside.nsw.gov.au>
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Lincoln

As discussed just now, I understand Council's response is expected in approximately 1½ weeks' time.

Lincoln, as agreed, I'm very much looking forward to receiving this response by week ending 23rd March.

I'll give you a call late next week to confirm this date is still on schedule.

Thanks Lincoln

Mark Jarvis
Senior Project Manager - Water Treatment Systems



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M: 0407 336 005
mark.jarvis@ixom.com | www.ixom.com



From: Mark Jarvis
Sent: Thursday, 8 March 2018 10:58 AM
To: 'Lincoln Lawler' <Lincoln.Lawler@bayside.nsw.gov.au>
Cc: 'christopher.mackey@bayside.nsw.gov.au' <christopher.mackey@bayside.nsw.gov.au>
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Lincoln

Have just left a message with your office.

Lincoln, it would be appreciated if you could please give me a call for an update on Council's preliminary response to the Botany Repack Project.

Thank-you

Mark Jarvis
Senior Project Manager - Water Treatment Systems



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mark.jarvis@ixom.com | www.ixom.com



From: Mark Jarvis
Sent: Thursday, 1 March 2018 12:06 PM
To: 'Lincoln Lawler' <Lincoln.Lawler@bayside.nsw.gov.au>
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Lincoln

I'll give you a call this afternoon for an update.

Thanks Lincoln

Mark Jarvis
Senior Project Manager - Water Treatment Systems



Level 10, 1 Nicholson Street, East Melbourne, 3002
M: 0407 336 005
mark.jarvis@ixom.com | www.ixom.com



From: Mark Jarvis
Sent: Friday, 23 February 2018 10:47 AM
To: 'Lincoln Lawler' <Lincoln.Lawler@bayside.nsw.gov.au>
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Thanks so much Lincoln for making this happen.

I do appreciate it.

Mark Jarvis
Senior Project Manager - Water Treatment Systems



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mark.jarvis@ixom.com | www.ixom.com



From: Lincoln Lawler [<mailto:Lincoln.Lawler@bayside.nsw.gov.au>]
Sent: Friday, 23 February 2018 10:00 AM
To: Mark Jarvis <mark.jarvis@ixom.com>
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Mark

I am reviewing the material tomorrow and we have an internal meeting to discuss next week.

Thanks

Lincoln

From: Mark Jarvis [<mailto:mark.jarvis@ixom.com>]
Sent: Wednesday, 21 February 2018 8:27 AM
To: Lincoln Lawler <Lincoln.Lawler@bayside.nsw.gov.au>
Cc: Christopher Mackey <Christopher.Mackey@bayside.nsw.gov.au>
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Lincoln

I'll give you a call shortly to discuss your initial thoughts.

Kind regards

Mark Jarvis
Senior Project Manager - Water Treatment Systems



Level 10, 1 Nicholson Street, East Melbourne, 3002
M: 0407 336 005
mark.jarvis@ixom.com | www.ixom.com



From: Mark Jarvis
Sent: Thursday, 15 February 2018 9:56 AM
To: 'lincoln.lawler@bayside.nsw.gov.au' <lincoln.lawler@bayside.nsw.gov.au>
Cc: 'christopher.mackey@bayside.nsw.gov.au' <christopher.mackey@bayside.nsw.gov.au>
Subject: FW: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Lincoln

As discussed this morning, in December 2017 Ixom issued the draft Botany Repack Environmental Assessment (EA) to DP&E for comment.

DP&E's response to Ixom states '*Please ensure the final EA includes responses from ... Bayside City Council*'. Responses have been received from all requested external stakeholders, except Bayside City Council. The final EA cannot be submitted until receipt of Council's response.

Lincoln, can Bayside City Council please review the email below dated 6th December 2017 and the attached suite of enclosed information ASAP.

This draft EA file size is large, so will be forwarded to your good self separately.

Following receipt of Council's preliminary comments, Ixom will then formally lodge the EA. DP&E will then formally notify Bayside City Council of the application, and request Council's final response.

Thanks Lincoln, and will talk again on Wednesday 21st February.

Mark Jarvis
Senior Project Manager - Water Treatment Systems



Level 10, 1 Nicholson Street, East Melbourne, 3002
M: 0407 336 005
mark.jarvis@ixom.com | www.ixom.com



From: Mark Jarvis
Sent: Wednesday, 7 February 2018 9:59 AM
To: 'christopher.mackey@bayside.nsw.gov.au' <christopher.mackey@bayside.nsw.gov.au>
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Chris

Am just following up on from the message left with your receptionist on Monday.

Chris, when you have a few minutes, can you please give me a call.

regards

Mark Jarvis
Senior Project Manager - Water Treatment Systems



Level 10, 1 Nicholson Street, East Melbourne, 3002
M: 0407 336 005
mark.jarvis@ixom.com | www.ixom.com



From: Mark Jarvis
Sent: Friday, 2 February 2018 4:08 PM
To: 'christopher.mackey@bayside.nsw.gov.au' <christopher.mackey@bayside.nsw.gov.au>
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Chris

Am just following on my message and emails below.

DP&E has provided comments on Ixom's draft EA, including : *'Please ensure the final EA includes responses from ... Bayside City Council'*.

Chris, I'll give your good self another call on Monday for some clarity on when we can expect to receive Bayside City Council's response.

This preliminary response will then be captured in the updated EA, which will be issued to DP&E next week.

Thanks Chris, and looking forward to talking again on Monday.

Mark Jarvis
Senior Project Manager - Water Treatment Systems



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From: Mark Jarvis
Sent: Thursday, 25 January 2018 1:06 PM
To: 'christopher.mackey@bayside.nsw.gov.au' <christopher.mackey@bayside.nsw.gov.au>
Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Chris

Am just following up on from the message left with your receptionist earlier today.

Chris, when you have a few minutes, it would be great if you could please give me a call.

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Mark Jarvis
Senior Project Manager - Water Treatment Systems



Level 10, 1 Nicholson Street, East Melbourne, 3002

M: 0407 336 005

mark.jarvis@ixom.com | www.ixom.com



From: Mark Jarvis
Sent: Friday, 8 December 2017 9:03 AM
To: 'christopher.mackey@bayside.nsw.gov.au' <christopher.mackey@bayside.nsw.gov.au>

Cc: Steven Barclay <steven.barclay@ixom.com>

Subject: RE: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Chris

A couple of additional pieces of information I should have included on Wednesday's email are below :

1. Please find the attached BIP Site Map showing truck routes to and from the proposed Repack Facility ; and
2. The attached Department of Planning political donations disclosure statement states '*A separate Disclosure Statement Template is available for disclosures to councils*'. Chris, if Bayside requires Ixom to populate an additional disclosure statement for Bayside, or any other council specific documents, it would be great if you could please send through this template.

Kind regards

Mark Jarvis
Senior Project Manager - Water Treatment Systems



Level 10, 1 Nicholson Street, East Melbourne, 3002

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From: Mark Jarvis

Sent: Wednesday, 6 December 2017 12:38 PM

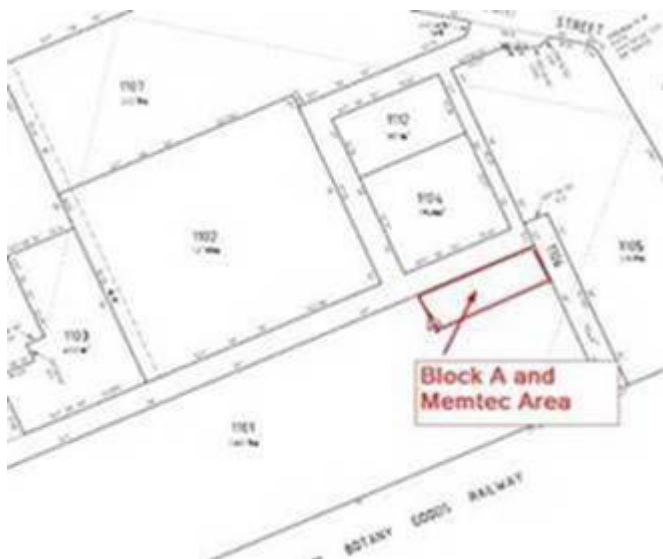
To: 'christopher.mackey@bayside.nsw.gov.au' <christopher.mackey@bayside.nsw.gov.au>

Cc: Steven Barclay <steven.barclay@ixom.com>

Subject: AUS16-23 - Botany Repack Project Notification - Bayside Council

Hi Chris

As discussed this morning, Ixom is proposing to construct a new Botany Repack Facility located on the Botany Industrial Park. This would be sited on Lot 1101 'Block A' and the adjacent 'Memtec Area', located outside the Ixom Botany Control Room building, as shown in the enclosed drawing PGA01 and below. Please also refer to the attached Botany Block A Site Photos.



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Ixom engaged Sherpa to undertake a Preliminary Hazard Analysis, as attached. This November 2017 report concluded :

- *there are no significant offsite risk impacts from the Repack Facility proposal and the facility complies with the risk criteria given in HIPAP 4*
- *the proposal will have no impact on the cumulative offsite risk from the CAP or the overall BIP ; and*
- *the proposal will have no impact on the cumulative DG transport risk along Denison St.*

Ixom has submitted a Preliminary Environmental Assessment Report to Department of Planning and Environment (DP&E) requesting the Secretary's Environmental Assessment Requirements. DP&E has issued these requirements to Ixom, including minimum external stakeholder engagement obligations. Ixom is scheduled to issue the draft Environmental Assessment Report to DP&E within the next 21 days.

Chris, it would be wonderful if you could please review the attached suite of enclosed information at your earliest convenience.

If Bayside Council requires Ixom to submit a formal letter, or a particular Council pathway approval form, or similar, it would be great if you could please let me know, and Ixom will then make this an urgent priority.

Thanks so much Chris, and will talk again when you're ready.

Mark Jarvis
Senior Project Manager - Water Treatment Systems



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9.8. Appendix 8 – Statutory Licences

Licence to operate a major hazard facility

This licence is granted under the *Work Health and Safety Regulation 2011* by SafeWork NSW to operate a major hazard facility subject to the conditions in SafeWork NSW's letter to the operator dated 14 December 2016.

Business name of operator

IXOM Operations Pty Ltd
ABN: 51600546512
Level 8, 1 Nicholson Street
MELBOURNE VIC 3000

Licence number

10358-01

Date granted

11/02/2014

Location of facility

16-20 Beauchamp Road
MATRAVILLE NSW 2036

Expiry date

11/02/2019

Facility number

10358



Andrew Battye

A/Director
Hazardous Chemicals Services Team

Environment Protection Licence

Licence - 20547



Licence Details

Number:	20547
Anniversary Date:	19-February

Licensee

IXOM OPERATIONS PTY LTD

LEVEL 3,1 NICHOLSON STREET

EAST MELBOURNE VIC 3002

Premises

BOTANY CHLORALKALI PLANT

16-20 BEAUCHAMP ROAD

MATRAVILLE NSW 2036

Scheduled Activity

Chemical Production

Chemical Storage

Waste Processing (non-thermal treatment)

Waste Storage

Fee Based Activity

Scale

Dangerous goods production	> 25000 T produced
General chemicals storage	> 5000-100000 kL stored
Non-thermal treatment of hazardous and other waste	Any T treated
Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste	> 0 T stored

Region

Metropolitan - Sydney Industry

Level 13, 10 Valentine Ave

PARRAMATTA NSW 2150

Phone: (02) 9995 5000

Fax: (02) 9995 6900

PO Box 668 PARRAMATTA

NSW 2124

Environment Protection Licence

Licence - 20547



INFORMATION ABOUT THIS LICENCE	4
Dictionary	4
Responsibilities of licensee	4
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Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

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The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

IXOM OPERATIONS PTY LTD
LEVEL 3,1 NICHOLSON STREET
EAST MELBOURNE VIC 3002

subject to the conditions which follow.

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1 Administrative Conditions

A1 What the licence authorises and regulates

- A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Chemical Production	Dangerous goods production	> 25000 T produced
Chemical Storage	General chemicals storage	> 5000 - 100000 kL stored
Waste Processing (non-thermal treatment)	Non-thermal treatment of hazardous and other waste	Any T treated
Waste Storage	Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste	> 0 T stored

A2 Premises or plant to which this licence applies

- A2.1 The licence applies to the following premises:

Premises Details
BOTANY CHLORALKALI PLANT
16-20 BEAUCHAMP ROAD
MATRAVILLE
NSW 2036
PART LOT 104 DP 1192400
AS DEFINED BY THE RED CROSS-HATCHED AREA IN DRAWING NO B 104671 REV A, TITLED "BOTANY INDUSTRIAL PARK SITE – LICENSED PREMISES" AND DATED 28/11/2014.

- A2.2 The premises location is shown on the map below.

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EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Discharge to air Air emissions monitoring	Discharge to air Air emissions monitoring	Vent from the hypochlorite backing tower marked "EPA Point 1" on the aerial photograph titled "CAO EPL Attachment 5_CAP monitoring points" and dated 19 February 2015.
2	Discharge to air Air emissions monitoring	Discharge to air Air emissions monitoring	Vent from the absorption tail tower marked "EPA Point 2" on the aerial photograph titled "CAO EPL Attachment 5_CAP monitoring points" and dated 19 February 2015.
3	Discharge to air Air emissions monitoring	Discharge to air Air emissions monitoring	Emergency chlorine vent marked "EPA Point 3" on the aerial photograph titled "CAO EPL Attachment 5_CAP monitoring points" and dated 19 February 2015.

P1.2 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

3 Limit Conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Concentration limits

L2.1 For each monitoring/discharge point or utilisation area specified in the table below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L2.2 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table.

L2.3 Air Concentration Limits

POINT 1

Pollutant	Units of measure	100 percentile concentration limit	Reference conditions	Oxygen correction	Averaging period
Chlorine	milligrams per cubic metre	200			

POINT 2

Pollutant	Units of measure	100 percentile concentration limit	Reference conditions	Oxygen correction	Averaging period
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Hydrogen chloride	milligrams per cubic metre	30
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L3 Waste

- L3.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled "Waste" and meeting the definition, if any, in the column titled "Description" in the table below.

Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled "Activity" in the table below.

Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled "Other Limits" in the table below.

This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
NA	Waste	Any waste received on site that is below licensing thresholds in Schedule 1 of the POEO Act, as in force from time to time		NA
NA	General or Specific exempted waste	Waste that meets all the conditions of a resource recovery exemption under Clause 92 of the Protection of the Environment Operations (Waste) Regulation 2014	As specified in each particular resource recovery exemption	NA
B100	Acidic solutions or acids in solid form		Waste processing (non-thermal treatment) Waste storage	B100 waste is limited to ferrous chloride (Pickle liquor)

L4 Noise limits

- L4.1 For the operation of plant and equipment located at Botany Industrial Park (BIP) premises the following conditions L4.2 to L4.10 inclusively apply:

- L4.2 Noise emissions emanating from all active Plants in the BIP premises, including loading and unloading of material in or above the premises and when determined as a sound level contribution, shall not exceed the following amenity LAeq criteria when measured or computed at any point within one metre of the nearest boundary of any residence in the vicinity of the premises, using the "FAST" response on the sound level meter.

Time of Day	LAeq
-------------	------

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Day	65
Evening	55
Night	50

- L4.3 The intrusive noise criterion for all active plants in the BIP shall be that the LAeq15 minute noise levels shall not exceed the amenity LAeq noise levels by more than 5 dB(A) when measured or computed at any point within one metre of the nearest boundary of any residence in the vicinity of the premises, using the "FAST" response on the sound level meter.
- L4.4 Each existing BIP Plant shall ensure that new or replacement equipment is selected and/or installed so that no increase in noise emissions is thereby created when measured or computed at any point within one metre of the nearest boundary of any residence in the vicinity of the premises, using the "FAST" response on the sound level meter.
- L4.5 A report for all BIP Licences (L7494 Huntsman Corporation Australia Pty Ltd; L 2148 Orica Australia Pty Ltd, L 10000 Qenos Pty Ltd and L 20547 Chemicals Australia Operations Pty Ltd) demonstrating compliance with the noise conditions listed at Condition L4.1 to L4.3 must be appended to the Annual Return for Qenos L10000.
- L4.6 For the purpose of Condition L4.1, L4.2 and L4.3:
- a) Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays,
 - b) Evening is defined as the period from 6pm to 10pm, and
 - c) Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.
- L4.7 Noise from the premises is to be measured at the most affected point on or within the residential boundary to determine compliance with the LAeq(15 minute) noise limits in condition L4.2.
- Where it can be demonstrated that direct measurement of noise from the premises is impractical, the EPA may accept alternative means of determining compliance. See Chapter 11 of the NSW Industrial Noise Policy.
- The modification factors presented in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise level where applicable.
- L4.8 The noise emission limits identified in condition L4.2 apply under meteorological conditions of:
- a) wind speeds up to 3 m/s at 10 metres above ground level; or
 - b) temperature inversion conditions of up to 3 degreesC /100m and wind speeds up to 2m/s at 10 metres above ground level.
- L4.9 Activities at the premises, other than construction work, that meet the noise goal provided in L4.2 may be conducted on a continuous basis.
- L4.10 The following activities may be carried out at the premises outside the hours specified in conditions L4.6:

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- a) the delivery of materials as requested by Police or other authorities for safety reasons; and
- b) emergency work to avoid the loss of lives, property and/or to prevent environmental harm.

L5 Hours of operation

- L5.1 All construction work at the premises must only be conducted between 7:00am to 6:00pm Monday to Friday, 8:00am to 1:00pm Saturdays with no construction activities on Sundays or Public Holidays. Construction is permitted any time if it is not audible at the nearest affected receivers. Audible means that it can be heard by a person at the nearest affected receivers.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

- O1.1 Licensed activities must be carried out in a competent manner.
This includes:
- a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
 - b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

- O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
- a) must be maintained in a proper and efficient condition; and
 - b) must be operated in a proper and efficient manner.

5 Monitoring and Recording Conditions

M1 Monitoring records

- M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.
- M1.2 All records required to be kept by this licence must be:
- a) in a legible form, or in a form that can readily be reduced to a legible form;
 - b) kept for at least 4 years after the monitoring or event to which they relate took place; and
 - c) produced in a legible form to any authorised officer of the EPA who asks to see them.
- M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
- a) the date(s) on which the sample was taken;

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- b) the time(s) at which the sample was collected;
- c) the point at which the sample was taken; and
- d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

M2.2 Air Monitoring Requirements

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
Chlorine	milligrams per cubic metre	Continuous	In line instrumentation

POINT 2

Pollutant	Units of measure	Frequency	Sampling Method
Hydrogen chloride	milligrams per cubic metre	Quarterly	Method approved in writing by the Authority

POINT 3

Pollutant	Units of measure	Frequency	Sampling Method
Chlorine	milligrams per cubic metre	Continuous	In line instrumentation

M2.3 Emission monitoring for hydrogen chloride in point 2 must be undertaken when the burner is on line at such a steady rate as will facilitate sampling in accordance with the EPA's letter dated 20 August 2002.

M2.4 At Point 2, the licensee is required to take a grab sample during 4 start-ups and shutdowns to determine the concentration of HCl emissions during start-up or shutdown conditions. In these circumstances, the EPA's letter dated 20 August 2002 or any other methods approved in writing by the EPA.

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:

- a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
- b) if no such requirement is imposed by or under the Act, any methodology which a condition of this

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licence requires to be used for that testing; or

c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

Note: The *Protection of the Environment Operations (Clean Air) Regulation 2010* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M4 Recording of pollution complaints

M4.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M4.2 The record must include details of the following:

- a) the date and time of the complaint;
- b) the method by which the complaint was made;
- c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- d) the nature of the complaint;
- e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
- f) if no action was taken by the licensee, the reasons why no action was taken.

M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M5 Telephone complaints line

M5.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M5.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M5.3 The preceding two conditions do not apply until : the date of the issue of this licence.

6 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:
a) a Statement of Compliance; and

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b) a Monitoring and Complaints Summary.

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:

a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and

b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:

a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or

b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

a) the licence holder; or

b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R2 Notification of environmental harm

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

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R3 Written report

- R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
- a) where this licence applies to premises, an event has occurred at the premises; or
 - b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
- and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.
- R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.
- R3.3 The request may require a report which includes any or all of the following information:
- a) the cause, time and duration of the event;
 - b) the type, volume and concentration of every pollutant discharged as a result of the event;
 - c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
 - d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
 - e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
 - f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
 - g) any other relevant matters.
- R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

7 General Conditions

G1 Copy of licence kept at the premises or plant

- G1.1 A copy of this licence must be kept at the premises to which the licence applies.
- G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.
- G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .

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TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non - putrescible), special waste or hazardous waste

Mr James Goodwin

Environment Protection Authority

(By Delegation)

Date of this edition: 19-February-2015

End Notes	
2	Licence format updated on 03-Jun-2015
3	Licence varied by notice 1533631 issued on 28-Sep-2015

Consent to discharge industrial trade wastewater

HUNTSMAN CORPORATION AUSTRALIA PTY LTD

A.C.N. 083 984 187

and

ORICA AUSTRALIA PTY LTD

A.C.N. 004 117 828

and

QENOS PTY LTD

A.C.N. 054 196 771

and

IXOM OPERATIONS PTY LTD

A.C.N. 600 546 512

ACTIVITY: ORGANIC LIQUIDS (DC01)

RISK INDEX: 03

CONSENT NO: 489

CONNECTION NO: 2

PROPERTY NUMBER: 4004456

**This CONSENT is made on
Executed for and on behalf of
Sydney Water Corporation**

day: 19 month: 05 year: 2017

By



(Signature)

Caleb Furner

Manager Major Customers

In the presence of:

Witness

MICHAEL CERRETO

(Print name of witness)



(Signature)

A) HUNTSMAN CORPORATION AUSTRALIA PTY LTD

B) ORICA AUSTRALIA PTY LTD

C) QENOS PTY LTD

D) IXOM OPERATIONS PTY LTD

A) Earl Merritt

(Print name of signatory)



(Signature)

B) Colin Hiley

(Print name of signatory)



(Signature)

C) PETER BEATTIE

(Print name of signatory)



(Signature)

D) David ORAM

(Print name of signatory)



(Signature)

This consent must be executed by the Customer prior to execution by Sydney Water and submitted by the Customer to Sydney Water for its consideration. Submission of a consent executed by the Customer under no circumstances obliges Sydney Water to enter into or complete the consent. Submission of an executed consent by the Customer constitutes an application for a consent which Sydney Water may in its reasonable discretion reject, or with the consent of the Customer modify any of the proposed terms thereto.

Consent to Discharge Industrial Trade Wastewater

SCHEDULE 1

(SUBJECT TO PUBLIC DISCLOSURE)

TRADE WASTEWATER WHICH MAY BE DISCHARGED

1. Trade wastewater substances

- (a) The Customer may discharge trade wastewater into the Sewer in a manner whereby the substance characteristics of the trade wastewater are of a type and discharged at a rate, level or concentration equal to or less than that described in this schedule.
- (b) The Customer must not discharge trade wastewater into the Sewer in a manner whereby the trade wastewater discharged;
- (i) contains, possesses or produces a substance characteristic not provided in, or which may be determined as being contrary to that described in this schedule.
- (ii) is at or of a rate, level, or concentration not provided in, or which may be determined as being contrary to, that described in this schedule.

SUBSTANCE	LTADM (kg/day)	MDM (kg/day)	Standard (mg/L)
AMMONIA (AS N)	50	150	100
BIOCHEMICAL OXYGEN DEMAND	1200	7200	
SUSPENDED SOLIDS	410	1300	600
TOTAL DISSOLVED SOLIDS	25000	75000	10000
GREASE	90	330	110
SULPHATE	1500	9000	2000
ARSENIC	0.09	0.5	1
BARIUM	1.38	3.6	5
VOLATILE HALOCARBONS	0.72	1.4	1
CHLORINATED PHENOLICS	0.01	0.05	0.05
IRON	40	200	50
MERCURY	0.01	0.06	0.03
PHENOLIC COMPOUNDS	1.7	3.5	1
SULPHIDE	4.2	14.5	5
ZINC	2.5	7.1	5
PETROLEUM HYDROCARBONS - FLAMMABLE (C6-C9)			10

RECONCILIATION PROCEDURES:

LONG TERM AVERAGE DAILY MASS:

The Long Term Average Daily Mass is a twelve month arithmetic average of ALL daily mass discharges as calculated for each composite sample. The Daily Mass discharged is to be calculated for each of the above substances, and checked against the above Long Term Average Daily Mass (kg/day) on the basis of average concentrations of substances discharged (mg/L) over any 24 hour period as determined from composite samples, obtained by either the Customer (in accordance with Schedule 2) or Sydney Water, or a combination of sample results by both.

This average concentration (mg/L) is to be multiplied by the total discharge (kL) as recorded by the Customer's discharge flow meter over the 24 hour period in order to calculate the Daily Mass of substances discharged (kg). Exceeding the Long Term Average Daily Mass does not constitute a Breach.

ACCEPTANCE STANDARD:

The Composite Sample Concentration is to be determined for each of the above substances, and checked against the above Acceptance Standard (mg/L) for each sample obtained. Exceeding the Acceptance Standard constitutes a Breach and will also incur an increased Quality Charge as detailed in Schedule 3.

The Discrete Sample Concentration is to be determined for each of the substances identified at Schedule 2, 2 (b) and checked against the above Acceptance Standard (mg/L) for each sample obtained. Exceeding the Acceptance Standard constitutes a Breach.

MAXIMUM DAILY MASS:

The Daily Mass discharged is to be calculated for each of the above substances, and checked against the above Maximum Daily Mass (kg/day) on the basis of average concentrations of substances discharged

Consent to Discharge Industrial Trade Wastewater

(mg/L) over any 24 hour period as determined from composite samples, obtained by either the Customer (in accordance with Schedule 2) or Sydney Water, or a combination of sample results by both.

This average concentration (mg/L) is to be multiplied by the total discharge (kL) as recorded by the Customer's discharge flow meter over the 24hour period in order to calculate the Daily Mass of substances discharged (kg). Exceeding the Maximum Daily Mass constitutes a Breach.

Consent to Discharge Industrial Trade Wastewater

2. The trade wastewater discharged must at all times have the following properties:

- | | |
|----------------------------------|---|
| Temperature | - Not to exceed 38 degrees Celsius. |
| Colour | - Determined on a system specific basis |
| pH | - Within the range 7.0 to 10.0. |
| Fibrous material | - None which could cause an obstruction to Sydney Water's sewerage system. |
| Gross solids (other than faecal) | - A maximum linear dimension of less than 20 mm, a maximum cross section dimension of 6 mm, and a quiescent settling velocity of less than 3 m/h. |
| Flammability | - Where flammable and/or explosive substances may be present, the Customer must demonstrate to the satisfaction of Sydney Water that there is no possibility of explosions or fires occurring in the sewerage system. The flammability of the discharge must never exceed 5% of the Lower Explosive Limit (LEL) at 25° Celsius. |

3. Rate of discharge of waste to sewer:

- (a) Instantaneous maximum rate of gravitated discharge 225 litres per second
- (b) Maximum daily discharge 7500 kilolitres
- (c) Average daily discharge 5500 kilolitres

RECONCILIATION PROCEDURE:

The data obtained from applying these procedures is to be checked by the interface of a chart recorder to the Customer's flow metering equipment, or by the installation of flow metering equipment by Sydney Water, for a minimum of 7 days.

Consent to Discharge Industrial Trade Wastewater

SCHEDULE 2

(SUBJECT TO PUBLIC DISCLOSURE)

SAMPLING, ANALYSIS, FLOW RATES AND VOLUME DETERMINATION

1. The Customer must provide and make available for the purpose of sampling and analysis;
 - (a) Sampling point located at gauging pit, excluding domestic sewage prior to the point of connection to the Sewer.
 - (b) Equipment necessary to allow collection of composite automatic samples on either a flow proportional or a time basis.
2. The Customer is to undertake collection and analysis of samples in accordance with the schedule detailed below:
 - (a) Composite samples are to be obtained:
 - (i) For Barium, Ammonia, Biochemical Oxygen Demand, Volatile Halocarbons, Mercury, Sulphide, Sulphate, Grease, Suspended Solids, Total Dissolved Solids, Zinc, Iron, Phenolic compounds and Total Chlorinated Phenolics, Composite samples are to be obtained over one full production day on 26 May 2017 and every 8 days hereafter by combining equal volumes taken at 15 minute intervals. The volumes are to be such that at least 3000 millilitres are obtained over the full day. The reading of the flow meter is to be obtained at the commencement and conclusion of the sampling. If trade wastewater is not discharged on this day, then the sample is to be taken on the next day that trade wastewater is discharged.
 - (ii) For HCB composite samples are to be obtained over one full production day on 5 June 2016 and every 32 days thereafter by combining equal volumes taken at 15-minute intervals. The volumes are to be such that at least 3000 millilitres are obtained over the full day. The reading of the flow meter is to be obtained at the commencement and conclusion of the sampling. If trade wastewater is not discharged on this day, then the sample is to be taken on the next day that trade wastewater is discharged.
 - (b) Discrete samples are to be obtained as detailed below to check compliance with the parameters specified:

pH	at the start and finish of each sample day
AMMONIA (AS N)	at the finish of each sample day
VOLATILE HALOCARBONS	at the finish of each sample day
 - (c) Composite samples are to be analysed according to the procedures and methods specified in Sydney Water's published analytical methods, or methods otherwise agreed to and detailed hereunder, to determine the concentrations or levels of the following substance characteristics

AMMONIA (AS N)
BIOCHEMICAL OXYGEN DEMAND
SUSPENDED SOLIDS
TOTAL DISSOLVED SOLIDS
GREASE
SULPHATE
ARSENIC
BARIUM
VOLATILE HALOCARBONS
CHLORINATED PHENOLICS
IRON
MERCURY
PHENOLIC COMPOUNDS
SULPHIDE
ZINC
 - (d) The Customer, or the laboratory contracted by the customer, is to submit results of analyses to Sydney water within 21 days from the date the sample was taken. All analysis results are to be submitted on the

Consent to Discharge Industrial Trade Wastewater

- (c) sample analysis report provided as appendices 1 and 2 to this Consent OR in such format as may be specified from time to time by Sydney Water.
- (d) All data requested on the sample analysis report must be provided.
- (e) Sydney Water must be notified in writing within 7 days of;
 - (i) any failure to obtain samples in accordance with the provisions of Schedule 2; or
 - (ii) any loss of any analytical data.

Where data is unavailable, lost or not provided, the Quality Charge, as detailed in Schedule 3, will be assessed on the basis of the highest Composite Sample concentration recorded in the 12 months prior to the date of the missing sample data.

- 3. The volume of wastewater discharged must be obtained from the reading of the total flow on the Customer's flowmetering system.

The rate of waste discharged is to be obtained by the reading of the instantaneous flow rate indicator on the Customer's flowmetering system, or from any chart recorder interfaced to the Customer's flowmetering system.

The flowmetering system is to be calibrated at least annually at the Customer's expense, by a person or company approved by Sydney Water and a copy of the calibration certificate supplied to Sydney Water within one month of such certificate being received by the Customer.

If the Customer's flowmetering system fails to record data for any period, Sydney Water is to be advised in writing by the Customer within 7 days of any such failure becoming known by the Customer. An estimate of any data not recorded is to be made as follows:

Average of the waste discharged, registered for the four weeks before and/or after the failure to record.

Consent to Discharge Industrial Trade Wastewater

SCHEDULE 3

(SUBJECT TO PUBLIC DISCLOSURE)

PAYMENTS

The charges are effective from 17 May 2017 and will continue until otherwise advised by Sydney Water.

All trade waste fees and charges are subject to CPI adjustments from 1 July each year in accordance with Determination No 1, 2012 made by the Independent Pricing and Regulatory Tribunal (IPART) and are detailed in fact sheets on the Sydney Water website.

1. CHARGES FOR TRADE WASTEWATER DISCHARGE

Sydney Water will conduct a reading of the Customer's discharge meter at approximately 90 day intervals. The volume of trade wastewater discharged for the period since the previous reading will be calculated.

Charges are based on the Daily Mass calculated from composite samples and corresponding meter readings for each sampling day in the billing period, and calculated in accord with (c), (d), (e), and (f) below. The charge for each sampling day is then multiplied by a flow weighting factor to give a flow weighted charge. The total charge for each substance for the billing period is equal to the sum of the flow weighted charges for the billing period.

Total Charge = the sum of the flow weighted charges for the billing period

Flow Weighted Charge = (charge for all sample days) x (flow weighting factor) and:

$$\text{Flow Weighting Factor} = \frac{(\text{total volume discharged during billing period})}{(\text{sum of volumes discharged during all sample days during billing period})}$$

In this formula volume discharged refers to the volume of trade wastewater discharged.

(a) Mass Discharged:

For each substance, the Mass Discharged is calculated by multiplying the Composite Sample concentration by the Trade Wastewater discharge for that sample day.

(b) Chargeable Trade Waste Mass:

- (i) For the following substances, the Chargeable Trade Waste Mass is equal to the Mass Discharged:

SUBSTANCE
ARSENIC
BARIUM
VOLATILE HALOCARBONS
CHLORINATED PHENOLICS
IRON
MERCURY
PHENOLIC COMPOUNDS
SULPHIDE
ZINC

- (ii) For the following substances, the Chargeable Trade Waste Mass is calculated by subtracting the Equivalent Domestic Mass from the Mass Discharged. The Equivalent Domestic Mass is defined as the Domestic Concentration multiplied by the Trade Wastewater discharge.

SUBSTANCE	DOMESTIC CONCENTRATION mg/L
AMMONIA (AS N)	35
BIOCHEMICAL OXYGEN DEMAND	230
SUSPENDED SOLIDS	200
TOTAL DISSOLVED SOLIDS	450
GREASE	50
SULPHATE	50

If the resulting Chargeable Trade Waste Mass is zero or negative, then no Quality charges will apply for that substance for that sample day.

Consent to Discharge Industrial Trade Wastewater

(c) . Quality Charge:

- (i) For the following substances, the Quality Charge is determined by multiplying the Chargeable Trade Waste Mass by the Rate for that substance as detailed in the Industrial Customers Acceptance Standards and charging rates for the applicable financial year fact sheet on the Sydney Water website.

SUBSTANCE

AMMONIA (AS N)
SUSPENDED SOLIDS
TOTAL DISSOLVED SOLIDS
GREASE
ARSENIC
BARIUM
VOLATILE HALOCARBONS
CHLORINATED PHENOLICS
IRON
MERCURY
PHENOLIC COMPOUNDS
SULPHIDE
ZINC

- (ii) For the following substances, the Quality Charge is determined by multiplying the Chargeable Trade Waste Mass by the Rate, where the Rate is a function of the composite sample concentration recorded for that sample day.

SUBSTANCE

BIOCHEMICAL OXYGEN DEMAND

(d) Concentration Breach Charge:

Where the Composite Sample concentration is greater than the Acceptance Standards specified in Schedule 1 (with the exception of sulphate), any charges calculated in (c) above will be doubled for that sampling day.

(e) Failure to collect required samples:

Where the Customer fails to collect and analyse samples in accord with this consent the above charges will be assessed on the basis of the highest composite concentrations recorded for any billing period within the previous 12 months and the average daily discharge for the current billing period.

(f) pH and Temperature charges:

Sydney Water regularly assesses its wastewater networks to determine if a system is affected by accelerated odour and corrosion. Where Sydney Water declares a wastewater system to be affected by accelerated odour and corrosion, the temperature and pH charge will only apply if the customer is not committed to or not complying with an effluent improvement program.

2. CHARGES FOR INSPECTIONS

- (a) If, in the opinion of Sydney Water, it is necessary for a Business Customer Representative to exercise rights under clause 6.1, the Customer will incur no liability for payment for any such exercise unless the Business Customer Representative has already exercised rights under clause 6.1 on 13 occasions within a period of one year.
- (b) If it is necessary, in the opinion of Sydney Water, to carry out more than 13 occasions within a period of one year, the additional inspections will be charged at the current inspection rate.
- (c) Any inspection required following up an alleged breach or a default notice will result in a fee payable even if the number of inspections nominated in paragraph 2 (a) has not been exceeded.
- (d) For the purposes of 2 (a) and 2 (b), above, one year is defined as the period from 1 July to 30 June the following year.

Consent to Discharge Industrial Trade Wastewater

3. CHARGES FOR INSPECTIONS

- (e) If, in the opinion of Sydney Water, it is necessary for a Business Customer Representative to exercise rights under clause 6.1, the Customer will incur no liability for payment for any such exercise unless the Business Customer Representative has already exercised rights under clause 6.1 on 13 occasions within a period of one year.
- (f) If it is necessary, in the opinion of Sydney Water, to carry out more than 13 occasions within a period of one year, the additional inspections will be charged at the current inspection rate.
- (g) Any inspection required following up an alleged breach or a default notice will result in a fee payable even if the number of inspections nominated in paragraph 2 (a) has not been exceeded.
- (h) For the purposes of 2 (a) and 2 (b), above, one year is defined as the period from 1 July to 30 June the following year.

4. CHARGES FOR ADMINISTRATION OF TRADE WASTE CONSENT

A consent fee per quarter is payable from 17 May 2017.

5. CHARGES FOR VARIATION OR RENEWAL OF TRADE WASTE CONSENT

Where a Variation is made to the Consent a fee will be payable. There will be no charge for renewal.

6. CHARGES FOR GREASE TRAPS

Wastesafe administration charges are levied per pit per year.

7. PAYMENT OF FEES AND CHARGES

An account will be issued for all fees and charges. Any fees or charges payable by the Customer must be paid by the Customer within 30 days of the receipt by the Customer of the account detailing those fees and charges.

Consent to Discharge Industrial Trade Wastewater

SCHEDULE 4 ADDITIONAL REQUIREMENTS

1. EFFLUENT IMPROVEMENT PROGRAM

N/A

2. WASTE MANAGEMENT PLAN

The existing pre-treatment will result in the generation of 500 tonnes per annum of waste substances in the form of a sludge containing generally solids. The waste substances are, and will continue to be disposed of, in compliance with the requirements of The Environment Protection Authority.

3. OTHER REQUIREMENTS

- (a) A Backflow Containment Device must be installed and maintained at the water meter outlet/property boundary in line with Sydney Water's Responsibilities of Connected Customers Policy.
- (b) Backflow individual/zone protection is required on any tap located within 5m of the trade waste apparatus.

Consent to Discharge Industrial Trade Wastewater

SCHEDULE 5 APPARATUS, PLANT AND EQUIPMENT

EXISTING:

Non GTP Flows:

14th Avenue Diversion

Mercury

ChlorAlkali Plant Interceptor Pit

ChlorAlkali Plant Effluent Diversion Tank

ChlorAlkali Plant Effluent Equalisation Tank

Suspended Solids

8th Avenue Grit Pits

Alkathene Effluent Interceptor Pit

Alkatuff Effluent Interceptor Pit

Alkathene API Separator

Alkatuff CPI Separator

pH and Acid Demand

pH Adjustment at 8th Avenue Effluent Treatment Plant

Demineralisation Plants Effluent Neutralisation System

7 additional pH probes installed around Effluent System

Grease

Alkathene Effluent Interceptor Pit

Alkatuff Effluent Interceptor Pit

Alkathene API Separator

Alkatuff CPI Separator

Surfactants Weir Pit

Volatile Halocarbons

14th Avenue Effluent Diversion Basin

Groundwater Treatment Plant, with discrete pipeline discharge to the 14th Avenue gauging pit

On line Monitoring Equipment

Pollutant

Analysis Technique

Acid demand

Titration to pH with HCL

Sulphate

Spectrophotometric, barium precipitation

Ammonia

Ion Selective Electrode

Suspended Solids

Not operational

Chlorinated Hydrocarbons

Headspace GC/FID

TOD

TOD Catalysed thermal oxidation

pH

pH electrode

Operation of on line analysers for non – GTP effluent for day to day management of non GTP effluent including the diversion basin.

Ground Water Treatment Plant On Line Monitoring

Monitoring of flow rate, volume pH, conductivity, and temperature for this pipeline.

Flow Diversion

The diversion of effluent for high TOD, low pH or high pH is now fully automated.

PROPOSED:

Not Applicable

Consent to Discharge Industrial Trade Wastewater

SCHEDULE 6 SPECIAL CONDITIONS

1. DANGEROUS DISCHARGES

In this Schedule, the term "may pose a danger to the environment, the Sewer or workers at a sewage treatment plant";

- (a) means an occurrence whereby matter is discharged to the Sewer which either alone or in conjunction with other matter discharged cannot be adequately treated or may cause corrosion or a blockage, explosion or the production of dangerous gases in the Sewer or may adversely affect the operation of a sewer or sewage treatment plant; and
- (b) includes, but not so as to restrict the generality of paragraph (a), matter or substances, which is or are;
 - (i) toxic or corrosive;
 - (ii) petroleum hydrocarbons;
 - (iii) heavy metals;
 - (iv) volatile solvents;
 - (v) phenolic compounds;
 - (vi) organic compounds.

2. UNINTENDED DISCHARGES

- (a) For purposes of avoiding unintended discharges to the Sewer or the stormwater drainage system, all matter and substances on the Premises must be processed, handled, moved and stored in a proper and efficient manner.
- (b) Any substance on the Premises which, if discharged to the Sewer, may pose a danger to the environment, the Sewer or workers at a sewage treatment plant or may harm any sewage treatment process must be handled, moved and stored in areas where leaks, spillages or overflows cannot drain by gravity or by automated or other mechanical means to the Sewer or the stormwater drainage system

3. NOTIFICATION

In the event of a discharge of matter to the sewer that poses or may pose a danger to the environment, the Sewer or workers at a sewage treatment plant the Customer must immediately notify:

(a) MALABAR STP CONTROL ROOM TEL: (02) 9931 8319 FAX: (02) 9931 8366

and

(b) BUSINESS CUSTOMER SERVICES (8AM TO 5PM MON TO FRI) TEL: 1300 985 227

and

(c) BUSINESS CUSTOMER SERVICES EMERGENCY CONTACT (24 HOURS) TEL: (02) 8849 5029

4. PROVISION OF SAFE ACCESS

The Customer shall provide safe access to Sydney Water employees visiting the site. In the event that unsafe conditions are identified the Customer must take reasonable steps to correct unsafe conditions and create safe access.

Sydney Water employees must also comply with the Customer's safety policies and procedures and any directions from the Customer's staff while on the Customer's site.

Consent to Discharge Industrial Trade Wastewater

5. ELECTRONIC REPORTING OF SAMPLE ANALYSIS RESULTS

Sydney Water reserves the right to vary this consent to specify the option of reporting by electronic mail as outlined in Schedule 2, 2 (d).

6. CALIBRATION AND MAINTENANCE SCHEDULES

The customer must calibrate, validate and maintain on-line analysers according to the manufacturer's instructions and criteria agreed with Sydney Water from time to time. The customer must provide on a quarterly basis commencing, internal calibration, validation and maintenance records in a format as agreed with Sydney Water.

7. MAINTENANCE SHUTDOWNS

It is acknowledged that periodic maintenance activities must occasionally be conducted in all plants. In some cases, these activities will include effluent treatment devices with the result that standards achieved with all Plants operational may not be attainable for the duration of the maintenance.

Provided that Botany Industrial Park Pty Ltd provides Sydney Water with at least one calendar month notice of a planned maintenance shut down, the parties may negotiate for an increased concentration of pollutants to be discharged to sewer for the duration of the shutdown.

These higher limits shall take into consideration the operational requirements of Sydney Water with respect to, inter alia, the concentration and mass of the substances present in the discharge and the times of discharge.

8. METHODS OF ANALYSIS

Where the customer, or the Customer's laboratory, cannot employ the specified analytical method for a Particular substances, the Customer must notify and seek permission from Sydney Water with respect to the use of an alternate method.

9. GENERAL CONDITIONS CLAUSE 11.3

Clause 11.3 on the attached printed folder to this agreement is to be replaced with the following clause 'The Customer must comply with any notice under clause 11.1 or 11.2 subject only to any delay that may be required to safeguard the health and safety of any person or impact on the environment'.

Consent to Discharge Industrial Trade Wastewater

SCHEDULE 7

1. Premises for which Consent is granted
16-20 BEAUCHAMP RD, BANKSMEADOW NSW 2019

Huntsman Plant:
Surfactants

Orica Plants:
Groundwater Treatment Plant Air Stripping of contaminated ground water (EDC)
Former Solvents Plant area (disused, but still retaining active effluent treatment facilities for the removal of HCB from the internal drainage of the HCB storage facility).

Qenos Plants:
Alkathene
Alkatuff
Olefines (Feed Preparation Cooling Tower blowdown only)
Site Utilities

IXOM Operations Pty Ltd Plant:
ChlorAlkali

2. Industrial or other commercial activities for which Consent is granted
ORGANIC LIQUIDS (DC01)
3. Discharge point for which Consent is granted
BOUNDARY TRAP
4. The date for purposes of clause 3.1 is 17 May 2017
5. The period for purposes of clause 3.2 is 12 months
6. The receiving Treatment Plant is MALABAR Wastewater Treatment Plant / Water Recycling Plant

Consent to Discharge Industrial Trade Wastewater

SCHEDULE 8

NOTICES AND COMMUNICATION ADDRESSES

SYDNEY WATER MANAGER MAJOR CUSTOMERS
PO Box 399
PARRAMATTA 2150

TEL: 1300 985 227
A.H: (02) 8849 5029

CUSTOMER: DR RICHARD BENSON
BIP OPERATIONS MANAGER
BOTANY INDUSTRIAL PARK
16-20 BEAUCHAMP ROAD
MATRAVILLE NSW 2036

TEL: (02) 8336 1357
FAX: (02) 8336 1385

SCHEDULE 9

AUTHORISED OFFICERS

SYDNEY WATER: MANAGER MAJOR CUSTOMERS
PO Box 399
PARRAMATTA 2150

TEL: 1300 985 227
A.H: (02) 8849 5029

Email: businesscustomers@sydneywater.com.au

CUSTOMER: BEN LIM
SITE ENVIRONMENT ENGINEER
BOTANY INDUSTRIAL PARK
16-20 BEAUCHAMP ROAD
MATRAVILLE NSW 2036

Email: ben.lim@orica.com

93818143 *Blm*
TEL: (02) ~~9352 2343~~
FAX: (02) ~~9352 2371~~
93818112 *val.*

SCHEDULE 10

NOMINATED REPRESENTATIVES

SYDNEY WATER: MANAGER MAJOR CUSTOMERS
PO Box 399
PARRAMATTA 2150

TEL: 1300 985 227
A.H: (02) 8849 5029

CUSTOMER: DR RICHARD BENSON
BIP OPERATIONS MANAGER
BOTANY INDUSTRIAL PARK
16-20 BEAUCHAMP RD
MATRAVILLE NSW 2036

TEL: (02) 8336 1357
FAX: (02) 8336 1385

Consent to Discharge Industrial Trade Wastewater

APPENDIX 1 (Example)

SAMPLE ANALYSIS REPORT (COMPOSITE) DISCHARGE METER

Consent Number:	489
Company Name:	HUNTSMAN ORICA QENOS IXOM PTY LTD
Company Address:	16-20 BEAUCHAMP RD, BANKSMEADOW NSW 2019
Sample Type:	
☐ 6 (composite, manual time based)	Start date: ____/____/____
☐ 7 (composite, manual flow proportional)	Finish date: ____/____/____
☐ 8 (composite, automatic time based)	Start time: ____:____ am/pm
☐ 9 (composite, automatic flow proportional)	Finish time: ____:____ am/pm
grabs taken in sample period: _____	Initial meter reading: _____ kL
sample intervals min/kL _____	Final Meter reading: _____ kL
mL per grab: _____	Volume discharged: _____ kL

Laboratory:		
Substance	Acceptance Standard Acceptance Standard (mg/L)	Measured Units Measured Concentration(mg/L)
AMMONIA (AS N)	100	
BIOCHEMICAL OXYGEN DEMAND		
SUSPENDED SOLIDS	600	
TOTAL DISSOLVED SOLIDS	10000	
GREASE	110	
SULPHATE	2000	
ARSENIC	1	
BARIUM	5	
VOLATILE HALOCARBONS	1	
CHLORINATED PHENOLICS	0.05	
IRON	50	
MERCURY	0.03	
PHENOLIC COMPOUNDS	1	
SULPHIDE	5	
ZINC	5	

COPY OF ORIGINAL ANALYTICAL LABORATORY REPORT TO BE ATTACHED

NOTE: LABORATORY REPORT MUST CERTIFY NATA REGISTRATION FOR EACH ANALYSIS

Comments: _____

Customer Signature: _____ Date: ____/____/____

Designation: _____

OFFICE USE ONLY

Sample No:

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EMAIL TO:
michael.cerreto@sydneywater.com.au

Consent to Discharge Industrial Trade Wastewater

APPENDIX 2 (Example)

SAMPLE ANALYSIS REPORT (DISCRETE SAMPLE)

Consent Number: 489
Company Name: HUNTSMAN ORICA QENOS IXOM PTY LTD
Company Address: 16-20 BEAUCHAMP RD, BANKSMEADOW NSW 2019

Sample Type: DISCRETE

Date

Time

Laboratory:

Substance	Acceptance Standard (units or mg/L)	Measured Units or Concentration.
pH at start	7 - 10	
pH at finish	7 - 10	
NH3	100	
6C	10	
CHC	1	

COPY OF ORIGINAL ANALYTICAL LABORATORY REPORT TO BE ATTACHED
NOTE: LABORATORY REPORT MUST CERTIFY NATA REGISTRATION FOR EACH ANALYSIS

Comments: _____

Customer Signature: _____ Date: ____/____/____
Designation: _____

OFFICE USE ONLY

Sample No:

--	--	--	--	--

EMAIL TO:
michael.cerreto@sydneywater.com.au

GENERAL CONDITIONS

Recitals:

- A. Under its Operating Licence, Sydney Water provides sewerage services and treats and disposes of trade wastewater. The objectives of Sydney Water include operating as an efficient business, maximising the net worth of the State's investment and exhibiting a sense of social responsibility by having regard to the interests of the community. Sydney Water has special objectives of reducing risks to human health and preventing degradation of the environment.
- B. Sydney Water is granted licences by the Environment Protection Authority, which are subject to conditions to discharge pollutants. A change to a licence condition may require that variations be made to a consent granted by Sydney Water.
- C. In the conduct of its business operations, Sydney Water must comply with its obligations, duties and responsibilities under the Act and its Operating Licence and the Protection of the Environment Administration Act 1991, the Protection of the Environment Operations Act 1997 and the Protection of the Environment Legislation Amendment Act 2011.
- D. The customer requests that Sydney Water grant consent to the customer for purposes of discharge of trade wastewater from the premises to the sewer.

Sydney Water grants to the customer consent to discharge trade wastewater, subject to the terms and conditions specified in this consent. The customer accepts the consent and agrees to be bound by the terms and conditions of this consent:

1. Definitions and interpretation

- 1.1 In this consent, unless the contrary intention appears;

Acceptance standards means Sydney Water's published concentration limits for certain substances in trade wastewater.

Act means the Sydney Water Act 1994.

Business Customer Representative means an officer of Sydney Water who is authorised to enter land or buildings for purposes of carrying out his or her duties in relation to Sydney Water's trade wastewater service.

Consent means this consent together with its attached schedules and appendices. Any definitions or standards referred to in this consent but not contained in it are deemed to form a part of this consent with necessary changes being made to accommodate their inclusion.

Authorised officer means:

- with respect to Sydney Water, the person from time to time holding the position pertained in schedule 9 or such other person or position as may be nominated by Sydney Water from time to time;
- with respect to the customer, the person identified, and includes the details specified, in schedule 9 or as may be notified to Sydney Water by the customer from time to time.

Breach means any contravention of or non-compliance with a term, condition or provision of this consent or the Act.

Chargeable trade waste mass means the mass of a pollutant subject to quality or critical substance charges.

Composite sample means a sample of trade wastewater obtained by combining equal volumes at either equal time or flow intervals.

Critical mass charge means the charge applied to some critical and over capacity substances as calculated in accordance with the provisions set out in schedule 3.

Critical substance means a substance determined to be critical and notified from time to time by Sydney Water.

Customer means the party or parties (except Sydney Water) who executes or execute this consent.

Daily mass means the mass of a substance discharged during a 24-hour period.

Default notice means a notice issued in accordance with clause 8.1.

Domestic concentration means the concentration of a pollutant deemed by Sydney Water to be equivalent to that found in domestic wastewater.

Domestic wastewater means water which has in it human faecal matter, urine or refuse of any type produced in, and which is permitted to be discharged to a Sydney Water sewer from, any premises used exclusively for residential purposes.

Environment Protection Authority means the statutory authority established under section 15 of the Protection of the Environment Administration Act 1991

Equivalent domestic mass means the mass of a substance that would be expected in the trade wastewater if it were at domestic concentration.

Flow weighted charge means the portion of a substance's charge for a billing period that is attributed to any sample collected in accordance with schedule 2 or, if such sample is required but is not collected, then fixed by Sydney Water in accordance with schedule 2.

Flow weighting factor means a factor used to determine charges as described in schedule 3.

Long term average daily mass means, for each pollutant, the figure listed in schedule 1 and used to determine critical mass charges as described in schedule 3.

Lower explosive limit means the minimum concentration of flammable and/or explosive substances that would result in a fire or explosion.

Mass discharged means the mass of a pollutant discharged on a sample day and is measured by multiplying the composite sample concentration by

GENERAL CONDITIONS

the trade wastewater discharge for that sample day.

Maximum daily mass means the greatest mass of a substance permitted for discharge within a 24-hour period.

Over capacity means the status of a substance as determined in accordance with Sydney Water's Trade Waste Policy, 2007.

Over capacity substance means a substance determined to be over capacity and notified from time to time by Sydney Water.

Premises means the land, plant and buildings described and specified in paragraph 1 of schedule 7, on or in which the customer carries on industrial or other commercial activities specified in paragraph 2 of schedule 7.

Quality charge means a pollutant charge applied to trade waste discharges based on the mass of each pollutant discharged to sewer.

Regulator means any statutory authority, which may grant permission, authority or licence to Sydney Water to operate the sewer or treat or dispose of sewage treatment by-products.

Residual products means biosolids, re-use water or such other product intended for re-use as may be developed by Sydney Water from time to time.

Risk index means a ranking applied to the consent by Sydney Water to describe the relative risk of accepting the trade wastewater. Determination of the risk index will be based on the methodology determined from time to time by Sydney Water, or as may be necessary in the opinion of Sydney Water to take into account particular circumstances. The risk index is used to determine, among other things, the amount of self-monitoring required, the number of inspections to be performed by Sydney Water, the annual consent fee and the term of the consent.

Sewer means the sewerage service of Sydney Water, including the sewage treatment plant, discharge to which is facilitated by a discharge point situated on the premises and specified in item 3 of schedule 7.

Significant breach means any breach of a nature outlined at clause 15.2. Such breaches may result in immediate suspension or termination of the consent.

Standard mass charging rate means the charge per kilogram for substances as defined in schedule 3.

Sydney Water means Sydney Water Corporation.

Responsibilities of connected customers policy means Sydney Water's policy detailing the conditions under which Sydney Water will agree to accept trade wastewater to sewer.

Trade wastewater means any liquid and any substance in it that is produced in an industrial or commercial activity at the premises and

discharged into the sewer, but does not include domestic wastewater.

Trade waste residue means any substance separated and retained, from trade wastewater being discharged into the sewer.

1.2 In this consent, unless the contrary intention appears:

- (a) A reference to an Act or any delegated legislation or instrument made under an Act includes any other Act delegated legislation or instrument as may amend or replace any of them.
- (b) A reference to a word or expression
 - (i) in the singular form includes a reference to the word or expression in the plural form; and
 - (ii) in the plural form includes a reference to the word or expression in the singular form.
- (c) A reference to a party or a natural person includes a reference to a corporation.
- (d) A word or expression that indicates one or more particular genders is taken to indicate every other gender.
- (e) Headings to clauses and paragraphs are included in this consent to assist understanding of its terms and conditions but are not intended to affect the meaning or application of any term or condition.
- (f) A reference to a clause, schedule or appendix is a reference to a clause of or schedule or appendix to this consent and any such schedule or appendix is a part of this consent.

1.3 Remedies available to the parties under this consent;

- (a) are cumulative; and
- (b) do not prejudice or affect any other remedy available to the parties.

1.4 No rule of construction applies to the disadvantage of a party because that party was responsible for the preparation of this consent or any part of it.

2. Application of certain statutes and laws

2.1 This consent is made under and is subject to the provisions of the Act.

2.2 This consent is governed by and will be performed according to the law applicable in the State of New South Wales.

2.3 Subject to the terms and conditions of this consent the customer has lawful authority to dispose of trade wastewater for purposes of;

- (i) Section 115 of the Protection of the Environment Operations Act 1997; and
- (ii) Section 49 of the Act; and

GENERAL CONDITIONS

3. Commencement and term of consent

- 3.1 This consent commences on the date specified in paragraph 4 of schedule 7.
- 3.2 This consent will, unless terminated or renewed in accordance with this consent, continue for the period specified in item 5 of schedule 7.

4. Discharge of trade wastewater into sewer

- 4.1 The customer may discharge trade wastewater from the premises into the sewer in accordance with the provisions of schedule 1 and schedule 4.
- 4.2 The customer must not discharge trade wastewater from the premises into the sewer contrary to the provisions of schedule 1 and schedule 4.
- 4.3 The customer indemnifies Sydney Water against all damages, losses, costs or expenses suffered or incurred by Sydney Water, caused by any unauthorised discharge from the premises in respect of:
 - (a) injury (including death) or harm to any person; or
 - (b) damage to property vested in Sydney Water; or
 - (c) contamination of residual products; or
 - (d) material harm to any sewage treatment processprovided that the said damages, losses, costs or expenses suffered or incurred by Sydney Water are caused by any unauthorised discharge of trade wastewater or other matter into the sewer by the customer which is in breach of this consent or by any other person from the customer's premises, except to the extent to which the damages, losses, costs or expenses (as the case may be) were caused by either the negligent or wilful act or omission of Sydney Water or a breach of this consent by Sydney Water.

- 4.4 The customer must take all precautions reasonably practicable to ensure that no person, other than a person acting for or on behalf of or with the consent of the customer, discharges any matter from the premises into the sewer.

- 4.5 For purposes of this consent, every discharge of matter from the premises into the sewer will be taken to have been a discharge by a person acting for or on behalf of, or with the consent of, the customer.

5. Charges

- 5.1 The customer must pay Sydney Water charges with respect to trade wastewater discharged to the sewer, the administration of this consent and, when applicable, the processing of grease trap waste determined in accordance with, and within the time and in the manner specified in schedule 3.
- 5.2 Sydney Water may vary the basis of charges or the charging rates in schedule 3;
 - (a) as and when determined by the Independent Pricing and Regulatory Tribunal of New South Wales (IPART); or
 - (b) by written consent with the customer.

6. Inspections

- 6.1 A Business Customer Representative may enter the premises at any time;
 - (a) for purposes of inspecting whether the activities of the customer are being conducted in accordance with this consent; or
 - (b) for the purposes described in Section 38 of the Act or exercising any right or function conferred on Sydney Water under this consent.

This clause does not limit Sydney Water's statutory powers of entry.

- 6.2 When exercising rights under clause 6.1;
 - (a) a Business Customer Representative must not cause any delay or inconvenience to the efficient conduct of business activities by the customer which could be reasonably avoided; and
 - (b) except for any relevant safety precautions, a Business Customer Representative must not be impeded or delayed by any person on the premises.

- 6.3 If, in the opinion of Sydney Water, it is necessary for a Business Customer Representative to exercise rights under clause 6.1, the customer will make payment in accordance with the provisions of schedule 3.

7. Inquiries

- 7.1 Sydney Water may convene and determine the terms of reference of a joint inquiry about the circumstances relating to an incident that may have caused a breach.
- 7.2 An inquiry under clause 7.1 is to be conducted informally and without legal representation for purposes of gathering information about an incident directly from any person who may be expected to know, from his or her own observations, about the circumstances relating to the incident.
- 7.3 An inquiry under clause 7.1 may be conducted irrespective of whether the incident, the subject of the inquiry, is also the subject of a default notice.
- 7.4 Before conducting an inquiry under clause 7.1, the customer and Sydney Water may agree about what action, if any (except any action pursuant to a statutory obligation), may be taken with respect to any information that may be gathered during the inquiry.

8. Default procedures

- 8.1 If, in the opinion of Sydney Water, the customer commits, causes or allows a breach to occur, Sydney Water may issue to the customer a default notice.
- 8.2 A default notice must;
 - (a) provide any relevant particular of the breach alleged by Sydney Water, including any particular known to Sydney Water that may assist the customer to ascertain the alleged breach; and

GENERAL CONDITIONS

- (b) specify that the customer must provide a response in writing to Sydney Water within seven days of receipt of the notice.
- 8.3 A default notice is not invalid merely because it does not provide a particular that may assist the customer to ascertain the alleged breach.
- 8.4 Any supply to the customer by Sydney Water of particulars under clause 8.7(a) is taken, for purposes of clause 8.5, to be a default notice under clause 8.1.
- 8.5 The customer must supply to Sydney Water a written response to a default notice within seven days of receipt of the default notice which must;
- (a) request further particulars of the alleged breach; or
 - (b) describe or explain the circumstances causing;
 - (i) the event which appeared to Sydney Water to be a breach; or
 - (ii) the breach to occur; and
 - (c) describe any action taken with respect to the alleged breach; and
 - (d) provide a plan of action to be taken by the customer to avoid the occurrence of any incident similar to the alleged breach; or
 - (e) explain the reasons of the customer for disputing the alleged breach.
- 8.6 The customer may make one request only for particulars under clause 8.5(a) with respect to a default notice.
- 8.7 When the customer responds in writing to Sydney Water in accordance with clause 8.5, Sydney Water must within seven days of receipt of that response either;
- (a) with respect to clause 8.5(a), provide in writing to the customer any further particulars that it may be able to provide in which case the customer shall be allowed a further seven days from receipt of those particulars to respond as required by clause 8.5(b)
 - (b) specify to what extent it accepts, rejects or disagrees with the response under 8.5(b) and provide details of any action it proposes to take (including any special requirements it may impose) to deal with the breach.
- 8.8 The issue by Sydney Water of a default notice is without prejudice to any right or power Sydney Water may have pursuant to this consent or conferred on it by statute or statutory rule.
- 9. Improvement program**
- 9.1 The customer must, at its own expense, establish and carry out the improvement program specified in, and in accordance with the provisions of, schedule 4.
- 9.2 If, prior to any failure to comply, the customer notifies Sydney Water that it may not be able to comply with any obligation under clause 9.1, Sydney Water will consider any reasonable proposal of the customer to vary a term or condition of the improvement program.

10. Diligence program

- 10.1 Within six months of the making of this consent, the customer must give a notice to Sydney Water specifying a current diligence program.
- 10.2 For purposes of clause 10.1, a diligence program includes a plan, whereby the customer demonstrates that the management of the customer is exercising reasonable care in planning and taking appropriate action, to prevent or minimise the effects of any incident that may constitute a breach.

11. Suspension or termination of consent to discharge trade wastewater

- 11.1 Sydney Water may suspend the consent granted in clause 4.1 if;
- (a) the customer does not comply with clause 8.5, 9.1, 12.1, 12.2 or notice of the suspension is given to the customer; or
 - (b) Sydney Water is for any reason specified in clause 11.2 unable to accept for treatment trade wastewater that may be discharged by the customer.
- 11.2 Sydney Water may, by a notice given to the customer, suspend the consent granted in clause 4.1 if, in the reasonable opinion of Sydney Water;
- (a) an emergency prevents the sewer from accepting any or certain specified categories of trade wastewater that may be discharged by the customer; or
 - (b) an event has occurred, which could have an adverse effect on any employee or agent of or contractor to Sydney Water or the sewer, including any biological process.

whether the emergency or event is caused by fire, storm, tempest, flood, malicious damage, act of war, civil disobedience, explosion, earthquake or an act or omission of an employee, or agent of, or contractor to Sydney Water, or an unlawful discharge of matter into the sewer, or some other cause.

- 11.3 The period of any notice of suspension given under clause 11.2 will be no shorter than any period, which in the opinion of Sydney Water the circumstances dictate.
- 11.4 The customer must comply with any notice under clause 11.1 or 11.2 subject only to any delay that may be required to safeguard the health or life of any person.
- 11.5 Any suspension under clause 11.1 or 11.2 must not be for a period longer than, in the opinion of Sydney Water, the circumstances dictate.
- 11.6 If the customer does not cease discharging trade wastewater in accordance with a notice given under clause 11.1 or 11.2 and Sydney Water is of the opinion that the customer is not taking appropriate measures to stop the discharge, a Business Customer Representative may, with such other persons as he or she may think necessary, enter the premises and take such

GENERAL CONDITIONS

measures as he or she may think necessary to stop the discharge.

- 11.7 A suspension under clause 11.1 or 11.2 or any action that may be taken in accordance with clause 11.6 does not give rise to any remedy to the customer against Sydney Water for, or in respect of, the suspension or action.
- 11.8 Any costs incurred by Sydney Water with regard to taking action under clause 11.6 is a debt payable to Sydney Water by the customer on demand made by Sydney Water.
- 11.9 Sydney Water may suspend the consent granted in clause 4.1 if; the discharge of trade wastewater by the customer in accordance with the consent granted under clause 4.1, by itself or in conjunction with the discharges of other persons is likely, in the opinion of Sydney Water, to cause Sydney Water to contravene any legislation, permission, authority or licence granted by a regulator, or any other regulatory authority.
- 11.10 Any suspension under clause 11.9 must be terminated as soon as Sydney Water is reasonably satisfied that the conditions giving rise to the suspension no longer exist.
- 11.11 If the customer and Sydney Water cannot agree in accordance with clause 11.10, they will initiate and attend discussions with the regulator to resolve any relevant matter.
- 11.12 If, after discussions under clause 11.11 the customer and Sydney Water fail to agree in accordance with clause 11.10, the consent granted in clause 4.1 may be terminated by Sydney Water.
- 11.13 Without limitation of the effect of any other clause in this consent, Sydney Water may terminate or suspend the customer's permission to discharge trade wastewater immediately by written notice to the customer, if in the opinion of Sydney Water the customer's discharge of trade wastewater is in breach of this consent and is likely to cause;
- (a) Sydney Water's contravention of the condition of any licence issued to it by the EPA; or
 - (b) the failure to meet a product specification of any of Sydney Water's residual products.
 - (c) Sydney Water to breach or fail to comply with any legislation.
- 11.14 A suspension under clause 11.9 or 11.13 in accordance with the terms of this consent or a termination under clause 11.12 or 11.13 in accordance with the terms of this consent does not give rise to any remedy to the customer against Sydney Water for or in respect of the suspension or termination.
- 11.15 Without limitation of the effect on any other clause in this consent, Sydney Water may terminate or suspend the customer's consent to discharge trade wastewater immediately by written notice served on the customer in accordance with Section 100 of the Act, on the occurrence of any one of the following events;

- (a) The customer fails to pay to Sydney Water any amount due and payable under this consent within twenty-one days of the due date for payment and such payment is not made within fourteen days of a written request from Sydney Water to do so.
- (b) The customer is in breach of the consent and is unable or unwilling to remedy the breach of consent as required by Sydney Water.

The customer acknowledges and agrees that if, following the termination of the consent, it continues to discharge trade wastewater into the sewer, a Business Customer Representative may enter the customer's premises and take all reasonable necessary steps to stop the customer's continued discharge of trade wastewater to the sewer. The right of entry conferred by this clause is in addition to, and not in substitution for, any power of entry conferred on Sydney Water by the Act.

12. Supply of information

- 12.1 Any information supplied by the customer to Sydney Water for purposes of making this consent or for any purpose of this consent must as far as reasonably possible be a true and complete disclosure by the customer for purposes of enabling Sydney Water to;
- (a) determine whether to grant the consent in clause 4.1; and
 - (b) determine whether there has been any breach of this consent.
- 12.2 The customer must not, in or in connection with a document supplied to Sydney Water for purposes of making this consent or for any purpose of this consent, furnish information, which is false or misleading in a material particular with regard to the trade wastewater to be discharged to the sewer.
- 12.3 Sydney Water must not disclose any confidential information obtained in connection with the administration or execution of this consent, unless that disclosure is made;
- (a) with the consent in writing of the customer
 - (b) with other lawful excuse.

13. Sampling

- 13.1 For purposes of this consent, schedule 2 specifies sampling and analysis criteria, flow rates and volume determinations of trade wastewater to be discharged or discharged under clause 4.1.
- 13.2 A Business Customer Representative may take as many samples of trade wastewater at any point in any production process or storage facility, or at any other point on the premises, as he or she thinks fit.
- 13.3 The customer must comply with the provisions of schedule 2.

14. Apparatus, plant and equipment for recording or treating trade wastewater

GENERAL CONDITIONS

14.1 The customer must, at its own cost, provide, operate and maintain in an effective and efficient working order, the apparatus, plant and equipment described in schedule 5 for purposes of regulating, treating, determining and measuring the quality, quantity and rate of discharge of trade wastewater under clause 4.1.

14.2 Sydney Water may require the customer to use its discretion to formulate and take such additional actions as may be appropriate to achieve the objects which, in the opinion of Sydney Water, are necessary for the customer to regulate, treat, determine or measure trade wastewater for purposes of discharge under clause 4.1.

14.3 The customer must, at its own costs, maintain records in such manner as may be required by Sydney Water, of all measurements, sampling and results obtained in the course of treatment and discharge of trade wastewater under clause 4.1.

14.4 The customer must submit to Sydney Water documents containing records of results specified in schedule 2.

14.5 The customer must maintain records of particulars and dates of cleaning and maintaining all apparatus, plant and equipment described in schedule 5 and particulars, dates and method of disposal of trade waste residue from such apparatus, plant and equipment.

14.6 The customer acknowledges that Sydney Water does not approve or warrant that any apparatus, plant or equipment used by the customer is sufficient for purposes of processing or treating trade wastewater for discharge under clause 4.1.

15. Variation and renewal of consent

15.1 Before varying, substituting or adding any process conducted or to be conducted on the premises that may cause the volume, rate or quality of wastewater discharged to change from that agreed under schedule 1 and schedule 4, the customer shall give Sydney Water not less than 14 days written notice of its intention. Any variation, substitution or addition shall only be conducted after receipt of written approval to same and subject to any conditions (including any requirement to vary the terms of this consent) that Sydney Water may impose.

15.2 Sydney Water may vary the terms of this consent where:

- (a) Sydney Water alleges a single significant breach or three breaches of the same nature, to have occurred in a six month period; or
- (b) in the opinion of Sydney Water, a substantial or material part of any plan of action under clause 8.5(d) may not be completed for a period exceeding 90 days; or
- (c) the customer gives Sydney Water notice under clause 15.1.

For the purposes of this clause and without limitation, the following circumstances shall be regarded as being a single significant breach:

- (i) an activity or event that could adversely affect; the health and safety of any employee, agent or contractor to Sydney Water, the integrity of Sydney Water assets or the viability of any of Sydney Water's treatment processes or products; or
- (ii) failure to achieve effluent improvement program milestone; or
- (iii) failure to install pre-treatment; or
- (iv) by-pass pre-treatment and/or installation of equipment that facilitates by-pass of pre-treatment; or
- (v) flow-meter turned off or bypassed.

15.3 A renewal of this consent may be initiated by the customer:

- (a) not less than two months before the date of expiration of this consent, and
- (b) not more than six months before the date of expiration of this consent.

15.4 If this consent remains current immediately prior to the expiration of the term detailed in 3.2, or any subsequent terms renewed in accordance with this clause, and:

- (a) the customer has not given notice in accordance with clause 20.1 of this consent and;
- (b) Sydney Water has not given to the customer at least 30 days' notice prior to the expiration of this consent, of its intention to permit the consent to expire in accordance with clause 3.2

Then this consent shall be deemed to be renewed immediately following its expiration, for a further period of six months.

15.5 Any amended schedules that Sydney Water prepares in response to a variation or renewal will be taken to be incorporated into this consent;

- (a) on execution by the customer; or
- (b) after 14 days of receipt by the customer of the notice of the variation or renewal.

15.6 The notification of alterations to the critical status of any pollutants does not constitute a variation.

16. Disposal of trade waste residue

The customer must not dispose of any trade waste residue, except in accordance with the requirements of the EPA.

17. Disposal of grease trap wastes

The customer must not dispose of grease trap wastes other than in accordance with Sydney Water's 'Wastesafe' Management System.

18. This consent comprises all applicable terms and conditions

18.1 The provisions of this consent comprise all of the applicable terms and conditions between the parties.

GENERAL CONDITIONS

18.2 It is declared by the parties that no further or other promises or provisions are, or will be claimed to be implied, or to arise between the parties by way of collateral or other agreement by reason of any promise, representation, warranty or undertaking given or made by any party (or its agent) to another, on or prior to the execution of this deed, and the existence of any such implication or collateral or other agreement, is hereby negated by the parties.

18.3 Clauses 18.1 and 18.2 do not prejudice the ability of the parties to vary or amend this consent in accordance with the provisions of this consent or by a further consent in writing.

19. No transfer or assignment

The customer cannot transfer or assign the consent granted in clause 4.1 nor any other right or obligation the customer has or may have under this consent, without the prior consent in writing of Sydney Water.

20. Termination of consent by customer

20.1 Termination of this consent may be effected by the customer upon the giving of at least 30 days' notice in writing to Sydney Water. The notice must state the date on which this consent terminates.

20.2 The customer is bound by the provisions of this consent with regard to any discharge of trade wastewater into the sewer from the premises, including the payment of charges under clause 5.1, from the commencement of this consent until its termination.

20.3 Notwithstanding provisions contained elsewhere in this consent the parties may terminate this consent in writing by mutual agreement provided the parties enter into a further trade waste consent immediately following termination of this consent.

21. Notices and communications

21.1 A notice or communication under this consent must be in writing.

21.2 For purposes of clause 21.1, a notice or communication may;

- (a) be left at the address of the addressee; or
- (b) be sent by prepaid ordinary post to the address of the addressee; or
- (c) sent by facsimile transmission to the facsimile number of the addressee
- (d) sent by email to the email address of the addressee

as specified in schedule 8 or such other address as may be notified by the addressee to the other party.

21.3 Unless a later time is specified in it, a notice or communication takes effect from the time it is received.

21.4 Unless the contrary is shown, for purposes of clause 21.3, if a notice or communication is;

- (a) a letter sent by pre-paid post, it will be taken to have been received on the third day after posting; or
- (b) a facsimile, it will be taken to have been received on receipt by the sender, of the written or oral advice of the addressee that the whole of the facsimile transmission has been received by the addressee in a form that is legible.

22. Miscellaneous

Each party must act in good faith in the implementation of this consent and, without limiting the scope of this obligation, must also seek to resolve any difference or dispute between them as to the consent in good faith.

23. Entire consent

This consent constitutes the entire agreement between the parties in relation to its subject matter. No understanding, arrangement or provision not expressly set out in this consent will bind the parties. Accordingly all correspondence, negotiations and other communications between the parties in relation to the subject matter of this consent that precede this consent are superseded by and merged in it.

Note: This consent has no effect until it is executed for and on behalf of Sydney Water Corporation.

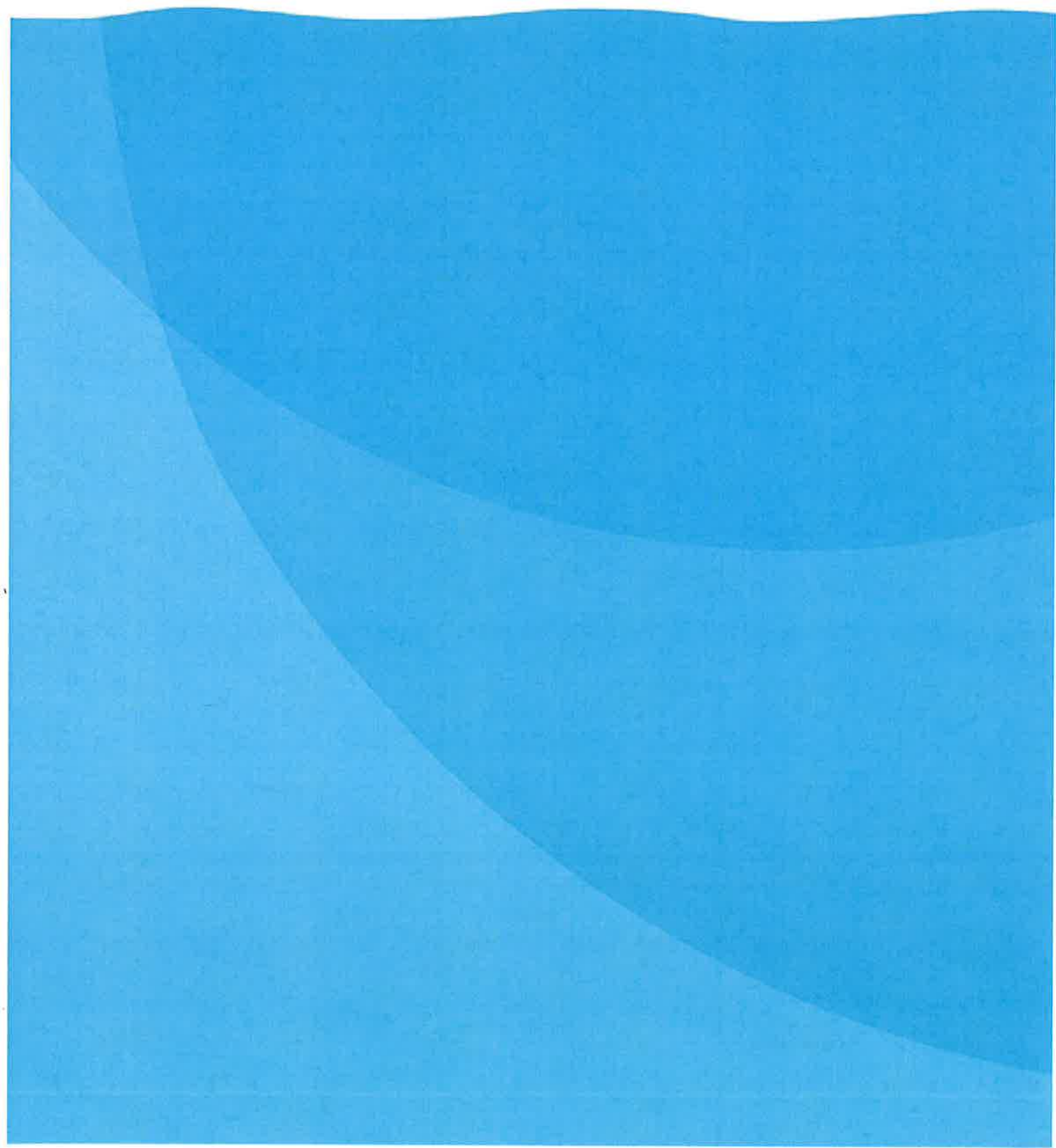
Contact Us

To find out more visit
sydneywater.com.au
or call 13 20 92

Postal address

Sydney Water
PO Box 399
Parramatta NSW 2124

Sydney Water
ABN 49 776 225 038
BCS034



9.9. Appendix 9 – Existing DA 35/98 Conditions of Consent

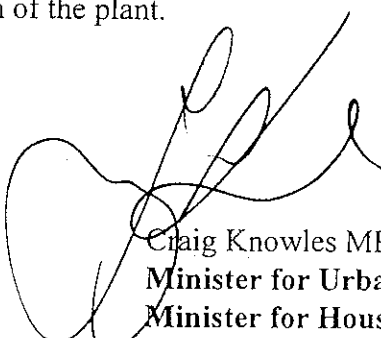
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

**DETERMINATION OF A DEVELOPMENT APPLICATION
PURSUANT TO SECTION 91 OF THE
"UNAMENDED" ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979**

I, the Minister for Urban Affairs and Planning, in pursuance of section 91 of the Unamended Environmental Planning and Assessment Act, 1979, and Clause 8 of State Environmental Planning Policy No. 34 – Major Employment Generating Industrial Development (SEPP 34), determine the development application referred to in Schedule 1 by granting consent to that application subject to the conditions set out in Schedule 2 (file R98/00010).

The reasons for the imposition of conditions are to ensure that potential hazards do not pose an unacceptable risk both on-site and off-site; ensure that best management practices and technology are adopted in the operation of the facility; provide for environmental monitoring and reporting of the future performance of the development; and protect the environmental and amenity of the locality during construction and operation of the plant.

Sydney, 6.11. 1998



Craig Knowles MP
Minister for Urban Affairs and Planning
Minister for Housing

SCHEDULE 1

Application made by:	Orica Australia Pty Ltd
To:	Minister for Urban Affairs and Planning
In respect of land being:	16-20 Beauchamp Road, Matraville NSW 2036 Lot 1, DP 608153
For the following development:	Installation of replacement Chlor-alkali plant to produce 35,000 tonnes per annum gaseous chlorine.
Development Application	The Development Application DA No. 35/98 lodged with the Department of Urban Affairs and Planning on 30 June, 1998 accompanied by the environmental impact statement (EIS) entitled "Replacement Chlor-Alkali Plant for Orica Australia Pty Ltd", June 1998, prepared by Dames & Moore Pty Ltd.

ABBREVIATIONS AND INTERPRETATION

The Department	Department of Urban Affairs and Planning
The Director-General	Director-General of the Department of Urban Affairs and Planning
The Council	Botany Bay City Council
The Applicant	Orica Australia Ltd
DA	Development application
DLWC	Department of Land and Water Conservation
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EP&A Act	Unamended Environmental Planning and Assessment Act, 1979
EPA	Environment Protection Authority
RAC	Rail Access Corporation
SAC	Sydney Airport Corporation
Site	Site of proposed development, being Lot 1 DP 608153
TMP	Transport Management Plan

SCHEDULE 2

CONDITIONS OF DEVELOPMENT CONSENT

1. The Applicant shall carry out the development generally in accordance with the environmental impact statement (EIS) dated June, 1998 prepared by Dames & Moore Pty Ltd, drawing number B73359 Rev A and as modified by the following conditions. Any alteration, variation or extension of the development shall require the further consent of the Minister for Urban Affairs and Planning.
2. At no time shall the existing Chlor-alkali plant and the proposed Chlor-alkali plant operate simultaneously.
3. The existing bulk chlorine storage tanks must be purged no later than 6 months after the date of commissioning of the proposed development.
4. Within 6 months from the date of this consent, the Applicant shall prepare for the approval of the Director-General a report detailing the proposed timetable and procedures for decommissioning the existing Chlor-alkali plant and commissioning of the proposed Chlor-alkali plant.

COMPLIANCE

5. The Applicant shall comply with all the reasonable requirements of the Director-General of Urban Affairs and Planning (the Director-General) in respect of the implementation of measures arising from the following conditions of development consent. Further, the Applicant shall bring to the attention of the Director-General any matter that may require further investigation and the issuing of instructions from the Director-General. The Applicant shall implement those instructions to the satisfaction of the Director-General within such time as the Director-General may specify.

6. The Applicant shall meet reasonable requirements of all public authorities having statutory responsibilities in respect of the proposed development.

COMPLIANCE REPORT

7. PRE-CONSTRUCTION

At least one month prior to the commencement of substantial construction, or within such period as otherwise agreed by the Director-General, the Applicant shall submit for the approval of the Director-General a compliance report detailing compliance with all the relevant conditions that apply prior to the commencement of substantial construction. The pre-construction compliance report should include:

- (a) the dates of submissions of the various studies and/or requirements of various conditions, and of their approvals and terms of approvals;
- (b) action taken or proposed to implement the recommendations made in terms of approvals and/or studies;

8. PRE-OPERATION

At least one month prior to the commencement of substantial operation, or within such period as otherwise agreed by the Director-General, the Applicant shall submit for the approval of the Director-General a compliance report detailing compliance with all the relevant conditions that apply prior to the commencement of substantial operation. The pre-operation compliance report should include:

- (a) the dates of submissions of the various studies and/or requirements of various conditions, and of their approvals and terms of approvals;
- (b) action taken or proposed to implement the recommendations made in terms of approvals and/or studies;

HAZARD MANAGEMENT

9. PRE-CONSTRUCTION

At least one month prior to the commencement of construction (except for construction of preliminary works that are outside the scope of the hazard studies) of the proposed development, or within such further period as the Director-General or her nominee may agree, the Applicant shall prepare and submit for the approval of the Director-General the following studies:

- (a) *Fire Safety Study*

A fire safety study for the proposed development and for the existing operations affected by it. This study shall cover all aspects detailed in the Department's Hazardous Industry Planning Advisory Paper No. 2, *Fire Safety Study Guidelines*. The study shall also be submitted for the approval of the New South Wales Fire Brigades. The study shall take into account the New South Wales Government's *Best Practice Guidelines for Contaminated Water Retention and Treatment Systems*. Where there is an existing plant

or site study, the condition of consent will be considered to be satisfied by the updating of that study.

In undertaking this study, or updating an existing study, the Applicant shall ensure the following matters are included:

- An outline of all fire prevention, protection and fire fighting measures proposed, together with the effect on existing installed fire suppression systems
- Details of the type, capacity and proposed location upon the site of all appliances and the reasons for their suitability as proposed
- Details of availability of fire fighting water, location of connection and rates of application, supported by full hydraulic calculations
- An outline of essential services maintenance procedures.

(b) *Hazard And Operability Study*

A Hazard and Operability Study (HAZOP) for the proposed development, chaired by an independent qualified person approved by the Director-General. The study should be carried out in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 8, *HAZOP Guidelines*.

(c) *Final Hazard Analysis*

A final hazard analysis of the proposed development as well as any existing operations affected by it. The analysis should be prepared in accordance with the Department of Urban Affairs and Planning's Hazardous Industry Planning Advisory Paper No. 6, *Guidelines for Hazard Analysis*.

(d) *Construction Safety Study*

A construction safety study prepared in accordance with Hazardous Industry Planning Advisory Paper No. 7, *Construction Safety Study Guidelines*.

10. PRE-OPERATION

At least two months prior to the commencement of operation of the proposed development, or within such further period as the Director-General may agree, the Applicant shall prepare and submit for the approval of the Director-General:

(a) *Emergency Plan*

A comprehensive emergency plan and detailed emergency procedures for the proposed development. This plan should include detailed procedures for the safety of people in areas outside the development. The plan should be in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 1, *Industry Emergency Planning Guidelines*. Where there is an existing plant or site plan, the condition of consent will be considered to be satisfied by the updating of that plan.

(b) *Safety Management System*

A comprehensive safety management system, covering all operations on-site and associated transport activities. The system should clearly specify all safety related procedures, responsibilities and policies, along with details of mechanisms for ensuring adherence to procedures. Records must be kept on-site and should be available for inspection by the Director-General upon request. The Safety Management System should be developed in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 9, *Safety Management*. Where there is an existing plant or site system, the condition of consent will be considered to be satisfied by the updating of that system.

The Safety Management System shall also detail the procedures for testing and ensuring continuous time and date functionality of all systems including embedded systems associated with the Chlor-alkali and Derivatives complex.

11. ONGOING HAZARDS MANAGEMENT

Three years after the commencement of operations of the proposed development or within such further period as the Director-General may agree, the Applicant shall update the hazard analysis for the Chlor-alkali and derivatives complex at the Applicant's expense. This analysis shall be forwarded to the Director-General for approval. Further updates will be required every three years or as may be requested by the Director-General. The analysis shall be prepared in accordance with the Department of Urban Affairs and Planning's Hazardous Industry Planning Advisory Paper No. 6, *Guidelines for Hazard Analysis*. This report shall cover individual fatality, injury and irritation risk and societal risk using the most recently available population and meteorological data.

Note: the Applicant shall comply with all reasonable requirements of the Director-General in respect of the implementation of any measures arising from the studies undertaken as a result of Condition 11 and shall implement those instructions to the satisfaction of the Director-General within such time as the Director-General may specify

12. INCIDENT REPORTING

Within 24 hours of any incident or near incident with actual or potential significant off-site impacts on people or the biophysical environment, a report shall be supplied to the Department outlining the basic facts. A further detailed report shall be prepared and submitted following investigations of the causes and identification of necessary additional preventative measures.

13. HAZARD AUDIT

Twelve months after the commencement of operations of the proposed development or within such further period as the Director-General may agree, the Applicant shall carry out a comprehensive hazard audit of the proposed development and submit a report on the audit to the Director-General. This audit is to be carried out at the Applicant's expense by a duly qualified independent person or team to be approved by the Director-General. Further audits will be required every three years or as may be requested by the Director-General. Hazard audits should be carried out in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 5, *Hazard Audit Guidelines*. This audit

shall also contain confirmation that time and date functionality of all systems have been tested in accordance with the Safety management System specified in condition 10(b).

BUILDING HEIGHT

14. Prior to lodging application for construction, the Applicant shall seek the approval of Sydney Airport Corporation and the Civil Aviation Safety Authority (CASA) in respect of any structure, inclusive of vents, chimneys, aerials, TV antennae and construction which exceeds the height at which approval is required under the Civil Aviation (Buildings Control) Regulations. This includes any temporary structure and/or equipment planned to be used during construction. This application must include the following information:
- (a) The nature of the proposed structure/activity
 - (b) The proposed location of the structure/activity relative to Mapping Grid of Australia 1994 (MGA94)
 - (c) The maximum overall height of the proposed structure/activity relative to Australian Height Datum (AHD)
 - (d) The purpose for which the structure/activity is intended to be used;
 - (e) The maximum height, relative to AHD of any temporary structure or equipment including construction cranes, intended to be used in the erection of the proposed building/structure
 - (f) The period of the proposed operation and desired operating hours for any temporary structures.

TRAFFIC AND TRANSPORT

15. No later than two months prior to the commencement of commissioning of the proposed development, or within such further period as the Director-General may agree, the Applicant shall prepare and submit for the approval of the Director-General a Traffic Management Plan (TMP) outlining management measures to ensure that road tanker drivers will predominantly use the main arterial roads – namely Foreshore Drive, General Holmes Drive and Wentworth Avenue, except for local deliveries. The Applicant shall endeavour to enter into contractual arrangements with transport companies to require their trucks to use the routes determined under the TMP.
16. On-site parking shall be provided for all vehicles associated with the operation and construction of the proposed development. This shall include vehicles transporting equipment, materials, contractors and workers. Under no circumstances shall vehicles transporting equipment or materials queue or park in neighbouring streets.
17. No more than one full (13 tonnes) road tanker of chlorine shall be parked on site at any given time. The total amount of time a full road tanker is present on site shall not exceed 4380 hours in any 12 month period. The tanker is to be parked in a dedicated area away from any main thoroughfare.
18. All parking spaces shall be drained, sealed and line marked to the satisfaction of Botany Bay City Council.

ENVIRONMENTAL MANAGEMENT

19. One month prior to commencement of construction work, the Applicant shall prepare an Environmental Management Plan (EMP) in consultation with the Environment Protection Authority (EPA) and Department of Land and Water Conservation (DLWC) for the approval of the Director-General. The EMP shall be implemented during the construction phase of the upgrade to the satisfaction of the Director-General. The EMP should be submitted as a supporting document for the application of the Pollution Control Approval from the EPA.
20. The EMP should address but not be limited to:
 - (a) Details of the soil and groundwater investigation to be carried out in the area proposed for earthworks
 - (b) Details of the management strategy for the handling , treatment and disposal of any acid sulphate soils and any contaminated material;
 - (c) Soil sediment control measures
 - (d) Surface run-off control
 - (e) Dust management plan
 - (f) Quality of excess water from construction site and monitoring
 - (g) Methods and discharges or use of excess water including criteria for discharge of stormwater to sewer, stormwater or treatment
 - (h) Groundwater protection
 - (i) The manner in which air and noise management and environmental monitoring will be implemented in relation to the new facilities.

No site works involving ground disturbance shall commence prior to approval of the plan.

21. During construction, excavated soils shall undergo a physical examination by a suitably qualified person to assess the possibility of contamination. Should there be reason to suspect contamination based on the physical examination, sampling and laboratory testing of the material shall be undertaken to allow the formation of appropriate management procedures to the satisfaction of the EPA.
22. The Applicant shall ensure that the proposed development, during construction and operation, does not impact on the neighbouring rail embankments. Details of drainage and stormwater management must be discussed with Rail Access Corporation (RAC) and Rail Estate to ensure that there is no impact on the operation of rail.
23. The Applicant shall submit for the approval of the Director-General, evidence that the environmental management of the proposed facilities has been integrated into the existing site Safety, Health and Environment Procedures.
24. At 3 year intervals, from the date of commencement of operations of the development, or as required by the Director-General, the Applicant shall submit an independent environmental audit of the development in accordance with ISO 14011 – Procedures for Environmental Auditing (or equivalent).

The audit shall be carried out at the Applicant's expense and be undertaken by a duly qualified independent person or team approved by the Director-General. The Applicant shall comply with all reasonable requirements of the Director-General in respect of the implementation of any measures arising from the studies undertaken as a result of Condition 22 and shall implement those instructions to the satisfaction of the Director-General within such time as the Director-General may specify.

POLLUTION CONTROL APPROVALS AND LICENSES

25. The Applicant shall obtain from the EPA all statutory approvals and licenses required under the Clean Air, Clean Waters, and Noise Control Acts and shall renew and maintain the licenses for the life of the development.

WORKCOVER REQUIREMENTS

26. The Development shall comply with the requirements of the Dangerous Goods Act 1975, as administered by WorkCover NSW, and if necessary be licensed under this Act.
27. One month prior to the commencement of operation, the Applicant shall inform the Director-General in writing of the dangerous goods requirements for the in-transit storage of Chlorine in bulk road tankers.

NOISE

28. No later than one month prior to the start of construction, the Applicant shall develop, to the satisfaction of the EPA, a Construction Noise Management Plan. This shall provide details of noise control measures to be undertaken during construction. This plan shall be developed in accordance with the requirements of the EPA Noise Control Manual.
29. All construction activities, likely to generate perceivable noise offsite, shall be restricted to the hours 7.00am to 6.00pm, Monday to Friday, and 7.00am to 1.00pm, Saturday, unless otherwise agreed to in writing by the EPA on a case by case basis.
30. The technique used for piling during construction shall be "auger piling" to ensure that there will be no vibration effects on nearby buildings or surrounding properties.
31. During construction the Applicant shall ensure that the L_{10} noise level (measured over a period of not less than 15 minutes when the construction site is in operation) does not exceed the background level by more than 5 dB(A) at residential boundaries and beyond, under prevailing meteorological conditions weather conditions.
32. The Applicant shall ensure that the noise emission from the operation of all plant and equipment associated with the proposed development shall conform to the Orica Pollution Control Licence No 2148 noise conditions. In addition:
 - (a) The operation of all new equipment in the Chlor-Alkali plant when assessed on any residential boundary shall not give rise to a sound pressure level that exceeds (L_{A10}) 40dB(A) night time and (L_{A10}) 50dB(A) day time.

- (b) The operation of all reused equipment in the Chlor-Alkali plant when assessed on any residential boundary shall not give rise to a sound pressure level that exceeds (L_{A90}) 47dB(A) night time and (L_{A10}) 60dB(A) day time.

New and reused equipment is as defined in the EIS "Replacement Chlor-Alkali Plant" (Dames & Moore dated 25 June 1998).

33. The Applicant shall ensure that the noise emission from the operation of all plant and equipment shall not give rise to a sound pressure level that exceeds L_{A10} 65dB(A) (when assessed on any neighbouring commercial/industrial premises).

Note: For assessment purposes, L_{A10} sound levels shall be assessed over a period of 10-15 minutes. Where the sound contains prominent tonal or frequency varying characteristics or is impulsive, a correction factor of 5dB(A) shall be added to the measured levels.

The noise emission limits apply for prevailing meteorological conditions, except under conditions of temperature inversions. Noise impacts that may be enhanced by temperature inversions must be addressed by

- (a) *documenting noise complaints received to identify any higher level of impacts or patterns of temperature inversions;*
 - (b) *where levels of noise complaints indicate a higher level of impact then actions to quantify and ameliorate any enhanced impacts under temperature inversions conditions should be detailed in the noise management protocol.*
34. Where practicable, during the commissioning of the Chlor-alkali plant, the Applicant shall ensure that test runs are conducted during daytime.
35. No later than one month prior to the start of operation, the Applicant shall prepare to the satisfaction of the EPA, a Noise Management Plan to address operating the proposed development in accordance with the Site Noise Reduction Program.
36. All machinery shall be installed and/or housed in such a manner as to prevent the emission of noise and transmission of vibration outside the premises.

AMENITY

37. 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.
38. 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.
39. All raw materials, manufactured goods and machinery shall be stored wholly within the development and not in adjacent forecourts, yards, access ways, car parking areas, or on Council's footpath.

40. All work shall be carried out inside the development and not in adjacent forecourts, yards, access ways, car parking areas, or on Council's footpath.
41. The Applicant shall screen or direct all on-site lighting away from residences and roadways to the satisfaction of Council.
42. Prior to construction, a colour scheme for the Chlor-alkali plant shall be prepared by the Applicant consistent with the aims and objectives of the Botany Bay City Council's "Environmental Improvement Program – Banksmeadow Industrial Area" submitted to and approved by the Director-General.
43. Any temporary structure erected on the southern or western side of the site shall be removed within 3 months being completed. Further, the temporary parking area for the contractors shall cease being used within one month of the plant commissioning being completed.

LANDSCAPING

44. Prior to seeking a construction certificate the Applicant shall prepare a detailed landscape plan for the development to be implemented within 6 months of the commissioning of the proposed development to the satisfaction of Botany Bay City Council.

UTILITY SERVICES

45. Any necessary alterations to public utility installations shall be made at the Applicant's own expense and shall meet the requirements of both the Council and the relevant authority/s.

HERITAGE

46. Any equipment or structure decommissioned or demolished as a result of this development consent should be fully documented. A report detailing the chemical and manufacturing processes should be maintained together with any oral history, flow diagrams of the manufacturing process, photographic records and documentation including scale drawings in accordance with the Guidelines from the Heritage Office. Three copies of this report to be forwarded to Council.

ANNUAL REPORT

47. The Applicant shall submit an annual report to Director-General in respect of the implementation and effectiveness of the conditions contained in this consent and compliance with the EIS and shall bring to the notice of the Director-General those matters which the Applicant considers may require further investigation. The first report shall be submitted one year from the date of this consent, and subsequent reports shall be submitted on the anniversary of this date or such period as the Director-General may agree.

This report shall include a record of commercial traffic movements into and out of the site annually from the date of commencement of operation. The report shall also include details of the hours spent by loaded chlorine road tankers on site.

48. The Applicant shall prepare an annual report to be distributed to the public detailing environmental performance, details of annual vehicle movements including dangerous goods, and compliance with conditions of consent. This report shall include details of the types and number of community complaints received during the year.

YEAR 2000 CONFORMITY

49. One month prior to the commencement of commissioning, the Applicant shall provide the Director-General with a report confirming that all automated systems, including embedded systems, used for plant operation, pollution control, fire safety and monitoring have been tested in accordance with the most recent edition of BSI/DISC PD2000-1 to confirmed continuous time and date functionality of those systems.

GENERAL

50. Adequate provision shall be made within the development for the storage, collection and disposal of waste and recyclable materials to the satisfaction of the Council of Botany Bay. A Waste Management Plan shall be submitted to Council at the commencement of construction detailing the type and quantity of waste to be generated by the development; materials to be reused or recycled; facilities/procedures for the storage, collection and disposal of waste and on-going management of waste.
51. Prior to the commencement of construction the Applicant shall implement an advertised 24-hour telephone service to handle complaints from members of the public during the construction period.
52. During the construction period the Applicant shall maintain a Complaints Register which shall be used to record details of all complaints received and actions taken by the Applicant in response to such complaints. The Register shall be available for inspection to all relevant approval/consent authorities.
53. The Applicant shall ensure the facility is built to withstand rail related vibration from the neighbouring rail yards.
54. The Applicant shall also ensure that no adverse impacts from construction and operation of the development on the nearby rail corridor and railway land.
55. Any dispute arising between any of the parties in respect to these conditions shall be referred to the Director-General for resolution.
56. Before commencing construction, the Applicant shall install and maintain vibration monitoring equipment in areas of vibration sensitive equipment on any neighbouring plants. This equipment shall be maintained and monitored over the life of the construction and commissioning of the proposed development.
57. This approval and consent does not relieve the Applicant of the obligation to obtain any other approval under the Local Government Act, 1993 as amended, the Ordinance made thereunder or any other Act.

RIGHT OF APPEAL

If you are dissatisfied with this decision, section 97 of the Unamended Environmental Planning and Assessment Act, 1979 gives you the right to appeal to the Land and Environment Court within 12 months of the date of receipt of this notice.

- Note:**
- (a) This consent operates from the date endorsed on the notice of determination of the development application (see Section 93 of the Unamended Environmental Planning and Assessment Act, 1979); and
 - (b) This consent lapses 5 years after the date from which it operates (see Section 99 of the Unamended Environmental Planning and Assessment Act, 1979). The conditions of consent will however continue to be valid for the full operating life of the development.

Notice of Modification

Section 96(1A) of the *Environmental Planning & Assessment Act 1979*

I, Chris Wilson, the A/ Executive Director, of Sustainable Development Assessments as delegate of the Minister for Planning, modify the development consent referred to in Schedule 1 as set out in Schedule 2.



Chris Wilson
A/ Executive Director
Sustainable Development Assessments

Sydney

6 June

2006

File No: R98/00010-7
MOD-12-2006

SCHEDULE 1

- Development consent:** granted by the Minister for Urban Affairs and Planning on 16 November 1998.
- In respect of:** development application 35/98, lodged with the Department of Urban Affairs and Planning on 30 June 1998, in relation to land described as Lot 1 DP 608153, 16-20 Beauchamp Road, Matraville
- For the following:** Installation of replacement chlor-alkali plant to produce 35,000 tonnes per annum gaseous chlorine.
- Modification Application:** Modification (MOD-12-1-2006) to: demolish the decommissioned ChlorAlkali plant buildings at the Botany Industrial Park

SCHEDULE 2

The development consent is modified by:

1) replacing existing conditions 1 and 1A with new conditions 1 and 1A as follows:

1. The Applicant shall carry out the development generally in accordance with:
 - a) the Environmental Impact Statement dated June 1998, prepared by Dames & Moore Pty Ltd and drawing number B73359 RevA;
 - b) modification application MOD-180-11-2005 with respect to replacement of the sodium hypochlorite loading bays; upgrade of sodium the hypochlorite tank farm; and replacement of the technicians' changing room;
 - c) modification application MOD-12-1-2006 with respect to the demolition of the decommissioned ChlorAlkali plant buildings at the Botany Industrial Park;
 - d) the letter to the Department dated 4 May 2006 prepared by Robert Evans, Site Environment Engineer, Orica relating to hazard reduction measures; and
 - e) the conditions of this consent.
- 1A. In the event of an inconsistency between:
 - a) the conditions of this consent and any document listed from condition 1a) to 1d) inclusive, the conditions of this consent shall prevail to the extent of the inconsistency; and
 - b) any document listed from condition 1a) to 1d) inclusive, and any other document listed from condition 1a) to 1d) inclusive, the most recent document shall prevail to the extent of the inconsistency.

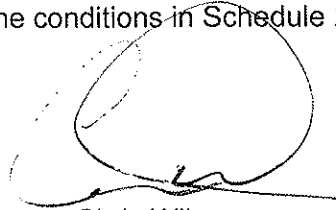
2) Inserting a new condition 19A following existing condition 19 as follows:

- 19A. Prior to the commencement of any demolition associated with MOD-12-1-2006, the Applicant shall update and implement the EMP (referred to in condition 19 above) to include a program for daily monitoring of atmospheric mercury concentrations for the demolition works. The program must include procedures for immediate stoppage of the offending activity on detection of emission levels exceeding the limit under the POEO (Clean Air) Regulations, of 0.2 mg/cubic metre. Work shall not recommence until remedial measures have been initiated to the satisfaction of the Director General and the DEC.
-

Notice of Modification

Section 96(1A) of the *Environmental Planning & Assessment Act 1979*

Under the Minister for Planning's delegation of 4 March 2009, I modify the development consent referred to in Schedule 1, subject to the conditions in Schedule 2.



Chris Wilson
Executive Director

Sydney, 29 SEPTEMBER 2009

SCHEDULE 1

The development consent (DA 35/98) granted by the Minister on 6 November 1998 for the construction and operation of a replacement Chlor-Alkali plant in the Botany Industrial Park.

SCHEDULE 2

The development consent is modified by:

1) **Replacing existing condition 1e) with the following:**

1e) MOD 3 to relocate the sodium hypochlorite plant; and

2) **Inserting immediately after condition 1e) the following:**

1f) the conditions of this consent.

3) **Replacing existing condition 1A with the following:**

1A In the event of an inconsistency between a condition of this consent and the documents listed under a) to e) above, the conditions of consent shall prevail to the extent of the inconsistency.

4) **Replacing existing condition 8 with the following:**

8 Pre-Startup

The Applicant shall submit to the Director-General a report detailing compliance with conditions 9 and 10(a) one month prior to the commencement of operation of Mod 3.

5) Replacing existing condition 9 with the following:

HAZARD MANAGEMENT

9. Pre-Construction

Construction of Mod 3, other than of preliminary works that are outside the scope of the hazard studies set out under subsection 9(a) to 9(c) shall not commence until the study recommendations have been considered, and where appropriate, acted upon.

(a) *Fire Safety Study*

Prior to commencement of construction of Mod 3, the Applicant shall update the existing Fire Safety Study (FSS) consistent with the Department of Planning's *Hazardous Industry Planning Advisory Paper No. 2 'Fire Safety Study Guidelines'*.

(b) *Hazard and Operability Study*

Prior to commencement of construction of Mod 3, the Applicant shall prepare a Hazard and Operability Study (HAZOP) for the relocation of the sodium hypochlorite plant. The HAZOP shall be chaired by an independent qualified person and shall be consistent with the Department of Planning's *Hazardous Industry Planning Advisory Paper No. 8 'HAZOP Guidelines'*

(c) *Construction Safety Study*

Prior to commencement of construction of Mod 3, the Applicant shall prepare a Construction Safety Study consistent with the Department of Planning's *Hazardous Industry Planning Advisory Paper No. 7 'Construction Safety Study Guidelines'*.

6) Replacing existing condition 10(a) with the following:

(a) *Emergency Plan*

Prior to commissioning Mod 3, the Applicant shall develop a new or updated Emergency Plan. The plan shall be consistent with the Department of Planning's *Hazardous Industry Planning Advisory Paper No. 1 'Industry Emergency Planning Guidelines'*.

7) Replacing existing condition 21 with the following:

21(a) Excavated material shall be screened, tested and disposed of in accordance with the Department of Environment, Climate Change and Water's *Waste Classification Guidelines 2008*. Testing shall include, but not be limited to, mercury and hexachlorobenzene.

21(b) Materials found to be contaminated shall be disposed of to an appropriately licensed facility and not reused on site for any purpose.

8) Insert new condition 26A immediately following condition 26:

27A Mod 3 shall comply with Australian Standard AS 3780 *The Storage and Handling of Corrosive Substances*.

9) Insert new condition 27A immediately following condition 27:

27A The Applicant shall dispose of any asbestos contaminated materials in accordance with the requirements of WorkCover NSW.

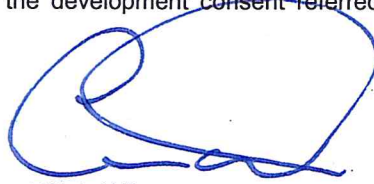
10) Inserting new condition 46A immediately following condition 46:

46A The Applicant shall provide a supplementary report for any equipment or structure decommissioned or demolished as a result of Mod 3. The report shall detail the chemical and manufacturing processes associated with the sodium hypochlorite plant with any oral history, photographic records and documentation including scale drawings. Copies of the supplementary report shall be provided to the Director-General and the City of Botany Bay Council.

Notice of Modification

Section 75W of the *Environmental Planning & Assessment Act 1979*

As delegate of the Minister for Planning and Infrastructure, under the delegation executed on 14 September 2011, I hereby modify the conditions of the development consent referred to in Schedule 1, subject to the conditions in Schedule 2.



Chris Wilson
Executive Director
Major Projects Assessment

Sydney

10 SEPTEMBER

2012

SCHEDULE 1

Development Consent

Construction and operation of a replacement Chlor-Alkali plant at the Botany Industrial Park DA 35/98 granted by the Minister on 6 November 1998.

SCHEDULE 2

1. In the list of definitions delete:

Department	Department of Urban Affairs and Planning
Director-General	the Director-General of the Department of Urban Affairs and Planning
DLWC	Department of Land and Water Conservation

and insert in alphabetical order:

Department	Department of Planning and Infrastructure,
Director-General	The Director-General of the Department
NOW	NSW Office of Water

2. Replace all references to the Director-General of Urban Affairs and Planning with the Director-General
3. Replace all references to DLWC with NOW
4. Replace existing condition 1f) Schedule 2 with the following:
 - (f) modification application 35/98 Mod 4, in relation to replacement of caustic tanks lodged with the Department of Planning and Infrastructure on 13 April 2012 and accompanied by an environmental assessment prepared by Parsons Brinckerhoff dated May 2012; and
 - (g) the conditions of this consent.
5. replace existing condition 1A Schedule 2 in with the following:
 - 1A In the event of an inconsistency between the conditions of this consent and any document listed from condition 1a) to 1f) inclusive, the conditions of this consent shall prevail to the extent of the inconsistency; and
6. Insert the following new condition 1B after existing condition 1A Schedule 2:

1B The Applicant shall construct the spill containment area of the caustic tanks in accordance with:
AS 3780-2008 The storage and handling of corrosive substances.

7. replace existing condition 9 Schedule 2 with the following:

9 Prior to commencement of construction of Mod 4, the Applicant shall prepare a Construction Safety Study consistent with the Department of Planning's *Hazardous Industry Planning Advisory Paper No. 7 'Construction Safety Study Guidelines'*.

8. Insert the following new condition 19B after condition 19A Schedule 2:

19B Prior to the commencement of the construction of Mod 4, the Applicant shall prepare a Construction Environmental Management Plan (CEMP) (in consultation with the EPA and to the satisfaction of the Director-General. The CEMP shall reflect the works proposed as part of Mod 4 and shall include:

- (a) the results of the recent soil sampling undertaken by Orica and documented in the Figure titled *Orica Botany Caustic Tank Project* and dated 02/08/2012;
- (b) measures, such as additional sampling and/or remedial measures, to manage any areas of shallow soil contamination;
- (c) details of the management strategy for the handling, treatment and disposal of any contaminated material
- (d) a defined heavy vehicle route restricted to the arterial road network and contractor induction requiring the use the defined route;
- (e) construction noise and vibration management measures including:
 - monitoring of heritage listed items during the use of any vibration intensive equipment; and
 - safe working distances for the vibration intensive equipment;
- (f) soil sedimentation and runoff control measures;
- (g) management measures to control dust; and
- (h) waste management measures.

9. replace existing condition 46A Schedule 2 with the following:

46A The Applicant shall provide a supplementary report including a photographic record of any equipment or structure decommissioned or demolished as a result of Mod 4. Copies of the supplementary report shall be provided to the Director-General and the City of Botany Bay Council prior to demolition.

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

DETERMINATION OF A DEVELOPMENT APPLICATION PURSUANT TO SECTION 80(1)(a) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

I, the Minister for Urban Affairs and Planning, in pursuance of section 80(1)(a) of the Environmental Planning and Assessment Act, 1979, determine the development application referred to in Schedule 1 by granting consent to that application subject to conditions set out in Schedule 2 (file R98/00168).

The reasons for the imposition of conditions are to ensure the continuing management of the existing total industrial complex on the subject land such that potential hazards do not pose an unacceptable risk to the adjoining neighbourhood; to ensure that conditions of consent for existing plants on the subject land are maintained or modified to reflect the new property boundaries created by the subdivision; and to ensure the continuing protection of the environment and amenity of the neighbouring area.

Sydney, 16/12/1998.

Minister for Urban Affairs and Planning

SCHEDULE 1

Application made by	Orica Limited
To	Minister for Urban Affairs and Planning
In respect of land being	Lots 1 and 2, DP 608153 and lots 3 and 4, DP 206413, known as 16-20 Beauchamp Road, Matraville
For the following development	Subdivision of the subject land into 9 lots
Development Application	The Development Application (DA) No. 30/98 lodged with the Department of Urban Affairs and Planning on 18 September 1998, accompanied by a Statement of Environmental Effects, dated 11 September 1998, prepared by Woodward-Clyde Pty Ltd.

ABBREVIATIONS AND INTERPRETATION

Act	<i>Environmental Planning and Assessment Act, 1979</i>
Applicant/Orica	Orica Limited and its successors in title
BIP	Botany Industrial Park
Class A Shareholders	The owners of the SPC (Orica Limited, Huntsman Corporation Pty Ltd and Olefines Pty Ltd, and their successors in title) or any other person that is issued with Class A shares in accordance with the constitution of the SPA
Council	City of Botany Bay Council
CPWE	Area subject to MP 06_0197 for the remediation of the car park waste encapsulation area located in the north-east corner of the BIP
DA	Development Application
Department	Department of Planning and Environment
EPA	Environment Protection Authority
LEP	Local Environmental Plan
Minister	Minister for Planning
Regulation	<i>Environmental Planning and Assessment Regulation, 2000</i>
RMS	Roads and Maritime Services
Secretary	Secretary of the Department of Planning and Environment, or delegate
SEE	Statement of Environmental Effects
SPC	Special Purpose Company
Subject Land	Area illustrated by Drawing No. B87210 (Rev 6), submitted with Development Application No. 30/98 (subject to final survey) and as amended by Figure 4, prepared by AECOM Pty Ltd dated 14 August 2014 and included in Attachment A.

SCHEDULE 2

1. The subdivision shall be carried out in accordance with the Statement of Environmental Effects (SEE), dated 11 September, 1998, and Drawing No. B87210 (Rev 6), submitted with Development Application No. 30/98 (subject to final survey) and as amended by Drawing No. NA50613011 prepared by Cardno (NSW/ACT) Pty Ltd, dated 10 January 2013, and as amended by Environmental Assessment titled S75W Modification Assessment Contemporisation of the Botany Industrial Park Subdivision submitted with modification request DA 30/98 MOD 2 dated 14 August 2014 and prepared by AECOM Australia Pty Ltd.
2. A Special Purpose Company (SPC) shall be established to the satisfaction of the Secretary. The function of the SPC shall be maintained throughout the life of this consent in accordance with the SEE and these conditions of consent.
3. The SPC shall be responsible for the management of the Botany Industrial Park (BIP) in accordance with its Constitution and Rules. These rules will deal with, but not be limited to, matters listed in schedule 3 to this consent.
4. The owner and any lessee or occupier of a lot created in the subdivision shall become and shall remain a member of the SPC and shall comply with the Constitution and Rules of the SPC, including those related to matters referred to in Condition 3. A covenant shall be placed, and remain on the Certificate of Title of each new lot created, requiring the owners of all lots to comply with this Consent.
The present occupiers of Lot 6 (BOC Gases Australia Ltd) and Lot 7 (Air Liquide Australia) are not required to become members of the SPC nor are they bound by this consent. However, a future

change of occupancy or of use of these lots will bind future owners or occupiers to all conditions of this consent.

5. Within three years from the date of approval of modification request DA 30/98 MOD 2 and every three years thereafter, the SPC shall provide a report to the Secretary on the environmental performance and compliance with all conditions of consent for developments within the BIP.
6. Within three years from the date of approval of modification request DA 30/98 MOD 2 and every three years thereafter, the SPC shall submit a triennial report to the Secretary for approval. This report shall detail the implementation of responsibilities identified in Schedule 3 of this consent as well as any other matter that may require further investigation. The SPC shall comply with the reasonable requirements arising from the Secretary's assessment of this report.
7. The SPC shall ensure internal pedestrian and vehicular access to all lots in the BIP.
8. Adequate car parking and vehicle manoeuvring areas shall be provided for each new lot created, to the satisfaction of the Council.
9. No new access points are to be created to any public roads without the approval of the Council and RMS.
10. The operators of existing plants on the new lots shall obtain/renew all licenses necessary for the continued operation of the plants. Prior to the sale and or leasing of any lot created by this consent, the respective buyer/lessee must consult all relevant agencies with respect to licence requirements.
11. Compliance with the requirements of any EPA licence or approval relating to premises within the BIP, or to activities on those premises, shall not be detrimentally affected by the granting of consent to this application.
12. The applicant shall, within ninety (90) days of the date of this consent, apply for modification of existing conditions of consent, as specified in schedule 4 to this consent, in accordance with section 96 of the Act. Within 60 days of this consent, the Applicant shall inform the Secretary of any other existing consents which, due to the granting of this consent, are rendered invalid or are altered in such a way as to change the original intention of that consent.
13. No loading or unloading of vehicles shall occur on the Right of Carriageway, being lot 9 in the proposed subdivision, without the written approval of the Secretary.
14. No parking or queuing of vehicles shall occur on the Right of Carriageway, being lot 9 of the proposed subdivision.
15. The Applicant shall comply with all the reasonable requirements of the Secretary in respect of the implementation of measures arising from this development consent. Further, the Applicant shall bring to the attention of the Secretary any matter that may require further investigation and the issuing of instruction from the Secretary. The Applicant shall implement those instructions to the satisfaction of the Secretary within such time as the Secretary may specify.
16. The Applicant shall meet reasonable requirements of all public authorities having statutory responsibilities in respect of the proposed development.

RIGHT OF APPEAL

If you are dissatisfied with this decision, section 97 of the Act gives you the right to appeal to the Land and Environment Court within 12 months of the date of receipt of this notice.

Note:

- a) This consent operates from the date endorsed on the notice of determination of the development application (see section 93 of the Act); and
- b) This consent lapses 5 years after the date from which it operates (see section 99 of the Act). The conditions of consent will however to be valid for the full operating life of the development.
- c) All existing conditions of development and building consents relating to existing plants on the subject land remain in force until/unless they are expressly revoked or modified in accordance with the Act.

SCHEDULE 3

RESPONSIBILITIES OF THE SPC AND ITS MEMBERS

The Special Purpose Company (SPC) shall be responsible for, inter alia, the overall coordination and implementation of the following aspects of the Botany Industrial Park (BIP) operations:

1. Site Safety Management Systems
All members of the SPC shall maintain a Safety Management System for their own operations, consistent with the requirements of *Hazardous Industry Planning Advisory Paper No. 9 – Safety Management Systems* (DoP, 2011) and the *Work Health and Safety Regulation 2011*.
2. Site Fire Safety Study
 - a. The SPC shall maintain an up-to-date Fire Safety Study for the BIP.
 - b. All members of the SPC shall maintain a Fire Safety Study for their own operations. Each study shall cover the relevant aspects of *Hazardous Industry Planning Advisory Paper No. 2 – Fire Safety Study Guidelines* (DoP, 2011) and the New South Wales Government's "Best Practice Guidelines for Contaminated Water Retention and Treatment Systems".
 - c. Any member of the SPC who proposes changes which potentially affect its Fire Safety Study shall also review the BIP Fire Safety Study and provide information for updating of the BIP Fire Safety Study, if an update is required.
 - d. Any revision that would result in a significant change to the BIP Fire Safety Study shall be submitted for the approval of the Secretary and the New South Wales Fire Brigades.
3. Site Emergency Plan
 - a. The SPC shall maintain an up-to-date Site Emergency Coordination Plan for the BIP.
 - b. All members of the SPC shall maintain an Emergency Plan for their own operations, consistent with the requirements of *Hazardous Industry Planning Advisory Paper No. 1 – Industry Emergency Planning Guidelines* (DoP, 2011).
 - c. Any member of SPC proposing changes which may affect the BIP Emergency Coordination Plan shall provide the SPC with relevant information to allow update the BIP Emergency Coordination Plan.
 - d. Any revision that would result in a significant change to the BIP Emergency Coordination Plan shall be submitted to the Secretary for approval.
4. Site Cumulative Risk Assessment
 - a. The SPC shall maintain an updated Quantitative Risk Assessment for the BIP. This Risk Assessment shall be updated:

- i. If there is a change at the BIP, which will significantly change the results of the Risk Assessment; or
 - ii. If required by the Secretary; or
 - iii. In accordance with the provisions of the Work Health and Safety Regulation 2011; or
 - iv. At least every 5 years.
 - b. Each quantitative risk assessment (or update to such an assessment) shall include individual, fatality, injury and irritation risks and societal risks using the most recently available population and meteorological data. Each quantitative risk assessment (or update to such an assessment) shall be in accordance with Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis (DoP, 2011).
 - c. Each member of SPC shall provide the relevant information and resources to the SPC to ensure that each quantitative risk assessment (or update to such an assessment) is reviewed and updated as necessary.
 - d. Each quantitative risk assessment (or update to such an assessment) shall be submitted to the Secretary for approval.
6. Stormwater Management
- The SPC shall ensure that there is appropriate management in place for that part of the stormwater system that is common to all parties within the subject land and provide relevant information to the EPA upon request.
7. Approval of Development proposals
- a. The SPC shall ensure that there is a procedure in place for the internal review by all Class A Shareholders of the SPC of any Development Application, Part 4A certificate or any application to modify any consent, approval or certificate prior to lodgement of such an application with the relevant consent authority or certifying authority.
 - b. The SPC shall ensure that adequate consideration of the application has been given with regard to the integrated operations of the site.
8. Management of Site Services and Infrastructure
- The SPC shall ensure that the common site services and infrastructure are maintained to a standard agreed by the Class A Shareholders.
9. Community Consultation
- The SPC shall maintain a Community Consultative Committee, which shall meet regularly. The Committee shall include at least two representatives from the SPC as well as positions to be occupied by four community representatives and Council, should it wish to participate. The SPC shall provide regular information and environmental performance results of the BIP to the Committee.
10. Site Security and Controlled Access Management
- The SPC shall ensure adequate security for the perimeter of the BIP. Access to the BIP shall be a standard comparable with the objectives of the Work Health and Safety Regulation 2011 (Chapter 9).
11. Landscaping of the Site, regeneration, general improvement and maintenance
- a. The SPC shall be responsible for ensuring the ongoing health and maintenance of the outer boundary landscaping for the BIP.

ATTACHMENT A – BOTANY INDUSTRIAL PARK BOUNDARY AND SUBDIVISION LAYOUT



SCHEDULE 4

CONDITIONS OF DEVELOPMENT CONSENTS FOR EXISTING PLANTS THAT ARE REQUIRED TO BE MODIFIED GENERALLY AS SPECIFIED BELOW

POLYTHENE & ETHYLENE OXIDE, PT LOT 1 DP 584643 - APPROVED BY PEC 12.7.79

- (c) Noise levels emanating from the proposed uprated plants shall not exceed a night time limitation of 50 dBA in adjacent residential properties
- (i) In the event of abnormal environmental conditions arising from the development hereby approved, the developer shall promptly take remedial action in order to minimise any inconvenience to the public at large

OLEFINES 2 STAGE 2 --PT LOT 1, D.P.584643 - APPROVED BY DIRECTOR OF PEC
7.1.80 (DA 79-A-184)

- (vi) In the event of abnormal environmental or safety conditions arising from the development hereby approved, the developer shall promptly advise the Police, the EPA, Botany Bay City Council, and any other statutory body that may be appropriate.
- (ix) The noise contribution from the proposed plant to the overall noise emission from the whole work complex, on land currently in the ownership of Orica Australia Pty Ltd, at the nearest residential area, shall not exceed a night time limitation of 40dB(A) and noise levels emanating from the whole work complex, including the proposed plants, shall not exceed a night time limitation of 50 dBA in adjacent residential properties.

SURFACTANTS, LOT 1 D.P. 608153 - APPROVED BY THE MINISTER 17.10.88 (DA 1789)

- (8) The premises and operations being conducted in such a manner as not to interfere with the amenity of the neighbourhood outside the boundaries of the whole complex currently owned by Orica Australia Pty Ltd, by reason of noise, vibration, smell, fumes, vapour, steam, soot, ash, dust, waste water, waste products, grit, oil or otherwise.
- (9) The occupier of the premises shall not cause, permit or allow the emission of any odour or odorous air impurity from the plant capable of detection outside the boundaries of the whole complex currently owned by Orica Australia Pty Ltd.
- (12) All loading and unloading in relation to the use of the premises shall take place wholly within the lot on which the plant is located.

ALKATUFF - LOT 1 DP 608153 - APPROVED BY THE MINISTER 5.2.90 (DA 2181)

- (11) The Applicant shall obtain the approval of the EPA and Botany Bay City Council with respect to the details of all stormwater collection and disposal from the lot on which the plant is located.
- (17) The premises and operations being conducted in such a manner as not to interfere with the amenity of the neighbourhood outside the boundaries of the whole complex

currently owned by Orica Australia Pty Ltd, by reason of noise, vibration, smell, fumes, vapour, steam, soot, ash, dust, waste water, waste products, grit, oil or otherwise

- (20) All loading and unloading of vehicles in relation to the use, shall take place wholly within the lot on which the plant is located

SOLVENTS CLOSURE, LOT 1 DP 608153 - APPROVED BY THE MINISTER 20.12.90
(DA 2438)

- (3) The premises and operations shall be conducted in such a manner as not to interfere with the amenity of the neighbourhood outside the boundaries of the whole complex currently owned by Orica Australia Pty Ltd by reason of noise, vibration, smell, fumes, vapour, steam, soot, ash, dust, waste water, waste products, grit, oil or otherwise.
- (4) The occupier of the premises shall not cause, permit or allow the emission of any odour or odorous air impurity or other gas emission from this development such that it can be detected by odour from this development outside the property boundaries of the whole complex currently owned by Orica Australia Pty Ltd.
- (14) All loading and unloading of vehicles in relation to the use of the premises shall take place wholly within the lot on which the plant is located.

FERRIC CHLORIDE LOT 1, DP 608153 - APPROVED BY THE MINISTER 23.12.92 (DA 2834)

- (4) The operation of the proposed plant shall be conducted as not to interfere with or materially affect the amenity of the neighbourhood outside the boundaries of whole complex currently owned by Orica Australia Pty Ltd, by reason of noise, vibration, smell, fumes, vapour, steam, soot, ash, dust, waste water, waste products, grit, oil or otherwise.
- (5) The operator of the proposed plant shall not cause, permit or allow the emission of any odour or odorous air impurity from this development such that it can be detected by odour outside the property boundaries of the whole complex currently owned by Orica Australia Pty Ltd.
- (12) All loading and unloading of vehicles in relation to the use of the proposed plant shall take place wholly within the lot on which the plant is located.
- (23) Within 1 working day of any incident or near incident with actual or potential significant impacts on people or the biophysical environment outside the lot on which the plant is located, a report shall be supplied to the Department outlining the basic facts. A further detailed report shall be prepared and submitted following investigations of the causes and identification of necessary additional preventative measures.

ETHANE CONVERSION LOT 2 & PT. LOT 1 DP 608153 - APPROVED BY THE MINISTER 22.11.94 (DA 27/94)

- (4) Within 24 hours of any incident or near incident with actual or potential significant impacts on people or the biophysical environment outside the lot on which the plant is located, a report shall be supplied to the Director-General outlining the basic facts. A

further detailed report shall be prepared and submitted following investigations of the causes and identification of necessary additional preventative measures.

ALKATUFF PLANT UPGRADE, LOT 1 DP 608153 - APPROVED BY THE MINISTER
20.11.97 (DA 35/97)

- (5) Within 24 hours of any incident or near incident with actual or potential significant impacts on people or the biophysical environment outside the lot on which the plant is located, a report shall be supplied to the Director-General outlining the basic facts. A further detailed report shall be prepared and submitted following investigations of the causes and identification of necessary additional preventative measures.
- (11) The premises and operations shall be conducted in such a manner as not to interfere with or materially affect the amenity of the neighbourhood outside the boundaries of whole complex currently owned by Orica Australia Pty Ltd, by reason of noise, vibration, smell, fumes, vapour, steam, soot, ash, dust, waste water, waste products, grit, oil or otherwise.
- (12) The occupier of the premises shall not cause, permit or allow the emission of any odour or odorous air impurity from this development such that it can be detected outside the property boundaries of the whole complex currently owned by Orica Australia Pty Ltd.
- (18) The operation of all plant and equipment when assessed on any commercial/industrial premises adjacent to the lot on which the plant is located, shall not give rise to a sound pressure level that exceeds LA10 65dB(A) at any time.

ALKATHENE SWITCH ROOM, LOT 1, DP 608153 - APPROVED BY COUNCIL 10.7.97
(DA/BA 97/0662)

Part A (Planning Conditions)

- (2) The premises and operations shall be conducted in such a manner as not to interfere with or materially affect the amenity of the neighbourhood outside the boundaries of whole complex currently owned by Orica Australia Pty Ltd, by reason of noise, vibration, smell, fumes, vapour, steam, soot, ash, dust, waste water, waste products, grit, oil or otherwise
- (3) The occupier of the premises shall not cause, permit or allow the emission of any odour or odorous air impurity from this development such that it can be detected outside the property boundaries of the whole complex currently owned by Orica Australia Pty Ltd.

ALKATHENE BLENDING SILO, LOT 1, DP 608153 - APPROVED BY COUNCIL 11.9.97
(DA/BA 97/0715)

Part A (Planning Conditions)

- (3) The occupier of the premises shall not cause, permit or allow the emission of any odour or odorous air impurity from this development such that it can be detected outside the property boundaries of the whole complex currently owned by Orica Australia Pty Ltd.

- (7) All loading and unloading of vehicles in relation to the use of the Holding Silo shall take place wholly within the lot on which the plant is located.
- (8(c)) The operation of all plant and equipment when assessed on any commercial/industrial premises adjacent to the lot on which the plant is located, shall not give rise to a sound pressure level that exceeds LA10 65dB(A).
- (10) The premises and operations shall be conducted in such a manner as not to interfere with or materially affect the amenity of the neighbourhood outside the boundaries of whole complex currently owned by Orica Australia Pty Ltd, by reason of noise, vibration, smell, fumes, vapour, steam, soot, ash, dust, waste water, waste products, grit, oil or otherwise.

CHLOR-ALKALI PLANT, LOT 1, DP 608153 - APPROVED BY THE MINISTER 6.11.98
(DA 35/98)

- (9(a)) (Second bullet point)....Details of the type, capacity and proposed location upon the lot on which the plant is located, of all appliances and the reasons for their suitability as proposed.
- (10(a)) A comprehensive emergency plan and detailed emergency procedures for the proposed development. This plan should include detailed procedures for the safety of people in areas outside the whole complex currently owned by Orica Australia Pty Ltd. The plan shall be in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 1, *Industry Emergency Planning Guidelines*. Where there is an existing plant or site plan, the condition of consent will be considered to be satisfied by the updating of that plan.
- (12) Within 24 hours of any incident or near incident with actual or potential significant impacts on people or the biophysical environment outside the lot on which the plant is located, a report shall be supplied to the Director-General outlining the basic facts. A further detailed report shall be prepared and submitted following investigations of the causes and identification of necessary additional preventative measures.
- (16) Parking shall be provided within the lot on which the plant is located, for all vehicles associated with the operation and construction of the proposed development. This shall include vehicles transporting equipment, materials, contractors and workers. Under no circumstances shall vehicles transporting equipment or materials queue or park in neighbouring streets.
- (17) No more than one road tanker full of chlorine (13 tonnes) shall be parked within the lot on which the plant is located, at any given time. The total amount of time a full road tanker is present within the lot shall not exceed 4380 hours in any 12 month period. The tanker is to be parked in a dedicated area away from any main thoroughfare.
- (23) The Applicant shall submit for the approval of Director-General, evidence that the environmental management of the proposed facilities has been integrated into the existing Safety, Health and Environment Procedures for the whole complex currently owned by Orica Australia Pty Ltd.
- (29) All construction activities, likely to generate perceivable noise outside the boundaries of the lot on which the plant is located, shall be restricted to the hours 7.00am to 6.00pm, Monday to Friday, and 7.00am to 1.00pm, Saturday, unless otherwise agreed to in writing by the EPA.

- (32) The Applicant must ensure that the noise emission from the operation of all plant and equipment shall:
- (c) not give rise to a sound pressure level that exceeds $L_{A10} 65\text{dB(A)}$ (when assessed on any commercial/industrial premises adjacent to the lot on which the plant is located,
- (37) The premises and operations shall be conducted in such a manner as not to interfere with, or materially affect, the amenity of the neighbourhood outside the boundaries of whole complex currently owned by Orica Australia Pty Ltd, by reason of noise, vibration, smell, fumes, vapour, steam, soot, ash, dust, waste water, waste products, grit, oil or otherwise.
- (38) 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 of the whole complex currently owned by Orica Australia Pty Ltd.
- (43) Any temporary structure erected on the southern or western side of the whole complex currently owned by Orica Australia Pty Ltd, shall be removed within 3 months of being completed. Further, the temporary parking area for the contractors shall cease being used within one month of the plant being completed.
- (47) (Second paragraph) This (Annual) report shall include a record of commercial traffic movements into and out of the lot on which the plant is located, annually from the date of commencement of operation. The report shall also include details of the hours spent by loaded chlorine road tankers on the lot.

ENVIRONMENTAL IMPACT STATEMENT
REPLACEMENT OF CHLOR-ALKALI PLANT
16-20 Beauchamp Road, Matraville, NSW
for
Orica Australia Pty Ltd

EXECUTIVE SUMMARY

I. INTRODUCTION

Orica Australia Pty Ltd has operated a petrochemical complex at Botany, New South Wales, since July 1997. The complex was formerly owned and operated by ICI Australia Operations Pty Ltd. The complex is comprised of six main plants within the site. These plants are the Chlorine & Derivatives, Alkathene (Polythene 1), Alkatuff (Polythene 2), Surfactants, Olefines and Site Utilities.

Approximately 660 employees work on the Orica site and a total of almost 50 basic chemical and plastic polymer products are produced, which both Orica and its customers use.

Orica propose to replace portions of the Chlorine & Derivatives Plant, specifically the Chlor-alkali plant. The Chlor-alkali plant produces chlorine, sodium hydroxide (caustic soda) and hydrogen. These form the principle raw materials for the current derivative plants; namely the chlorine liquefaction plant, hydrochloric acid plant, sodium hypochlorite plant and the ferric chloride plant. The main raw materials used at the Chlor-alkali plant are sodium chloride (salt), water and electricity.

The existing Chlor-alkali plant manufactures chlorine by electrolysis of brine in mercury cells. The proposed replacement plant will use modern membrane cell technology, eliminating the use of mercury from the plant.

This Environmental Impact Statement (EIS) has been prepared in accordance with the requirements of Part IV of the Environmental Planning and Assessment Act 1979 (EP&A Act) and associated regulations, and covers the proposed plant replacement. The proposal falls within the scope of Designated Development within the meaning of Schedule 3 of the Environmental Planning and Assessment Regulation, 1994. As such an EIS covering all matters specified in the Regulation must

accompany the Development Application (DA). The development also falls within the requirements of SEPP 34 and the SEPP34 development approval process will be followed.

II. THE DEVELOPMENT

Development Consent is being sought for the replacement of the Chlor-alkali plant and other portions of the Chlorine & Derivatives Plant. The proposed replacement plant will remain within the current Chlorine & Derivatives Plant area.

The proposed development involves:

- replacement of the existing Chlor-alkali mercury cell technology with modern membrane cell technology with production capacity of 35,000 tonnes/yr. The brine treatment system, chlorine drying and compression systems will be modernised and a caustic evaporation system will be installed;
- closure of the chlorine liquefaction plant and all chlorine liquid storage tanks. Orica intend to centralise liquid chlorine production in Melbourne and Gladstone. Ongoing in-transit storage of liquid chlorine (produced in the proposed Melbourne facility) in drums, cylinders and road tankers will continue; and
- relocation of the caustic soda loading facility.

The total chlorine produced will be reduced from 50,000 tonnes/year to 25,000 tonnes/year. This decrease in production is a consequence of decreased demand for chlorine at the Botany site following closure of the Ethylene Dichloride (EDC) plant and the transfer of liquid chlorine facilities to Melbourne and Gladstone.

These changes involve construction work, installation of new equipment and changing existing equipment. The total capital investment for the development and commissioning of the replacement Chlor-alkali plant is estimated to be \$40 million. The proposed development covered by this EIS does not include decommissioning and demolition of the existing Chlor-alkali plant. These activities will be handled in a separate project.

III. PROJECT NEEDS, OBJECTIVES AND ALTERNATIVES

The proposed development is a substantial part of Orica's strategic plan to meet existing and future demand for chlorine derivative products and caustic soda in Australia in an economic and environmentally acceptable manner.

The primary objectives of the proposed replacement plant are to:

- *increase the efficiency of the chlorine production process;*
- *decrease the amount of chlorine produced at the plant; and*
- *continue to effectively use existing capital on the Orica site.*

Benefits from the proposed development will be realised with respect to improving the overall environmental, safety and economic performance of the Chlorine & Derivatives Plant. The new technology proposed will eliminate the use of mercury, providing many flow-on benefits from both an environmental and safety standpoint. Decreased operating and maintenance costs associated with the replacement plant will enable the business to compete more effectively against imports.

Due to the existing site infrastructure and plant equipment, the current site has the benefit of being able to easily integrate the proposed replacement plant. Due to the advantages offered by the existing site and close proximity to the product markets there are no feasible alternatives that offer the same benefits as the existing site in Botany.

Alternative processes were investigated. The membrane technology is commercially viable and the technology of choice for new Chlor-alkali plants is currently used to produce 20% of the world's chlorine. Membrane cell technology is the most energy efficient process for production of chlorine and is currently in use at Orica's Gladstone facility. Thus, membrane technology is considered to be the most appropriate process for the proposed replacement plant.

Should the proposed development not be approved, efficiency will continue to decline, opportunity to reduce the cost of production will be lost and environmental impacts would increase over time as equipment ages and efficiency decreases.

IV. EXISTING OPERATIONS

The existing Chlor-alkali plant is located within the Chlorine & Derivatives Plant, in the southern section of the Botany site. The Chlor-alkali plant manufactures chlorine from a mercury cell process, using salt, water and electricity as the main inputs.

The co-products; caustic soda and hydrogen are generated from the process. These products are either used on-site or sold to customers.

Chlorine produced is used in the following "derivative" plants, which are located within the bounds of the Chlorine & Derivatives Plant:

- *Hydrochloric Acid;*
- *Ferric Chloride;*
- *Sodium Hypochlorite; and*
- *Liquid Chlorine.*

Production of chlorine from the plant was originally 70,000 tonnes/year with a capacity to produce 80,000 tonnes/year. Until recently (March 1998), chlorine was also used in the derivative Ethylene Dichloride (EDC) plant. Following the closure of the EDC plant, the demand for chlorine reduced, and production decreased to 50,000 tonnes of chlorine/year. Production of chlorine at the existing Chlor-alkali plant will be in the order of 35,000 tonnes/year until the proposed replacement Chlor-alkali plant comes on-line in 2000.

The main processes at the existing Chlor-alkali plant comprise:

- *brine preparation and treatment;*
- *electrolysing the brine in a mercury cell system;*
- *separating the products into chlorine, hydrogen and caustic soda;*
- *caustic soda purification;*
- *chlorine drying; and*
- *hydrogen purification.*

The plant currently operates 24 hours a day, seven days a week. Current operating up-time is between 80% to 85% of the year due to planned and unplanned outages. The number of staff employed at the plant is 98.

V. PROPOSED DEVELOPMENT

The proposed Chlor-alkali plant will have the capacity to produce approximately 35,000 tonnes/year of chlorine using membrane cell technology. The plant will be commissioned around December 2000 and be located within the existing Chlorine & Derivatives Plant boundary approximately 20 m to the west of the existing Chlor-alkali plant. As with the existing plant, chlorine produced will be in a gaseous state, and will be transferred by pipeline to existing derivative plants at the Botany site where it will be used for the production of hydrochloric acid, ferric chloride and sodium hypochlorite. Caustic soda and hydrogen will continue to be produced.

The main differences between the existing and proposed replacement Chlor-alkali plant are as follows:

- production will decrease from 35,000 tonnes/year of chlorine to approximately 25,000 tonnes/year of chlorine;
- the uptime of operating the plant will increase from 83% to operating greater than 95% of the time;
- the membrane cell system will replace the existing mercury cell technology. Mercury will not be used at the plant;
- the brine treatment system will be replaced;
- chlorine gas produced in the membrane cells will be dried using modernised equipment;
- the dried chlorine will then be compressed in a liquid ring compressor;
- a new caustic evaporator will be installed to increase the concentration of the relatively low strength caustic soda generated by the membrane cell process;
- the liquefaction chlorine plant will be shut down, and all liquid chlorine stock tanks will be decommissioned. There will be a need for in transit storage of packed liquid chlorine at the site, in the form of cylinders, drums and road tankers. These will be supplied by the Orica Melbourne facility;
- closure of various transformers etc, installation of a replacement rectifier;

- an emergency scrubber/"backing tower" will be installed to replace and perform the function of the existing backing tower; and
- the placement of the proposed plant will be such that it will be necessary to relocate the liquid caustic loading bay.

It is proposed that the new Chlor-alkali plant will operate 24 hours, 7 days a week, 350 days per year. The 15 days off-line will be made up of an annual 7 day shutdown for maintenance, plus up to 8 days a year of unplanned maintenance.

The staffing level for the new plant will be approximately 40% of current levels hence reduced from 98 to approximately 40 staff, as a result of the more efficient operation of the modern plant and the changed scope of operations i.e. closure of chlorine liquefaction plant. The expected cost of the proposed plant installation will be \$40 million. Additional contract personnel will be employed during construction and commissioning stages.

In general, the quantities of raw materials, energy and water used at the replacement plant will be less, due to decreased chlorine production and increased efficiency. Quantities of wastes produced will decrease. Mercury containing wastes will no longer be generated from manufacturing activities.

Environmental Management at the Chlor-alkali Plant

The Orica Safety, Health and Environment Management system provides the framework for environmental management of the existing and proposed Chlor-alkali plant. The system has been established to ensure that all activities conducted at the Botany site which may have an impact on safety, occupational health or the environment are carried out in a manner that fully complies with:

- all relevant statutory regulations and codes;
- Orica Australia Safety Health & Environment Standards (SHE Standards) and other mandatory requirements; and
- responsible Care Codes of Practice.

A key feature of the Environmental Management System at the Botany site is procedures. The overall Botany Site SHE Procedures cover environmental and safety issues, such as:

- environmental noise;

- wildlife conservation;
- cleaner production, recycling and reuse; and
- fire risk management.

The Chlor-alkali plant has specifically implemented the system through the development of work instructions which address issues such as:

- management of brine waste;
- safety data sheets;
- management of housekeeping;
- incident communication with Sydney Water Corporation; and
- workplace hazardous substances assessment.

This system will continue to be implemented, and improved upon, during operation of the proposed plant.

An Environmental Management Plan (EMP) will be developed and implemented for the construction phase of the proposed development. The EMP will incorporate and document specific mitigation measures proposed to minimise construction impacts.

VI. CONSULTATION

Government Consultation

In the preparation of the EIS, relevant Government Authorities were consulted. A Planning Focus Meeting was held on 29th January 1998, from which the Director General's Requirements for the project were prepared.

Following the Planning Focus Meeting, a brief letter explaining details of the proposed development and requesting comment was sent to the following relevant Government Authorities: Department of Land and Water Conservation, WorkCover, Randwick City Council, Botany Bay City Council, Sydney Water, Roads and Traffic Authority, Environment Protection Authority, and NSW Fire Brigades.

Issues raised during the consultation process are addressed in the EIS.

Community Consultation

No formal community consultation process was undertaken as part of this EIS. Active community groups were informed of the project, and formal consultation with the community will take place in parallel with the EIS exhibition period.

VII. ENVIRONMENTAL ASSESSMENT

A. Landuse and Planning

The land uses surrounding the Orica site are primarily comprised of industrial developments. Some light industrial, commercial and residential areas are located around the Orica site. The area is one of Sydney's main industrial regions.

The Orica site and immediate surroundings are subject to planning provisions contained within the Botany City Council Local Environmental Plan (LEP). Under the LEP the Orica site is Zoned Industrial General (4a). The proposed replacement plant is consistent with the relevant LEP and other state statutory controls, planning provisions and policies applicable to the site.

B. Air Quality

Construction

The nature of the soil at the site and type and minor scale of civil works required for the development of the proposed plant will result in minimal dust emissions from site preparation and construction traffic. Dust from construction traffic will primarily be associated with the disposal of excavated material. Standard requirements with regard to the transportation of this material will minimise these dust emissions.

The handling of contaminated soil and/or groundwater has the potential to release volatile hydrocarbons into the air. Prior to construction, a soil and groundwater contamination investigation will be conducted in the areas proposed for earthworks. Should any contaminated material be encountered, a contamination management plan will be developed, approved by the EPA and incorporated into the construction EMP. The plan will cover handling, treatment and disposal of contaminated materials and will address air emissions.

Operation

Air emissions from the proposed plant will generally comprise the same pollutants as those currently emitted, however mercury vapour will no longer be emitted. In general, the quantities emitted will decrease due to the decrease in production and changes in the technology used. The main pollutants of concern are chlorine and emissions associated with the generation of electricity and steam (NO_x , particulates and CO_2).

Chlorine emissions will have a negligible impact on local air quality as fugitive chlorine emissions from the new membrane cell area will be minimal and emissions from the replacement backing tower will be sufficiently low to ensure ambient air quality criteria are met. A number of control measure will also be in place. NO_x and particulates emitted from Orica site boilers will increase as a result of the slight increase in steam demand. This slight increase will be offset by a decrease in steam demand from other plants at the Botany site and will not impact on local or regional air quality. Greenhouse gas emissions will decrease as a result of increased energy efficiency, with no impact on air quality.

Other Issues

A cogeneration plant is being developed adjacent to the Botany site. The cogeneration plant will provide both steam and electricity to the site. The cogeneration plant will use natural gas as fuel to produce steam and electricity. Should the cogeneration plant proceed, there will be no further demand for steam from Orica's boilers, or electricity from coal-fired power stations. The use of steam and electricity from the cogeneration plant at the replacement plant will result in a decrease in particulate and greenhouse gas (CO_2) emissions and of NO_x emissions.

C. Noise Impact

Construction

In accordance with EPA requirements construction work will be limited to Monday to Friday 7am to 6pm, and Saturday from 7am to 1pm if required.

Due to the location of the plant from residential boundaries, normal construction activities will result in noise site boundary noise levels similar to the existing daytime background levels.

The small number of truck movements associated with construction will be virtually imperceptible, when compared to existing traffic flows. Accordingly in terms of noise impact, vehicles associated with the construction phase will have negligible impact.

Operation

As a result of the decommissioning of some of the existing equipment, continued operation of remaining existing equipment and operation of new equipment, there will be a net reduction in the noise contribution of the Chlor-alkali plant at the residential boundaries. This will comply with the requirements of the Orica Site Noise Reduction Program, which has been approved by the EPA.

D. Water Management

Surface Water Impacts, Construction

During construction, there is potential for excavated material to migrate off the site to Springvale Drain or the Denison Street system and ultimately Botany Bay during rainfall periods. A soil and water management plan will be developed for the construction phase of the works. The main aim of the soil and water management plan is to prevent sediment leaving the construction areas and to minimise the potential for erosion. Impacts upon surface water as a result of construction at the site are expected to be minimal.

Surface Water Impacts, Operation

Potential impacts on Springvale Drain and Botany Bay water quality during operation of the replacement plant as with the existing plant, could occur as a result of: overflow of contaminated stormwater, leaks or spillages of chemicals and overflow of contaminated firewater into the drains. However, a number of mitigation measures are in place to minimise the potential for any adverse impact on surface waters. These measures include separation and treatment of potentially contaminated stormwater, and handling, storage and transport of Dangerous Goods in accordance to prescribed regulations, to minimise the potential for spills or leaks of chemicals.

The total impervious area and drainage aspects of the replacement plant will remain mostly unchanged. Consequently, the proposed development will not modify the runoff characteristics of the

site and therefore will not impact on the hydraulic behaviour of the adjacent Springvale Drain or the Denison Street stormwater system.

Water Supply

The proposed plant will utilise towns water in all of the same processes, with the exception of the denuder, and brine purge make-up. The proposed Chlor-alkali plant will use approximately 100 million litres of water per year. The total amount of water used will be approximately 30% less than that used at the existing Chlorine & Derivatives Plant.

Wastewater

The majority of sources of wastewater associated with the proposed Chlor-alkali plant will be as for the existing plant. The quality of the wastewater associated with the proposed plant will be improved as no mercury will be present in process wastewater. The quantity of wastewater generated by the proposed plant will most likely decrease in line with the decrease in water used.

E. Wastes

Construction

Construction waste could include potentially contaminated soil and groundwater removed from the site to build the proposed plant and construction refuse, including packaging. Due to the possibility of contamination, any soils/groundwater requiring disposal will be appropriately tested and disposed in accordance with EPA requirements. A management plan, including cleaner production initiatives will be developed and implemented for the disposal of contaminated soils and groundwater and other construction wastes.

Operation

The proposed plant has been designed from the outset to embrace the concept of "cleaner production". The plant will have the significant benefit of eliminating the generation of any hazardous mercury wastes.

Wastes generated by the operation of the proposed plant will be disposed to landfill except where indicated otherwise, and they include: general rubbish, brine sludge, salt dissolver sludge, spent ion exchange resin, used membranes, hypochlorite cartridge filter elements, spent sulphuric acid (returned to supplier) and accidental spilled materials (collected and disposed by contractors).

As a result of the mitigation measures, which are currently, and will continue to be, implemented at the site, the impact of waste generated at the proposed plant will significantly reduce the negative impacts upon the environment.

F. Soil And Groundwater

Based on the available data, regarding soil and groundwater contamination at the site and how it may affect construction related activities and site conditions the following conclusions have been made:

- excavated material containing hydrocarbons, chlorinated hydrocarbons and/or metals, specifically mercury, may be encountered during some of the excavation and construction activities. Following detailed design of the upgrades, additional soil and groundwater investigations will be undertaken to verify the concentrations of contaminants, which may be encountered during construction. Based on these results, and if required, the construction management plan will cover construction activities impacted by any onsite contamination and will cover storage, handling and disposal of contaminated material(s) at the site. The management plan will incorporate an occupational health and safety plan for construction activities which complies with all State and Federal regulations, and addresses potential exposure of construction workers to contaminants at the plant; and
- shallow groundwater exhibiting high salinity and electrical conductivities may be encountered during construction works. The groundwater geochemistry will be considered during the design and materials selection for the plant foundations;
- shallow groundwater containing chlorinated hydrocarbons and possibly mercury may be encountered during some of the construction activities. Groundwater contamination at the Botany site is a widespread issue, and a proposed remediation strategy to address this issue is currently under consideration. It is not anticipated that remediation of groundwater at the Chlor-alkali plant will be required prior to construction; and
- the activities during the operational phase of the proposed development are not expected to impact the existing soil or groundwater contamination or pose a potential risk to onsite plant workers from soil or groundwater contamination.

G. Traffic And Transport

Construction Road Transport

The small increase of traffic during construction would be virtually imperceptible and have no significant impact when compared to the traffic generated by both the existing and proposed Chlor-alkali plants.

Operational Road Transport

Overall, the operation of the proposed replacement Chlor-alkali plant will result in a slight decrease in average traffic movements and a decrease in the days of intense salt "campaign" deliveries. The decrease in the number of heavy vehicles and employee cars will be small in relation to existing flows. The traffic travelling to and from the plant will continue to use appropriate arterial and sub-arterial roads. Consequently there will be a slight improvement in the operations and amenity of the road network.

Rail Transport

Orica is actively maintaining its interest by engaging in discussions with FreightCorp as to the possibility for transporting materials and products to the site by rail in regard to the proposed development. However, in the foreseeable future, road is the most viable form of material and product transport. Should the rail facility be fully developed it will offer only limited feasible opportunities to reduce traffic associated with the operation of the proposed plant.

H. Visual

The Botany area and specifically the Orica site is predominately characterised by an industrial visual amenity. Due to the flat topography of the site and surrounding area, and the extensive amount of vegetative screening and existing built structures, the amount of viewing area is small. Furthermore, the sensitivity of the local land user groups to the proposed plant is generally considered to be low in the context of the industrial setting. Consequently, the proposed development will result in only a minor visual impact.

I. Flora And Fauna

No flora or fauna species, population or communities of conservation significance are known to occur at the proposed development site. No flora or fauna are expected to be directly affected by the proposal. The existing native landscape located along the boundary of the existing plan will not be affected by the proposal.

During rainfall periods in the construction phase, there is a potential for excavated material to migrate off the site to Springvale Drain and the Denison Street system, therefore impact on the potential dispersal pathway for the possible species present was investigated. An 8-part test was undertaken to assess the significance of this interaction.

Given the information gathered for this report and the detailed assessment of impacts provided, it is considered that no threatened species, populations or ecological communities or their habitats will be affected by the proposed development, and that a Species Impact Statement is not required.

J. Heritage

The Orica site has been significantly disturbed for at least the last 40 years. The proposed replacement Chlor-alkali plant will not have an impact on any known "Aboriginal relics" or "Aboriginal places" or Natural or Urban Heritage items.

K. Socio-Economic Impact

Construction

During the construction phase, an additional 50-100 personnel will be required on-site. Construction activities will also generate indirect jobs from the purchase of construction materials, transportation of materials, contractors, etc.

Operation

Staff of the proposed replacement Chlor-alkali plant will decrease from 98 employees to approximately 40 employees. Those employees not required for the operation of proposed plant will be relocated in other plants within the Orica site if possible. While the proposed development may

slightly negatively affect Sydney employment in the short-term, the transfer of the chlorine liquefaction plant to Orica's proposed Melbourne plant will partly off-set this decrease in the overall national employment levels.

There will be overall economic and social benefits associated with the operation of the proposed Chlor-alkali plant. This will be realised through training of existing personnel in the operation of the modern membrane cell technology, which will allow Orica to maintain competitiveness with importers and help maintain the long-term viability of the Chlorine & Derivatives Plant. Increased plant efficiency will bring additional income to Orica. This additional income will be passed to various sectors of the local economy and includes charges such as Commonwealth and State taxes.

An important social benefit associated with the proposed development is the decrease in the inherent risk associated with the proposed changes to the Chlorine & Derivatives Plant.

L. Risk and Safety

The risk associated with the Chlorine & Derivatives Plant has been assessed and compared against the DUAP risk criteria for existing and modified facilities.

The hazard analysis and risk assessment indicates that risk to adjacent land uses from potential incidents associated with the production and handling of chlorine and associated material at the modified Chlorine & Derivatives Plant on Orica's site will be reduced when compared with risk from the existing plant, and also complies with the NSW Department of Urban Affairs and Planning's guideline for tolerable toxic fatality risks (ie. societal and individual risk) for existing developments.

The replacement Chlor-alkali plant complies with the NSW Department of Urban Affairs and Planning's guideline for tolerable toxic fatality risks for new developments. The toxic injury risk criteria from the replacement plant are exceeded, with the injury and irritation risk exceeding the specified frequency criteria of 10 pmpy and 50 pmpy respectively. However, these criteria are not strictly relevant for modifications to existing facilities.

Risk to the biophysical environment from the modified Chlorine & Derivatives Plant was found to be minimal. Risk related to fire and explosion potential was also found to be minimal.

The major off-site risk is due to the potential for a releases of chlorine and hydrogen chloride from an incident within the Chlorine & Derivatives Plant. To reduce the likelihood and severity of such releases, safety critical software (procedures) will be implemented.

VIII. CONCLUSION

Environmental impacts associated with the proposed replacement plant have been identified and assessed in this EIS. Where appropriate, environmental safeguards and management strategies have been incorporated to minimise environmental impacts of the project. Environmental impacts associated with the proposed Chlor-alkali plant will be less than those associated with the operation of the existing plant, which utilises a mercury process.

No significant adverse environmental impacts have been identified through the course of the studies. Those impacts, which have been identified, comply with the appropriate standards and are capable of mitigation by appropriate environmental management controls.