



Chlorine Liquefaction Plant | Modification to State significant development consent SCOPING REPORT

Prepared for IXOM Operations Pty Ltd | 27 May 2024





Chlorine Liquefaction Plant

MODIFICATION TO STATE SIGNIFICANT DEVELOPMENT CONSENT | SCOPING REPORT

Prepared for IXOM Operations Pty Ltd
27 May 2024

PR329

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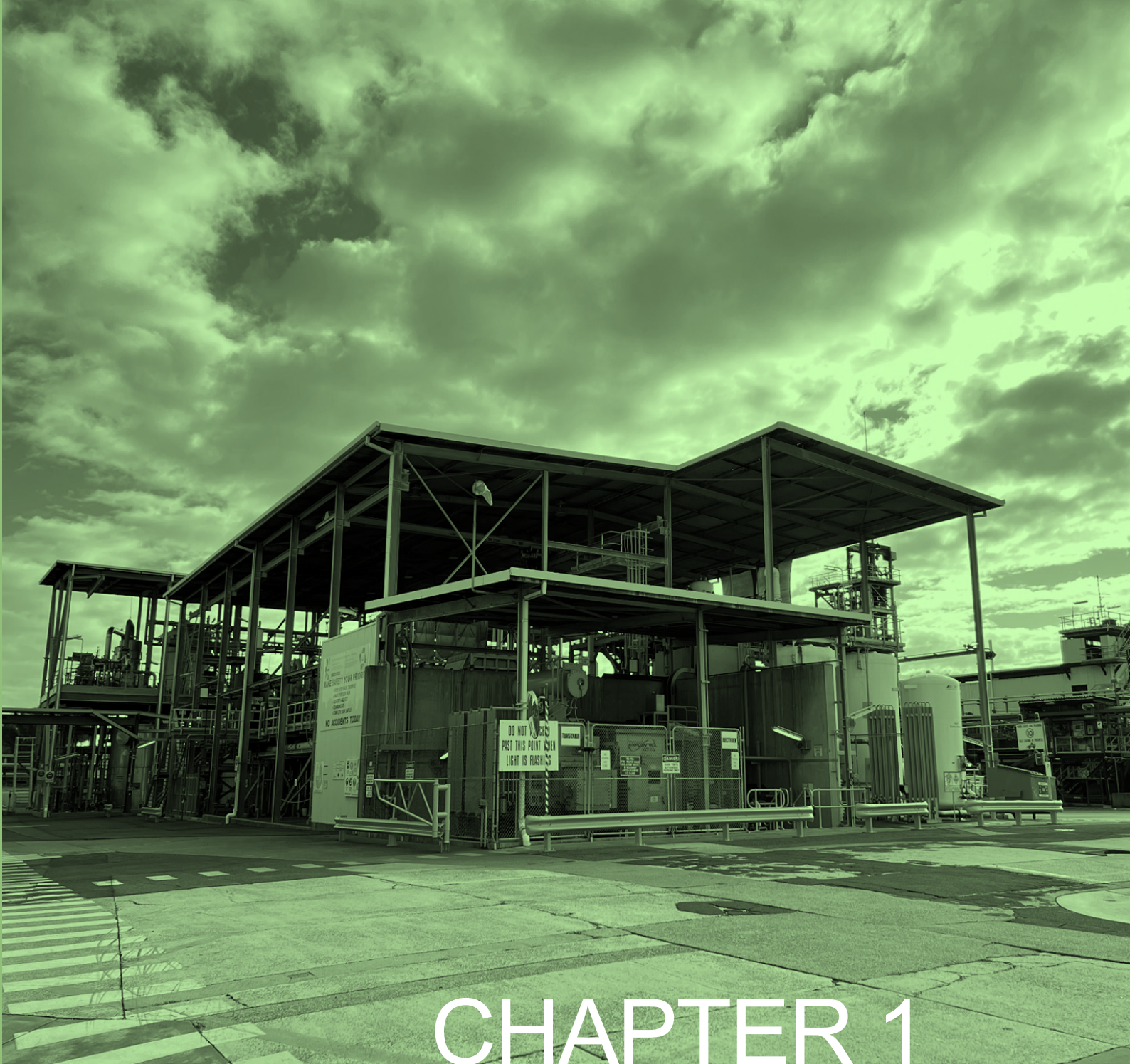
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CHAPTER 1

INTRODUCTION

1 INTRODUCTION

1.1 Overview

This scoping report has been prepared by Element Environment Pty Limited (Element) on behalf of IXOM Operations Pty Ltd (IXOM). The report shall be submitted to the NSW Department of Planning, Housing and Infrastructure (DPHI) to seek the Secretary's environmental assessment requirements (SEARs) for the modification of a State significant development (SSD) consent under Section 4.55(2) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) to construct and operate a chlorine liquefaction plant at IXOM's Botany - Chlor-alkali Plant (CAP) at 16-20 Beauchamp Road, Banksmeadow NSW 2019 (the proposal).

1.2 Proponent

IXOM is the proponent for the proposal and its company and contact details are provided in Table 1.1.

Table 1.1 Proponent details

Item	Detail
Project contact	IXOM Operations Pty Ltd
Postal address	16-20 Beauchamp Road, Banksmeadow NSW 2019
ABN	51 600 546 512 (IXOM OPERATIONS PTY LTD)
Report authors	Jacob Vickers (B. Env. Science) Mark Roberts (B. Env. Science)
Site owner	Private

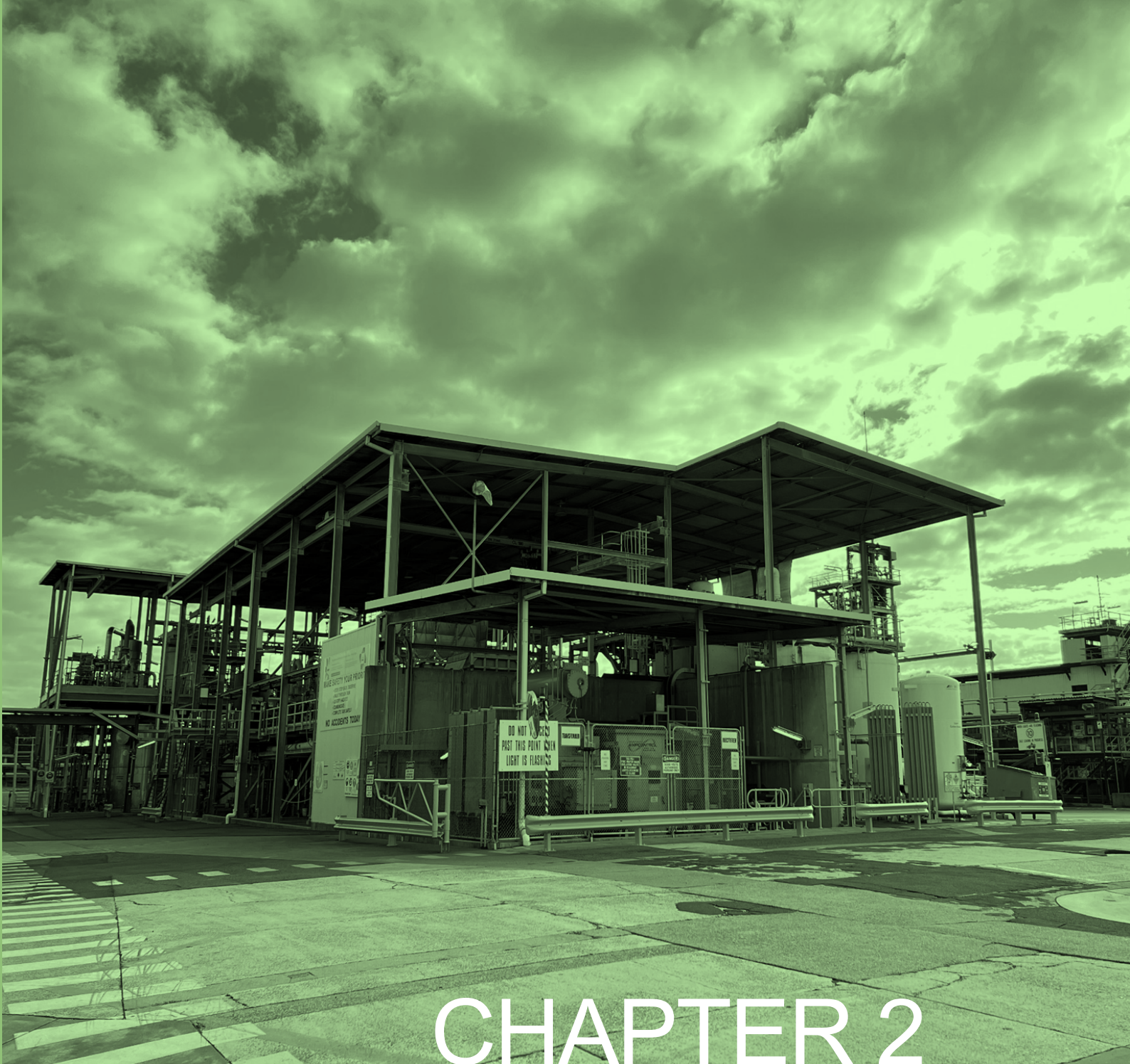
IXOM plays a vital part in the lives of tens of millions of people every day as an established and trusted industry player in water treatment and chemical sourcing, manufacturing, storage and distribution. Headquartered in Australia, IXOM's operations span four continents and ten countries, including New Zealand, Southeast Asia, the United Kingdom and the United States.

IXOM is one of Australia's larger manufacturers of chlor-alkali products including chlorine, caustic soda, sodium hypochlorite and hydrochloric acid. IXOM is the only local chlorine manufacturer currently supplying water treatment facilities in Australia due to IXOM's storage and distribution infrastructure, safety and security systems, and regulatory compliance. The supply of chlorine is critical to Australia, as it is the primary disinfection method for drinking water and the safe management of wastewater.

1.3 Purpose of this report

This scoping report describes the following to assist DPHI in preparing SEARs for the modification report accompanying the application to modify the consent:

- nature, scale, and extent of the proposal;
- environmental context of the site;
- planning, legislative and policy context of the proposal;
- environmental matters likely requiring further assessment; and
- community and stakeholder engagement for the proposal.



CHAPTER 2

PROPOSAL OVERVIEW

2 PROPOSAL OVERVIEW

2.1 Site details

The site is at 16-20 Beauchamp Road, Banksmeadow (Lot 1105 DP 1227173) NSW 2019 in the Botany Industrial Park (BIP) (Figure 2.1 and Figure 2.2). IXOM operates on the following lots in BIP (the site; see Figure 2.4):

- Lot 1105 DP 1227173
- Lot 1101 DP 1127173
- Lot 1102 DP 1127173
- Lot 1103 DP 1127173
- Lot 1104 DP 1127173
- Lot 1115 DP 1127173

The site is privately owned by Orica Australia Pty Ltd (Orica) and leased by IXOM.

2.2 Site location, character and surrounding land use

The site is in Banksmeadow, an industrial suburb approximately 11 kilometres (km) south of Sydney Central Business District (CBD). It covers approximately 67,500 square meters (m²), including private internal two-way roads that it shares with other users of the BIP.

The site is in the Bayside Council local government area (LGA) and is zoned IN1 General Industrial under Chapter 5 of the State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP) (Figure 2.3).

The site is bordered by a rail corridor to the west, Beauchamp Road to the south, Denison Street to the east and other users of the BIP to the north, including Ventia, Indorama, Orica and Qenos. Following recent public announcements, it is understood that the Qenos major hazard facility will be ceasing operations in the BIP in the near future, reducing the overall societal risk from the BIP.

The closest residents are in Hillsdale, near the east of the BIP, on the eastern side of Denison Street. Banksmeadow is bordered by the residential suburbs of Hillsdale and Matraville to the east, Botany and Pagewood to the west, Daceyville to the north and the industrial suburb of Port Botany to the south.

Figure 2.1
Regional context

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Figure 2.2
Local context

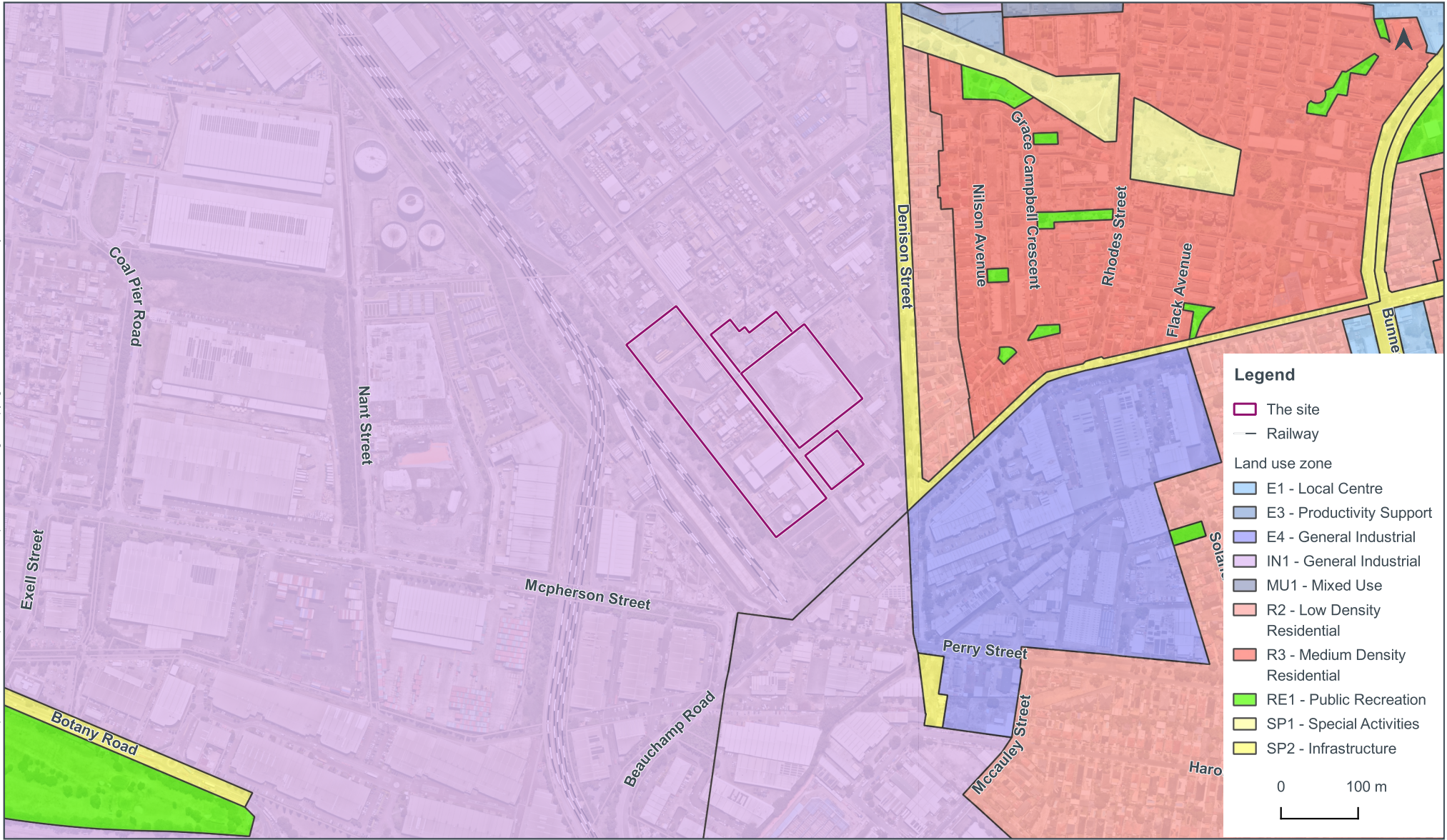
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Figure 2.3
Zoning

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2.3 Existing activities

Summary

The former Minister of Urban Affairs and planning originally granted consent DA35/98 to the development in 1998 under Part 4 of the EP&A Act for the installation of a replacement CAP to produce 35,000 tonnes per annum (tpa) of gaseous chlorine, including:

- Replacement of the existing chlor-alkali mercury cell technology plant with a modern membrane cell technology, including the modernisation of the brine treatment, chlorine drying and compression systems.
- Closure of the chlorine liquefaction plant and all chlorine liquid storage tanks.
- Relocation of the caustic soda loading facility.

The new CAP was commissioned in 2001 and the development has been modified five times since original approval:

- 2006 – Construction of sodium hypochlorite manufacturing facilities – Part 4 modification.
- 2006 – Demolition of old CAP – Part 4 modification.
- 2009 – Relocation of sodium hypochlorite manufacturing facilities – Part 4 modification.
- 2012 – Replacement of two 1.1 megalitre steel caustic tanks and demolition of two existing and disused steel caustic storage tanks – Part 3A modification.
- 2018 – Construction of repackaging facility – Part 3A modification.

Liquefied chlorine was packaged into containers at the BIP until 2001. Liquefied chlorine was sourced from several outdoor stock tanks with a combined capacity of 400 tonnes.

The chlorine plants in Sydney and Melbourne were replaced in 2001 to:

- Replace old assets with new assets to reduce operating cost and environmental impact.
- Re-distribute chlorine production capacity to match local chlorine and chlorine-derivative product requirements.
- Minimise asset requirements after the cessation of polyvinyl chloride manufacture at the BIP meant chlorine was no longer required for ethylene dichloride.
- Eliminate risk associated with storing liquefied chlorine outside and at a pressure exerted by chlorine at ambient temperature.

The CAP operates under Environment Protection License (EPL) 20547 which permits the scheduled activities of chemical production, chemical storage, waste processing (non-thermal treatment) and waste storage, including the:

- production of over 25,000 tonnes (t) of dangerous goods annually;
- storage of up to 100,000 kilolitres (kL) of general chemicals;
- non-thermal treatment of any amount of waste including hazardous waste; and
- storage of hazardous, restricted solid, liquid, clinical and related and asbestos waste.

The CAP manufactures chlorine and caustic soda through the electrolysis of salt using a mercury-free membrane technology. Hydrogen is generated as a by-product during this process, which is combined with chlorine to manufacture hydrochloric acid. The chlorine is also used to manufacture sodium hypochlorite and ferric chloride. These downstream processes are referred to as 'product plants', in which all chlorine produced on site is consumed.

The site does not have a chlorine liquefaction plant and liquefied chlorine is not stored in process tanks. All liquefied chlorine is transported to site from the IXOM owned chlorine liquefaction plant at Laverton, Victoria, in both 33 kg and 70 kg cylinders and 920 kg drums for distribution primarily to NSW and QLD customers. The site can be used to provide transit storage for 13 tonne tankers.

Site infrastructure

Existing site infrastructure comprises (Figure 2.4):

- Administration building.
- Brine treatment and electrolyser.
- Caustic evacuation plant
- Caustic loading bays.
- Caustic soda product tanks.
- Chlorine container storage (Block Q).
- Control room.
- Cooling tower.
- Ferric chloride product plant, including product tanks and tanker loading bay.
- HCl product plant, including product tanks and tanker loading bay.
- Old Chlorine container filling facilities (decommissioned 2001).
- Repackaging facility.
- Salt storage pile.
- Sodium hypochlorite loading bay (Block L).
- Sodium hypochlorite product plant including product tanks
- Workshop.

The BIP is accessible via main gates (1-3) on Denison Street and Gate 4 provides access from Corish Circle, however, Gate 3 is the main access. Gate 5 is for emergency exit or entry.

Chlorine production and product plants

Chlorine electrolysis

The chlorine manufacturing process involves the electrolysis of a brine solution, which produces chlorine gas, caustic soda solution and hydrogen gas. Raw salt is imported and stored on-site before being dissolved to re-concentrate recovered, depleted brine solution. Then the brine undergoes chemical pre-treatment to facilitate settling and filtration to remove impurities present in the salt, such as calcium and magnesium compounds. The filtered brine then passes through ion exchange columns to complete the purification process.

An electric current is passed through the brine solution with electrolysis. Caustic soda solution is bled from the electrolysis circuit and chlorine and hydrogen gas is separated for further processing.

Hydrochloric acid plant

Hydrochloric acid is produced by burning hydrogen in chlorine to form hydrogen chloride, which is immediately absorbed in water. HCl is sold to market primarily for use in the food and steel industries.

Ferric chloride plant

Ferric chloride is manufactured through the controlled reaction of chlorine and elemental iron. Ferric chloride and ferrous chloride are primarily used in municipal water treatment.

Sodium hypochlorite plant

Sodium hypochlorite is manufactured by contacting a diluted caustic soda solution with chlorine gas. Sodium Hypochlorite is primarily used for bacteriological control and water disinfection.

Hours of operation, vehicles and employment

The site operates 24 hours a day, seven days a week for 350 days a year. There is an allowance of 15 days per year for planned and unplanned maintenance work including scheduled plant shutdowns.

The site employs approximately 45 people in total (16 of which are on a 24/7 shift roster).

The site receives and dispatches heavy vehicles during salt delivery campaigns and normal operations. There are two eight-day salt delivery campaigns during the year, each involving approximately 1,000 truck movements in total.

There are approximately 76 truck movements per day during normal operations for delivery of raw materials and product dispatch.

Employees, contractors and visitors generate approximately 100 light vehicle movements per day.

Services and utilities

Site water demands are met by a connection to the Sydney Water reticulated potable network and Orica Ground Water Treatment plant treated water. The site uses water for dilution of caustic, electrolysis, cooling and demineralisation for use in production of hydrochloric acid and sodium hypochlorite.

Electricity is provided from a grid connected 11 kV supply and distributed across the BIP by substations. The substations include transformers to step the high voltage supply down to 415 Volts and less for use by equipment. The site uses steam from generators within the BIP.

Figure 2.4
Site layout

Botany Chlorine Liquefaction Plant
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2.4 Proposal description

2.4.1 Proposed modification

Ixom propose to construct and operate a new chlorine liquefaction and packaging plant at the site which will be integrated into existing site operations with all chlorine material being sourced from existing CAP processes. The chlorine liquefaction plant will provide redundancy in the event that the existing chlorine liquefaction plant at Laverton becomes non-operational or is no longer able to meet market demands. During this unlikely scenario, the proposed Botany chlorine liquefaction plant would produce liquified chlorine products as required to compensate for any loss of production volume at the Laverton liquefaction plant. During normal operation, the chlorine liquefaction plant will operate at a reduced rate to supply bulk liquified chlorine throughout NSW.

Plant capacity and operating modes

The chlorine liquefaction plant will have a maximum production capacity of 50 tpd but will operate at a reduced rate to supply liquified chlorine in 13 tonne tankers to the NSW region. This will not have a significant impact on chlorine derivative product volumes produced under normal operation.

During normal operation, the chlorine liquefaction plant will be monitored from the control room. It will be unattended except when:

- a tanker is being moved to or from the building;
- a tanker is being connected or disconnected;
- during routine inspection; or
- during maintenance or for handling of chlorine drums and cylinders.

Neither the operator nor the driver is expected to be in attendance for the duration of the filling of a tanker.

The plant will operate at up to full capacity only in the unlikely event that the Laverton Chlorine Liquefaction Plant became non-operational for an extended period to supply the national liquified chlorine demand. Chlorine gas for derivative product requirements would be less available through this period. In this contingent operation mode, the Botany liquefaction plant will be used to degas and fill 920 kg chlorine drums and 70 kg, and 33kg chlorine cylinders in addition to 13 tonne chlorine tankers.

In normal operation, the space required for drum and cylinder filling functions will be used to store drums and cylinders that are currently stored in an outdoor storage area. In the contingent operation mode, internal storage of drums and cylinders will be restricted and IXOM will use its supply chain capacity and existing licensed chlorine container storage locations across Australia to continue to handle and store containers.

Plant location

The proposal considered alternative plant locations within the BIP including Block M, Block L and Block Q. Block L was determined to be the most viable option for the new chlorine liquefaction plant considering the amount of available space, off site risk, potential escalation risk from other BIP operations and current and future traffic flow (Item 8 on Figure 2.4).

To make space available for the new plant, the sodium hypochlorite loading bay will be relocated to the adjacent Block Q (existing loading bay shown in Figure 2.5). A new driveway and hardstand will be constructed on Block Q prior to relocation of the sodium hypochlorite loading bay to the new hardstand (Item 2 on Figure 2.4).

There will be sufficient internal and external space for heavy vehicles to drive through Block Q to access the loading point (Figure 2.8).



Figure 2.5 Existing sodium hypochlorite loading bay

Containment Building

Most of the chlorine liquefaction plant will be in a containment building to minimise risk associated with a fugitive chlorine gas emission. The building will have a steel girt frame and steel portal frame roof (Figure 2.6). It will have a reinforced concrete floor and the exterior wall and roof cladding will comprise Colorbond sheet steel.

The Containment Building shall be approximately 8 m high extending to approximately 16 m at its highest point, approximately 60 m long and 33 m wide. There will be sufficient internal and external space for heavy vehicles to drive through the building to access the loading point (Figure 2.7). There will be roller doors on the vehicle entry and exit points.

The Containment Building will be fitted with a scrubbing system to ensure any potential chlorine emissions are captured and treated. The stack of the scrubbing system will extend about 3 m above the roofline and any chlorine gas emission from the stack will be well below the existing site stack limits even in the event of the highest loading case.

Chlorine liquefaction plant details

The chlorine liquefaction plant will be designed from proven equivalent IXOM processes. It will comprise (Figure 2.9):

- Shell and tube heat exchanger to liquefy chlorine.
- Ammonia refrigeration system (most of this system will be located outside of the Containment Building as it will not contain chlorine).
- Chlorine Separator to separate liquefied chlorine from incondensable gasses.

- Two chlorine stock tanks to store up to 50 tonne of liquefied chlorine at -34°C and atmospheric pressure. One will be kept in service and the other kept empty to receive chlorine.
- Two chlorine storage pumps to distribute chlorine for tanker and container filling.
- Vacuum chlorine catch pot to ensure any liquefied chlorine from filling functions will pass the absorption system as gas.
- Chlorine tanker loading station.
- Two chlorine drum filling stations.
- Two chlorine cylinder filling stations.
- Eight chlorine drum degassing stations.
- 12 chlorine cylinder degassing stations.
- Degas reactor to absorb incondensable gasses from the separator and intermittent liquefied chlorine and chlorine gas from chlorine container filling and degassing functions (most of this system will be located outside of the Containment Building as it will not contain minimal chlorine). The vent from the degas reactor will be directed to the Containment Building scrubbing system.
- Containment building scrubbing system to absorb any fugitive emissions of chlorine in the building and to provide tertiary absorption of any chlorine gas from storage and container degassing and filling functions.

Inherent safety features

The process has been designed with the following safety features:

- Minimal extension of existing chlorine gas header. Most of the new chlorine piping will run through the containment building.
- Refrigerated chlorine storage at low temperature and atmospheric pressure, which is safer than storage at ambient temperatures.
- The lowest practical operating inventory of chlorine will be held in a stock tank.
- A fully redundant chlorine stock tank will be provided.
- There will be dedicated bunds for stock tanks to reduce flash rate if the stock tank ruptures.
- The proposal has been located to meet *Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning* escalation risk criteria.

The building design will incorporate the following proven safety features of the Laverton chlorine liquefaction building:

- The building will be leak tight.
- The building will be kept closed except when access/egress is required.
- It will be fitted with a ventilation system to meet building code requirements for normal operation and a caustic scrubbing system for a chlorine gas leak.
- A slight negative pressure will be maintained by the ventilation system or by the caustic scrubbing system to prevent gas from leaking out.
- It will be fitted with weighted dampers to allow for air flow into the building.
- The building will be fitted with a gas detection system to detect gas leaks at very low concentration. In the event of a gas detection, the ventilation system will shut down and the caustic scrubbing system will be brought into service automatically.
- A chlorine leak from a tanker in the existing external store is the single largest consequence on the site, accounting for 60% of total societal risk represented by the CAP. The Containment Building will be able to store tankers internally which will significantly reduce this risk.
- The drums and cylinders currently stored outside will be stored in the Containment Building during normal operations. A chlorine leak from a drum in the external store currently contributes to just less than the balance (i.e., 40%) of the total societal risk represented by the site. This risk will be significantly reduced by storing the containers in the proposed building.

The scrubbing system will be based on proven equivalent systems at several IXOM sites and will comprise:

- Capacity to absorb all the chlorine gas that would be generated in a chlorine stock tank rupture (total of 50 t with a peak rate of almost 2 t per hour in a 14.6 t gas mix per hour).
- In-service/stand-by circulation pumps and extraction fans all with back-up power supply.
- Redundant instrumentation to ensure the scrubbing solution has sufficient capacity to absorb chlorine.
- Will be continuously on-line supplying dilute caustic to the degas reactor to absorb chlorine in liquefier tailgas and degassing operations.
- Caustic from existing on-site tanks. 113 t would be required for a chlorine stock tank rupture event. Caustic will be supplied from a dedicated service/stand-by circulation pumps with back-up power supply.
- Just over 350 kL of sodium hypochlorite would be generated in a chlorine stock tank rupture, with almost 100 kL in the first 12 hours. The volume of hypochlorite that would be generated in this event can be managed with existing stock tanks and supply chain.

Hours of operation, employment and vehicles

In the normal operating mode, operations will be required to produce liquefied chlorine from the control room. This work is likely to be absorbed and as such there should be no change to employment. Existing employees will periodically occupy the building during tanker loading and carry out routine inspections and maintenance as required.

Employees could be mobilised from Laverton to perform drum and cylinders degassing and filling functions in the contingent operating mode if the Laverton Chlorine Liquefaction Plant became non-operational for an extended period. These employees would return to the Laverton plant once it became operational again.

Three 13 t bulk liquid tankers will arrive for loading and be dispatched with liquefied chlorine per week.

Services

The suitability of site services has been assessed and the following was concluded:

- Electricity – overall supply will be sufficient but some additional motor control centres and distributed control systems may be required. There is sufficient space in existing substations to instal these without the requirement for new structures.
- Firefighting – the new building will require the following:
 - Fire hydrant system in accordance with *National Construction Code 2022* Clause E1D2.
 - Fire hose reel system in accordance with *National Construction Code 2022* Clause E1D3.
 - Portable fire extinguishers in accordance with *National Construction Code 2022* Clause E1D14.
- Cooling water – there will be sufficient remaining potable water to supply the proposal with cooling water, after other existing CAP uses, such that additional mains supply will not be required.
- Demineralised water – there will be sufficient remaining potable water to supply the proposal with demineralised water, after other existing CAP uses, such that additional mains supply will not be required.

Construction

The construction stage will comprise:

- Block Q:
 - Works to prepare Block Q for relocation of the sodium hypochlorite loading bay, comprising removal of surface material and paving the access driveway and hardstand.
 - Dismantling the Sodium hypochlorite loading bay on Block L and relocating to/assembly on Block Q.
- Block L:
 - Earthworks on Block L to remove existing surface material, level the block, excavate building footings and install services.
 - Paving external hardstand areas and pouring the reinforced concrete building floor.
 - Erection of the steel girt frame and portal frame roof.
 - Cladding of external walls and installation of roof sheeting.
 - Installation of internal componentry.
 - Commissioning and testing.

It will take approximately 12 months to construct the proposal. The proposal will be constructed during standard construction hours, that is:

- Monday-Friday: 7am-6pm.
- Saturday: 8am-1pm.
- Sunday and public holidays: no construction.

There will be up to 20 construction personnel on site at any one time.

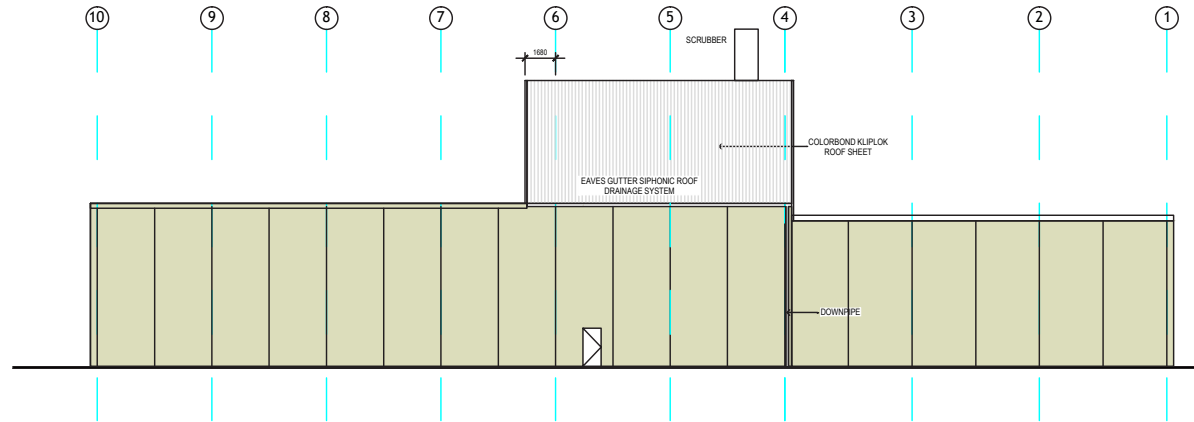
Construction equipment will likely comprise:

- Excavator including rock hammer.
- Front end loader, backhoe and/or skid steer loader.
- Roller.
- Forklift.
- Franna crane.
- Concrete agitator.
- Generator.
- Site truck.
- Delivery and dump trucks.

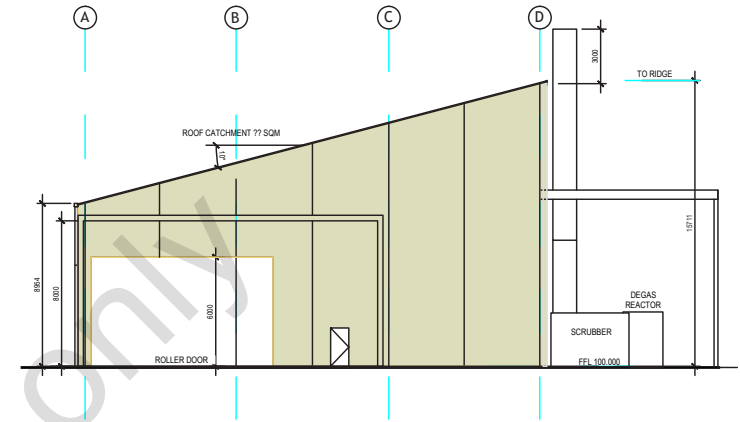
Truck numbers associated with construction will be estimated during preparation of the modification report.

Figure 2.6
Conceptual elevations

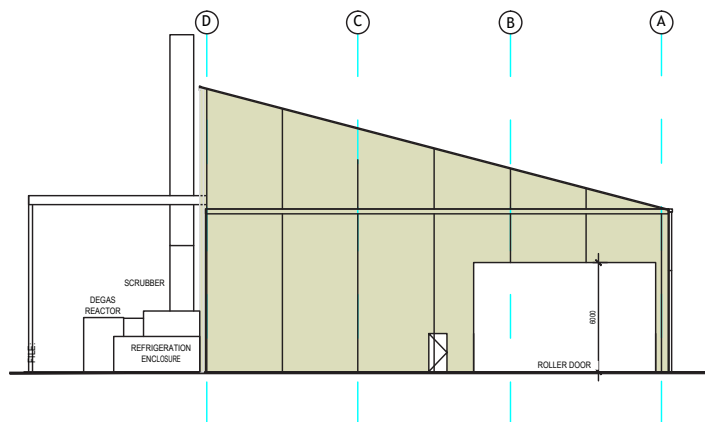
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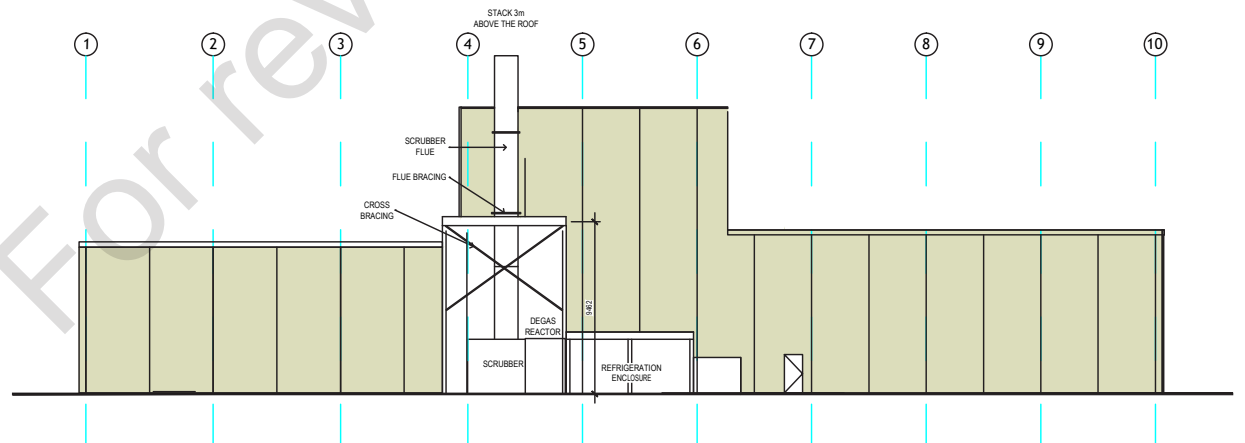
SOUTH EAST ELEVATION



NORTH EAST ELEVATION



SOUTH WEST ELEVATION



NORTH WEST ELEVATION

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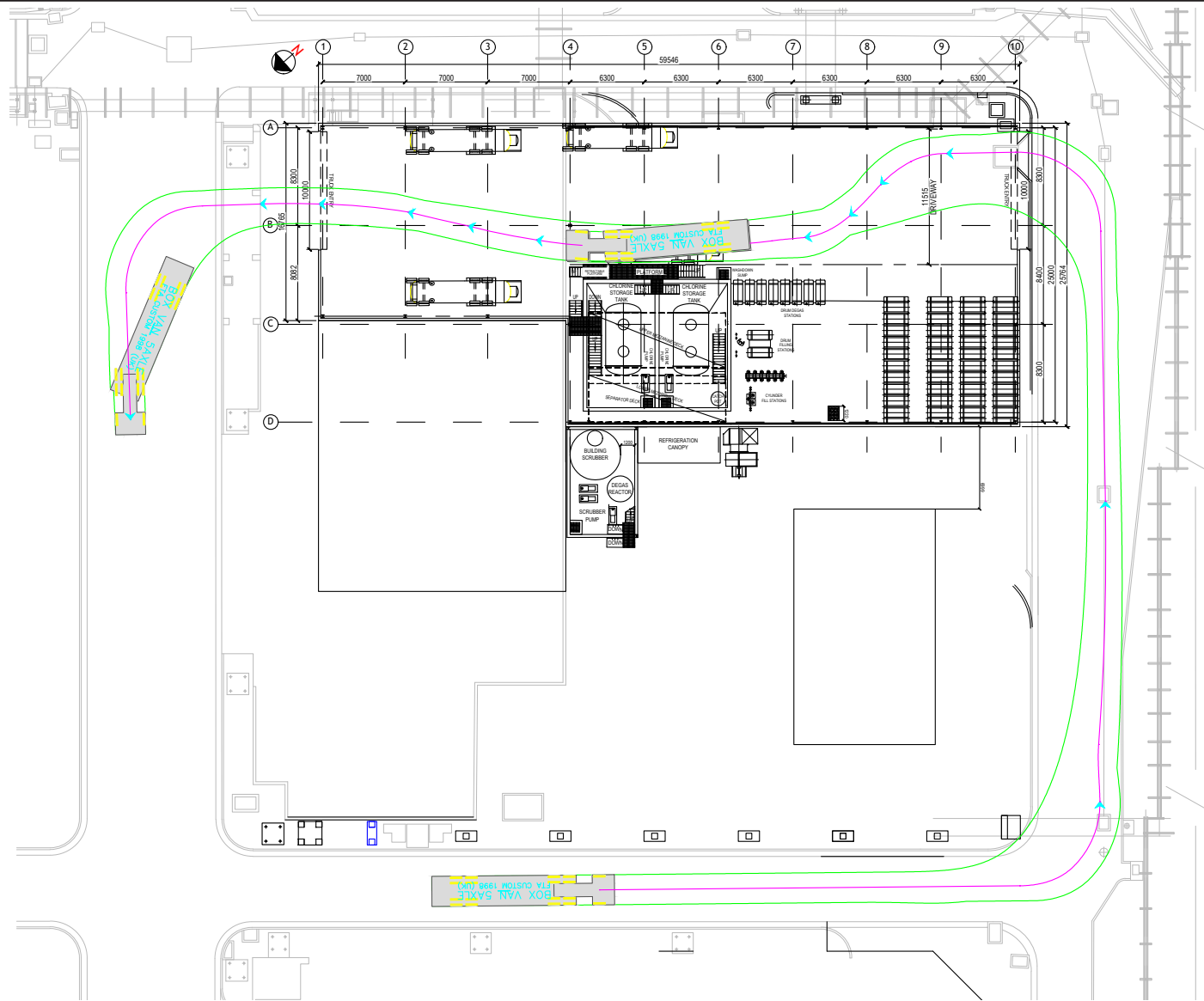
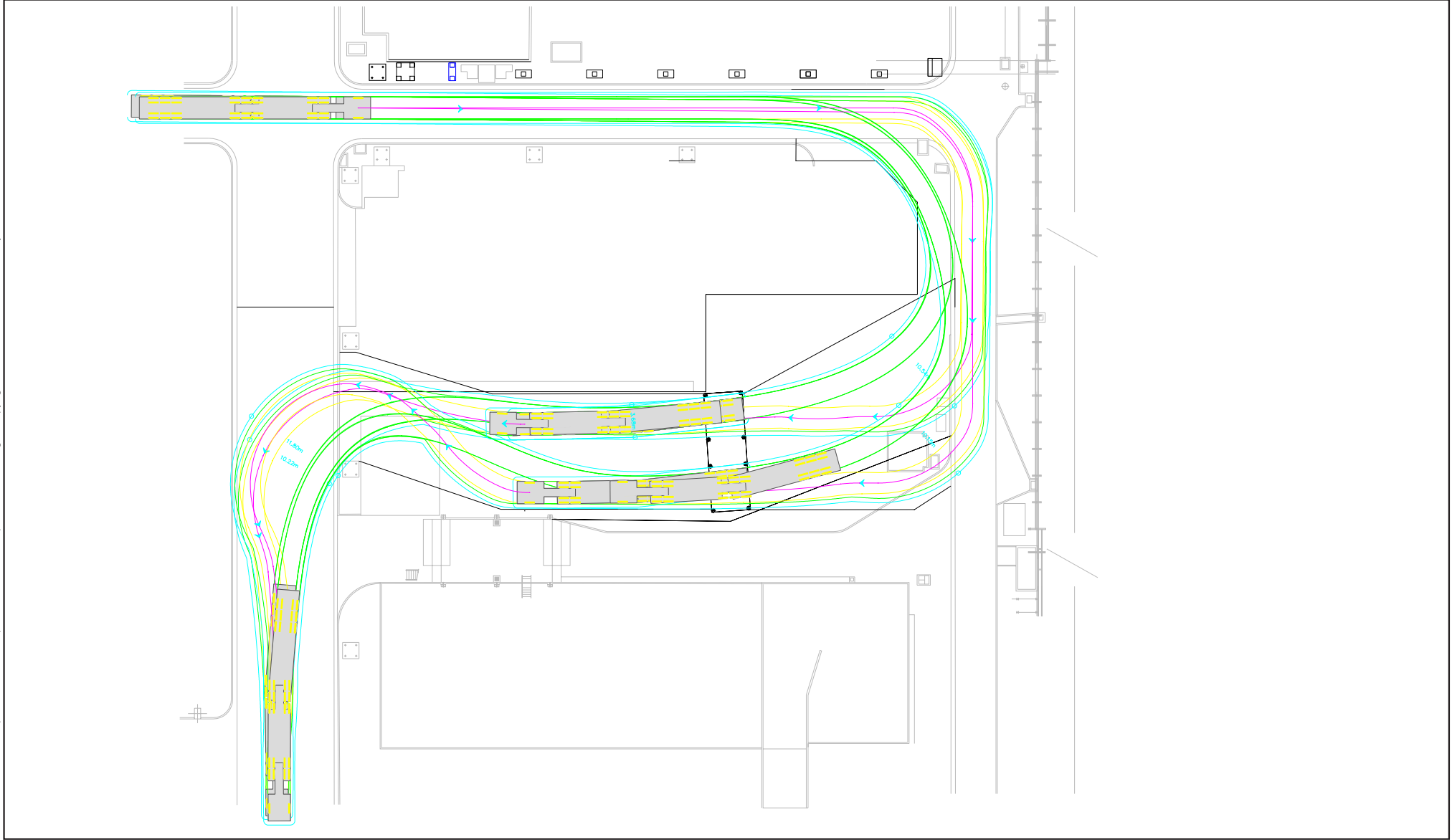


Figure 2.8
Conceptual sodium hypochlorite loading bay swept path analysis

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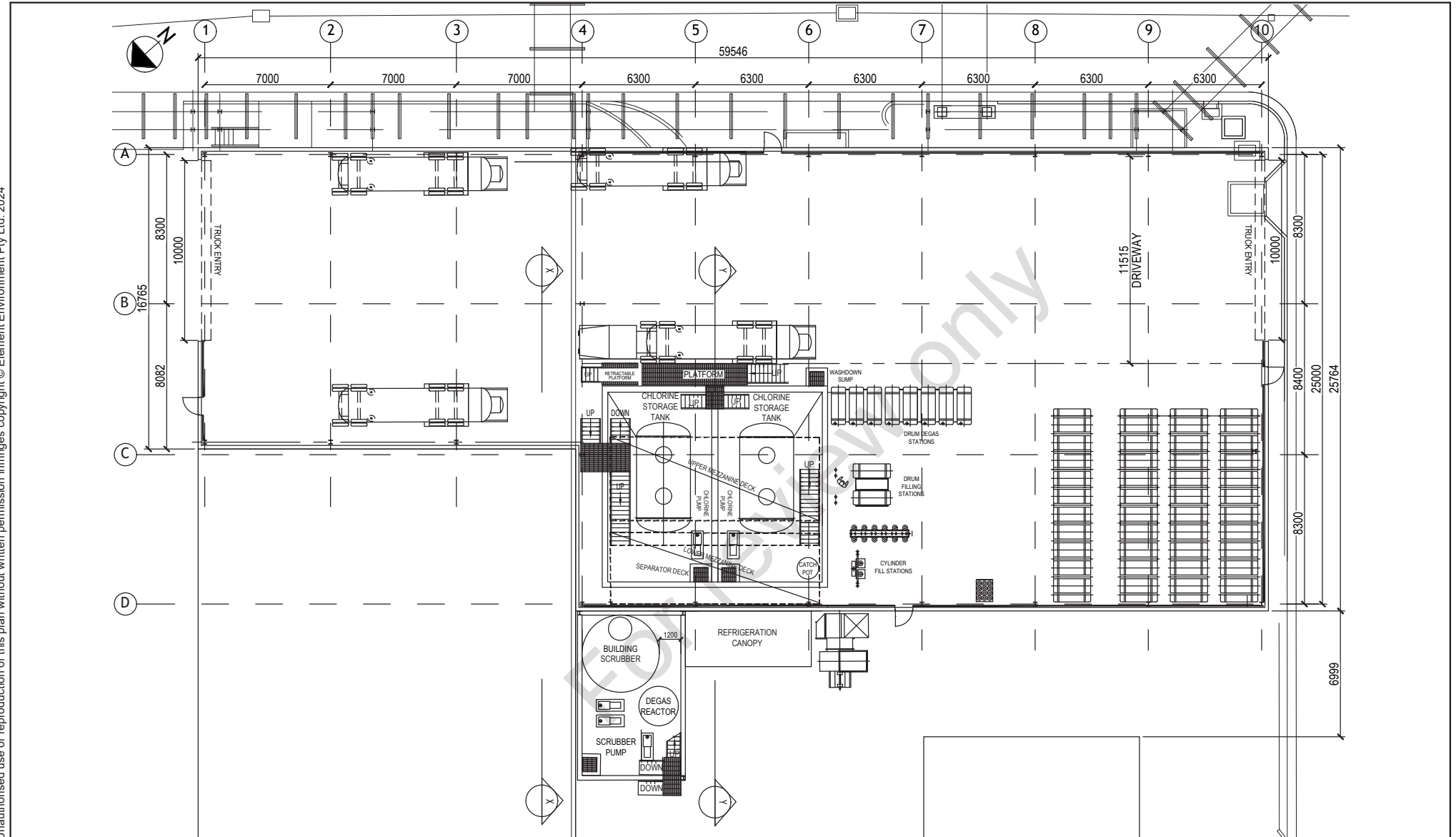


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Figure 2.9
Conceptual chlorine liquefaction plant layout

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Source: Kellogg Brown & Root Pty Ltd (KBR), 2024

2.4.2 Justification

Liquefied chlorine gas is used by Australian municipalities and water authorities in the treatment of water to provide communities with safe drinking water. Declining market demand, latent production capacity, and the significant capital investment required to safely store and distribute liquefied chlorine gas on a national scale are all factors that have resulted in IXOM being the only local chlorine gas manufacturer that supplies water treatment facilities in Australia.

These factors also make it challenging for a second liquefied chlorine gas producer to serve this segment. IXOM produces 100% of its packaged and bulk liquefied chlorine gas in its Laverton plant in Victoria. IXOM is the only certified organisation in Australia with the storage and distribution infrastructure, safety and security systems, and regulatory compliance currently capable of safely supplying bulk or packaged liquefied chlorine gas to the segment.

In the unlikely event that the chlorine liquefaction plant at Laverton becomes non-operational, Australia would be required to import liquefied chlorine from the international market, which will likely result in a national shortage of liquefied chlorine due to the lead time of imports.

Assuming the required volume of chlorine gas can be procured internationally, the most significant barrier to liquefied chlorine gas imports is consistent access to sea freighters, not only due to ongoing volatility in capacity, port access and broader global shipping challenges, but also because liquefied chlorine gas (as a dangerous good) is often first to be removed from a freighter if there is a safer alternative product to ship.

The Water Services Association of Australia (WSAA) has identified this potential scenario as a significant risk. On 13 December 2023, the WSAA applied, on behalf of itself and current and future members, for authorisation to engage in conduct for the purpose of improving the resilience of the supply chain of chlorine in Australia.

Therefore, IXOM proposes to construct and operate a second chlorine liquefaction plant at the Botany site to ensure the contingent supply of liquefied chlorine in Australia.

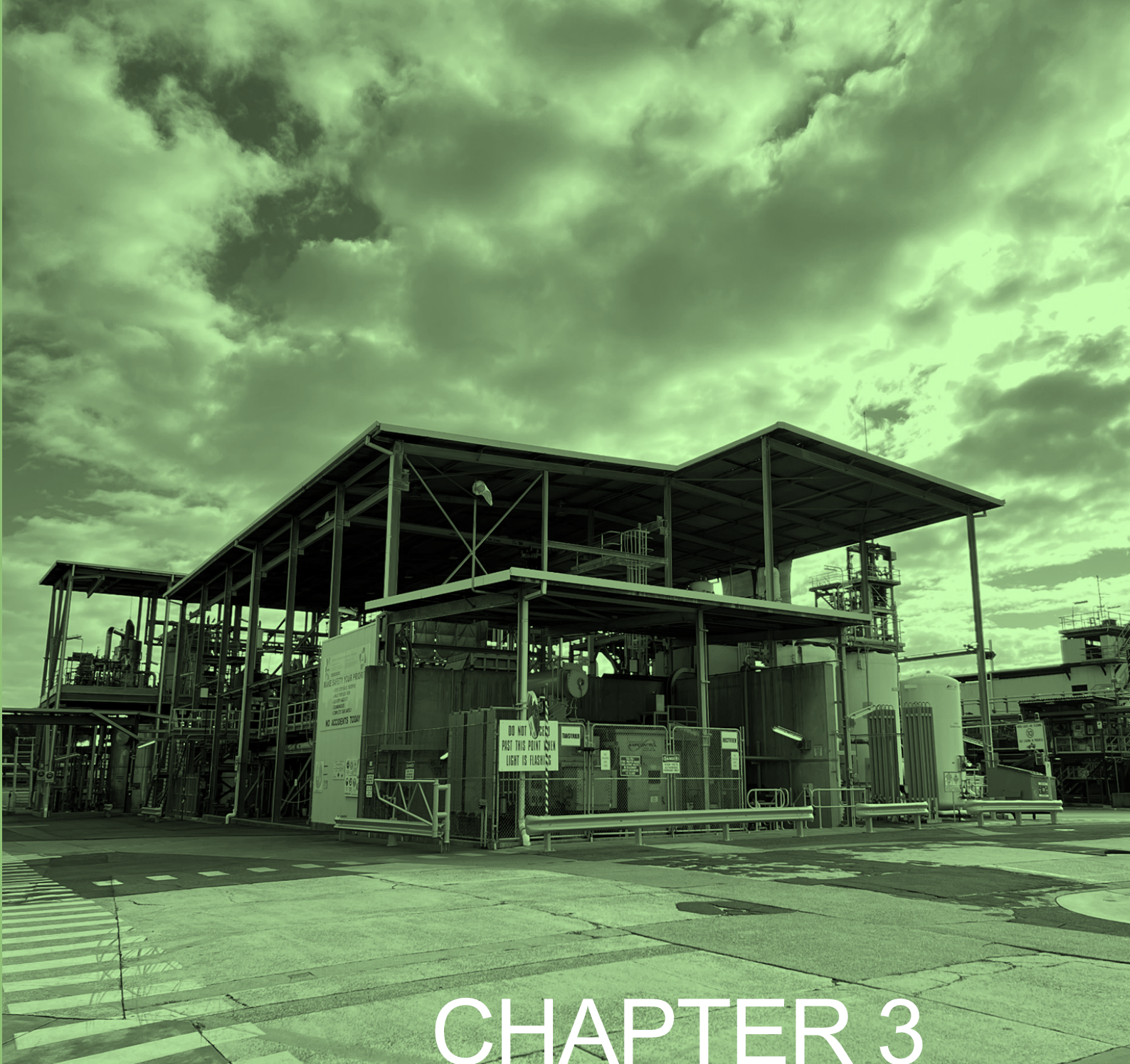
2.4.3 Alternatives

IXOM considered a number of other alternatives to provide contingency for the current packaged chlorine supply from Laverton Victoria to water and wastewater customers.

These alternatives included:

- Expansion of IXOM's current safety stock storage in Australia.
- Importation of chlorine into Australia and provision of additional 'major hazard facility' storage facilities.
- An existing chlorine producer in Australia building a chlorine packaging plant.
- A greenfield site set up in Australia by a new chlorine producer.
- Substitution of chlorine for alternative disinfection methods (such as Sodium Hypochlorite or on-site generation using electro-chlorination).

IXOM believes that the most economical and safest option to provide contingent chlorine supply across Australia is for IXOM to build a liquification and packaging facility at the existing Botany CAP. The site has an available raw material feed, required infrastructure and available and appropriately zoned industrial land. This option likely has the lowest capital investment and the lowest operating expenditure. It also leverages IXOM's existing technical and manufacturing capabilities and infrastructure to ensure that there is immediate access to a safe and continuous supply of liquefied chlorine gas across Australia, and a commercially viable supply could be maintained over the long term. It also takes advantage of IXOM's storage, distribution, and safety record and provides scale sufficient to continue serving all market demand.



CHAPTER 3

ENVIRONMENTAL CONTEXT

3 ENVIRONMENTAL CONTEXT

3.1 Topography and waterways

The site is flat and predominantly sealed with hardstand or surfaced with gravel, with a grassed area around the office building and the overflow car parking off Beauchamp Road, where there are also several exotic and native plantings.

There are no waterways in or adjacent to the site. The Botany Bay foreshore area is approximately 1 km south-west of the site, with Botany dams and Mills Stream approximately 2 km to the north.

The site is approximately 1 km west of the maximum extent of land subject to the Botany Bay Foreshore Beach Floodplain Risk Management Strategy. Bayside Council flood mapping shows that all lots within the BIP are flood affected as they are within the 1% annual exceedance probability (AEP) flood level plus 0.5 m freeboard and probable maximum flood (PMF) level. The flood extent primarily impacts internal roads with only minor portions of IXOM-operated lots being in the 1% AEP and PMF flood levels.

3.2 Protected areas

There are no protected areas adjacent to the site, such as reserves or national parks protected under the NSW *National Parks and Wildlife Act 1974* (NPW Act).

3.3 Geology, soils, salinity and groundwater

3.3.1 Geology

According to Sydney 1:100,000 Geological Series Sheet 9130 (NSW Department of Mineral Resources, 1983), the site is underlain by medium to fine-grained marine sand with podsols (Figure 3.1).

3.3.2 Soils

According to the Department of Environment, Climate Change and Water (DECCW, 2009) *Soil landscapes of the Sydney 1:100,000 Sheet map*, the site primarily comprises the 'Tuggerah' soil landscape (Figure 3.1) which consists of gently undulating to rolling coastal dune fields. This soil landscape is limited by extreme wind erosion and non-cohesive, highly permeable soil with very low fertility with localised flooding and permanently high waterbodies.

The site is also intersected by 'disturbed terrain', which features level plains to hummocky terrain, is extensively disturbed by human activity, and includes complete disturbance, removal or burial of soil. Limitations of this soil landscape are mass movement hazard, unconsolidated low wet strength materials, impermeable soil, poor drainage, localised very low fertility and toxic materials.

3.3.3 Acid sulfate soils

According to the NSW DPHI 'Environmental Planning Instrument – Acid Sulfate Soils' mapping, the site is mapped as class 3 acid sulfate soils land (Figure 3.2). The NSW Acid Sulfate Soil Management Committee's (1998) *Acid Sulfate Soil Manual* states class 3 land has potential to contain acid sulfate soils (ASS). However, the Bayside Council LEP mapping shows that the site has a low probability of occurrence for ASS.

Development consent is required for the carrying out of class 3 land where works are more than 1 m below the natural ground surface and works by which the water table is likely to be lowered more than 1 m below the natural ground surface.

3.3.4 Salinity

The DEECW (2016) Hydrogeological Landscapes of New South Wales and the Australian Capital Territory map indicates that the site is not in an area where salting is evident. This means land in these areas have soil, geology, topography and groundwater that are unlikely to produce saline surface conditions.

3.3.5 Groundwater

A search of DPIE Water's continuous water monitoring network (<http://allwaterdata.water.nsw.gov.au/water.stm>) identified numerous groundwater wells within 1 km of the site (Figure 3.2). Any potential for impact on groundwater will be reviewed when the required excavations are better understood as the design process progresses,

The closest residents are approximately 50 m to the east of the BIP boundary and 265 m from the proposal in the residential suburb of Hillsdale. These residents are near the east of the BIP, on the eastern side of Denison Street (Figure 2.2).

3.4 Traffic and access

The site is accessed via the following State roads:

- From south – Botany Road, Beauchamp Road and Denison Street.
- From north – M1 Motorway, Wentworth Avenue and Denison Street.

Heavy vehicles primarily access the BIP from an access gate (Gate 3) on Denison Street, from which they travel on internal private two-way roads to their on-site destination. All internal roads are speed restricted to 25 km/h or lower. Access is also possible from Gate 1 at the southern end of the BIP off Beauchamp Road and Gate 4 from the north. Vehicles greater than 6 m high cannot access the site due to height restrictions.

All vehicles entering the site must operate on designated sealed internal roads only and must only travel to areas for which clearance has been granted from the appropriate control room. All employees and contractors entering the site must be authorised by the Operations Manager.

Employees must use the car parks provided external to the plant and all visitors must park outside of a security fence and report to reception.

3.5 Air quality

The main sources of air pollution in the area are anthropogenic activities such as motor vehicle exhaust, industrial and commercial activities. The National Pollutant Inventory map was searched in February 2024 which identified 18 industrial contributors to the local air shed.

3.6 Noise

The noise catchment is characterised by industrial and commercial activities and motor vehicle traffic. Noise sources include the operation of plant and equipment at industrial and commercial premises and heavy and light vehicles within and outside of the BIP.

Noise is monitored monthly at eleven locations around the BIP, including at the nearest residential receivers on Denison Street. The November 2023 noise report found that noise along Denison Street is primarily influenced by passing and distant road traffic and both BIP and non-BIP plant noise. All active plants within the BIP were observed to be below the 50 dB(A) $L_{Aeq}(15\text{ minute})$ criterion when measured at the nearest residential receivers on Denison Street.

3.7 Heritage

State Environmental Planning Policy (Three Ports) 2013 (Three Ports SEPP) lists the 'Main Administration Building "Orica" and Mature Ficus' as listed heritage items although it also states that these items are not state heritage items. There are no other items of heritage value on the site (Figure 3.3).

The Matraville public school is the nearest historic heritage item to the site (approximately 540 m east).

The Aboriginal Heritage Information Management System (AHIMS) was searched on 15 February 2024 and no Aboriginal places or items were identified in the vicinity of the site.

3.8 Biodiversity

There is no vegetation on the site other than several native and exotic plantings in the vicinity of the front office-building. The only mapped native vegetation near the site is an area of Plant Community Type (PCT) 3806 Sydney Coastal Sand Mantle Heath approximately 100 m south-west of the site (Figure 3.3).

3.9 Contamination

The Botany Bay LGA is underlain by the Botany Bay Sand Beds which contains a coastal sand bed aquifer. The Botany Sands aquifer (the aquifer) has a shallow water table and has been contaminated with chemicals such as chlorinated hydrocarbons, per- and poly-fluoroalkyl substances (PFAS), solvents, petroleum hydrocarbons (petrol and diesel) and heavy metals by historical industrial land use in the area. Whilst only a small portion of the aquifer is contaminated, the groundwater resource has been declared a 'groundwater extraction exclusion zone' which prohibits pumping of groundwater and prevents further development of the resource.

The land above the contaminated aquifer has been declared a contaminated land area (area 3203) by the NSW Environment Protection Authority (EPA) and includes the BIP and the proposal site. The contaminated aquifer is currently being managed by the site owner (Orica) under a voluntary management proposal (Notice number 20201704) as approved by the EPA under section 17(3) of the NSW *Contaminated land Management Act 1997* (CLM Act).

A search of the EPAs contaminated land records identified that the land associated with this contamination is the only contaminated land recorded in the vicinity of the site.

Figure 3.1
Geology, soil landscapes and soil classification

Botany Chlorine Liquefaction Plant
MODIFICATION TO STATE SIGNIFICANT DEVELOPMENT - SCOPING REPORT



Figure 3.2
Acid sulphate soils and groundwater

Botany Chlorine Liquefaction Plant
MODIFICATION TO STATE SIGNIFICANT DEVELOPMENT - SCOPING REPORT

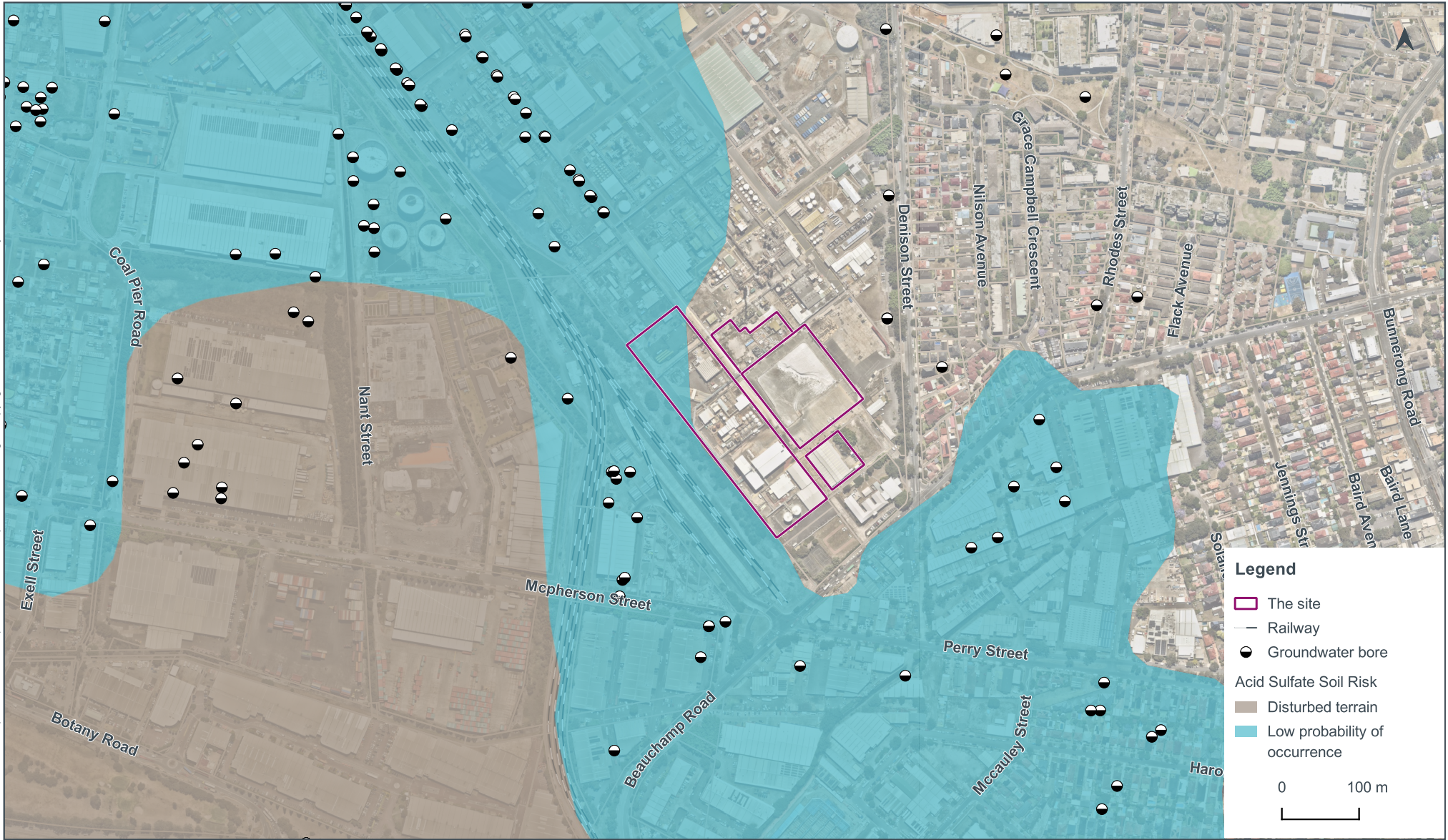
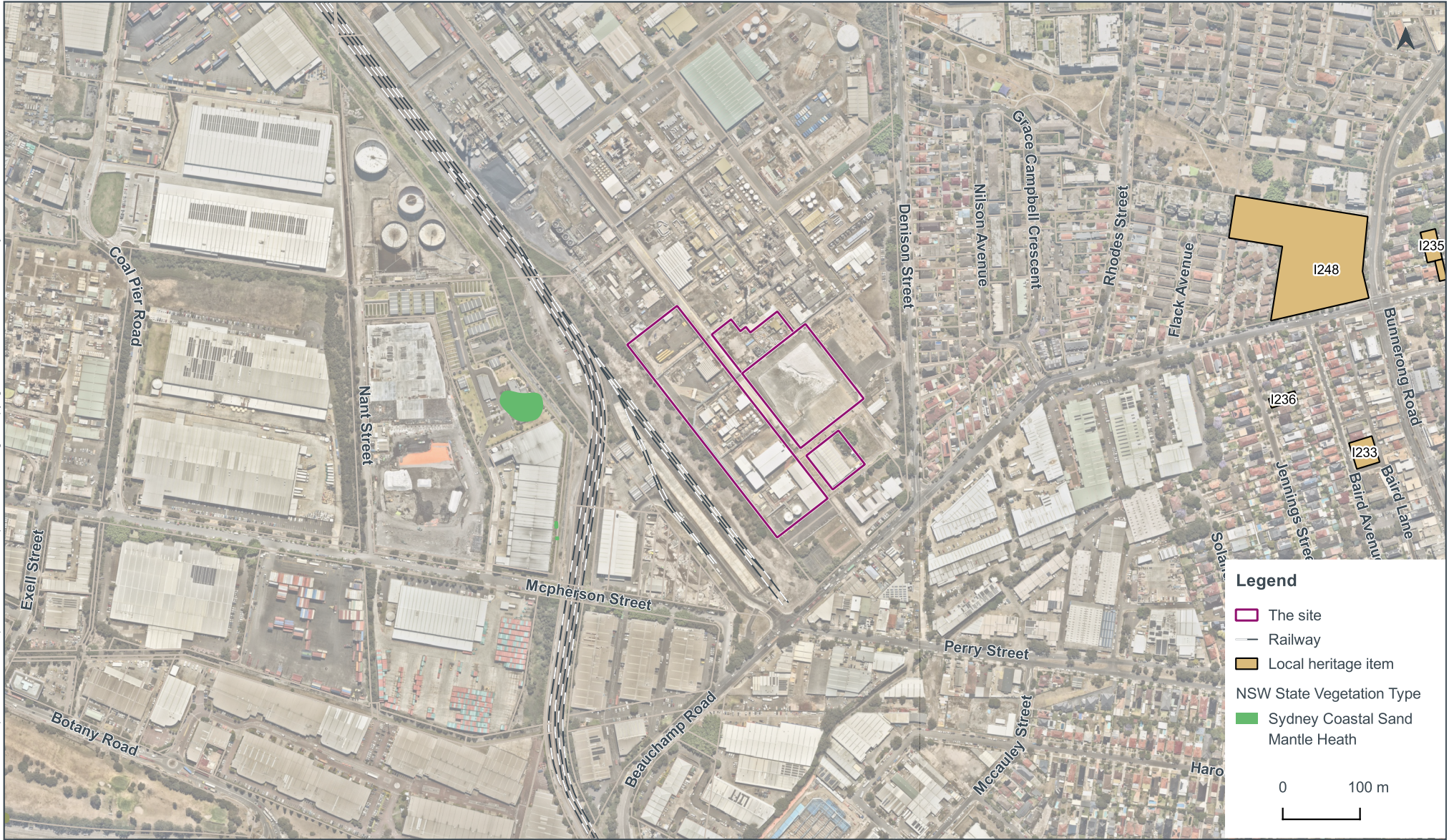
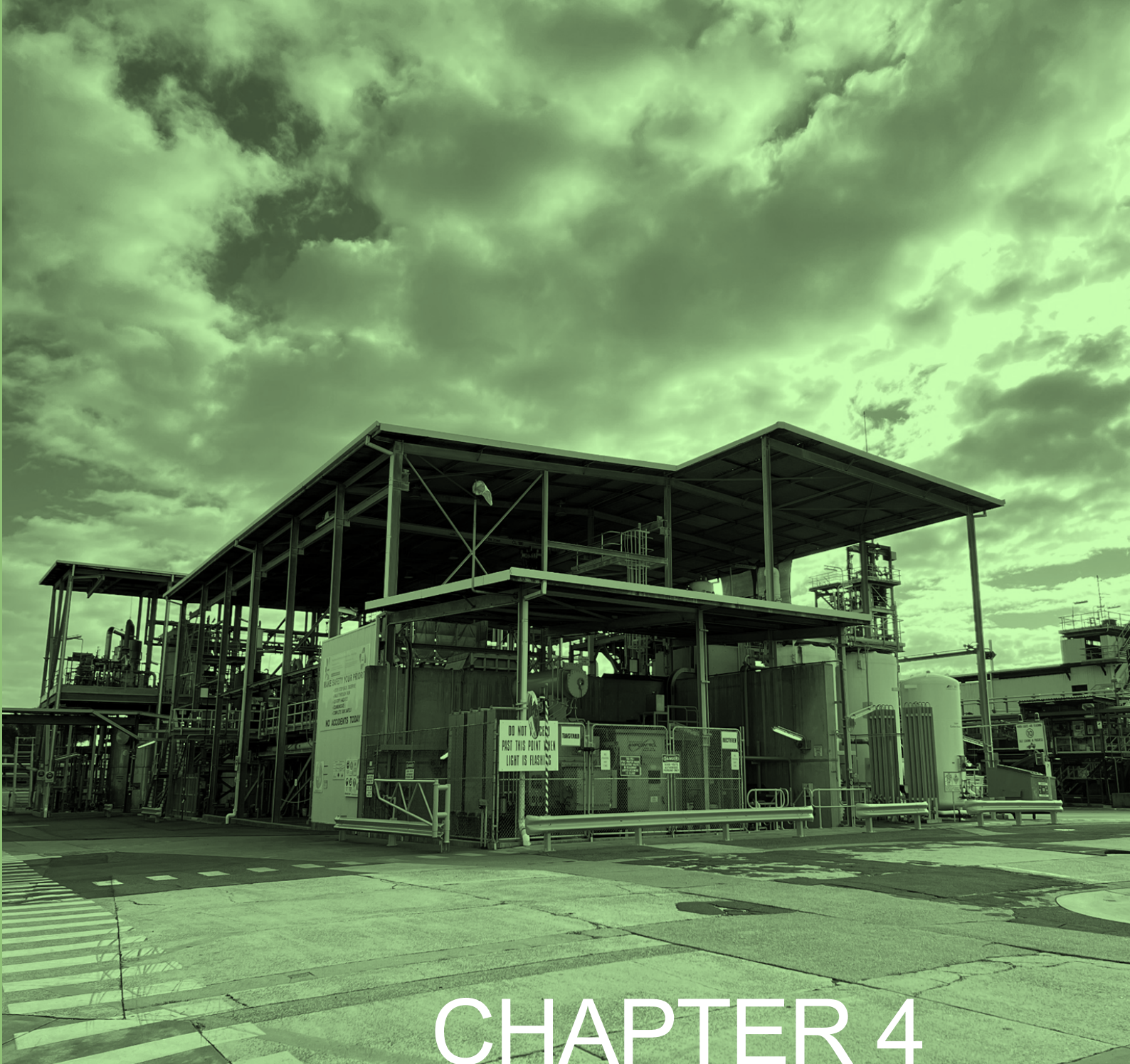


Figure 3.3
Heritage and biodiversity

Botany Chlorine Liquefaction Plant
MODIFICATION TO STATE SIGNIFICANT DEVELOPMENT - SCOPING REPORT





CHAPTER 4

STRATEGIC CONTEXT

4 STRATEGIC CONTEXT

4.1 Strategic plans

4.1.1 Botany Bay Planning Strategy 2031

The Botany Bay Planning Strategy 2031 (the strategy) sets out seven strategy directions and several objectives to successfully achieve each direction. The strategic directions include:

- Strategy Direction 1: Enhancing Housing Choice and Liveability.
- Strategy Direction 2: Revitalising Botany Road and Traditional Centres.
- Strategy Direction 3: Managing Growth in the Eastern Centres.
- Strategy Direction 4: Reviving the Local Economy.
- Strategy Direction 5: Maintaining Sydney Airport as a Global Gateway.
- Strategy Direction 6: Maintaining Port Botany as a Global Gateway.
- Strategy Direction 7: Protecting the Natural Environment.

The proposal would support Objective 6.1 of strategy direction 6: Maintaining Port Botany as a Global Gateway, as it would assist in retaining Banksmeadow for general industrial activities and continue to utilise the land in an effective and efficient manner for general industrial land use.

4.1.2 Greater Sydney Region Plan

The *Greater Sydney Region Plan: A Metropolis of Three Cities* (Greater Sydney Commission [GSC], 2018) provides the basis for strategic planning for the Greater Sydney region by setting out a 40-year vision and establishing a 20-year plan to manage growth and change. The GSC was dissolved on 1 January 2024, however these plans are now under control of DPHI and remain relevant until a new plan is released for the region.

The Greater Sydney Region Plan establishes 10 directions supported by 40 objectives that outline the framework for the city's liveability, productivity and sustainability. The proposal supports the following directions and objectives of the plan:

Direction 1 (*Infrastructure supporting new developments*) is focused on improving transport corridors and supporting and prioritising investments in new infrastructure. It is supported by four objectives, including 'Objective 1: Infrastructure supports the three cities' and 'Objective 4: Infrastructure use is optimised'. The proposal meets these objectives as it would introduce infrastructure in an optimal area that is critical to support safe drinking water for the population of NSW.

Direction 9 (*An Efficient City*) recognises the importance of responding to anticipated growth through strategic land use for the management of water, energy, resources and waste to reduce costs, carbon emissions and environmental impacts. The proposal would reduce transport-related greenhouse gas emissions by producing liquefied chlorine in Sydney for distribution to the NSW market, rather than transporting liquefied chlorine from Victoria.

4.1.3 Eastern City District Plan

The site is in Sydney's eastern district and the Eastern City District Plan sets out the planning priorities and actions for implementing the plan at a district level. The planning priorities relevant to the proposal are:

Planning priority E1 – Planning for a city supported by Infrastructure – the objectives directly relevant are:

- Objective 1 – Infrastructure supports the three cities.
- Objective 3 – Infrastructure adapts to meet future needs.
- Objective 4 – Infrastructure use is optimised.

The proposal will ensure Sydney maintains access to liquefied chlorine if the liquefaction plant at Laverton becomes non-operational, now and into the future. Further, infrastructure use will be optimised through the local distribution of bulk liquefied chlorine to NSW from the Botany plant.

Planning priority E12 – Retaining and managing industrial and urban services land – the objectives relevant to the proposal are:

- Objective 23 – Industrial and urban services land is planned, retained and managed.

The proposal would retain and manage the industrial land within the BIP for its highest and best industrial use, being the development of infrastructure that provides a critical service to the state.

Planning priority E19 – Reducing carbon emissions and managing energy, water and waste efficiently:

- Objective 33 – A low-carbon city contributes to net-zero emissions by 2050 and mitigates climate change.

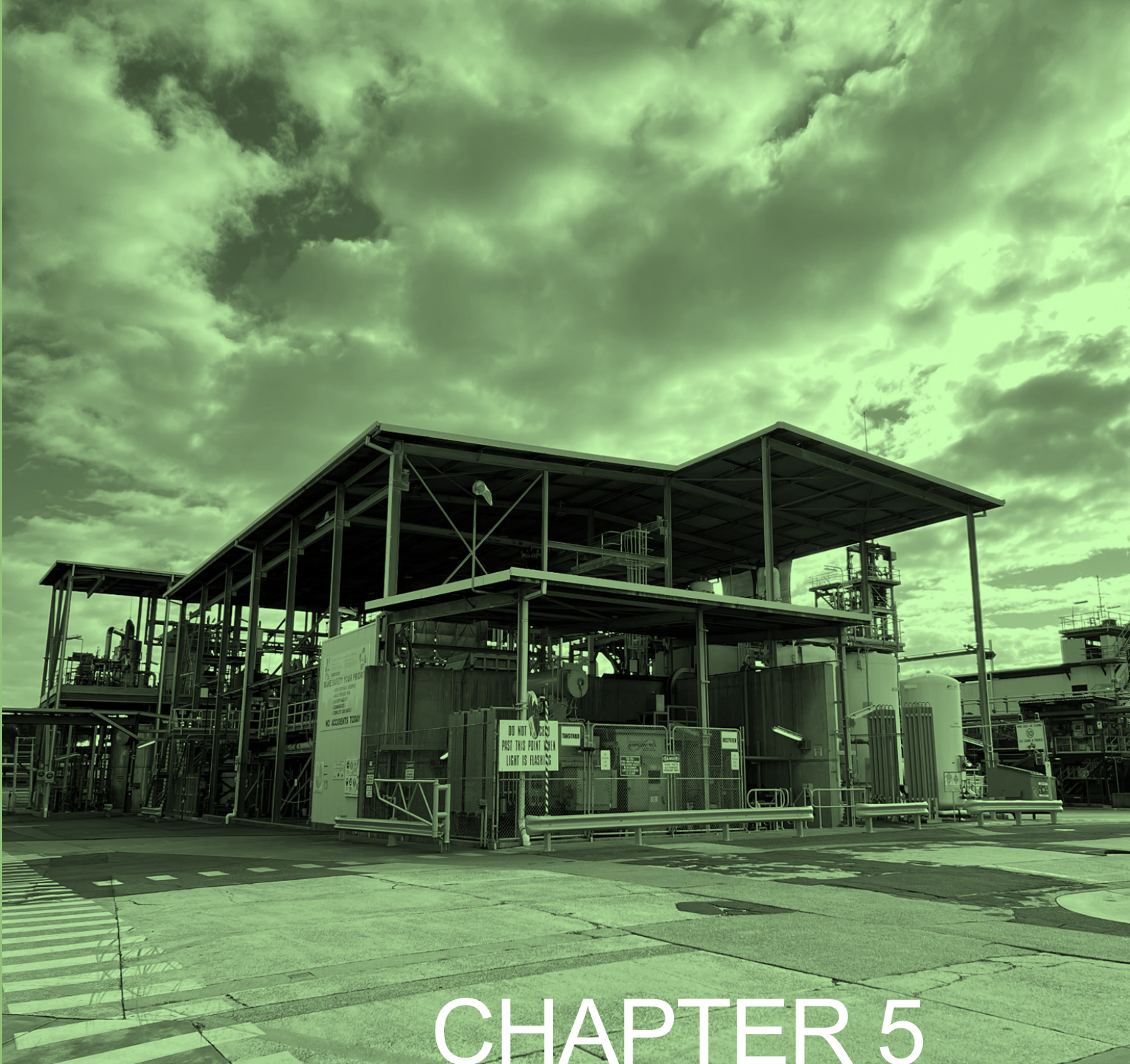
The proposal would enable the reduction of transport-related emissions by providing the option to supply NSW demand for bulk liquefied chlorine from Botany rather than transporting bulk liquefied chlorine to NSW from the chlorine liquefaction plant in Laverton, Victoria.

4.1.4 Bayside Local Strategic Planning Statement – A land-use vision to 2036

The planning priorities set out in the Bayside Local Strategic Planning Statement are grouped under the same themes identified in the Eastern City District Plan. The themes and planning priorities relevant to the proposal are:

- An efficient city – planning priority 23 – Reduce carbon emissions through improved management of energy, water and waste.

The proposal will reduce carbon emissions by optimising the transport route for bulk liquefied chlorine deliveries to NSW.



CHAPTER 5

STATUTORY CONTEXT

5 STATUTORY CONTEXT

5.1 Introduction

This chapter summarises the Commonwealth and NSW regulatory and policy framework applicable to the modification of an existing SSD under Section 4.55(2) of the EP&A Act. This chapter describes the assessment pathway under these pieces of legislation and identifies other approvals under State and Commonwealth legislation which are required.

5.2 Commonwealth legislation

5.2.1 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

Approval by the Commonwealth Minister for the Environment and Water is required for any action that may have a significant impact on matters of national environmental significance (MNES) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). If an activity is likely to have a significant impact on a MNES then it may be a controlled action and should be referred to the Commonwealth Minister for the Environment and Water for consideration. MNES, as defined under the EPBC Act, are:

- World heritage properties.
- National heritage places.
- Wetlands of international importance (Ramsar wetlands).
- Nationally threatened species and ecological communities.
- Migratory species.
- Commonwealth marine areas.
- The Great Barrier Reef Marine Park.
- Nuclear actions (including uranium mining).
- Water resources, in relation to coal seam gas development and large coal mining development.

An action that may affect a MNES has to be referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) for determination as to whether it is a controlled action.

The Protected Matters Search Tool was reviewed in February 2024 which identified several MNES within 10 km of the site that may be relevant to the proposal, including:

- Migratory species.
- Wetlands of international importance (Towra Point Nature Reserve).

The proposal will not significantly impact on any MNES as no habitat will be impacted and the site is not near the Towra Point Nature Reserve and the requirements of the EPBC Act are not relevant. As such, referral of the proposal to DCCEEW is not required.

5.2.2 Commonwealth Native Title Act 1993

The Commonwealth *Native Title Act 1993* recognises and protects native title rights in Australia. It allows a native title determination application (native title claim) to be made for land or waters where native title has not been validly extinguished, for example, extinguished by the grant of freehold title to land.

Applications for compensation for extinguishment or impairment of native title rights can also be made. All native title claims are subjected to a registration test and will only be registered if claimants satisfy a number of conditions. A register of native title claims is maintained by the National Native Title Tribunal.

Proposed activities or development that may affect native title are called 'future acts'. Claimants whose native title claims have been registered have the right to negotiate about some future acts, including mining and granting of a mining lease over the land covered by their native title claim. Where a native title claim is not registered, a development can proceed through mediation and determination processes, though claimants will not be able to participate in future act negotiations.

The National Native Title Tribunal's Register of Native Title Claims was searched. No relevant native title claims were identified on the Register of Native Title Claims.

5.3 NSW legislation

This section provides an overview of NSW legislation associated with the proposal.

5.3.1 Permissibility and planning pathway

The site is zoned IN1 – General Industrial under the TISEPP. The development is consistent with the definition of a general industry, which by virtue of TISEPP is permitted with consent in the IN1 land use zone. The proposed modification will not alter the permissibility of the development.

The proposed modification will be assessed under section 4.55(2) of the EP&A Act, and a modification report will accompany the modification.

Section 4.55(2) states an approval authority may modify a consent if it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified (if at all).

IXOM contends construction and operation of the proposal would be substantially the same development as the development for which consent was granted because:

- Prior to granting of consent DA35/98 and as described in Section 3.3.4 of Dames & Moore (1998) *Environmental Impact Statement: Replacement Chlor-Alkali Plant for Orica Australia Pty Ltd*, a chlorine liquefaction plant was historically operated on the site and, therefore, the proposal would not be a new use of the site.
- The site already receives, stores and handles liquefied chlorine as it is received from the Laverton facility in 33kg, 70 kg cylinders and 920 kg drums for distribution to NSW and QLD customers.
- The site is permitted to store one 13 tonne chlorine tanker on the site for half of any 12 month period.
- Chlorine is safely reticulated across the site to manufacture several chlorine derivative products.
- The processes that will be introduced are equivalent to those that have been safely demonstrated by IXOM at the Laverton plant for an extended period.
- IXOM has well developed and practiced plans for managing leaks from chlorine containers.

IXOM is seeking to modify the consent of an existing SSD, and as per section 4.5(a) of the EP&A Act the Minister for Planning and Public Spaces is the consent authority for the proposed modification.

5.3.2 Other SEPPs

In addition to the TISEPP and PSSEPP summarised in Section 5.1 the modification report will consider Chapter 3 Hazardous and offensive development of State Environmental Planning Policy (Hazards and Resilience) 2021 (Hazards SEPP) and any other SEPP relevant to the proposal.

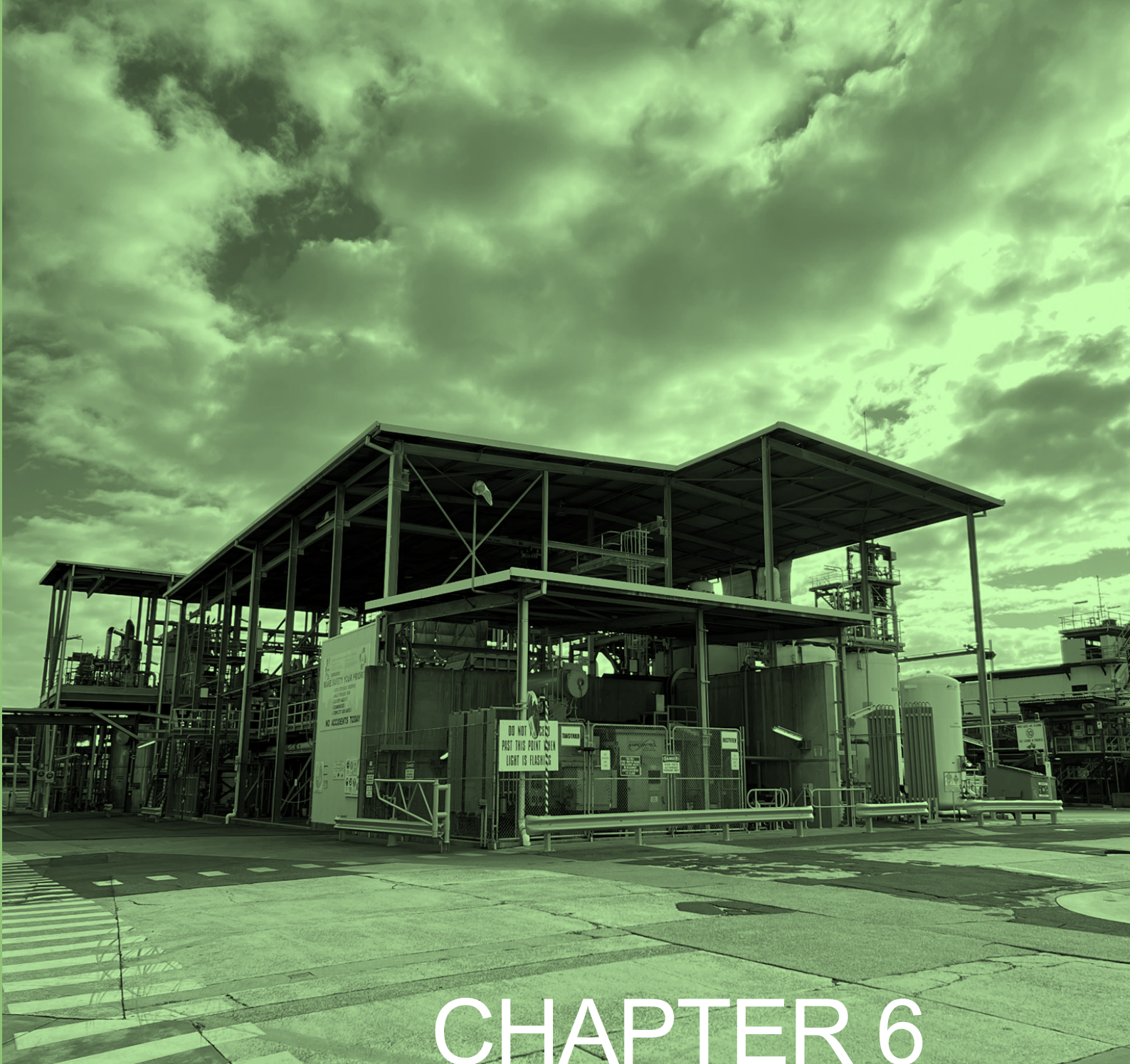
5.3.3 Other approvals and licenses

The POEO Act aims to protect, restore and enhance the quality of the environment in the context of ecologically sustainable development and to reduce risks to human health and prevent degradation of the environment.

According to Clause 48 of the Act, an EPL is required from the EPA for the premises-based activities in Schedule 1 of the Act.

The proposal satisfies clauses 8 (chemical production), 9 (chemical storage), 41 (waste processing (non-thermal treatment)) and 42 (waste storage) of Schedule 1 of the Act.

Accordingly, EPL 20547 has been issued for the site and IXOM will consult EPA on the need to amend this licence in accordance with the proposal.



CHAPTER 6

MATTERS AND IMPACTS

6 MATTERS AND IMPACTS

6.1 Scoping worksheet

Element used DPHIs scoping worksheet to determine the environmental matters requiring detailed or standard assessment in the modification report, and those matters which will not require further assessment.

This chapter describes how the level of proposed assessment was determined for environmental matters, and why certain matters are not proposed to be assessed further (these will still be acknowledged in the modification report with an explanation of why they were not assessed in detail).

6.2 Key matters

The scoping worksheet determined the following to be key matters requiring detailed assessment for the modification report. Reports will be prepared for these assessments, which will be appended to, and summarised in, the modification report.

6.2.1 Hazards and risks – dangerous goods and hazardous and/or offensive development

This Hazards SEPP requires the consent authority to consider whether a development proposal is a potentially hazardous industry or a potentially offensive industry.

Potentially hazardous industry means a development for the purposes of any 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.

Potentially offensive 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 emit a polluting discharge (including for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land, and includes an offensive industry and an offensive storage establishment.

The site has been identified as a major hazard facility as defined under Schedule 15 of the Work Health and Safety Regulation 2017 due to existing storage and processing of significant quantities of chlorine at the site.

A preliminary quantitative risk assessment (QRA) of the proposal has been completed by Sherpa Consulting. To assess the risk from the proposed liquefaction plant (by itself, i.e. not cumulatively with the existing CAP) the following two cases were assessed:

- Without containment building – chlorine releases from the liquefaction plant are not contained inside a building (no containment case). The purpose of this case is to show the risk reduction effect of providing the containment building.
- With containment building – all chlorine releases from the liquefaction plant occur inside a containment building and do not result in an outdoor release.

The preliminary modelling indicates that provided a containment building can be designed to fully contain the liquefaction plant releases, the offsite fatality and toxic injury risk profile does not materially change compared to the existing CAP plant risk profile.

However, as summarised in Section 2.4.1, there is an opportunity to further reduce the risk compared to the existing CAP risk levels if the existing external storage of chlorine containers and parked road tanker can be stored inside the proposed building.

The QRA will be finalised and a preliminary hazard analysis (PHA) carried out in accordance with the *Hazardous Industry Planning Advisory Paper No 6 – Hazard Analysis* (DPE, 2011). The PHA will assess the proposal against relevant quantitative risk criteria for the chlorine liquefaction plant as well as for cumulative risk and road transport risk. The PHA will also take into consideration any changes in risk profiles as they occur, such as the potential reduction in cumulative risk following the imminent cessation of Qenos's operations within the BIP.

Reporting will also consider the following, which were highlighted during initial consultation with SafeWork NSW:

- A cost-benefit analysis/so far as is reasonably practicable analysis of alternate chlorine supply options to justify the proposal.
- Cumulative risk in terms of overall CAP, BIP and adjacent industrial operations.
- Worst case consequences in addition to overall risk.
- Potential for operator error.
- Selection and justification of management measures.

6.2.2 Access – traffic and access

There are busy state roads in the region, with some of these roads passing through residential areas and others important routes for local businesses and their customers. The proposal is expected to generate heavy vehicle traffic within the BIP during loading of liquefied chlorine, as well as incoming and outgoing traffic on the local and wider road network during deliveries. Any impact from the additional vehicle movements is expected to be minor as the proposal includes the loading of tankers during normal operations.

Traffic and transport impacts will be assessed in accordance with RMS's (2002) *Guide to Traffic Generating Development* addressing the key heads of consideration for traffic generation and impacts, transport issues, road safety, parking and internal circulation.

The assessment will involve:

- A swept-paths analysis for new internal truck movements.
- Examination of the road network near the site and the roads that form the transport routes including principal intersections.
- Traffic volume and vehicle classification counts as well as intersection counts as required to establish base line traffic conditions.
- Assessment of the proposal in relation to background traffic growth in the region.
- Assessment of the existing road network comprising road widths, intersection treatments, compliance with current standards, existing traffic volumes and vehicle classifications, road safety and identified deficiencies.
- Assessment of the traffic and transport impacts of operating the proposal comprising level of service, physical condition of the roads, road safety issues and potential cumulative impacts from other approved projects in the area.
- Recommendations for improving intersection performance and road safety, if required.

6.2.3 Amenity – noise and vibration

The residences in Hillsdale and commercial and industrial land uses adjacent to the site could be sensitive to construction and operational noise generated by the proposal. Trucks could also generate noise at nearby receivers.

Operational noise will be assessed using a quantitative method in accordance with:

- EPA's (2017) *NSW Noise Policy for Industry* (NPI).
- EPA's (2011) *NSW Road Noise Policy*.
- EPA's (2009) *Interim Construction Noise Guideline*.

The noise assessment will comprise:

- Characterisation of background noise using existing and measured monitoring data.
- Assessment of prevailing weather conditions using historical weather data from the nearest BoM weather station over a minimum period of 12 months to derive metrological parameters for prediction of noise during calm and noise enhancing weather.
- Identification of noise-sensitive receivers surrounding the site.
- Determination of plant and equipment sound power levels.
- Use of Environmental Noise Model software or equivalent to predict noise levels for day, evening and night and determine compliance with relevant noise criteria. This will involve:
 - Developing operational noise modelling scenarios.
 - Importing digital topographic data, including nearby residential areas and detailed site development plans.
 - Predicting contributed noise emissions for calm and noise enhancing weather using modelling.
 - Predicting site intrusive noise levels for daytime, evening and night-time for the operating scenarios to sensitive receivers.
 - Producing noise contours to clearly indicate the impact of noise emissions.
 - Identifying noise mitigation measures including noise reduction equipment and control processes.
 - Description of how the proposal noise trigger levels would be achieved, monitored and audited, and how corrective action would be taken when needed.
- Road transportation noise impacts would be assessed using existing traffic with proposal truck and employee vehicle movements.

6.2.4 Air – particulate matter and gases

Potential pollutants could be particulates, or potential fugitive emissions from the chlorine liquefaction plant following absorption in the scrubbing system, and products of fuel combustion from vehicles and mobile and fixed equipment associated with the proposal. The proposal is unlikely to significantly increase ambient concentrations of these pollutants given the small quantity of emissions and varying distances between the site and residential receivers.

A quantitative method will be used to assess air quality impacts, using air dispersion modelling in accordance with EPA's (2016) *Approved methods for the modelling and assessment of air pollutants in NSW*, comprising:

- Review of existing air quality monitoring data to characterise site meteorology and background dust levels and to determine criteria and potential constraints for the proposal.
- Characterisation of air quality and odour in the regional air shed considering approved and foreseeable projects based on publicly available information.
- Identification of the proposal and neighbouring sources of air emissions and odour.

- Development of an air dispersion model to determine the extent and severity of operational air quality and odour impacts.
- Quantitative analysis and assessment of operational air quality and odour, including reference to measured background levels which include the emissions from other activities.
- Quantitative analysis and assessment of greenhouse gas generation.
- Description of pollution control equipment and processes to be employed at the site to suppress or minimise emissions.

6.2.5 Flooding and stormwater

The site stormwater and effluent system is managed by BIP site utilities. The stormwater system captures rainfall across the BIP roadways and non-plant areas and flows through stormwater interceptor pits which is pumped to the site's effluent system for disposal to sewer via a Sydney Water trade waste service agreement. Excess flows are discharged to Springvale Drain which flows to Botany Bay.

The BIP area has been used for manufacturing and general industry since 1942 and significant floods have not been reported at the site. The BIP was established in 1998, when it was subdivided and approved for continued industrial land use by the Minister of the then NSW Department of Urban Affairs and Planning (DA 30/98).

The Botany Bay Foreshore Beach Floodplain Risk Management Strategy does not identify any flood risk at the BIP as it falls outside the extent of flooding mapped within the floodplain strategy.

Local council mapping shows some minor inclusions of flood risk within the site, however these are scattered and largely confined to the internal roadways, where the managed stormwater system would pump excess water to the sewer or Springvale Drain.

Given the BIP has been assessed and approved for industrial land-use, and the proposal will not significantly alter existing ground levels, it is fit for purpose and no further flood assessment is required.

The proposal will increase the sealed surface area of the BIP and the resulting impact on stormwater quantity will be addressed. There will be no risk to stormwater quality and therefore an assessment of the proposal's impact on stormwater quality is not required.

6.3 Other matters

The scoping worksheet determined the matters in the following sections will require a standard assessment in the modification report.

6.3.1 Land and groundwater contamination

Given the BIP has a history of land and groundwater contamination (see section 3.9), IXOM will consult with the landowner regarding the history of blocks L and Q to determine if further investigation is required or if construction of the proposal can be managed in accordance with any existing management plans.

If further investigation is required, a contamination assessment will be carried out to determine the suitability of the proposed site. The contamination assessment may include review of all historical contamination investigations at the site and if insufficient information is available to accurately characterise the contaminants that may be encountered during construction, then targeted soil sampling and preliminary waste classification may be required, along with recommending mitigation measures to manage any residual contamination identified at the site.

6.3.2 Geology and soils

As outlined in Section 3.3, the proposal may interact with acid sulfate soils during construction. A geotechnical investigation will be carried out for the site to ensure suitability of the on-site soils and to inform design of the foundations required to support the structures associated with the proposal.

6.4 Scoping only matters

The following matters appear in the scoping worksheet but have not been considered in detail as they are unlikely to be significantly impacted by the proposal. The modification report will note these matters and describe why they were not assessed further.

- Visual amenity – the proposal will be isolated to the BIP and will be in character with the surrounding industrial land use. Further, the chlorine liquefaction plant will not be visible from the nearest public road or residential receivers on Denison Street. The proposal will not have a significant impact on the visual amenity of the surrounding landscape.
- Biodiversity – the preferred location for the proposal is cleared of vegetation and does not support preferred habitat for native fauna.
- Built environment – the proposal will involve the construction of a new chlorine liquefaction plant including associated plant and equipment. This will necessitate the re-location of the existing Hypochlorite loading bay from Block L to Block Q, and the construction of the chlorine liquefaction plant on Block L. All construction works will be carried out in line with the National Construction Code 2022. All structural changes will be contained on the site and will not impact other private or public property or public domain.
- Economic – the proposal would have beneficial local economic impacts from continuation of employment and local expenditure opportunities during construction and operation. The proposal also has wider national economic benefits by ensuring the supply of critical water treatment products to allow the supply of suitably treated water across Australia in the event the Laverton site cannot operate.
- Aboriginal and non-Aboriginal heritage – a preliminary search for items of Aboriginal and non-Aboriginal heritage value was carried out which did not identify any items within proximity to the site. Given the site has been subjected to a long history of disturbance through over 80 years of manufacturing and industrial land use, the potential for the proposal to disturb remnant artefacts of heritage value is considered very low.
- Hazards and risks – other than the potential use and storage of hazardous goods, the proposal will not impact the following hazards and risks:
 - Biosecurity – the proposal will not involve any biosecurity impacts.
 - Coastal hazards – the proposal will not impact coastal processes or hazards such as erosion.
 - Dams – there are no dams on the site and the proposal will not involve construction of or alterations to a dam.
 - Land movement – the proposal will not involve undermining steep slopes and will not result in subsidence or land movement. The proposal will not require bulk earthworks or built structures to be constructed on steep slopes.
 - Waste - Operation of the proposal will not generate significant quantities of waste as by-products and potential emissions are captured for re-use in downstream product plants. The existing waste management plan will be revised in accordance with the Bayside Council waste management plan (document number 18/138430).
- Land
 - Land capability – the site is in an industrial area, is completely disturbed and cannot support agricultural uses. Therefore, its land capability class is not relevant to the proposal.

- Stability and structure – the site is level, predominantly sealed with hardstand or asphalt and will not be disturbed beyond what is required for the construction of the plant and structures associated with the proposal.
- Topography – no change is proposed to site topography.
- Social
 - Community services and facilities – operational employment and subsequent demand for community services will not change.
 - Health – emissions such as particulates and noise will be managed in accordance with best practice and the recommendations of the technical studies identified in this scoping report.
 - Housing availability – the proposal will not increase demand for housing.
 - Safety – a preliminary hazard assessment is being undertaken to inform the modification report. All mitigation measures recommended in the PHA will be implemented in the proposal to ensure safety of on-site workers and any potentially affected sensitive off-site receivers.
 - Social cohesion – the proposal will not result in an influx or change of profile of workers or other people and will not impact social cohesion.
- Water
 - Groundwater quality – the groundwater beneath the BIP is known to be impacted by contamination associated with historical industrial operations at the site. The proposal will involve minor excavations for the construction of structural footings, but is not expected to interact with groundwater. The proposal will not have any impact to groundwater and will not require access to the Botany Sands groundwater resource. The plant area will be sealed with hardstand and all chemical storage tanks will be bunded to 110% of the tank volume. Any potential stormwater runoff from the site is unlikely to infiltrate the surface and interact with groundwater as it will be captured within the plant area or within the BIP-managed drainage along the sealed internal roadways.
 - Water availability – no changes to surface water runoff are proposed, which is captured in the BIP site utilities managed stormwater system and discharged to the sewer or Springvale drains where it flows to Botany Bay.

6.5 Cumulative impacts

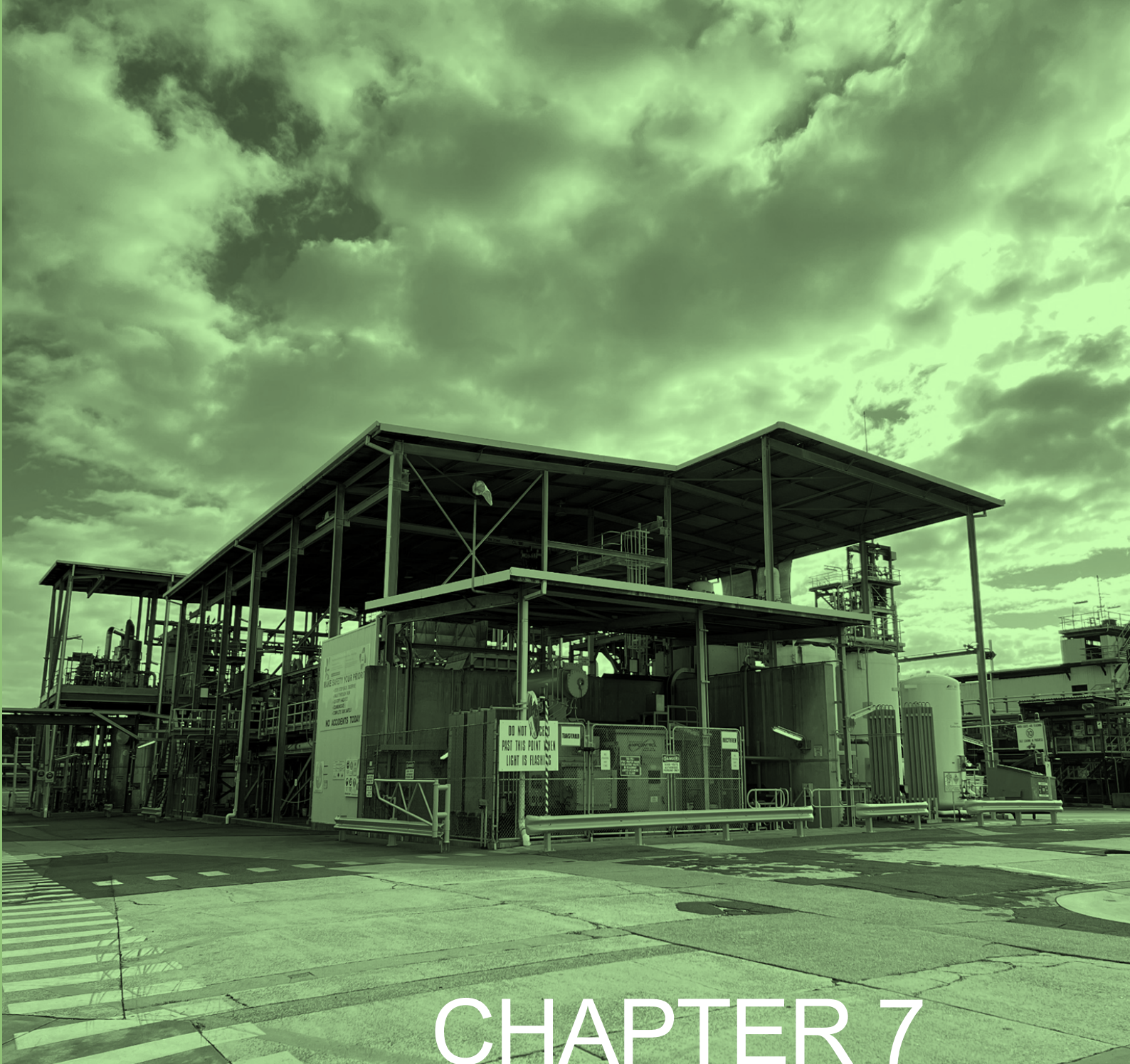
The proposal may result in the following cumulative impacts:

- Air quality – emissions associated with the proposal could combine with emissions from existing and future operations and result in cumulative impacts. However, the risk of significant cumulative impacts will be low as air emissions will be mitigated using best practice measures. Additionally, thresholds for regional cumulative impacts are provided in EPA's (2016) *Approved methods for the modelling and assessment of air pollutants in NSW*, which apply to all regional sources, not only individual projects.
- Noise – like air quality, noise generated by the proposal could combine with noise from surrounding operations and result in cumulative impacts. However, the risk of significant cumulative impacts will be low as noise emissions associated with the proposal will be mitigated using best practice measures.

Noise assessments under the NPI inherently consider cumulative impacts as the noise trigger levels are derived from either the project intrusiveness or amenity noise level, whichever is lowest. The intrusiveness level seeks to not increase noise by more than 5 dB over background noise levels and the amenity level seeks to prevent the ambient noise level of all industrial noise sources in an area combined from exceeding a recommended level.

Residual noise impacts are determined by subtracting the noise trigger level from the noise predicted to be generated by the proposal, and management measures applied according to the level of residual impact.

- Traffic – Potential cumulative intersection impacts are considered using the LoS calculations in RMS's (2002) *Guide to Traffic Generating Development*. When an intersection's LoS is unsatisfactory, the roads authority may consider upgrades to improve its performance.



CHAPTER 7

COMMUNITY AND STAKEHOLDER ENGAGEMENT

7 COMMUNITY AND STAKEHOLDER ENGAGEMENT

7.1 Scoping phase engagement and community views

IXOM has sought to proactively consult with key stakeholders at early stages of the project including:

- Key customers, including Sydney Water.
- The Federal Member for Kingsford Smith, Hon Matt Thistlethwaite MP.
- Orica, in its capacity as landowner.
- Other users of the BIP.

Subsequent to the submission of the scoping report, information will be distributed to:

- Bayside Council.
- Orica Botany Liaison Committee.
- Community members of the Botany Industrial Park Community Consultative Committee.
- Immediate local residents to inform them of the proposal and that there will be further consultation during the preparation of the modification report.

7.2 Proposed engagement during preparation of the modification report

The following engagement will be implemented during the preparation of the modification report:

1. Further consultation – engagement with interested stakeholders and community members will continue throughout the preparation of the modification report with a focus on providing further details around matters of community concern.
2. Meeting immediate neighbours – project representatives will continue to meet immediate neighbours. Any concerns raised by neighbouring property owners will be recorded and considered in the modification report.
3. Consultation with agencies – government agencies will be consulted as required to discuss SEARs, assessment outcomes, proposed mitigation measures and submissions. The following agencies are proposed to be consulted:
 - Council – regarding all aspects of the proposal including flooding.
 - DPHI – regarding all aspects of the proposal.
 - EPA – regarding existing EPL, air quality and noise.
 - Transport for NSW – regarding potential traffic impacts.
 - SafeWork NSW – regarding implications under the hazardous facility requirements.

Any engagement requirements not referenced above but outlined in the SEARs will be adopted.

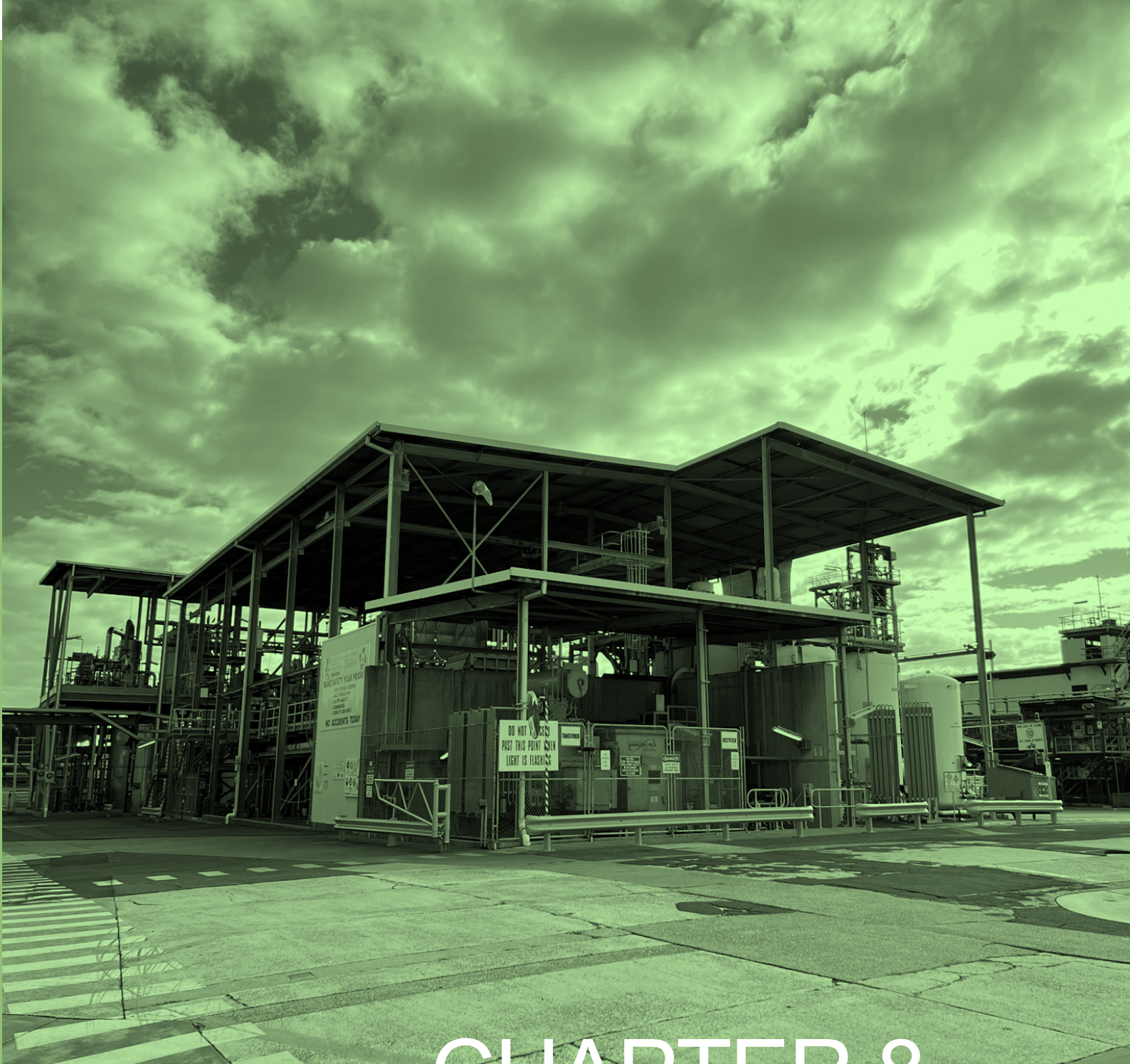
7.3 Future proposal stages and opportunities for engagement

The proposal is in the scoping stage. The next stage will be proposal description finalisation and planning and preparation of the modification report, when the engagement outlined in 7.2 will be undertaken. Feedback received during this stage will be considered and reported in the modification report.

The next stage will be public exhibition when government agencies and the public will have an opportunity to review the modification and prepare submissions.

The next stage will be response to submissions. DPHI will forward public and agency submissions on to the project team, which will respond in a report. The project team will engage with agencies during this stage if clarifications or negotiation on proposed changes are required.

The response to submissions report will be submitted to DPHI, which will present an opportunity for the project team to consult further with DPHI and agencies that have provided feedback regarding the final proposal description, impacts and conditions of consent.



CHAPTER 8

CONCLUSIONS

8 CONCLUSIONS

As described in this scoping report, IXOM proposes to construct and operate a new chlorine liquefaction plant within the BIP to provide the Australian liquefied chlorine market with redundancy in the event that the chlorine liquefaction plant at Laverton, Victoria becomes non-operational. The proposed chlorine liquefaction plant will have a maximum production capacity of 50 tpd but will normally operate at a reduced rate to supply liquefied chlorine in 13 tonne tankers to the NSW region.

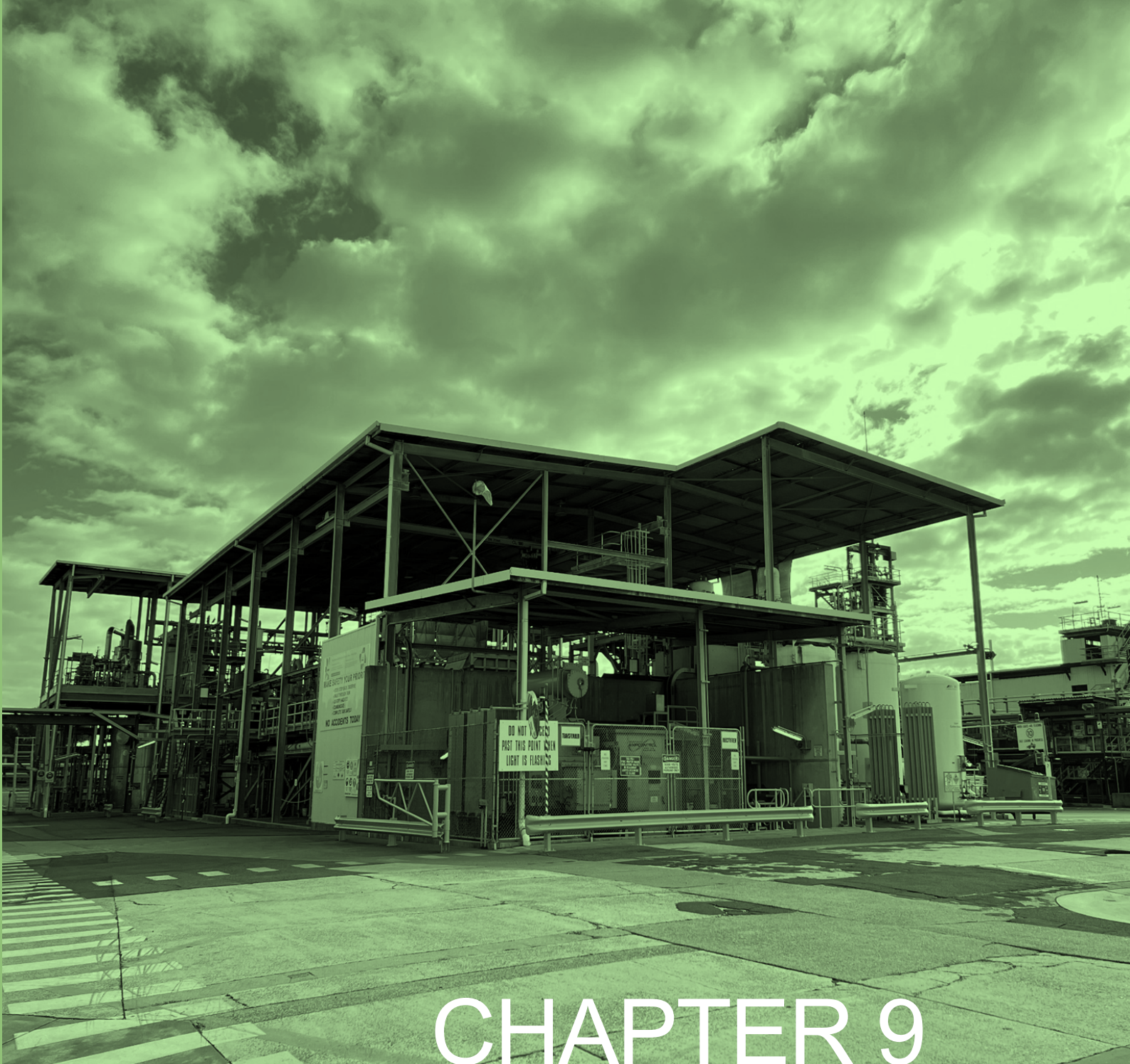
The proposal will be a modification to SSD under Section 4.55(2) of the EP&A Act and a modification report will need to be prepared to accompany the development application to the NSW Minister for Planning and Public Spaces.

The scoping process indicated the following matters will require detailed assessment, which will be addressed in technical studies that will be appended to and summarised in the modification report:

- Hazards and risks – dangerous goods and hazardous and/or offensive development.
- Access – traffic and access.
- Amenity – noise and vibration.
- Air – particulate matter and gases.
- Stormwater quantity.

Land and groundwater contamination and geology and soils will require standard assessment and will be addressed in a chapter of the modification report.

The other matters under the groups of amenity, biodiversity, built environment, economic, heritage, hazards and risks, land, social and water, not addressed above, are scoping only matters that will not be assessed in detail. They will be noted in the modification report with an explanation of why they will not be significantly impacted by the proposal.



CHAPTER 9

REFERENCES

9 REFERENCES

NSW DPE. 2011. *Hazardous Industry Planning Advisory Paper No 6 – Hazard Analysis*.

KBR. 2023a. *Project Gemini Chlorine Liquefaction Plant Pre-Feasibility Study – Site Adequacy Report*.

KBR. 2023b. *Project Gemini Chlorine Liquefaction Plant Pre-Feasibility Study – Preliminary Design Report*.



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