DGL GROUP LIMITED

Proposed Liquid Waste Treatment Plant

Flood Risk Management Study

16151 – August 2021

siteplus

planning . engineering . landscape . design . management

FLOOD RISK MANAGEMENT STUDY

PROPOSED LIQUID WASTE TREATMENT PLANT– UNANDERRA

PREPARED FOR

DGL GROUP LIMITED

PREPARED BY

Site Plus Pty Ltd
(Siteplus)

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Document Tracking

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3	Revised to Council Comment	A.C		August 2021	D.N		August 2021

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EXECUTIVE SUMMARY

DGL Group Limited is preparing an Environmental Impact Statement (EIS) for a proposed Liquid Waste Treatment Plant (LWTP) at their Unanderra Plant at Lot 3 DP 259921, 201 Five Islands Road, Uanaderra.

The site lies within the Allan's Creek catchment and is flood affected by both the 100yr and Probable Maximum Flood events. Wollongong City Council (Council) has an adopted 2019 flood study for the Allan's Creek catchment. Resulting in the site being located within the medium flood risk precincts.

Based on the results of the Council flood study and the fact that the LWTP is an indoor facility within an existing building onsite. The existing building is to be modified to meet the industrial controls within the medium flood risk precinct. Reducing the flood risk for the plant to an acceptable level.

This Report assesses the development in terms of Wollongong City Council's Chapter E13 Floodplain Risk Management to ensure that the proposal meets all the relevant flooding criteria. It finds that the industrial proposal can meet the flooding controls in Chapter E13.

From the flood risk assessment the following conclusions can be made:

1. The floor level within Building E which contains the proposed plant is to have a minimum floor level of 9.84m AHD (1%AEP level).
2. Provide a bund around the plant at the PMF level being 10.43m AHD. The existing building contains a reinforced concrete structure to approximately 3m high around the external wall to act as the bund and protect the building from flood damages.
3. The concrete bund above the PMF level will ensure the liquid wastes within the plant won't contaminate the floodwaters.
4. The development is located within the least flood affected portion of the site.
5. Site entry is located at the highest point of the site, which is the best location for access in terms of the flood evacuation;
6. A flood component is to be included within the sites Emergency Response Plan.

1. INTRODUCTION

1.1. Preliminary

1.1.1. Siteplus Engagement

SitePlus Pty Ltd (Siteplus) has been commissioned by DGL Group Limited to prepare a Flood Risk Management Report in response the Secretary's Environmental Assessment Requirements (SEARS).

1.1.2. Scope of Work

Siteplus determined the following investigations were required to complete a thorough flood risk assessment of the site:

- Define the flood risk precincts across the site, based on the flood information provided by Council and a previous Flood Study completed for the site.
- Evaluate the site in terms of Wollongong City Council's Chapter E13 Floodplain Risk Management requirements.
- Prepare a report which summarises the findings of the analysis.

1.2. Subject Land

The site is located at Lot 3 DP 259921, 201 Five Islands Road, Unanderra, New South Wales. The site is located on the southern side of Five Islands Road and the western side of the M1 Princes Motorway at Unanderra on the edge of the heavy industrial area of Port Kembla and Unanderra in the Wollongong LGA. Figure 1-1 identifies the site location.

The site lies within the lower reaches of the Allan's Creek system approximately 500m upstream of the confluence between Allan's Creek and American Creek.

A site survey is provided in Appendix A.

1.3. Previous Flood Studies

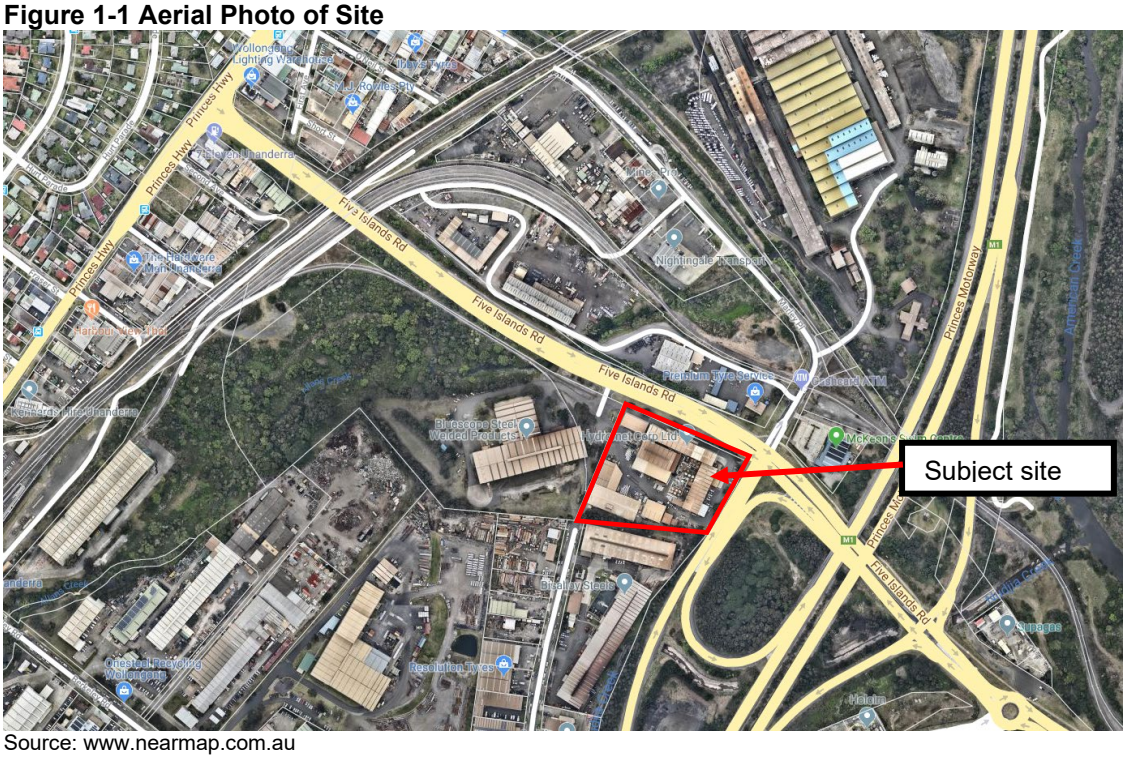
To conduct the flood risk assessment for the proposed development Council's flood information has been extracted from the Allan's Creek Flood Study conducted in September 2006 by Lawson & Treloar.

In 2019, Advisian completed an updated flood study using the latest available data, guidelines, modelling and techniques. The results indicated that there is an increase in flood levels

across the site. The 2019 flood levels have formed the basis for the flood risk management study.

Conducting Hydrological and Hydraulic analysis to attain flood levels is outside the scope of this Report.

Figure 1-1 Aerial Photo of Site



Source: www.nearmap.com.au

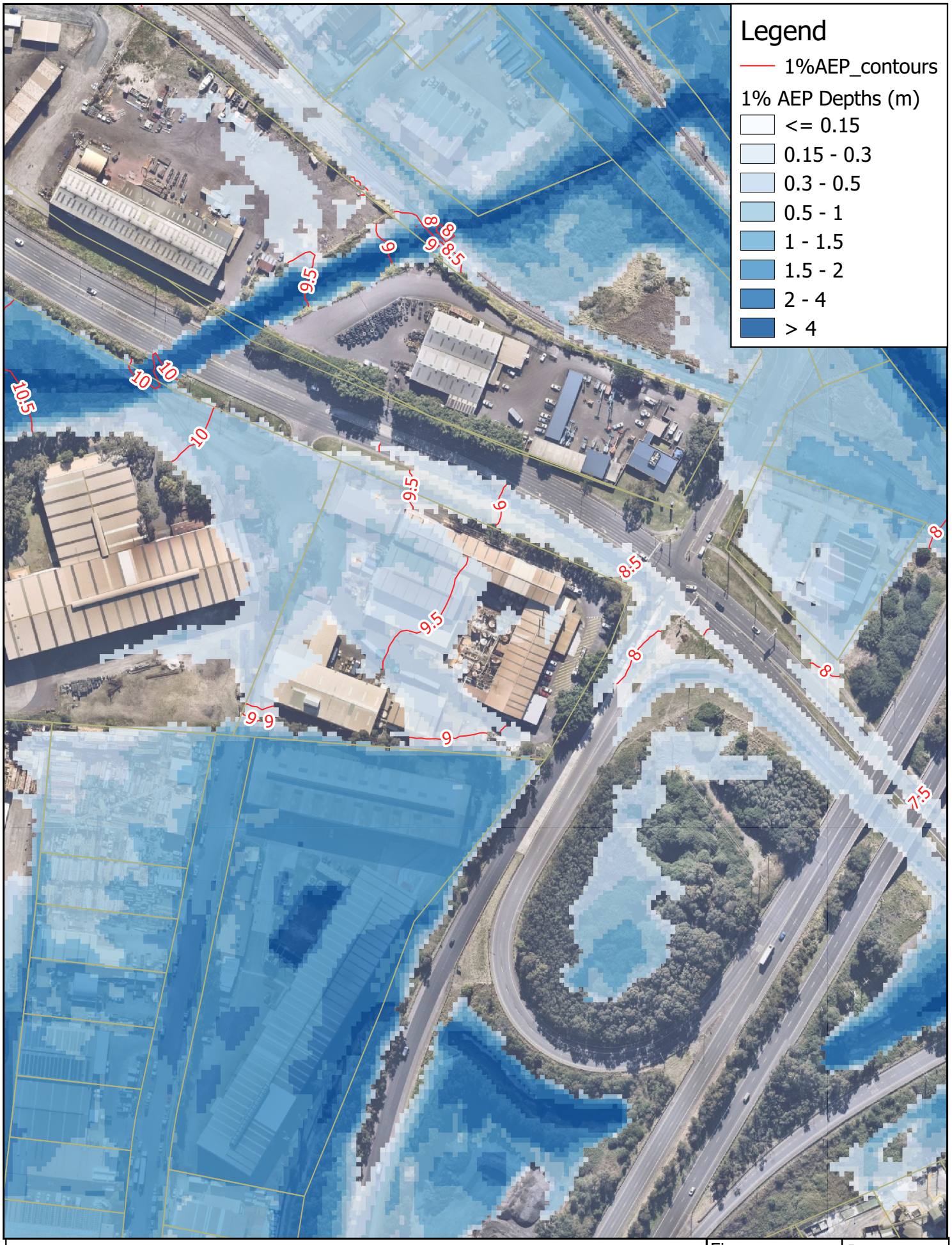
2. FLOOD STUDY RESULTS

Figure 2-2 and Figure 2-3 illustrate the extents and levels for the 100 year flood event and Probable Maximum Flood (PMF).

The results from the flood study seem to correspond in terms of survey levels across the site and worst case has been adopted in terms of assessment for setting floor levels and conducting the flood risk assessment.

Using the results of the 2019 Allan's Creek Flood Study the following flood levels apply to the site:

- 10yr 9.53m AHD.
- 100yr 9.84m AHD.
- PMF 10.43m AHD.



Title:
1% AEP Risk Management Flood Extents

Figure: **2-2**

Rev: **A**

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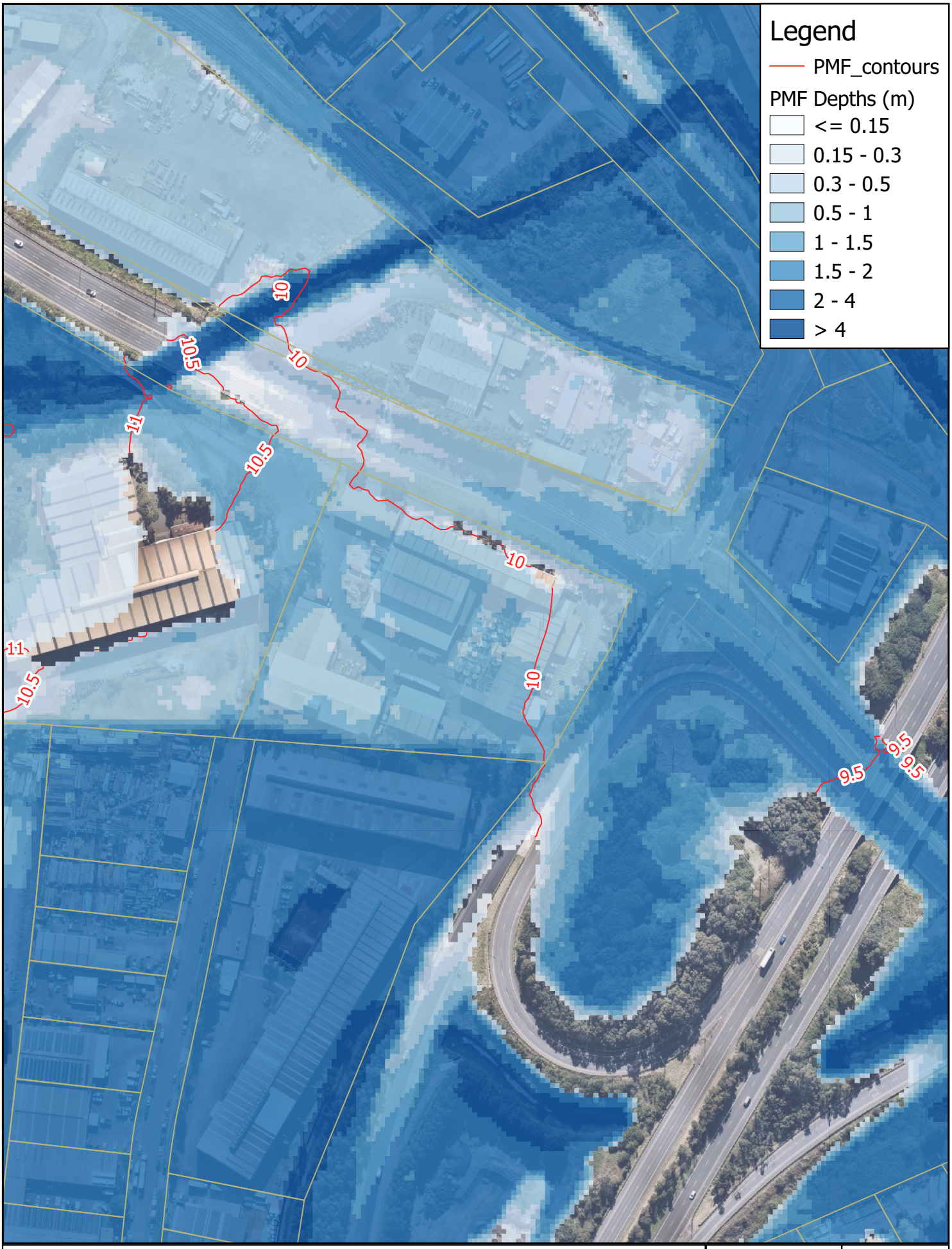


Title:
PMF Risk Management Flood Extents

Figure: **2-2**

Rev: **A**

N

0 20 40 60 80 100 m

siteplus

3. CHAPTER E13 DCP REQUIREMENTS

Using “Schedule 4 Allan’s Creek Floodplain” from Wollongong City Council’s DCP Floodplain Management Plan, the following standard requirements must be addressed when considering development of the site.

The site contains predominately medium and low flood risk precincts.

Appendix B illustrates that all the proposed works are within medium flood risk precinct. All the works are outside of the 100yr flood extents.

For the purpose of the Flood Risk Assessment the development has been assessed as being within the medium flood risk precinct.

3.1. Schedule 4 Development Controls

3.1.1. Floor Level

The following Table 3.1 defines the flood levels and associated floor levels at the proposed development location:

Table 3-1 Floor and Flood Level Summary Table

Floor and Flood Level Summary Table				
Proposed Building	1% AEP Flood level (m AHD)	PMF Flood level (m AHD)	1% AEP Flood Level Plus 500mm freeboard	Proposed Floor Level (m AHD)
Liquid Treatment Plant	9.84	10.43	10.34	9.84

The proposed minimum floor level is to be 9.84m AHD which is equal to the 1% AEP level. Appendix C illustrates the areas that are proposed at 9.84m AHD. The plant is for an industrial use and isn’t habitable.

All flood levels have been taken perpendicular to the flood water at the upstream extent of the building.

3.1.2. Building Components and Method

The existing building has been made from flood compatible materials above the PMF level. There is an existing reinforced concrete wall around the building to an approximate height of 3m above the existing ground level. This is above the PMF level and protects the building from flood forces. Photos of the external and internal walls are shown in Figure 3-1 and Figure 3-2. the wall will be utilised to form the bund around the plant.

Figure 3-1 External Concrete Wall

Figure 3-2 Internal Concrete Wall

3.1.3. Structural Soundness

A structural engineer's report will be required prior to the plant's operations starting. The report is to certify that the structure can withstand the forces of floodwater, debris, and buoyancy in a PMF event.

3.1.4. Flood Affectation

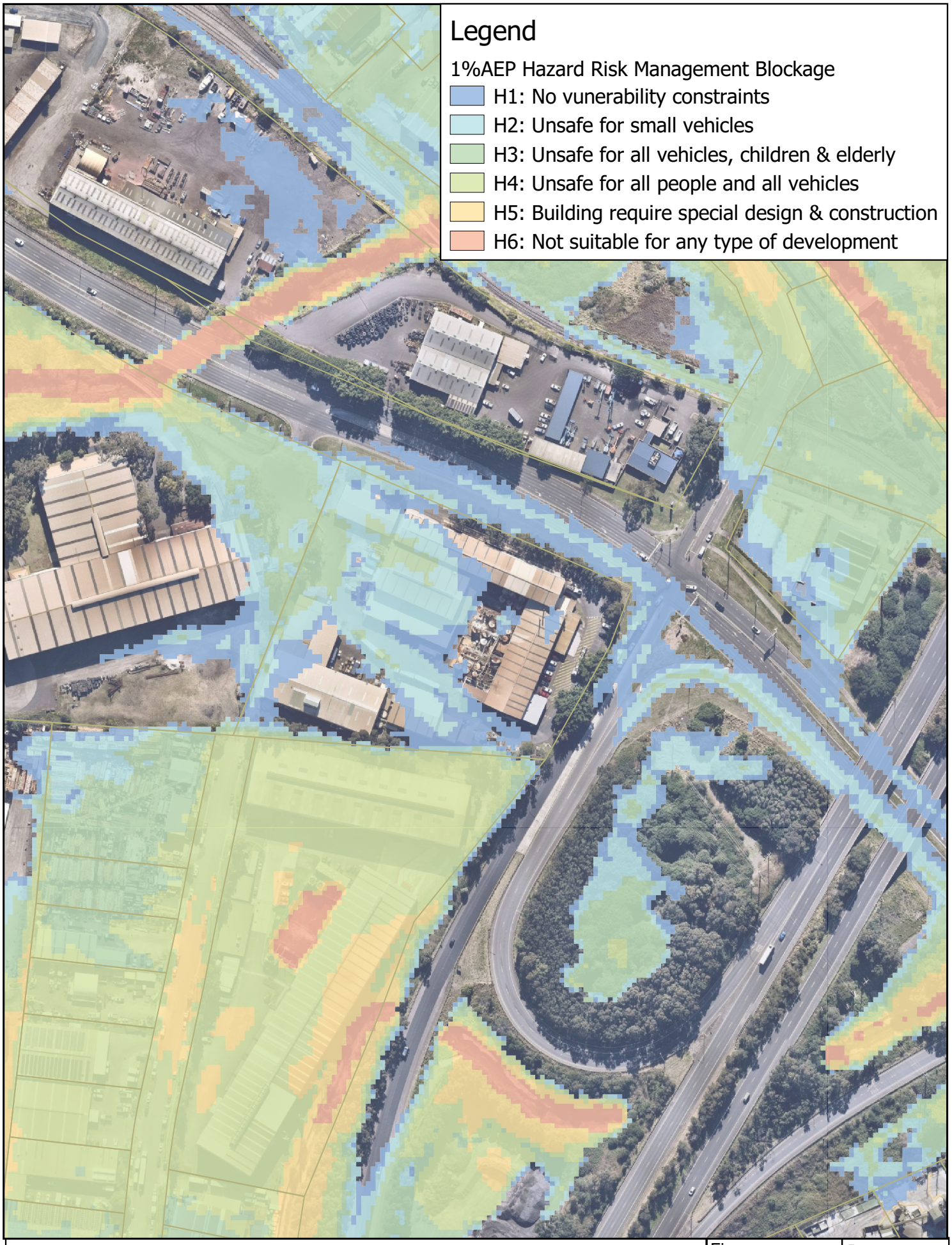
All of the proposed works are within existing buildings and utilise the existing onsite structures. Therefore, flooding will not change through the site and the properties of floodwater will not be affected.

3.1.5. Evacuation

Reliable access for pedestrians during a 100year flood event is provided via the adjoining eastern road reserve. Figure 3-3 shows the 1% AEP flood hazards. Pedestrians can easily vacate the site in an easterly direction and wait out the flood as it occurs.

In terms of vehicle access, there is a line of travel for large and heavy vehicles around the northern boundary of the site onto Five Islands Road. The maximum hazard is H3.

Siteplus, is not aware of any flood evacuation strategy or plan for the site or surrounding area. It is recommended that a flood evacuation procedure be included within the sites Emergency Management Plan.



Title:
1% AEP Risk Management Hazards

Figure: **3-3**

Rev: **A**

N

0 20 40 60 80 100 m

siteplus

3.1.6. Management and Design

A Site Emergency Response Plan is required for the site as it is below the PMF flood level.

The storage of goods is to be above the PMF level. All materials are proposed to be stored within the plant building in sealed storage containers, which is above the PMF level of 10.43m AHD.

A berm around the plant is proposed at the PMF level. This berm ensure that any liquid wastes are separated from the flood water should a large flood event occur.

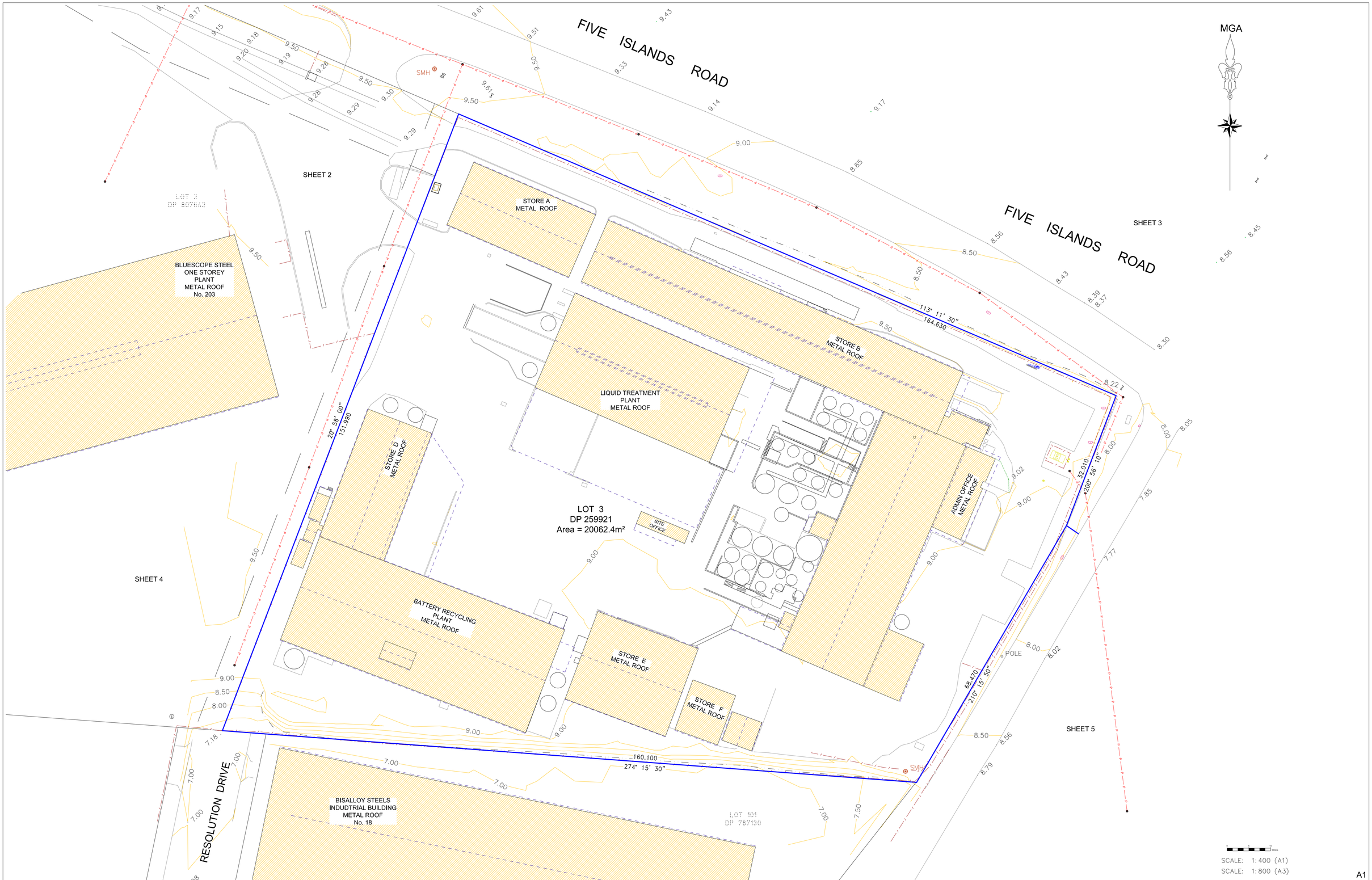
4. CONCLUSION

DGL Group Limited is seeking approval for a proposed Liquid Waste Treatment Plant at their Unanderra Plant Site at Lot 3 DP259921, 201 Five Islands Road, Unanderra.

The following conclusions can be made in regards to the Flood Risk Assessment:

- The development is permissible as the proposed LWTP lies within the medium flood risk precincts.
- The proposal utilises existing building and the proposed floor level is to be provided at the 1% AEP flood level being 9.84m AHD.
- No changes to the flood water properties will occur as works are within the existing buildings.
- Site access can occur during the 1% AEP via eastern boundary.
- All goods and liquid wastes are to be sealed and stored internally at or above the PMF level. A berm is to be provided around the entire plant at the PMF level to ensure flood waters don't mix with liquid wastes within the plant.
- The Site Emergency Response Plan should include a section on flood evacuation to ensure the safety of occupants during extreme floods.

APPENDIX A
SURVEY PLANS



SCALE: 1:400 (A1)
SCALE: 1:800 (A3)

A1

NOTES:

0.5m AND 1m CONTOURS SHOWN.

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VISIT US AT:
www.pinnaclesurveyors.com.au
ABN 59607099534

PROJECT : DETAIL AND LEVEL SURVEY AT No. 201 FIVE ISLAND ROAD, UNANDERRA

CLIENT : HYDROMET CORPORATION

SHEET	1 OF 5
DRAWING No. :	1348Det.dwg
JOB REF :	1348Det
DATE :	31 August 2018

FIVE ISLAND ROAD

LEGEND

AWNING	AWN	SHRUB	
BUILDING/STRUCTURE		STORMWATER PIT	
BENCH MARK		SEWER MANHOLE	
BOUNDARY		SEWER INSPECTION OPENING	S
DISH DRAIN	DD	TELSTRA PIT	T
FENCE		HYDRANT	
GARDEN		TOP OF GUTTER	TG
OVERHEAD CABLES	P P P	FL=FLOOR LEVEL GF=GROUND FLOOR FF=FIRST FLOOR	
POWER POLE		GL=GROUND LEVEL D=DIAMETER S=SPREAD H=HEIGHT	
RIDGE	R	H=WINDOW HEAD S=WINDOW SILL	

0 5 10 Meters

SCALE: 1:200 (A1)
SCALE: 1:400 (A3)

BENCH MARK CUT
TOP OF KERB
RL 9.55m
(AHD)

STORE A
METAL ROOF

BLUESCOPE STEEL
ONE STOREY
PLANT
METAL ROOF
No. 203

LIQUID TREATMENT
PLANT

ASPHALT CONCRETE

GRASS

CONCRETE

METAL BARRIER

TOP OF CONC. KERB

LIP OF CONC. KERB

CONC. KERB

TIMBER BARRIER

BUMPER BL.0.4K

RAIL

EASEMENT FOR RAILWAY PURPOSES

EASEMENT FOR ELECTRICITY 6 WIDE

SIGNAGE

FENCE

METAL FENCE

MESH WIRE FENCE

DWARF WALL

BOOSTER CONNECTION

SL9.92 IL9.48 0.9x0.45 GIP

SL9.94 SMH

SL9.14 IL8.44 0.9x0.45 GIP

SL8.92 IL7.15

SL9.08 IL8.68 0.45x0.45 GIP

SL9.25 IL8.65 0.6x0.6 GIP

SL8.96 IL7.98 0.9x0.9 GIP

SL9.18 1.1x1.1 PIT

MH SL9.25

MH

SV

DD

TG: 14.39

TG: 21.67

TG: 21.41

TG: 20.69

R: 15.10

R: 23.31

R: 23.83

R: 25.69

R: 22.71

R: 23.41

GL:10.11 D:0.15mø S:3m H:3m

GL:10.09 D:0.15mø S:3m H:3m

GL:9.79 D:0.15mø S:3m H:3m

GL:9.79 D:0.2mø S:3m H:4m

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GL:9.28 D:0.5mø S:8m H:18m

GL:9.25 D:0.5mø S:4m

GL:9.23 D:0.4mø S:6m H:12m

GL:9.18 D:0.5mø S:7m H:18m

GL:9.16 D:0.5mø S:7m H:18m

GL:9.13 D:0.3mø S:6m H:9m

GL:9.14 D:0.2mø S:3m H:5m

GL:9.11 D:0.4mø S:7m H:8m

GL:8.98 D:0.8mø S:9m H:12m

GL:8.85 D:0.65mø S:7m H:9m

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SHEET 2 OF 5

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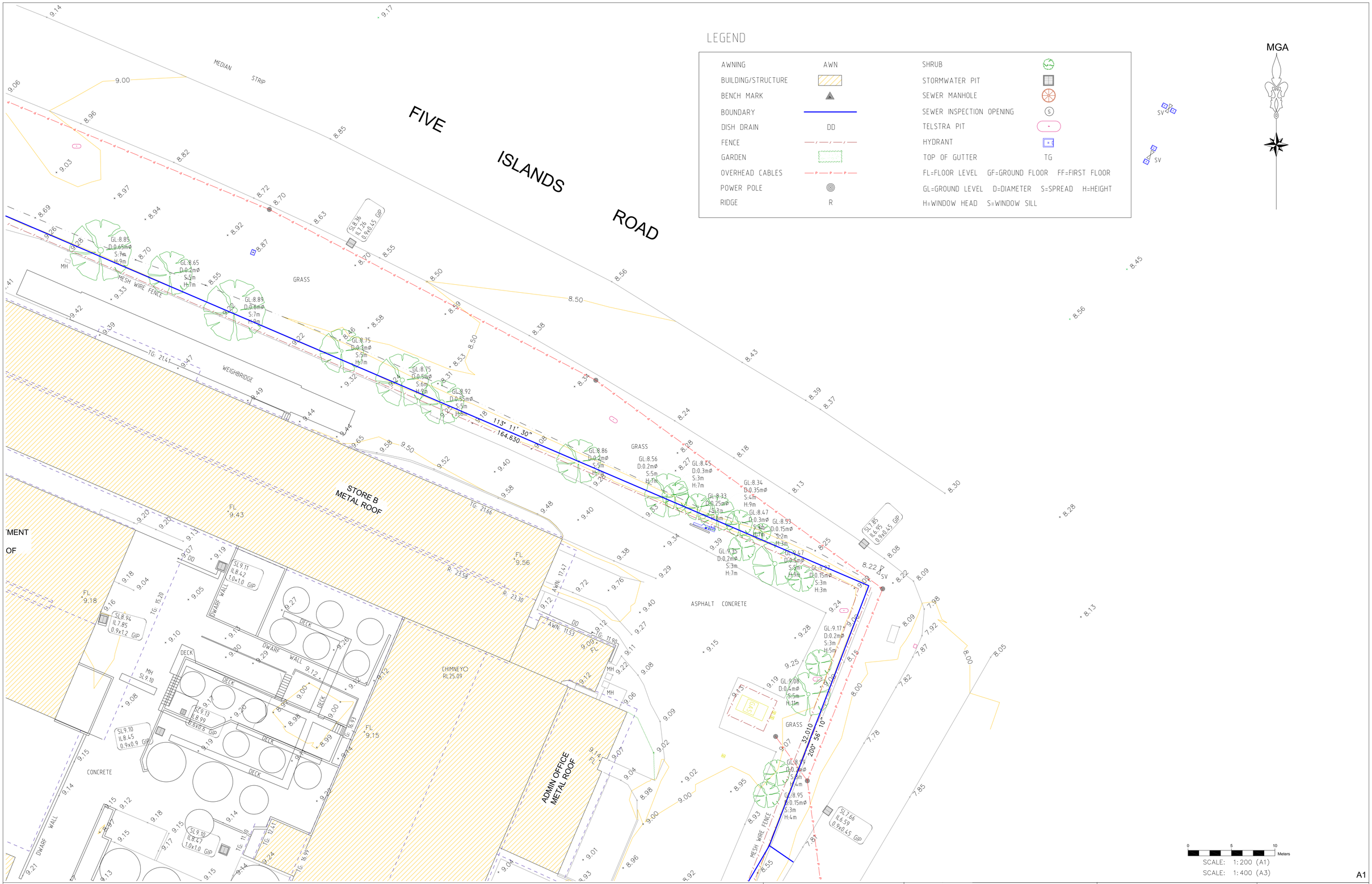
A1



LEGEND

AWNING	AWN	SHRUB	
BUILDING/STRUCTURE		STORMWATER PIT	
BENCH MARK		SEWER MANHOLE	
BOUNDARY		SEWER INSPECTION OPENING	S
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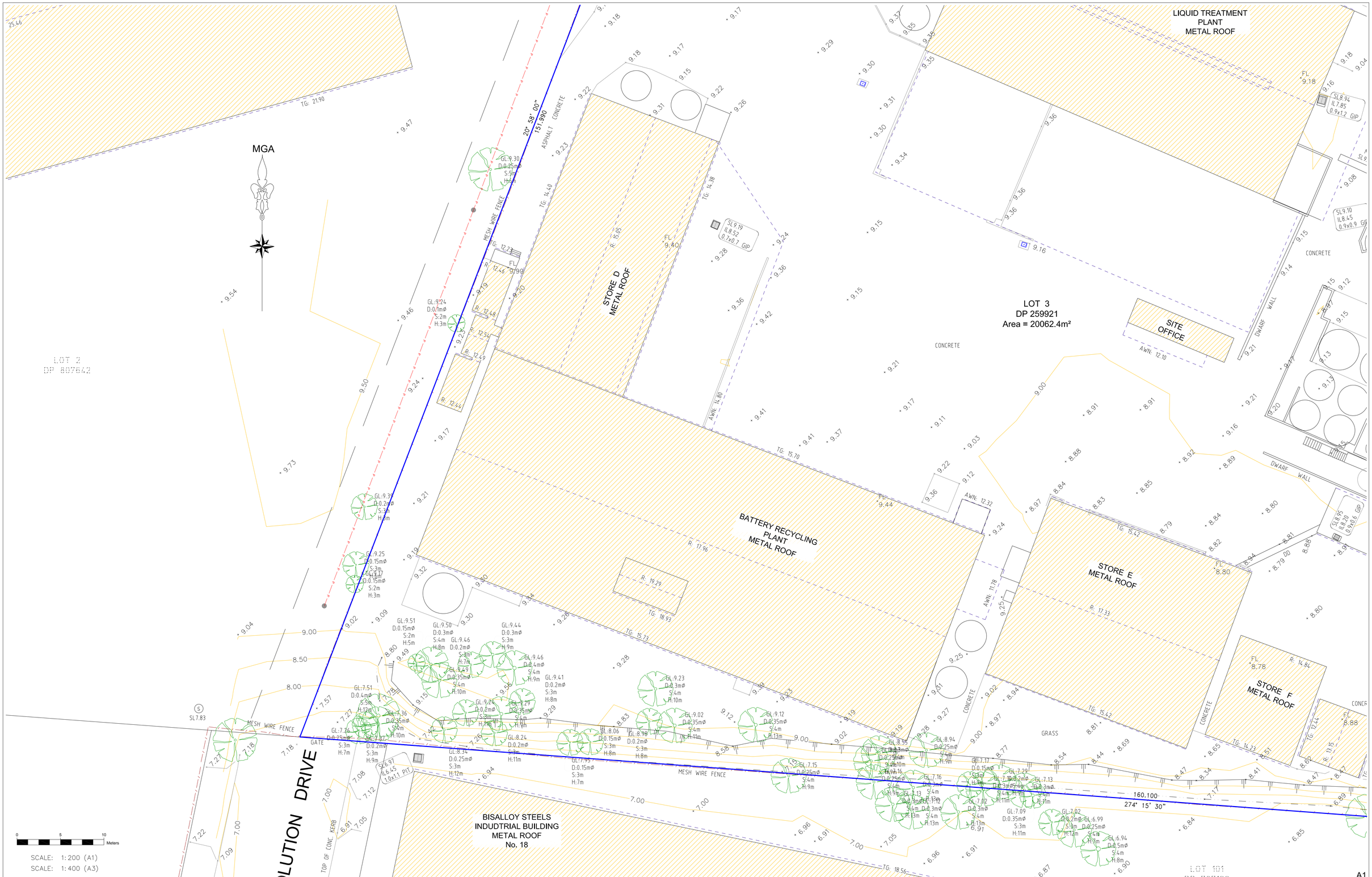

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SHEET 4 OF 5

DRAWING No. : 1348Det.dwg

JOB REF : 1348Det

DATE : 31 August 2018

LOT 3
DP 259921
Area = 20062.4m²

MGA

LEGEND

AWNING	AWN	SHRUB	
BUILDING/STRUCTURE		STORMWATER PIT	
BENCH MARK		SEWER MANHOLE	
BOUNDARY		SEWER INSPECTION OPENING	S
DISH DRAIN	DD	TELSTRA PIT	-
FENCE		HYDRANT	
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RIDGE	R	H=WINDOW HEAD S=WINDOW SILL	

0 5 10 Meters

SCALE: 1:200 (A1)
SCALE: 1:400 (A3)

A1

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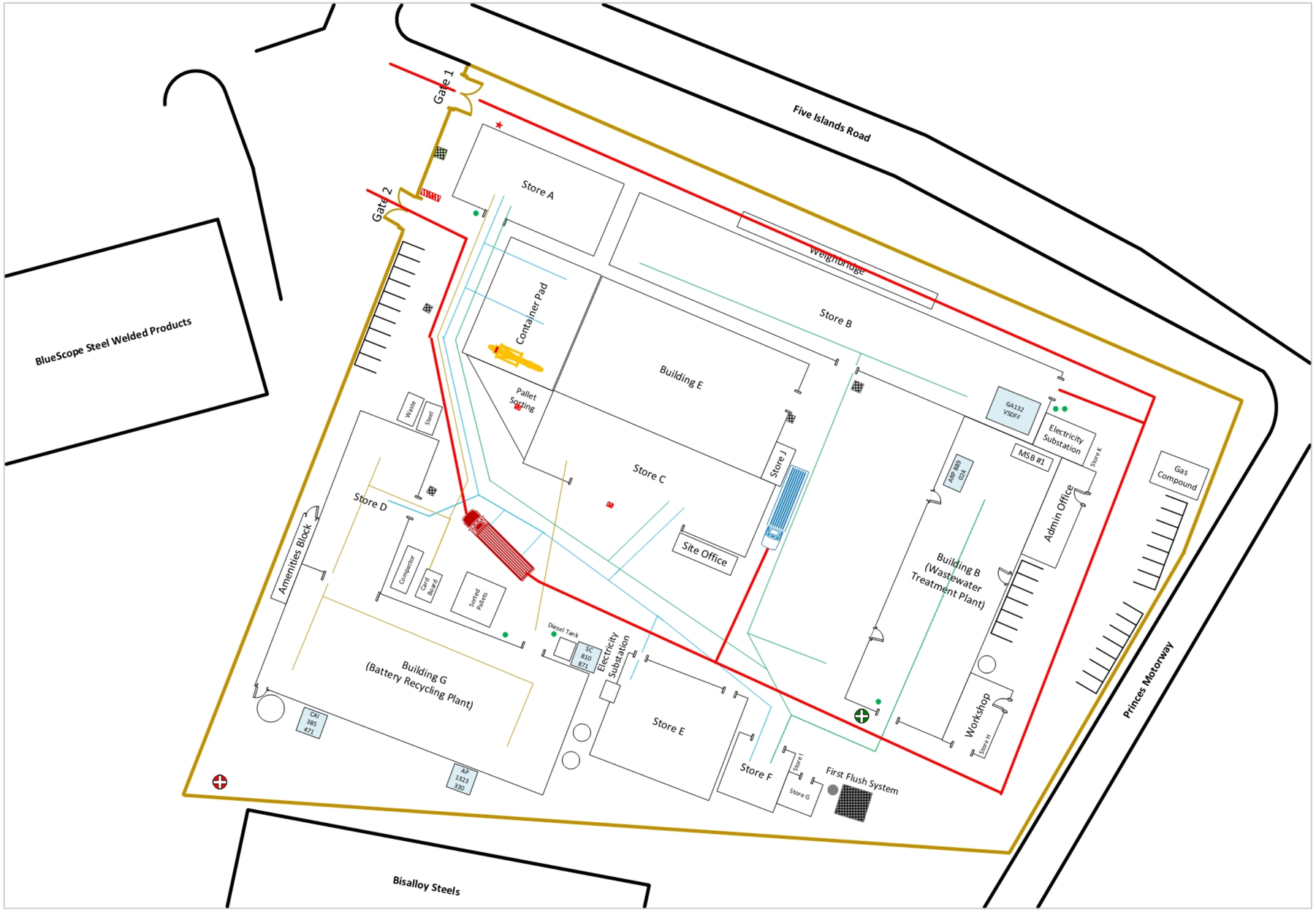
APPENDIX B
PROPOSED SITE PLANS

N



Plan Symbols	
★	Manifest Box
	Booster Hydrant
	Fire Hydrant
●	Spill Kit
	Mains Water Meter
	Blind Sump
	Storm Water Drain
	Parking Spaces
○	Rain Water Tank
	Site Boundary
⊕	Existing Trade Waste Discharge Point
⊕	New Trade Waste Discharge Point

Traffic Flow	
	Heavy Vehicles
	Logistics Forklift
	BRP Forklift
	LTP Forklift

DGL

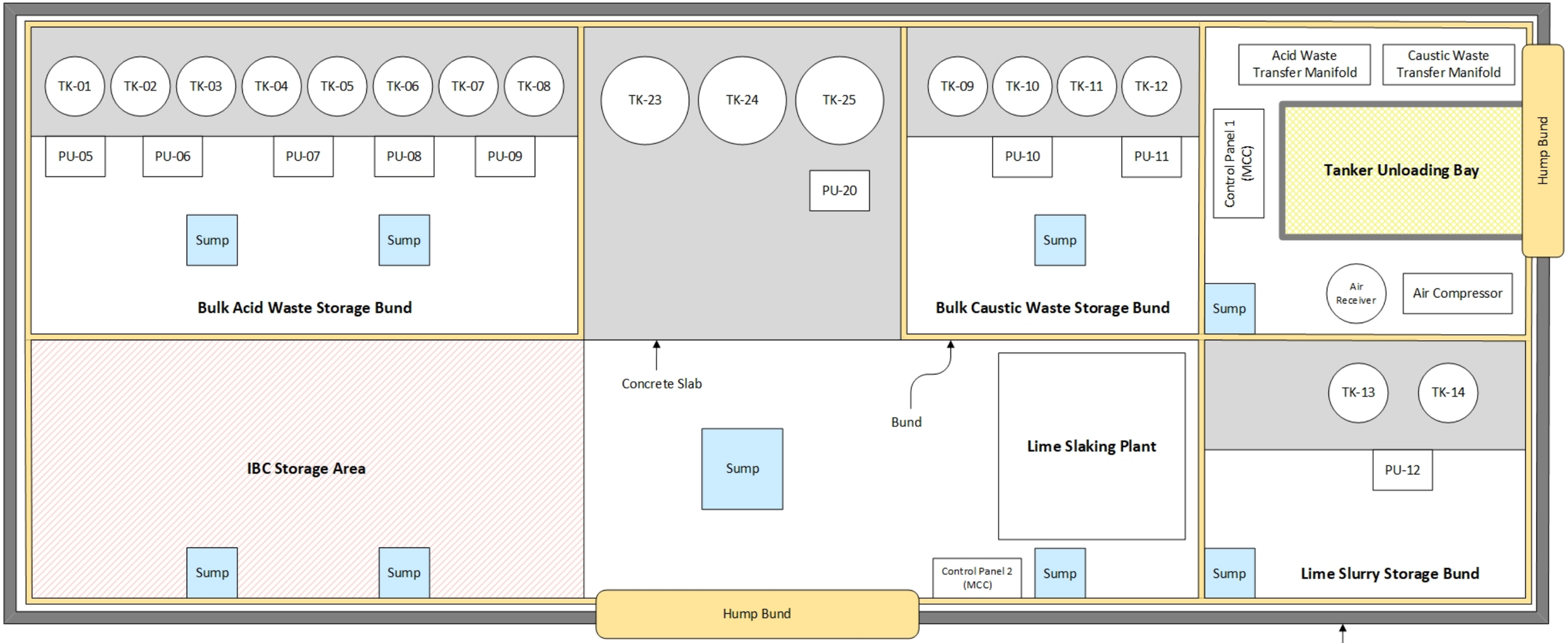
SITE PLAN

Unanderra NSW Resource Recovery Facility

201 Five Islands Road, Unanderra NSW 2526

DRAWN: JP	DATE: 20/03/2020	SIZE: A2	DWG NO: HMC.LAY.2003201
APPROVED:	DATE:	SCALE: 1:600	SHEET: 1 OF 1

REV: 7.0



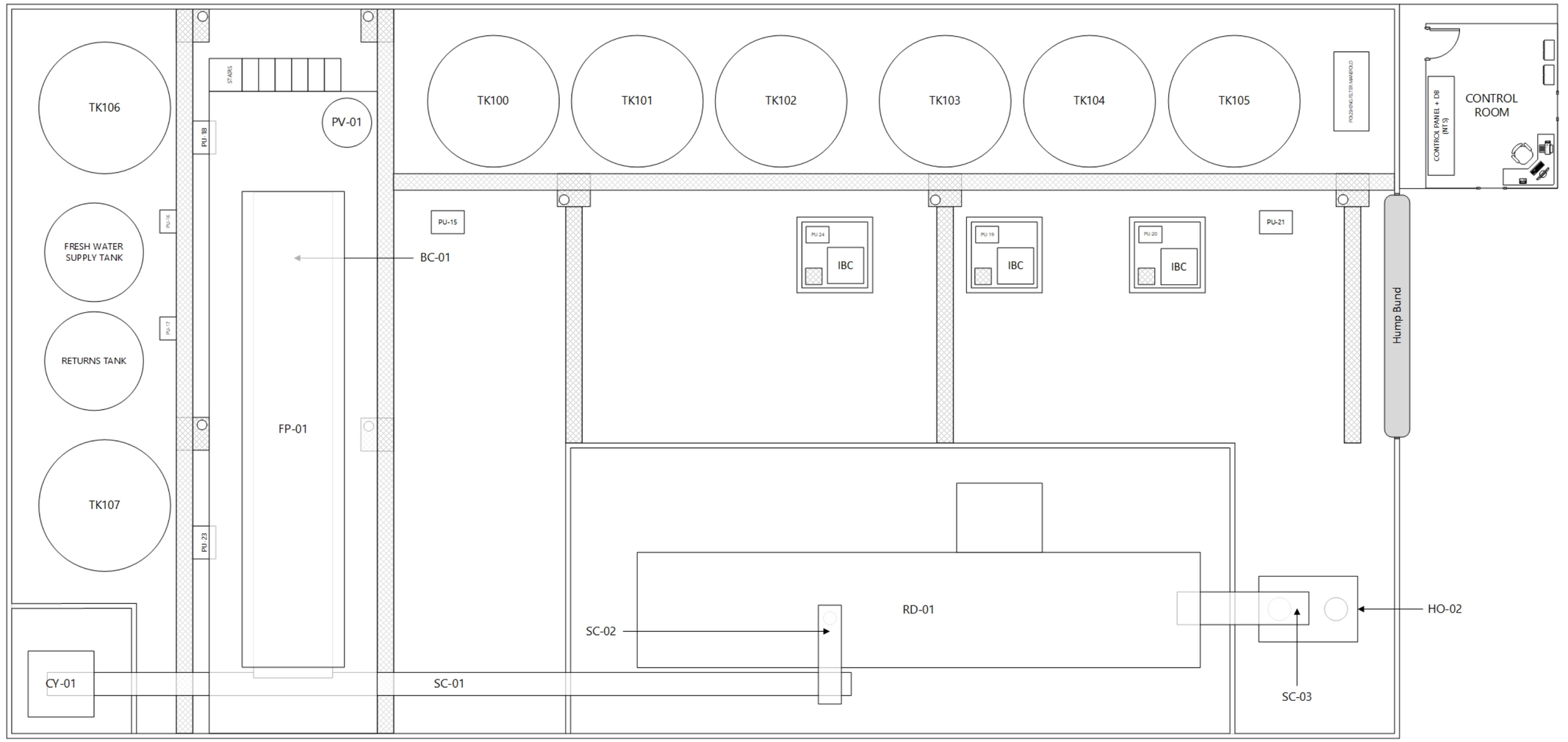
Tank Register		
Vessel ID	Vessel Name	Capacity (kL)
TK-01	BRP Effluent Tank 1	100
TK-02	BRP Effluent Tank 2	100
TK-03	B100 Waste Tank 1	100
TK-04	B100 Waste Tank 2	100
TK-06	SPL Tank 1	100
TK-07	SPL Tank 2	100
TK-08	SPL Tank 3	100
TK-09	Waste Caustic Tank 1	100
TK-10	Waste Caustic Tank 2	100
TK-11	Waste Caustic Tank 3	75
TK-12	Waste Caustic Tank 4	75
TK-13	Lime Slurry Storage Tank 1	40
TK-14	Lime Slurry Storage Tank 2	41
TK-23	Trade Waste Discharge Tank 1	160
TK-24	Trade Waste Discharge Tank 2	160
TK-25	Trade Waste Discharge Tank 3	160

Pump Register	
PU-05	BRP Effluent Transfer Pump
PU-06	Battery Acid Transfer Pump
PU-07	B100 Waste Transfer Pump
PU-08	SPL Transfer Pump 1
PU-09	SPL Transfer Pump 2
PU-10	Waste Caustic Transfer Pump 1
PU-11	Waste Caustic Transfer Pump 2
PU-12	Lime Slurry Dosing Pump
PU-20	Trade Waste Discharge Pump

DGL

PLANT LAYOUT
Bulk Liquid Waste Storage Facility

DRAWN: JP	DATE: 20/03/2020	SIZE	FSCM NO	DWG NO	REV
APPROVED:	DATE:	A3		HMC.LAY.2003201	1.0
		SCALE NTS		SHEET	1 OF 1



Vessel Register		
Vessel ID	Vessel Name	Capacity (kL)
TK100	Neutralisation Reactor 1	75
TK101	Neutralisation Reactor 2	75
TK102	Neutralisation Reactor 3	75
TK103	Holding Tank	75
TK104	pH Adjustment Tank 1	75
TK105	pH Adjustment Tank 2	75
TK106	Filtrate Storage Tank	75
TK107	Sumps Collection Tank	75

Process Equipment Register	
Equipment ID	Equipment Name
FP-01	Filter Press
RD-01	Rotary Dryer
CY-01	Cyclone
PV-01	Air Receiver
BC-01	Belt Conveyor
SC-01	Feed Conveyor 1
SC-02	Feed Conveyor 2
SC-03	Discharge Conveyor
HO-02	Bagging Hopper

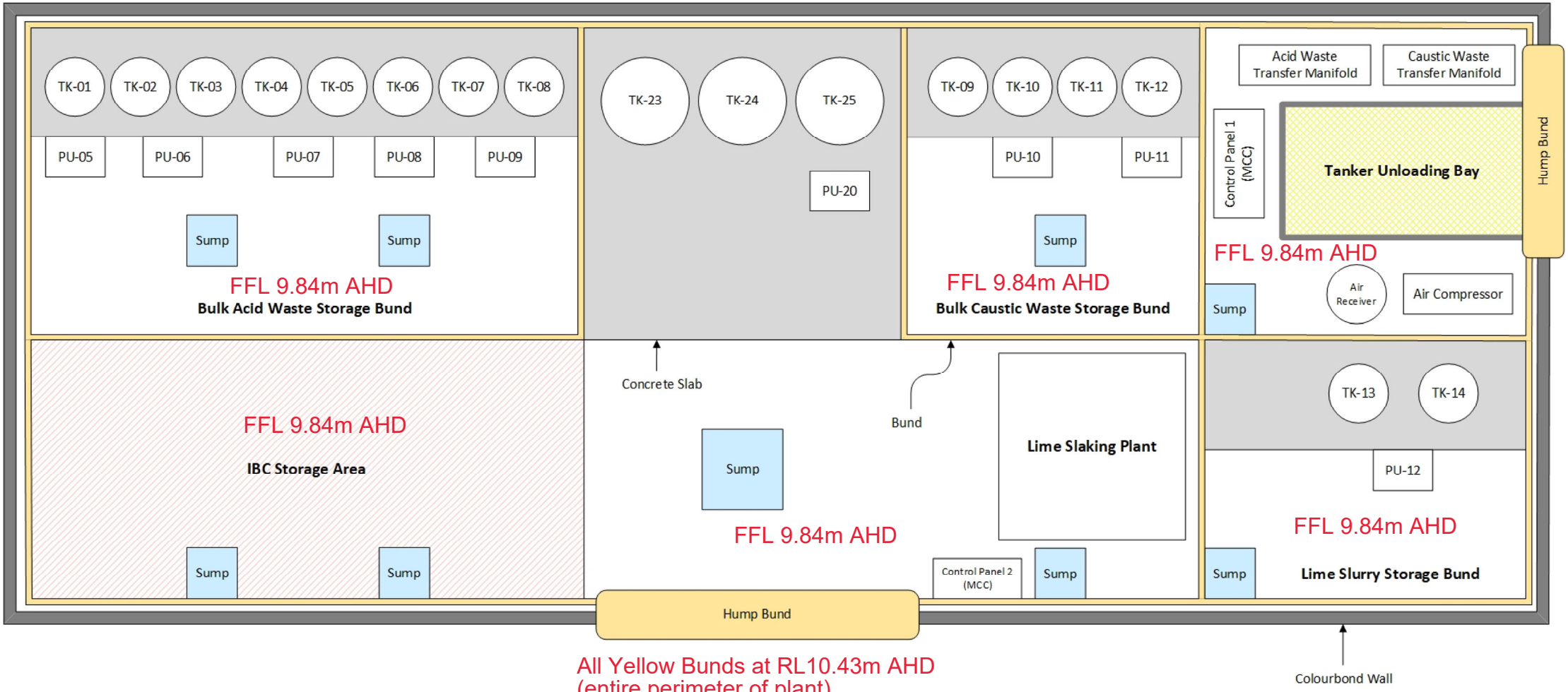
*All process pumps have been designated 'PU-##'

DGL

Liquid Waste Treatment Plant Layout

DRAWN JP	DATE 20.03.2018	SIZE A2		DRAWING REFERENCE HMC.LTP.180320JP1-LAYOUT	VERSION 5
APPROVED	DATE 20.03.2018	SCALE 1:100	COPYRIGHT ©	SHEET 1 OF 1	

APPENDIX C
PLANT LAYOUT MARKUP



Tank Register		
Vessel ID	Vessel Name	Capacity (kL)
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TK-02	BRP Effluent Tank 2	100
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TK-04	B100 Waste Tank 2	100
TK-06	SPL Tank 1	100
TK-07	SPL Tank 2	100
TK-08	SPL Tank 3	100
TK-09	Waste Caustic Tank 1	100
TK-10	Waste Caustic Tank 2	100
TK-11	Waste Caustic Tank 3	75
TK-12	Waste Caustic Tank 4	75
TK-13	Lime Slurry Storage Tank 1	40
TK-14	Lime Slurry Storage Tank 2	41
TK-23	Trade Waste Discharge Tank 1	160
TK-24	Trade Waste Discharge Tank 2	160
TK-25	Trade Waste Discharge Tank 3	160

Pump Register	
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PU-11	Waste Caustic Transfer Pump 2
PU-12	Lime Slurry Dosing Pump
PU-20	Trade Waste Discharge Pump

DGL

DRAWN: JP DATE: 20/03/2020

APPROVED: DATE:

PLANT LAYOUT
Bulk Liquid Waste Storage Facility

SIZE	FSCM NO	DWG NO	REV
A3		HMC.LAY.2003201	1.0
SCALE NTS			SHEET 1 OF 1

APPENDIX D
WOLLONGONG CITY COUNCIL REQUEST FOR ADVICE

wollongong
city of innovation

WOLLONGONG CITY COUNCIL

Address 41 Burelli Street Wollongong • **Post** Locked Bag 8821 Wollongong DC NSW 2500
Phone (02) 4227 7111 • **Fax** (02) 4227 7277 • **Email** council@wollongong.nsw.gov.au
Web www.wollongong.nsw.gov.au • ABN 63 139 525 939 - GST Registered

NSW Planning Industry & Environment
Att.katelyn.symington@planning.nsw.gov.au.

APPLICATION	DE-2018/65
Date	30 July 2021

Dear Sir/Madam

Development	Proposed Liquid Waste Treatment Plant - 2018 Advice on EIS - Liquid Treatment Plant - 2021
Location	201 Five Islands Road, UNANDERRA NSW 2526

STATE SIGNIFICANT DEVELOPMENT SSD 8304 – PROPOSED LIQUID WASTE TREATMENT– REQUEST FOR ADVICE

Thank you for providing Council with the opportunity to comment on this State Significant Development proposal.

The submitted documentation has been reviewed and comments are provided overleaf.

If you have any enquiries or wish to discuss these matters further, please contact me on (02) 4227 7111.

This letter is authorised by

John Wood
City Wide Development Manager
Wollongong City Council

Council comments for the proposed Liquid Waste Treatment Plant

The following matters are identified for consideration by the Department:

1. Planning

   · The site is zoned IN3 – Heavy Industrial pursuant to Wollongong Local Environmental Plan (WLEP) 2009. The proposed liquid waste treatment plant is considered permissible in the zone.

   · There is no maximum building height or floor space ratio for the subject allotment pursuant to WLEP 2009. It is noted that the proposal comprises of the installation of equipment and an internal fit out for the purposes of liquid waste treatment within the existing Building E. Whilst it is appears that no external or structural works are proposed to the existing building, any building works if proposed are to comply with the Building Code of Australia/NCC.

2. Development Engineering

   · Council's records indicate the site is flood affected and coded as 'Flood Risk Precinct Classification under Review'. Information on flooding at the site can be found in Council's adopted Allans Creek Flood Study dated 2019. Council's adopted flood model files can also be downloaded from the NSW State Emergency Service (SES) Flood Data Portal.

   · The flood assessment report by SitePlus (Rev No. 2 dated May 2021) uses information from a superseded flood study (being the Allans Creek Flood Study conducted in September 2006 by Lawson & Treloar) to address flood controls for the development. This has resulted in an underestimation of flood levels and flood affectation on the site. The flood assessment report and development proposal needs to be amended to address flood controls using the most up-to-date flood level information, being Council's adopted Allans Creek Flood Study dated 2019.

   · Council's adopted Allans Creek Flood Study dated 2019 indicates a significant flood flow path through the site flowing adjacent to and around the existing building within which a liquid waste treatment plant is proposed (i.e., 'Building E'), with predicted flood levels and corresponding above floor flood depths in existing Building E being as per the table below.

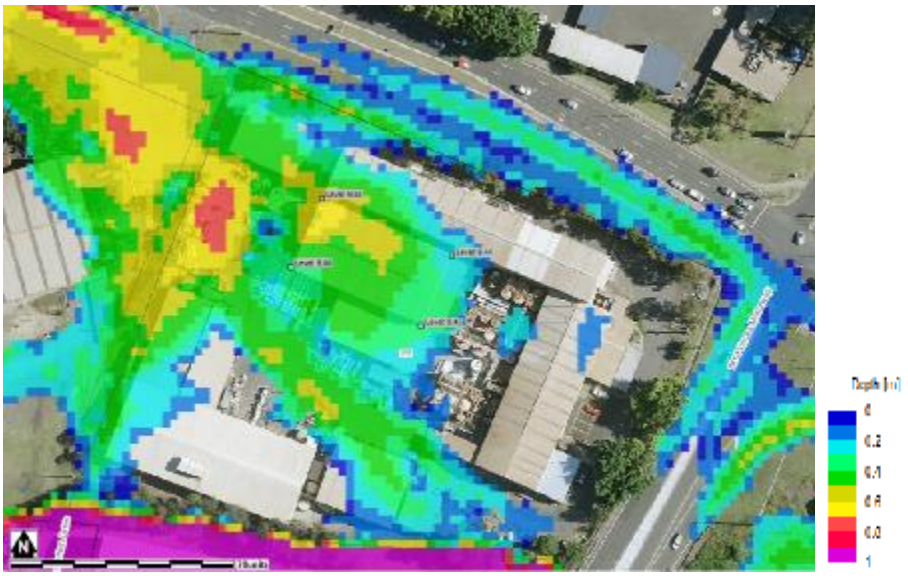
	10 % AEP (10 year ARI)	1 % AEP (100 year ARI)	PMF (Probable Maximum Flood)
Flood Level (m AHD)*	9.53	9.84	10.43
Above Floor Flood Depth (m)**	0.35	0.66	1.25

*The maximum flood level at Building E – predicted by Council's adopted Allans Creek Flood Study dated 2019.

**Above floor flood depth determined using the surveyed finished floor level for Building E (RL 9.18 m AHD) shown on the site survey plans appended to submitted flood risk assessment repot by SitePlus.

1 % AEP Flood Depths and Spot Flood Levels (m AHD)

NOTE: Image is in colour



- Council's adopted Allans Creek Flood Study dated 2019 also maps the location of Building E as a mix of hydraulic hazard category '*H2 – Unsafe for small vehicles*' and '*H3 – Unsafe for all vehicles, children & elderly*'.
- Due to the predicted flood levels, depths, and hazard through the site and within Building E (as above), the development proposal presents significant flood risks, due to potential damage to plant/equipment, machinery, etc., and pollution of the surrounding land in the event of floodwater combining with liquid waste.
- Due to the flood depths and hazard on the site, the area inside the existing building is categorised as Medium Flood Risk Precinct, in accordance with the definitions in Section 6.3 of Chapter E13 of the Wollongong DCP 2009. The development is categorised as 'Industrial and Commercial' development according to Appendix A – Land Use Categories in Chapter E13 of the Wollongong DCP 2009.
- The following controls apply to Industrial development within the Medium Flood Risk Precinct (refer Schedule 4: Prescriptive Controls – Allans Creek Floodplain, in Appendix C of Chapter E13 of the Wollongong DCP 2009):
  - For industrial land use only – All Floor Levels to be equal to or greater than the 1% AEP flood, being equal to or greater than RL 9.84 m AHD in this instance, unless justified by site specific assessment.
  - Habitable floor levels to be equal to or greater than the 1% AEP flood level plus 0.5m (freeboard), being a level of RL 10.34 m AHD. In applying this control, a habitable floor area means:

    *In an **industrial or commercial situation:** an area used for offices or to store valuable possessions susceptible to flood damage in the event of a flood.*
  - All structures to have flood compatible building components below or at the 1% AEP flood level plus 0.5m (freeboard), being a level of RL 10.34 m AHD.
  - Applicant to demonstrate that any structure can withstand the forces of floodwater, debris and buoyancy up to and including a 1% AEP flood plus freeboard (being RL 10.34 m AHD), or a PMF plus freeboard (being RL 10.93 m AHD) if required to satisfy evacuation criteria (*see below*).

- Engineers report required to certify that the development will not increase flood affectation elsewhere, includes medium and high density residential proposals.
- Reliable access or refuge required during a 1% AEP flood.
- The development is to be consistent with any relevant flood evacuation strategy or similar plan.
- Site Emergency Response Flood plan required (except for single dwelling-houses) where floor levels are below the PMF.
- Applicant to demonstrate that area is available to store goods above the 1% AEP flood level plus 0.5m (freeboard), being a level of RL 10.34 m AHD.
- No external storage of materials below the *flood planning level* (being a level of RL 10.34 m AHD) which may cause pollution or be potentially hazardous during any flood.

· In addition to the above and given the nature of the development and risk of environmental pollution in the event of a flood, it is also recommended that measures be integrated into the design of the development to ensure that liquid waste cannot physically come into contact with floodwaters in the event of a flood.

· Due to the flash flooding nature of the catchment, measures that rely on manual activation and/or human intervention are unlikely to be effective. The proposed method of physically segregating liquid waste from floodwaters should be failsafe and inherently integrated into the design and operation of the facility, e.g., permanent bunding with a suitable freeboard provided between the maximum flood levels and top of bund level or elevating all liquid waste treatment/storage/processing areas above the maximum flood levels such that there is no possibility of the liquid waste coming into contact with floodwater.

· In relation to the above, where it is found to be unfeasible or impractical to provide a suitable and failsafe method of physically separating liquid waste from floodwater flows, then the proposal is unlikely to be a suitable use for the site.

3. Traffic

It is noted that the site is accessed via the State Road network which is under the jurisdiction of TfNSW. Comments would need to be sought from TfNSW regarding the network and intersection impacts.

From review of the DA, it can be seen that background traffic growth has been established from previous traffic counts using pre-COVID data to estimate current and future (10 year) traffic growth assumptions. This method is accepted due to the current downturn in traffic from COVID restrictions/lockdowns etc.

The relevant intersections were assessed. The level of service at these intersections was found to exceed the operating capacity with background traffic alone.

However, the additional development traffic (5 additional heavy vehicles per day, and 6 additional peak hour staff movements) were shown to have a minimal effect on the future operation of these intersections.

Swept paths demonstrate that the design vehicle is able to enter and exit the site in a forward direction.

The proposed expansion of the internal car parking area appears to be generally acceptable. During construction the layout would need to comply with AS 2890.1.

· The parking dimensions, internal circulation, aisle widths, kerb splay corner clearance heights, ramp widths and grades of the car parking areas are to be in conformity with the current relevant Australian Standard AS 2890.1, except where amended by other conditions

of this consent. Details of such compliance are to be reflected on the Construction Certificate plans.

- Each disabled person's parking space must comply with the current relevant Australian Standard AS 2890.6 – Off-street parking for people with disabilities. This requirement shall be reflected on the Construction Certificate plans.

- Any proposed structures adjacent to the driveway shall comply with the requirements of the current relevant Australian Standard AS 2890.1 to provide for adequate sight distance. This includes, but is not limited to, structures such as signs, letterboxes, retaining walls, dense planting etc. This requirement shall be reflected on the Construction Certificate plans.

- Approval, under Section 138 of the Roads Act must be obtained from Wollongong City Council's Development Engineering Team prior to any works commencing or any proposed interruption to pedestrian and/or vehicular traffic within the road reserve caused by the construction of this development.

- The application form for Works within the Road Reserve – Section 138 Roads Act can be found on Council's website. The form outlines the requirements to be submitted with the application, to give approval to commence works under the roads act. It is advised that all applications are submitted, and fees paid, five (5) days prior to the works within the road reserve are intended to commence. The Applicant is responsible for the restoration of all Council assets within the road reserve which are impacted by the works/occupation. Restoration must be in accordance with the following requirements:

  a All restorations are at the cost of the Applicant and must be undertaken in accordance with Council's standard document, "Specification for work within Council's Road reserve".
  b Any existing damage within the immediate work area or caused as a result of the work/occupation, must also be restored with the final works.

4. Environment

- Stage 1 and Stage 2 Site Investigation
  Stage 2 Detailed Site Investigation resulted from the Stage 1 Preliminary Site Investigation recommending a targeted soil and groundwater sampling program and Environmental Management Plan (EMP).

  Council agrees with Dr James Fox (Principal Geochemist) Land & Water Consulting review and assessment of the Stage 2 Detailed Site Investigation.

- BDAR Waiver
  There are no issues with the BDAR waiver as the site is entirely hardstand or existing buildings.

- Noise Impact Assessment
  The Noise Impact Assessment and Modelling assumed a potential worst-case scenario with predicted results being within applicable criteria. Council agrees that proposed project can operate within acceptable noise criteria at the designated sensitive receivers.

- Air Quality and Greenhouse Gas Assessment

  Air Quality
  CALPUFF predictive air dispersion modelling was used to assess the potential for off-site air pollutant impacts. The consultant has stated…

  "It is predicted that the Project would have a negligible incremental and cumulative impacts at the surrounding residential receptor locations and would comply with the relevant air quality criteria.

  Nevertheless, the site would apply appropriate air quality mitigation and management measures to ensure it minimizes the potential occurrence of excessive air emissions from the site."

Greenhouse Gas Assessment

The consultant predicts annual contribution annual greenhouse emissions to be 0.0007 percent of the estimated greenhouse gas emissions for Australia during 2016 which was 533.0Mt CO2-e (Department of the Environment and Energy, 2019). Council is of the opinion with continued vigilance and improvement that this contribution is negligible.

Council agrees that proposed project can operate without causing significant air quality impact at residential receptors in the surrounding environment.

- Water and Land Pollution Incident - Flash Flooding

Council's Senior Stormwater Development Engineer's assessment using the Allans Creek flood model (2019) predicts that flooding in the 10yr ARI, 100yrARI and PMF would cause inundation of building to an above floor depth of 0.35m (10yr), 0.66m (100yr) and 1.25m (PMF). Additionally, due the nature of the catchment flooding could be categorised as flashy which will limit response time to a flooding event.

It would be essential for the applicant to meet the responsibilities of the POEO ACT (as a minimum the definition of water pollution) that the applicant provide assessments, documentation, design specifications of plant/equipment and management plans addressing the very real likelihood for the proposed project to be flooded during these events.

Council would need to be assured that potential pollution incidents related to flooding events can be mitigated and/or contained on site.