

Flood Impact Risk Assessment (FIRA)

Sludge Dewatering Plant- 7 Long Street, Smithfield, NSW



Final Report

P2410523JR01V01

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environmental science & engineering

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Executive Summary

This Flood Impact Risk Assessment (**FIRA**) has been prepared on behalf of Element Environmental to support an Environmental Impact Statement (**EIS**) to increase the processing limit of an existing sludge dewatering plant at 7 Long Street, Smithfield, NSW (the **site**). The processing limit would increase from 46,720 to 300,000 tonnes per annum (**tpa**) of liquid waste, comprising 200,000 tpa of sludge and groundwater and 100,000 tpa of general solid waste soils, VENM and ENM.

This FIRA finds that:

1. **Flood Behaviour** – The proposed development is affected by two different mechanisms of flooding, overland flash flooding and mainstream overbank flooding. These result in different extents, durations and available warning times.
2. **Flash Flood Levels** – Site flood levels in a flash flood are between 20.1 – 21.4 mAHD for the 1% annual exceedance probability (**AEP**) flood and between 21.0 – 22.1 mAHD for the probable maximum flood (**PMF**).
3. **Mainstream Flood Levels** – The site is flood free in mainstream events up until the PMF where the peak site flood level is 21.2 mAHD.
4. **Floor Levels** – The first storey floor level of the southern building fronting Long Street is approximately 24.72 mAHD, well above the peak flash flood and mainstream PMF levels.
5. **Sheltering in Place** – In the event that adequate warning time to safely evacuate the site is not available, all occupants can instead safely shelter-in-place (**SIP**) on the first storey of the southern building above the PMF.
6. **Evacuation Warning Time** – In the event of a mainstream flood large enough to inundate the southern portion of the site, there will likely be many hours (if not days) warning time to prepare for, and complete, a pre-emptive closure or early evacuation.
7. **Evacuation Route** – In the event of a mainstream flood, evacuation via the Tait Street exit, east to Cumberland Highway will likely be accessible, as the route is only cut off in extremely rare events. However, once rainfall has started staff should not evacuate unless advised to do so by the NSW SES.
8. **Risk to Property** – No material physical changes are proposed to the site as part of the development, hence there will be no material effect on the existing flood behaviour.
9. **Risk to Life** – Flood risk at the site is managed on the basis that habitable floor levels are available above the PMF to SIP in the event of a flash flood and there will be sufficient time to pre-emptively close the site or undertake an early evacuation in the event of a mainstream flood.

Although not necessary at this stage, it is recommended a detailed FERP be prepared as part of a construction certificate condition of consent to ensure flood emergency management is effectively implemented, reducing the flood risks at the site to acceptable levels.

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Glossary of Terms

AEP	Annual exceedance probability: the probability of a flood event occurring within a year. A 1% AEP flood has a 1% chance of occurring in any given year.
BoM	Bureau of Meteorology
Council	Cumberland City Council
DPHI	Department of Planning, Housing and Infrastructure
EIS	Environmental Impact Statement
FERP	Flood emergency response plan
FIRA	Flood Impact Risk Assessment
MA	Martens & Associates Pty Ltd
mAHD	Metres with respect to the Australian Height Datum
PMF	Probable maximum flood: the most extreme flood event possible for a certain location, with an approximate ARI of 100,000 to 10,000,000 years.
SEARs	Secretary's Environmental Assessment Requirements
SIP	Shelter-in-place
SSDA	State Significant Development Application
tpa	Tonnes per annum

1 Introduction

1.1 Overview

Martens & Associates Pty Ltd (**MA**) have prepared this Flood Impact Risk Assessment (**FIRA**) on behalf of Element Environmental to support an Environmental Impact Statement (**EIS**) to increase the processing limit of an existing sludge dewatering plant at 7 Long Street, Smithfield, NSW (the **site**). The processing limit would increase from 46,720 to 300,000 tonnes per annum (**tpa**) of liquid waste, comprising 200,000 tpa of sludge and groundwater and 100,000 tpa of general solid waste (**GSW**) (non-putrescible) soils, virgin excavated natural material (**VENM**) and excavated natural material (**ENM**).

1.2 Proposed Development

MA understands that the Demast, proposes to:

- Receive and process up to 300,000 tpa of waste.
- Expand the waste streams processed at the SDP to include groundwater, GSW soils, VENM and ENM.
- Extinguish all previous development consents for the site and absorb into a single SSD consent.

1.3 Project Scope

The project scope and objectives of the FIRA are:

1. Review site flooding characteristics based on Cumberland City Council (**Council**) flood maps, flood reports and provided flood advice letter (Refer to Appendix B).
2. Evaluate site flood characteristics, potential site flooding impacts, potential flood risks to occupants, and the suitability of the development.
3. Discuss preliminary flood emergency response plan (**FERP**) requirements.
4. Address the requirements of the project's Secretary's Environmental Assessment Requirements (**SEARs**) issued by the Department of Planning, Housing and Infrastructure (**DPHI**).

1.4 Relevant Guidelines

This report has been prepared in accordance with the following guidelines and policies:

1. NSW Department of Planning and Environment (2023), *Flood Impact and Risk Assessment: Flood Risk Management Guideline LU01*.
2. NSW Department of Planning, Housing and Infrastructure (1 March 2024), *Update on Addressing Flood Risk in Planning Decisions, Planning circular PS 24-001*.

3. NSW State Emergency Services & Cumberland City Council (2021), *Cumberland City Local Flood Emergency Sub Plan*.

2 Secretary's Environmental Assessment Requirements (SEARs)

The request for SEARs issued for the state significant development application (SSDA) 72775222 was responded to by NSW DPHI in July 2024. DPHI outlined matters that needed to be addressed in the EIS for the development. A list of the relevant flooding requirements and where they are addressed in this report is provided in Table 2, which demonstrates that all the applicable flooding requirements for the proposed development site are effectively addressed by this assessment.

Table 1: Flood specific SEARs provided by DPHI.

Flood Assessment Requirements	Section(s) of the Report
A flood impact risk assessment (FIRA) in accordance with the Flood risk management guideline LU01 - Flood impact and risk assessment (2023). The FIRA must:	
Identify any flood risk on-site (mainstream and overland) having regard to adopted flood studies, the potential effects of climate change, and any relevant provisions of the NSW Flood Risk Management Manual (2023)	Refer to Sections 4.2 and 5.3.
Assess the impacts of the development, including any changes to flood risk on-site or off-site, and detail design solutions and operational procedures to mitigate flood risk where required	Refer to Sections 4.3 and 5.3.
Identify flood behaviour, flood constraints and risks on the site and adjoining areas including the potential impacts of climate change for the full range of events up to and including the probable maximum flood (PMF) event.	Refer to Section 4.1 - 4.3
Include details of proposed management measures to minimise the impacts of flooding on the development and flood risk to the community	Refer to Sections 5.3 and 6.
Detail an emergency management and response strategy for local catchment (and/or overland) and mainstream flooding, which: - identifies potential options for emergency management and response, including safe evacuation from the site and/or shelter-in-place, based on adopted flood studies and flood warnings from the Bureau of Meteorology (where available) - evaluates the performance of safe evacuation from the site, including consideration of possible constraints of existing road networks, potential interruptions of traffic flows, and the lead time for evacuation from existing flood warning services - identifies the primary emergency management and response approach under significant events, up to and including the PMF event.	Refer to Section 6.

3 Previous Flood Studies

3.1 Overview

A review of previous flood investigations was undertaken to assess likely local flood behaviour and characteristics for the site. This review identified three previous flood studies which would be relevant to this assessment.

3.2 Cardno (2004) Review of Prospect Creek Flood Level

Cardno (now Stantec) undertook a mainstream flood assessment for this catchment on behalf of Fairfield City Council using the TUFLOW hydraulic modelling software, and summarised the assessment in the report, Review of Prospect Creek Flood Level (2004) (the Cardno flood Study).

3.3 Bewsher Consulting (2006) Prospect Creek Floodplain Management Plan, Flood Study Review

Bewsher Consulting undertook a review of the Cardno flood study and made updates to the hydraulic model as part of the Floodplain Management Plan. Bewsher Consulting summarised the changes and the updated assessment in the report, Prospect Creek Floodplain Management Plan, Flood Study Review (the Bewsher Flood Study).

3.4 Lyall & Associates (2017) Holroyd City LGA Overland Flow Study

Lyall & Associates undertook an overland flood assessment for this catchment on behalf of Fairfield City Council and Holroyd City Council (now Cumberland City Council) using the TUFLOW hydraulic modelling software, and summarised the assessment in the report, Holroyd City LGA Overland Flow Study (2017) (the Lyall & Associates Overland Flow Study).

4 Site Flood Characteristics

4.1 Flood Information

Relevant site flood information has been summarised in Council's flood advice letter (refer to Attachment C). The information contained in the certificate has been extracted from the Lyall & Associates Overland Flow study by Council, and details of the 1% annual exceedance probability (**AEP**) flood and probable maximum flood (**PMF**) have been provided. Information from the Bewsher Flood Study has also been reviewed to inform the mainstream overbank flooding characteristics in the vicinity of the site.

4.2 Summary of Flood Behaviour

The site is susceptible to two different mechanisms of flooding which result in different extents, durations and available warning times. The mechanisms are overland flash flooding from the local catchment and mainstream overbank flooding from Prospect Creek. The overland flash flooding is caused by short duration rainfall events ranging between 30 minutes to 3 hours. In the PMF event this results in the inundation of the site's ground floor, and Long, Tait, and Britton Streets, rendering evacuation unsafe. Mainstream overbank flooding from Prospect Creek is caused by longer duration large-scale events with critical durations of 9 hours in rare events. In the PMF this results in the inundation of the southern half of the site and Long Street.

We note:

1. Flash flooding at the site is attributed to overland flow from the local catchment. These floodwaters inundate both the northern and southern portions of the site.
2. Peak 1% AEP overland flow levels range from 20.1 – 21.4 mAHD with depths generally below 0.1 m across the site.
3. Peak PMF overland flow levels range from 21.0 – 22.1 mAHD with depths ranging from 0.2 m to 0.7 m at the site's buildings.
4. Mainstream flooding at the site is attributed to overbank flows from Prospect Creek. These floodwaters inundate the southern portion of the site, roads south of the site and other low-lying areas along Prospect Creek.
5. The site is free from flooding during the 1% AEP mainstream event.
6. Peak PMF mainstream flood levels range appear to peak at 21.2 mAHD, resulting in over floor flood depths up to 0.48 m in the southern building.

4.3 Assessment of Off-Site Impacts

The flood characteristics extracted from Council's adopted flood studies and Council's provided flood advice letter were assessed against the design details of the proposed development to determine the likelihood and extent of potential off-site impacts.

The proposed development will not increase the risk of off-site flood impacts up to and including the PMF due to the following:

- The only external works involve the accommodation of a turning space for vehicles up to 20 m long, which does not materially alter the site's built form or topography.
- No additional storage of recovered materials is proposed.

Since no offsite flooding impacts are anticipated up to and including the PMF, there will be no impacts under the climate change scenario.

5 Flood Risk Assessment

5.1 Overview

MA have prepared a flood risk assessment in accordance with the NSW Government Planning Circular PS 24-001 and Flood Risk Management Guideline LU01 which recommends that development proposals are designed and assessed according to a risk-based approach which should take account of the proposal's risk profile.

To facilitate the increased processing capacity minor changes are required to the site and its operation, as detailed in Section 1.2. The site will otherwise remain the same as approved in previous development applications and modifications, with no changes proposed to the following:

- Building and infrastructure footprints.
- Operating methodology or site infrastructure associated with the processing of liquid waste.
- Plant and equipment.
- Occupants.
- Vehicle parking.
- Landscaping.

As there are no changes to the above items, the risk as a consequence of the proposed development is low. The primary residual risk which should be managed is the risk to life. Risk to life isn't materially altered because of the proposed development but should and can be managed through measures described in Section 5.2.

5.2 Risk Mitigation Measures

The proposal incorporates risk mitigation measures, described in Table 2, which are designed to reduce risk to life and property to an appropriate level.

Table 2: Flood risk mitigation measures.

Risk	Mitigation Measure
Isolation and response	- The first storey habitable floor level of the southern building is above the PMF. - A flood emergency kit will be maintained onsite. - A construction certificate condition of consent should be prepared which requires a FERP to be prepared for the site. The FERP will be implemented and maintained by site management in perpetuity and detail the following: - Site flood characteristics and associated risks. - Flood warning mechanisms. - Roles and responsibilities of site management and staff. - Response phases and triggers with details of each response.
Evacuation	- Sufficient time is available to safely evacuate the site in the event of a mainstream flood emergency. - A construction condition of consent should be prepared which requires a FERP to be prepared for the site. The FERP will be implemented and maintained by site management in perpetuity.

5.3 Risk Assessment

Table 3 provides a risk assessment of the proposed development against flood risks for the full range of floods up to and including the PMF. The risk assessment was completed based on the implementation of risk mitigation measures outlined in Table 3. Issues considered in the risk assessment are consistent with the NSW Government Planning Circular PS 24-001 and Flood Risk Management Guideline LU01 including location of the proposed development, flood characteristics at the site, nature and type of the proposed development, impacts on surrounding property and flood behaviour, and risks to life and property.

The assessment finds that flood risks arising from the development can be readily managed and mitigated to an appropriate level.

Table 3: Flood risk assessment.

Risk Element	Issue	Assessment
Location of development	The site and its evacuation routes are affected by flash and mainstream flooding.	Risk mitigated - Shelter-in-place (SIP) is available on the first floor of the site's southern building, fronting Long Street. - During a mainstream flood, evacuation via the Tait Street exit, east to Cumberland Highway will likely be accessible as it is only cut off in extremely rare flood events.
Site flood characteristics	The site is first flooded in the 1% AEP event by flash flooding and in the PMF by mainstream flooding.	Risk mitigated - Early forecasts and warnings from Bureau of Meteorology (BoM) and the NSW SES will likely allow for safe evacuation prior to floodwaters cutting off the site. - In the event evacuation can't be undertaken, SIP is available on the first floor of site's southern building, fronting Long Street.

Risk Element	Issue	Assessment
Nature and type of the proposed development	The proposal is to increase the processing capacity at the site.	Risk mitigated - There is no increase to the number of staff required onsite or the material to be stored onsite. - There are no substantial changes to the site layout or operations.
Impact on flood behaviour and surrounding properties	Impacts of any physical works or operational changes.	Risk mitigated No material physical works or operational changes are proposed as part of the development which could alter the flow of water through the site.
Risk to life of occupants	Occupants may be exposed to hazardous floodwaters onsite during extreme floods.	Risk mitigated - Site management will implement in perpetuity a FERP to provide measures required to prepare for (e.g. training, flood wardens, education), respond to and recover from flood emergency situations. - Early forecasts and warnings from BoM and the NSW SES will provide sufficient time to allow for safe evacuation of all potential occupants prior to floodwaters cutting off the site. - In the event evacuation can't be undertaken, SIP is available on the first floor of the site's southern building, fronting Long Street.
Risk to property	Buildings are subject to over floor flooding which could result in damage.	Risk mitigated - No material physical works or layout changes are proposed as part of the development. - Both buildings are materially flood free in the 1% AEP flood events.

6 Preliminary Flood Emergency Response Plan Comments

6.1 Overview

The site is likely affected by short duration overland flow flash flooding from the local catchment, and longer duration, overbank mainstream flooding from Prospect Creek.

During a flash flood of the local catchment the site remains largely unaffected by flood depths greater than 0.1 m up to and including the 1% AEP event. But the site does become flood affected in larger events, up to the PMF, which results in the inundation of the majority of the site. However, the evacuation routes via Long and Britton Street are impacted more frequently, first being blocked off by hazardous flood waters in approximately the 2% AEP overland flow event.

In the event of a mainstream flood from Prospect Creek, the site and surrounding evacuation routes are flood free up to and including the 1% AEP event. During a PMF mainstream event, the southern portion of the site and Long Street are completely inundated, cutting the egress route, however Tait Street remains flood free.

6.2 Response Strategy

6.2.1 Flash Flood Response

In the PMF local event the ground floor of the site (at 21.72 and 21.36 mAHD) is likely to become inundated by flood waters. However, the building fronting Long Street has a first-floor level of approximately 24.72 mAHD, which is unaffected by the PMF.

If adequate warning time of a flood event is not received prior to a flash flood, SIP on the first floor of the building fronting Long Street is a viable emergency strategy if evacuation is not an option.

6.2.2 Mainstream Flood Response

A large-scale flood from Prospect Creek would be widely anticipated several hours if not days in advance with sufficient warning time, in which case pre-emptive evacuation would be the preferred emergency strategy over SIP. This strategy aligns with the Cumberland City Local Emergency Sub Plan (2021) which adopts evacuation as the primary response strategy when safe to do so and pre-emptive closure and excavation from vulnerable locations.

In the unlikely event that occupants are onsite during a major mainstream event, they will likely be able to evacuate via the Tait or Long Street exits, east along Long Street to Cumberland Highway as the routes are only cut off during extremely rare events. However, once rainfall has started staff should not evacuate unless advised to do so by the NSW SES.

In the improbable event occupants are onsite during a PMF event and do not have adequate time to evacuate they can still SIP on the first floor of the building fronting Long Street.

6.3 Summary of Emergency Response Measures

Although a detailed FERP is not considered necessary for the site at this stage, a detailed FERP is recommended to be produced prior to the issue of a construction certificate. The following preliminary comments are provided to demonstrate that the risks associated with flooding can be mitigated appropriately:

1. Access to flood free land above the PMF on the site is available on the first storey of the building fronting Long Street. Ample floor space is available for all occupants, at maximum operational capacity the number of occupants expected is 20 and the available floor area above the PMF level is approximately 140 m², allowing approximately 7 m² per person, well above the typically adopted minimum of 2 m² per person.
2. Site occupants should not attempt to evacuate the site once flooding has commenced due to the potential for hazardous flood waters along the evacuation routes. Any evacuation should occur before the occurrence of heavy rainfall at the site, unless advised otherwise by the NSW SES.
3. Since the critical duration for the local catchment PMF event is likely between 15 – 30 minutes, the duration of inundation in this event is likely to be short, in the order of 1 – 2 hours. Therefore, SIP for this period of time is acceptable.
4. Due to the nature of the flooding in Prospect Creek, adequate warning time should be available to safely evacuate prior to the site or surroundings becoming flooded, in these events.
5. The critical duration of the PMF event affecting Prospect Creek is not provided in the Bewsher Flood Study or Council's flood advice letter. However, since the critical duration for the Prospect Creek 1% AEP flood event is 9 hours, it has conservatively been assumed to be the same duration, although it is very likely shorter. The expected duration of PMF inundation is, therefore, likely to be a maximum of approximately 12 hours. Hence, if evacuation is unsafe, SIP for this period of time is acceptable.
6. Site occupants should be aware of weather forecasts and warnings by subscribing to NSW SES, BoM, Early Warning Network and other relevant warning systems.
7. The site manager / foreman should maintain a flood emergency kit on the first floor including torch with spare batteries, portable radio with spare batteries, first aid kit, high visibility vest, high visibility raincoat, non-slip foot ware, megaphone and bottled water (minimum 48 x 500 mL bottles)

6.4 Evacuation Performance Evaluation

Pre-emptive evacuation of the site is recommended as the primary emergency response for both flash and mainstream flooding scenarios. Evacuation will be undertaken as directed by the NSW SES and in accordance with specific triggers which will be provided in the detailed FERP. These two prompts for evacuation should provide occupants with sufficient warning time to evacuate the site safely, however if required, plenty of space is available within the building fronting Long Street to SIP.

As part of the development, the maximum number of staff required onsite will not change, but there will be an increase in the number of trucks visiting the site every day. These trucks are expected to be on site for a short duration and coupled with the available warning time are expected to have no impact on the evacuation outcome. Therefore the proposed development will not detrimentally affect the capacity, flow, or required evacuation lead time of the existing road network.

7 References

Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors) (2019), *Australian Rainfall and Runoff: A Guide to Flood Estimation*, Commonwealth of Australia.

Bewsher Consulting (2006), *Prospect Creek Floodplain Management Plan, Flood Study Review*.

Cardno (2004), *Review of Prospect Creek Flood Level*.

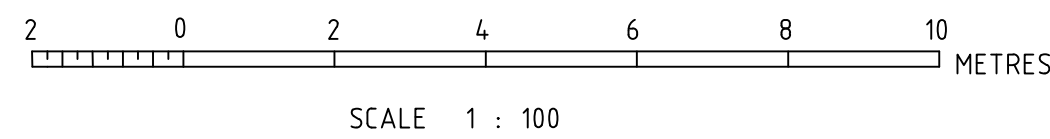
Lyall & Associates (2017), *Holroyd City LGA Overland Flow Study*.

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NSW Department of Planning and Environment (2023b), *Flood Impact and Risk Assessment: Flood Risk Management Guideline LU01*.

NSW State Emergency Services & Cumberland City Council (2021), *Cumberland City Local Flood Emergency Sub Plan*.

LONG STREET



9/3/23	DETAIL UPDATED	SH/LM	C
10/10/17	EDGE OF CONC LEVELS ADDED, SEWER DETAIL & LEVELS ADDED, TWO BENCH MARKS ADDED	SH/LM	B
11/9/17	PIT DETAIL ADDED IN TAIT STREET	SH/LM	A
DATE	REVISION	BY	ISSUE

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LOT 16 & 22
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LOT 16
(A) EASEMENT FOR ELECTRICITY PURPOSES (VIDE DP639279) W674987

DRAWN: LM
CHECKED: CS/SH
SURVEYED: CS/SH/MR

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PH: (02) 9636 3248
Email: office@fespl.com.au

CLIENT: DEMAST PTY LTD

DETAIL & LEVEL SURVEY FOR DA PURPOSES
WITHIN LOT 1 DP 1273012
KNOWN AS 7 LONG STREET
SMITHFIELD

SHEET 1 SOUTH

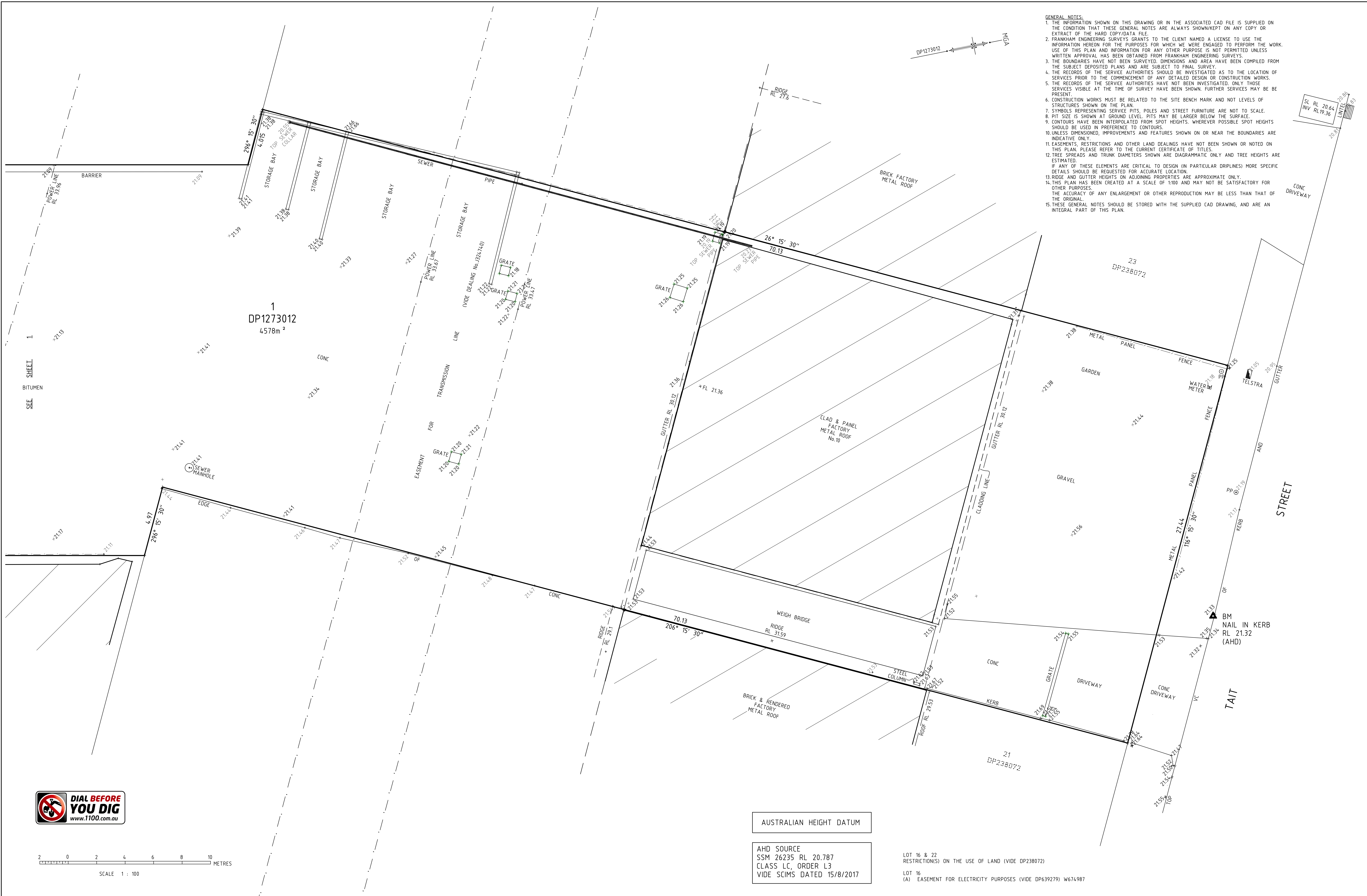


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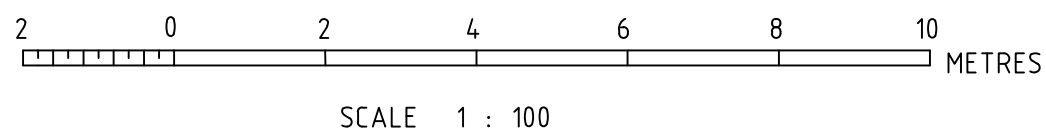
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 8. PIT SIZE IS SHOWN AT GROUND LEVEL, PITS MAY BE LARGER BELOW THE SURFACE.
 9. CONTOURS HAVE BEEN INTERPOLATED FROM SPOT HEIGHTS, WHEREVER POSSIBLE SPOT HEIGHTS SHOULD BE USED IN PREFERENCE TO CONTOURS.
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AUSTRALIAN HEIGHT DATUM

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VIDE SCIMS DATED 15/8/2017

LOT 16 & 22
RESTRICTIONS) ON THE USE OF LAND (VIDE DP238072)
LOT 16
(A) EASEMENT FOR ELECTRICITY PURPOSES (VIDE DP639279) W674.987

DATE	REVISION	BY	ISSUE
9/3/23	DETAIL UPDATED	SH/LM	C
10/10/17	EDGE OF CONC LEVELS ADDED, SEWER DETAIL & LEVELS ADDED, TWO BENCH MARKS ADDED	SH/LM	B
11/9/17	PIT DETAIL ADDED IN TAIT STREET	SH/LM	A

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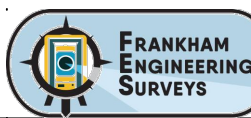
DRAWN: LM
CHECKED: CS/SH
SURVEYED: CS/SH/MR

FRANKHAM ENGINEERING SURVEYS
10 PRITCHARD STREET EAST, WENTWORTHVILLE, NSW 2145
P.O. BOX 281, WENTWORTHVILLE, NSW 2145.
PH: (02) 9636 3248
Email: office@fespl.com.au

CLIENT: DEMAST PTY LTD

DETAIL & LEVEL SURVEY FOR DA PURPOSES
WITHIN LOT 1 DP 1273012
KNOWN AS 7 LONG STREET
SMITHFIELD

SHEET 2 NORTH



SCALE: 1:100 ~ B1

DATE: 15/8/2017

DRAWING No.:

217055/C

Appendix A – Site Survey



CUMBERLAND
CITY COUNCIL

Ref: EC2024/1211

27 November 2024

Martens And Associates
Suite 201 20 George Street
HORNSBY NSW 2077

Dear Sir/Madam,

Subject: Flood Levels at 7 Long Street SMITHFIELD NSW 2164,
Lot 1 DP 1273012
Application No: EC2024/1211
Property: 7 Long Street SMITHFIELD NSW 2164

Council refers to your request dated 22 November 2024 requesting flood information at the above property.

1% ANNUAL EXCEEDANCE PROBABILITY (AEP) FLOOD:

The above property is shown to be **affected** by the 1% Annual Exceedance Probability (AEP) flood, according to the information available to Council from the "Prospect Creek Overland Flood Study" prepared by Lyall & Associates Consulting Water Engineers in June 2017.

The 1% AEP flood level refers to a flood which has a 1% chance of being equalled or exceeded in any one year and this site has been assessed as **a low and medium flood risk**. It should be noted that a flood could occur that is more severe than the 1% AEP flood at any time.

The maximum 1% AEP flood level relevant to the subject property has been determined (see the attached plan) to Australian Height Datum (AHD) as follows:

- | | | |
|------------------|---|-----------|
| 1. At location A | - | 21.4 mAHD |
| 2. At location B | - | 21.2 mAHD |
| 3. At location C | - | 20.8 mAHD |
| 4. At location D | - | 20.6 mAHD |
| 5. At location E | - | 20.4 mAHD |
| 6. At location F | - | 20.1 mAHD |

The subject property has been identified as Flood Control lot. Under the SEPP (Exempt & Complying Development) 2008 Regulation 3.5(1), a Complying Development Certificate must not be issued for, "Development under this code must not be carried out on any part of a flood control lot, other than a part of the lot that the council or a professional engineer who specialises in hydraulic engineering has certified, for the purpose of the issue of the relevant complying development certificate, as not being any of the following:

- a) a flood storage area,
- b) a floodway area,
- c) a flow path,
- d) a high hazard area,
- e) a high risk area.

16 Memorial Avenue, PO Box 42, Merrylands NSW 2160
T 02 8757 9000 E council@cumberland.nsw.gov.au W cumberland.nsw.gov.au
ABN 22 798 563 329

Welcome Belong Succeed

Council has determined that part of the flood control lies in one of the five items above – **items A, B and C**; therefore, a CDC cannot be issued on this site. The identified flood items are represented by the darker area within the 1% AEP flood extent on the attached map. If the development is proposed within any part of this zone (dark blue area), a pre and post flood study must accompany the Development Application. Alternatively, if the development is proposed within the uncoloured and/or light blue areas (flood fringe zone), a CDC may be considered for this site. However, the surface flows must not be impeded (blocked) and the redevelopment shall allow the free movement of the flood around any proposed structure(s).

In all cases, flood level on adjacent properties shall not be increased. Supporting documentation is to accompany the development.

Minimum habitable floor levels shall be 0.5m above the flood level at the upstream side of the structure. Minimum non-habitable floor levels (garages, laundry, sheds, etc.) shall be 0.15m above the flood level at the upstream side of the structure. Interpolation between flood levels is allowed.

The relationship between these levels and the ground surface may be determined by a survey of the property undertaken by a Registered Surveyor.

It should be noted that where the development or redevelopment of the property is proposed, reference should be made to the relevant Development Control Plan with regard to flooding and drainage issues. Please include a copy of this letter and map with any Development Application that you may lodge with Council for the subject site.

For modelling purposes, the models (pre and post development flood study) shall be calibrated to Council's 1%AEP Flood levels (or interpolated levels) at least 10 metres upstream and downstream from the property boundaries. "Council's TUFLOW model for the catchment is available and recommended to be used to undertake the assessment. Once engaged, the consultant must enter into a license agreement for the use of Council's flood model for the specific purpose of preparing the FIA for the proposed development. In cases where uses of the TUFLOW model proves impractical, using an alternative 2D model is advised for the FIA preparation".

Note:

The brown shaded area on the attached Map represents the flood waters with a depth of flow less than 100mm and does not attract any flood controls. It is presented on the flood map to show the continuity of flooding within the area. However, if development occurs within the brown areas, the structure shall not impede or divert flows to adjacent properties.

Flood levels are not static due to changing circumstances (e.g., revision of the flood model) and accordingly the above flood level is only valid for one year from the above date.

PROBABLE MAXIMUM FLOOD (PMF):

The above property is shown to be **affected** by the Probable Maximum Flood (PMF), according to the information available to Council.

The nearest PMF flood levels available from the "Prospect Creek Overland Flood Study" prepared by Lyall & Associates Consulting Water Engineers in June 2017 shown in the Map attached are as follows:

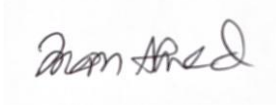
- | | | | |
|----|---------------|---|-----------|
| 1. | At location A | - | 22.1 mAHD |
| 2. | At location B | - | 21.7 mAHD |
| 3. | At location C | - | 21.5 mAHD |
| 4. | At location D | - | 21.3 mAHD |
| 5. | At location E | - | 21.1 mAHD |
| 6. | At location F | - | 21.0 mAHD |

The coloured areas on the attached map represents the extent of the flood event. The light brown areas do not attract flood controls.

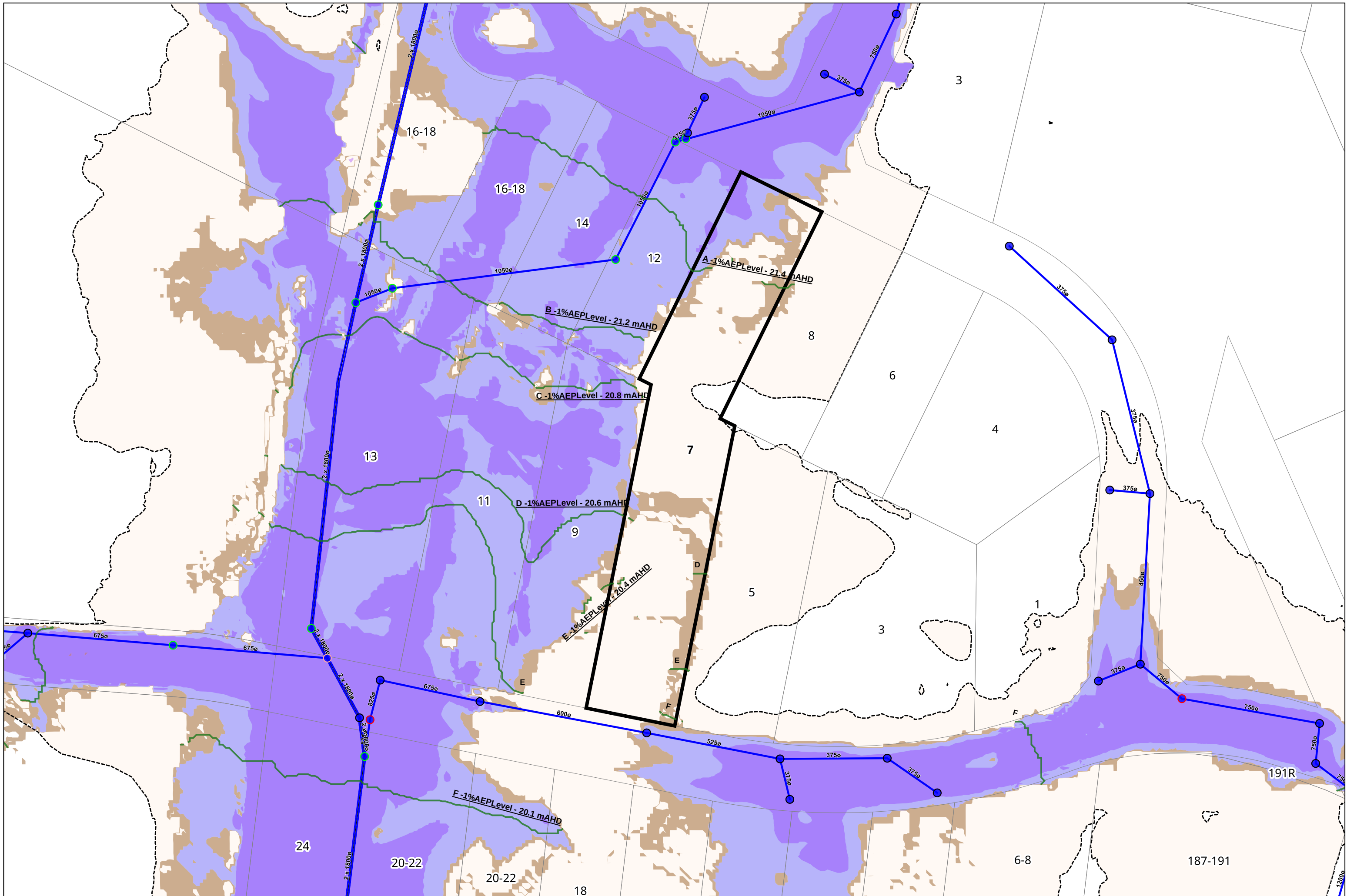
PMF levels are primarily used for evacuation purposes in the development of the property.

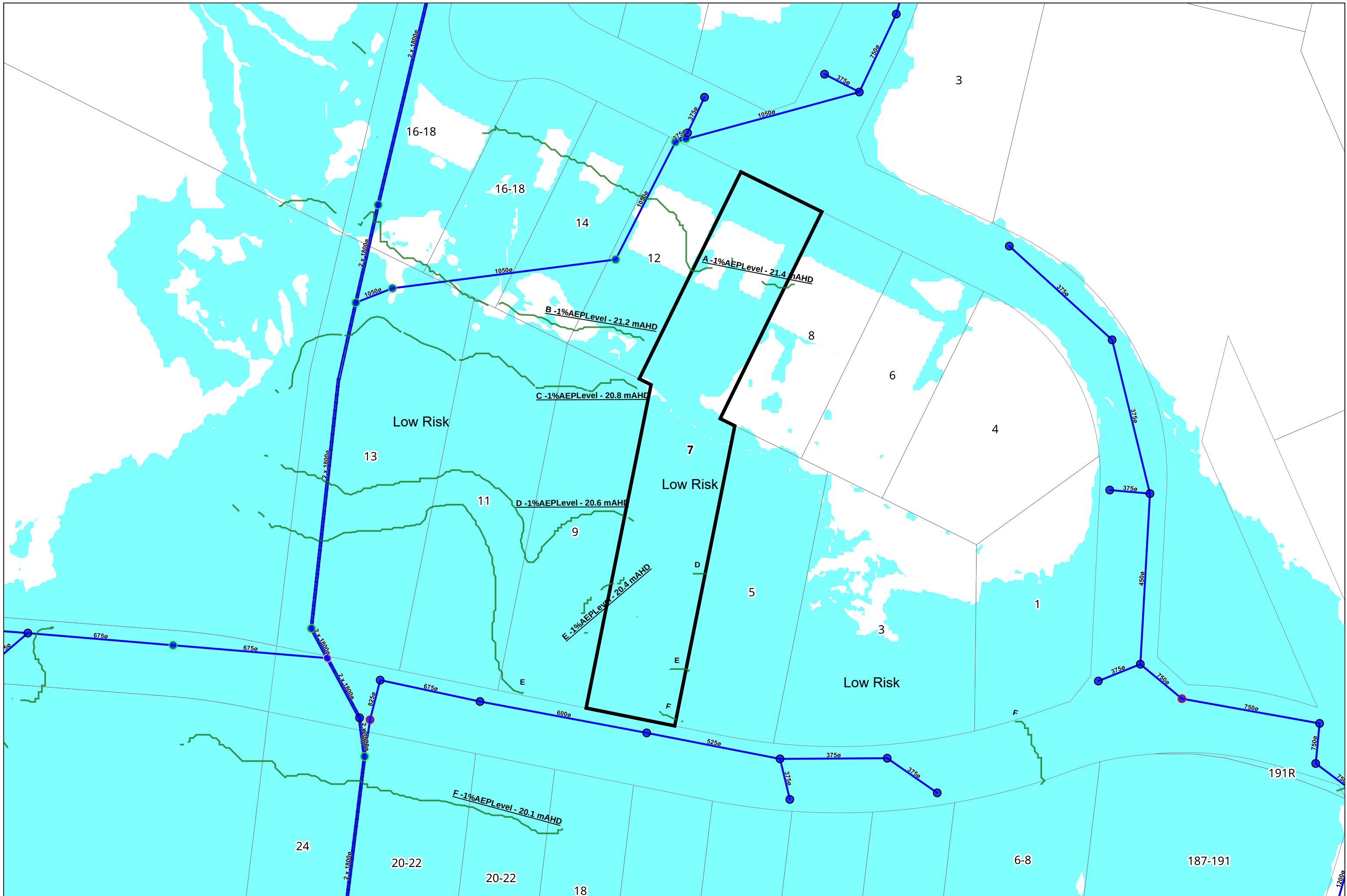
Should you have any further enquiries in this regard, please contact Luiza Atakulova, Planning Systems Support Officer during normal office hours, Monday to Friday on 8757 9955.

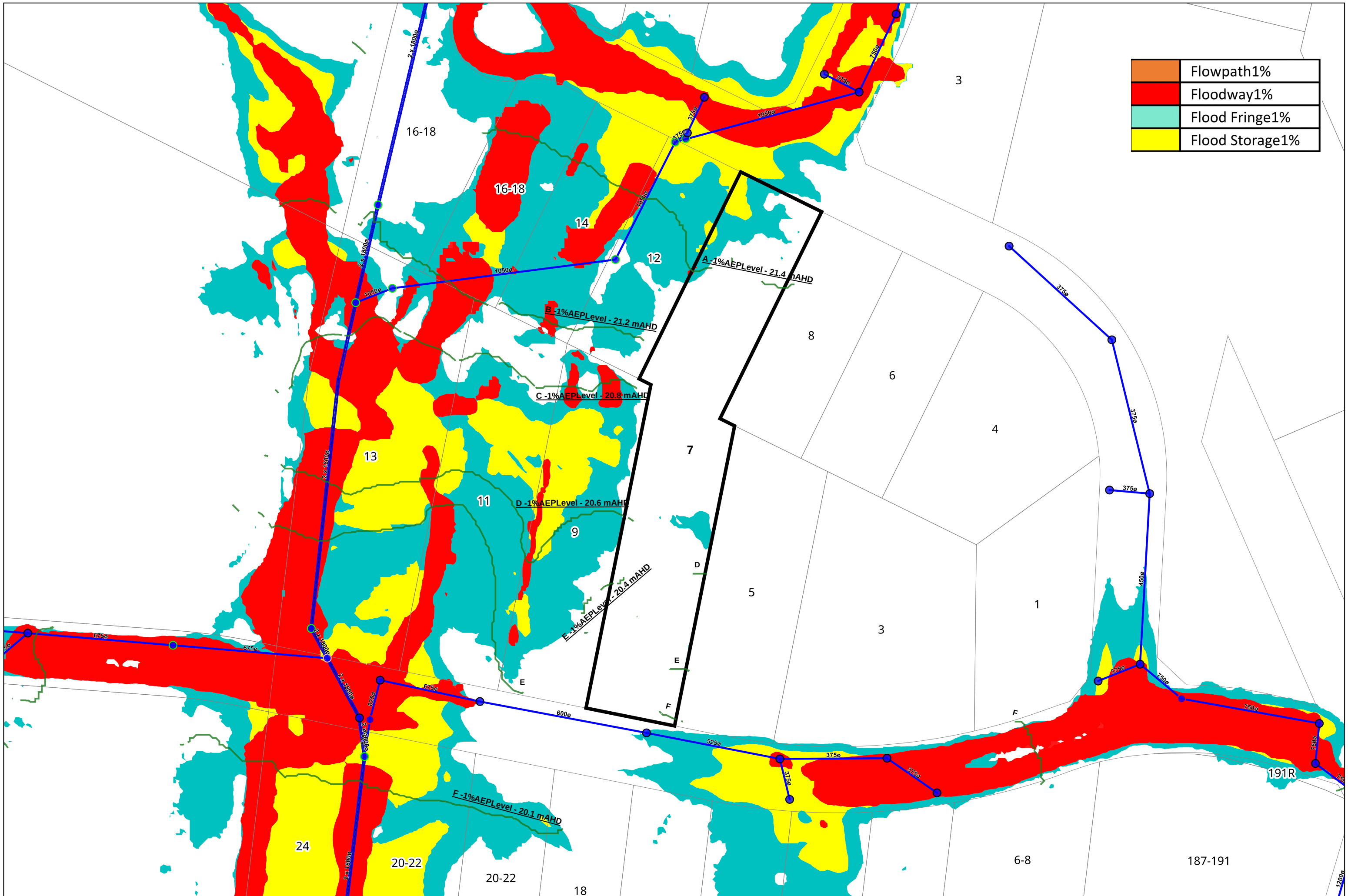
Yours sincerely,

A handwritten signature in black ink, appearing to read 'Inam Ahmed', is enclosed within a light gray rectangular box.

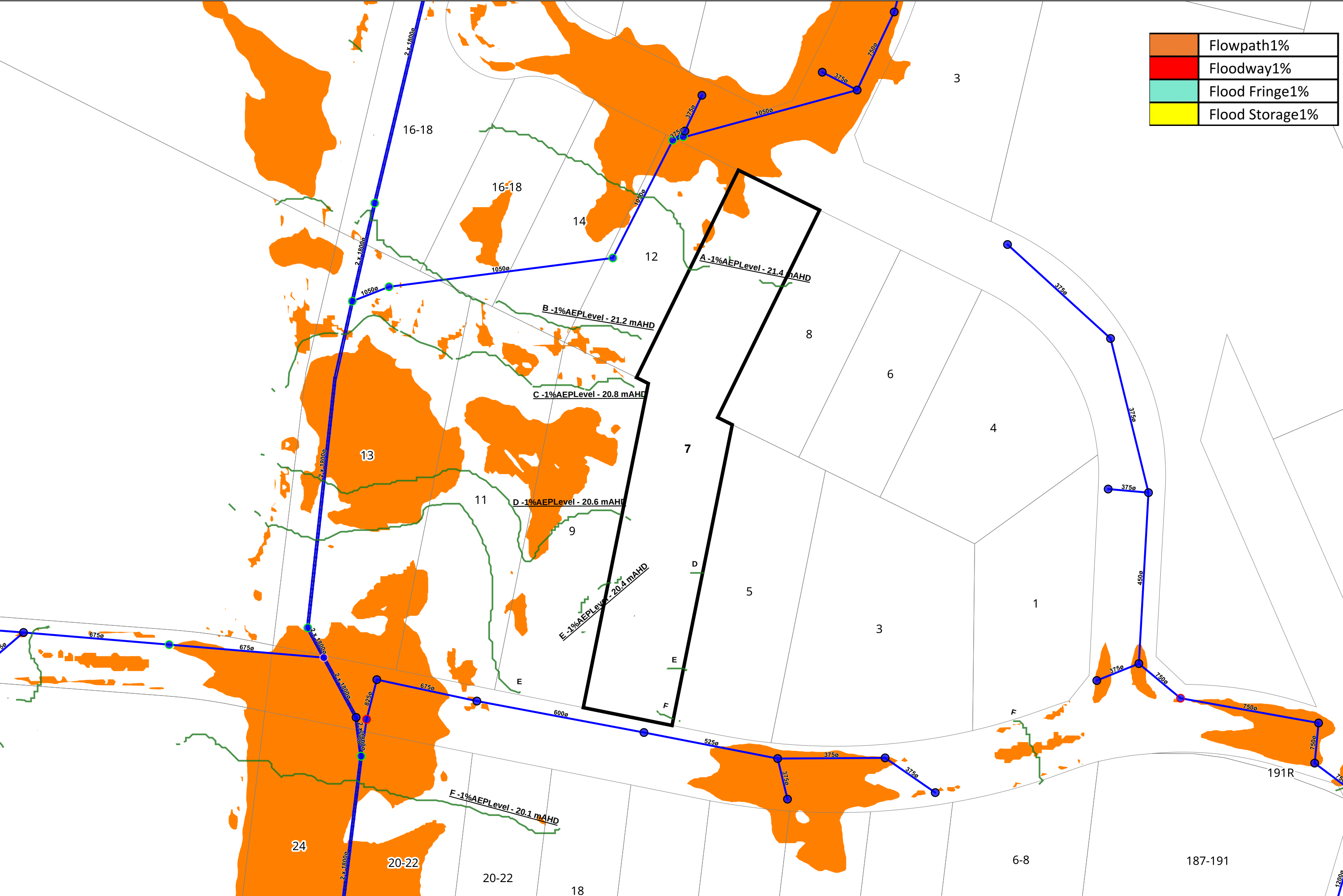
Inam Ahmed
Stormwater and Flood Management Planner

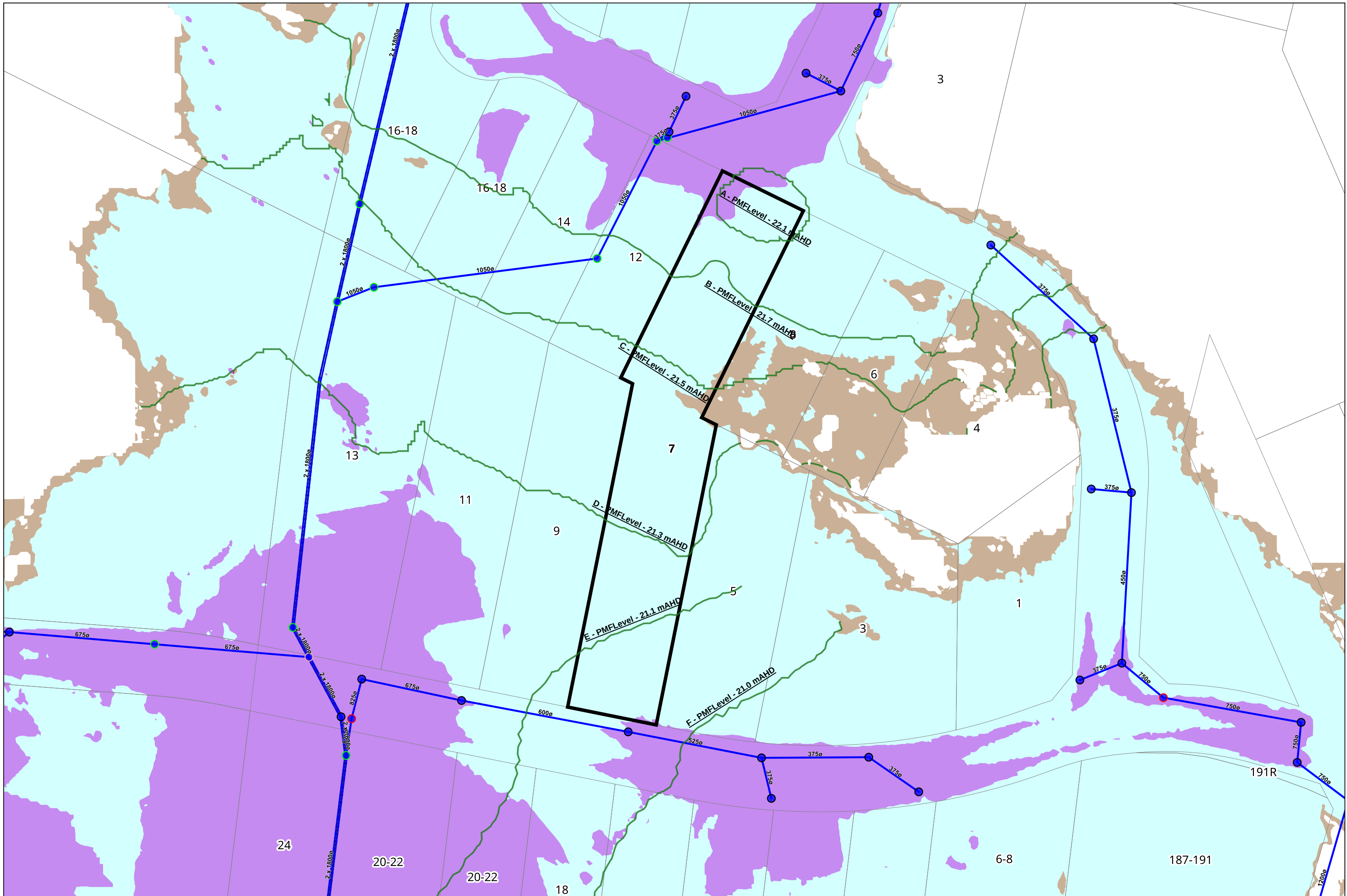






	Flowpath1%
	Floodway1%
	Flood Fringe1%
	Flood Storage1%





A1

A2

Appendix B – Council Flood Advice Letter
