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Technical Specification for:

***HYDROLOGICAL + FLOOD
STUDY***

**FRASERS BESS
AUSTRALIA**

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Doc. No.: FRA-GRE-CV-CAL-0001

Rev.: A3

Date : 03/Mar/2026

DOCUMENT CHANGES LOG

Revision	Date	Description	Section	Prepared	Approved
A1	06/Feb/2026	First Issue	-	PLM	MRC
A2	26/Feb/2026	Updated after comments	-	PLM	MRC
A3	03/Mar/2026	Updated after comments	-	PLM	MRC

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1. OBJECTIVE

This report presents the hydrological assessment undertaken for the proposed “Fraser’s Bess” development in Victoria, Australia. The study evaluates both external upstream catchment flows and direct rainfall runoff within the site to determine potential flood impacts and inform the drainage design.

Hydrological modelling has been carried out for the 5% and 1% Annual Exceedance Probability (AEP) storm events. The assessment quantifies peak discharges affecting the site for identifies potential flood risks associated with upstream inflows and on-site runoff.

The results indicate that the site is subject to external catchment inflows during major storm events. The results presented in the following sections do not indicate concerning values; however, in order to define the drainage system, they will need to be assessed in conjunction with the project layout.

Therefore, the report provides depth and velocity results for the specified return periods so that they can be used in subsequent phases of the project, in order to ensure the service life of the facilities.

2. SITE CONDITIONS

The Fraser’s Bess site is located on an agricultural property about 6 kilometres south of Toongabbie and 7 kilometres north of Glengarry, demarcated by Traralgon-Maffra Road at the East side and Fraser’s Lane on the North, in the Latrobe City Council, Victoria. The proposed solar plant will be connected to the electricity grid via the existing power lines which run along the west side of Traralgon-Maffra Road.

The geographic coordinates of the project are:

Fraser’s BESS

Latitude	38°05'07.20"S
Longitude	146°35'59.79"E
Elevation	61m AHD

Table 1 Project Location

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Figure 1. Project Location

3. CALCULATION METHOD

The selection of a hydrological model must align with the catchment type and the required level of accuracy. For this study, we are utilizing a ROG model, where the topography provided by *the client* is integrated with LiDAR data from [Elvis](#) to account for the site's external catchments.

The modelling for the Flood Study is carried out with a two-dimensional study software (HEC-RAS) that simulates the surface runoff and models the expected flood depths and velocities.

The purpose of this report is to obtain and analyse the results of the maximum water depth, interpret the findings, and adjust the design accordingly. To achieve this, the scope has been divided into two sections: hydrological and hydraulic.

Hydrological study

- To analyse the hydrological behaviour, the external catchments must be defined using LiDAR data. This is done with QGIS software, based on a digital terrain model.

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- The design storm for the hydrological model is determined by analysing and processing meteorological records to obtain rainfall data for the 5% and 1% AEP from the Bureau of Meteorology (BOM) website.
- Initial and continuous loss values are established according to the soil loss model recommended in the Australian Rainfall & Runoff 2019 (ARR 2019) guide.

Flood Study

The HEC-RAS software application processes the following information:

- The topographical characteristics of the site. Considering both the surveyed surface provided by the client and the LiDAR
- The storm events.
- The hydrological conditions of the soil, based on the information obtained from ARR Data Hub.

All this data is input into HEC-RAS to simulate runoff, allowing for the extraction of water depth and velocity within the layout area.

Subsequently, the model undergoes validation using the RFFE website to confirm that the calculated flow falls within the provided interval.

4. INITIAL DATA

The determination of the hydrological parameters of the study area is essential for assessing the hydrological and flood study.

The hydrological characterization of both the external and internal areas of the PV plant's plot is conducted by gathering the necessary data to define the catchment basins, determine the extreme rainfall regime, and analyse the runoff formation process.

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4.1. Digital Elevation Model

External catchments have been delineated based on a Digital Elevation Model (DEM), to obtain the surface runoff area that flows to the site.

The Digital Elevation Model (DEM) represents the ground surface topography, with vegetation features automatically removed using data from multiple vegetation maps. This process significantly enhances the quality and consistency of the information compared to the original SRTM data. The vegetation removal has yielded satisfactory results across most of the continent.

The terrain corrected products have been downloaded from Elvis Elevation and Depth (for the external catchments only):

<https://elevation.fsdf.org.au/>

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The hi-res products have a pixel size of 50cm and are generated from high-resolution. It has been studied with the QGIS software.

The reference system is GDA2020 / MGA zone 55 – Projected.

4.2. DEM Integration and Vertical Control

The hydraulic terrain model used for this assessment was developed by integrating two primary datasets:

- High-resolution LiDAR terrain obtained from the ELVIS Elevation and Depth portal for external catchments.
- Detailed topographic survey provided by the Client for the internal project area.

Both datasets are referenced to GDA2020 / MGA Zone 55 with vertical levels in AHD. Prior to merging, verification of datum consistency was undertaken to ensure alignment of horizontal and vertical reference systems.

The detailed survey surface was prioritised within the project boundary due to its higher relative accuracy. The LiDAR dataset was used to represent upstream and external catchments beyond the surveyed extent.

The LiDAR dataset represents bare-earth terrain; however, inherent limitations exist in vegetated or water-covered areas. These limitations are not expected to materially influence broad-scale catchment behaviour but may locally affect micro-topographic flow paths.

4.3. Plot area Topography

The “terrain” for the model was created with detailed survey developed by the client:

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Figure 2. Contours from topography survey

This information is based on the survey conducted for the Frasers Bess.

In addition, the information was supplemented with the existing topographic survey of the northern plot, intended for the installation of the Frasers photovoltaic plant.

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4.4. Rainfall Data

For this project, the terminology that has been used is consistent with Australian Rainfall and Runoff (AR&R). AEP is defined as the probability that an event will occur or be exceeded in any year. Its relationship with Average Recurrence Interval (ARI) is also included in the following table:

Table 1 - Relationship between AEP% & ARI (years)

AEP (%)	1EY	39	18	10	5	2	1	0.5
ARI (years)	1	2	5	10	20	50	100	200

The annual exceedance probabilities (AEP) of 5% and 1% have been considered.

A “critical storm duration” is determined by testing the model for a range of storm durations and AEPs. To obtain this “design storm”, the software DRAINS is used,

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which requires rainfall intensity data, temporal patterns, and pre burst depth need to be imported after completing of the ARR 2019 storms.

Routine data collection includes the standard and widely available data, such as rainfall data collected on a routine basis by major government agencies such as the Bureau of Meteorology. This data is collected to provide a long-term understanding of Australia's climatic conditions for a representative selection of sites throughout the country. These stations are the basis of many flood estimation procedures and for projects, though the data is appropriate for many other applications.

The IFD data values from Bureau of Meteorology of Australia (2016), with the exact coordinates of Frasers BESS:

[Bureau Home](#) > [Water Information](#) > [Design Rainfalls](#) > [Design Rainfall Data System](#)

[Water Information](#) [Regulations](#) [Standards](#) [About](#)

Design Rainfall Data System (2016)

[Conditions of Use](#) | [Help](#) | [New IFD feedback](#)

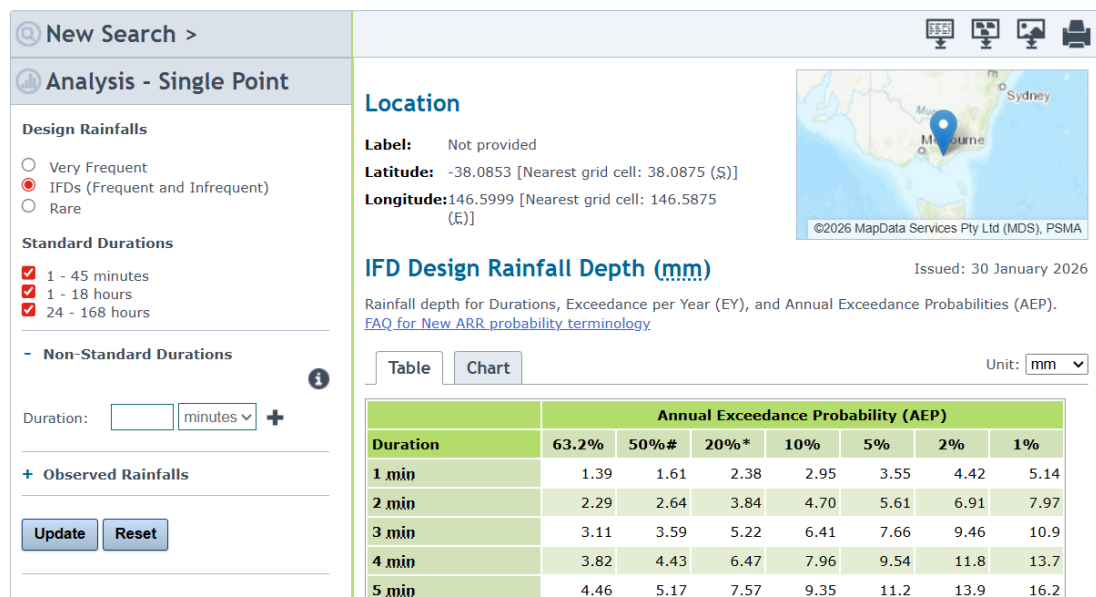


Figure 3. IFD data values from Bureau of Meteorology of Australia (2016) for Frasers BESS.

Storm Losses, temporal patterns, BOM IFD depth, median pre-burst depth and interim climate change factors have been downloaded.

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Australian Rainfall & Runoff Data Hub - Results

Input Data

Longitude	146.597
Latitude	-38.079
Selected Regions (clear)	
ARF Parameters	show
Storm Losses	show
Temporal Patterns	show
BOM IFDs	show
Median Preburst Depths and Ratios	show
Climate Change Factors	show

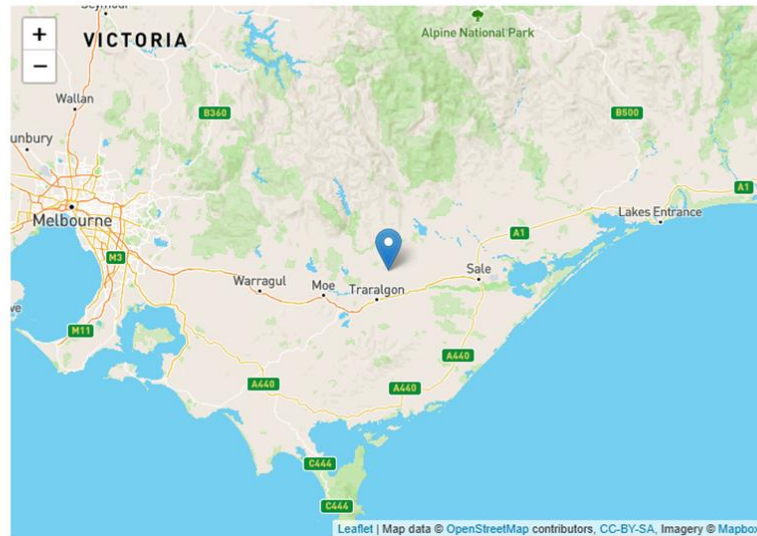


Figure 4. Precipitation data downloaded for the project.

This precipitation data is introduced in DRAINS Software to be processed in accordance with the ARR2019 guideline.

4.5. Initial and continuing loss

The "IL/CL" (Initial Loss–Continuing Loss) method has been adopted as the loss model for this report, as it is recognised as the most suitable approach for design flood estimation, as outlined in the *Australian Rainfall and Runoff (ARR) 2019* guidelines.

Initial Loss (IL) is the depth of rainfall that is intercepted and absorbed before runoff begins. It represents water that fills surface depressions, wet vegetation, and infiltrates into the soil until saturation is reached. In hydrological modelling, IL is deducted from the total rainfall at the start of an event.

The continuing loss represents the average loss rate throughout the remainder of the rainfall event, once the initial losses have been satisfied.

Recommended loss values are typically accessible through the ARR Data Hub, which provides reliable and standardized data for hydrological modelling and flood estimation purposes.

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Storm Losses

Note: Burst Loss = Storm Loss - Preburst

Note: These losses are only for rural use and are **NOT FOR DIRECT USE** in urban areas

Note: As this point is in Victoria the advice provided on losses and pre-burst in the VIC specific tab of the ARR Data Hub should be considered.

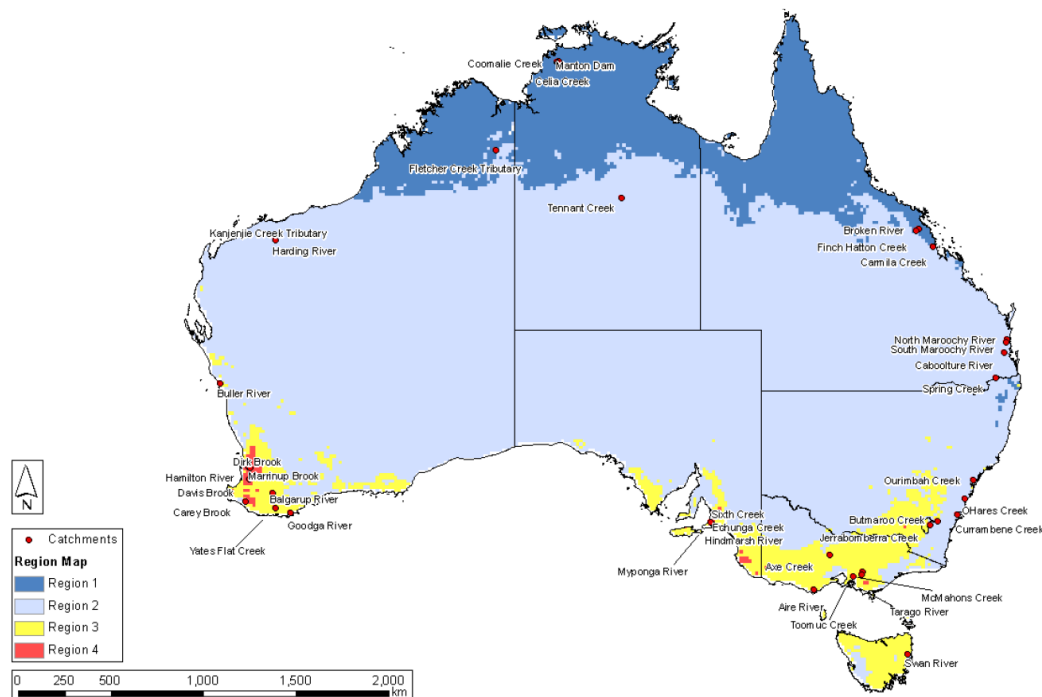
ID	1296.0
Storm Initial Losses (mm)	25.0
Storm Continuing Losses (mm/h)	3.6

Figure 5. Adjacent catchments losses values.

Loss values	
Initial loss (mm)	25.0
Constant continuing loss (mm/h)	3.60

Table 2 – Initial and Continuing Losses

The site is within region 3 according to the regions adopted for the loss prediction equations:



Screenshot - Australian Rainfall and Runoff, A Guide to Flood Estimation, Figure 5.3.16. Regions Adopted for Loss Prediction Equations

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4.6. Roughness

The surface roughness is represented using the Manning's coefficient "n". The roughness values used in the study area is 0.04. This value is according to the land use type description "Open pervious areas, minimal vegetation (grassed)". As set by the AR&R2019 guide, chapter 2. Open channel hydraulics, in section 2.5.2. Application of the Manning Equation, table 6.2.2

Table 6.2.2. Valid Manning 'n' Ranges for Different Land Use Types

Land Use Type	Manning 'n'
Residential areas – high density	0.2 – 0.5
Residential areas – low density	0.1 – 0.2
Industrial/commercial	0.2 – 0.5
Open pervious areas, minimal vegetation (grassed)	0.03 – 0.05
Open pervious areas, moderate vegetation (shrubs)	0.05 – 0.07
Open pervious areas, thick vegetation (trees)	0.07 – 0.12
Waterways/channels – minimal vegetation	0.02 - 0.04
Waterways/channels – vegetated	0.04 – 0.1
Concrete lined channels	0.015 – 0.02
Paved roads/car park/driveways	0.02 – 0.03
Lakes (no emergent vegetation)	0.015 – 0.35
Wetlands (emergent vegetation)	0.05 – 0.08
Estuaries/Oceans	0.02 – 0.04

Figure 6. Manning "n" For Different Land Use Types - AR&R2019

However, there are areas with other covers which have been set with a different n manning value. Those areas have been determined by analyzing the aerial images obtained during the topographic survey.

Manning n values	
General	0.04
Trees	0.09
Waterways	0.035
Dams	0.02
Asphalt roads	0.025
Granular roads	0.03

Table 3 – Manning "n" Values

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5. HYDROLOGICAL DESIGN

The calculation carried out is explained in the following sections of this document.

5.1. Catchment Area

The catchment areas have been generated with QGIS software from the Digital Elevation Model (Section 4.1). This program creates an analysis of the catchments and the stormwater runoff to define the catchment using the DEM from the affecting area.

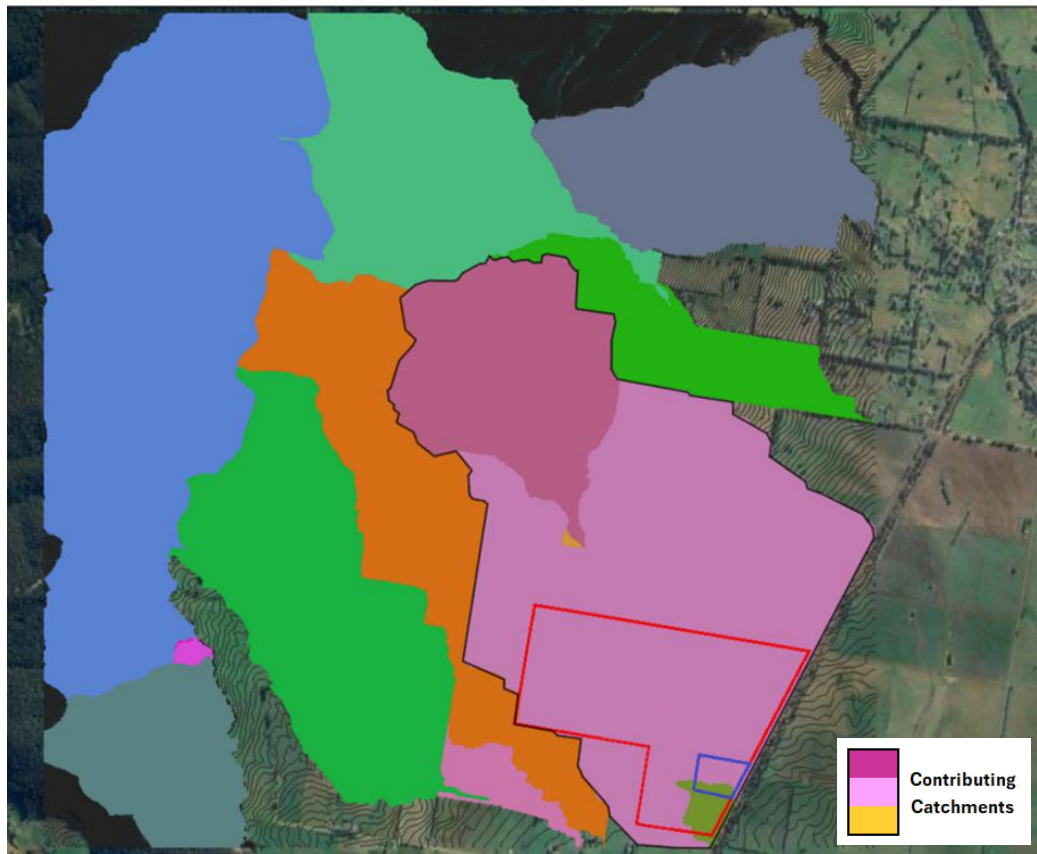


Figure 7. General Catchments.

The image above illustrates the catchments that influence the surface of the plot. The catchments include both of pink areas.

The red contour marks the boundary of the solar farm, and the blue contour marks the BESS area.

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5.2. Time of concentration

The time of concentration (tc) for a catchment is defined as either:

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- The time taken for water to flow from the most time-remote point within the catchment to the outlet or point of interest, or
- The time elapsed from the start of rainfall until the entire catchment is simultaneously contributing to flow at the outlet or point of interest.

The significance of the time of concentration lies in its ability to determine the maximum flow at the point of discharge, considering rainfall across all points within the catchment. The highest peak flow typically corresponds to a rainfall duration like the time of concentration.

According to AUSTROADS -Guide to Road Design Part 5: Drainage – General and Hydrology Considerations, section 6. Rural Hydrology (6.6.1 Rational Method), the time of concentration for rural areas in Australia, particularly in Victoria, is calculated using the following equation:

$$t_c = 0.76 \cdot A^{0.38}$$

Where:

t_c = Time of concentration (hours)

A = Area of catchment (km²)

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According to the catchment defined in Section 5.1, the parameters to calculate the time of concentration for the area is included in the next table:

Max. Height	Min. Height	Length	Area	Slope	Time of concentration
HM	Hm	L	A	Se	Tc
(m)	(m)	(km)	(km ²)	%	(min)
187.74	58.74	3.93	5.69	3.28	88.31

5.3. Design Rainfall

Rainfall can be defined either as an intensity or as a hyetograph. In the case of a hyetograph, the rain depth is distributed over time. For this design, rainfall was represented as a hyetograph in the calculations. The design rainfall hyetographs were generated using DRAINS, following the ARR2019 procedures and running simulations with a range of storm events within the ensembles.

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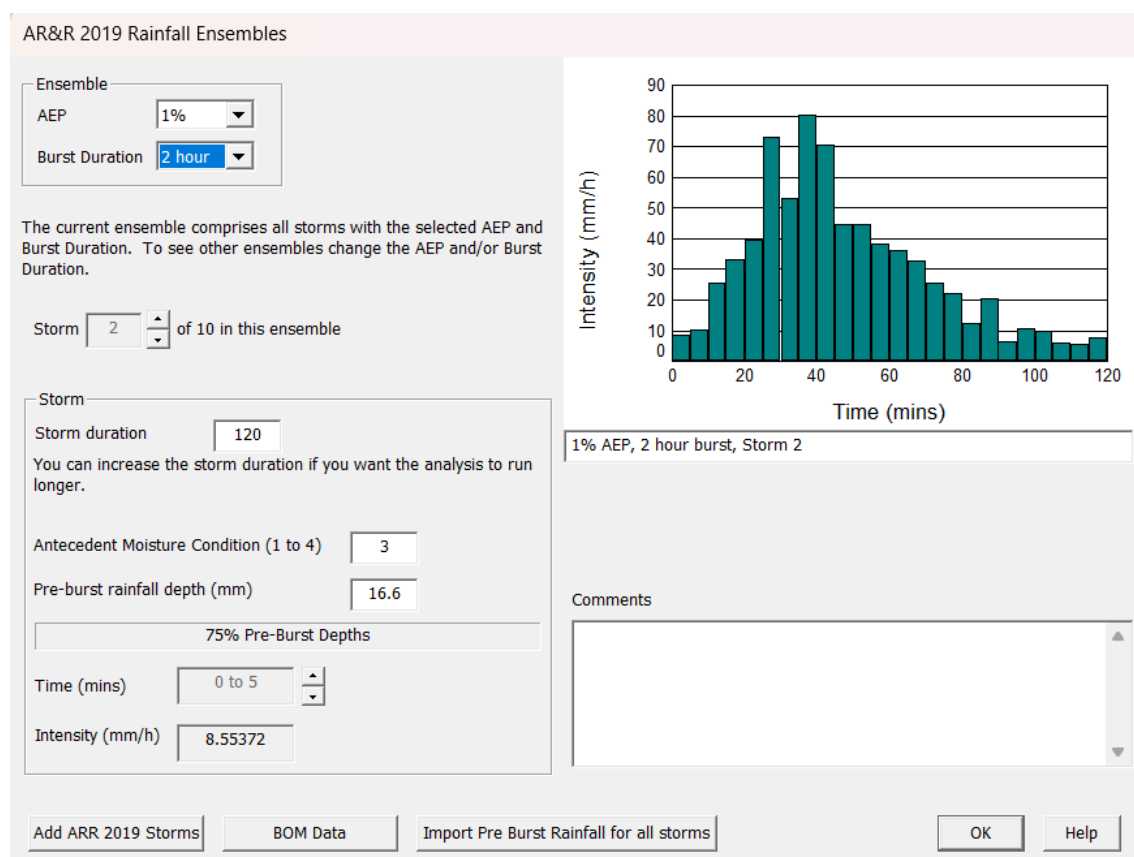


Figure 9. DRAINS Rainfall Ensembles Snapshot.

The image above illustrates how rainfall data from the Bureau of Meteorology (BOM) and Data Hub, including storm losses, temporal patterns, BOM IFD depths, and median pre-burst depths, are incorporated into the DRAINS software.

DRAINS integrates rainfall intensities and temporal patterns into ensembles of 10 storm patterns for various storm durations, applying them to each previously defined catchment area. These catchments were characterized in DRAINS based on size, time of concentration, and Manning's value. The software generates 10 different storm scenarios for each AEP considered.

The following chart presents the results for the entire study area—including the solar farm plot and the external catchments influencing the site—for the 1% AEP scenario as an example. It demonstrates how DRAINS evaluates the different storm simulations. The means and medians of the results are shown for each storm duration. The pink bars represent the values for each ensemble of 10 storms, while the red bar highlights the critical result—the highest among the pink values.

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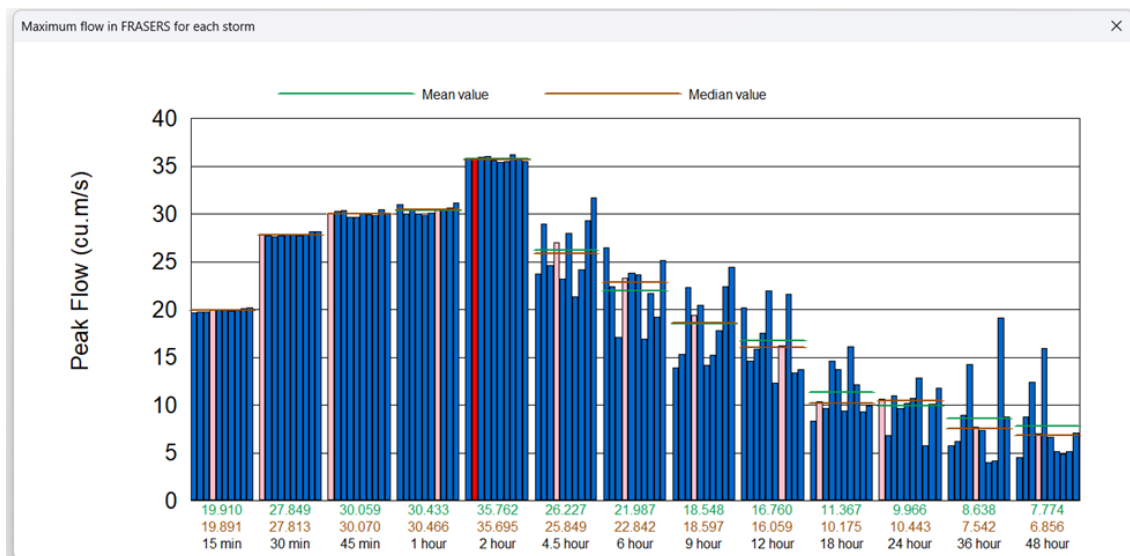


Figure 10. Catchment 1 – 1% AEP.

The following tables are the data obtained from the design rainstorm for both scenarios:

1% AEP, 2h Storm 2 - 75% Pre-Burst Depths		
Duration	Intensity	Precipitation
min	mm/h	mm
5.0	8.55	0.71
10.0	10.42	0.87
15.0	25.59	2.13
20.0	33.06	2.76
25.0	39.75	3.31
30.0	73.32	6.11
35.0	52.98	4.41
40.0	80.36	6.70
45.0	70.80	5.90
50.0	44.85	3.74
55.0	44.85	3.74
60.0	38.38	3.20
65.0	36.08	3.01
70.0	32.85	2.74
75.0	25.45	2.12
80.0	22.28	1.86
85.0	12.36	1.03
90.0	20.49	1.71
95.0	6.47	0.54
100.0	10.78	0.90
105.0	9.99	0.83
110.0	5.97	0.50
115.0	5.68	0.47
120.0	7.48	0.62

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5% AEP, 1h Storm 8 - 75% Pre-Burst Depths		
Duration	Intensity	Precipitation
min	mm/h	mm
5.0	28.80	2.40
10.0	22.37	1.86
15.0	34.90	2.91
20.0	19.61	1.63
25.0	17.58	1.46
30.0	87.47	7.29
35.0	42.36	3.53
40.0	36.77	3.06
45.0	43.50	3.63
50.0	28.55	2.38
55.0	37.28	3.11
60.0	24.40	2.03

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6. FLOOD STUDY

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6.1. Design

The calculation is carried out using HEC-RAS software, which is a two dimensional (2D) hydrodynamic routing within the unsteady flow analysis.

The 2D Saint Venant equations were selected for the simulation.

The following are the basic steps for performing the 2D modelling:

- Establish a horizontal coordinate projection, in this case, GDA_2020_MGA_zone 55.
- Develop a terrain model. The topography has been converted into a Digital Elevation Model (DEM) in Civil 3D software. And merged with the downloaded one so the external runoff can be also modelled.

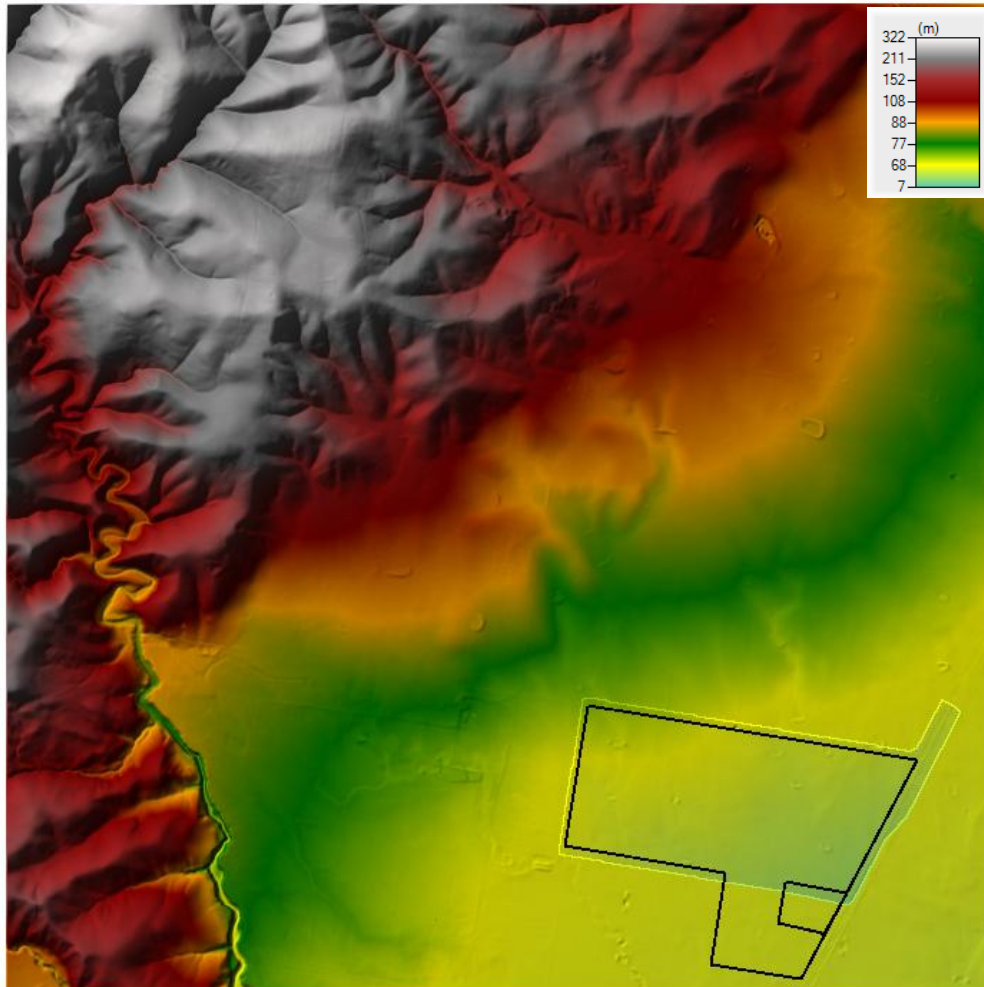


Figure 11. Clipped surface concerning the catchment

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- Establish a “Land Cover” classification by selecting the Manning’s value and one layer with the IL/CL values.

The IL/CL values were as described in section 4.4 considered for the whole catchment. The layer in which the IL/CL is introduced is used as an infiltration layer so the losses can be considered. The continuing loss is a constant parameter that represents the loss rate throughout the remainder of the rainfall event following the initial loss. This loss in conjunction with the initial loss, reduces the runoff through the site and it has been introduced into the model.

As a general value for the site a Manning's value of 0.04 has been considered according to section 4.5. Additionally in the HEC-RAS model other Manning's values have been considered according to the land cover types observed in Google Earth:

Table 4 – n Value per Land Cover Type

	n Value	Land Cover
	0.09	Tall vegetation / Trees
	0.035	Waterways / creeks
	0.02	Water dams
	0.025	Asphalt Roads
	0.03	Granular Roads

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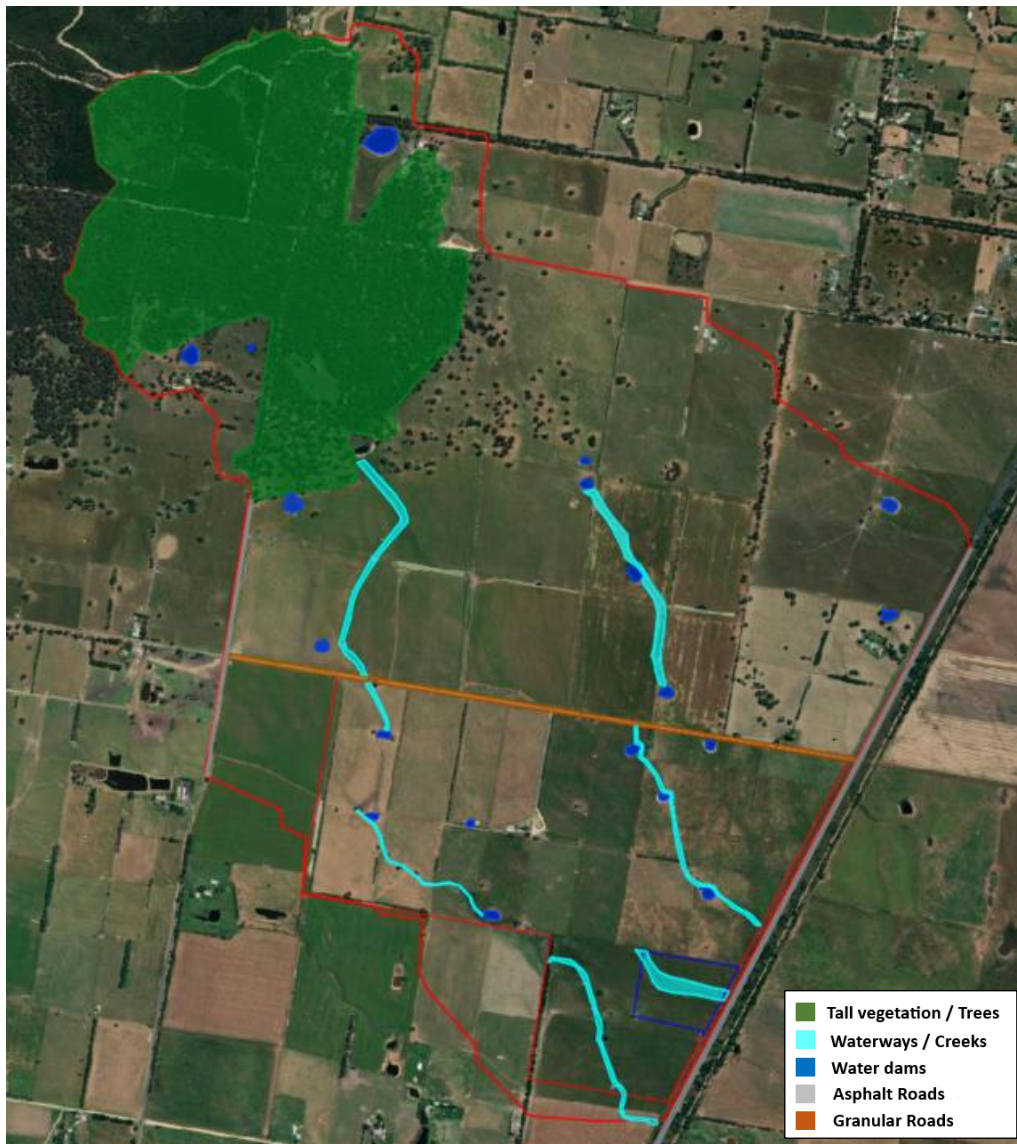


Figure 12. Land Cover.

- Create the 2D computational mesh and add the input flow which will be the direct rain introduced as a hyetograph into the mesh being, being then the boundary conditions set as exits and a ROG modelled.

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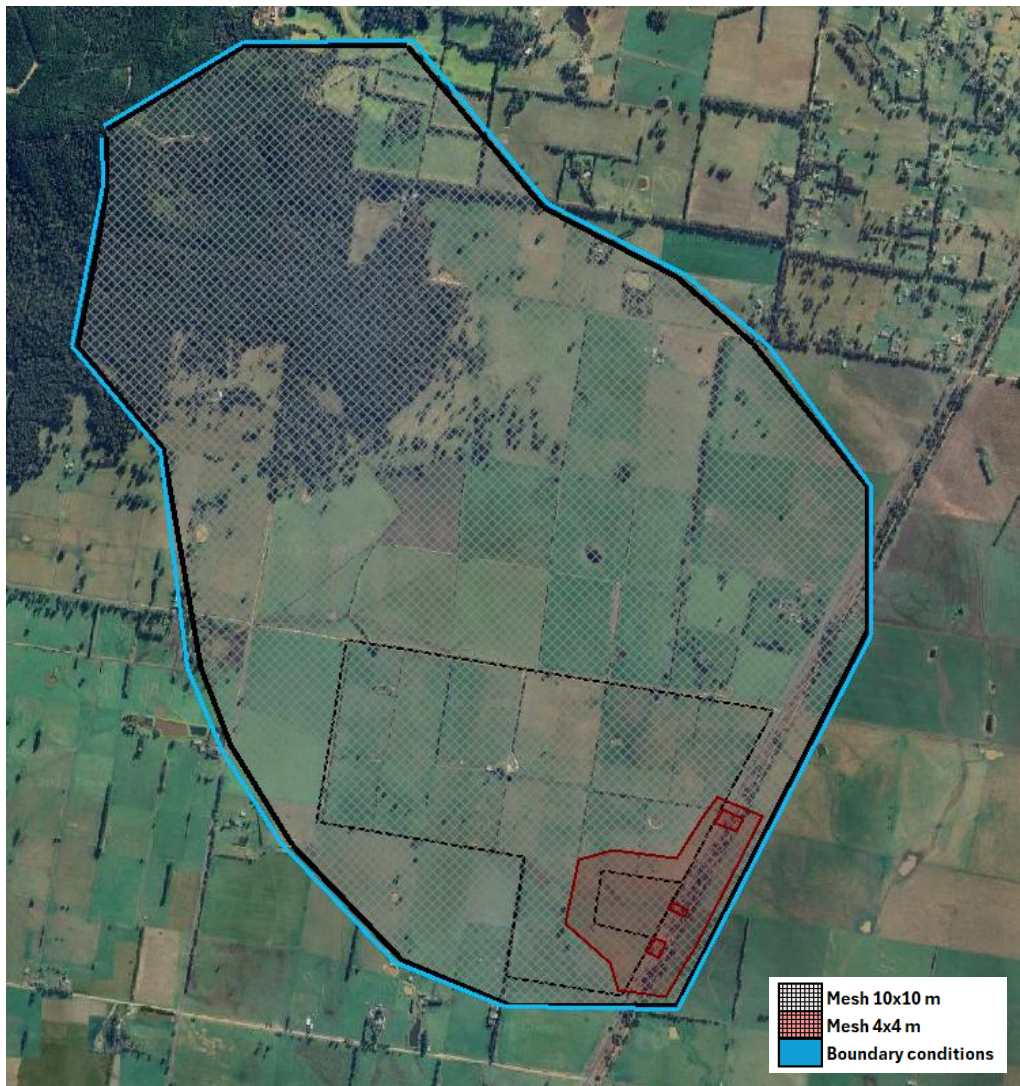


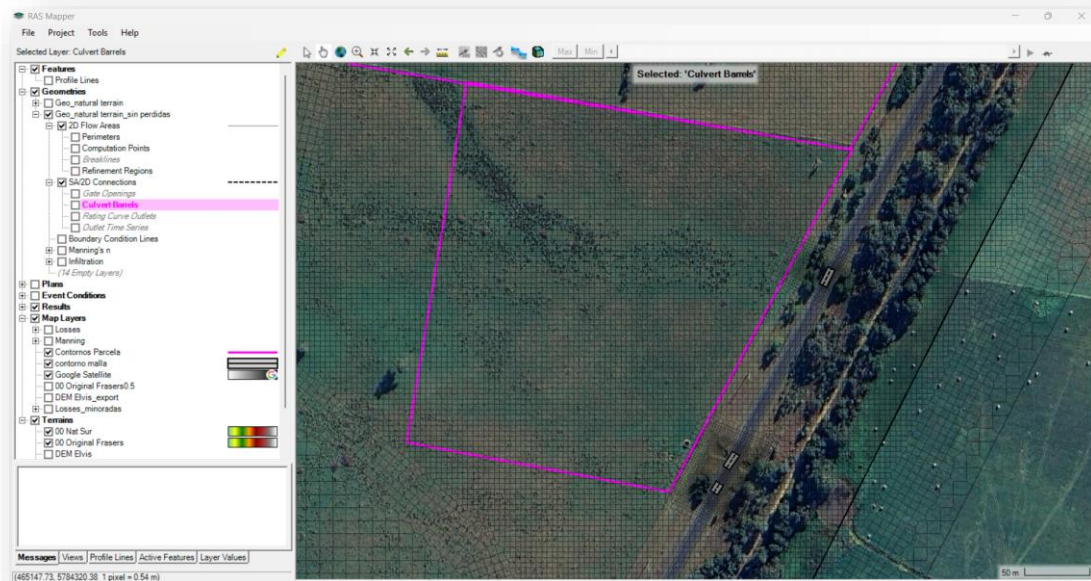
Figure 13. Boundary Conditions.

A mesh with a cell size of 10x10 m has been made and in the study area a refinement has been made achieving a cell size of 4x4 m.

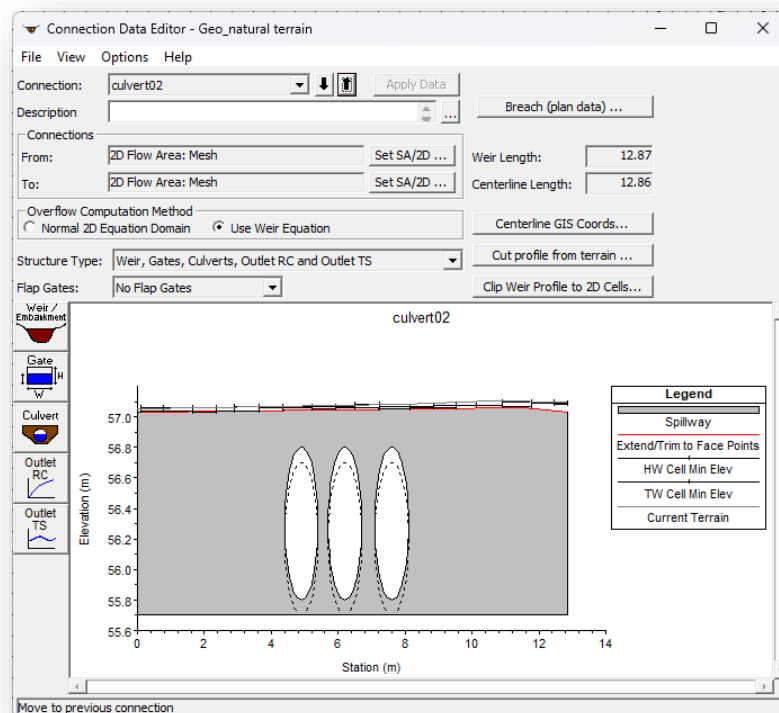
- Add the entire perimeter of the basin as a boundary condition for the flow outlet.
- Incorporate existing culverts. The existing culverts on Traralgon-Maffra Road have been introduced into the model.

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The following shows how an example of one of the existing culverts is considered in the model:



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Culvert Data Editor

Culvert Group: Culvert #1 ↓ ↑ 📄 🗑️ 🔍 🔗

Solution Criteria: Computed Flow Control

Shape: Circular Span: 1 Diameter: 1

Chart #: 1 - Concrete Pipe Culvert

Scale #: 1 - Square edge entrance with headwall

Culvert Length: 14 Depth to use Bottom n: 0

Entrance Loss Coeff: 0.3 ? Depth Blocked: 0

Exit Loss Coeff: 1 ? Upstream Invert Elev: 55.8

Manning's n for Top: 0.012 ? Downstream Invert Elev: 55.7

Manning's n for Bottom: 0.012

Culvert Barrel Data

Barrel Centerline Stations # Barrels: 3

	Barrel Name	US Sta	DS Sta	GIS Sta
1	Barrel#1	4.9	4.9	4.86
2	Barrel#2	6.2	6.2	6.22
3	Barrel#3	7.6	7.6	7.63
4				
5				

Barrel GIS Data: Barrel#1
Length: 12.8

	X	Y
1	465150.85	5784268.7
2	465162.18	5784262.7
3		
4		
5		

Individual Barrel Centerlines ... Show on Map OK Cancel Help

Select culvert to edit

- Run the Unsteady Flow Simulation.

The model was developed to primarily determine the existing runoff velocity and the depth throughout the site in the 1% AEP and 5% AEP flood events, subsequently, once both plans are created and run, the results could be analysed.

Unsteady Flow Analysis

File Options Help

Plan: Fusion1AEP-2hS2 Short ID: Fusion1AEP-2hS2

Geometry File: Geo_natural terrain

Unsteady Flow File: 1AEP-2hS2

Programs to Run

- ☒ Geometry Preprocessor
- ☒ Unsteady Flow Simulation
- ☐ Sediment
- ☒ Post Processor
- ☐ Floodplain Mapping

Plan Description

Simulation Time Window

Starting Date: 01SEP2008 Starting Time: 0000

Ending Date: 01SEP2008 Ending Time: 1200

Computation Settings

Computation Interval: 1 Second Hydrograph Output Interval: 1 Minute

Mapping Output Interval: 1 Minute Detailed Output Interval: 1 Minute

Project DSS Filename: o:\P26-0005-ING-FRASERS BESS-AUS\01 hecras\20260129\

Time Step is controlled by courant condition.

Compute

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Catchments were defined from the integrated DEM and modelled in DRAINS using ARR2019 rainfall data, ensemble temporal patterns, and IL/CL losses to determine peak flows and critical storm durations.

Rainfall was then applied directly to the 2D HEC-RAS mesh using the identified critical durations. Losses were incorporated as a uniform IL/CL infiltration layer consistent with ARR2019.

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6.2. Flood Results

The results of depth and runoff velocity are shown at their maximum. It has been then analysed and obtain the maximum water depth.

6.2.1. Flood Depth

The following image illustrates the depth of water that occurs on the plot for a return period of 100 years. (1% AEP).

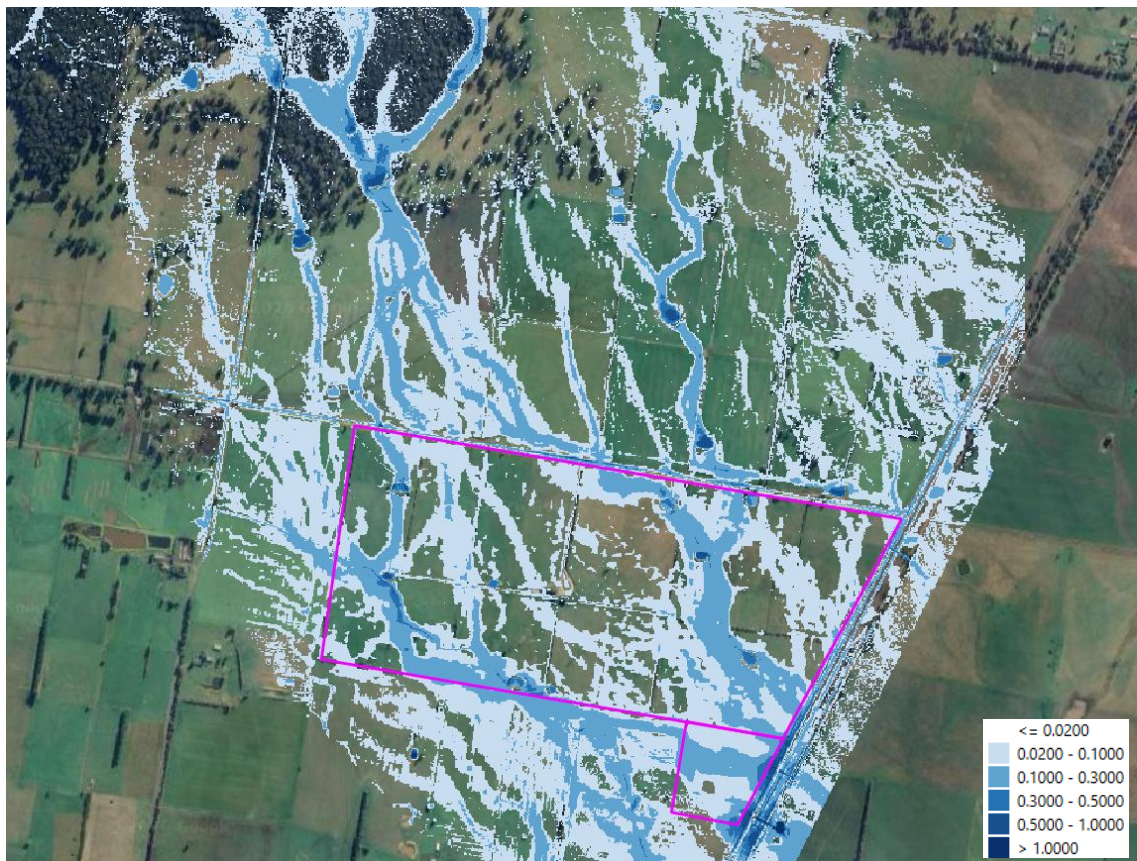


Figure 14. Depth – 1% AEP (heights in meters).

The following picture illustrates the study conducted for a return period of 20 years (5% AEP):

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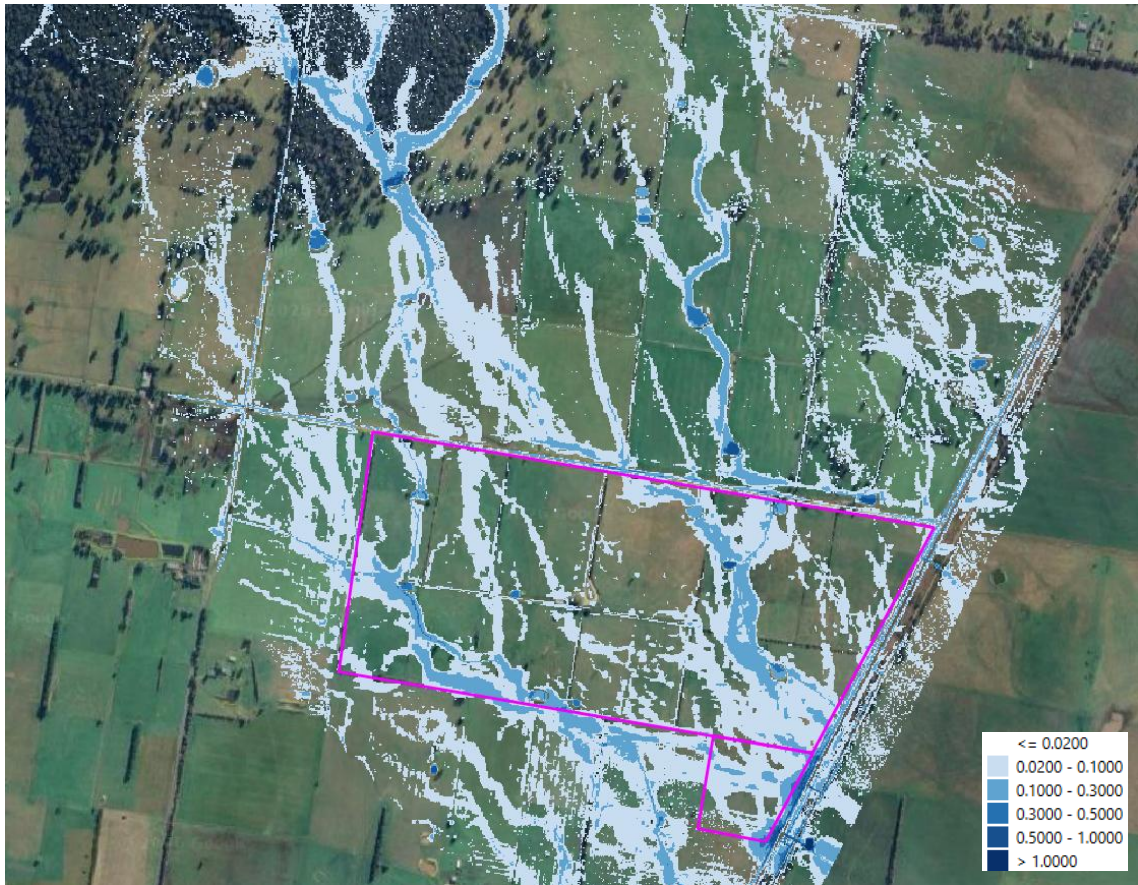


Figure 15. Depth – 5% AEP (heights in meters).

6.2.2. Flood Velocity

The following image shows the velocity that occurs on the plot for a return period of 100 years (1% AEP):

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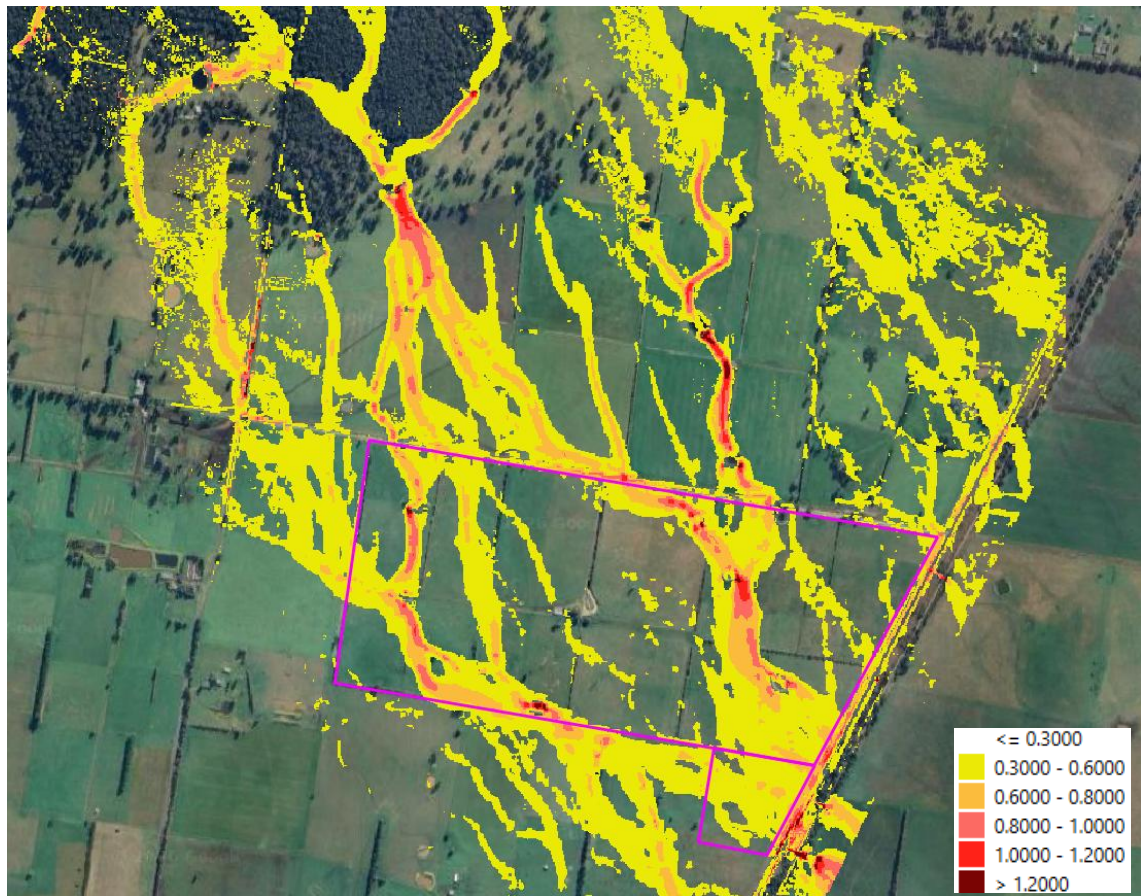


Figure 16. Velocity – 1% AEP (velocities in m/s).

For a return period of 5% AEP, the velocities achieved are as follows:

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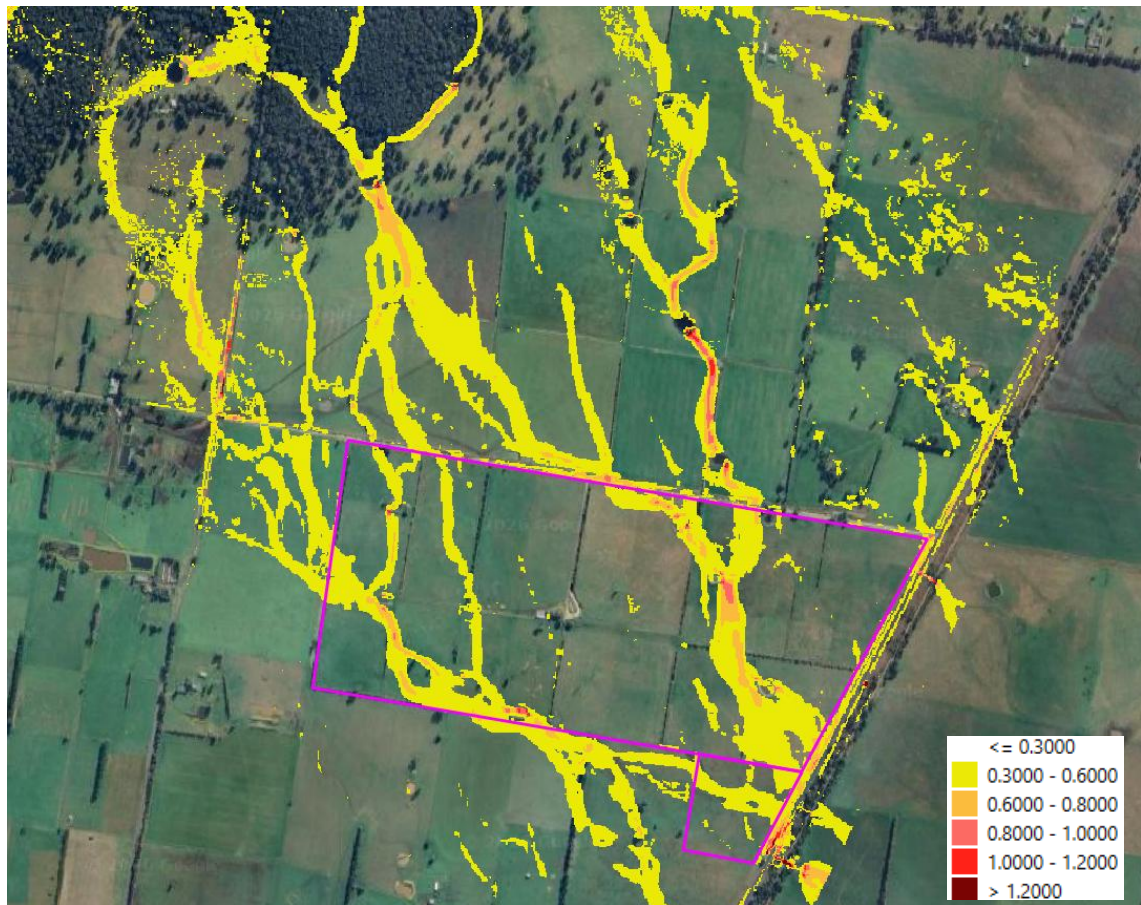


Figure 17. Velocity – 5% AEP (velocities in m/s).

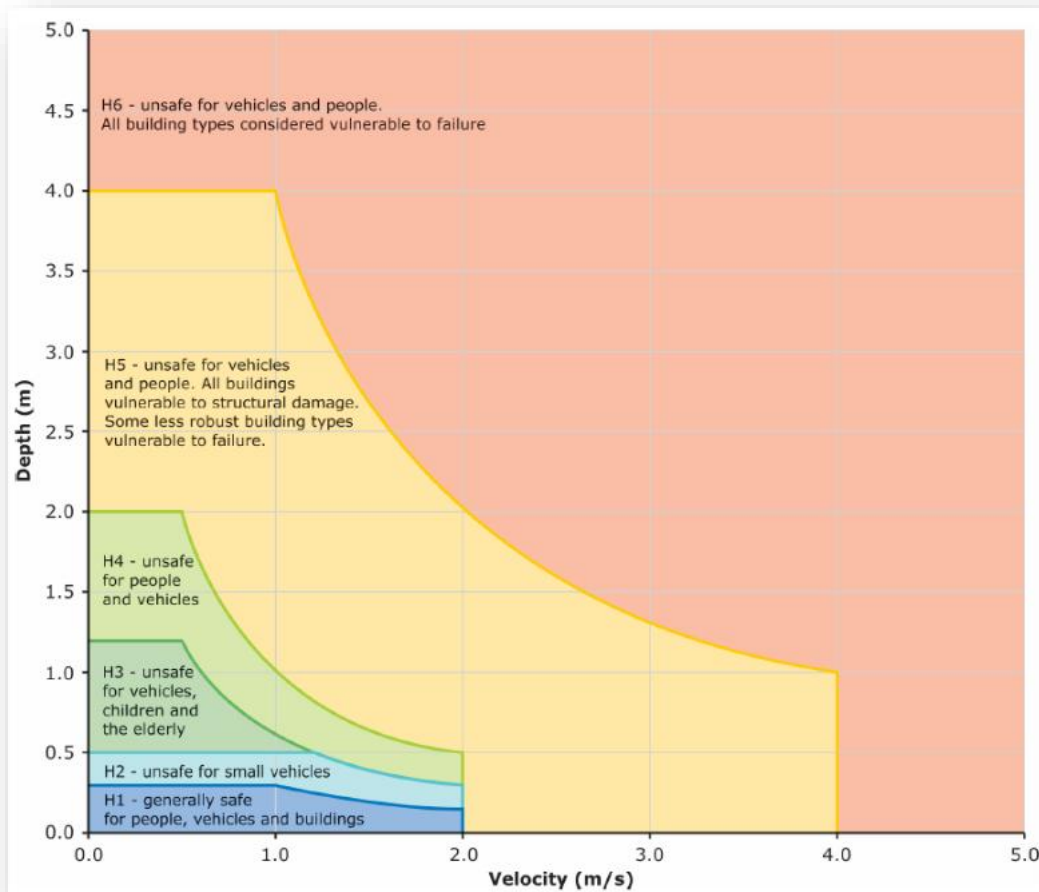
The depth and velocity maps are included in Annex A at a more suitable.

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7. FLOOD HAZARD ASSESSMENT

Using the most critical flooding and runoff velocity results from the 5% and 1% AEP event, the plot is classified for flood hazard in accordance with AR&R2019, applying the relevant hazard evaluation curves.



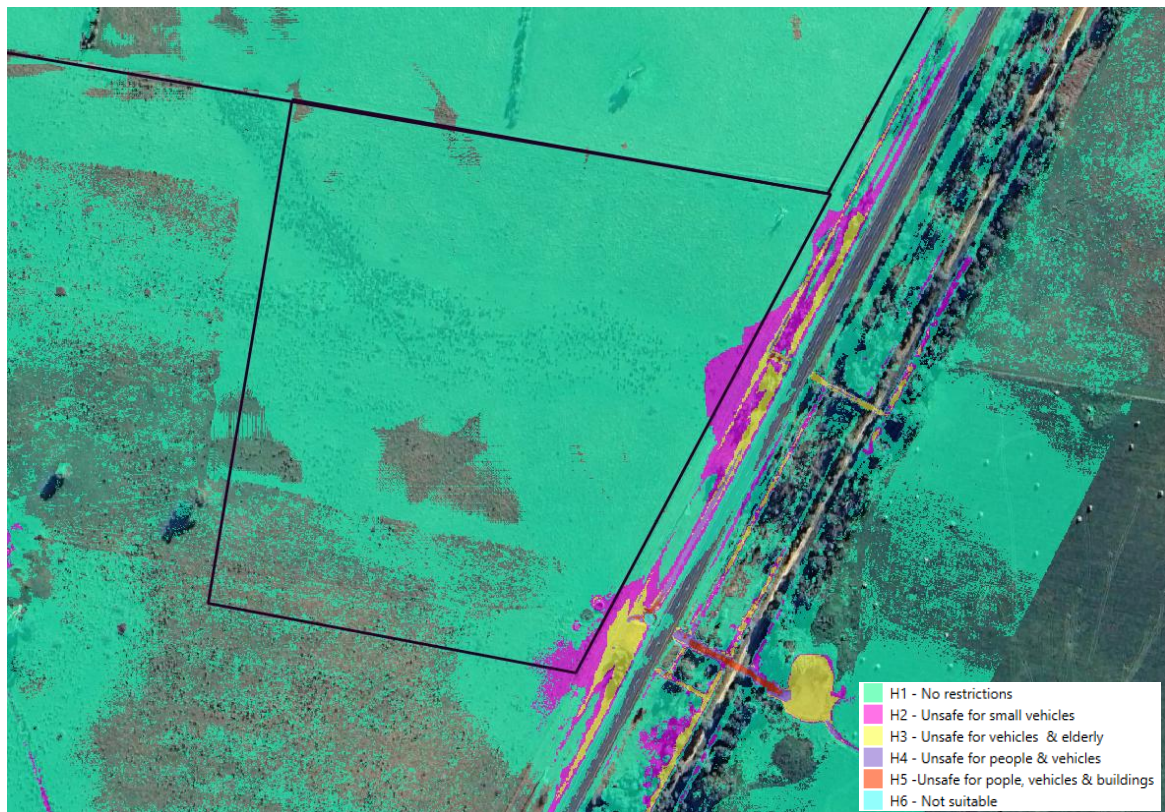
The combined flood hazard curves establish threshold values representing varying levels of vulnerability for people and vehicles exposed to floodwaters. These curves are divided into hazard categories; each linked to specific vulnerability criteria. The following table summarises the criteria for each classification:

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Hazard Vulnerability Classification	Description
H1	Generally safe for vehicles, people and buildings.
H2	Unsafe for small vehicles.
H3	Unsafe for vehicles, children and the elderly.
H4	Unsafe for vehicles and people.
H5	Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust buildings subject to failure.
H6	Unsafe for vehicles and people. All building types considered vulnerable to failure.

The results obtained for 1% AEP:

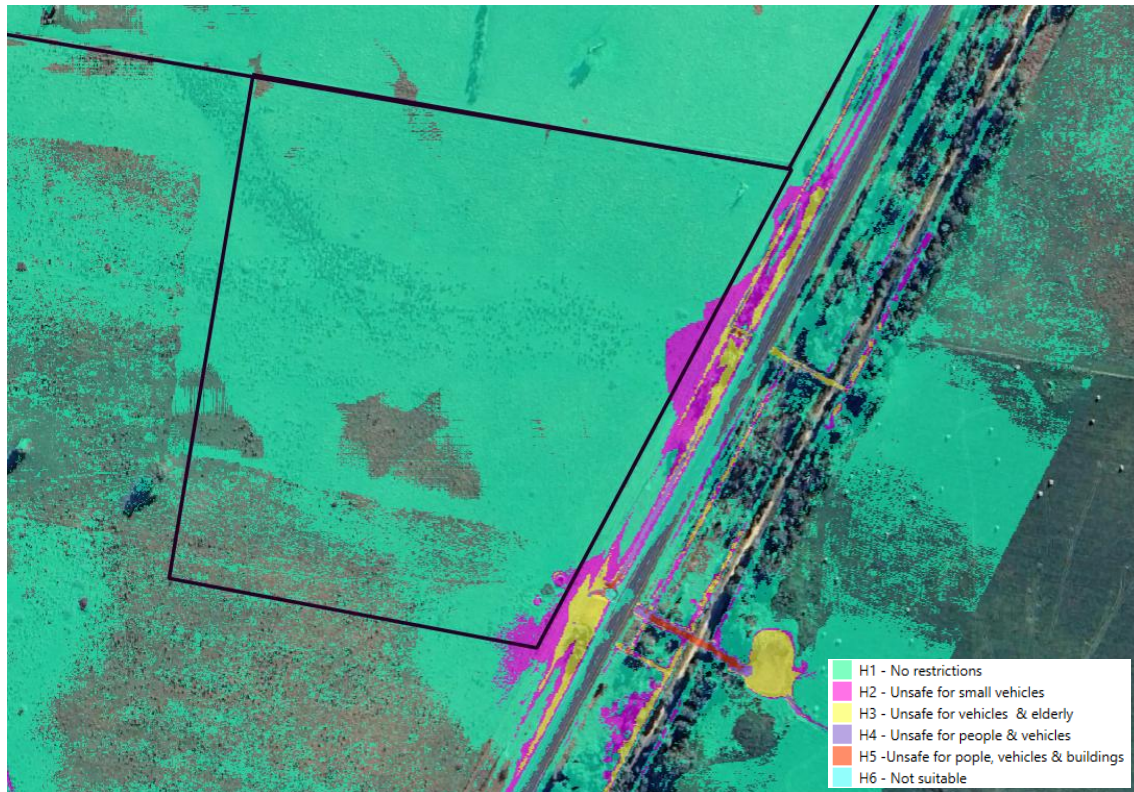


Flood hazard – 1%AEP

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The results obtained for 5% AEP:



Flood hazard – 5%AEP

The results are very similar for both return periods. For both events, most of the plot has a risk level of H1, meaning it is safe for vehicles, people and buildings.

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8. VALIDATION MODEL

A hydraulic verification was conducted to ensure that the results of the flood study align with real-world and historical site conditions. This verification was performed using the Regional Flood Frequency Estimation Model (RFFE), referencing the point of water exit and the centroid of the total catchment area affecting the plot and DRAIN results.

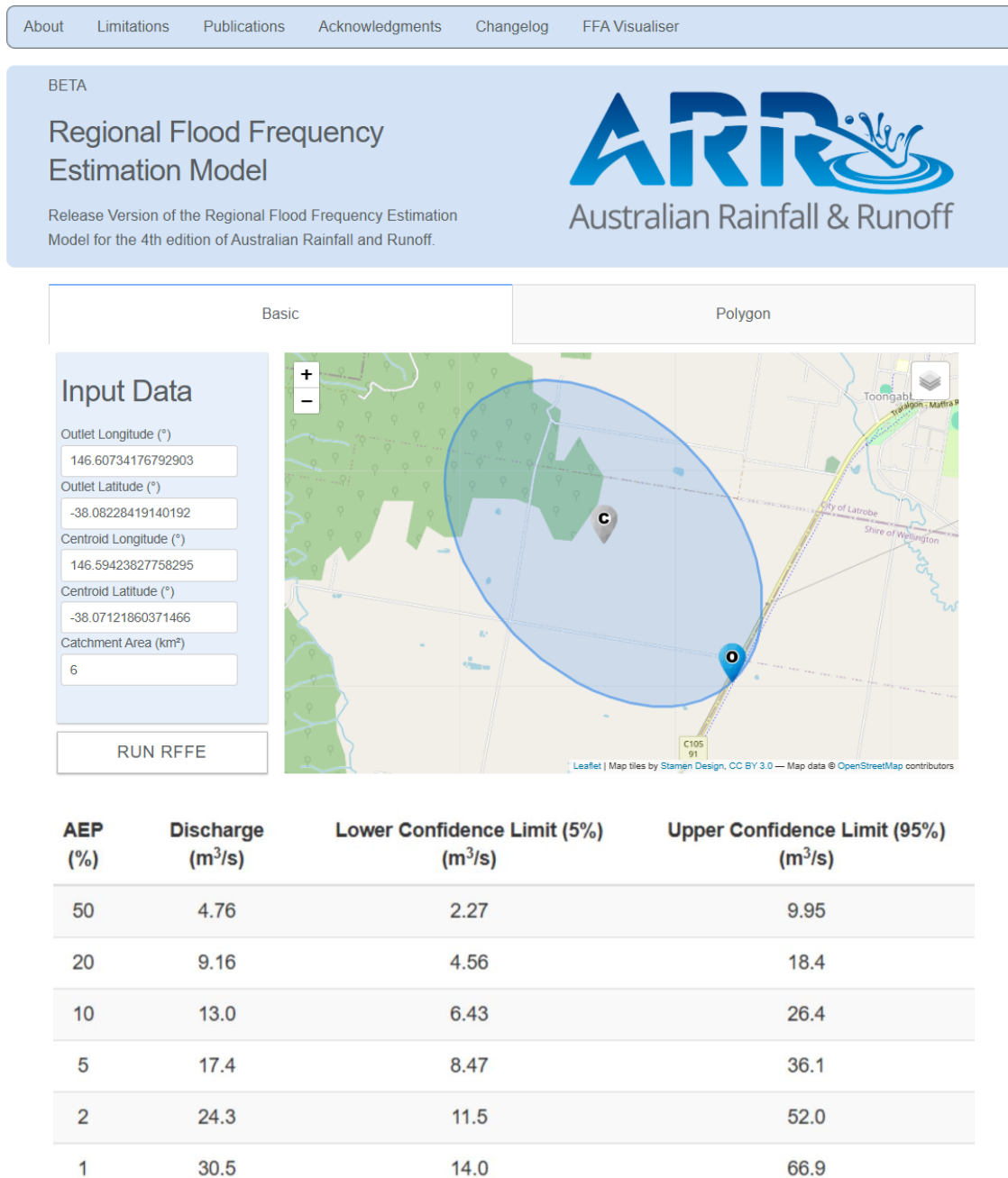


Figure 18. Table including the results from RFFE

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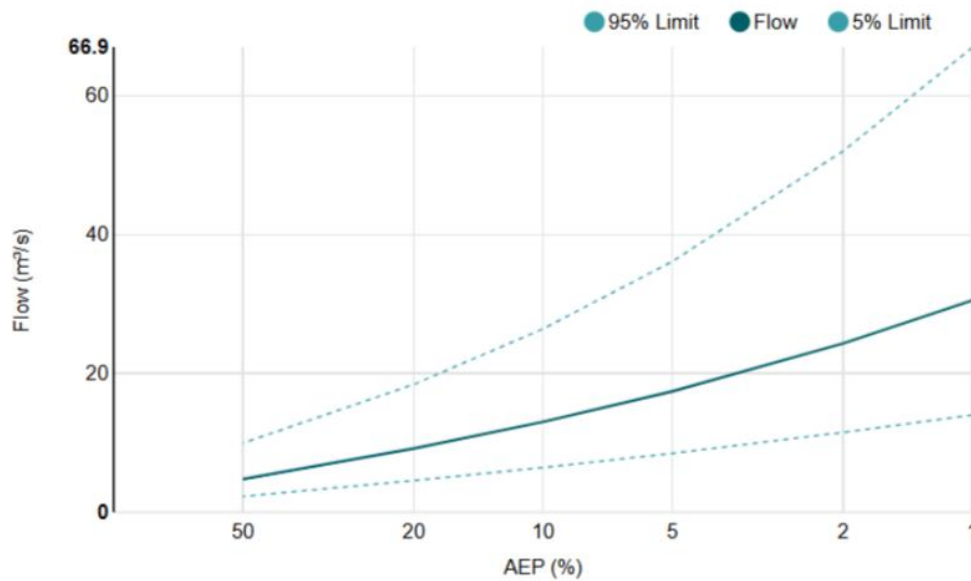


Figure 19. Graph including the results from RFFE.

The following graphic presents the flow rates provided by HEC-RAS for each return period, measured at the site's outflow perimeter (black line):



Figure 20. Outflow line.

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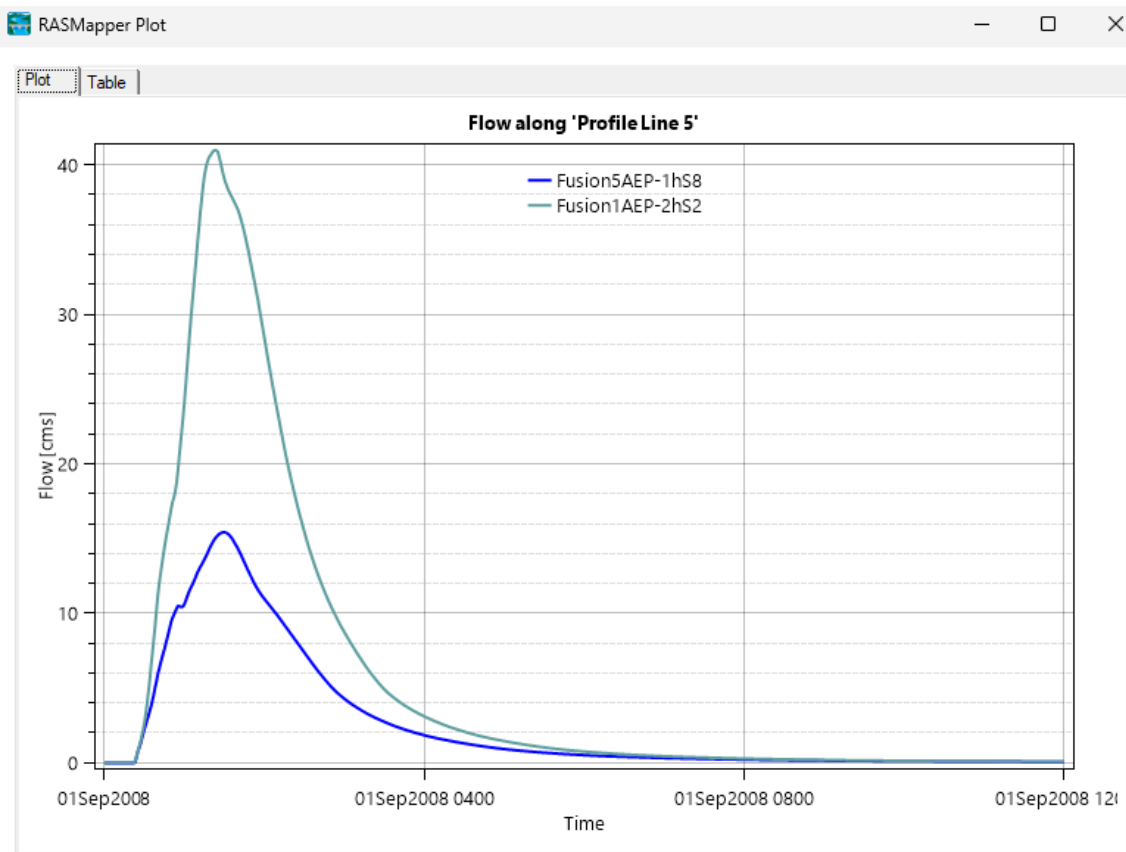


Figure 21. Graph including the results from HEC RAS.

It can be concluded that the results are within the confidence range. This check seeks verification of results:

Results comparison 1%AEP					
	Result obtained with HECRAS	Result obtained with DRAINS	RFPE		
	Q (m ³ /s)	Q (m ³ /s)	Expected Value (m ³ /s)	Lower confident limit (m ³ /s)	Upper confident limit (m ³ /s)
Runoff outlet perimeter	40.87	35.70	30.50	14.00	66.90

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Results comparison 5%AEP					
	Result obtained with HECRAS	Result obtained with DRAINS	RFFE		
	Q (m ³ /s)	Q (m ³ /s)	Expected Value (m ³ /s)	Lower confident limit (m ³ /s)	Upper confident limit (m ³ /s)
Runoff outlet perimeter	15.36	21.00	17.40	8.47	36.10

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9. CONCLUSION AND RECOMMENDATIONS

A detailed hydraulic assessment has been conducted to understand the behaviour of surface water flow, including velocity and localized flooding, originating from both upstream sources and within the proposed Frasers BESS in Victoria.

The flood study has been carried out under pre-development conditions, ensuring an accurate baseline assessment of flood behaviour before construction. The analysis is based on peak discharge estimates for 1% AEP and 5% AEP events, with the corresponding flood extents and flow characteristics presented in Annex A.

The findings should be examined alongside the site layout to identify and address locations at risk of flooding or erosion. Based on the analysis, the following conclusions are drawn:

- The hydraulic model results have been validated against estimates from the Regional Flood Frequency Estimation Model.
- Runoff flows across the site without forming pools or low points that permanently accumulate flow, although deeper water levels form in the east of the plot when it reaches the road.
- Runoff velocities are generally low, reducing the likelihood of erosion due to water movement.
- Flood Hazard's investigation indicates that the plot does not have significant risks.

Recommendations:

- Integration with Site Layout: Analyse the flood depth results alongside the proposed site layout to ensure that no critical infrastructure is impacted by unacceptable water depths.
- For areas where flood depths exceed acceptable design thresholds, implement appropriate mitigation measures such as local regrading, drainage infrastructure, or flow diversion works to safely manage and redirect runoff away from critical infrastructure.
- Erosion Control Measures: Identify locations where flow velocities could lead to erosion (>0.6 m/s) and implement protective measures such as energy dissipaters, soil stabilization, or other erosion control solutions.
- Ensure the maintenance and cleaning of the culverts located to the east of the plot on the Traralgon-Maffra Road to avoid higher depths.

This assessment is based on client-provided survey data within the site and publicly available LiDAR data for external catchments. No independent verification of underground services or culvert condition was undertaken. The model represents pre-development conditions only.

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Any earthworks or drainage modifications may alter flood behaviour and require reassessment.

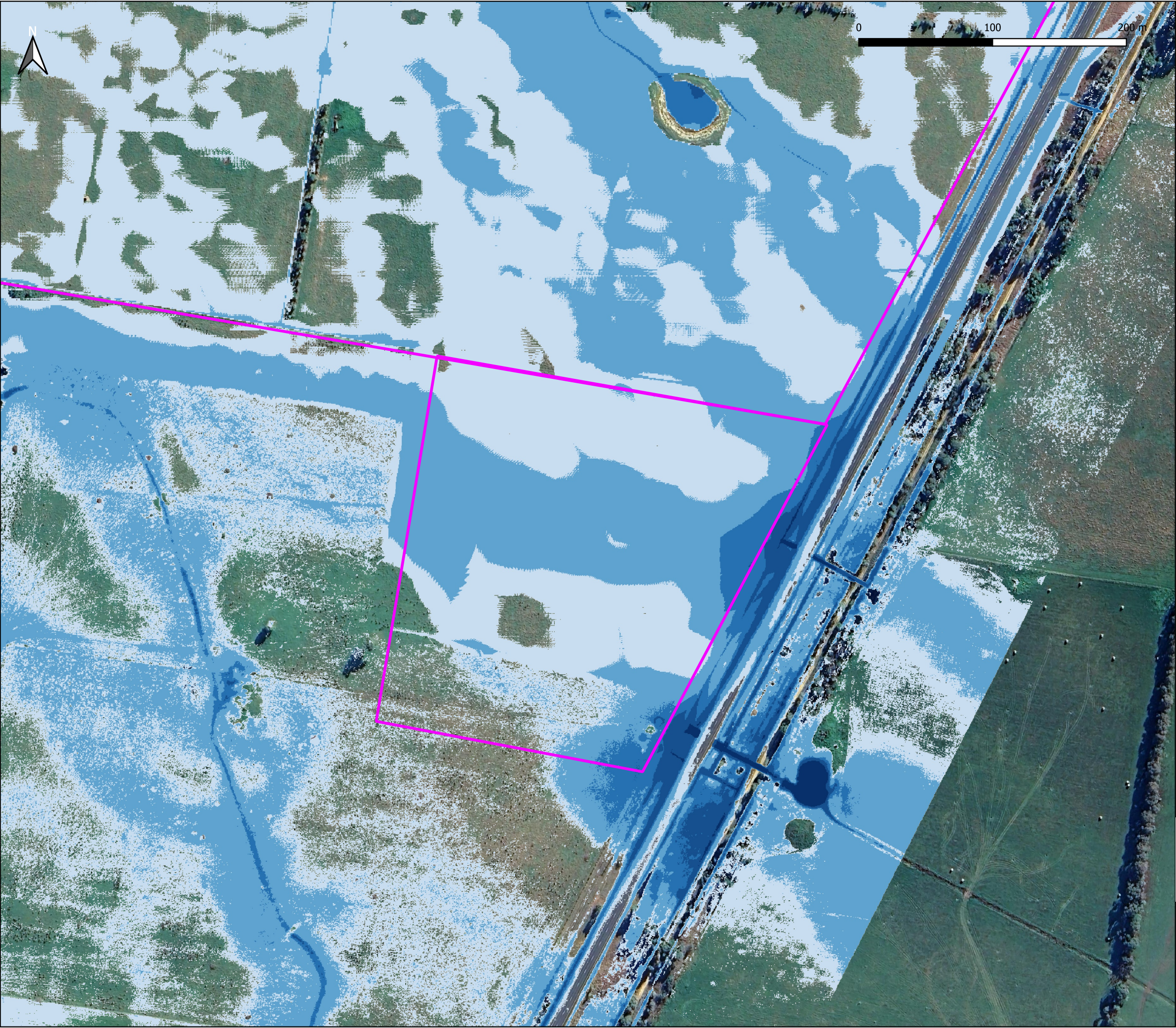
LiDAR and regional rainfall data contain inherent uncertainties; results should be interpreted accordingly.

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ANNEX A: FLOOD RESULTS

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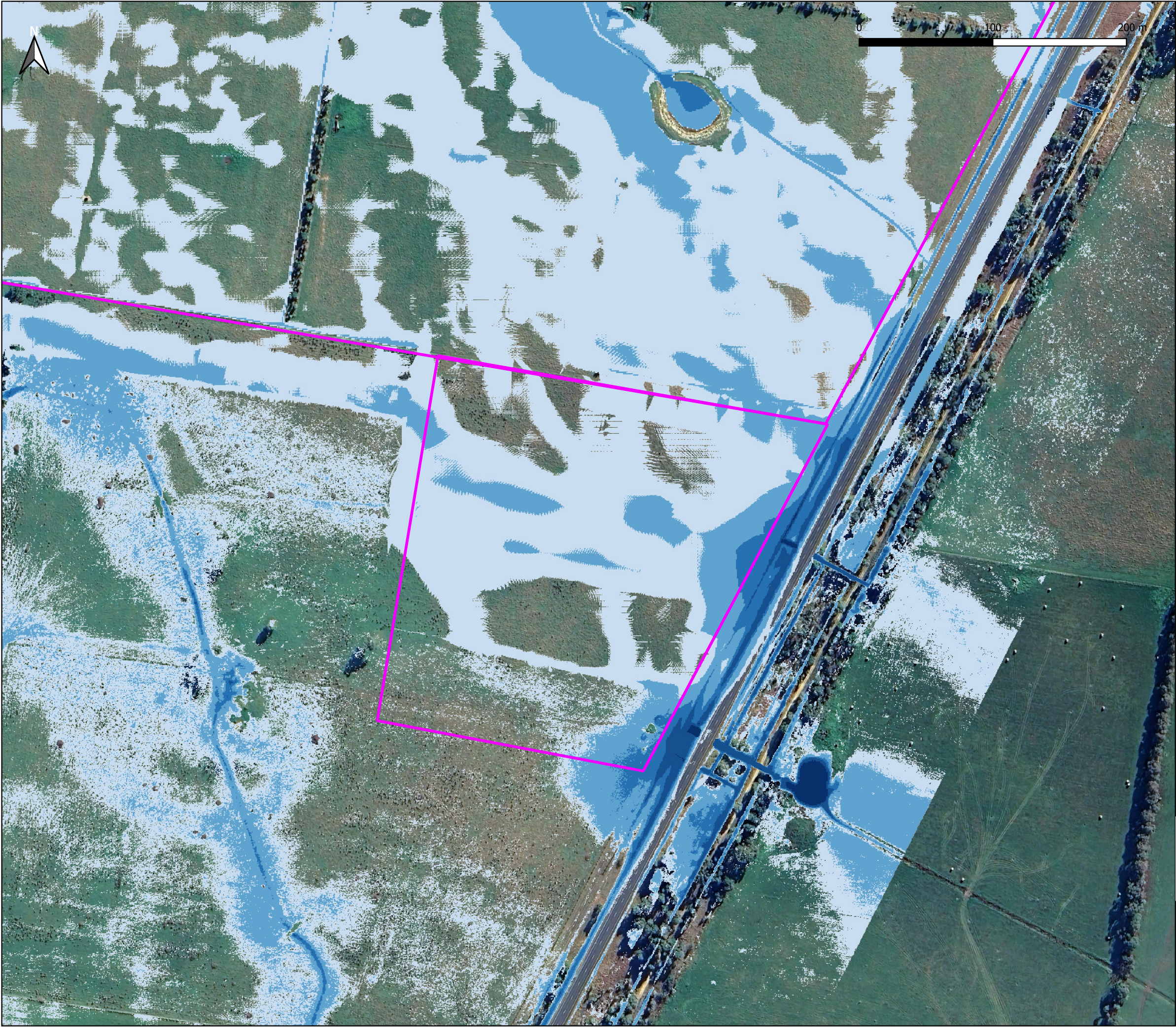
PLOT

MAX DEPTH 1%AEP (m)

[lightest blue]	<= 0.0200
[light blue]	0.0200 - 0.1000
[medium blue]	0.1000 - 0.3000
[darker blue]	0.3000 - 0.5000
[dark blue]	0.5000 - 1.0000
[darkest blue]	> 1.0000



Project	P26-0005-ING-FRASERS BESS-AUS
Title	1%AEP Max Depth (m)
By	PLM / MRC



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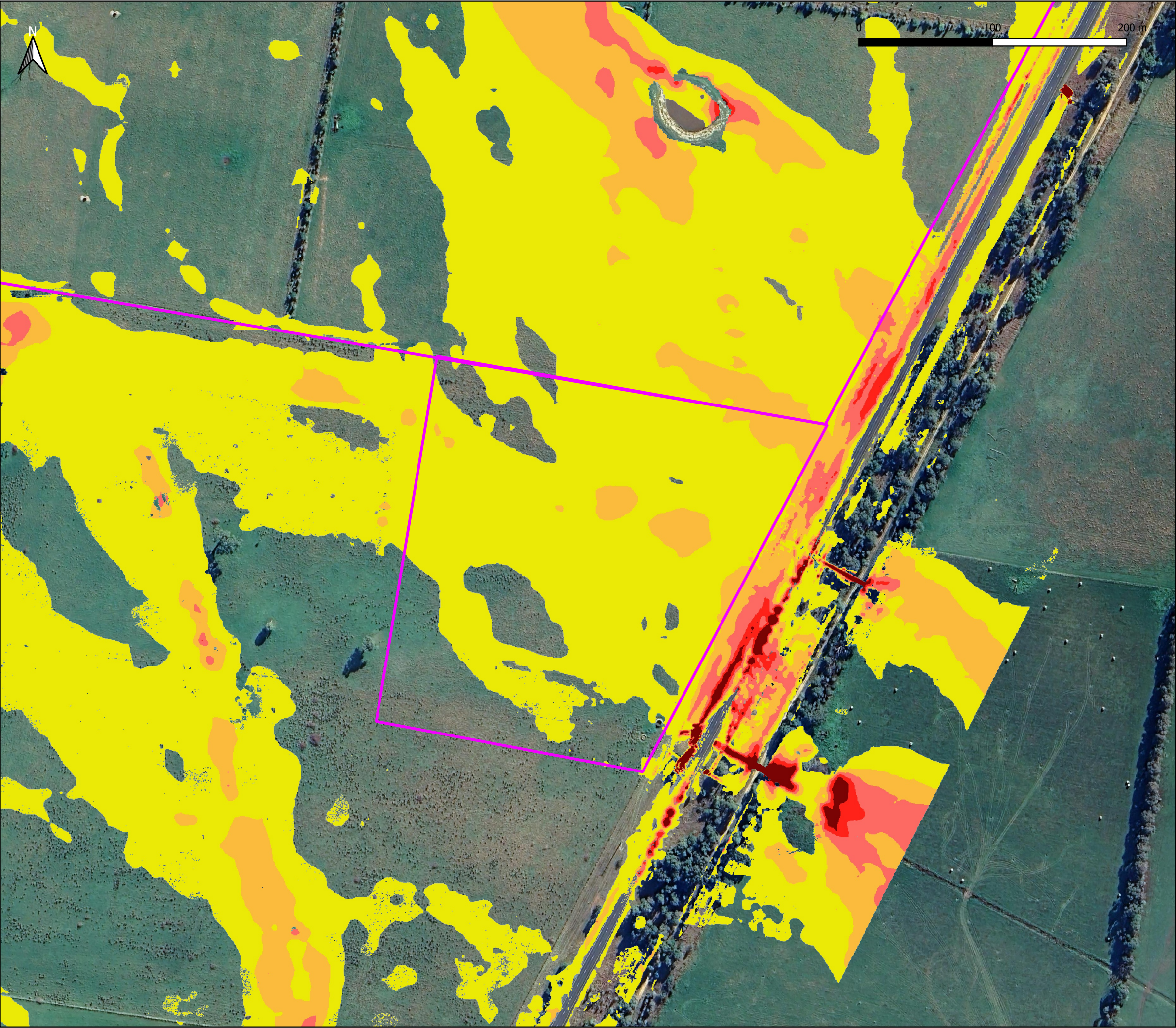
PLOT

MAX DEPTH 5%AEP (m)

[Lightest Blue]	<= 0.0200
[Light Blue]	0.0200 - 0.1000
[Medium Light Blue]	0.1000 - 0.3000
[Medium Blue]	0.3000 - 0.5000
[Dark Blue]	0.5000 - 1.0000
[Darkest Blue]	> 1.0000



Project	P26-0005-ING-FRASERS BESS-AUS
Title	5%AEP Max Depth (m)
By	PLM / MRC



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PLOT

MAX VELOCITY 1%AEP (m/s)

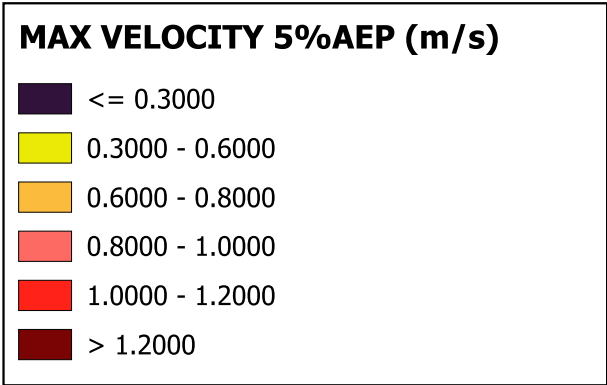
≤ 0.3000
0.3000 - 0.6000
0.6000 - 0.8000
0.8000 - 1.0000
1.0000 - 1.2000
> 1.2000

Project	P26-0005-ING-FRASERS BESS-AUS
Title	1%AEP Max Velocity (m/s)
By	PLM / MRC



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PLOT



Project	P26-0005-ING-FRASERS BESS-AUS
Title	5%AEP Max Velocity (m/s)
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