

Flood Risk Management Report for proposed development at No. 2 to 16 Pockley Avenue Roseville

SEARs Requirements Declaration: Pockley Island

Declaration

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Qualifications BE (Civil) MIEAus, CPEng, NER

The undersigned declares that Flood Risk Management Report for **Pockley Avenue** has been prepared in response to the following SEARs requirements issued for the Project on 15/11/2024 for SSD-77825469:

SEARs item no.	SEARs Requirement	Relevant Section of this Report
15	<ul style="list-style-type: none"> Identify the flood planning level as set out in the relevant council LEP or SEPP and identify any: flood risks on site having regard to adopted flood studies <ul style="list-style-type: none"> the potential effects of climate change, and any relevant provisions of the <i>NSW Flood Risk Management Manual</i>. Where the development is occurring on flood prone land a flood impact and risk assessment (FIRA) must be prepared having regard to the <i>Flood Impact and Risk Assessment Guideline - LU01</i> (FIRA guide). When determining the scope and category of the FIRA the requirements outlined in the FIRA guide must be considered. Detail any flood risk management measures that are to be incorporated as part of the development having regard to relevant guidelines (including any design solutions, flood modification measures, property modification measures, operational procedures or Flood Emergency Response Plan).Detail any flood risk management measures that are to be incorporated as part of the development having regard to relevant guidelines (including any design solutions, flood modification measures, property modification measures, operational procedures or Flood Emergency Response Plan). 	All report

Signed



Dated: 11 April 2025

Summary

The location of the site is shown on Figure 1. It is proposed to develop the site and construct a multi-level apartment complex with basement parking. The layout of the proposed Level 4 floor plan is shown on Figure 2 and a section through the development is shown on Figure 3.

It is necessary to conduct a flood study to determine the flood behavior for existing conditions and its impact on the proposed development and vice versa, the impact of the proposed development on flood behavior.

A detailed hydraulic model was established for the entire catchment and the resulting 1% AEP flood and Probable Maximum Flood maps are shown on Figures 4 and 5 respectively.

The development site is slightly affected by the 1% AEP flood at the North-Western corner, however the footprint of the development is not affected at all. It would be necessary to physically protect the North-Western corner of the site from the PMF plus say 200 mm freeboard to eliminate any risk of flooding during the maximum possible flood.

The part of the site where the proposed driveway crossing is located is not affected by flooding. The driveway hump should be higher than the kerb level.

The Probable Maximum Precipitation is much larger than the anticipated increase in rainfall intensity of 19% due to climate change. The flood resulting from PMP was adopted to determine the flood protection for the site to remain on a conservative side.

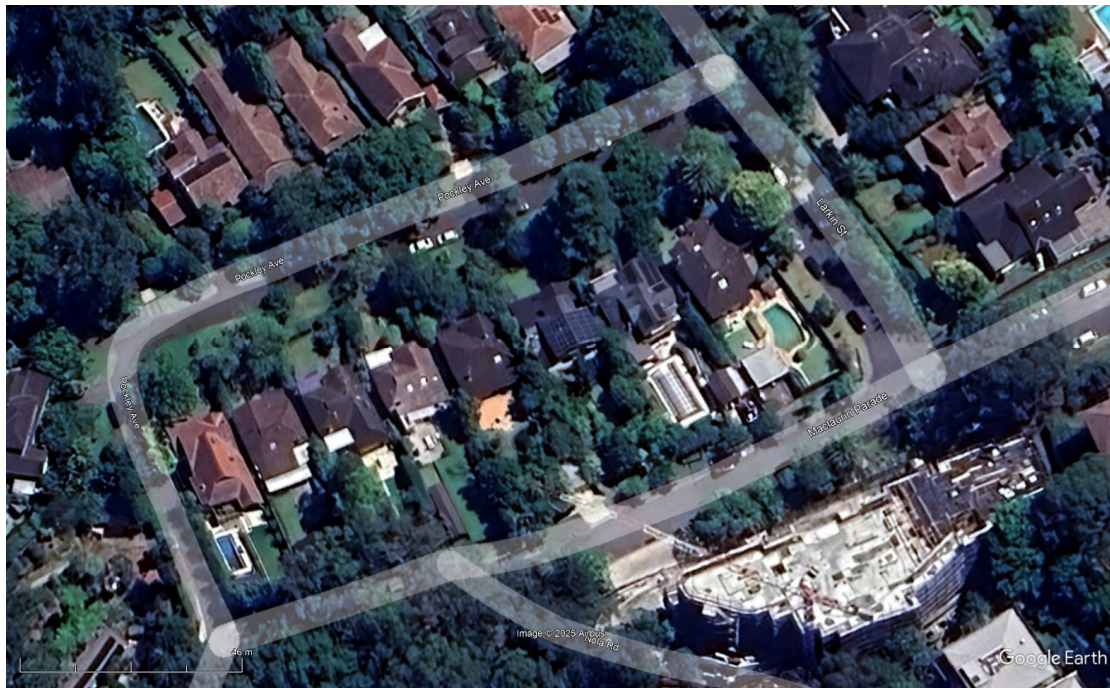


Figure 1 Site location

The details of the hydraulic modelling and the applicable flood controls are described in the following text, the emergency flood response plan is given in Appendix A and the relevant flood maps are presented in Appendix B.

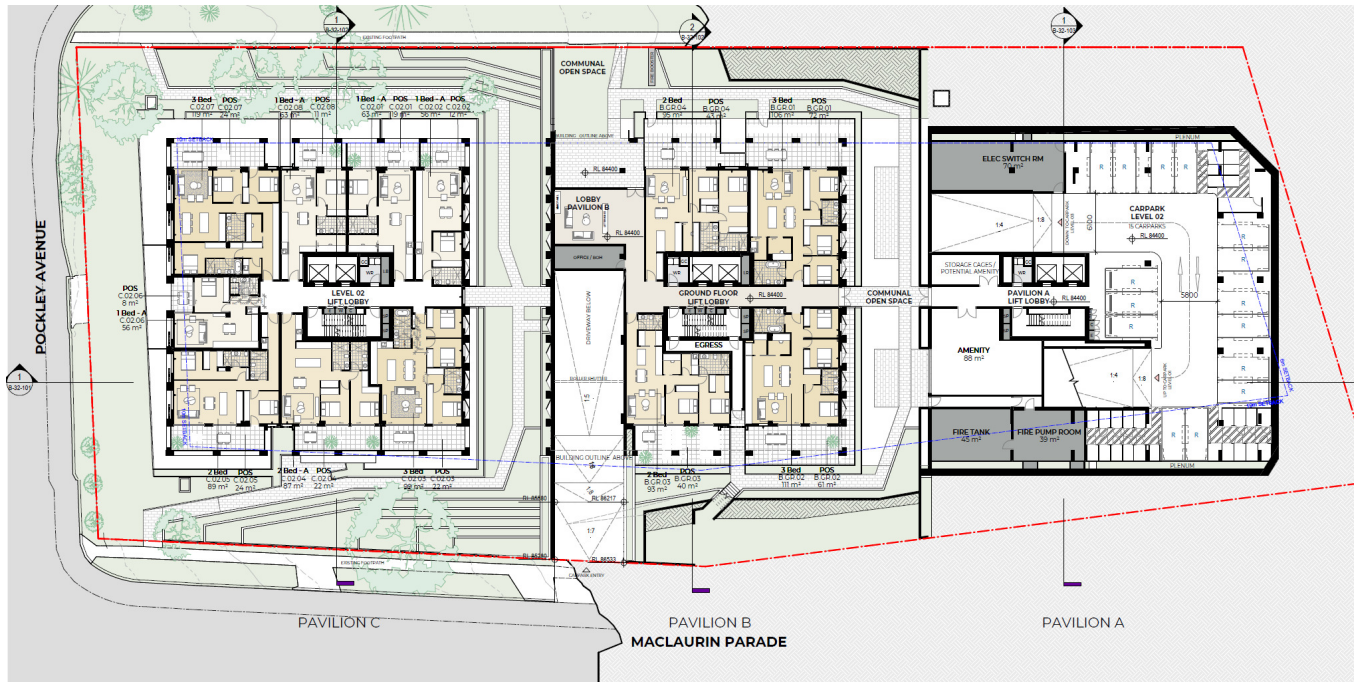


Figure 2, Proposed Basement 2, Note: Floor Level at RL 84.4m driveway hump level at RL 86.53m AHD

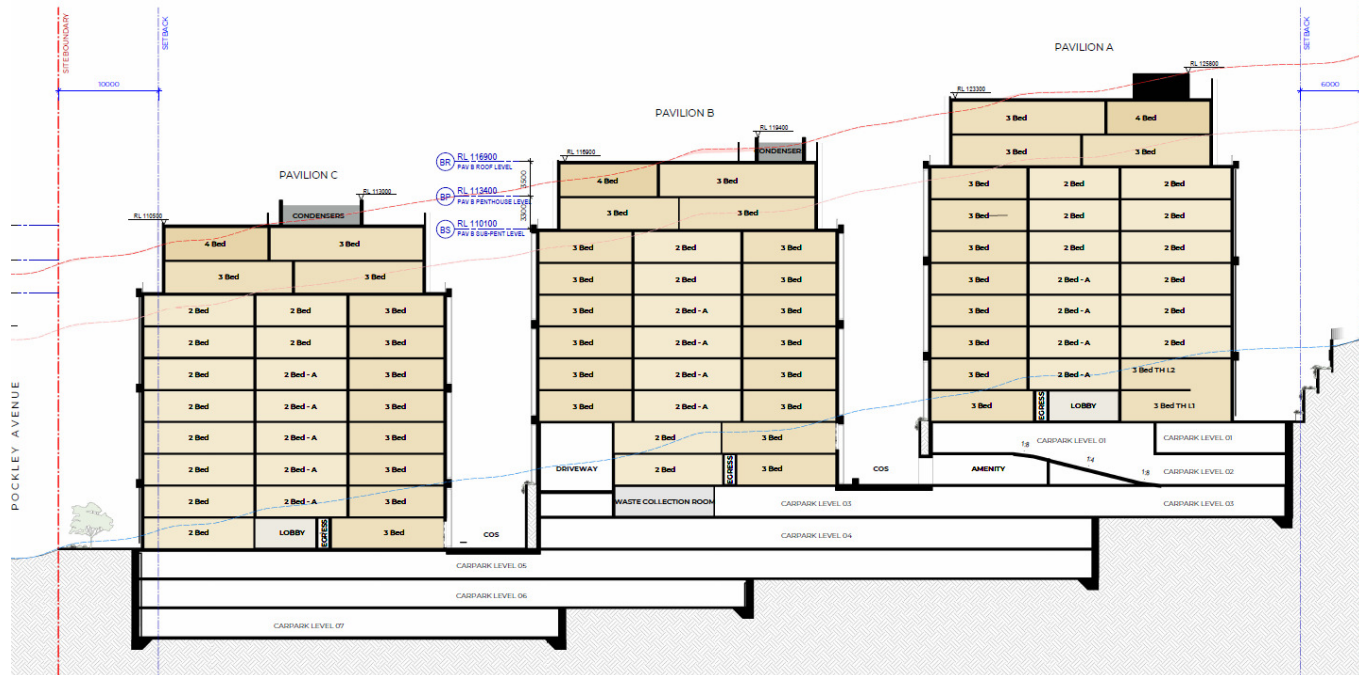


Figure 3, Section

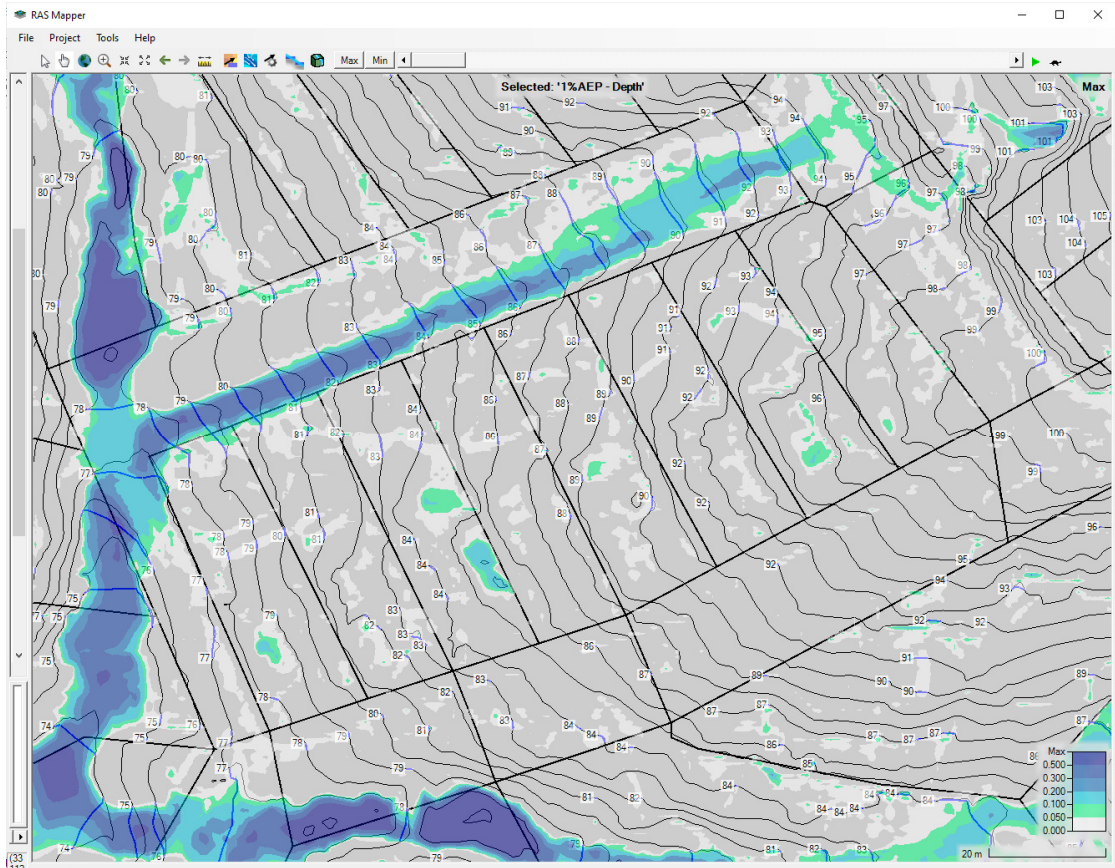


Figure 4, 1% AEP Flood Map

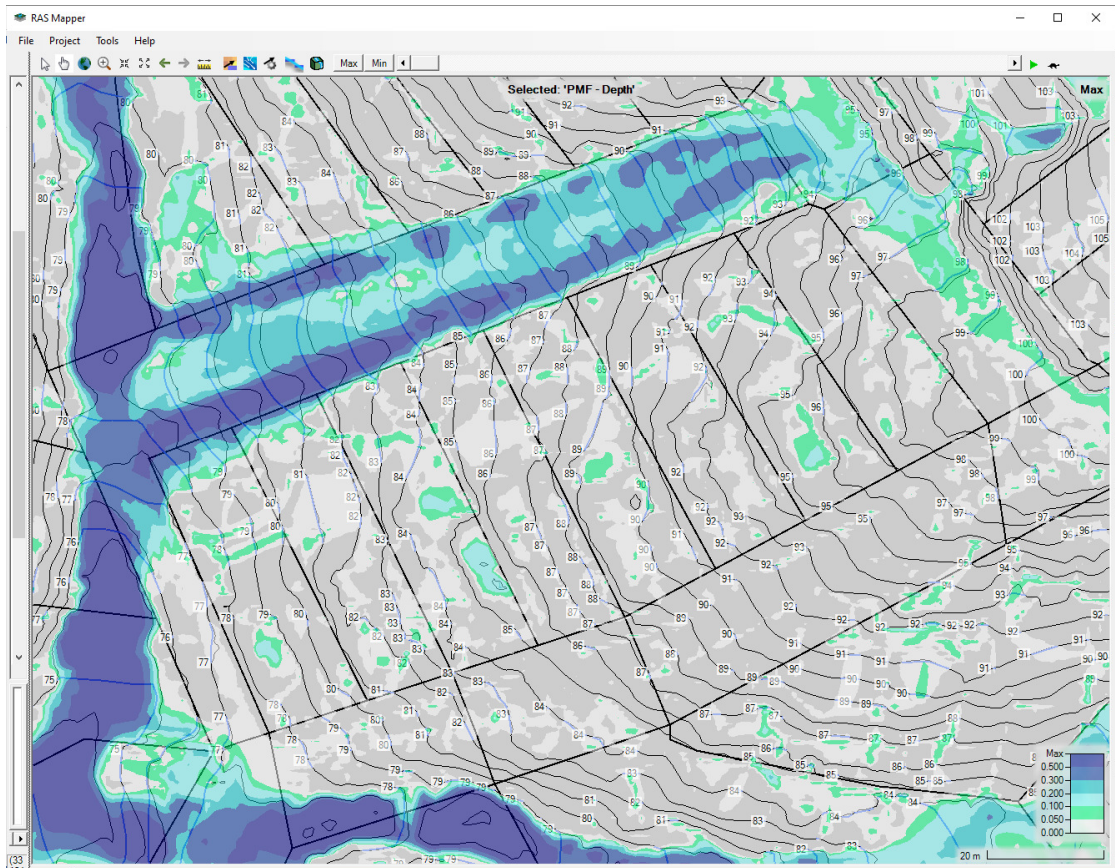


Figure 5, Probable Maximum Flood Map

Hydraulic Modelling

A flood study was prepared using a rainfall on grid approach. The design rainfall is directly applied to the entire catchment area and the flood behavior is modelled using a detailed hydraulic model based on HEC-RAS software. The design rainfall was determined in accordance with the recommendations in ARR 2019. The catchment is relatively steep and small. A 5 minute storm duration is the critical duration for this catchment.

The catchment (model) domain is shown on Figure 6. The hydraulic model was configured from the downloaded LIDAR data using 1x1m cells. Manning's n value of 0.05 was applied to the residential lots and 0.025 to the land dedicated to roads (cadastral information). 5 mm and 1.5 mm/hr were used as initial and continuous losses for the residential areas and 1mm and 0 mm/hr were used as initial and continuous losses for the land dedicated to roads.

The resulting Probable Maximum Flood map for the entire catchment is shown on Figure 7.

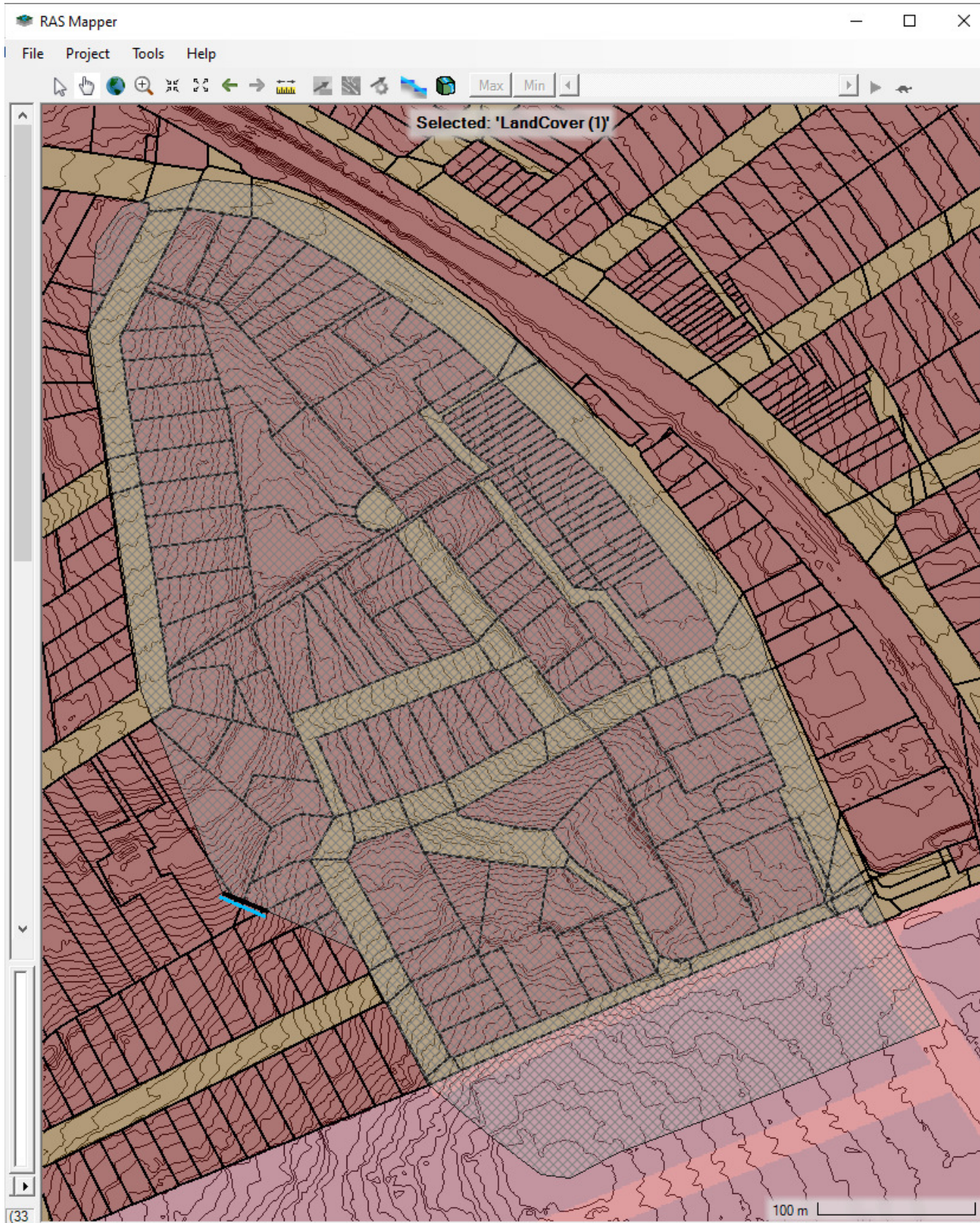


Figure 6, 2D domain

Figure 7, PMF, rainfall on grid

The various flood maps are shown in Appendix B. The flood hazard categories were determined in accordance with the diagram shown on Figure 8.

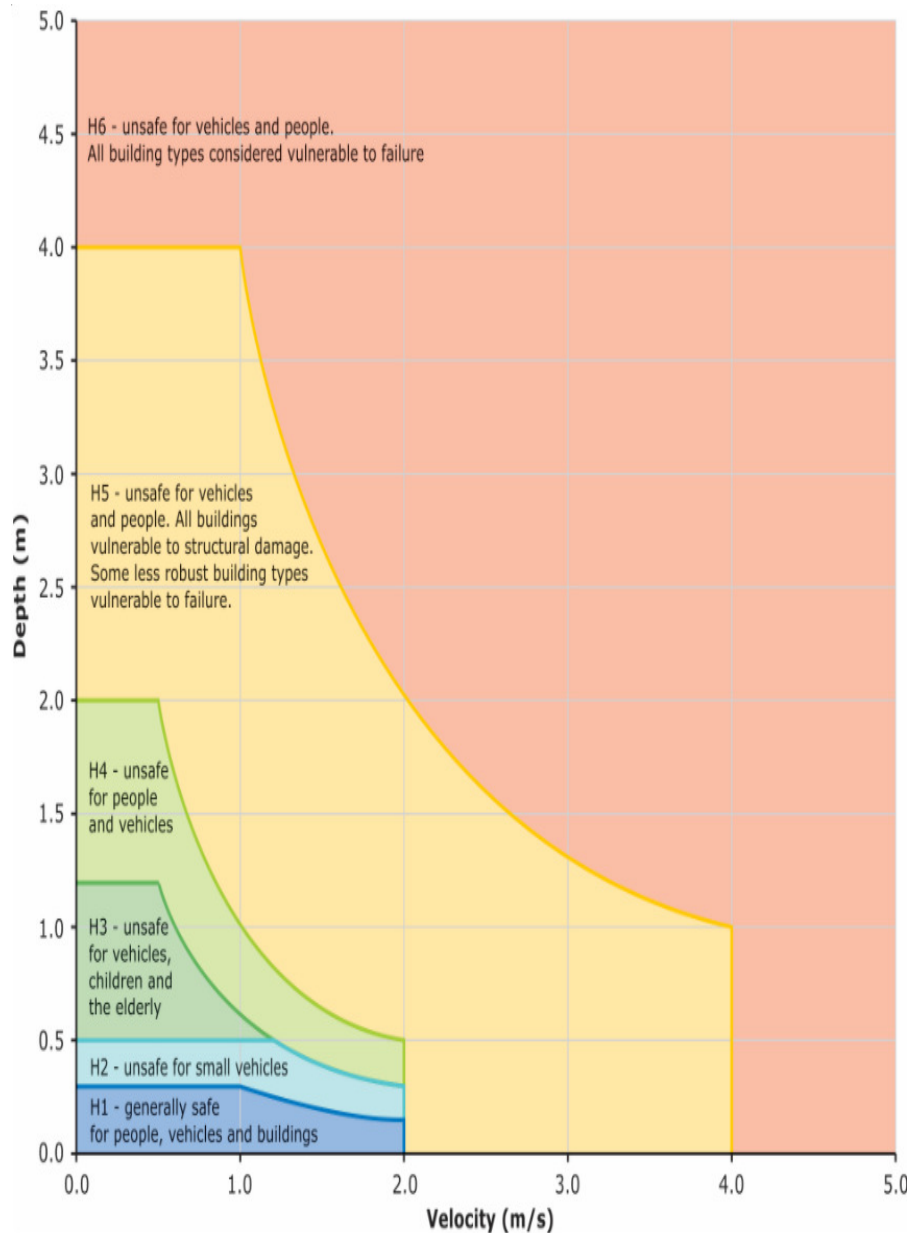


Figure 8, Flood Hazard Classification

Applicable Controls

The land use of the proposed development is residential. Most of the development is not affected by flood with some minor areas at the North-Western corner located in a Medium Flood Risk Precinct. The following controls are applicable to the site:

Floor Level

The lower ground floor and the basements' floor levels are lower than the 1%AEP flood levels in the streets, however, they are protected by the existing ground levels. The existing ground levels and all accesses to the building must be checked to be 500 mm above the 1% AEP levels.

Building Components

The proposed development must be constructed from flood compatible materials for the components exposed to flood waters. All electrical connections must be physically protected 500 mm above the 1% AEP flood levels.

Structural Soundness

The building structure is not exposed to floods, however any flood protection walls must be designed to withstand the forces of buoyancy, flowing water and debris during the PMF. The depth and the velocity of flow during the PMF event in contact with the flood protection wall are low and will be able to withstand the forces of water flow, debris and buoyancy, subject to a structural engineer's design and report at the CC stage.

Flood Affection

The proposed development would not result in an increase in 1% AEP flood levels anywhere in the catchment (Flood Map 9 in Appendix B). The increase in the site's runoff due to the development is offset by the compulsory Stormwater management measures such as OSD.

Evacuation

The proposed development is protected from flooding and it can be considered as safe during all possible floods. Evacuation from the building is not required. The streets around the site are affected by flooding with relatively high velocities and depths. The floods in this area would be of a short nature and it is recommended that the occupants remain within the site during the periods of extremely heavy rain.

Management and design

Site emergency response plan is given in Appendix A.



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Appendix A

Flood Emergency Response Plan

1. Floods in Roseville are considered as “flash floods” and no warning system for this catchment is available. Storms leading to major flooding are typically 2 hours long, however shorter storms as little as a 10 minutes long can produce significant flooding. Once the storm passes floodwaters usually disappear rapidly.
2. Extremely heavy rainfall should be used as an indicator of a possible flood in the street. The flood flow in the street will not last longer than say 15 to 20 minutes and it is advised not to leave the building during these events.
3. During floods many local and major streets and roads will be cut by floodwaters. Travelling through floodwaters on foot, or in a vehicle can be very dangerous as the water may be polluted, obstructions can be hidden under the floodwaters, or you could be swept away. It is recommended to remain within the nursing home as this is the safest option. If you need to leave the nursing home do so early in the flood event, before the flood level reaches the road level in front of the dwelling.
4. Do not evacuate from the building unless instructed to do so by the SES or the Police. Remember floodwaters are much deeper and flow much faster outside.
5. In the case of a medical emergency ring 000 as normal, but explain about the flooding.
6. A laminated copy of this plan should be permanently attached (glued) on an inside cupboard door in the kitchen.
7. This flood management plan should be reviewed every 5 years, particularly with the potential effects of Climate Change.



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Appendix B

Flood Maps

Map 1, Flood Levels and Depth, 1% AEP, Existing Conditions

Map 2, Velocity, 1% AEP, Existing Conditions

Map 3, Flood Hazard, 1% AEP, Existing Conditions, 1-H1, 2-H2, 3-H3, 4-H4, 5-H5, 6-H6

Map 4, Hydraulic Categories, 1% AEP, Exis. Conditions, 1-Flood Fringe, 2- Flood Storage, 3-Floodway

Map 5, Flood Levels and Depth, 1% AEP, Existing Conditions

Map 6, Velocity, 1% AEP, Existing Conditions

Map 7, Flood Hazard, 1% AEP, Existing Conditions, 1-H1, 2-H2, 3-H3, 4-H4, 5-H5, 6-H6

Map 8, Hydraulic Categories, 1% AEP, Ex. Conditions, 1-Flood Fringe, 2- Flood Storage, 3-Floodway

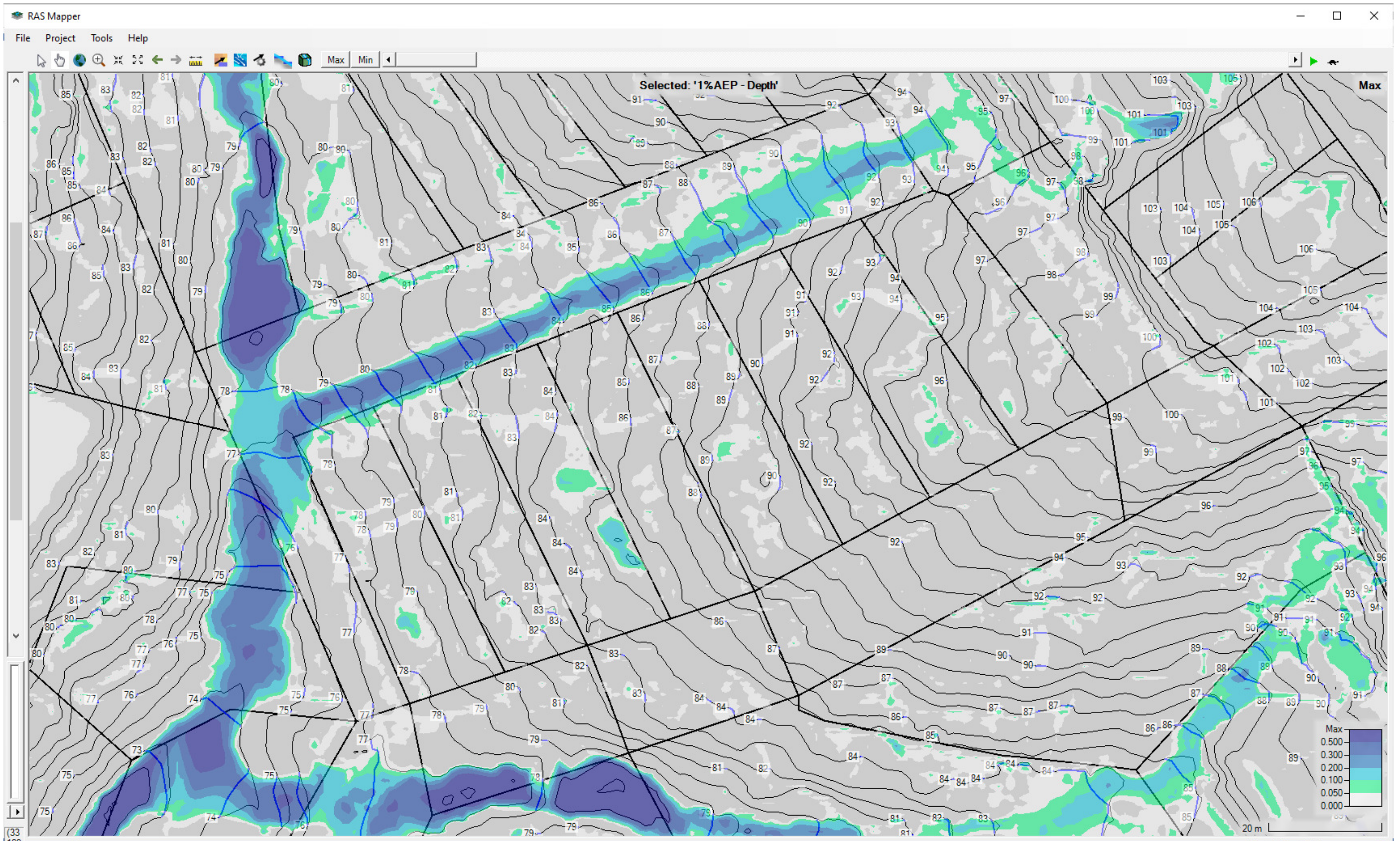
Map 9, Differences 1% AEP (Proposed-Existing)

Map 10, Flood Levels and Depth, PMF, Existing Conditions

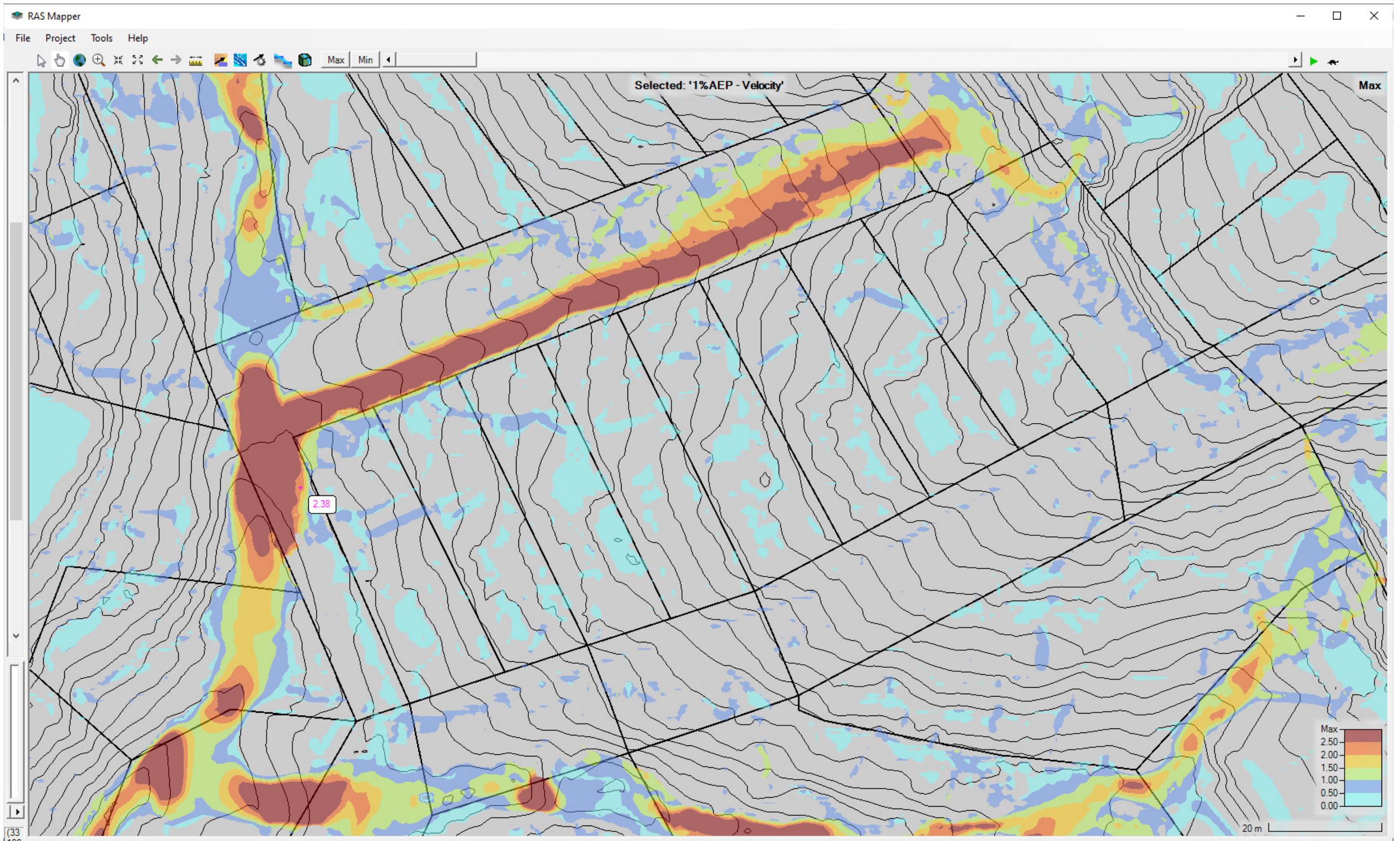
Map 11, Velocity, PMF, Existing Conditions

Map 12, Flood Hazard, PMF, Existing Conditions, 1-H1, 2-H2, 3-H3, 4-H4, 5-H5, 6-H6

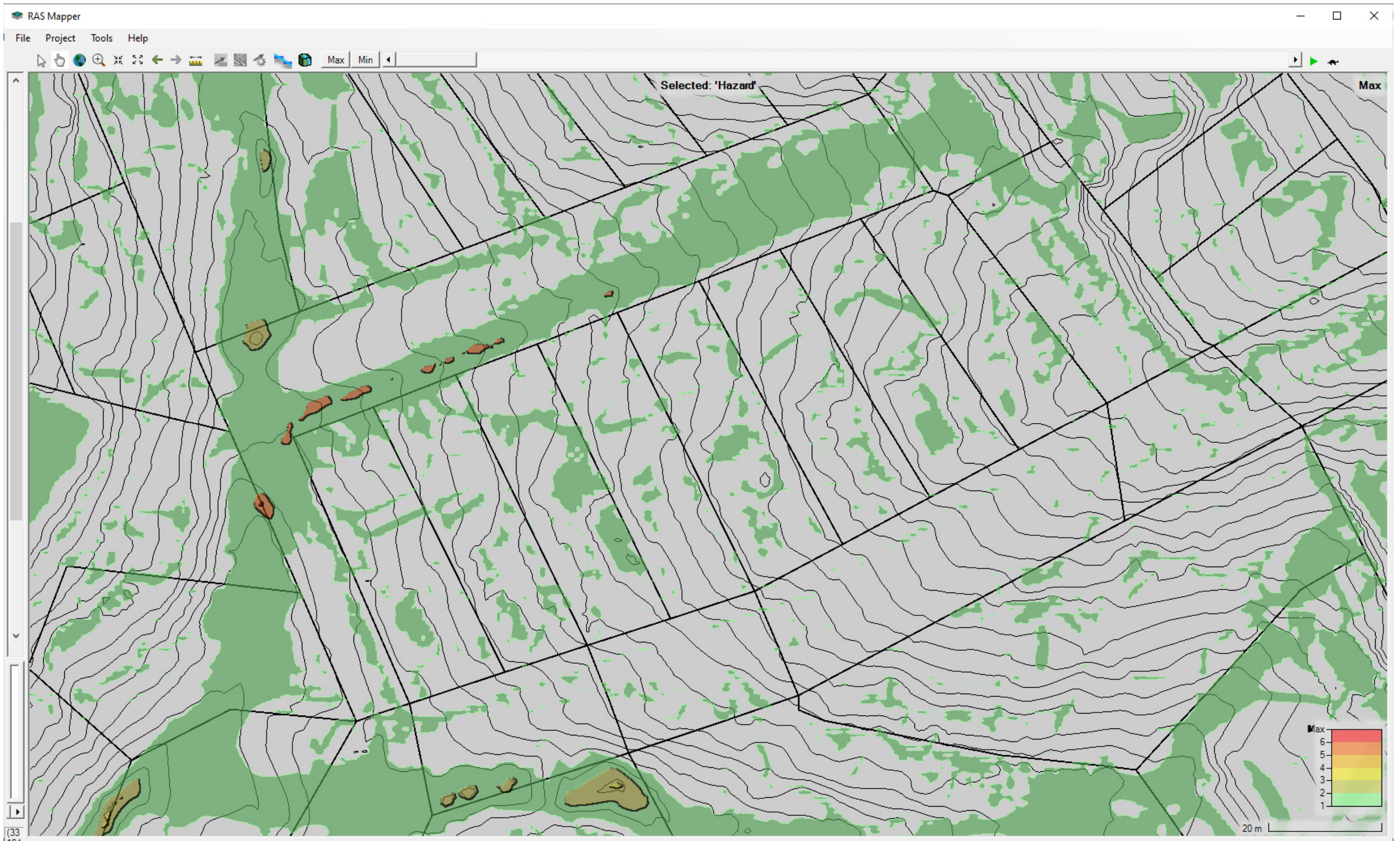
Map 13, Hydraulic Categories, PMF, Exis. Conditions, 1-Flood Fringe, 2- Flood Storage, 3-Floodway



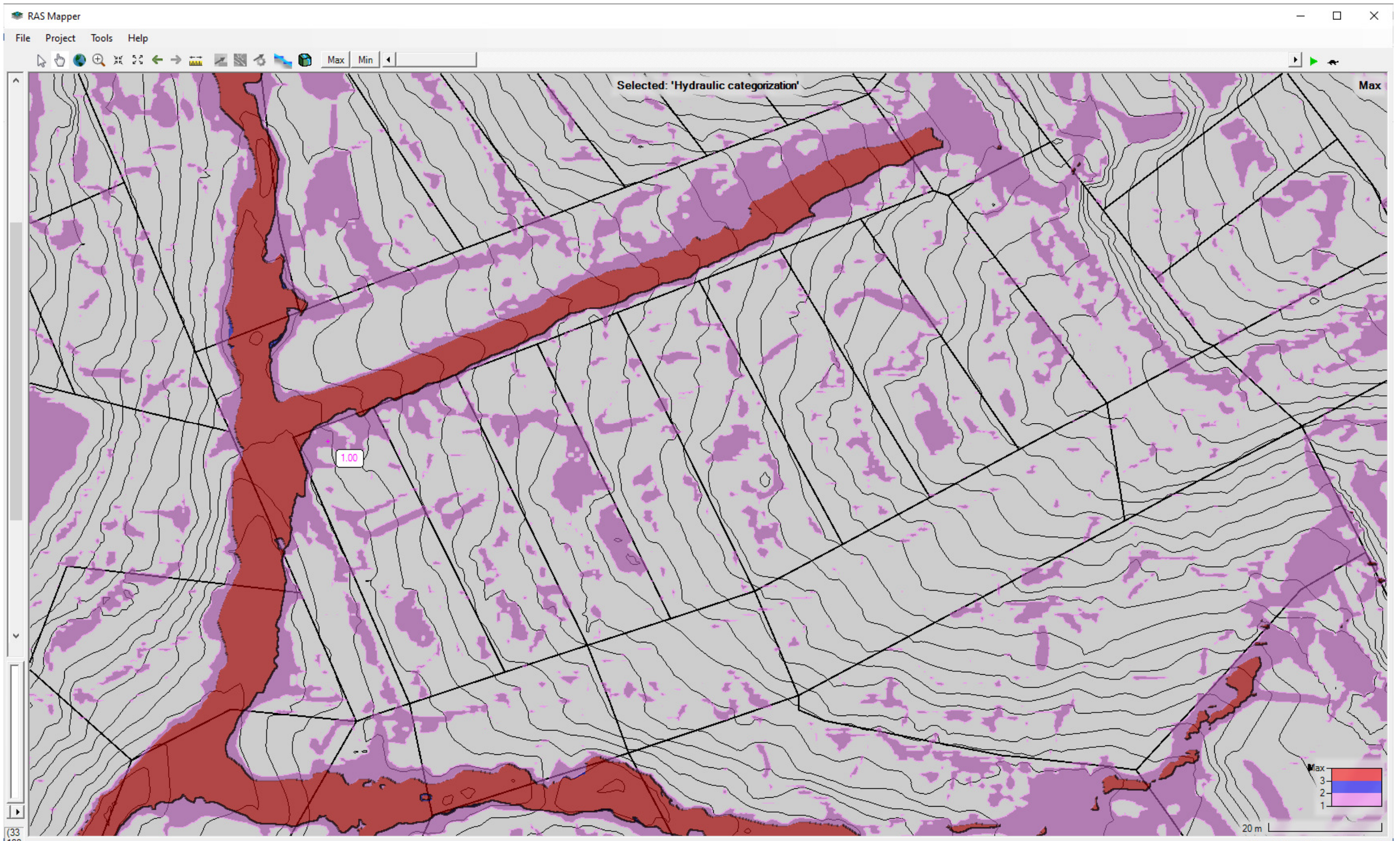
Map 1, Flood Levels and Depth, 1% AEP, Existing Conditions



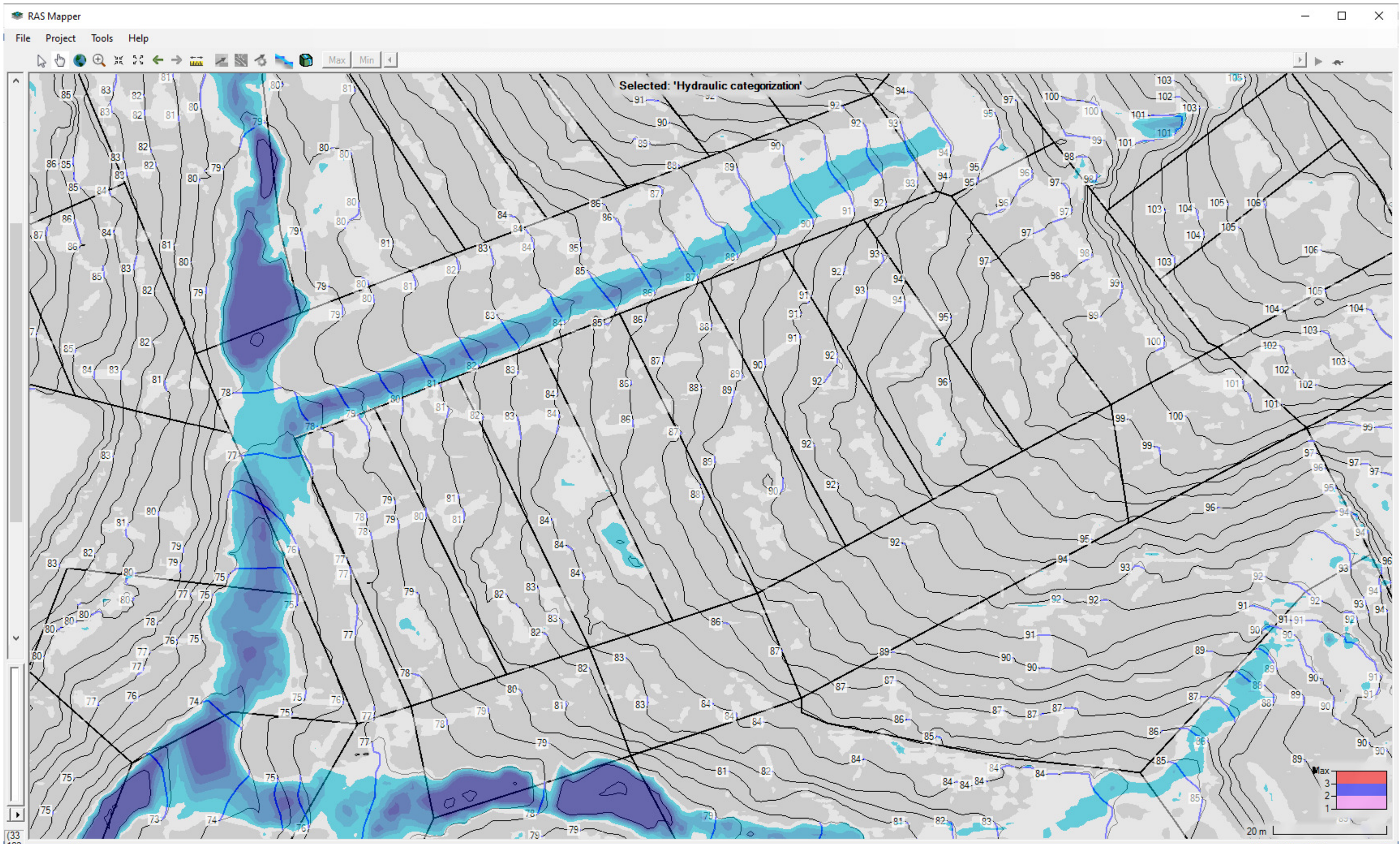
Map 2, Velocity, 1% AEP, Existing Conditions



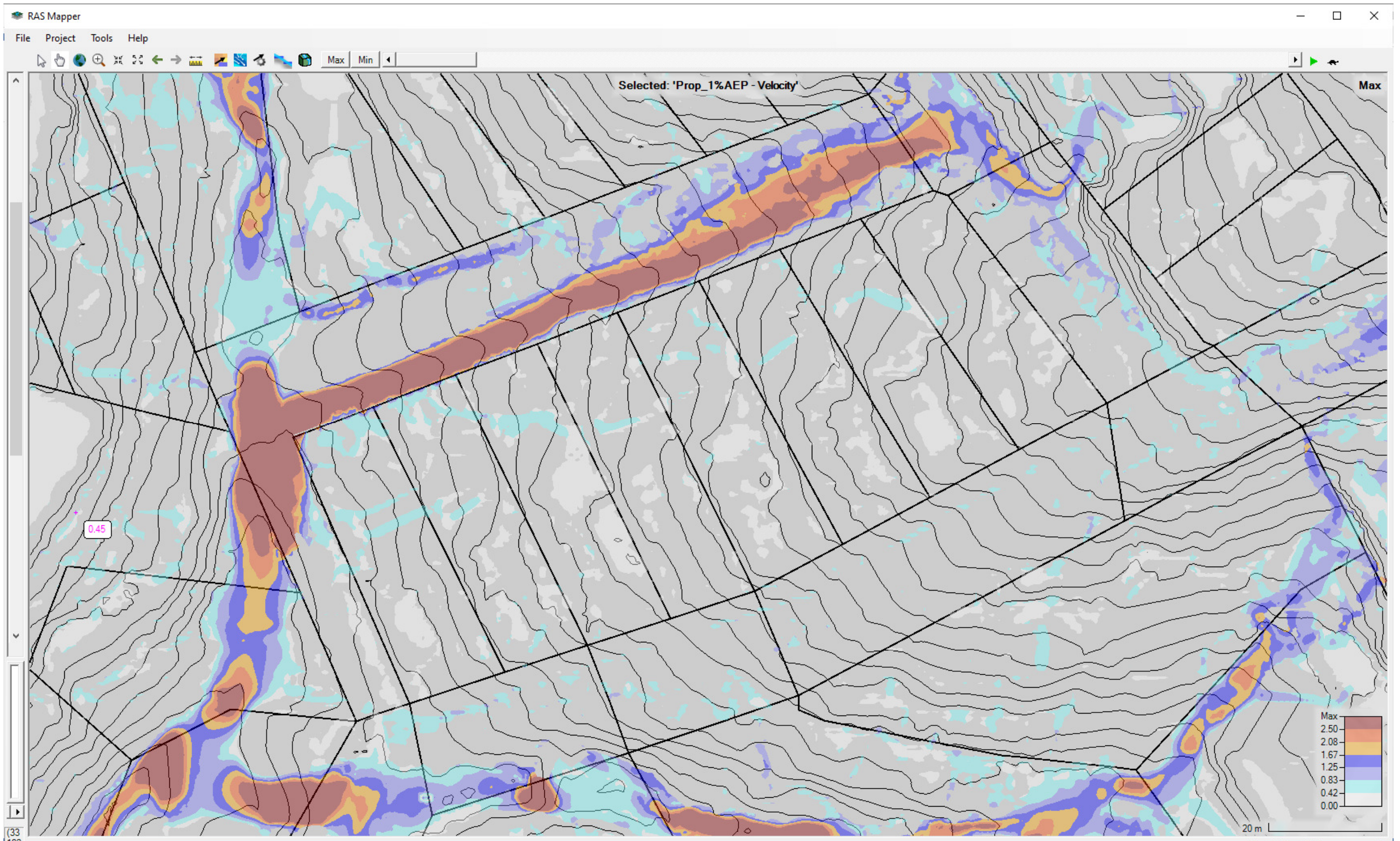
Map 3, Flood Hazard, 1% AEP, Existing Conditions, 1-H1, 2-H2, 3-H3, 4-H4, 5-H5, 6-H6



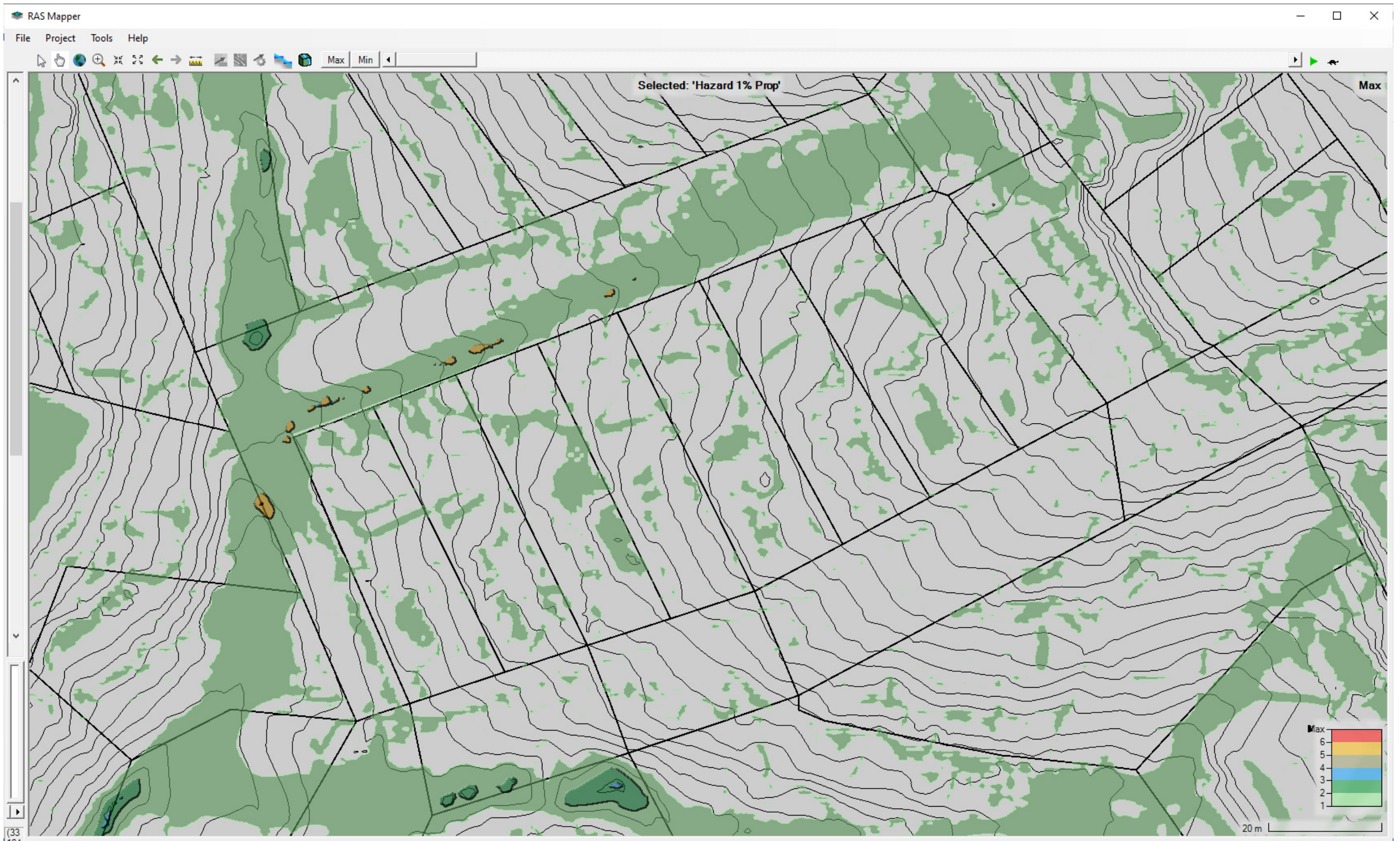
Map 4, Hydraulic Categories, 1% AEP, Exis. Conditions, 1-Flood Fringe, 2- Flood Storage, 3-Floodway



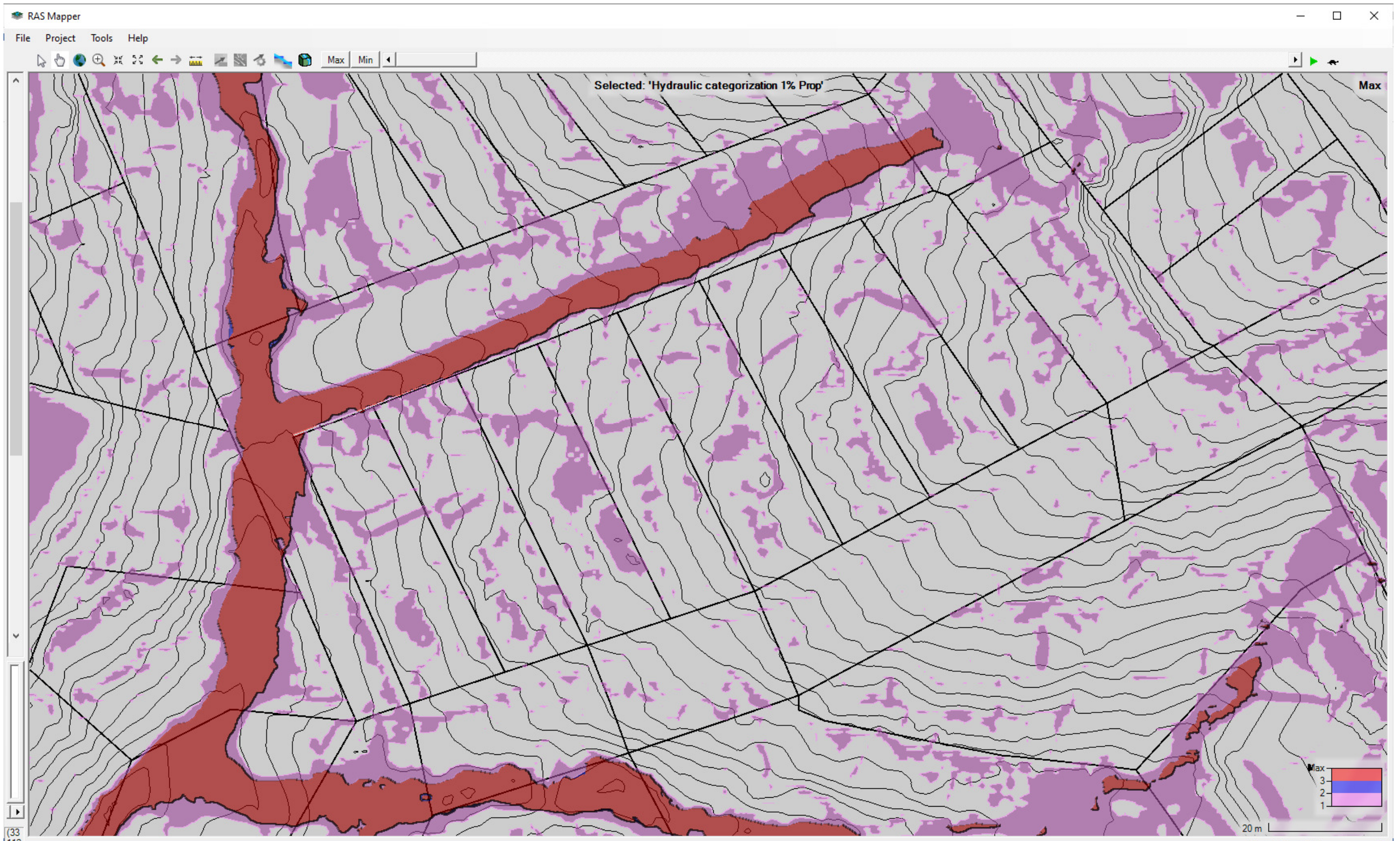
Map 5, Flood Levels and Depth, 1% AEP, Proposed Conditions



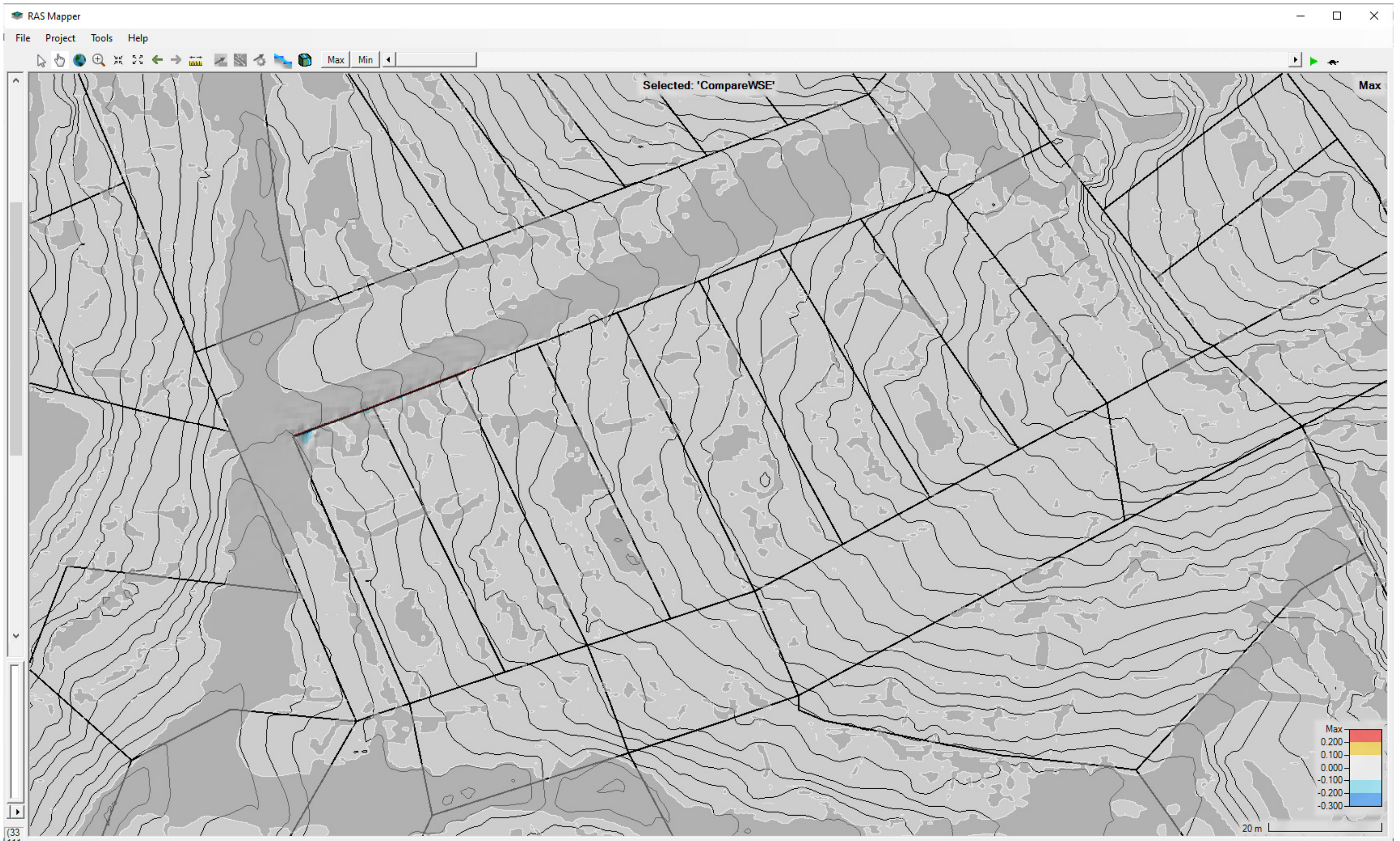
Map 6, Velocity, 1% AEP, Proposed Conditions



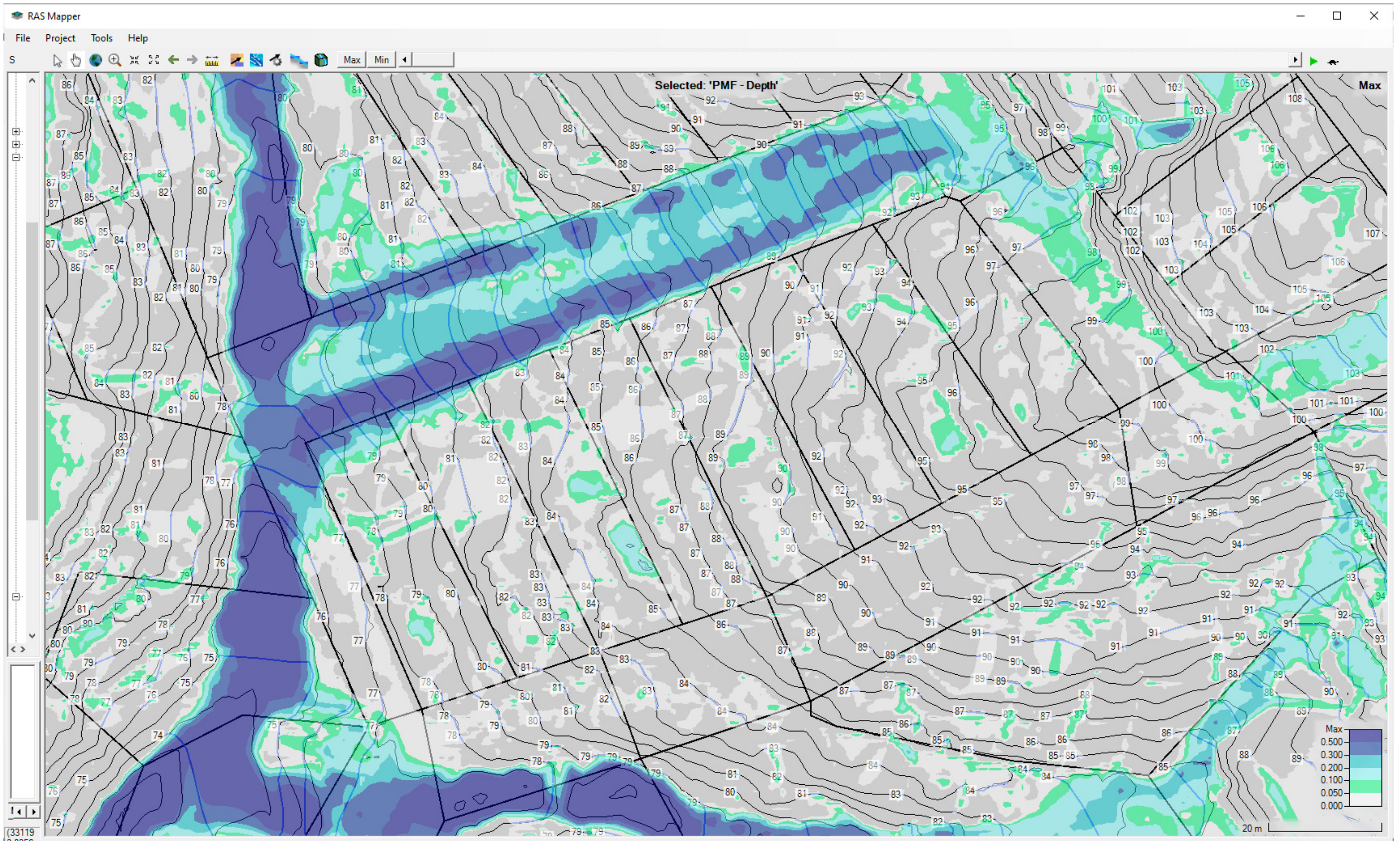
Map 7, Flood Hazard, 1% AEP, Proposed Conditions, 1-H1, 2-H2, 3-H3, 4-H4, 5-H5, 6-H6



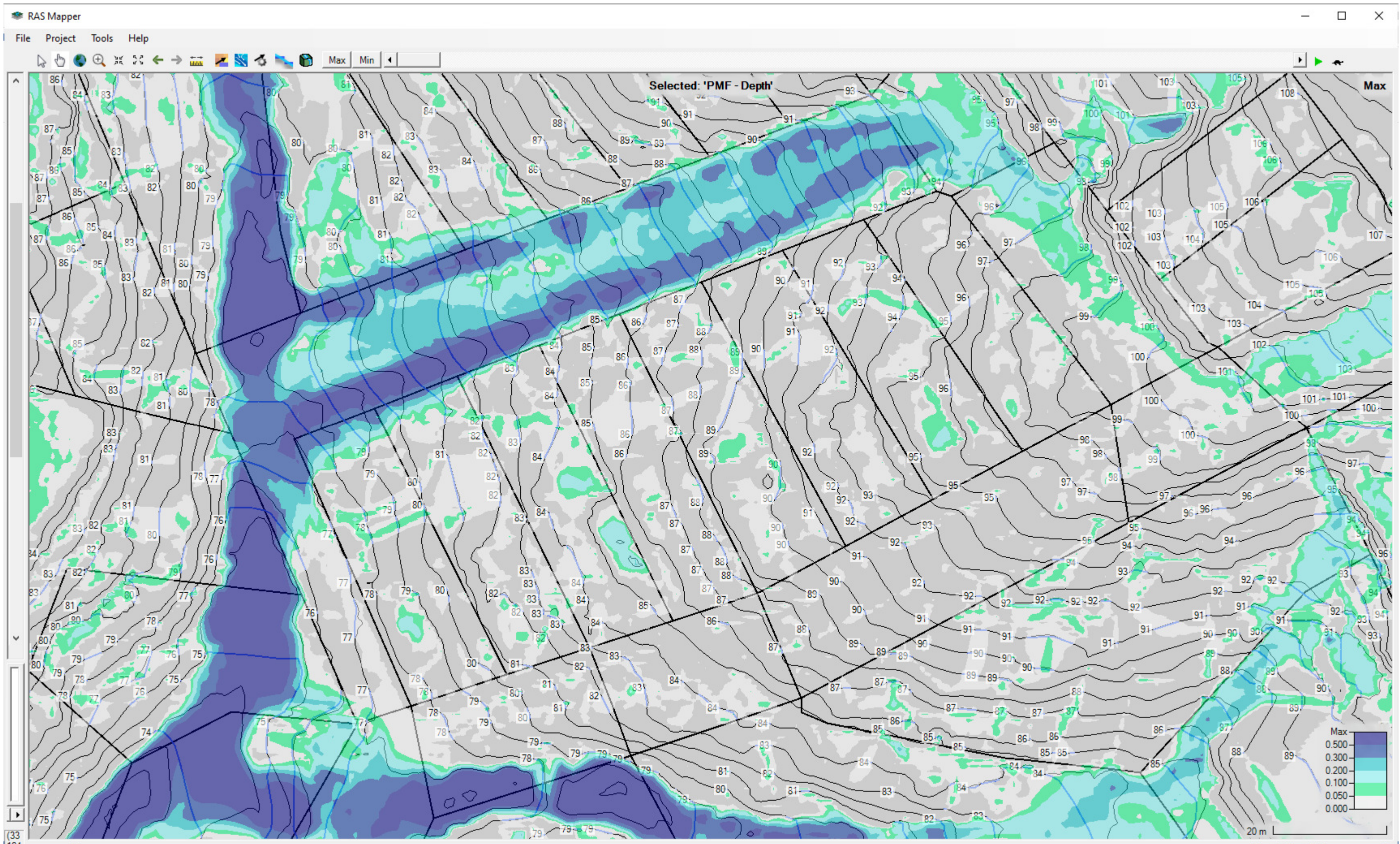
Map 8, Hydraulic Categories, 1% AEP, Prop. Conditions, 1-Flood Fringe, 2- Flood Storage, 3-Floodway



Map 9, Differences, 1%AEP, Proposed-Existing



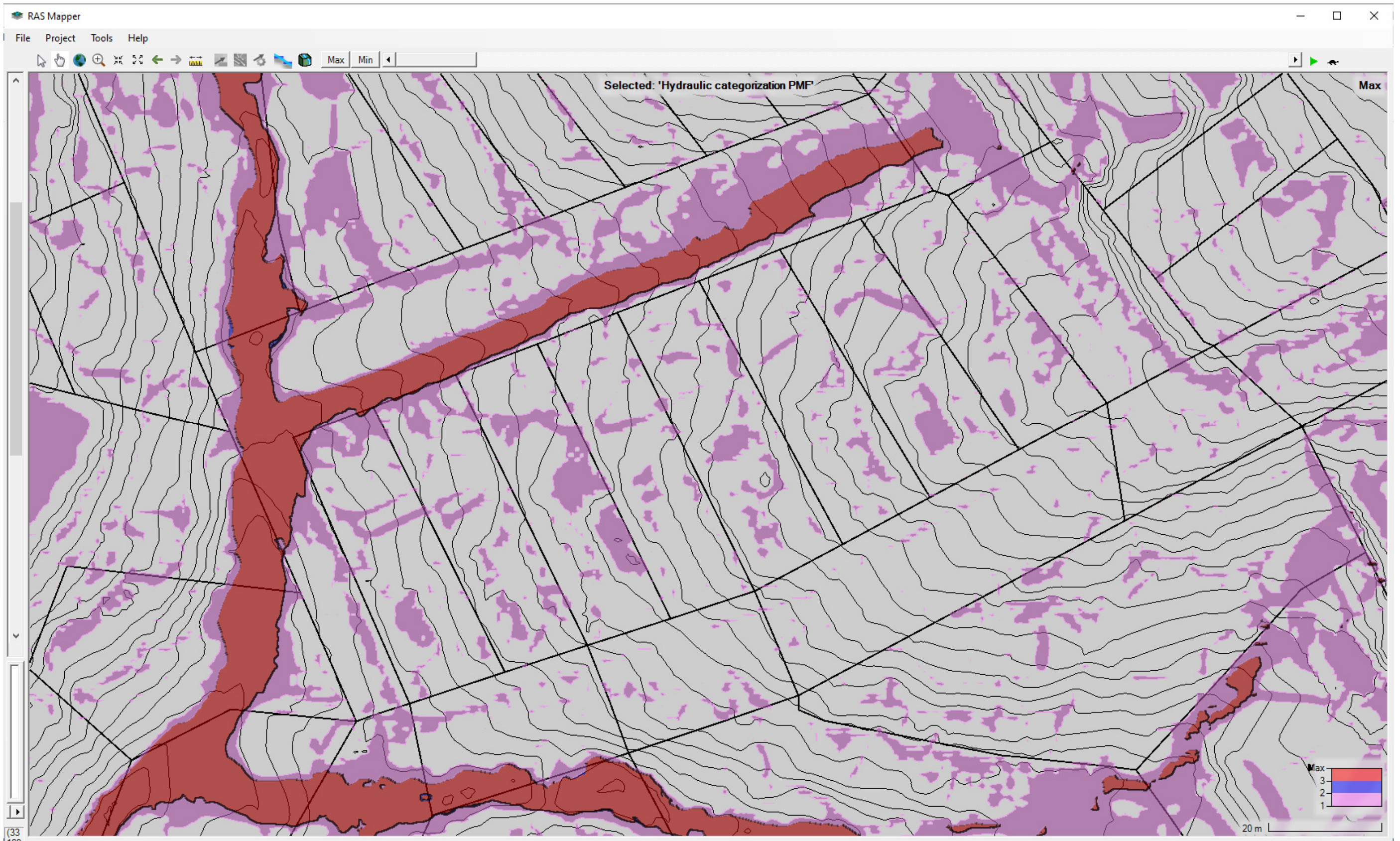
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