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MORETON BAY REGIONAL COUNCIL

REGIONAL FLOODPLAIN DATABASE

HYDROLOGIC AND HYDRAULIC MODELLING REPORT: NEURUM CREEK (NEU)

APPENDIX D: MODELLING QUALITY REPORT

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TECHNICAL NOTE

DATE 10 July 2010

TO Moreton Bay Regional Council

FROM Leonard Cheung

COPY

PROJECT 301001-01156

SUBJECT Neurum Creek Modelling Quality Report

DOC NO

FILE LOC

INTRODUCTION

A detailed TUFLOW model of the Neurum Creek (NEU) minor basin has been developed as part of Moreton Bay Regional Council's (MBRC) Regional Floodplain Database (RFD) Stage 2 project.

This technical note is prepared to demonstrate that the performance of the NEU model is suitable for the intended use and the associated model outputs can be adopted by MBRC for the RFD to deliver reliable flood information across the Neurum Creek minor basin.

MODEL PERFORMANCE

Model stability, warning messages and mass errors were monitored throughout model simulation periods to ensure that the model performance was acceptable. Careful attention has been paid to ensure that flows through the 1D structure elements in the model as well as flows over the floodplain in the 2D domain were stable during model simulation period.

Overland flow hydrographs were checked at key locations in the floodplain (PO lines) to ensure the simulation extended well beyond the peak throughout the NEU study area, especially around the areas close to the downstream boundary.

To demonstrate there are no significant loss or gain of flood volumes during model runs, a check of the mass balance of the flood volumes for the three selected critical durations of the 10Yr, 100Yr ARI and PMF flood events has been undertaken and presented in the following Table 1.



Table 1: Mass Balance Check

Event	10Yr ARI			100Yr ARI			PMF		
	120M	180M	1440M	120M	180M	1440M	60M	120M	180M
Volume at Start (m3)	1231632	1231632	1231632	2204620	2204620	2204620	23090394	23090394	23090394
Volume at End (m3)	4901123	7140670	3534877	5979815	8625536	3343243	43189859	57961991	61719247
Total Volume In (m3)	10847215	12242711	25441286	16558032	19280826	41652106	54193206	79188474	95640361
Total Volume Out (m3)	7156525	6308569	23083198	12751189	12825449	40431392	33975799	44148995	56808914
Volume Error (m3)	-21199	-25105	-54842	-31647	-34461	-82090.00	-117942	-167881	-202594
Final Cumulative ME (%)	-0.12%	-0.14%	-0.11%	-0.11%	-0.11%	-0.10%	-0.13%	-0.14%	-0.13%

The above table shows that there are no significant loss and gain of flood volume during the modelling and the mass balance errors are within the range of -0.14% to -0.10% for the critical duration runs of the three design events.

CONCLUSIONS

The quality of the NEU model run has been reviewed. It is considered that the overall model performance is suitable for the intended use and the associated model outputs can be adopted for the MBRC RFD to deliver reliable flood information across the Neurum Creek minor basin.



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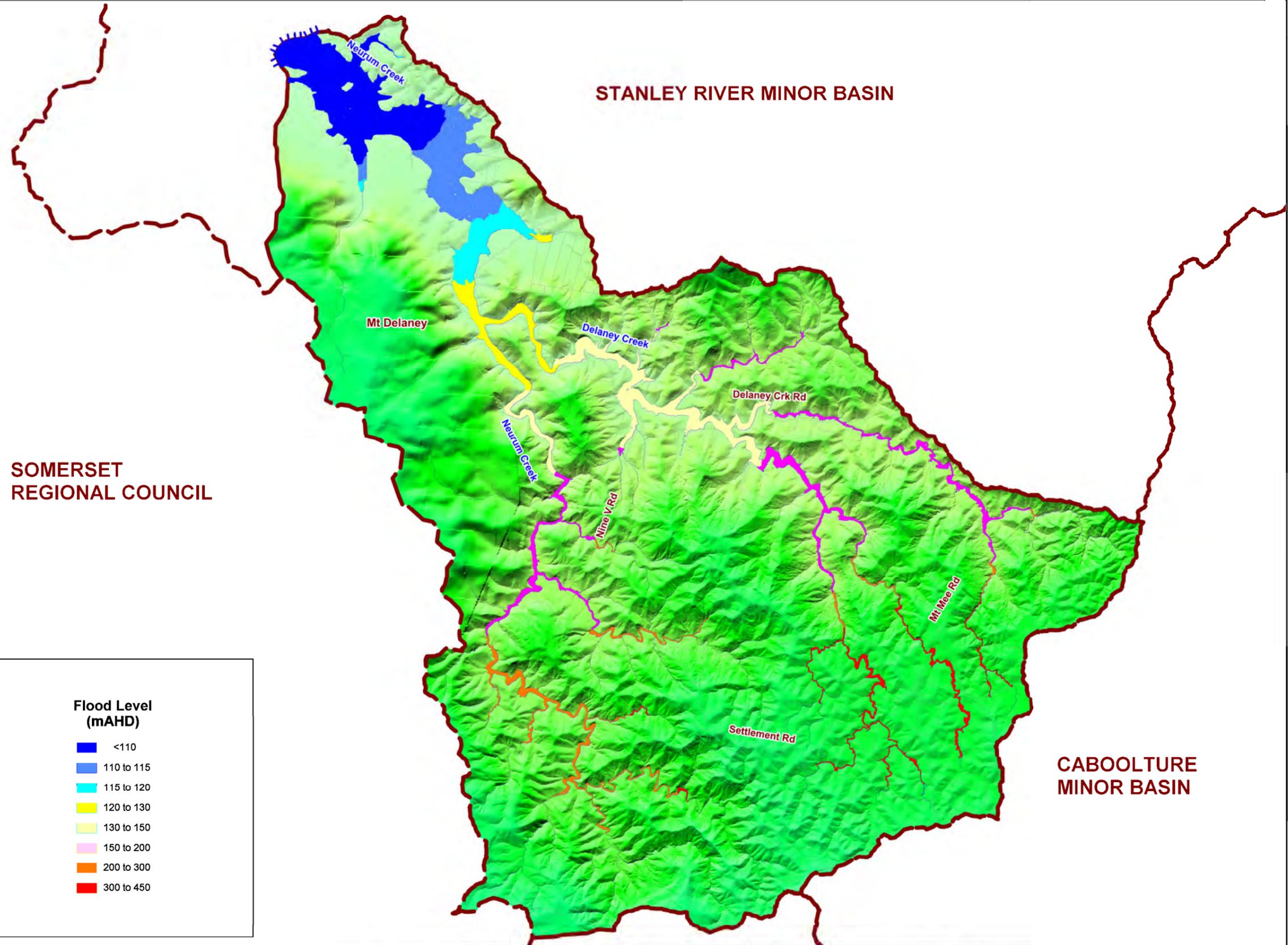
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MORETON BAY REGIONAL COUNCIL

REGIONAL FLOODPLAIN DATABASE

HYDROLOGIC AND HYDRAULIC MODELLING REPORT: NEURUM CREEK (NEU)

APPENDIX E: FLOOD MAPS – 100 YEAR ARI



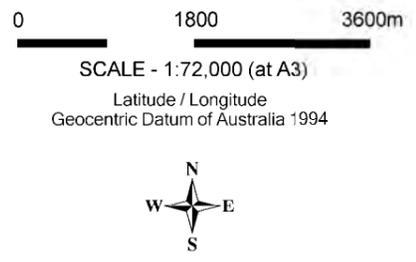
LEGEND

- Catchment Boundary
- Downstream Boundary
- Cadastral Boundaries
- 100 yr ARI Flood Extent

Flood Level (mAHD)

- <110
- 110 to 115
- 115 to 120
- 120 to 130
- 130 to 150
- 150 to 200
- 200 to 300
- 300 to 450

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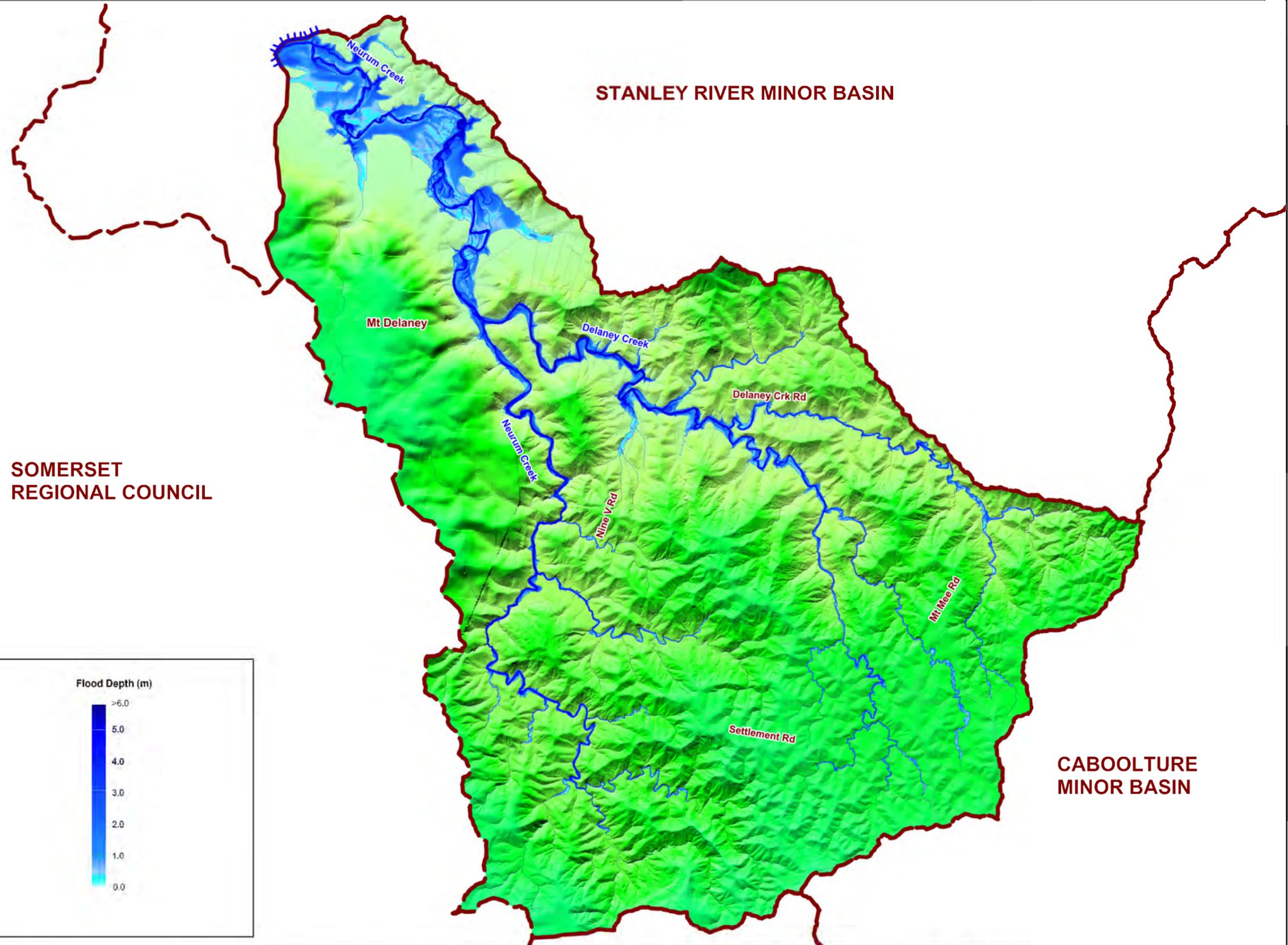


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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
NEURUM CREEK
FIGURE E1 PEAK FLOOD LEVEL MAP - 100 YEAR ARI

Project No: 301001-01156 Figure: 301001-01156-EN-DAL-0125 Rev: 0



LEGEND

- Catchment Boundary
- Downstream Boundary
- Cadastral Boundaries
- 100 yr ARI Flood Extent

Flood Depth (m)

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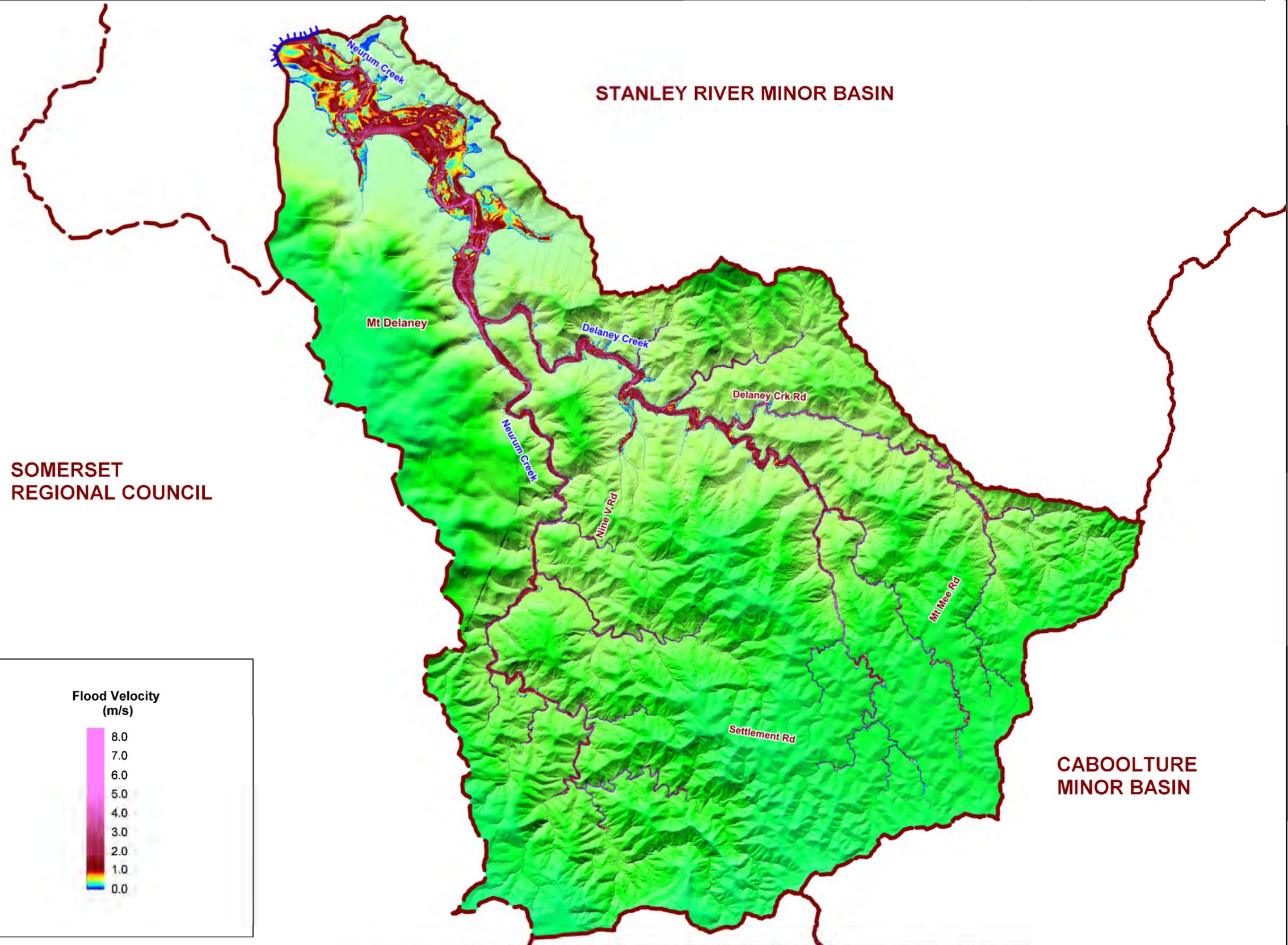
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 Latitude / Longitude
 Geocentric Datum of Australia 1994

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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
NEURUM CREEK
FIGURE E2 PEAK FLOOD DEPTH MAP - 100 YEAR ARI

Project No: 301001-01156 Figure: 301001-01156-EN-DAL-0126 Rev: 0



LEGEND

- Catchment Boundary
- Downstream Boundary
- Cadastral Boundaries
- 100 yr ARI Flood Extent

Flood Velocity (m/s)

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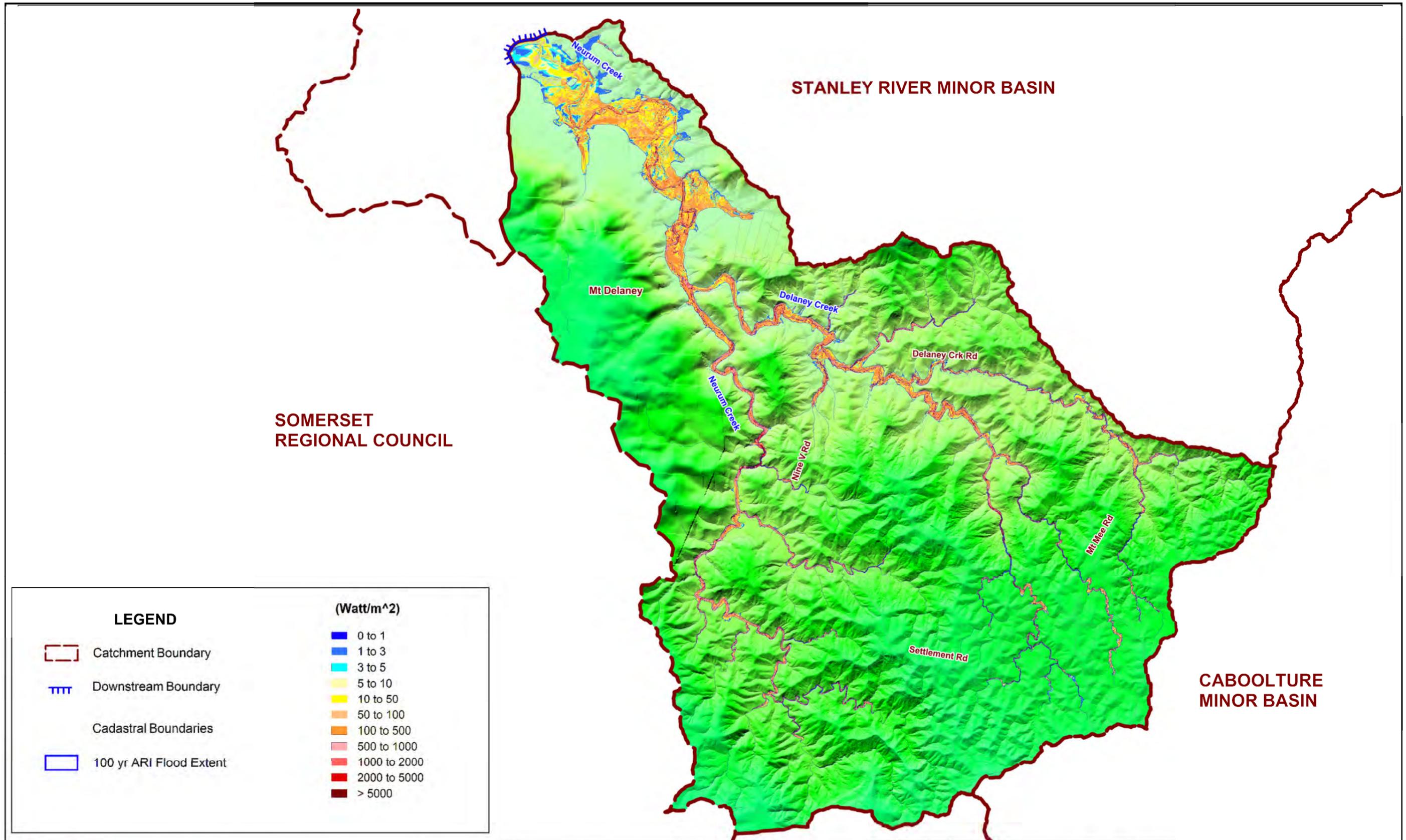
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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
NEURUM CREEK
FIGURE E3 PEAK FLOOD VELOCITY MAP - 100 YEAR ARI

Project No: 301001-01156 Figure: 301001-01156-EN-DAL-0127 Rev: 0



LEGEND

(Watt/m²)

- Catchment Boundary
- Downstream Boundary
- Cadastral Boundaries
- 100 yr ARI Flood Extent

- 0 to 1
- 1 to 3
- 3 to 5
- 5 to 10
- 10 to 50
- 50 to 100
- 100 to 500
- 500 to 1000
- 1000 to 2000
- 2000 to 5000
- > 5000

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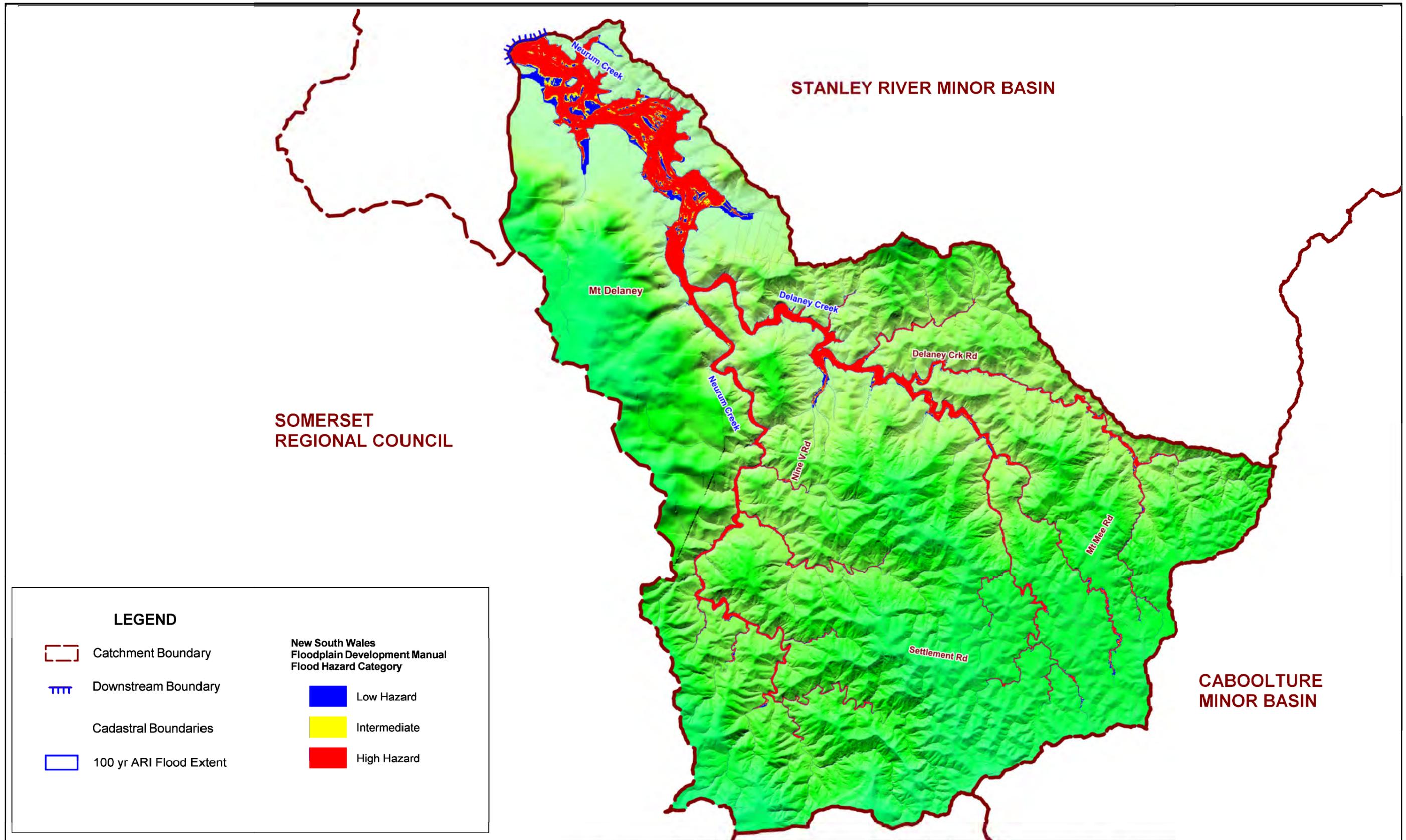
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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
NEURUM CREEK
FIGURE E4 PEAK STREAM POWER MAP - 100 YEAR ARI

Project No: 301001-01156 Figure:301001-01156-EN-DAL-0128 Rev: 0



SOMERSET
REGIONAL COUNCIL

STANLEY RIVER MINOR BASIN

CABOOLTURE
MINOR BASIN

LEGEND

- Catchment Boundary
 - Downstream Boundary
 - Cadastral Boundaries
 - 100 yr ARI Flood Extent
- New South Wales
Floodplain Development Manual
Flood Hazard Category**
- Low Hazard
 - Intermediate
 - High Hazard

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Latitude / Longitude
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**REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
NEURUM CREEK
FIGURE E5 PEAK FLOOD HAZARD MAP - 100 YEAR ARI**

Project No: 301001-01156 Figure:301001-01156-EN-DAL-0129 Rev: 0



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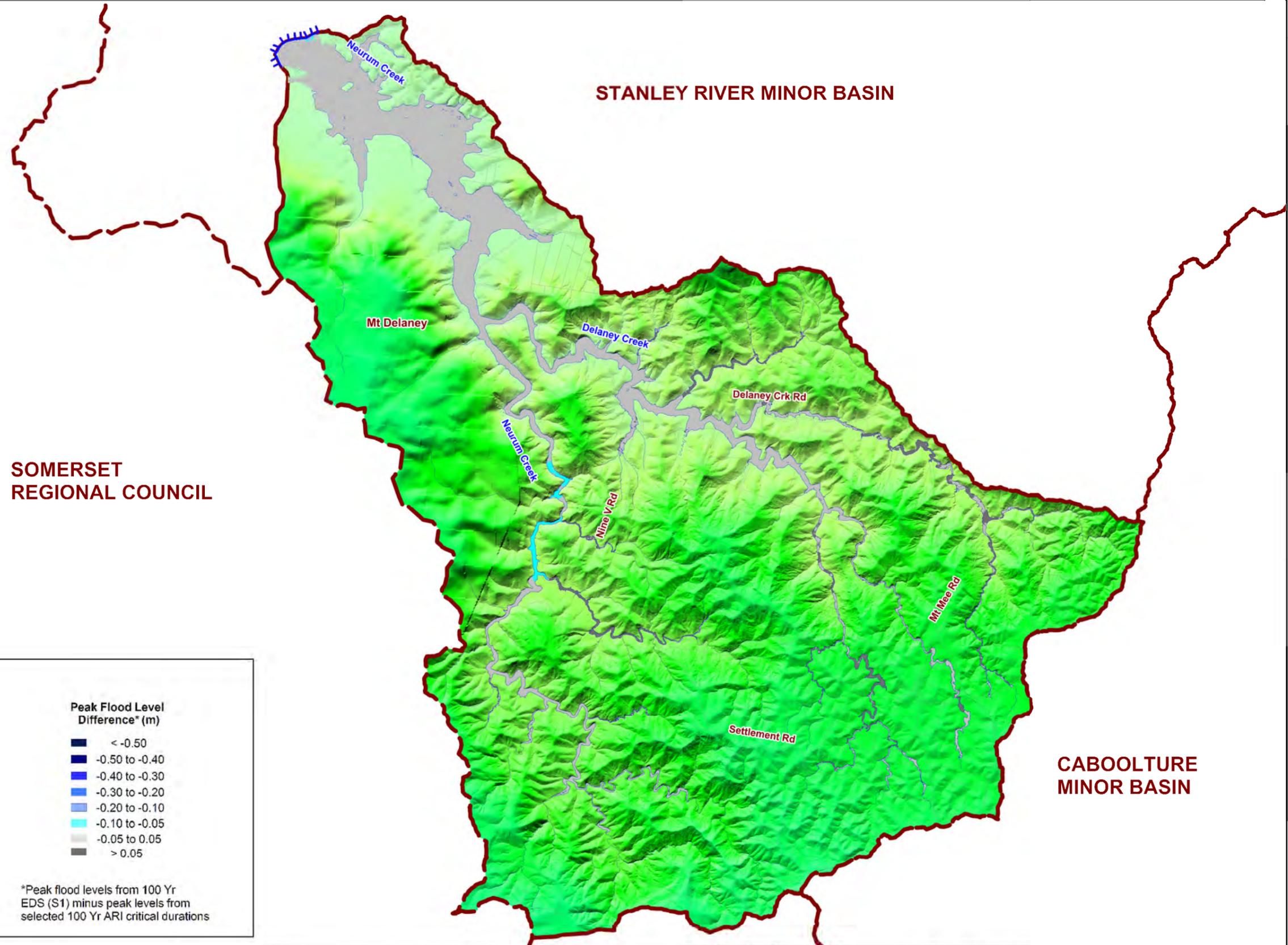
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REGIONAL FLOODPLAIN DATABASE

HYDROLOGIC AND HYDRAULIC MODELLING REPORT: NEURUM CREEK (NEU)

APPENDIX F: MODEL SENSITIVITY ANALYSIS MAPS



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**CABOOLTURE
MINOR BASIN**

LEGEND

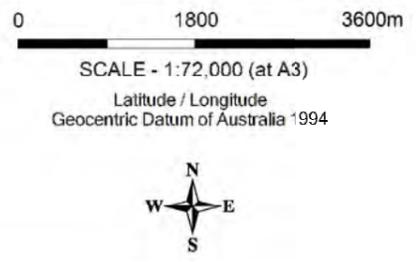
- Catchment Boundary
- Downstream Boundary
- Cadastral Boundaries
- 100 yr ARI Flood Extent

Peak Flood Level Difference* (m)

- <math>< -0.50</math>
- 0.50 to -0.40
- 0.40 to -0.30
- 0.30 to -0.20
- 0.20 to -0.10
- 0.10 to -0.05
- 0.05 to 0.05
- > 0.05

*Peak flood levels from 100 Yr EDS (S1) minus peak levels from selected 100 Yr ARI critical durations

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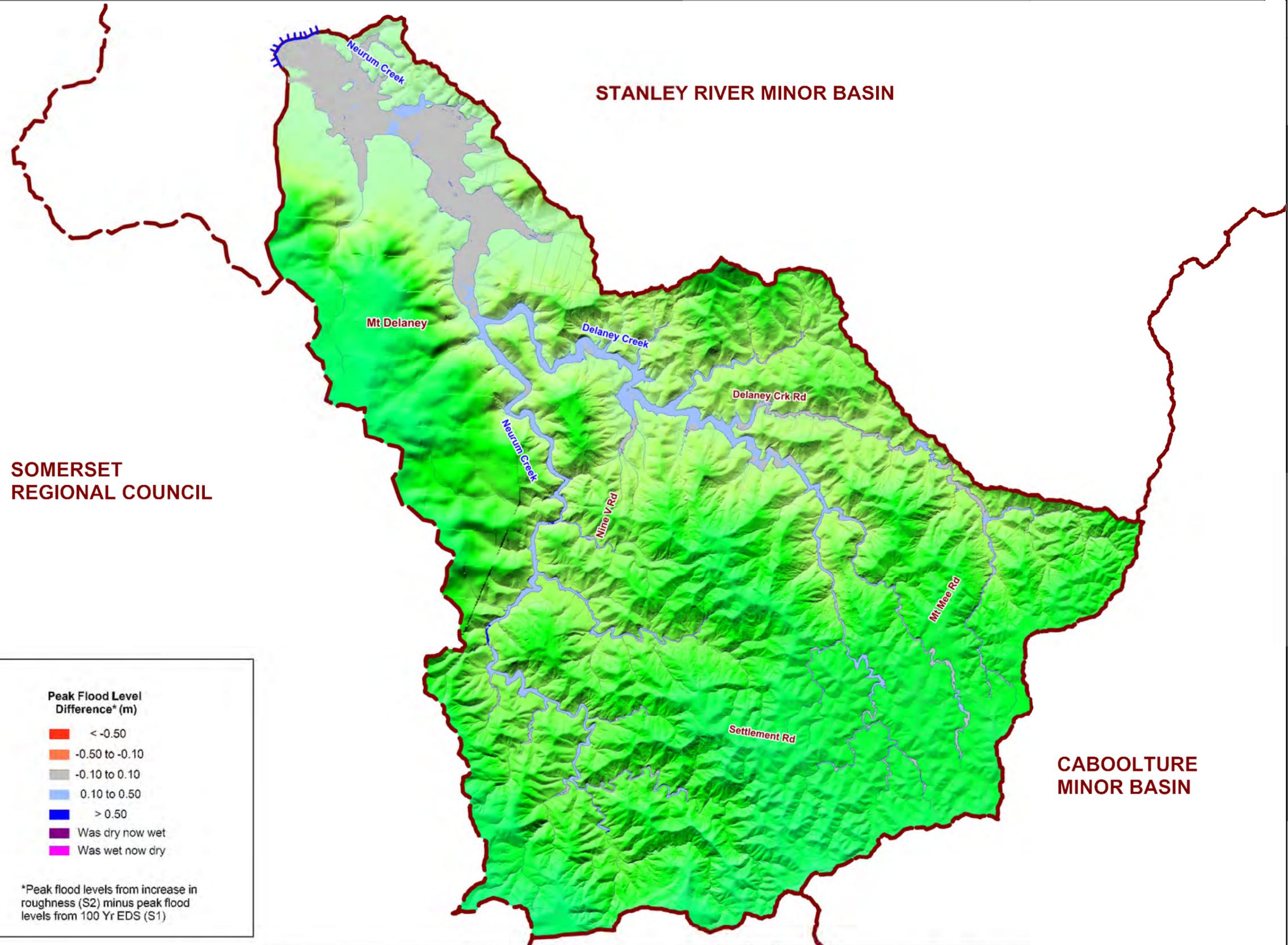
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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
NEURUM CREEK
FIGURE F1 FLOOD LEVEL DIFFERENCE BETWEEN EDS AND SELECTED CRITICAL STORM DURATIONS - 100 YR ARI (S1)

Project No: 301001-01156 Figure:301001-01156-EN-DAL-0130 Rev: 0



LEGEND

- Catchment Boundary
- Downstream Boundary
- Cadastral Boundaries
- 100 yr ARI Flood Extent

Peak Flood Level Difference* (m)

- < -0.50
- 0.50 to -0.10
- 0.10 to 0.10
- 0.10 to 0.50
- > 0.50
- Was dry now wet
- Was wet now dry

*Peak flood levels from increase in roughness (S2) minus peak flood levels from 100 Yr EDS (S1)

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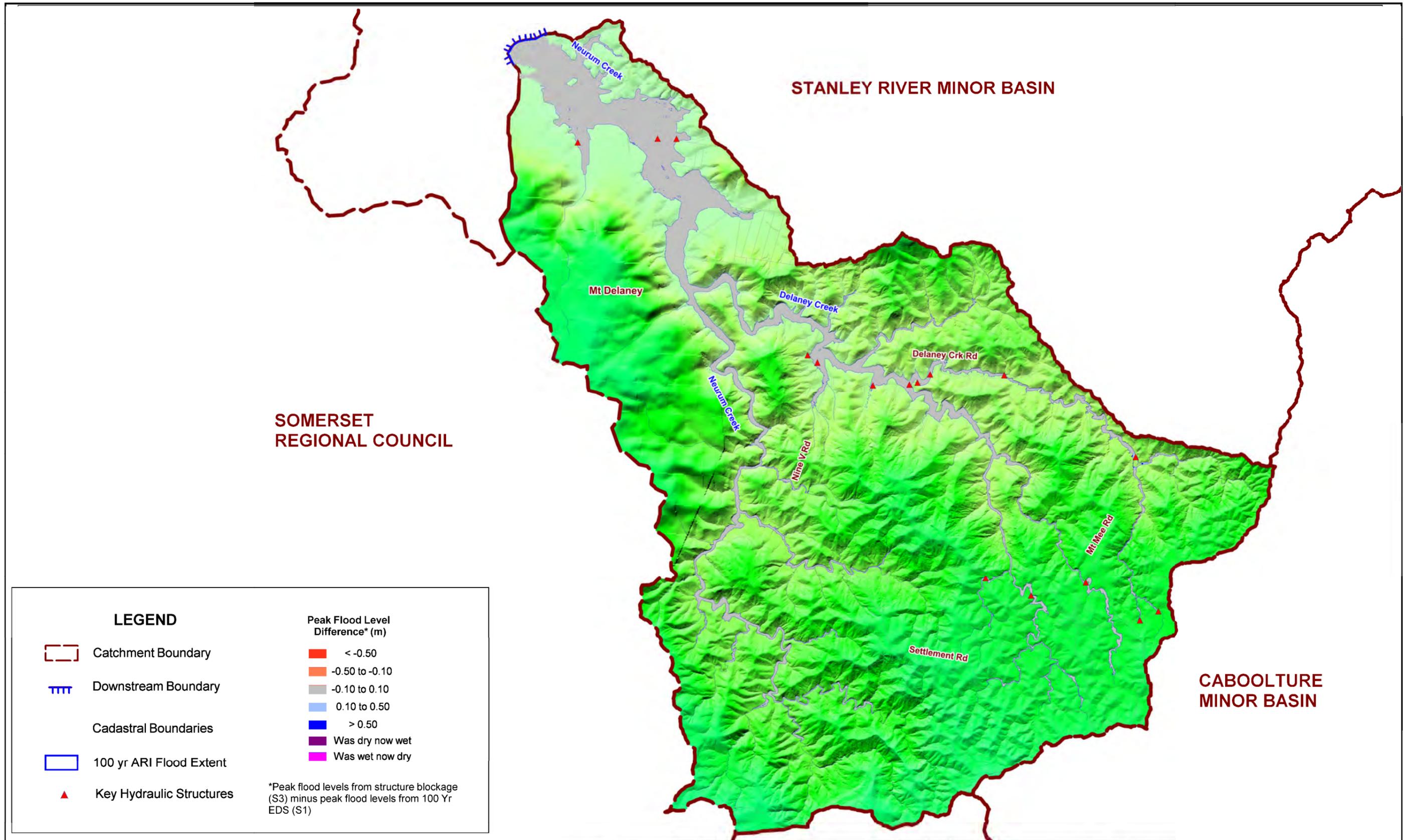
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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
NEURUM CREEK
FIGURE F2 INCREASE IN ROUGHNESS FLOOD LEVEL IMPACT - 100 YEAR EDS (S2)

Project No: 301001-01156 Figure:301001-01156-EN-DAL-0131 Rev: 0



LEGEND

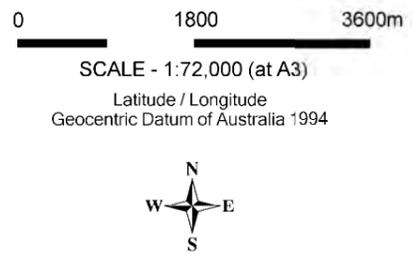
- Catchment Boundary
- Downstream Boundary
- Cadastral Boundaries
- 100 yr ARI Flood Extent
- Key Hydraulic Structures

Peak Flood Level Difference* (m)

- < -0.50
- 0.50 to -0.10
- 0.10 to 0.10
- 0.10 to 0.50
- > 0.50
- Was dry now wet
- Was wet now dry

*Peak flood levels from structure blockage (S3) minus peak flood levels from 100 Yr EDS (S1)

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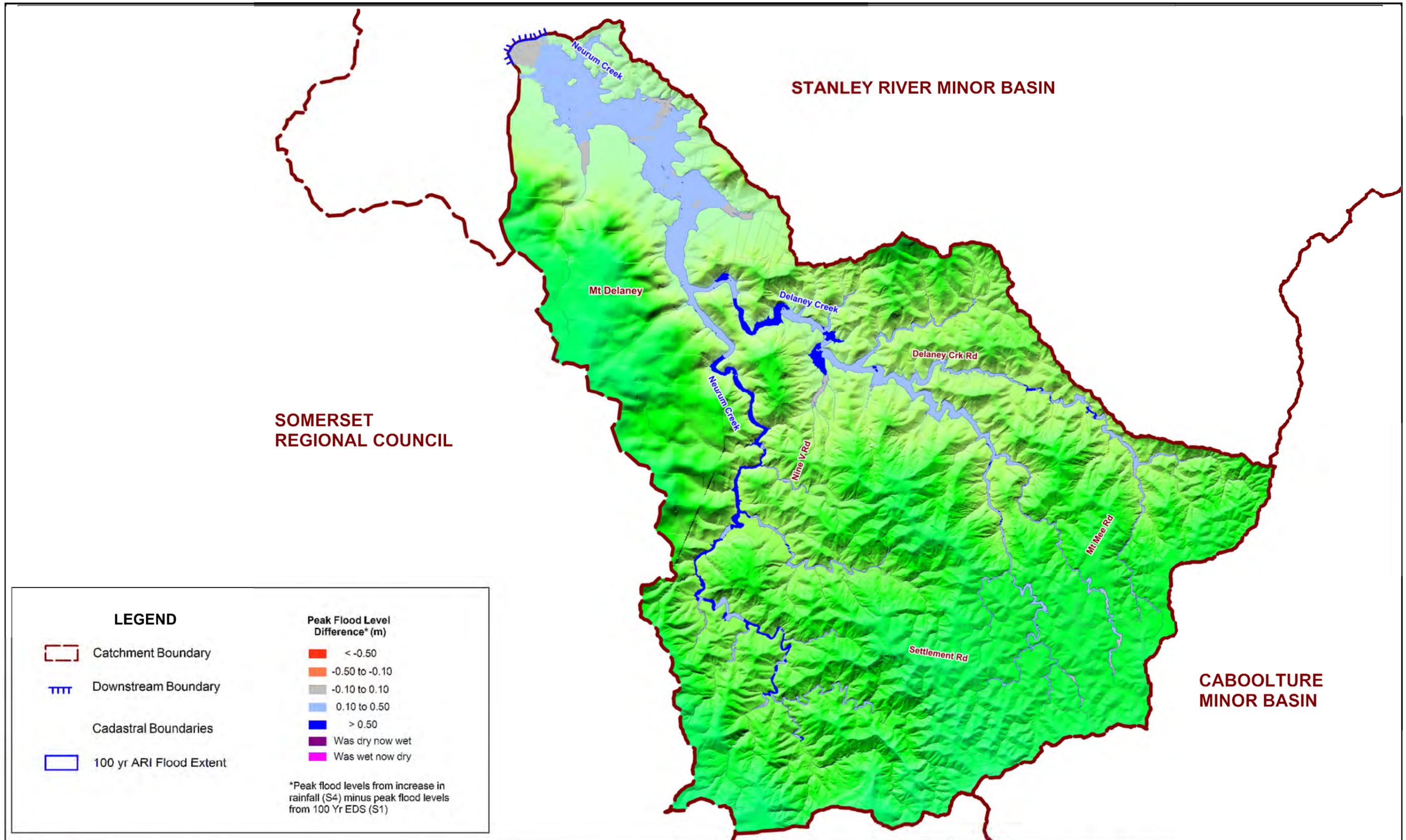


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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
NEURUM CREEK
FIGURE F3 STRUCTURE BLOCKAGE FLOOD LEVEL
IMPACT - 100 YEAR EDS (S3)

Project No: 301001-01156 Figure: 301001-01156-EN-DAL-0132 Rev: 0



LEGEND

- Catchment Boundary
- Downstream Boundary
- Cadastral Boundaries
- 100 yr ARI Flood Extent

Peak Flood Level Difference* (m)

- < -0.50
- 0.50 to -0.10
- 0.10 to 0.10
- 0.10 to 0.50
- > 0.50
- Was dry now wet
- Was wet now dry

*Peak flood levels from increase in rainfall (S4) minus peak flood levels from 100 Yr EDS (S1)

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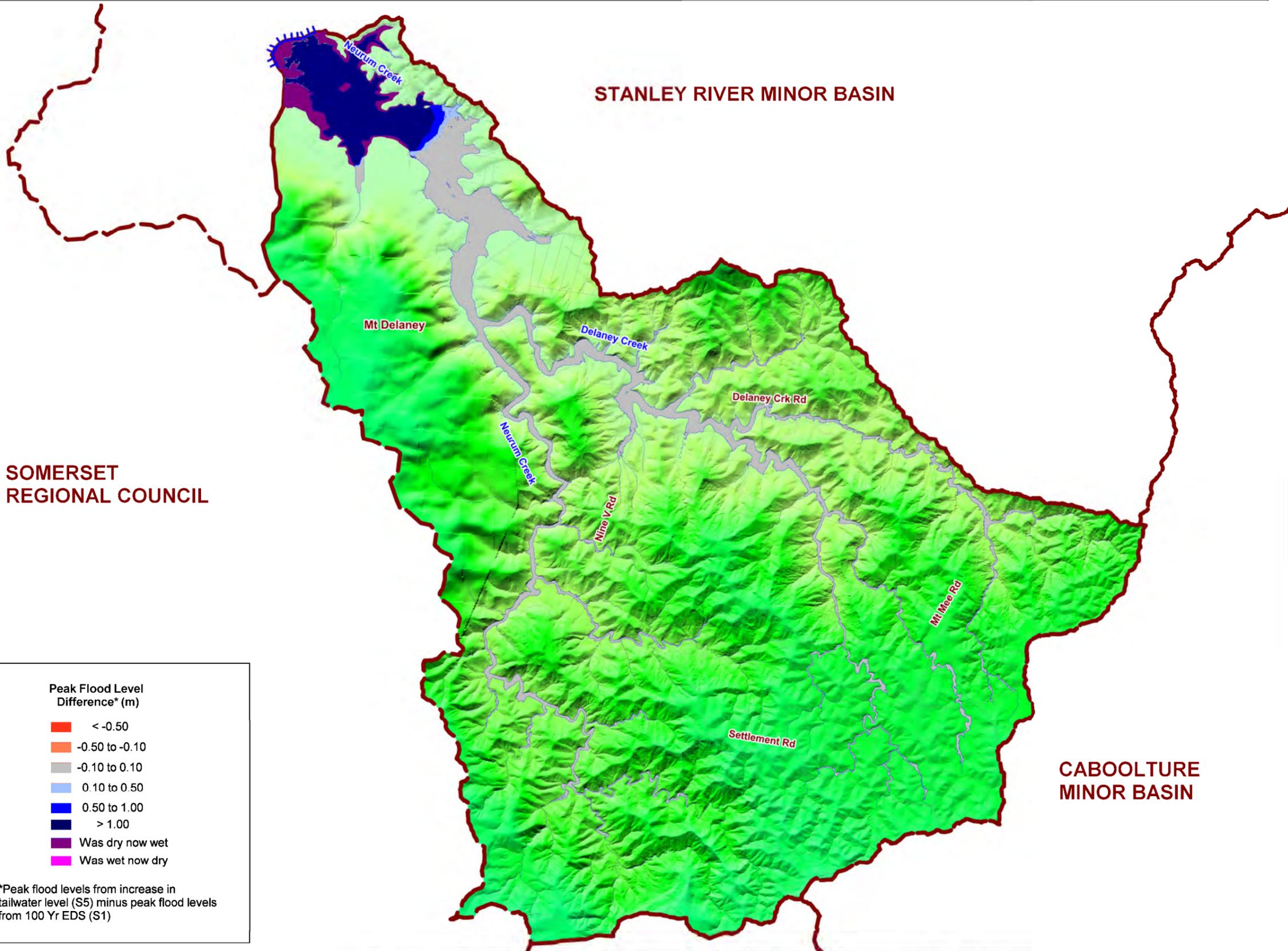
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 Latitude / Longitude
 Geocentric Datum of Australia 1994

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MORETON BAY REGIONAL COUNCIL

REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
NEURUM CREEK
FIGURE F4 INCREASE IN RAINFALL FLOOD LEVEL IMPACT - 100 EDS (S4)

Project No: 301001-01156 Figure:301001-01156-EN-DAL-0133 Rev: 0



LEGEND

- Catchment Boundary
- Downstream Boundary
- Cadastral Boundaries
- 100 yr ARI Flood Extent

Peak Flood Level Difference* (m)

- <-0.50
- 0.50 to -0.10
- 0.10 to 0.10
- 0.10 to 0.50
- 0.50 to 1.00
- > 1.00
- Was dry now wet
- Was wet now dry

*Peak flood levels from increase in tailwater level (S5) minus peak flood levels from 100 Yr EDS (S1)

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SCALE - 1:72,000 (at A3)

Latitude / Longitude
Geocentric Datum of Australia 1994

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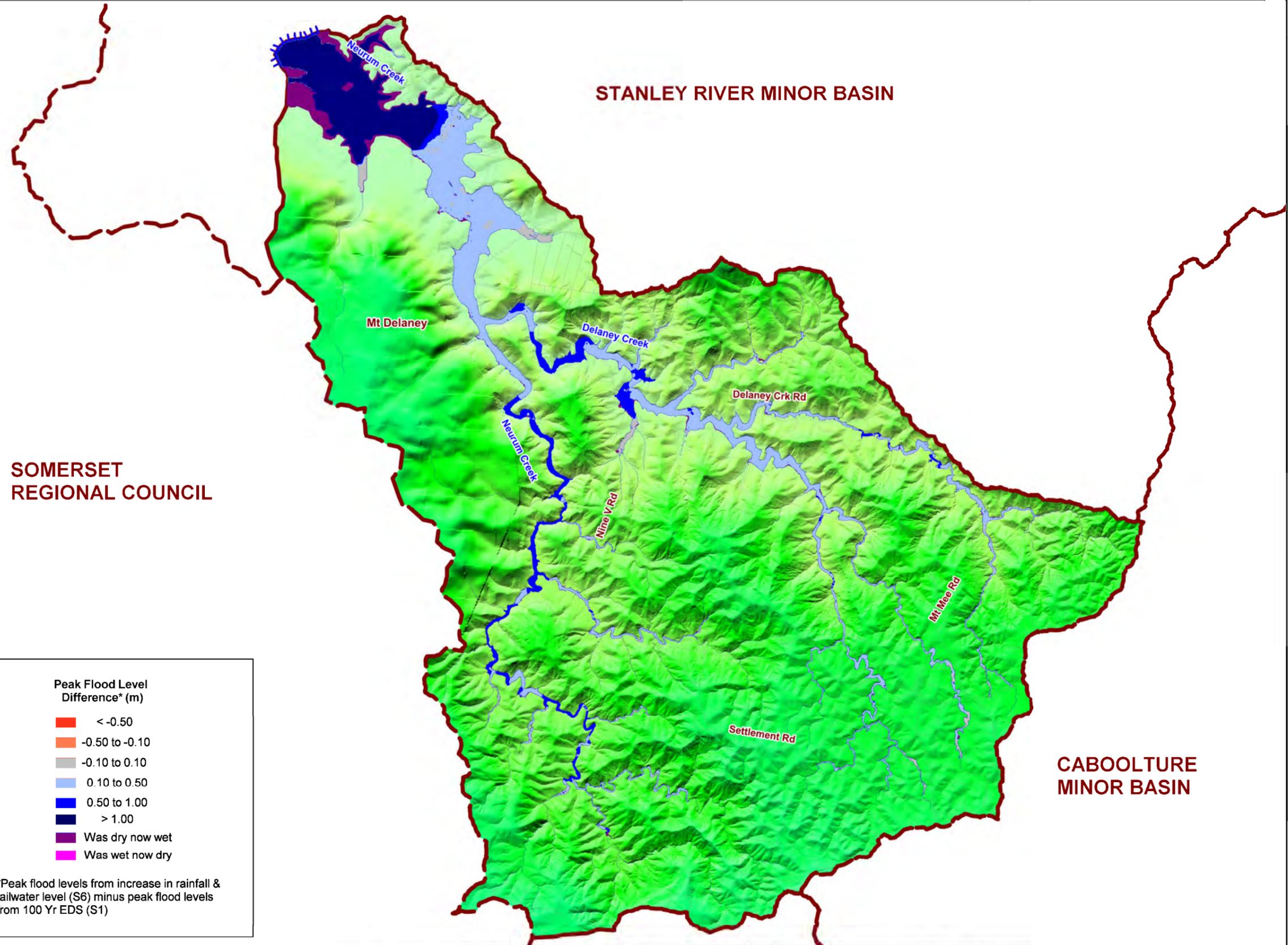
MORETON BAY REGIONAL COUNCIL

REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)

NEURUM CREEK

FIGURE F5 INCREASE IN TAILWATER LEVEL FLOOD LEVEL IMPACT - 100 EDS (S5)

Project No: 301001-01156 Figure:301001-01156-EN-DAL-0134 Rev: 0



STANLEY RIVER MINOR BASIN

SOMERSET REGIONAL COUNCIL

CABOOLTURE MINOR BASIN

LEGEND

- Catchment Boundary
- Downstream Boundary
- Cadastral Boundaries
- 100 yr ARI Flood Extent

Peak Flood Level Difference* (m)

- < -0.50
- 0.50 to -0.10
- 0.10 to 0.10
- 0.10 to 0.50
- 0.50 to 1.00
- > 1.00
- Was dry now wet
- Was wet now dry

*Peak flood levels from increase in rainfall & tailwater level (S6) minus peak flood levels from 100 Yr EDS (S1)

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Latitude / Longitude
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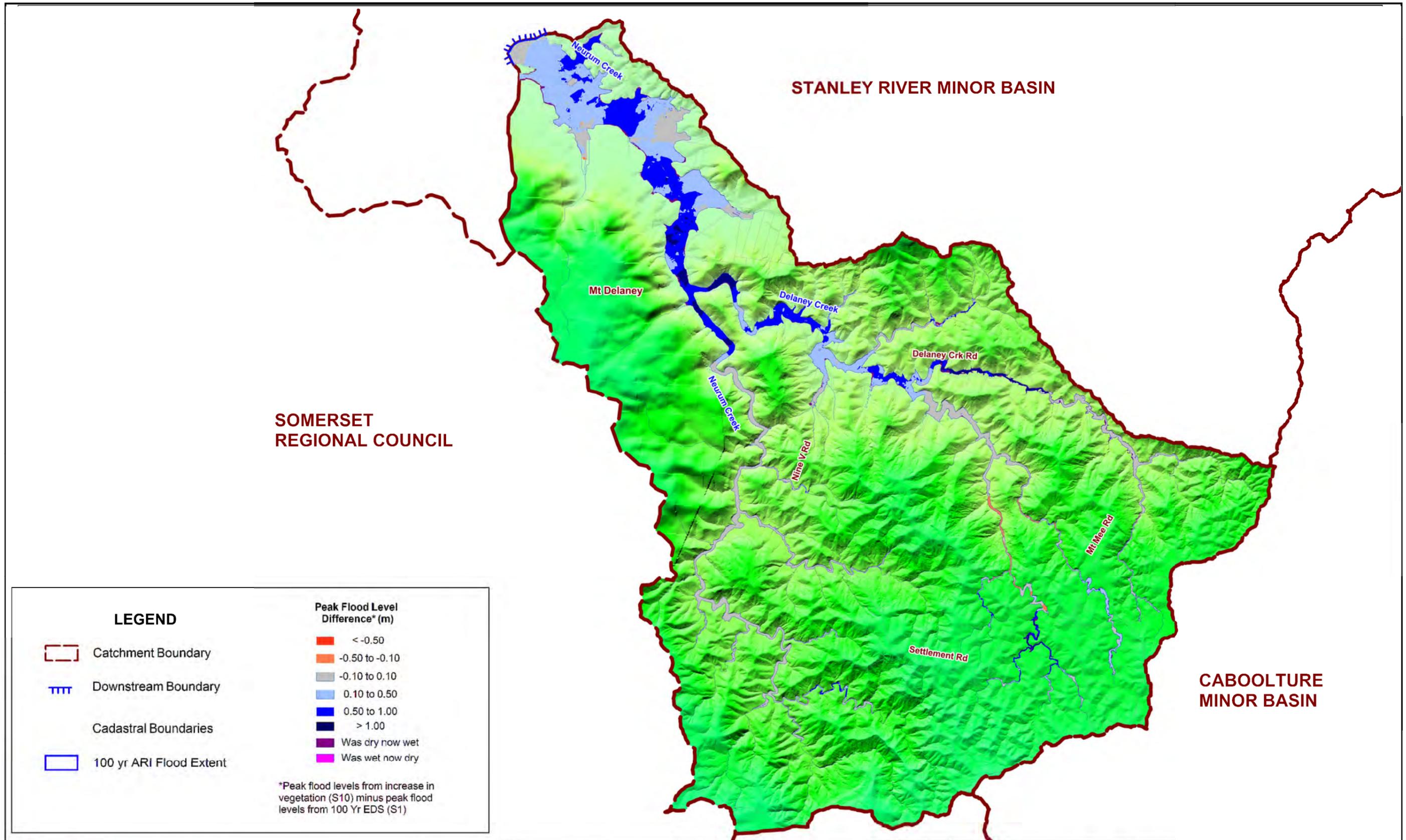
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Regional Council

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**REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
 NEURUM CREEK
 FIGURE F6 INCREASE IN RAINFALL & TAILWATER LEVEL
 FLOOD LEVEL IMPACT - 100 EDS (S6)**

Project No: 301001-01156 Figure:301001-01156-EN-DAL-0135 Rev: 0



LEGEND

- Catchment Boundary
- Downstream Boundary
- Cadastral Boundaries
- 100 yr ARI Flood Extent

Peak Flood Level Difference* (m)

- < -0.50
- 0.50 to -0.10
- 0.10 to 0.10
- 0.10 to 0.50
- 0.50 to 1.00
- > 1.00
- Was dry now wet
- Was wet now dry

*Peak flood levels from increase in vegetation (S10) minus peak flood levels from 100 Yr EDS (S1)

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 Latitude / Longitude
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REGIONAL FLOODPLAIN DATABASE PROJECT (STAGE 2)
NEURUM CREEK
FIGURE F10 INCREASE IN VEGETATION FLOOD LEVEL IMPACT - 100 EDS (S10)

Project No: 301001-01156 Figure:301001-01156-EN-DAL-0136 Rev: 0