APPENDIX D: MODELLING QUALITY REPORT

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TECHNICAL NOTE

DATE	10 July 2010
TO	Moreton Bay Regional Council
FROM	Leonard Cheung
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PROJECT	301001-01156
SUBJECT	Sideling Creek Modelling Quality Report
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FILE LOC	

INTRODUCTION

A detailed TUFLOW model of the Sideling Creek River (SID) 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 SID 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 SID 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 flood water flowing through the 1D structure elements in the model as well as flowing across 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) and the Sideling Creek Dam to ensure the simulation has well passed beyond the peak throughout the SID study area, especially the downstream boundary at the spillway of Sideling Creek Dam.

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

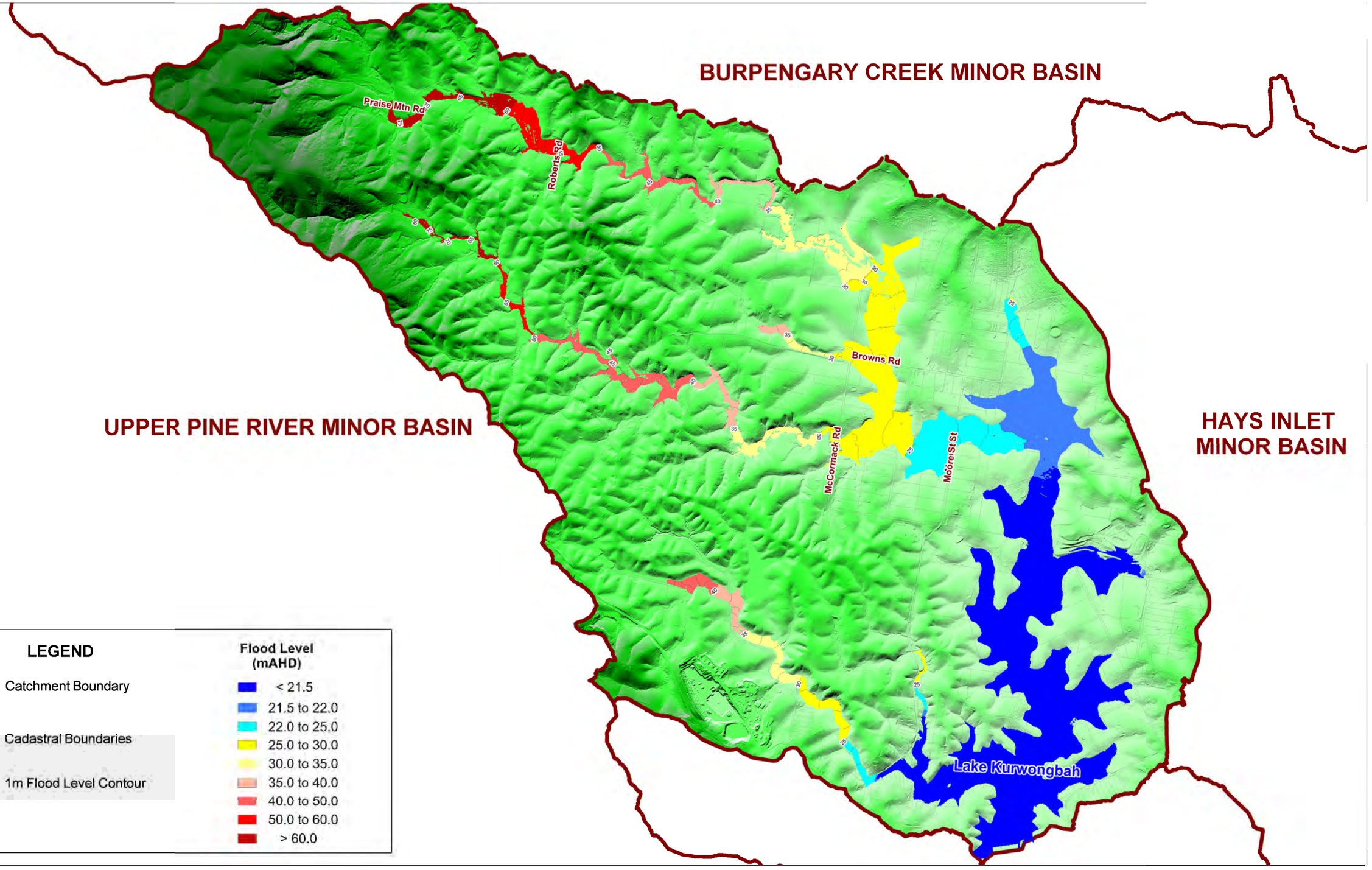
Event	10Yr ARI			100Yr ARI			PMF		
Critical Duration	060M	180M	360M	060M	180M	360M	120M	180M	300M
Volume at Start (m3)	9612415	9612415	9612415	9612415	9612415	9612415	9612415	9612415	9612415
Volume at End (m3)	10150121	10388068	10412879	10300106	10558580	10217259	11137993	11492142	10668642
Total Volume In (m3)	3382970	4937983	6468904	5261737	7835155	9785342	33235555	40389255	50533982
Total Volume Out (m3)	2712465	4215151	5763934	4390524	6938566	8866594	30975991	38407960	48872489
Volume Error (m3)	-132798	52822	95494	-183521	49576	-313904	-733985	-101567	-605265
Final Cummulative ME (%)	-1.31%	0.51%	0.78%	-1.78%	0.34%	-1.68%	-1.14%	-0.13%	-0.61%

The above table shows that there is no significant loss or gain of flood volume during the modelling and the mass balance errors are within the range of -1.78% to +0.78% for the selected critical duration runs of the three design events.

CONCLUSIONS

The quality of the SID 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 Sideling Creek minor basin.

APPENDIX E: FLOOD MAPS – 100 YEAR ARI



LEGEND

- Catchment Boundary
- Cadastral Boundaries
- 1m Flood Level Contour

Flood Level (mAHD)

- < 21.5
- 21.5 to 22.0
- 22.0 to 25.0
- 25.0 to 30.0
- 30.0 to 35.0
- 35.0 to 40.0
- 40.0 to 50.0
- 50.0 to 60.0
- > 60.0

0 1000 2000m

SCALE - 1:40,000 (at A3)

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

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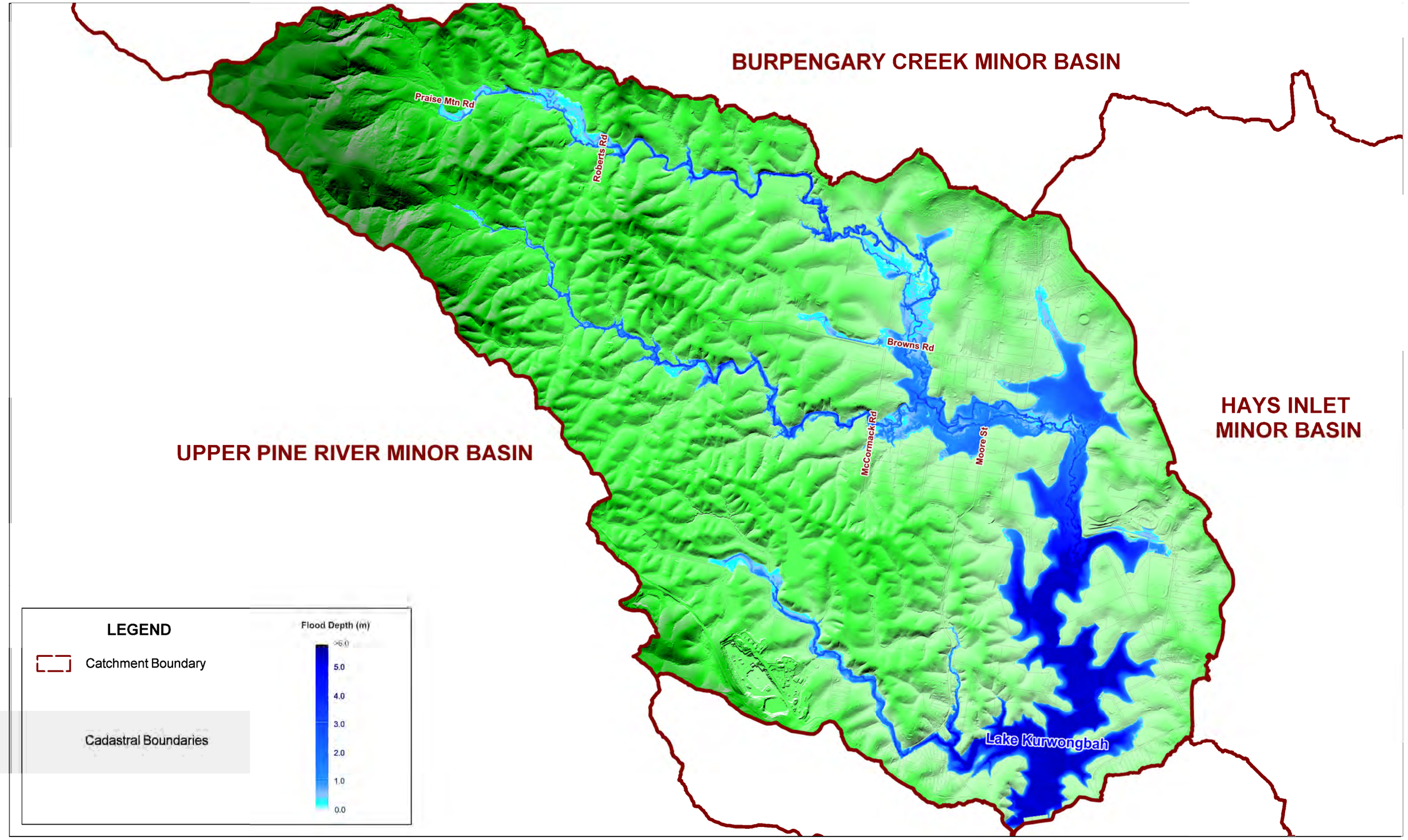

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SCALE - 1:40,000 (at A3)

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FIGURE E2 PEAK FLOOD DEPTH MAP - 100 YEAR ARI

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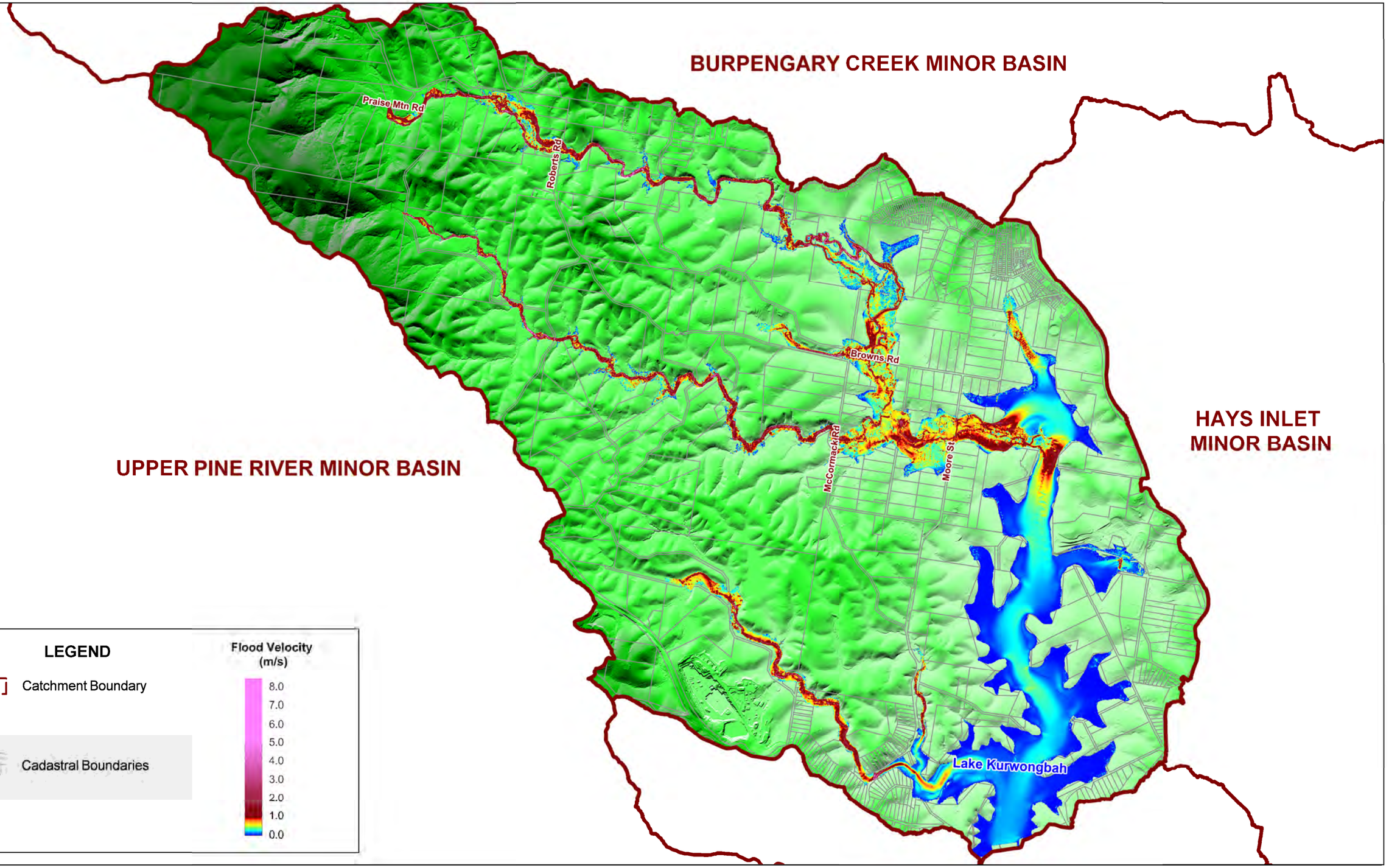

LEGEND

Catchment Boundary

Cadastral Boundaries

Flood Velocity (m/s)

8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0

0 1000 2000m

SCALE - 1:40,000 (at A3)

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FIGURE E3 PEAK FLOOD VELOCITY MAP - 100 YEAR ARI

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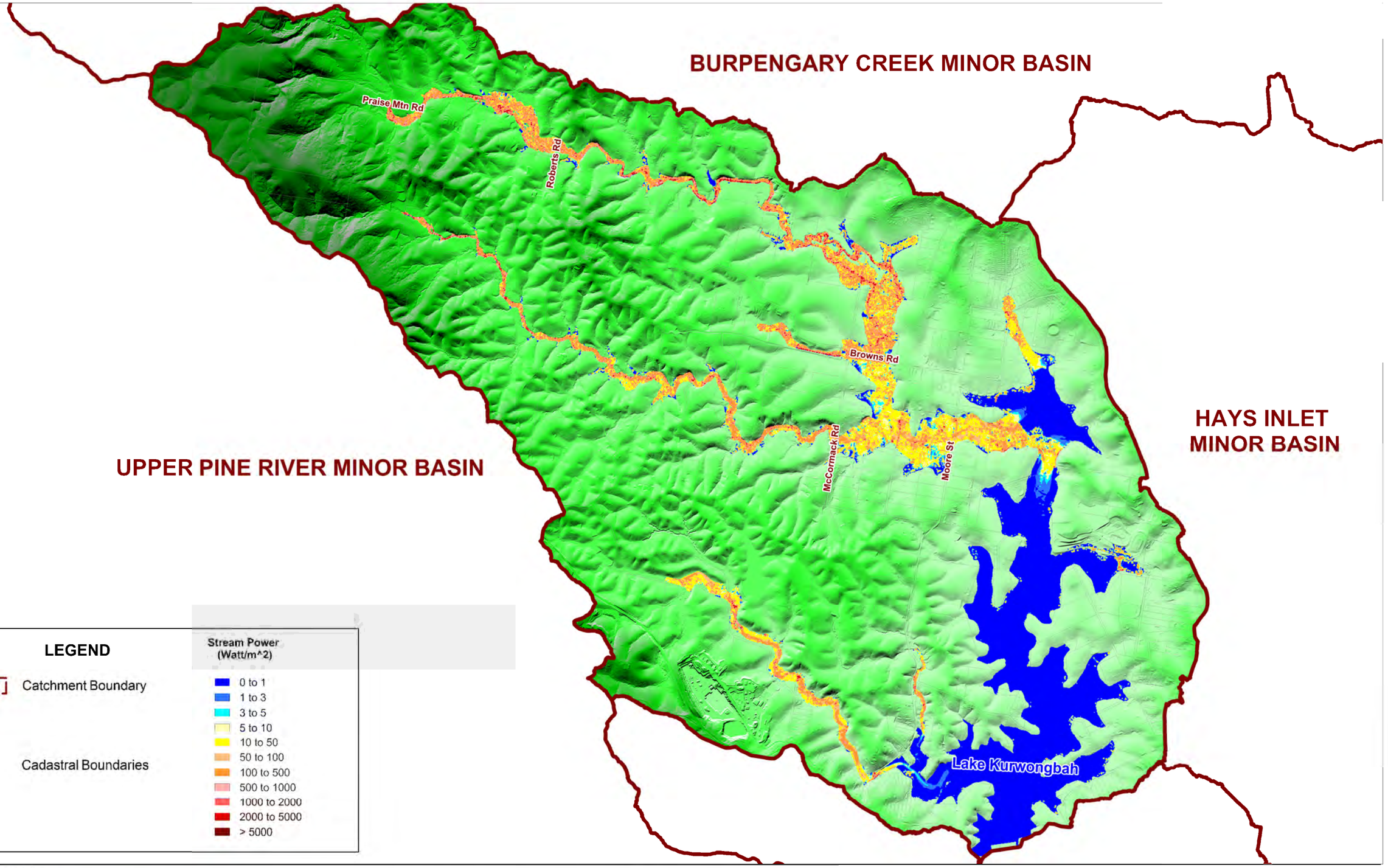

LEGEND

Catchment Boundary

Cadastral Boundaries

Stream Power (Watt/m^2)

- 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

0 1000 2000m

SCALE - 1:40.000 (at A3)

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FIGURE E4 PEAK STREAM POWER MAP - 100 YEAR ARI

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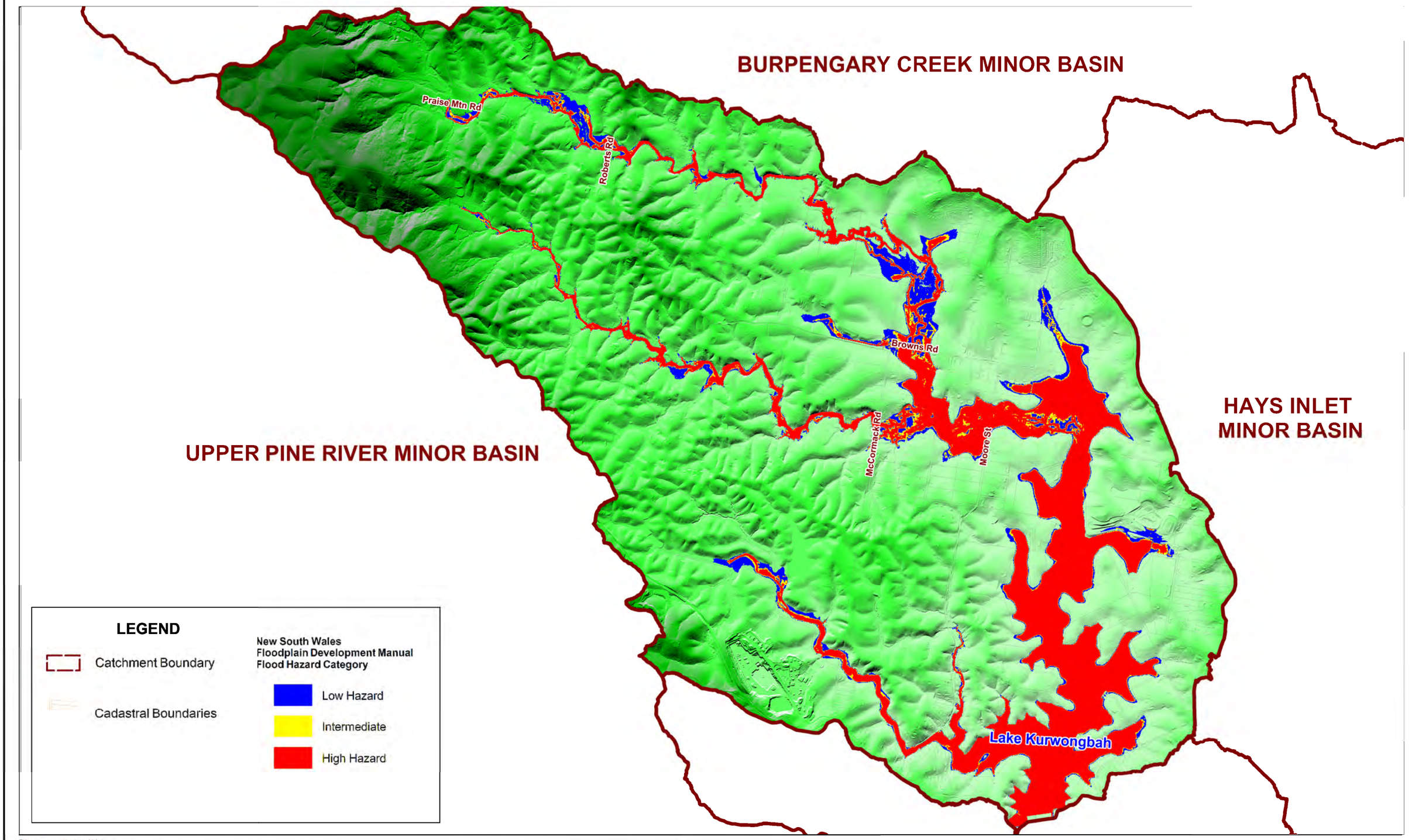

LEGEND

Catchment Boundary

Cadastral Boundaries

New South Wales Floodplain Development Manual Flood Hazard Category

- Low Hazard
- Intermediate
- High Hazard

0 1000 2000m

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FIGURE E5 PEAK FLOOD HAZARD MAP - 100 YEAR ARI

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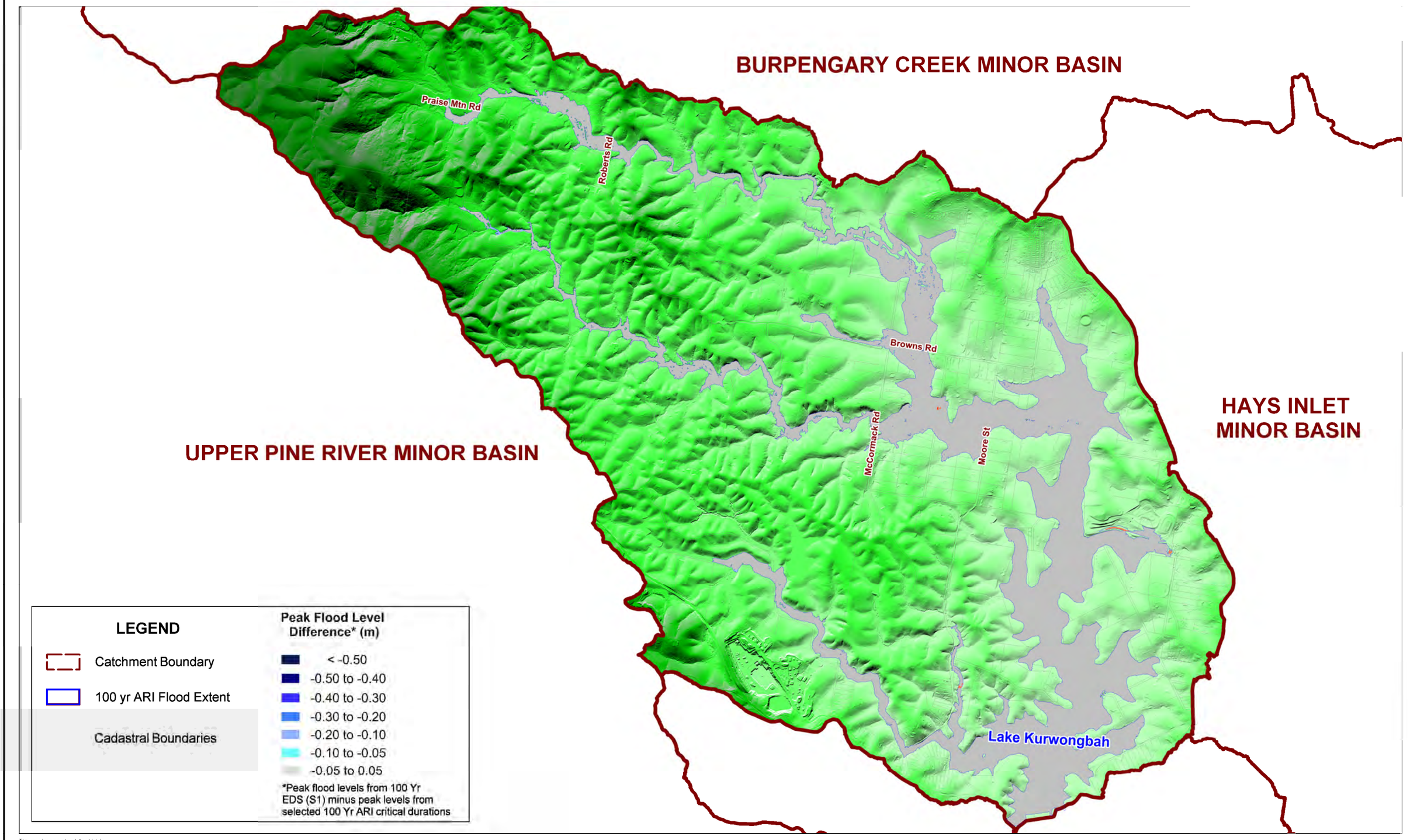
APPENDIX F: MODEL SENSITIVITY ANALYSIS MAPS



LEGEND

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

Peak Flood Level Difference* (m)

- < -0.50
- -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

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

0 1000 2000m

SCALE - 1:40,000 (at A3)

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FIGURE F1 FLOOD LEVEL DIFFERENCE BETWEEN EDS AND SELECTED CRITICAL STORM DURATIONS - 100 YR ARI (S1)

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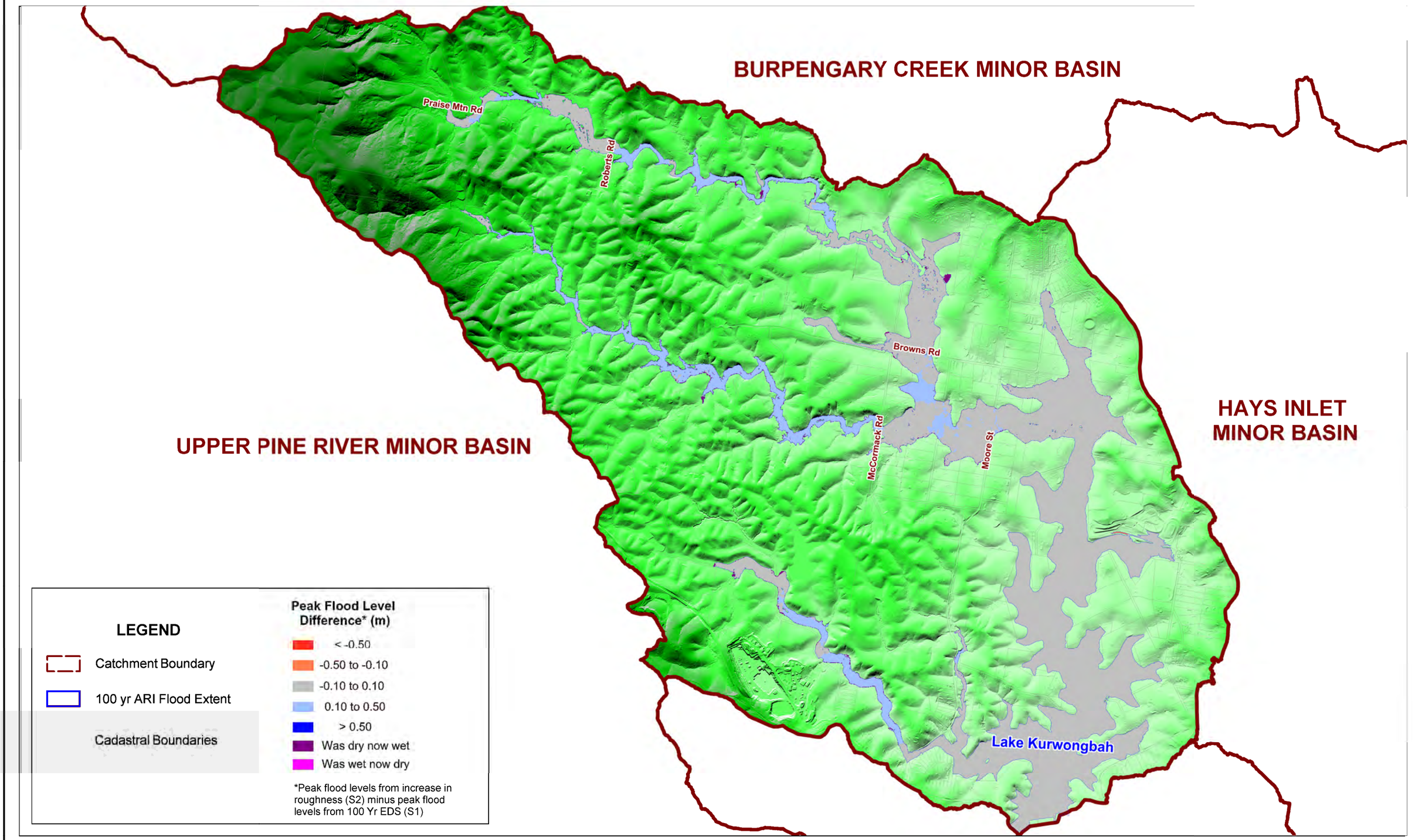

LEGEND

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

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)

0 1000 2000m

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FIGURE F2 INCREASE IN ROUGHNESS FLOOD LEVEL IMPACT - 100 YEAR EDS (S2)

Project No: 301001-01156	Figure:301001-01156-EN-DAL-0061	Rev: 0

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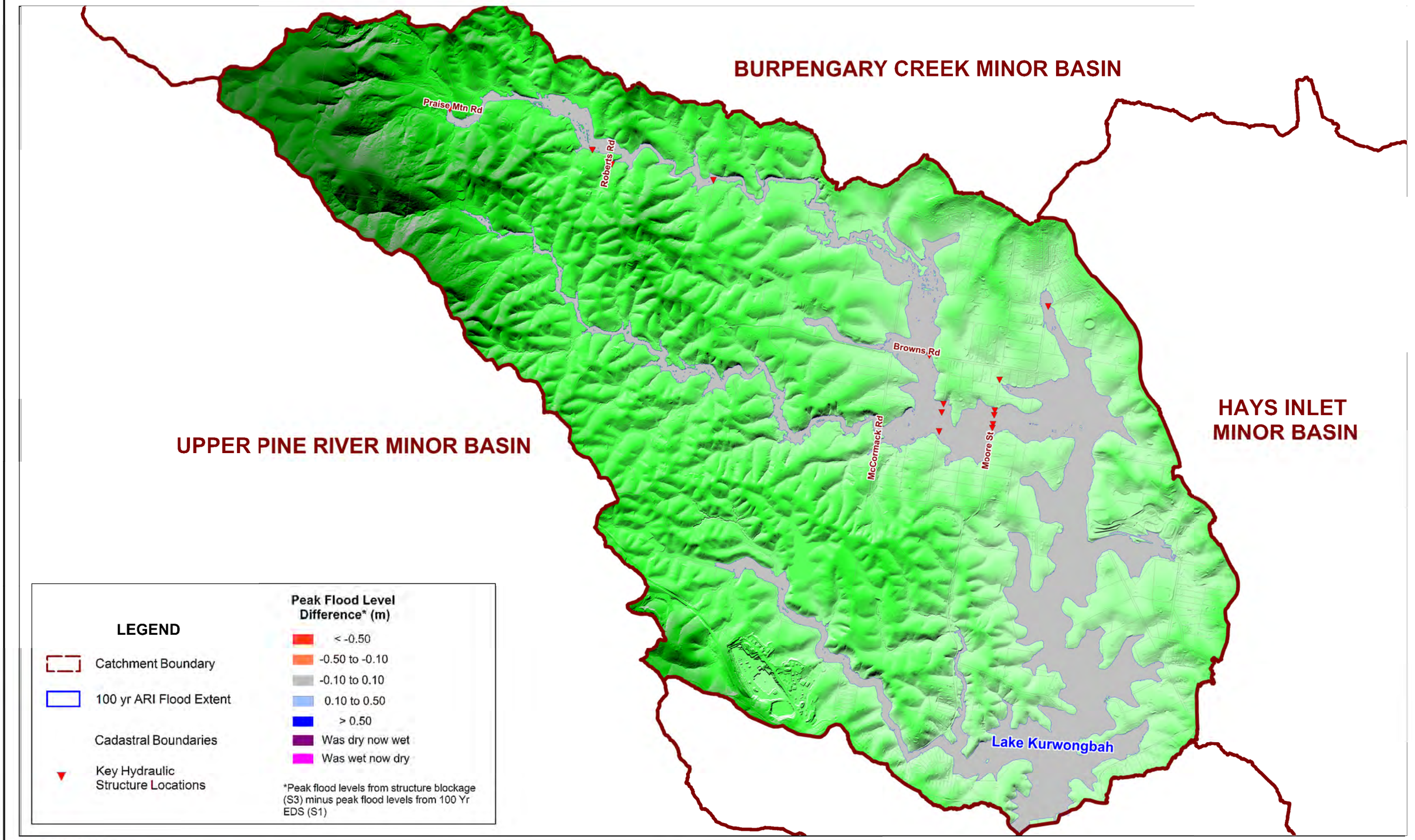

LEGEND

- Catchment Boundary
- 100 yr ARI Flood Extent
- Cadastral Boundaries
- Key Hydraulic Structure Locations

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)

0 1000 2000m

SCALE - 1:40.000 (at A3)

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FIGURE F3 STRUCTURE BLOCKAGE FLOOD LEVEL IMPACT - 100 YEAR EDS (S3)

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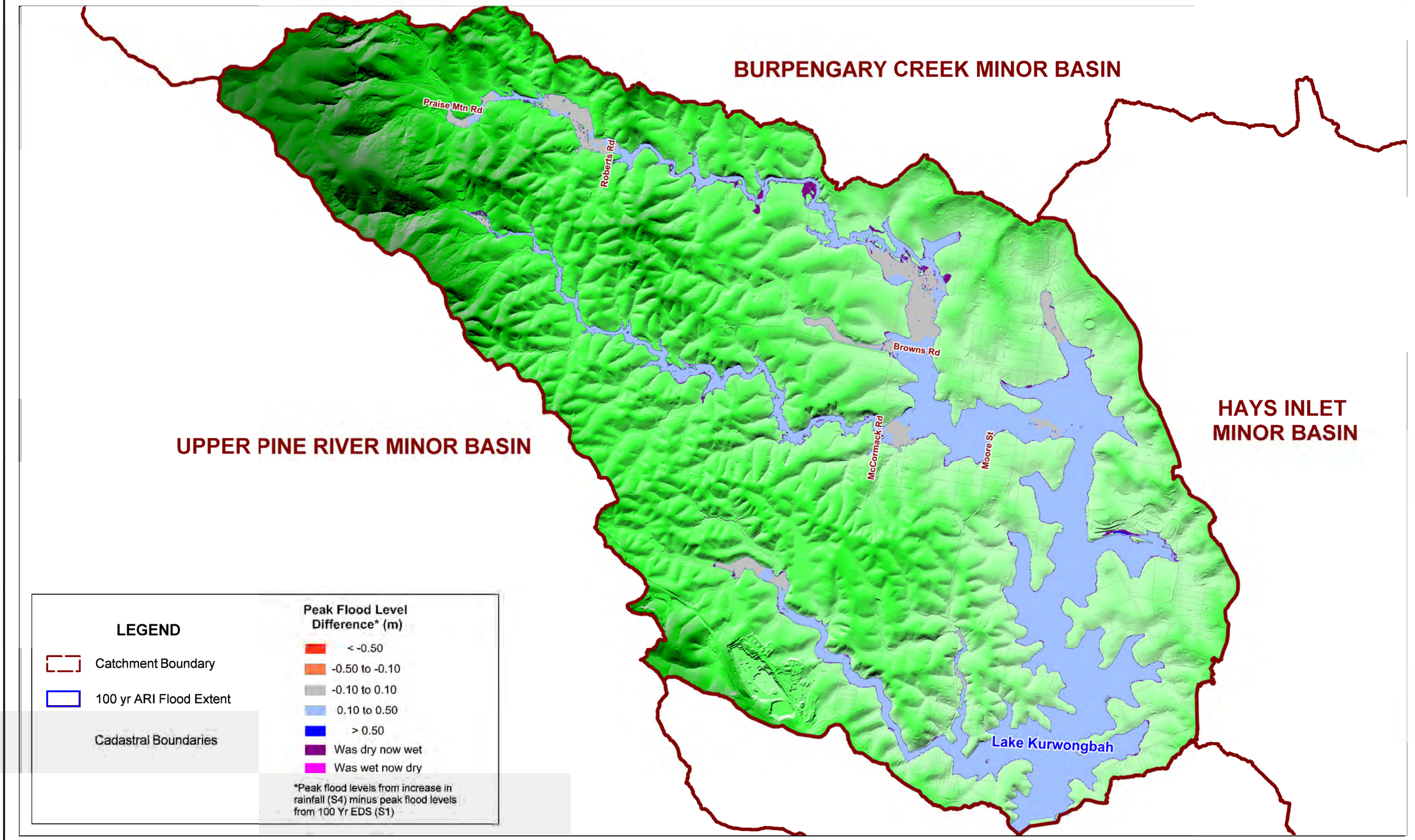

LEGEND

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

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)

0 1000 2000m

SCALE - 1:40,000 (at A3)

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FIGURE F4 INCREASE IN RAINFALL FLOOD LEVEL IMPACT - 100 EDS (S4)

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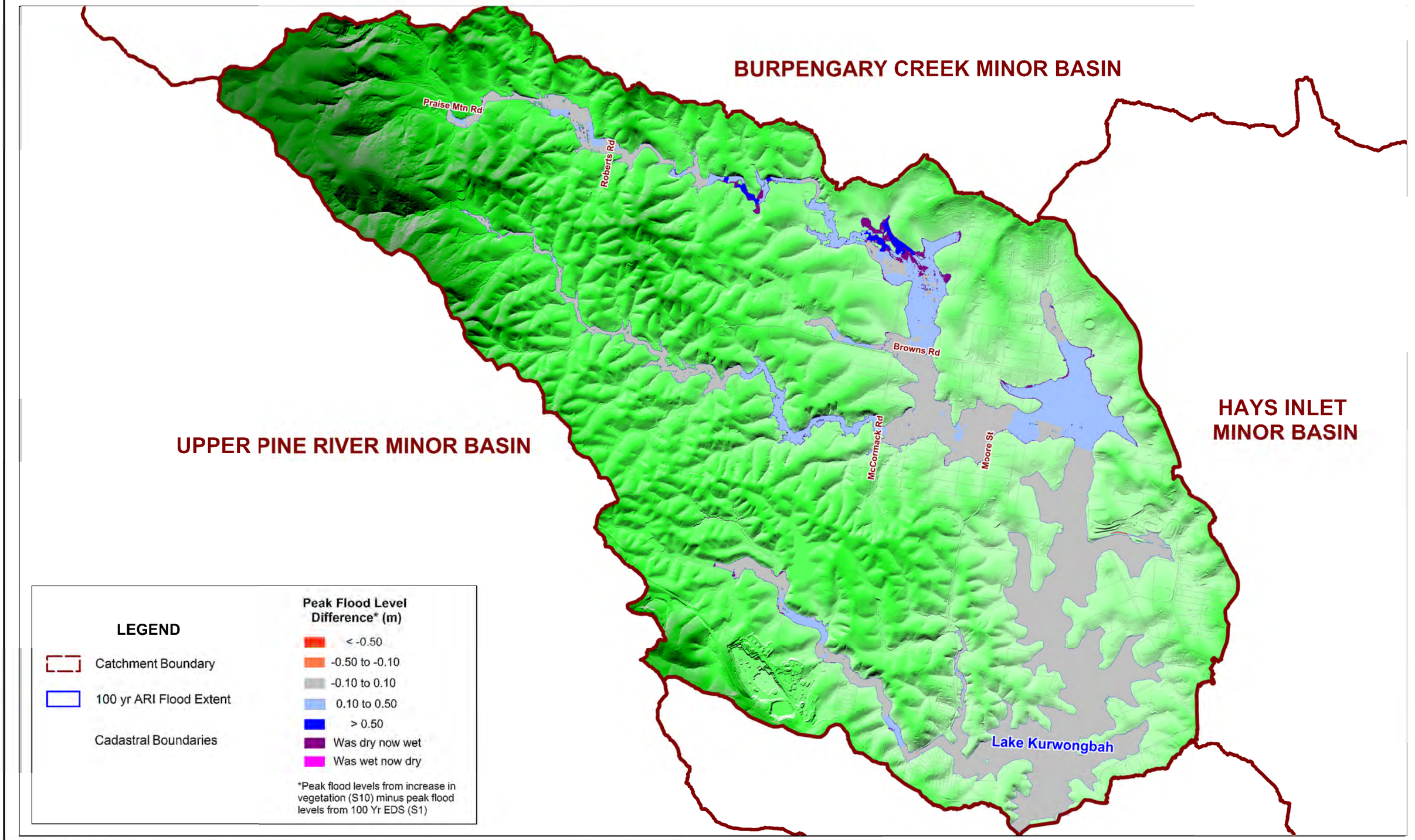

LEGEND

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

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 vegetation (S10) minus peak flood levels from 100 Yr EDS (S1)

0 1000 2000m

SCALE - 1:40.000 (at A3)

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

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