BMT WBM

Mount William Creek Flood Investigation

Final Report

Reference: R.M20045.007.01.FinalReport.docx
Date: December 2014

Mount William Creek Flood Investigation
Final Report

Prepared for:	Wimmera Catchment Management Authority
Prepared by:	BMT WBM Pty Ltd (Member of the BMT group of companies)

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Title:	Mount William Creek Flood Investigation Final Report
Project Manager:	Joel Leister
Author:	Joel Leister
Client:	Wimmera Catchment Management Authority
Client Contact:	Jack Purcell and Clare Wilson
Client Reference:	WCMA 2012 - 2013 - 017

Synopsis: **This final report documents the methodology and findings of the Mount William Creek Flood Investigation**

REVISION/CHECKING HISTORY

Revision Number	Date	Checked by		Issued by	
0	17/10/2014	DR		JL	
1	11/12/2014	MT		JL	

DISTRIBUTION

Destination	Revision										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
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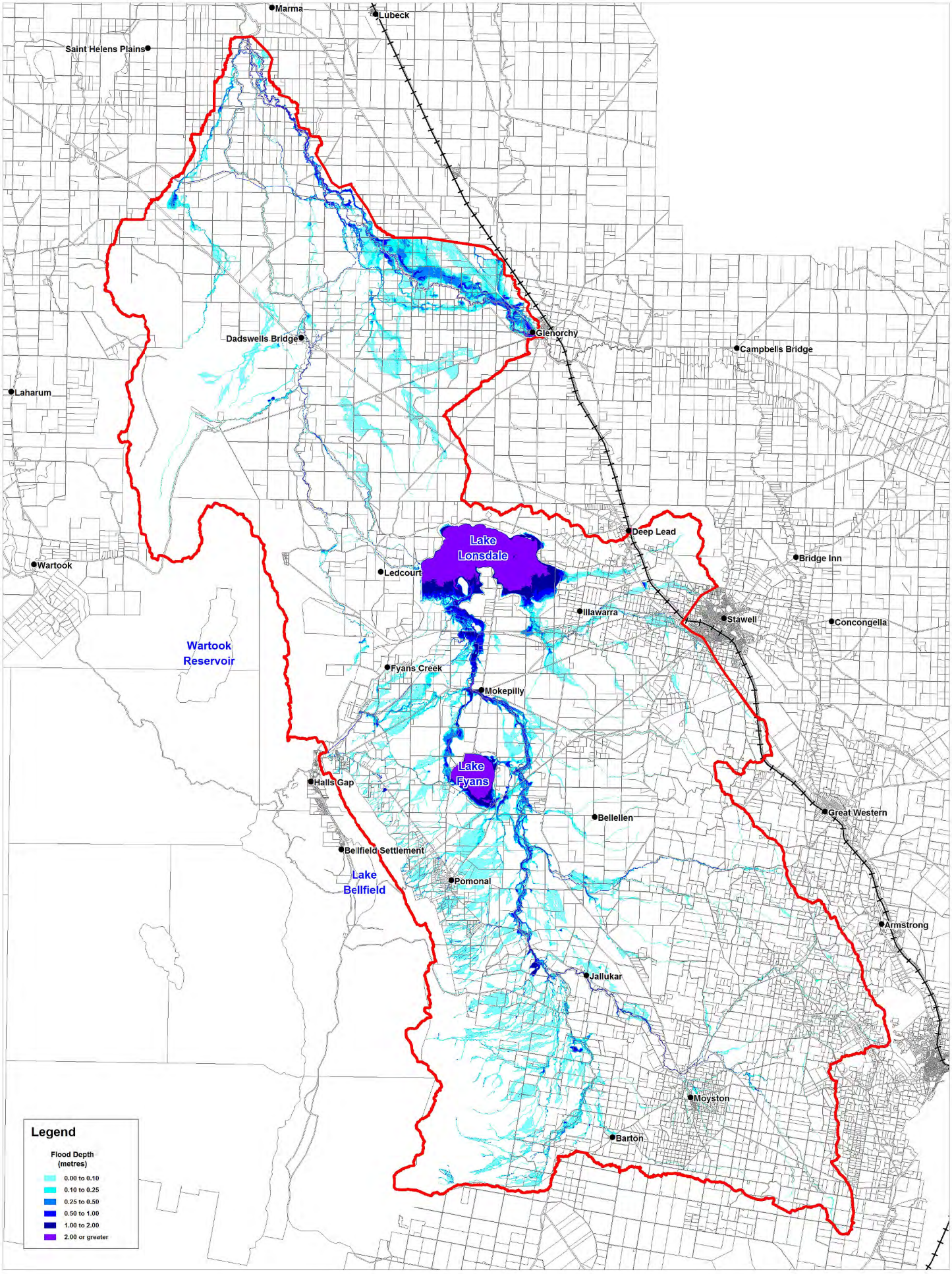
Appendix A Flood Depth Mapping



Title:

Mount William Creek Flood Investigation
1 in 5 Year ARI Flood Depths - Whole of Catchment

Figure: **A-1**

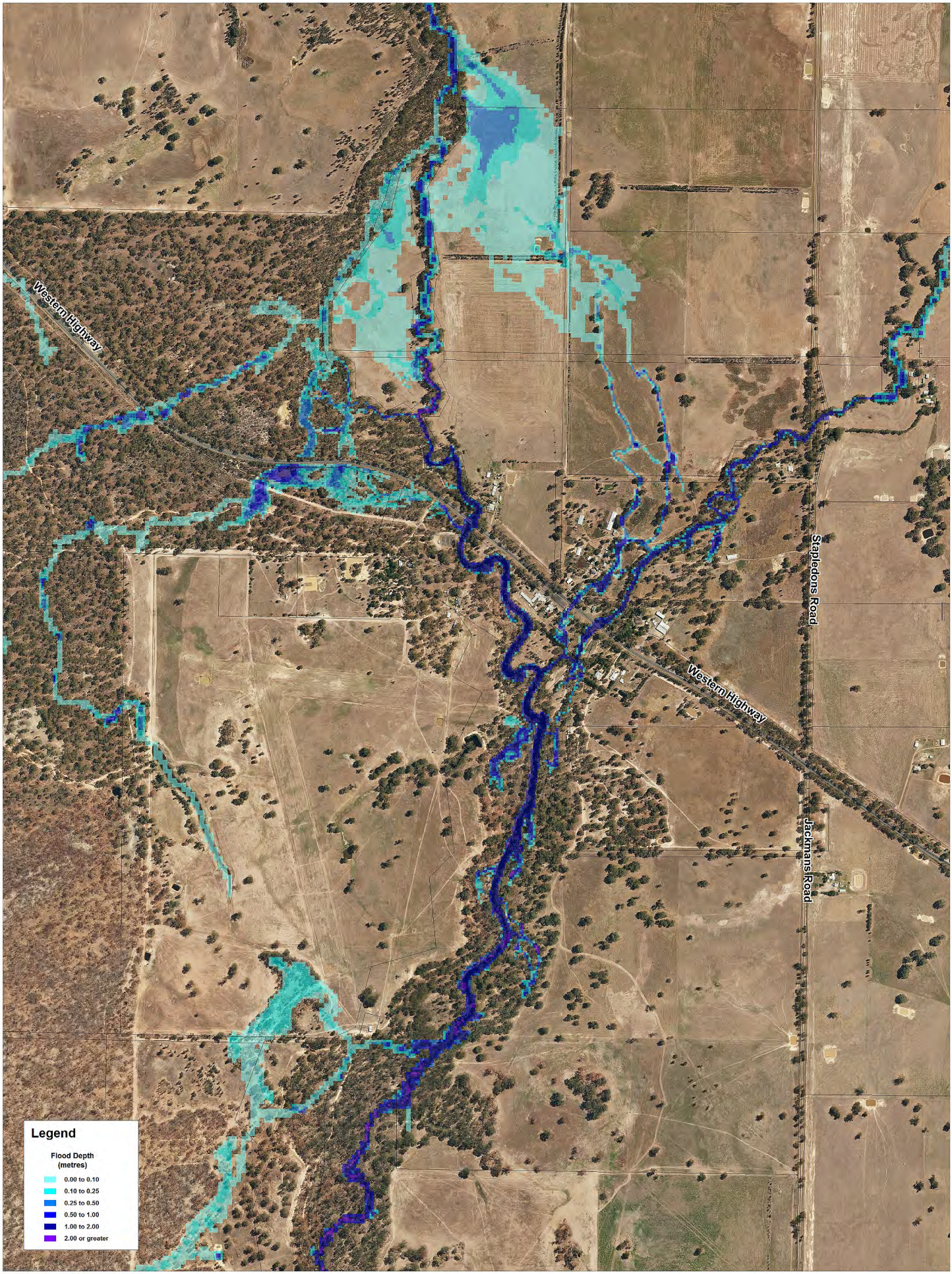
Rev: **A**

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-1_E01_5yr_047_dMax_catch_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 5 Year ARI Flood Depths - Dadswells Bridge

Figure: **A-2**

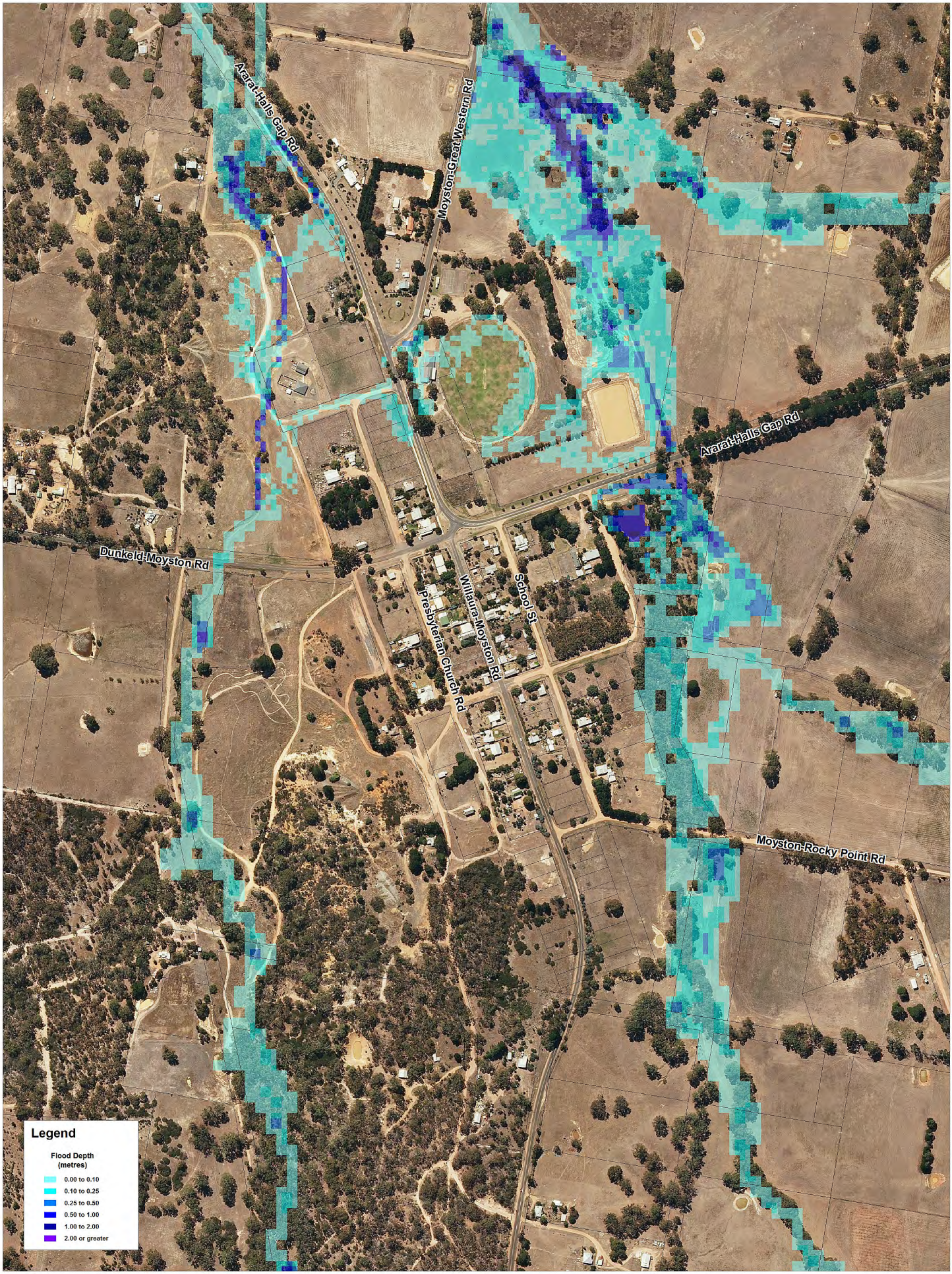
Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-2_E01_5yr_047_dMax_Dad_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 5 Year ARI Flood Depths - Moyston

Figure: **A-3**

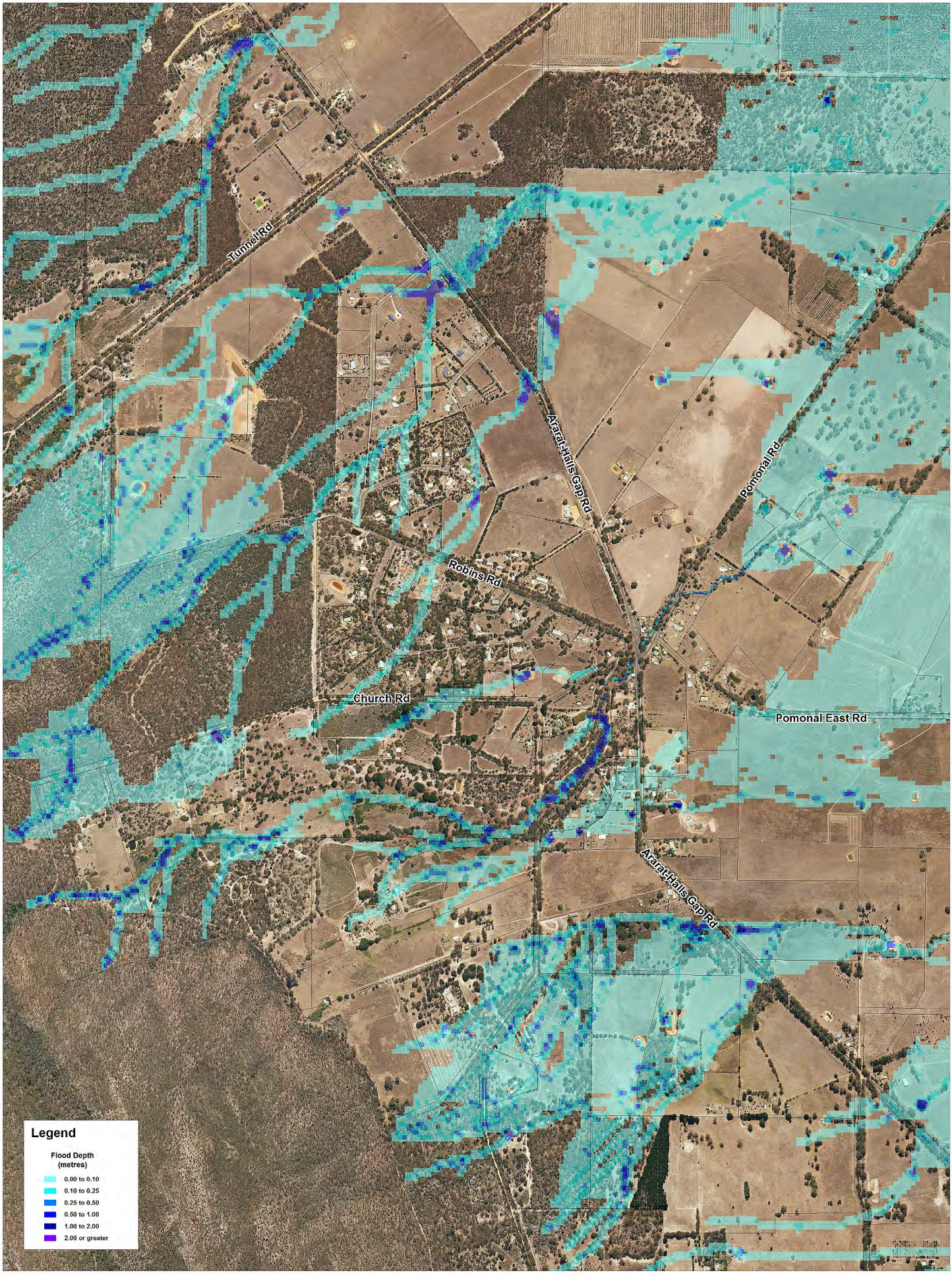
Rev: **A**

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-3_E01_5yr_047_dMax_Moy_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 5 Year ARI Flood Depths - Pomonal

Figure: **A-4**

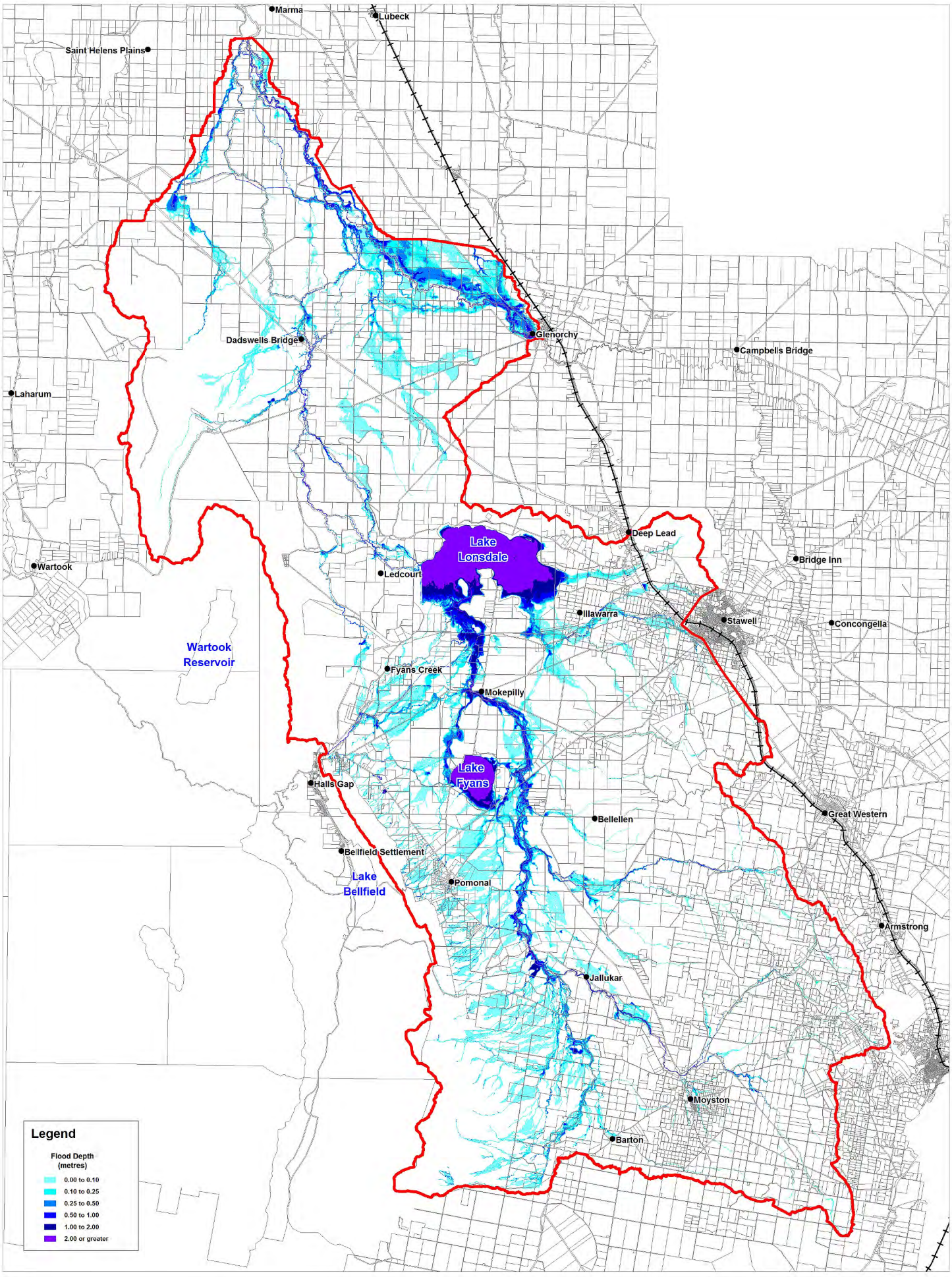
Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-4_E01_5yr_047_dMax_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 10 Year ARI Flood Depths - Whole of Catchment

Figure: **A-5**

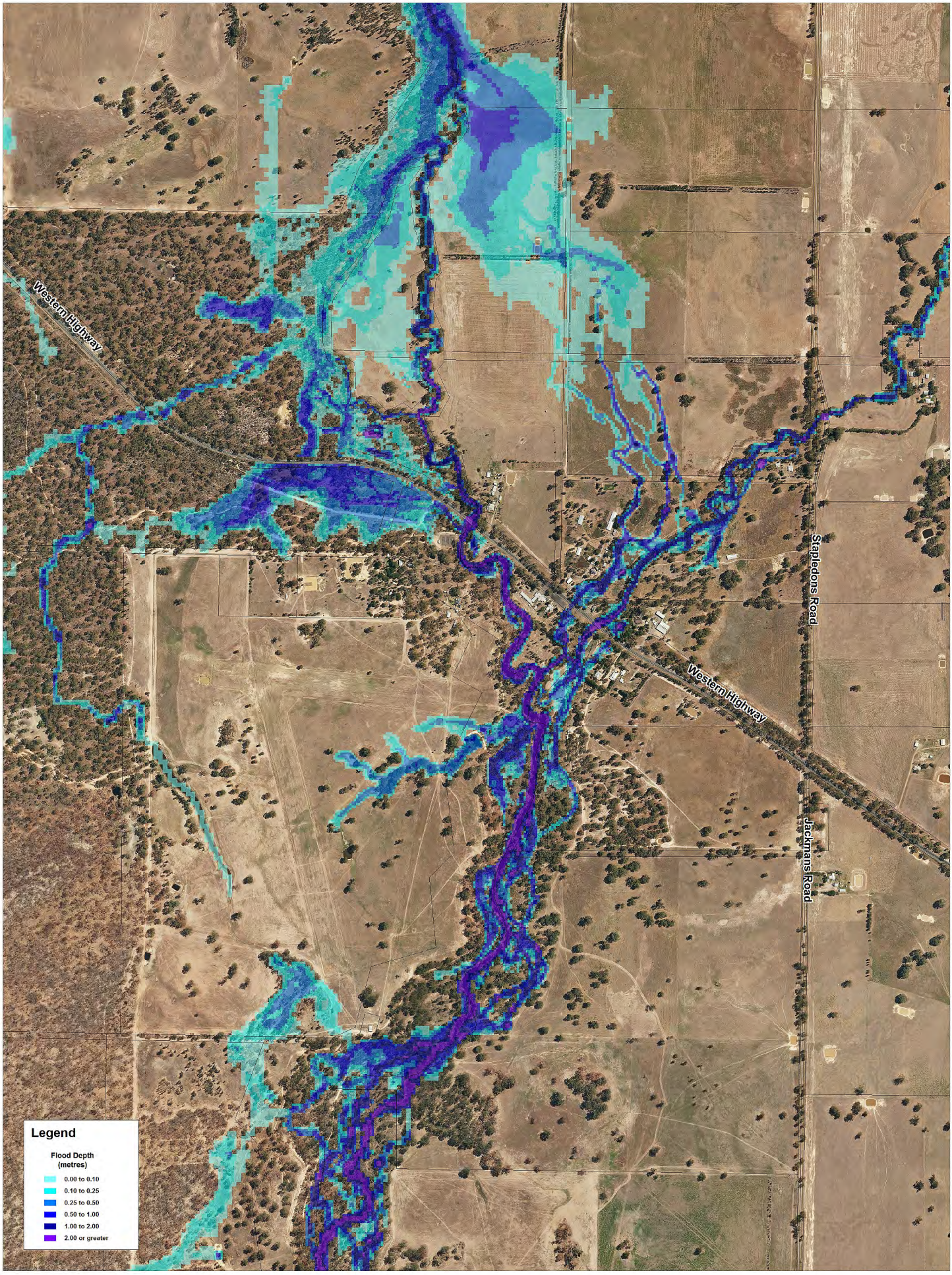
Rev: **A**

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-5_E01_10yr_047_dMax_catch_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 10 Year ARI Flood Depths - Dadswells Bridge

Figure: **A-6**

Rev: **A**

N

0 250 500m

Approx. Scale

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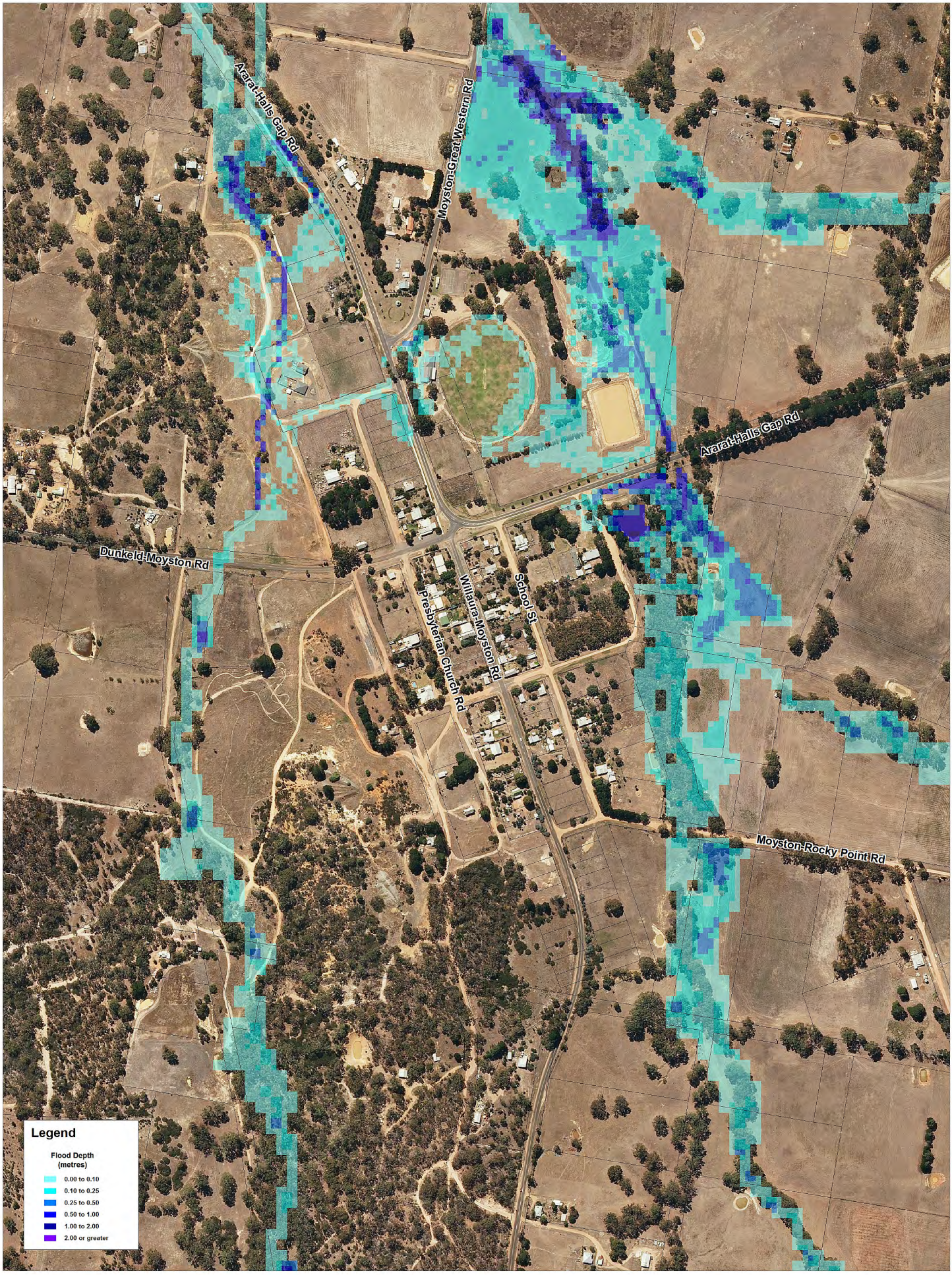

Title:

Mount William Creek Flood Investigation
1 in 10 Year ARI Flood Depths - Moyston

Figure: **A-7**

Rev: **A**

N

0 125 250m

Approx. Scale

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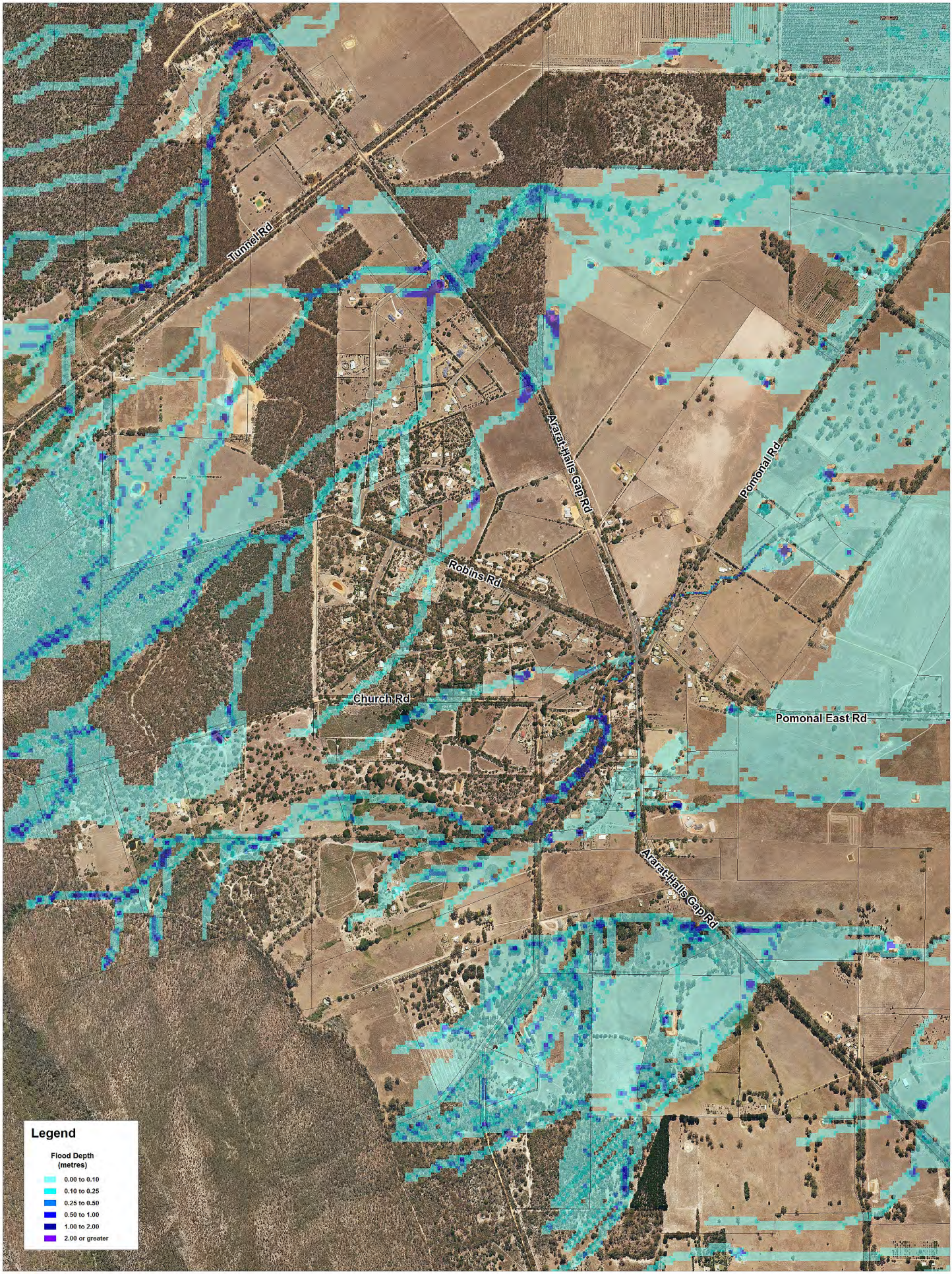

Title:

Mount William Creek Flood Investigation
1 in 10 Year ARI Flood Depths - Pomonal

Figure: **A-8**

Rev: **A**

N

0 250 500m

Approx. Scale

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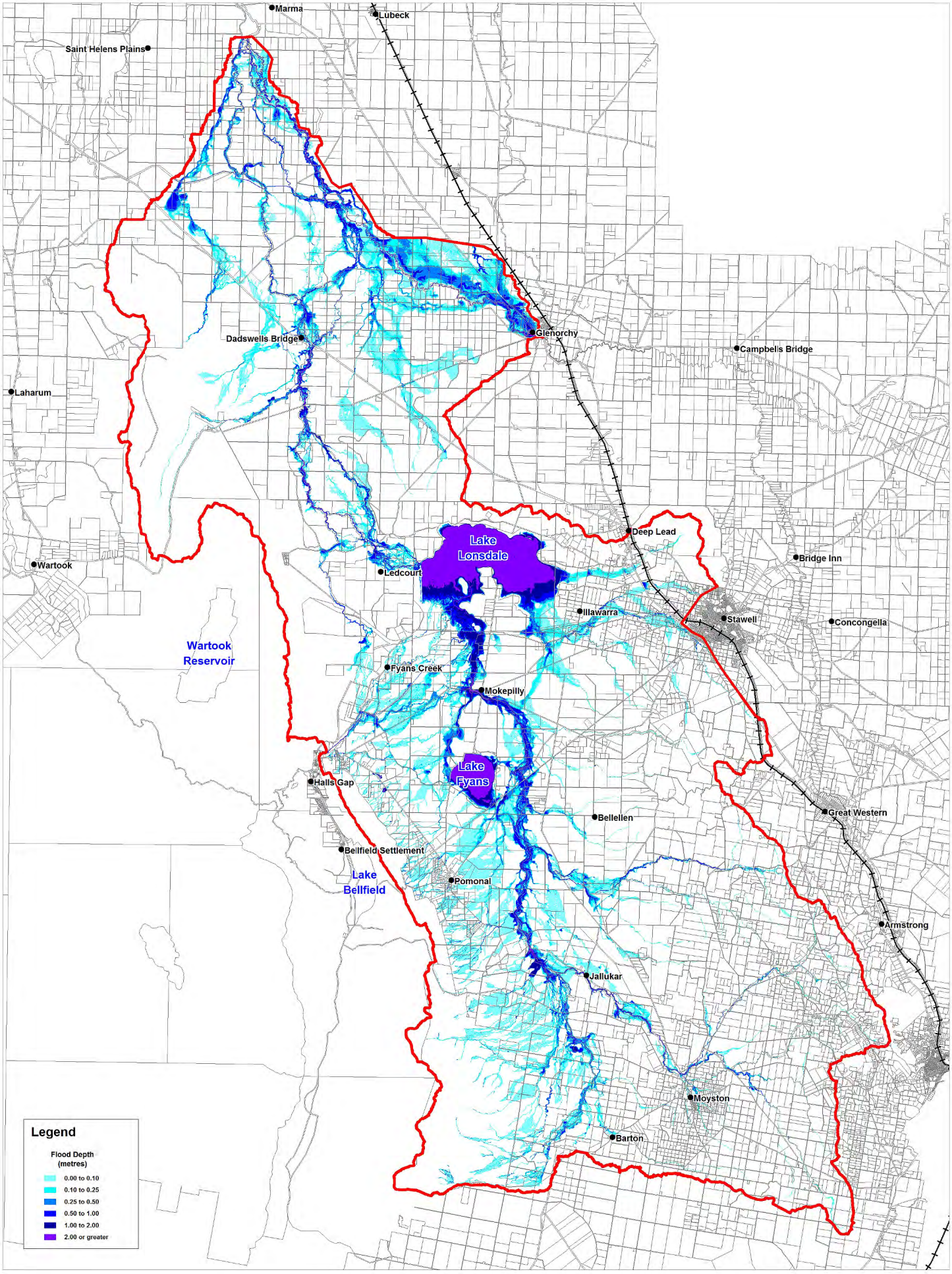

Title:

Mount William Creek Flood Investigation
1 in 20 Year ARI Flood Depths - Whole of Catchment

Figure: **A-9**

Rev: **A**

N

0 3.75 7.5km

Approx. Scale

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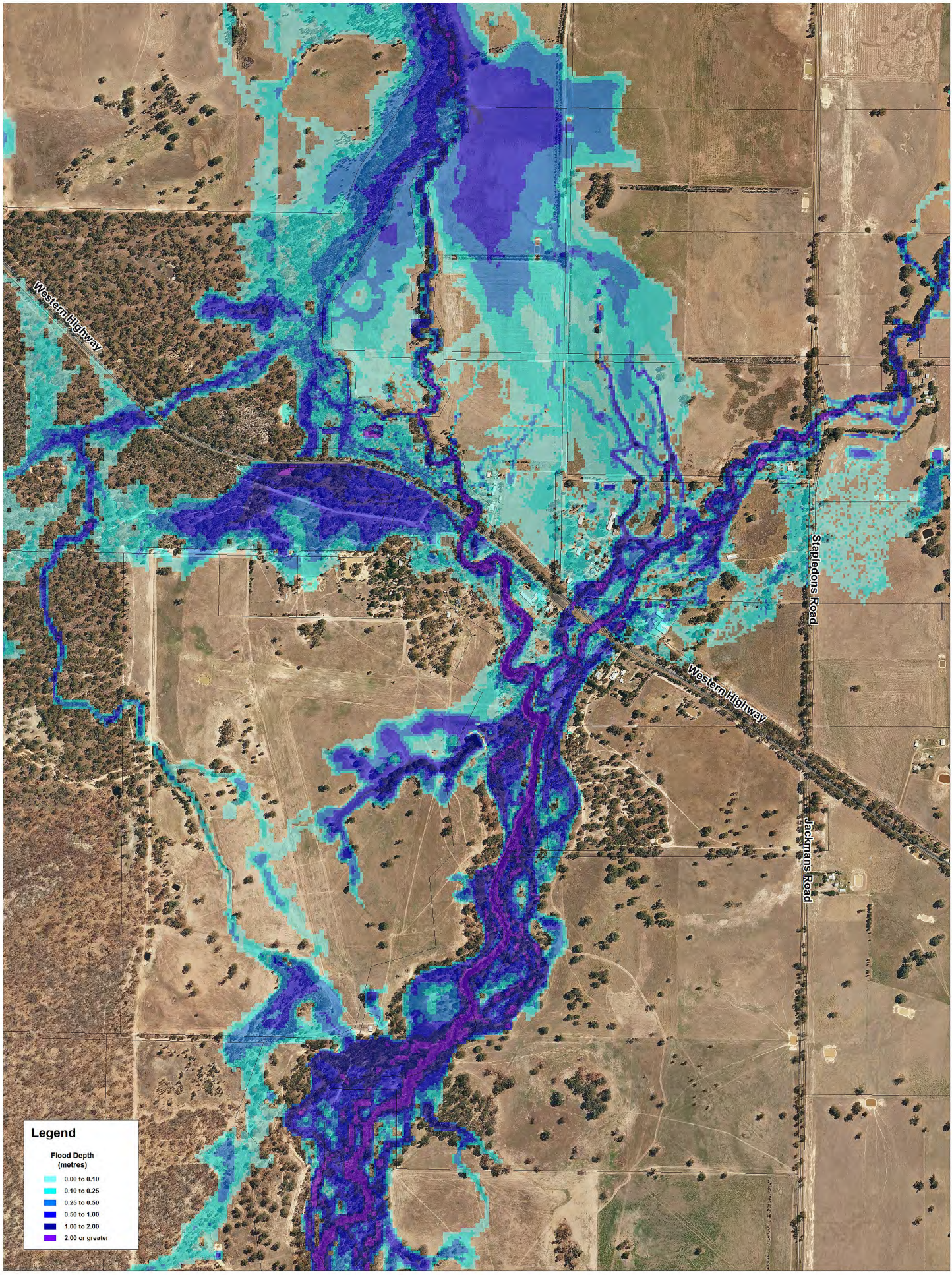


Title:

Mount William Creek Flood Investigation
1 in 20 Year ARI Flood Depths - Dadswells Bridge

Figure: **A-10**

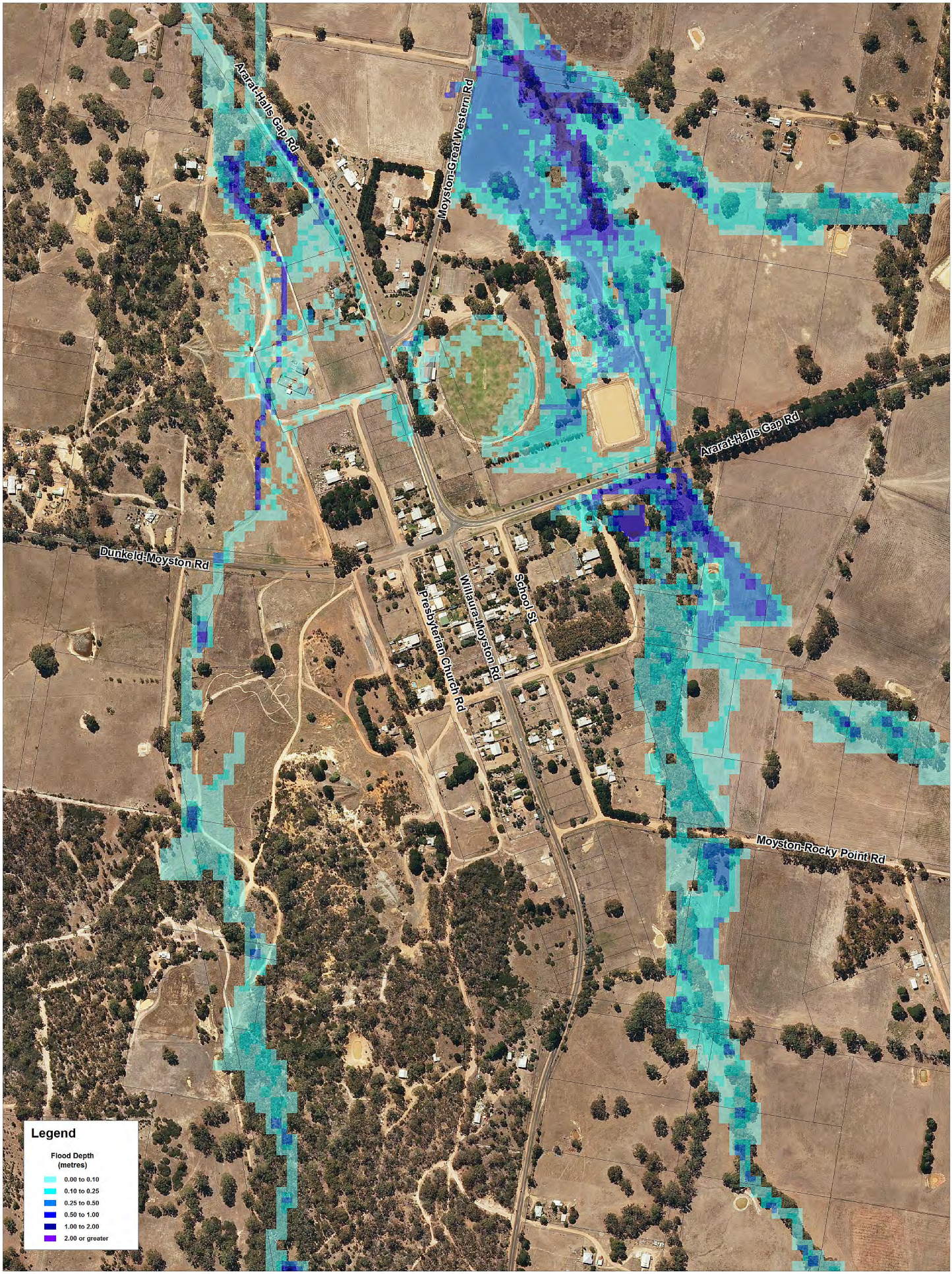
Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-10_E01_20yr_047_dMax_Dad_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 20 Year ARI Flood Depths - Moyston

Figure: **A-11**

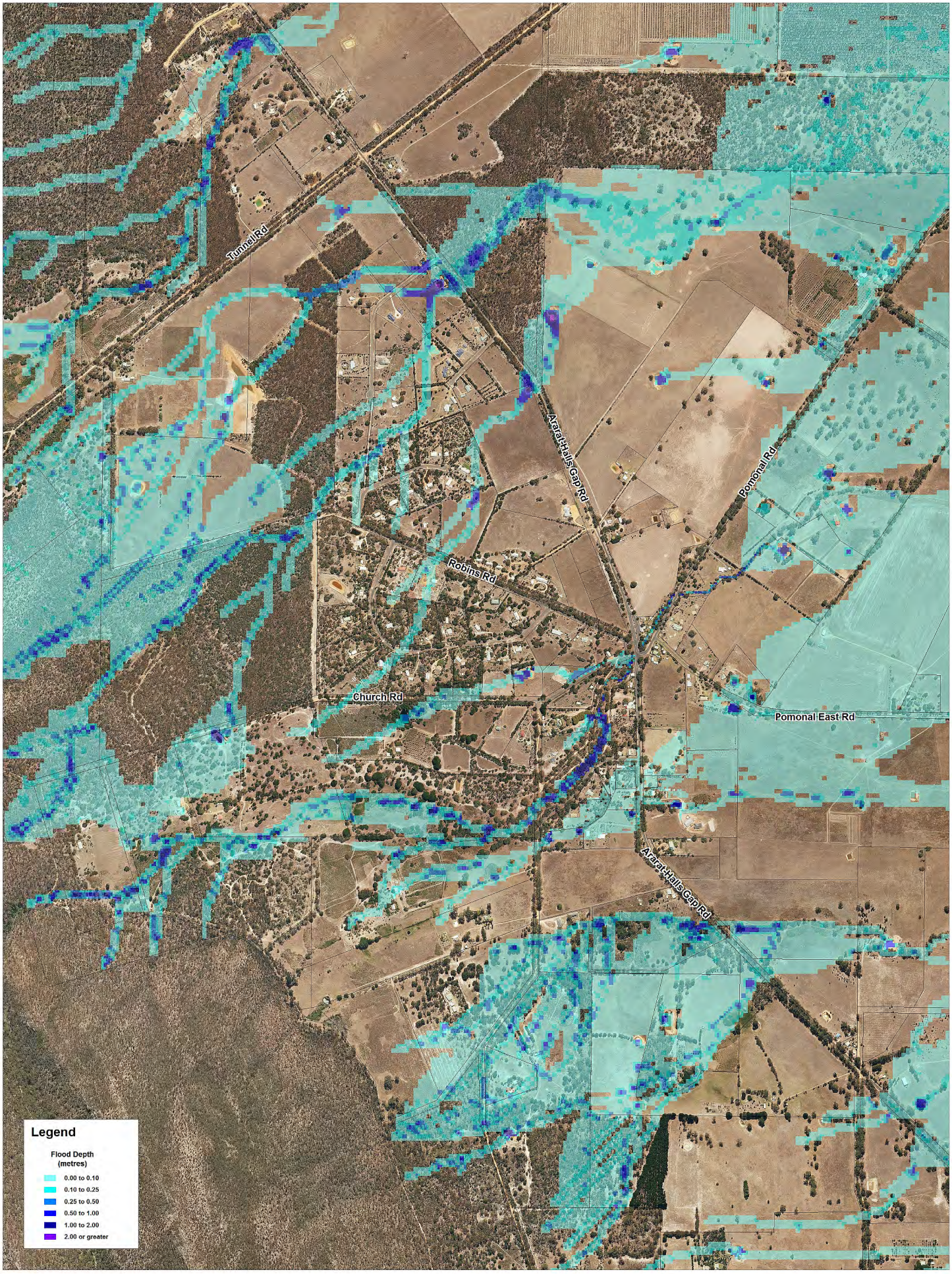
Rev: **A**

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-11_E01_20yr_047_dMax_Moy_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 20 Year ARI Flood Depths - Pomonal

Figure: **A-12**

Rev: **A**

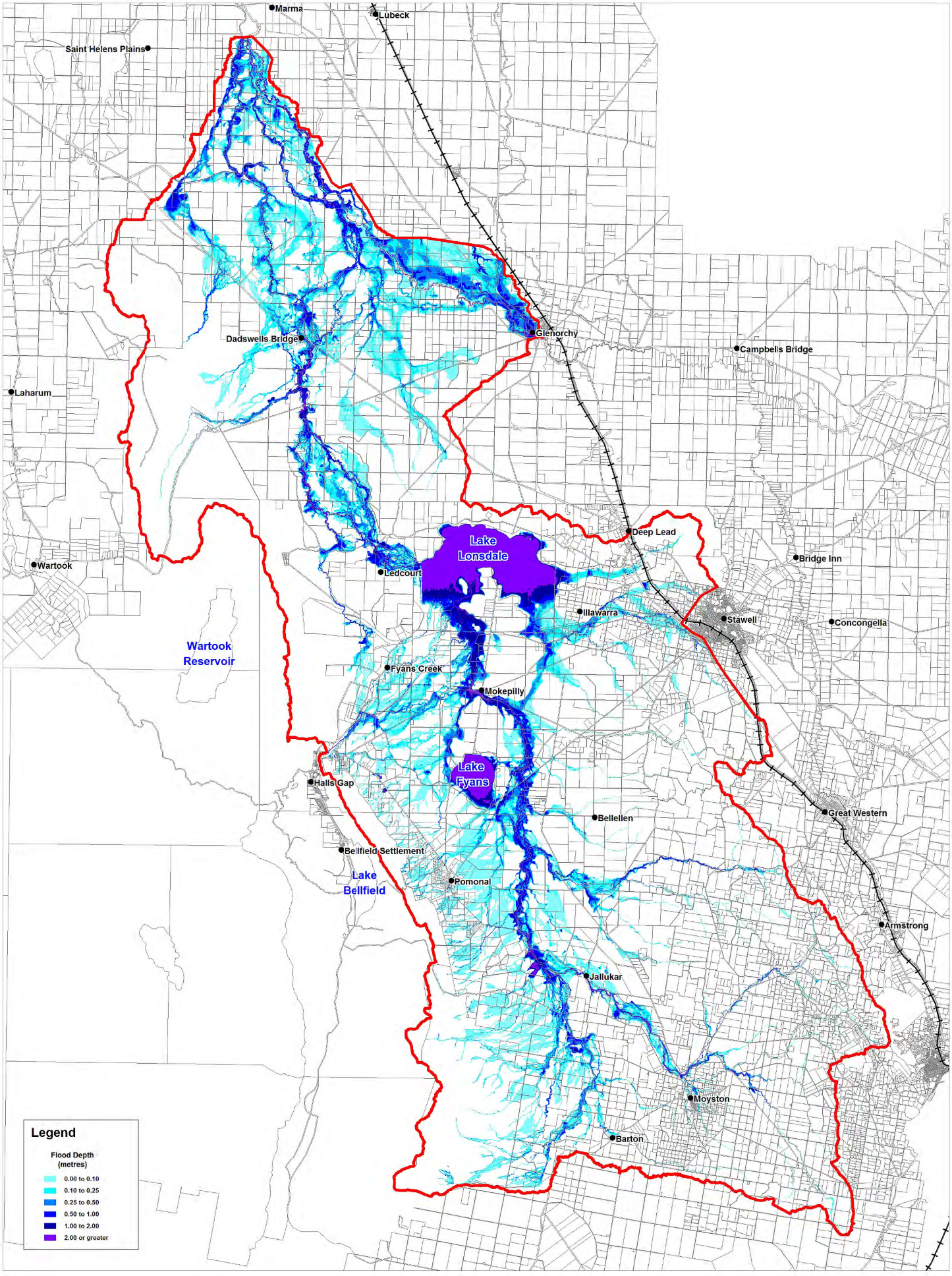
N

0 250 500m

Approx. Scale

Wimmera Catchment Management Authority · Ararat Rural City · Northern Grampians Shire · Horsham Rural City Council · Australian Government · Victoria · BMT WBM

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-12_E01_20yr_047_dMax_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 50 Year ARI Flood Depths - Whole of Catchment

Figure: **A-13**

Rev: **A**

N

0 3.75 7.5km

Approx. Scale

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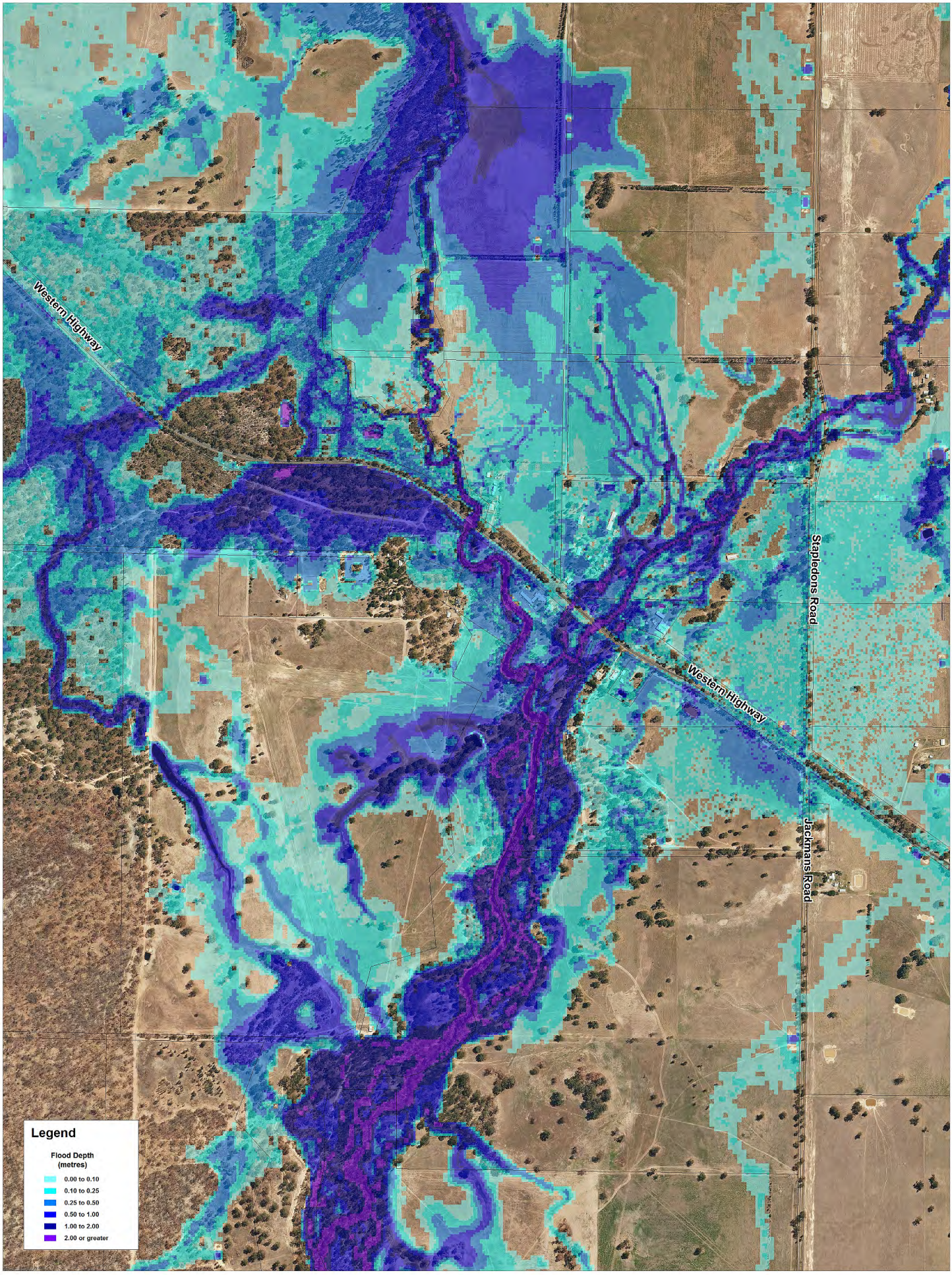

Title:

Mount William Creek Flood Investigation
1 in 50 Year ARI Flood Depths - Dadswells Bridge

Figure: **A-14**

Rev: **A**

N

0 250 500m

Approx. Scale

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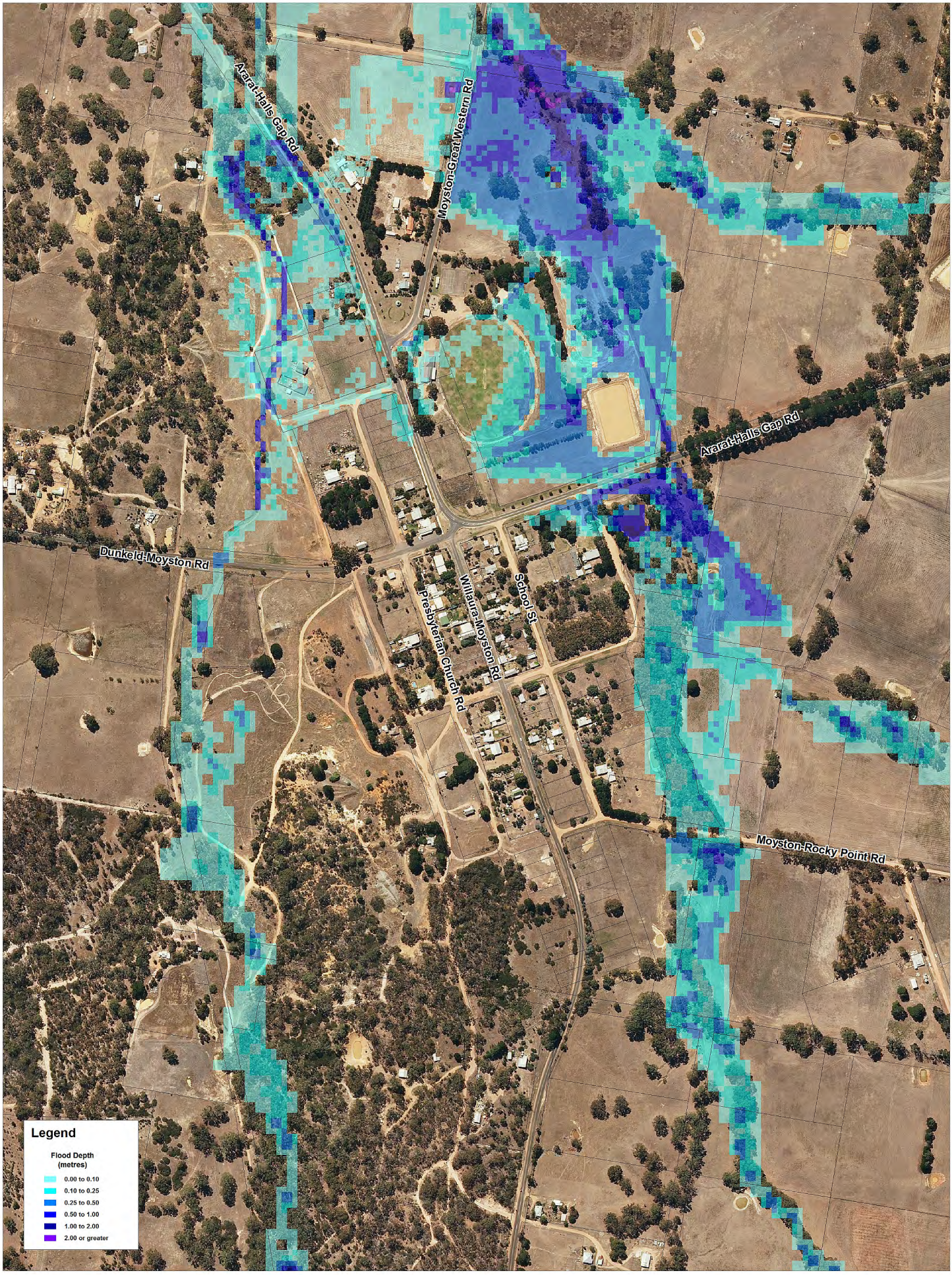

Title:

Mount William Creek Flood Investigation
1 in 50 Year ARI Flood Depths - Moyston

Figure: **A-15**

Rev: **A**

N

0 125 250m

Approx. Scale

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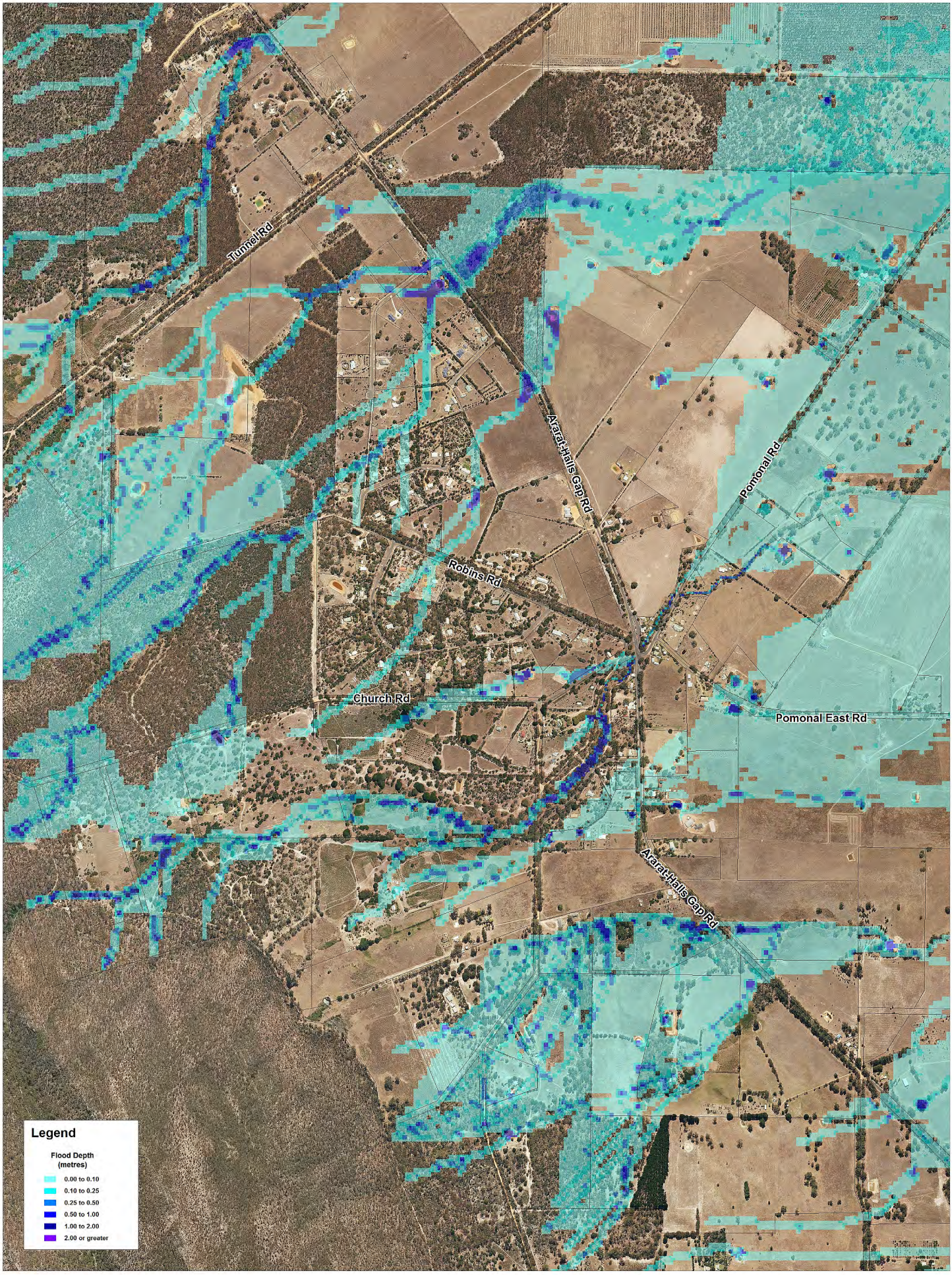

Title:

Mount William Creek Flood Investigation
1 in 50 Year ARI Flood Depths - Pomonal

Figure: **A-16**

Rev: **A**

N

0 250 500m

Approx. Scale

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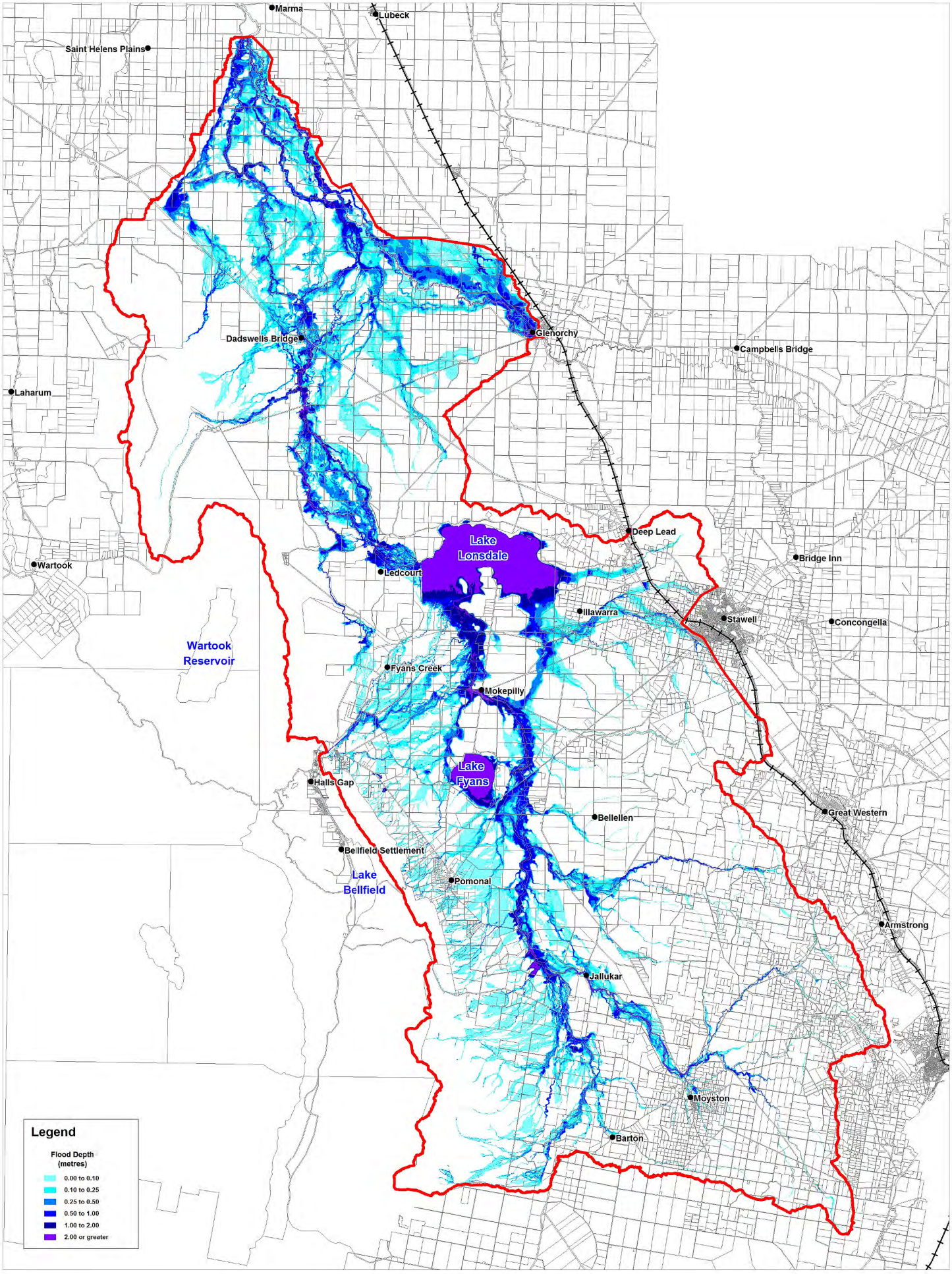

Title:

Mount William Creek Flood Investigation
1 in 100 Year ARI Flood Depths - Whole of Catchment

Figure: **A-17**

Rev: **A**

N

0 3.75 7.5km

Approx. Scale

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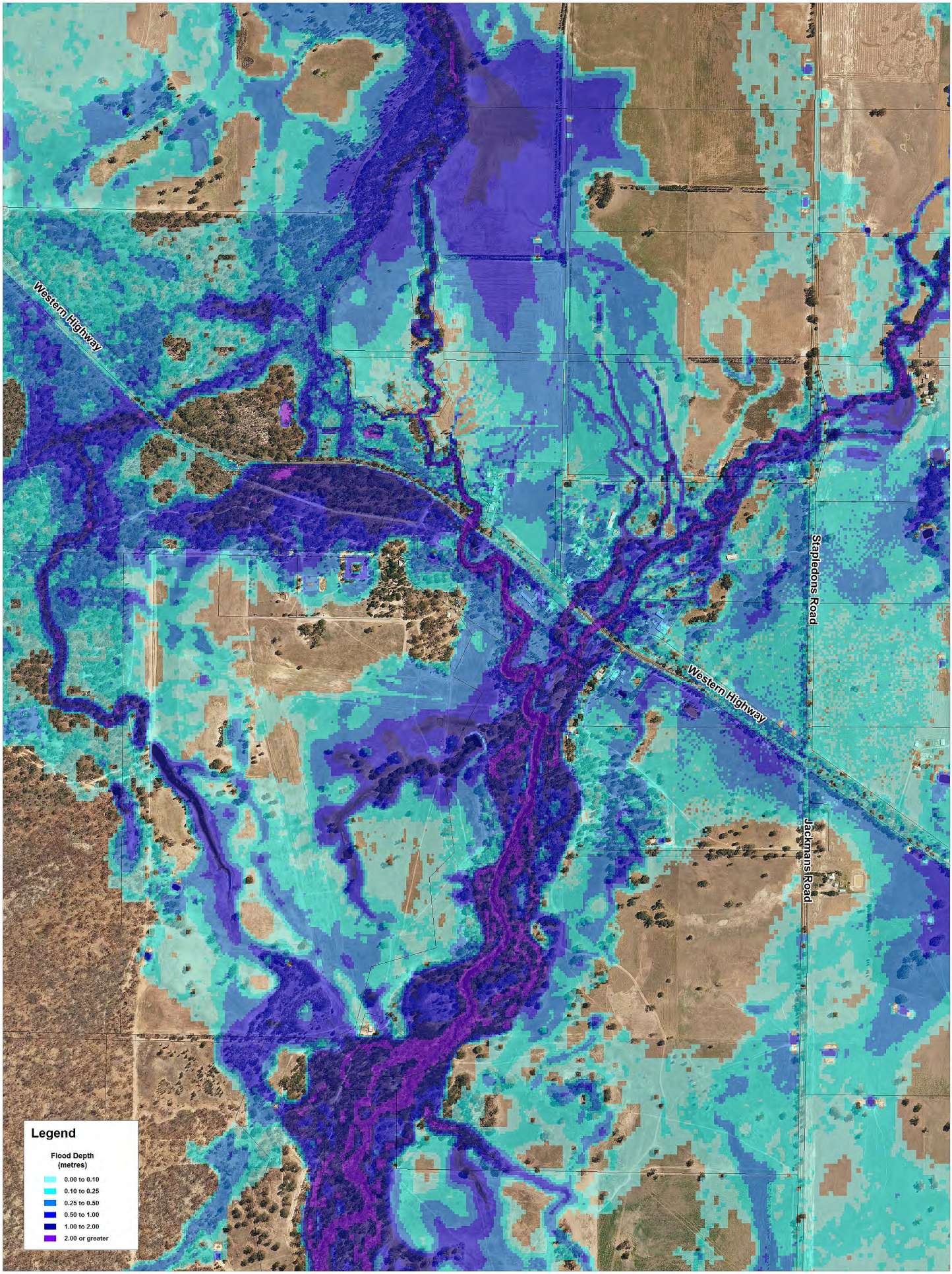

Title:

Mount William Creek Flood Investigation
1 in 100 Year ARI Flood Depths - Dadswells Bridge

Figure: **A-18**

Rev: **A**

N

0 250 500m

Approx. Scale

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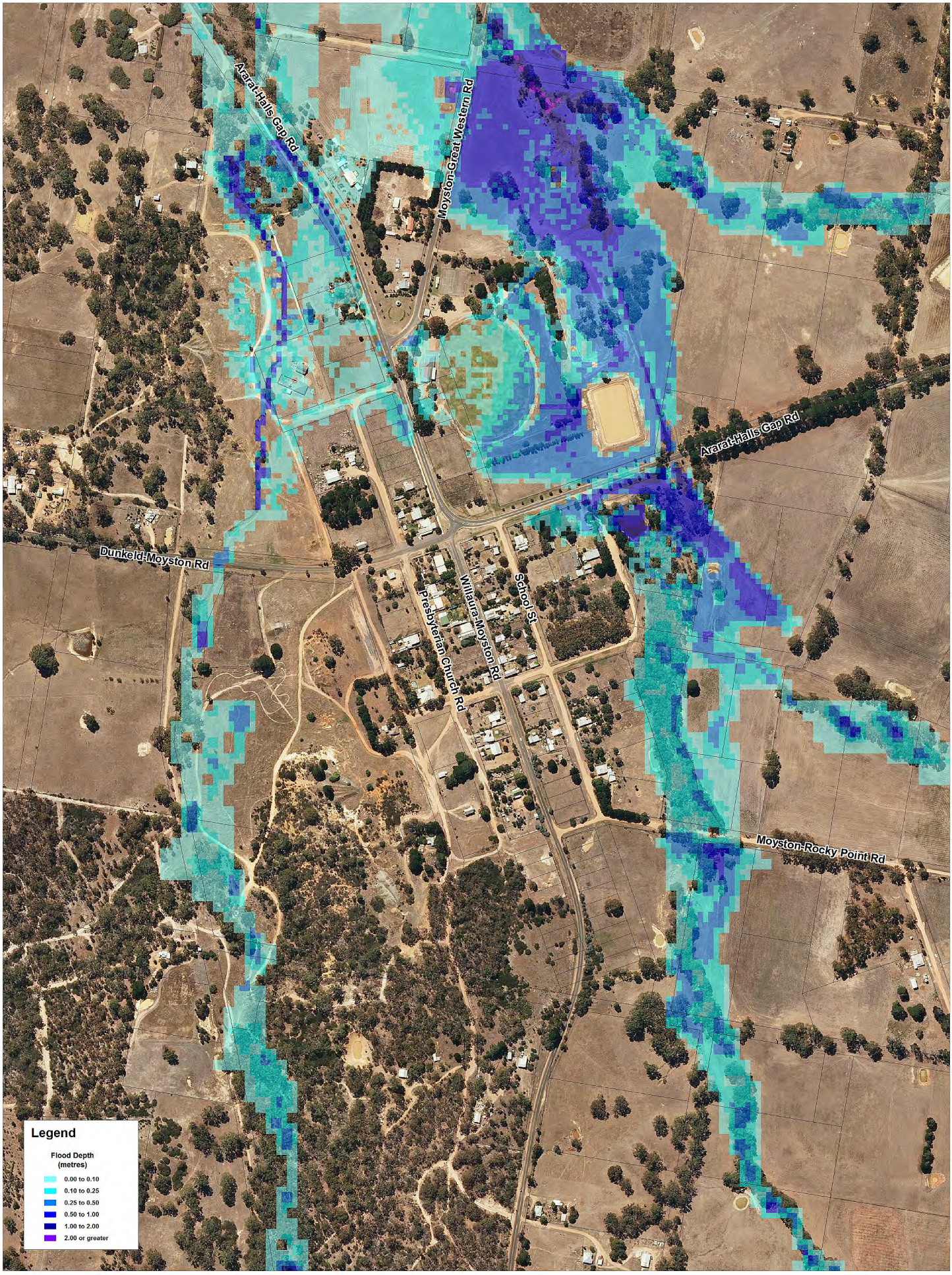


Title:

Mount William Creek Flood Investigation
1 in 100 Year ARI Flood Depths - Moyston

Figure: **A-19**

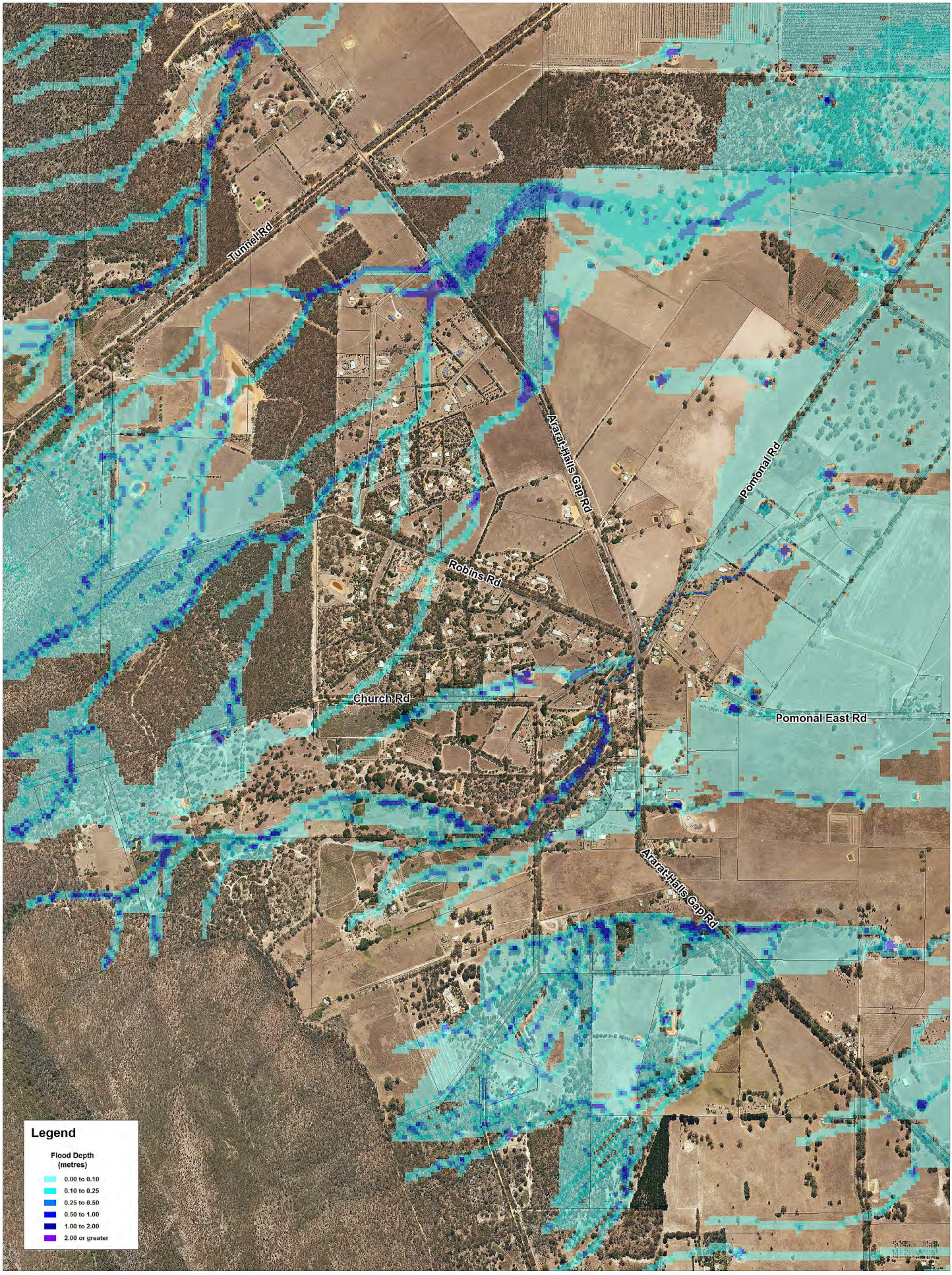
Rev: **A**

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-19_E01_100yr_047_dMax_Moy_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 100 Year ARI Flood Depths - Pomonal

Figure: **A-20**

Rev: **A**

N

0 250 500m

Approx. Scale

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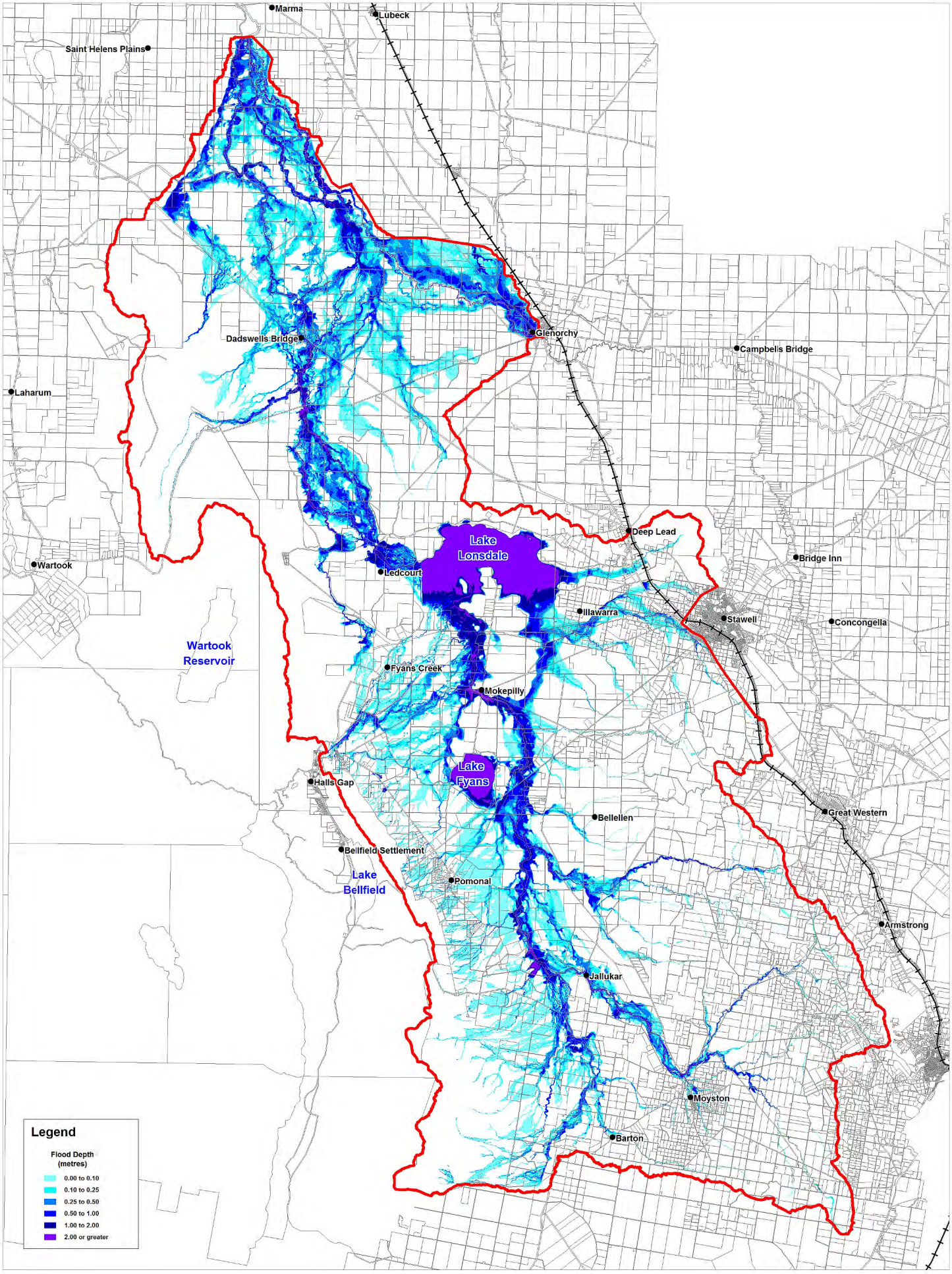


Title:

Mount William Creek Flood Investigation
1 in 200 Year ARI Flood Depths - Whole of Catchment

Figure: A-21

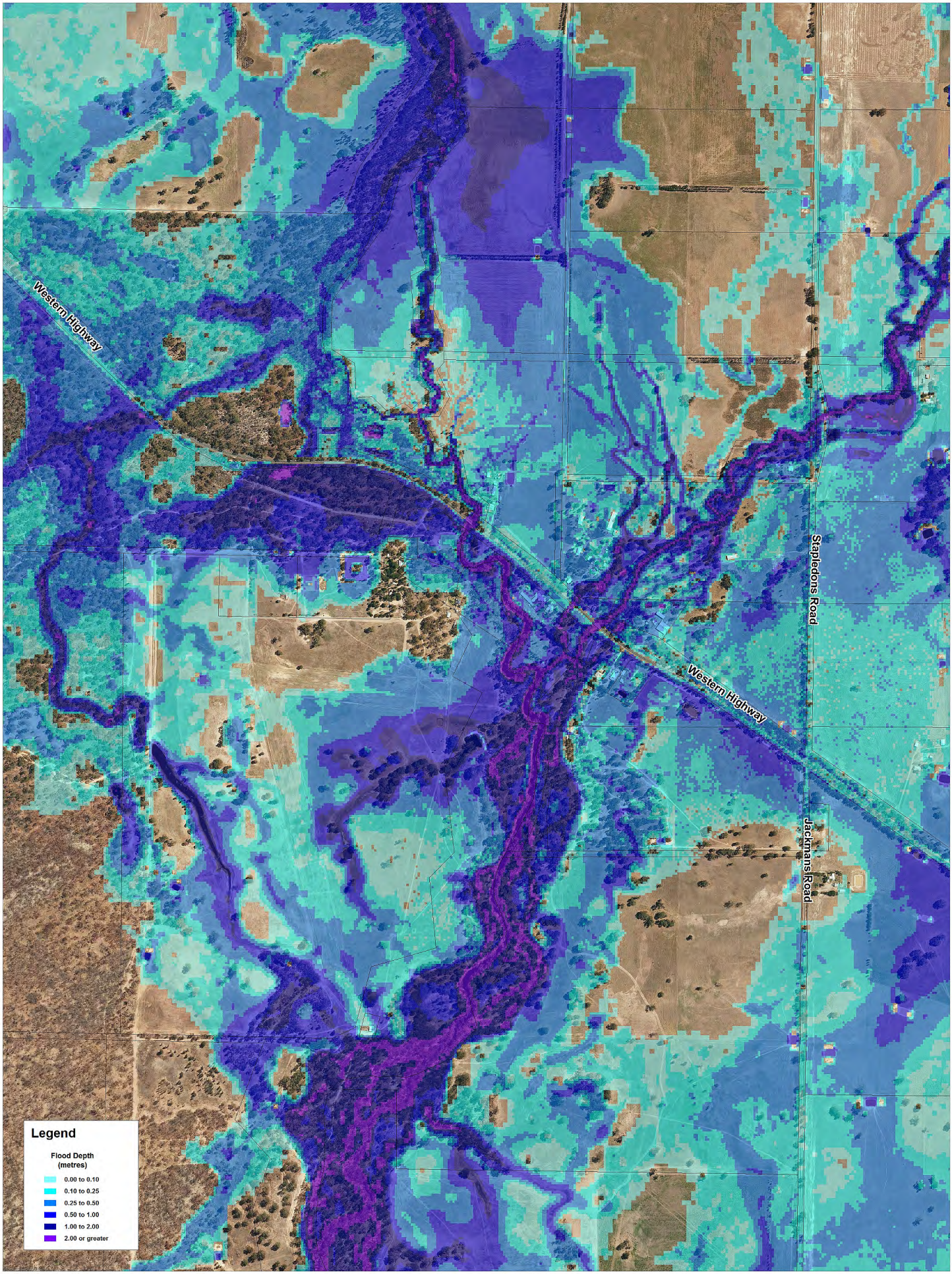
Rev: A

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-21_E01_200yr_047_dMax_catch_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 200 Year ARI Flood Depths - Dadswells Bridge

Figure: **A-22**

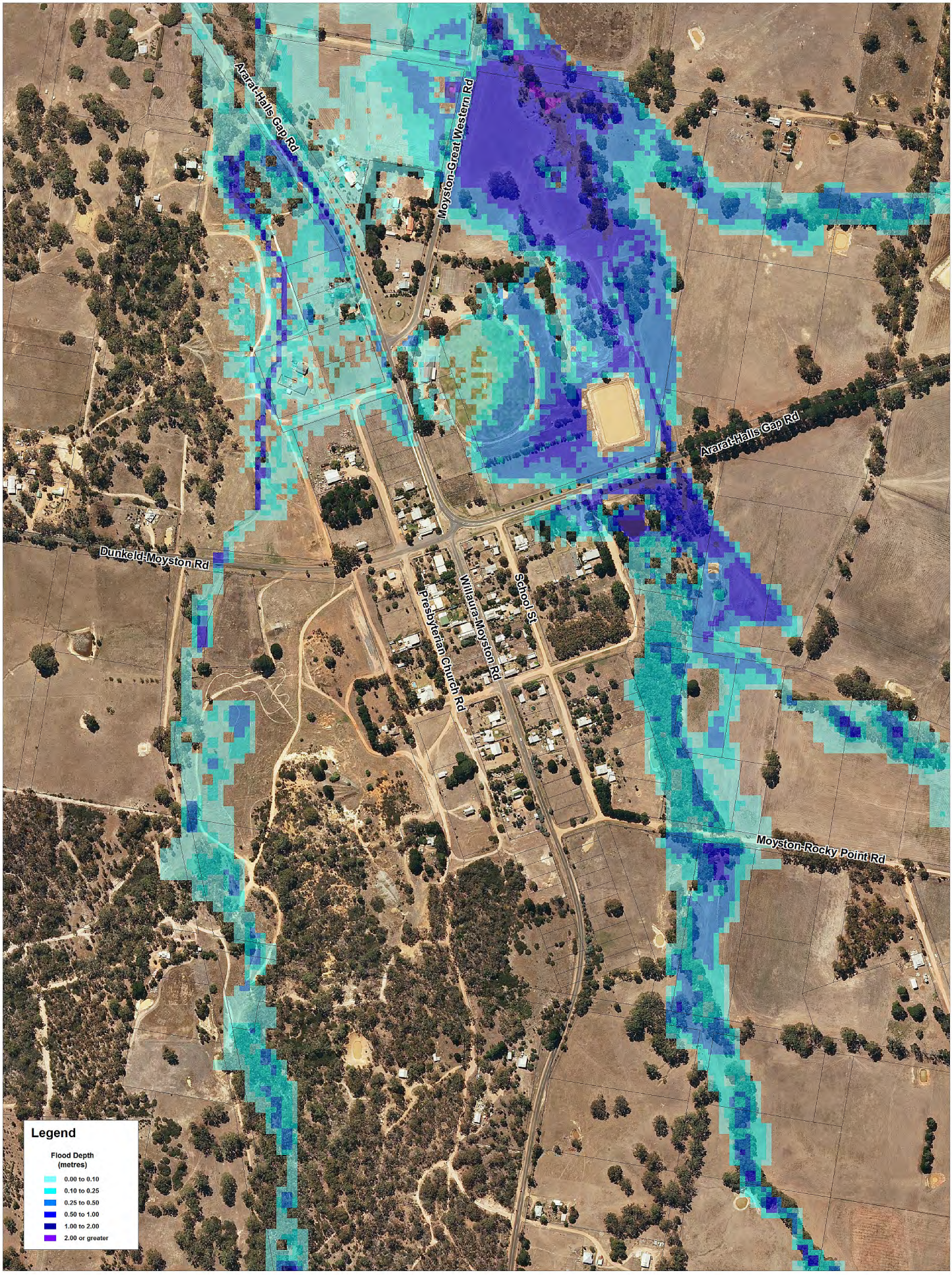
Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-22_E01_200yr_047_dMax_Dad_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 200 Year ARI Flood Depths - Moyston

Figure: **A-23**

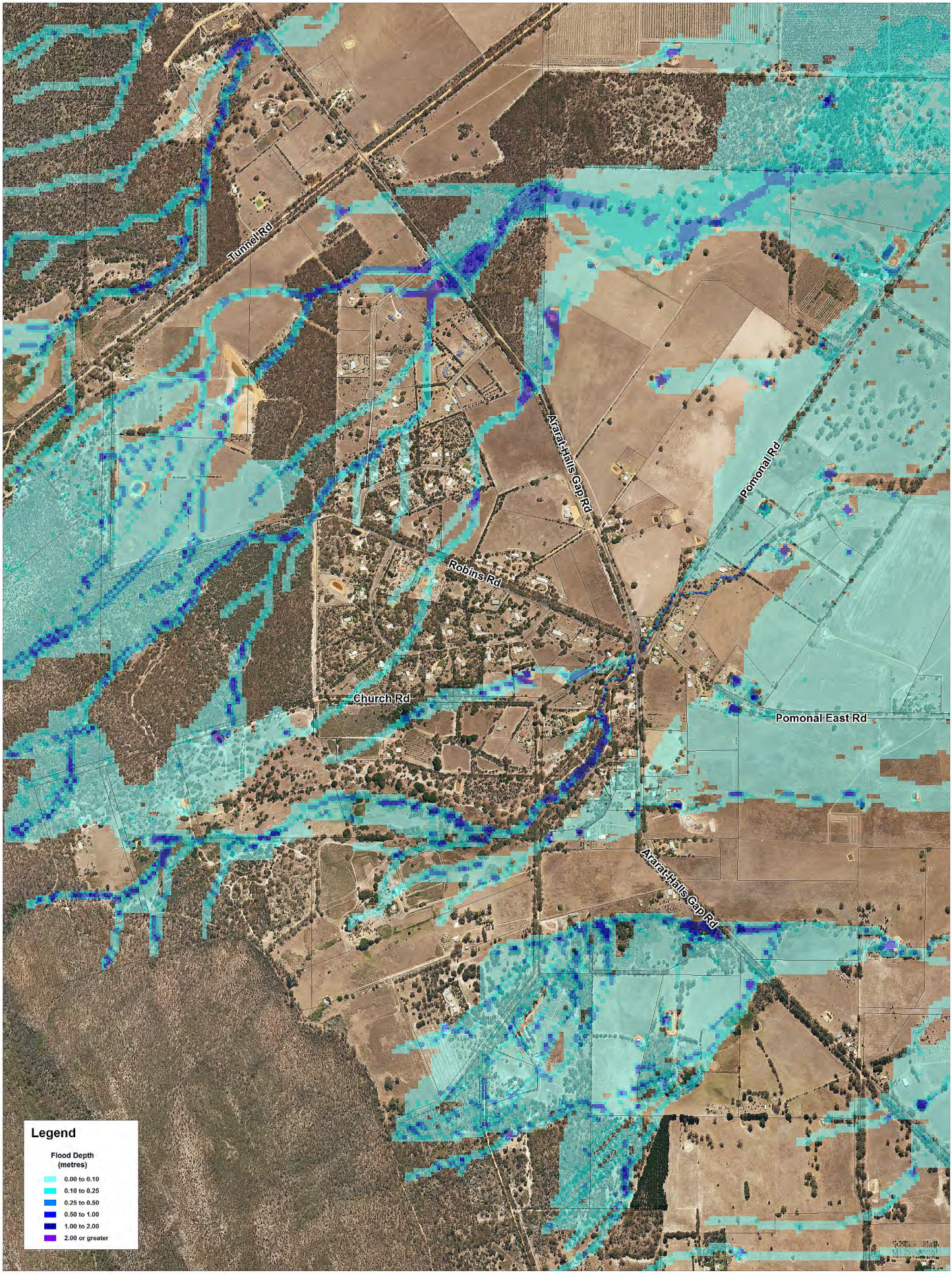
Rev: **A**

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-23_E01_200yr_047_dMax_Moy_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 200 Year ARI Flood Depths - Pomonal

Figure: **A-24**

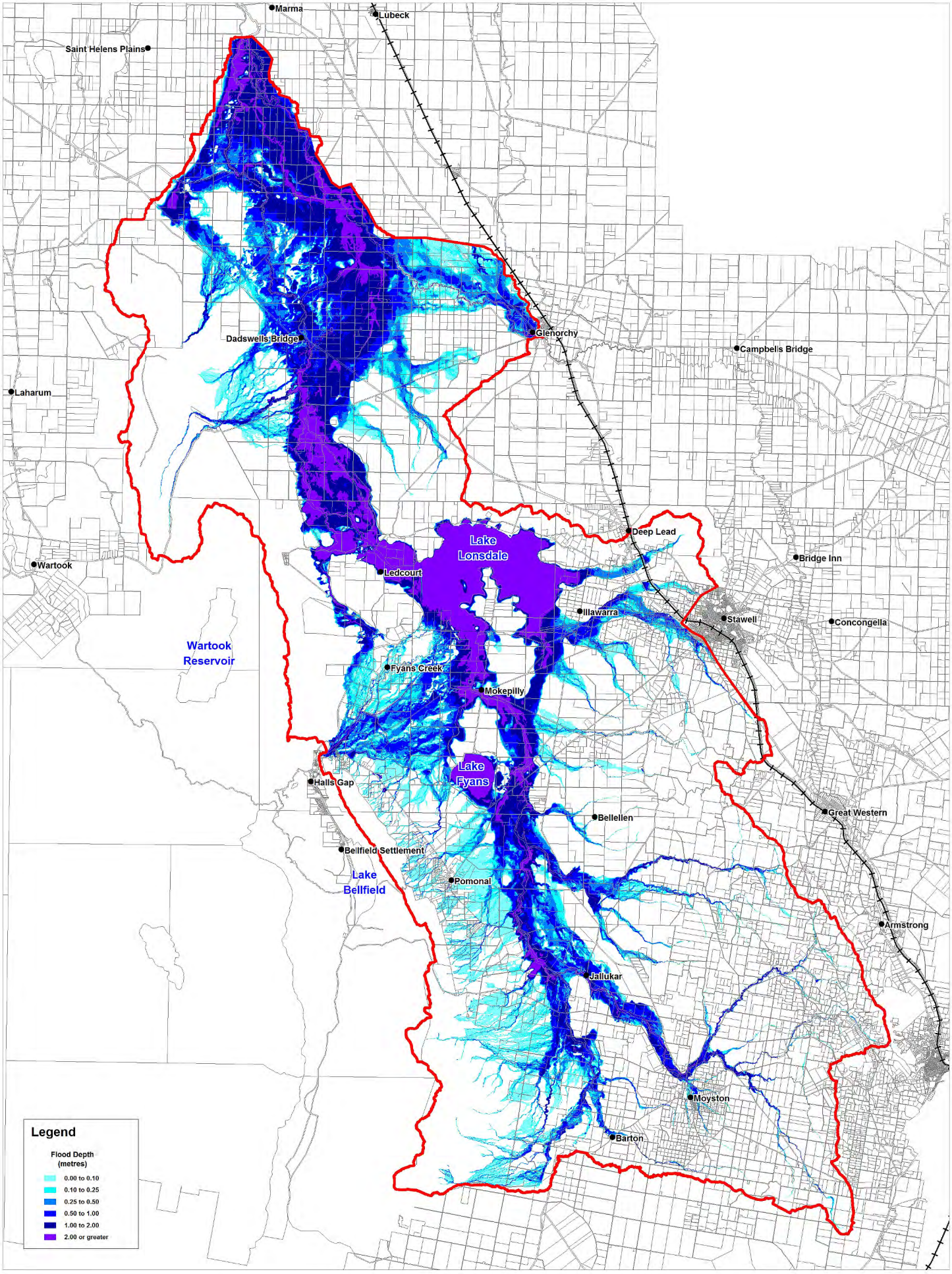
Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-24_E01_200yr_047_dMax_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
Probable Maximum Flood Depths - Whole of Catchment

Figure: **A-25**

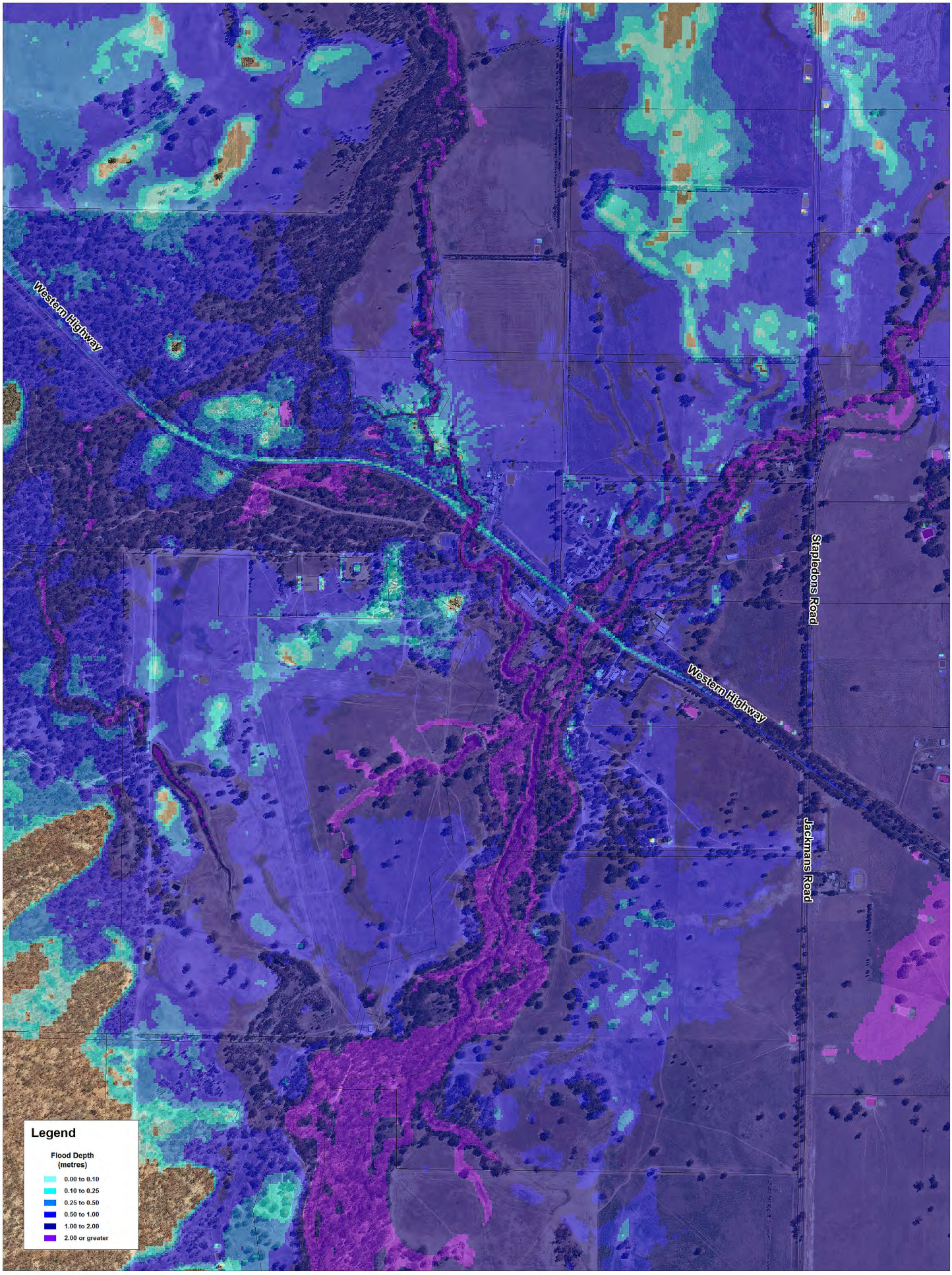
Rev: **A**

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-25_E01_PMP_047_dMax_catch_RevA.WOR



Title:

Mount William Creek Flood Investigation
Probable Maximum Flood Depths - Dadswells Bridge

Figure: **A-26**

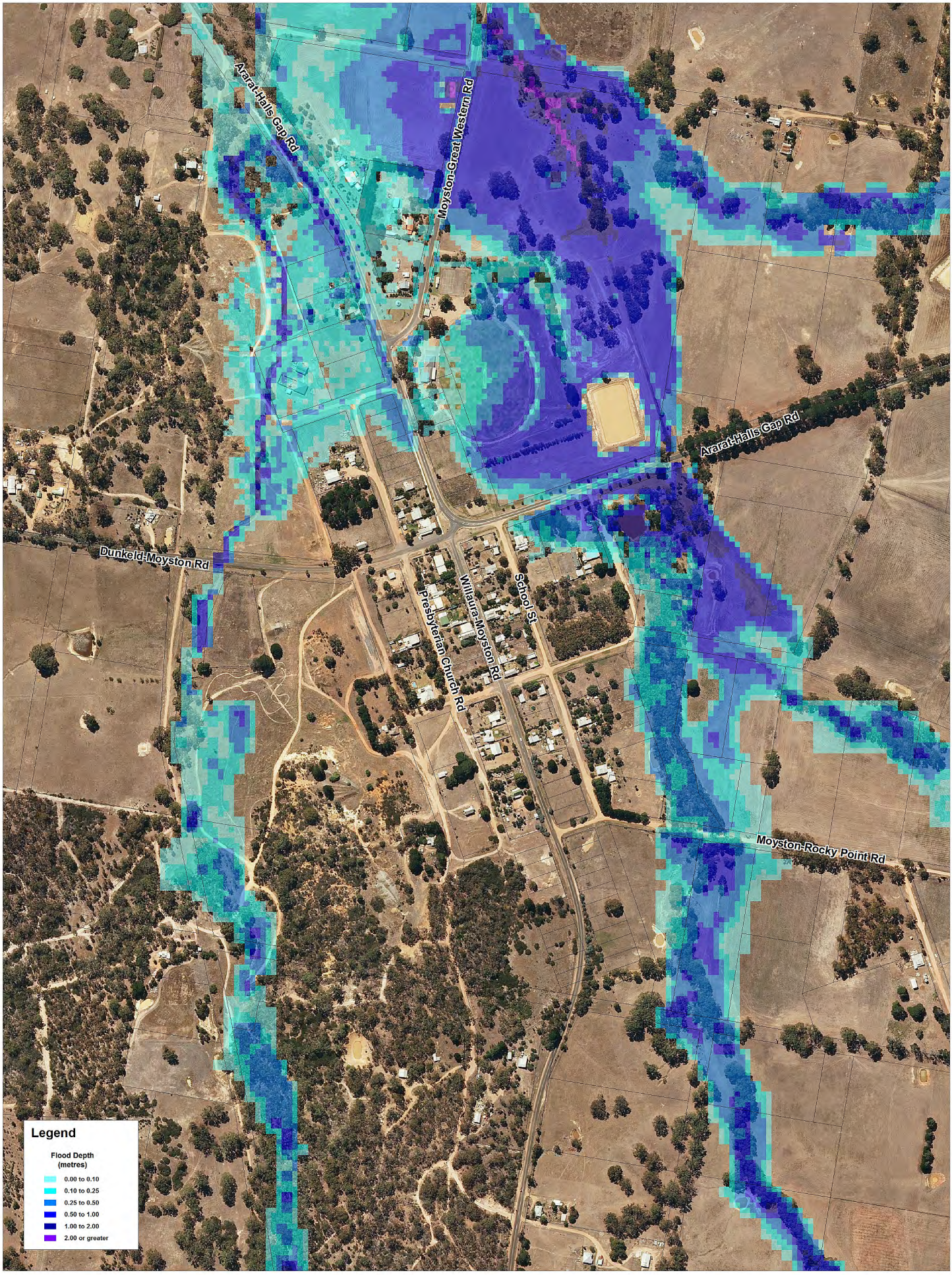
Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-26_E01_PMP_047_dMax_Dad_RevA.WOR



Title:

Mount William Creek Flood Investigation
Probable Maximum Flood Depths - Moyston

Figure: **A-27**

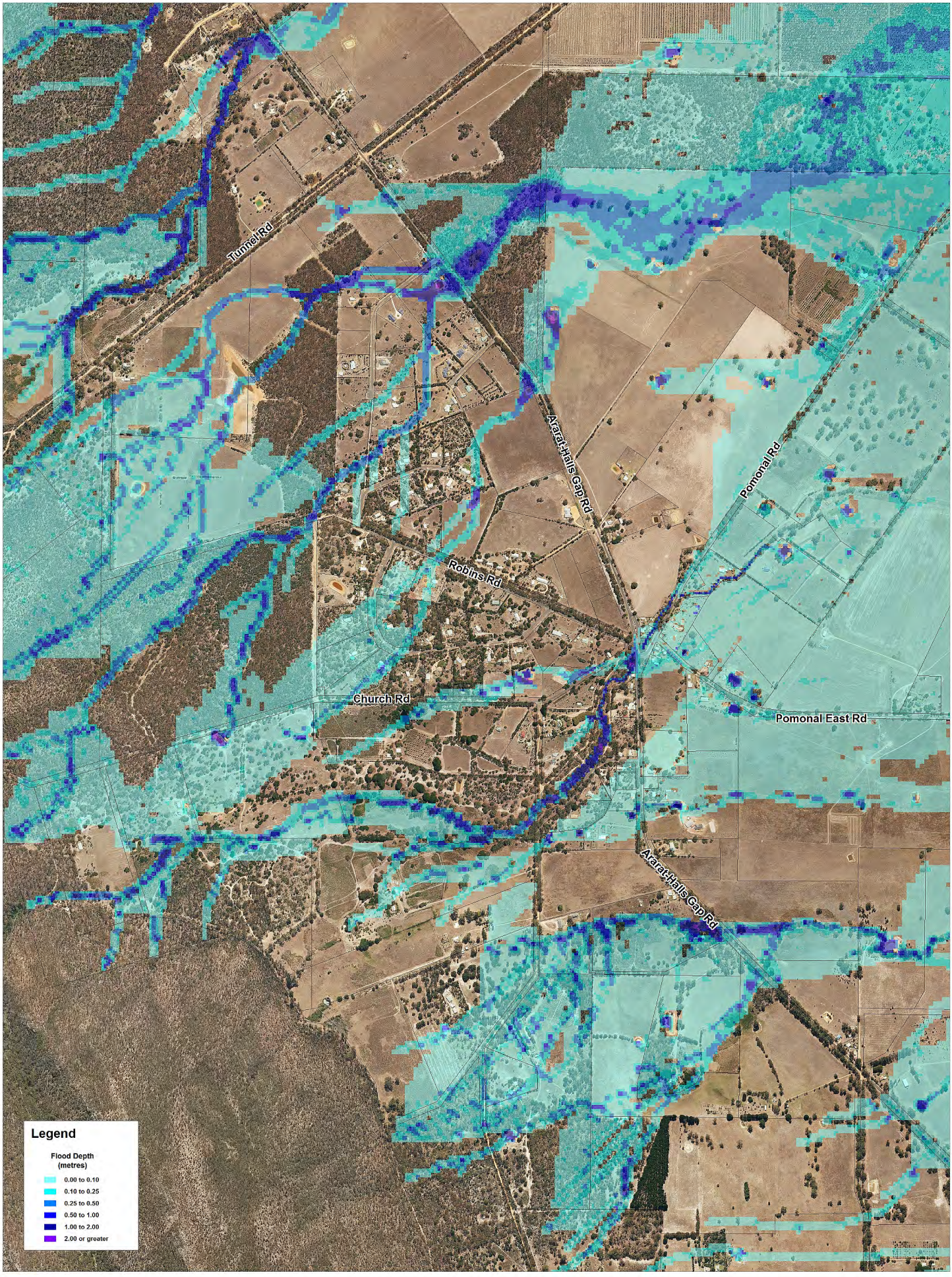
Rev: **A**

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-27_E01_PMP_047_dMax_Moy_RevA.WOR



Title:

Mount William Creek Flood Investigation
Probable Maximum Flood Depths - Pomonal

Figure: **A-28**

Rev: **A**

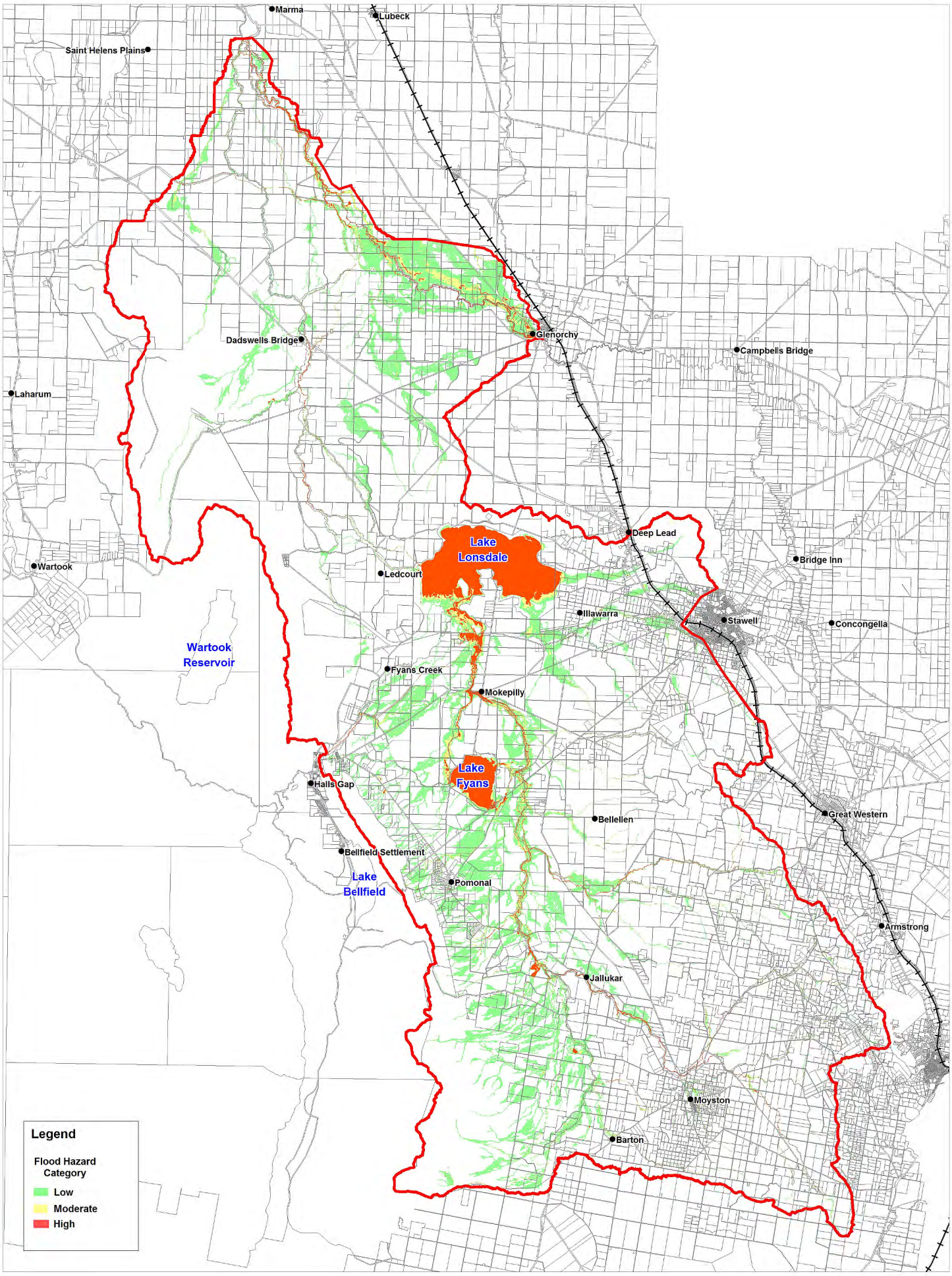
N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigA-28_E01_PMP_047_dMax_Pom_RevA.WOR

Appendix B Flood Hazard Mapping



Title:

Mount William Creek Flood Investigation
1 in 5 Year ARI Flood Hazards - Whole of Catchment

Figure: B-1

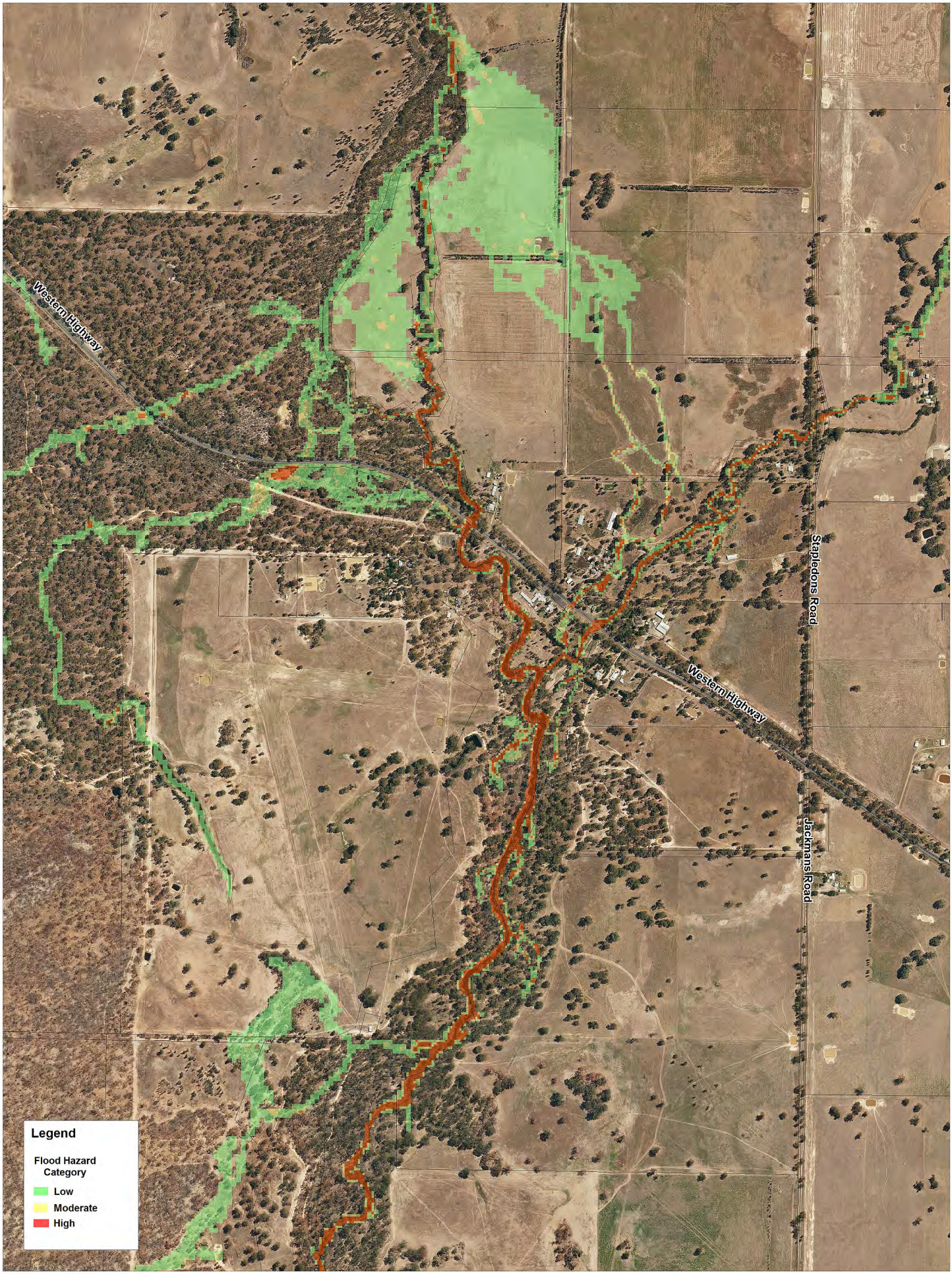
Rev: A

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-1_E01_5yr_047_Haz_catch_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 5 Year ARI Flood Hazards - Dadswells Bridge

Figure: **B-2**

Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-2_E01_5yr_047_Haz_Dad_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 5 Year ARI Flood Hazards - Moyston

Figure: **B-3**

Rev: **A**

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-3_E01_5yr_047_Haz_Moy_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 5 Year ARI Flood Hazards - Pomonal

Figure: **B-4**

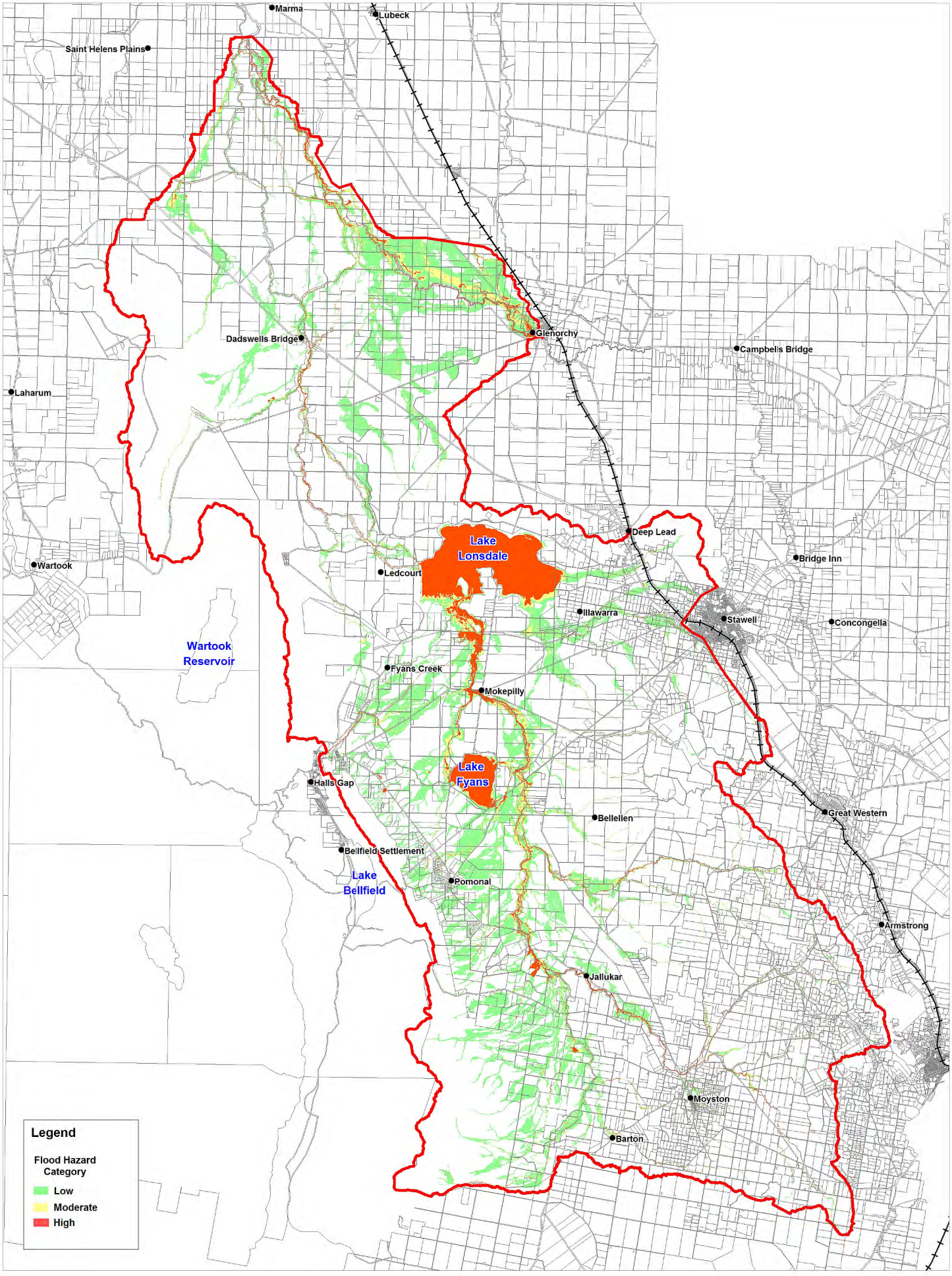
Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-4_E01_5yr_047_Haz_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 10 Year ARI Flood Hazards - Whole of Catchment

Figure: B-5

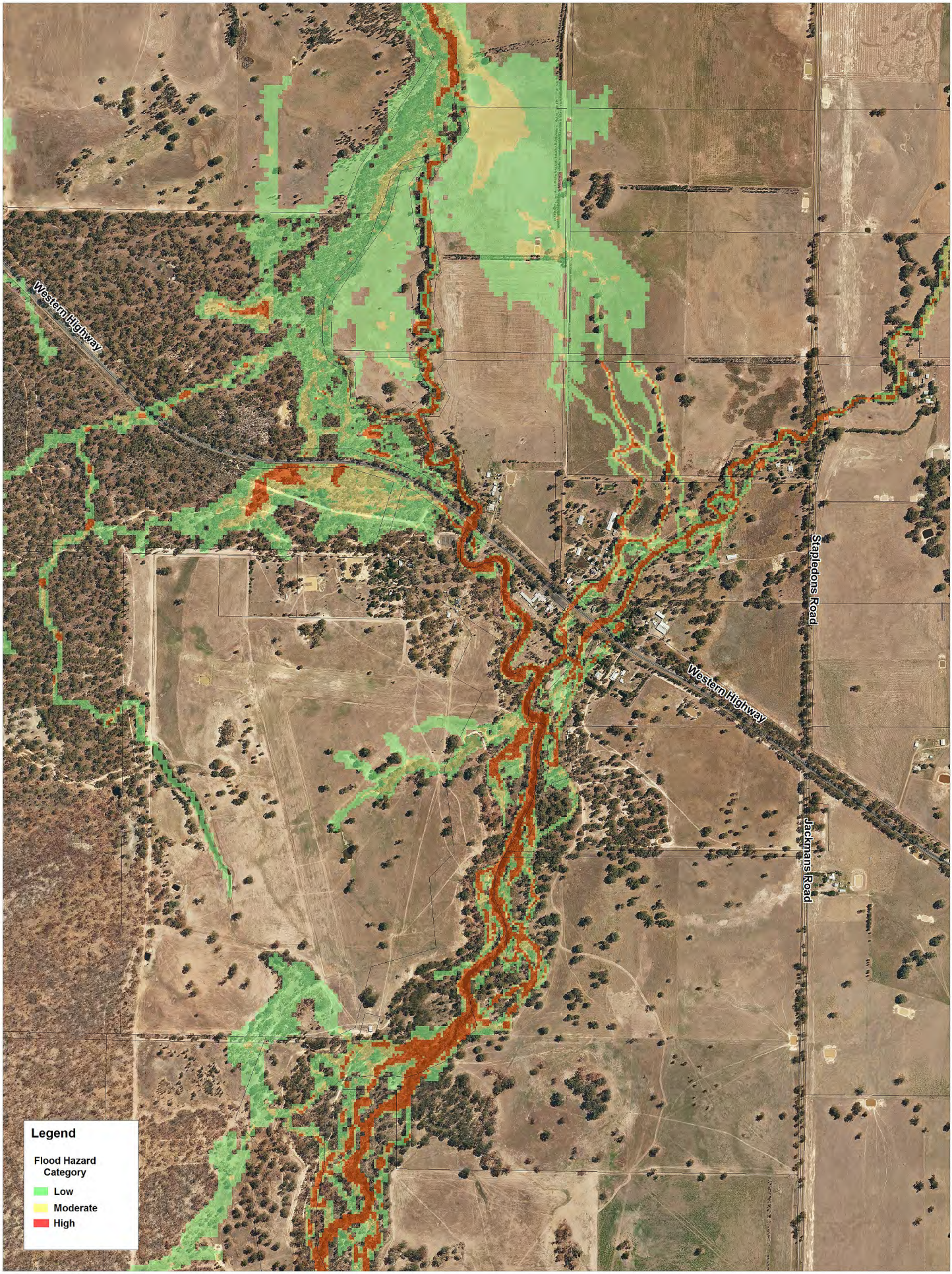
Rev: A

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-5_E01_10yr_047_Haz_catch_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 10 Year ARI Flood Hazards - Dadswells Bridge

Figure: **B-6**

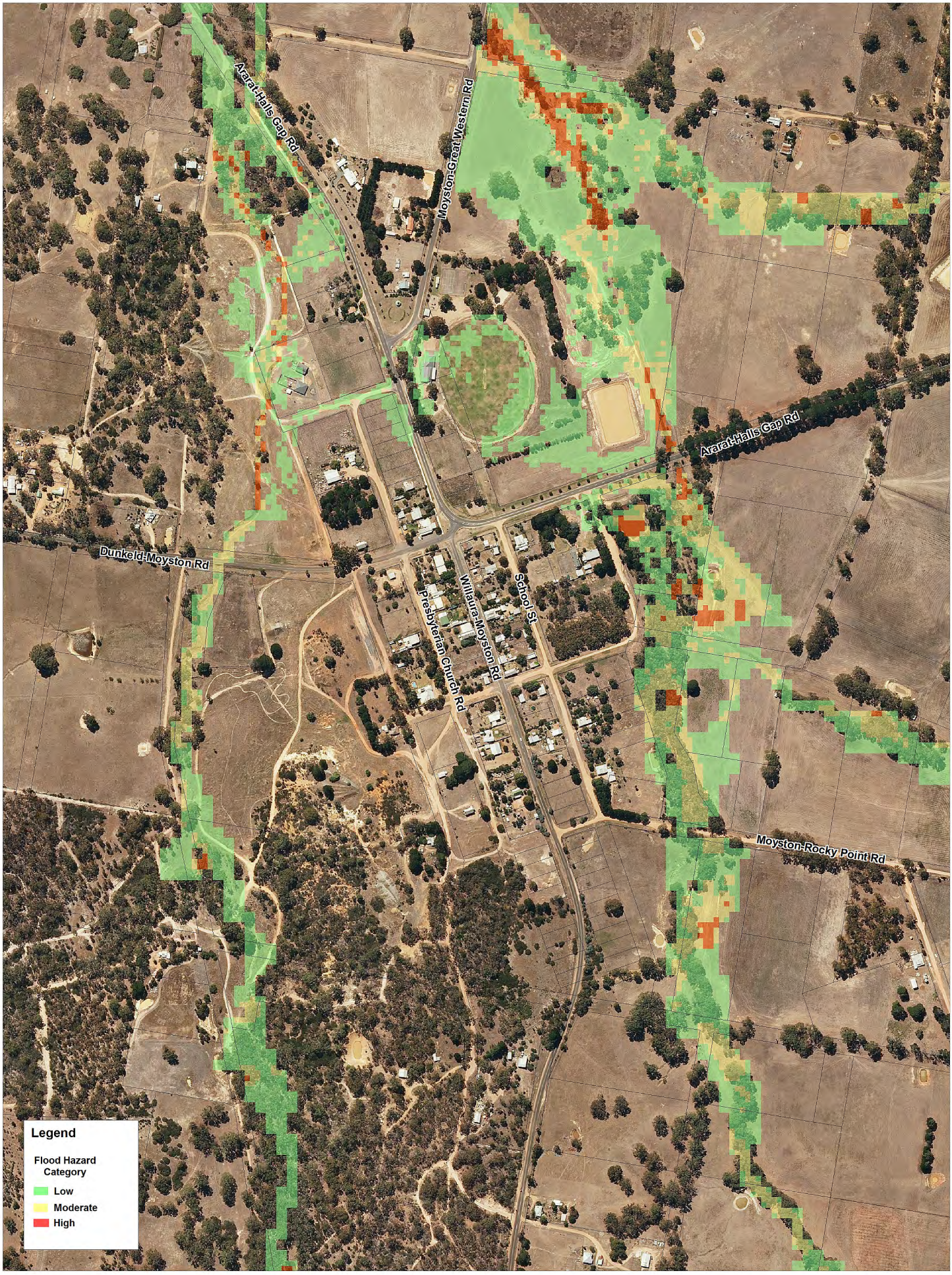
Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-6_E01_10yr_047_Haz_Dad_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 10 Year ARI Flood Hazards - Moyston

Figure: B-7

Rev: A

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-7_E01_10yr_047_Haz_Moy_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 10 Year ARI Flood Hazards - Pomonal

Figure: B-8

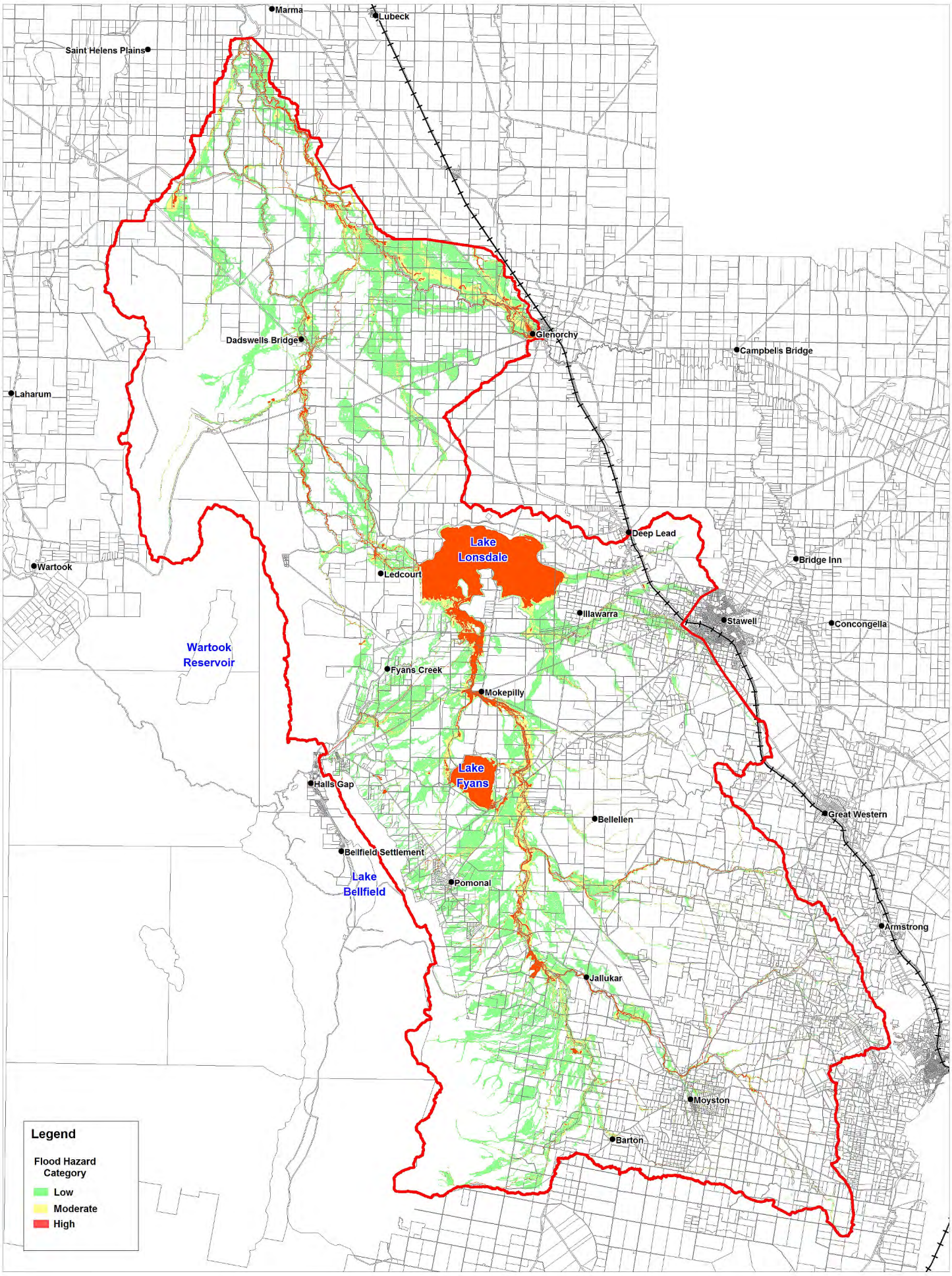
Rev: A

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-8_E01_10yr_047_Haz_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 20 Year ARI Flood Hazards - Whole of Catchment

Figure: B-9

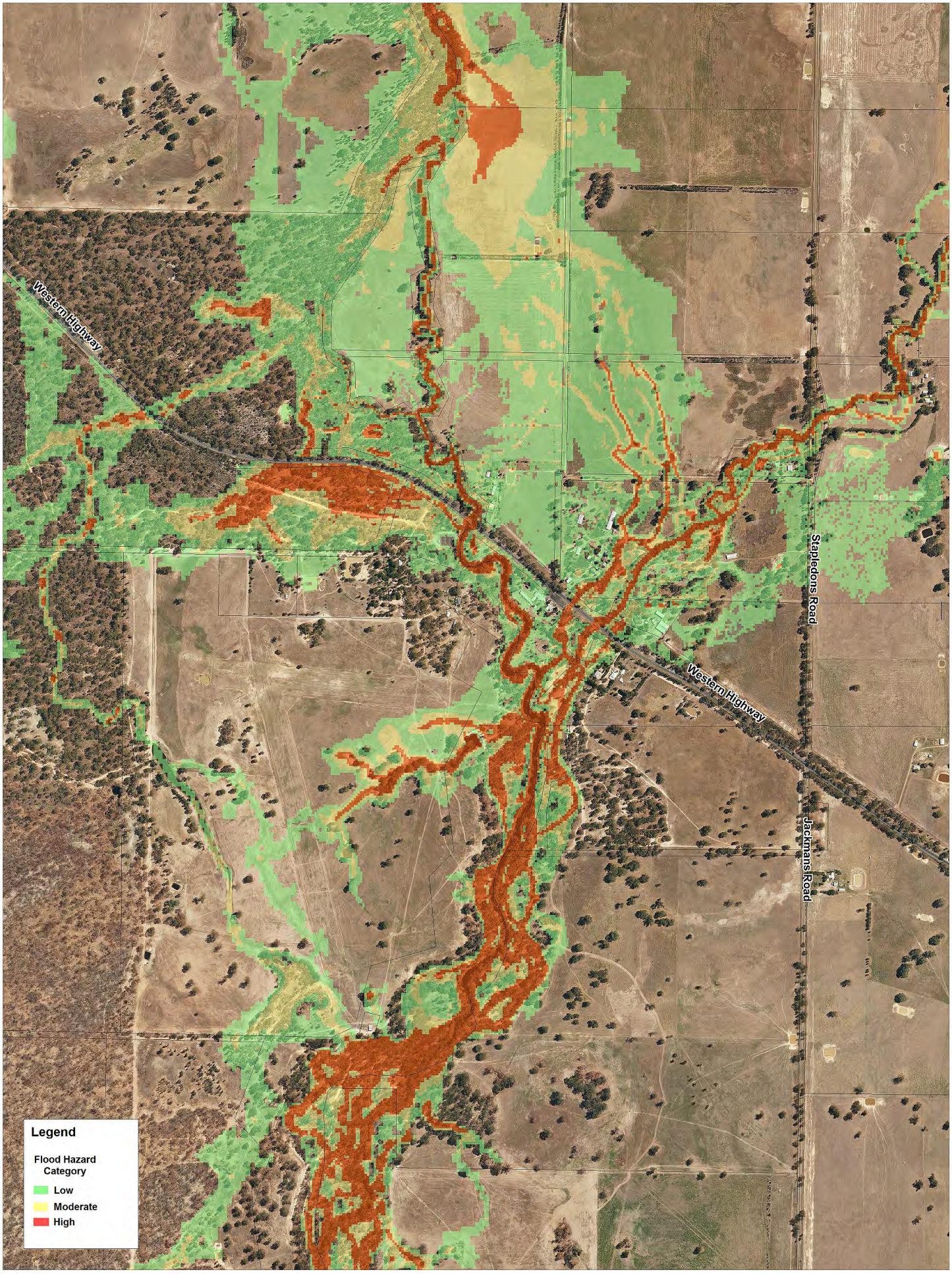
Rev: A

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-9_E01_20yr_047_Haz_catch_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 20 Year ARI Flood Hazards - Dadswells Bridge

Figure: **B-10**

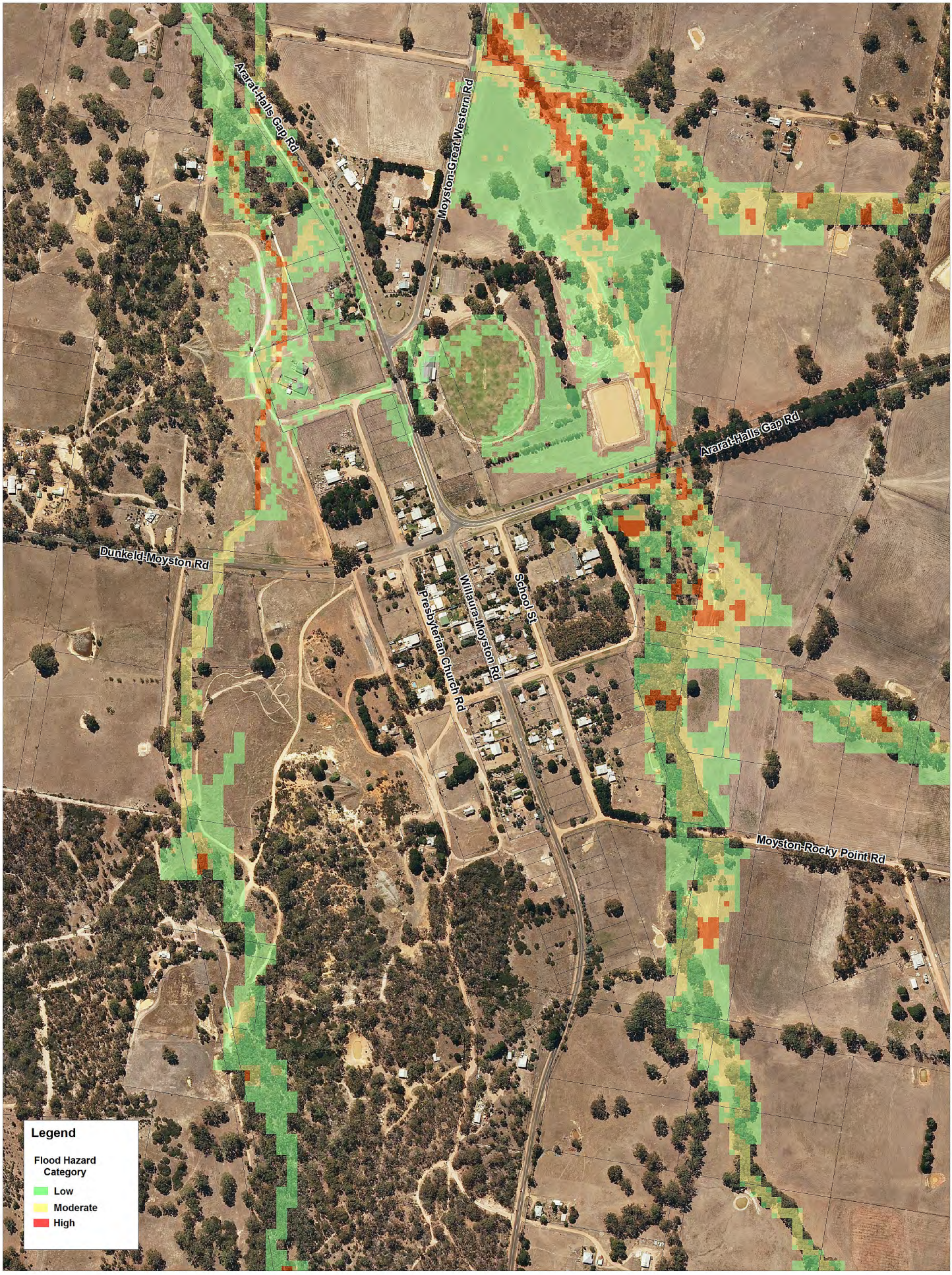
Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-10_E01_20yr_047_Haz_Dad_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 20 Year ARI Flood Hazards - Moyston

Figure: B-11

Rev: A

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-11_E01_20yr_047_Haz_Moy_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 20 Year ARI Flood Hazards - Pomonal

Figure: B-12

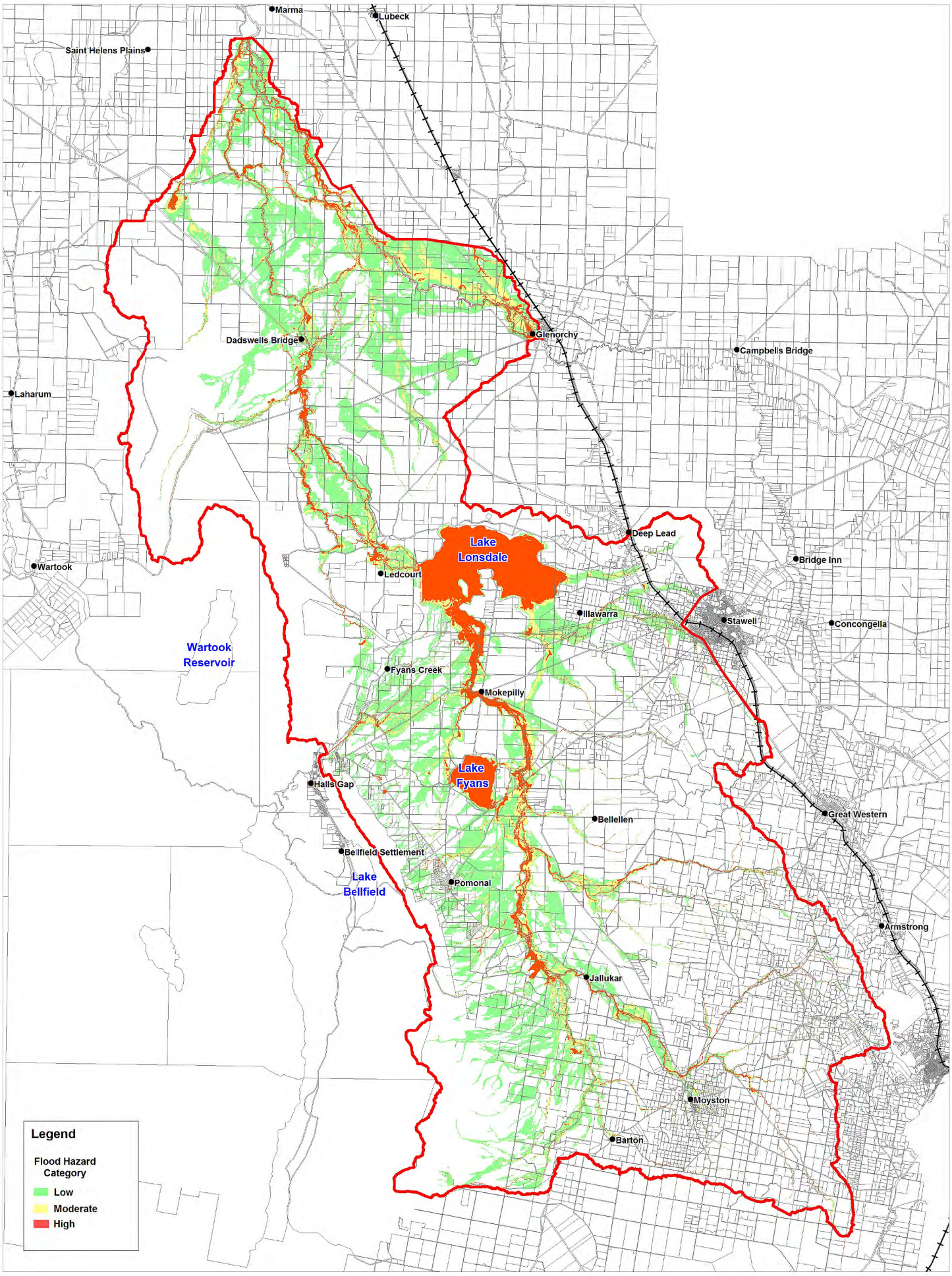
Rev: A

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-12_E01_20yr_047_Haz_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 50 Year ARI Flood Hazards - Whole of Catchment

Figure: B-13

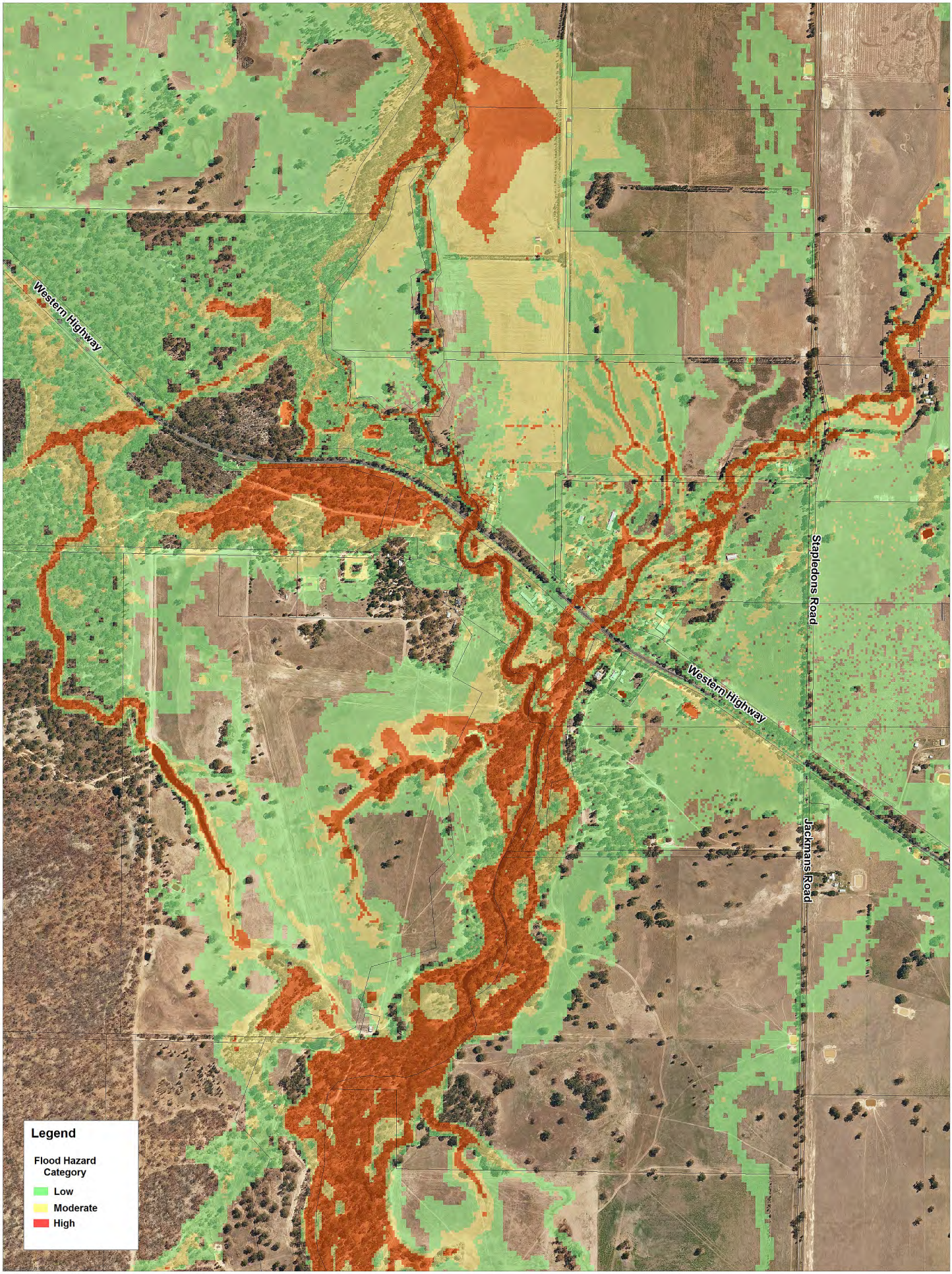
Rev: A

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-13_E01_50yr_047_Haz_catch_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 50 Year ARI Flood Hazards - Dadswells Bridge

Figure: **B-14**

Rev: **A**

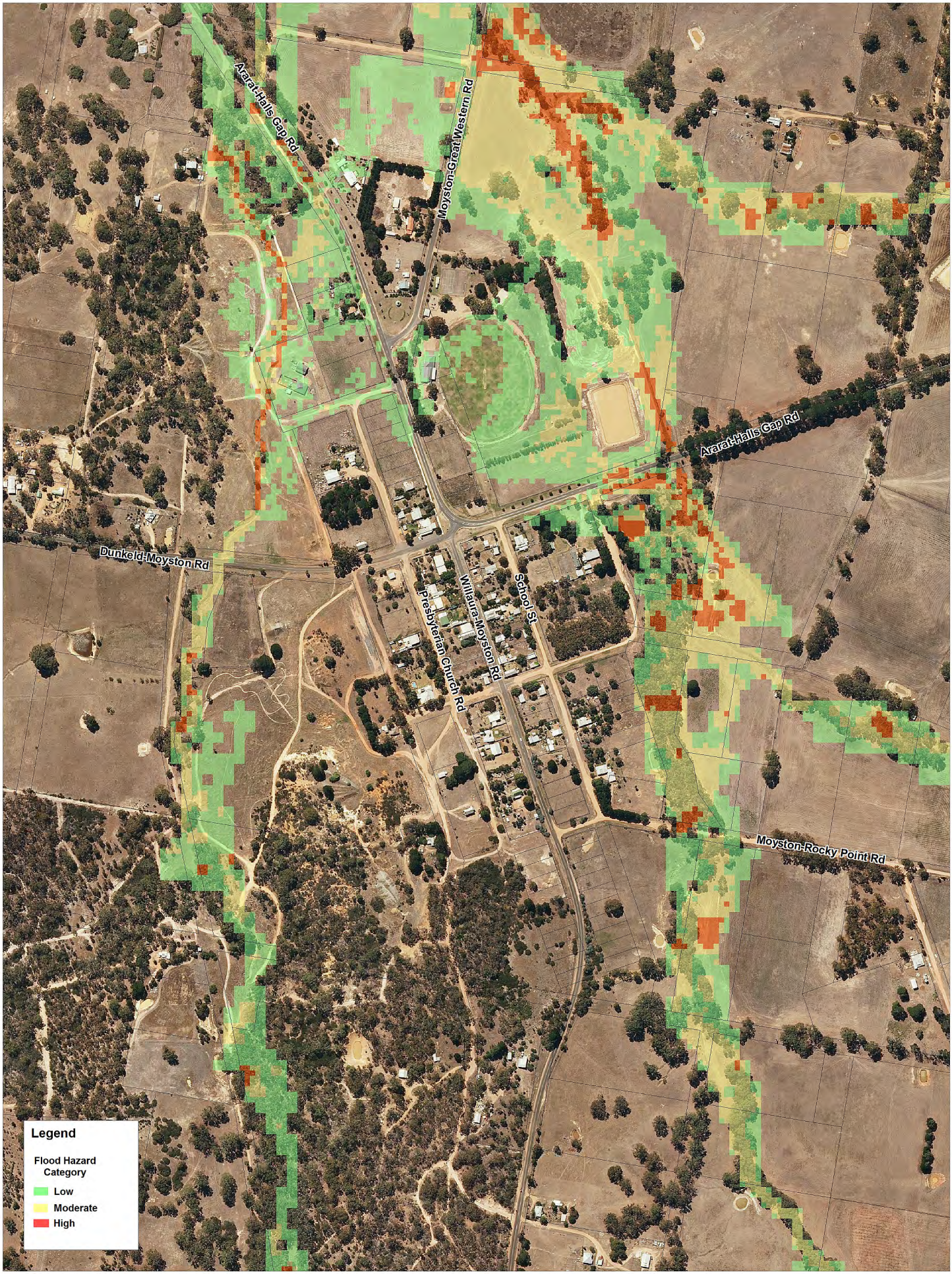
BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-14_E01_50yr_047_Haz_Dad_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 50 Year ARI Flood Hazards - Moyston

Figure: **B-15**

Rev: **A**

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-15_E01_50yr_047_Haz_Moy_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 50 Year ARI Flood Hazards - Pomonal

Figure: **B-16**

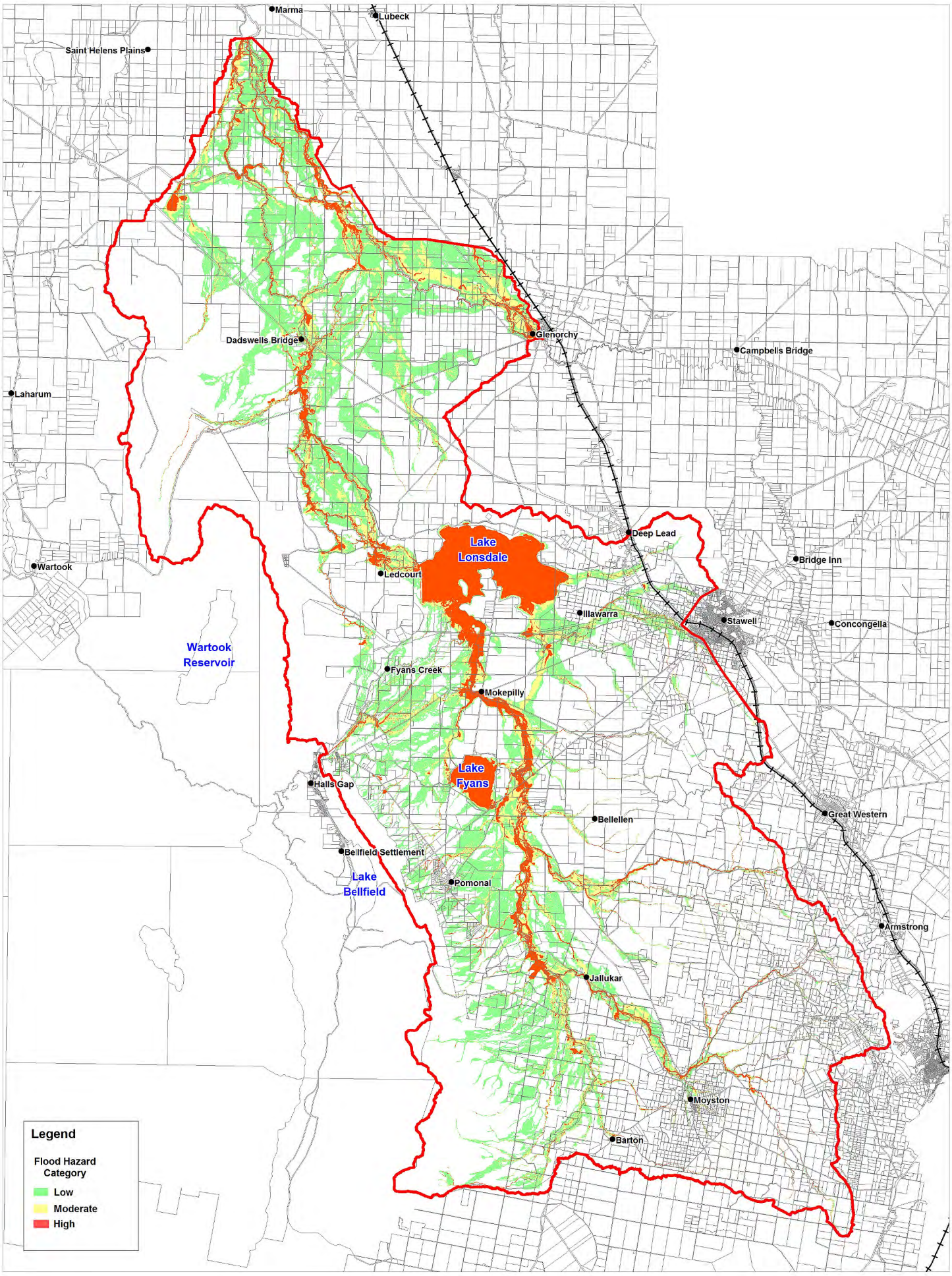
Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-16_E01_50yr_047_Haz_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 100 Year ARI Flood Hazards - Whole of Catchment

Figure: B-17

Rev: A

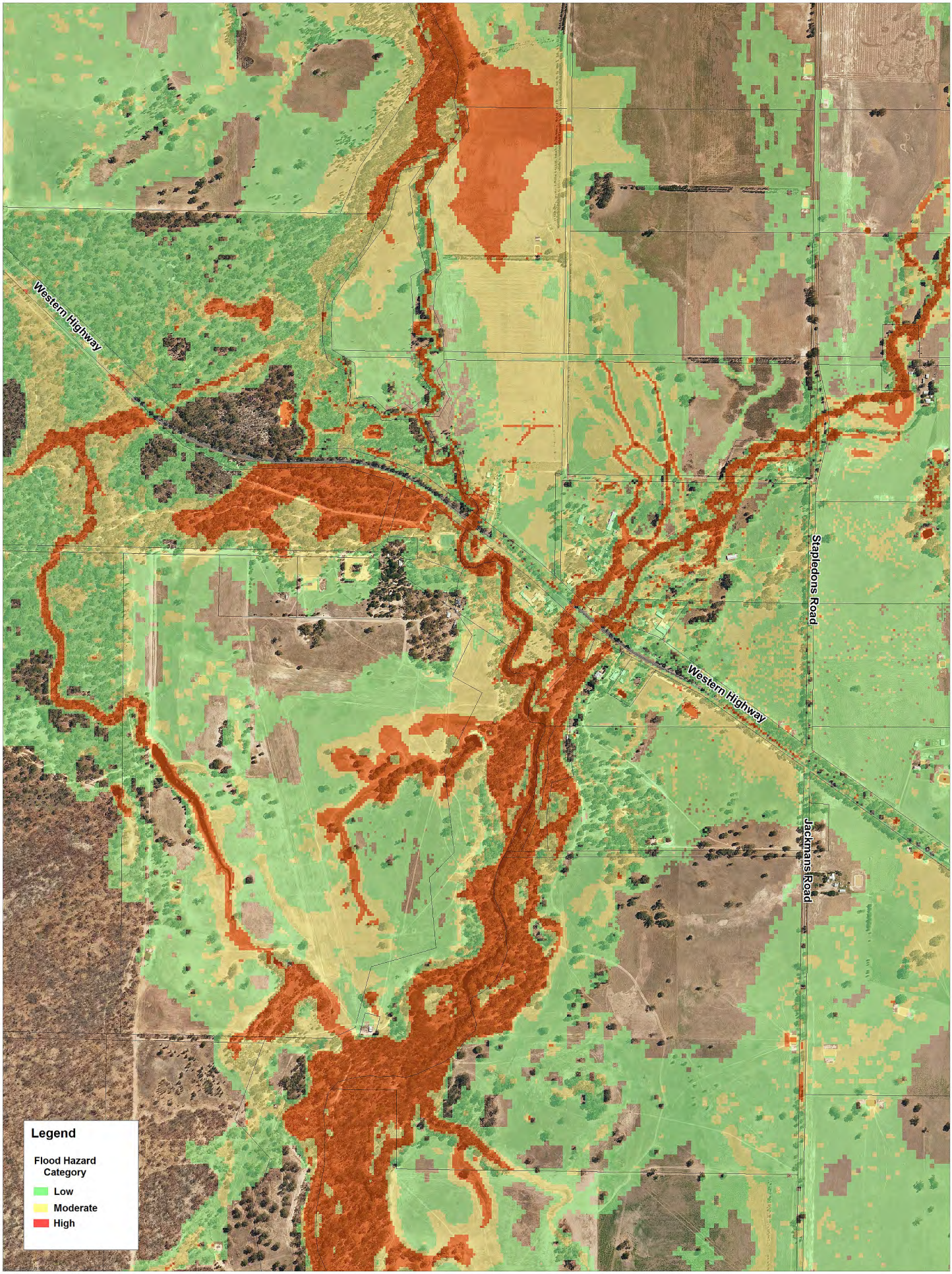
BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-17_E01_100yr_047_Haz_catch_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 100 Year ARI Flood Hazards - Dadswells Bridge

Figure: B-18

Rev: A

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-18_E01_100yr_047_Haz_Dad_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 100 Year ARI Flood Hazards - Moyston

Figure: **B-19**

Rev: **A**

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-19_E01_100yr_047_Haz_Moy_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 100 Year ARI Flood Hazards - Pomonal

Figure: **B-20**

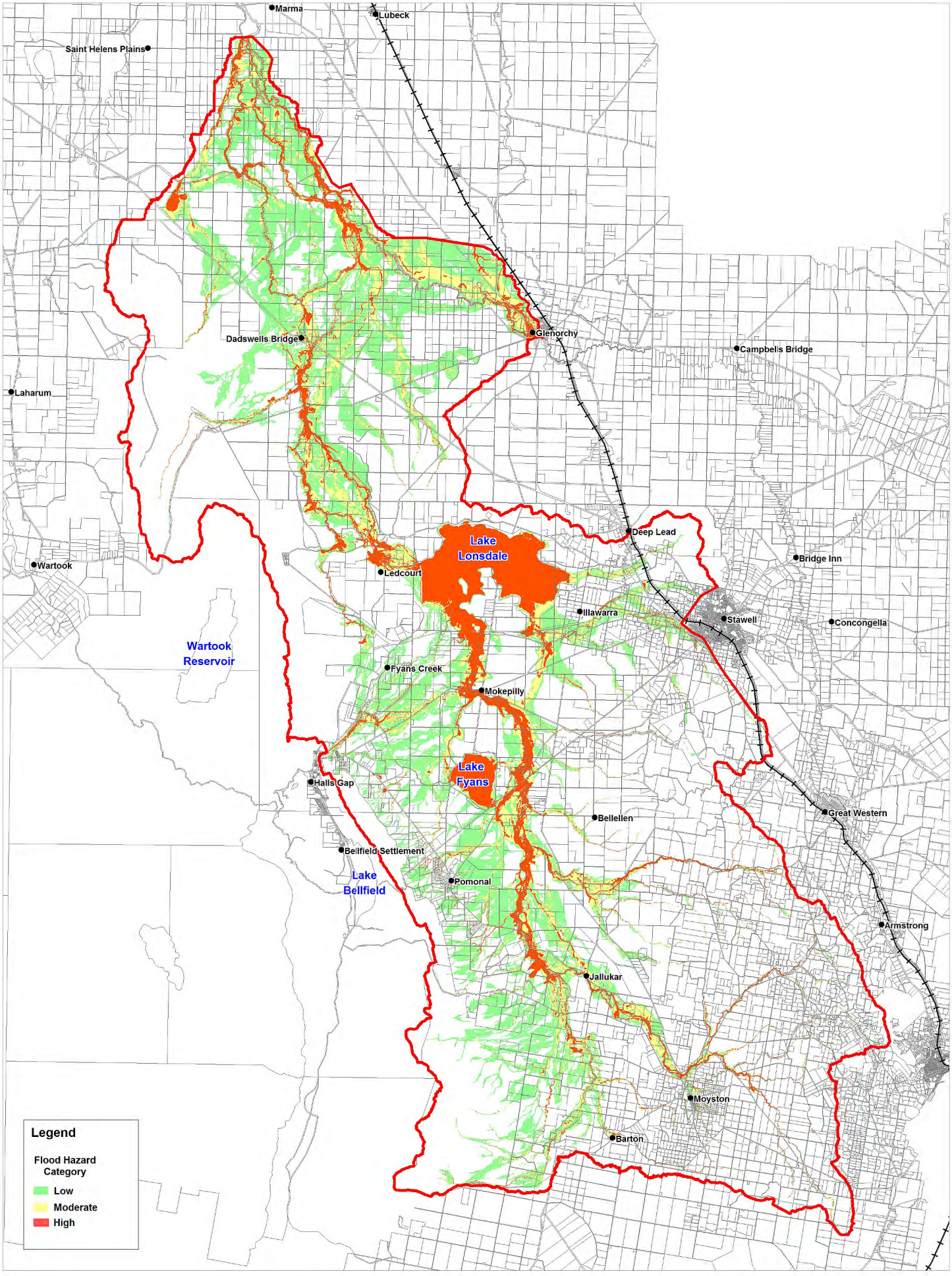
Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-20_E01_100yr_047_Haz_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 200 Year ARI Flood Hazards - Whole of Catchment

Figure: B-21

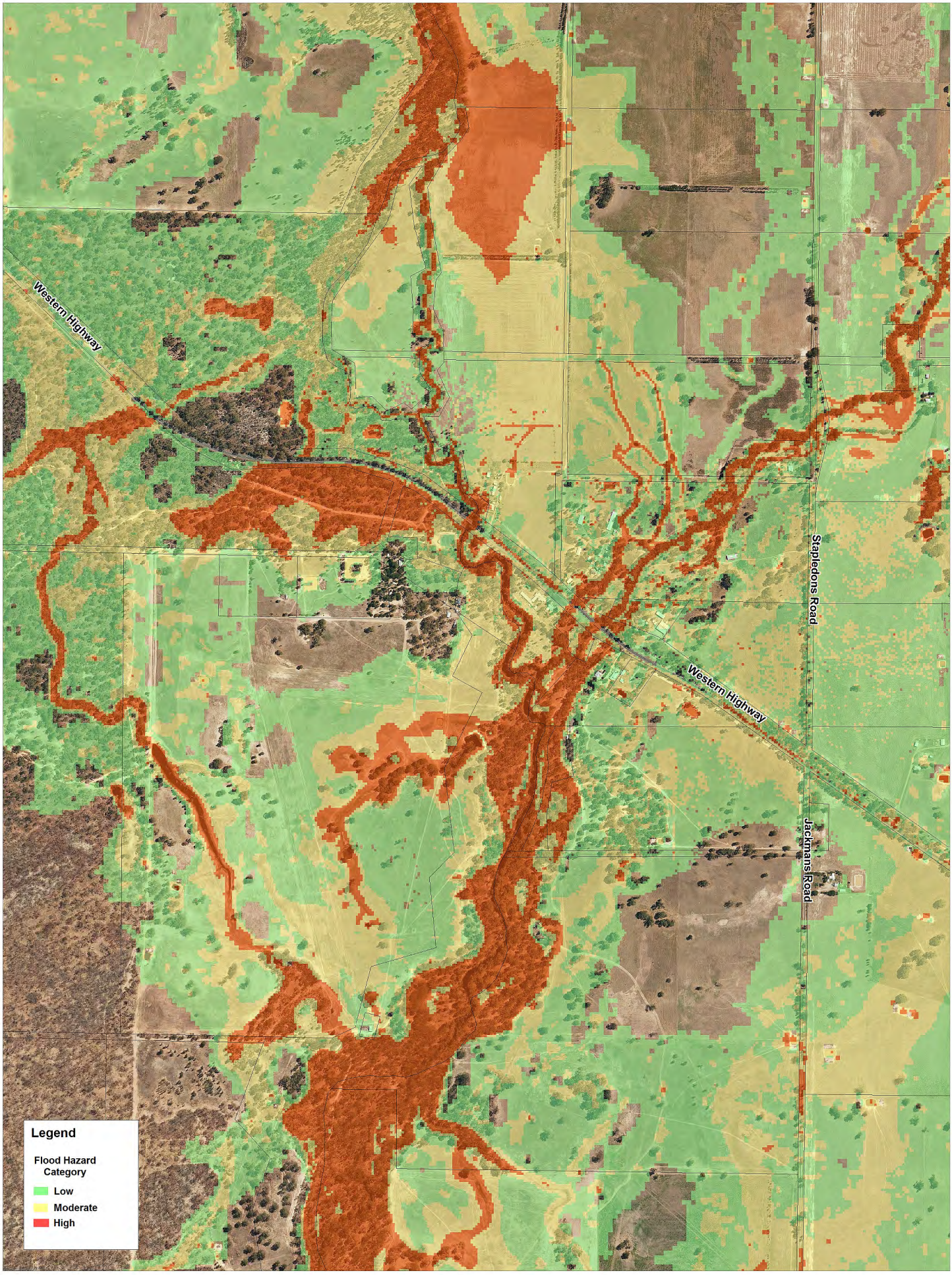
Rev: A

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-21_E01_200yr_047_Haz_catch_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 200 Year ARI Flood Hazards - Dadswells Bridge

Figure: **B-22**

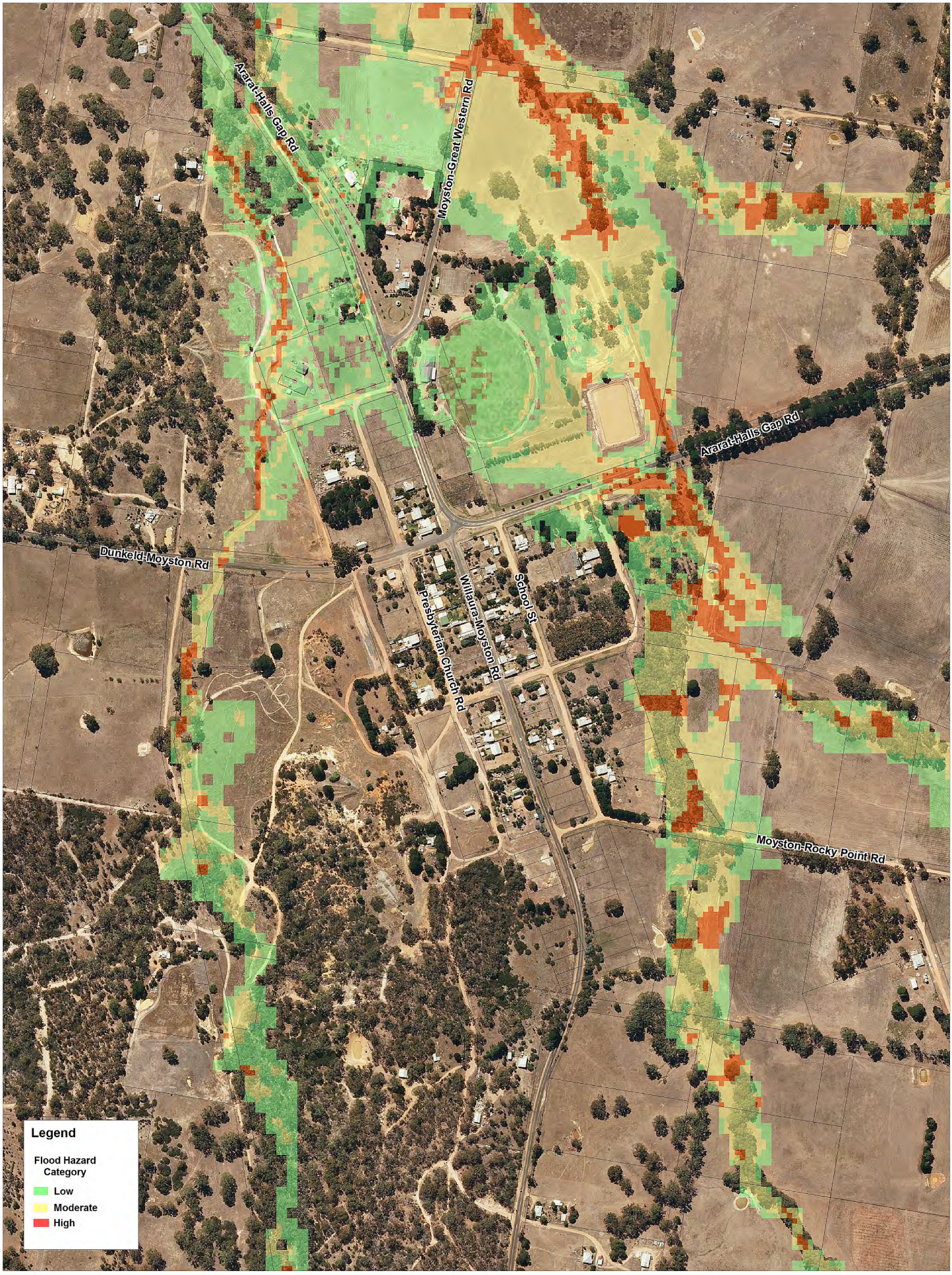
Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-22_E01_200yr_047_Haz_Dad_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 200 Year ARI Flood Hazards - Moyston

Figure: **B-23**

Rev: **A**

N

0 125 250m

Approx. Scale

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Title:

Mount William Creek Flood Investigation
1 in 200 Year ARI Flood Hazards - Pomonal

Figure: **B-24**

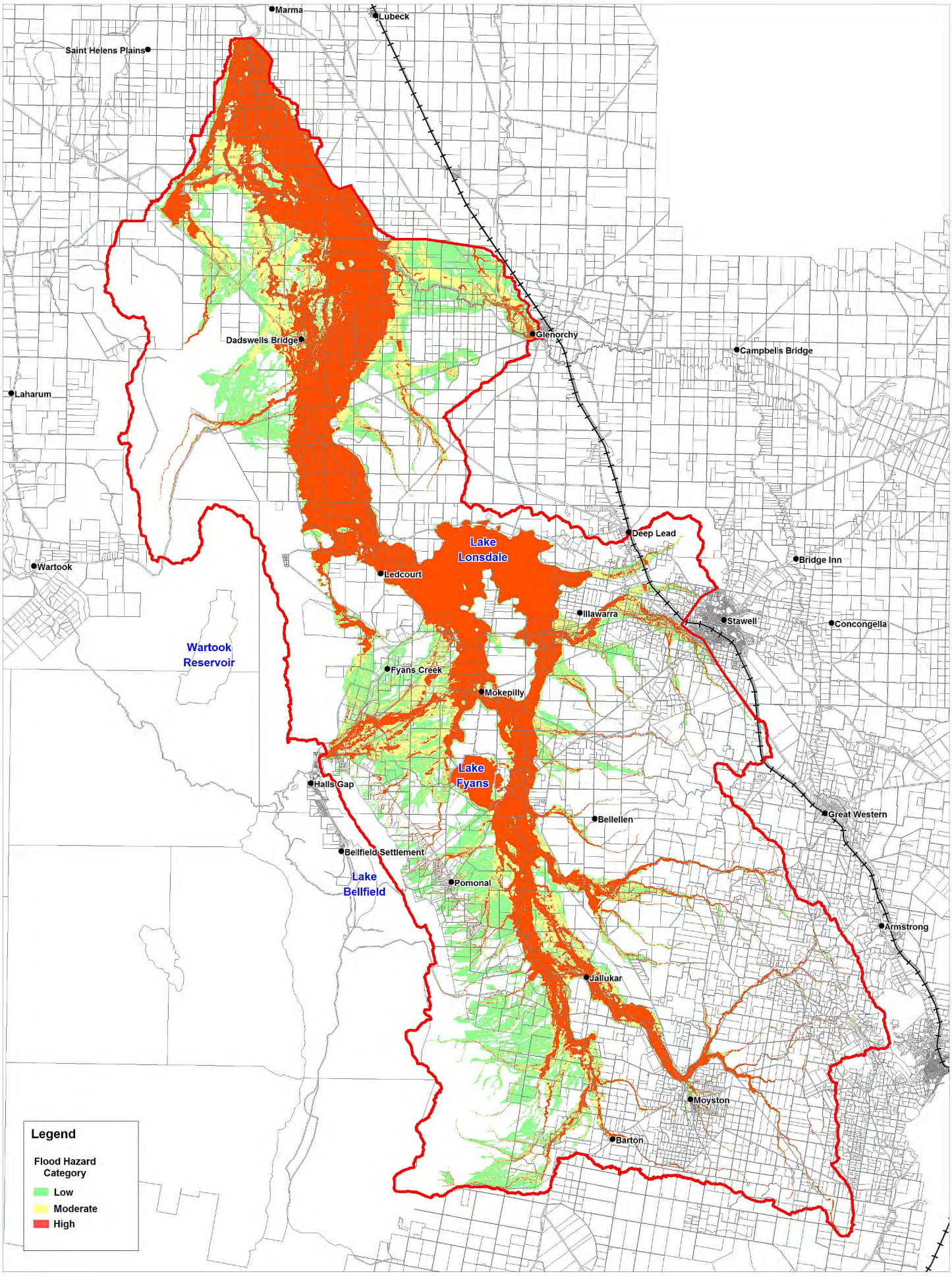
Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-24_E01_200yr_047_Haz_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
Probable Maximum Flood Hazards - Whole of Catchment

Figure: B-25

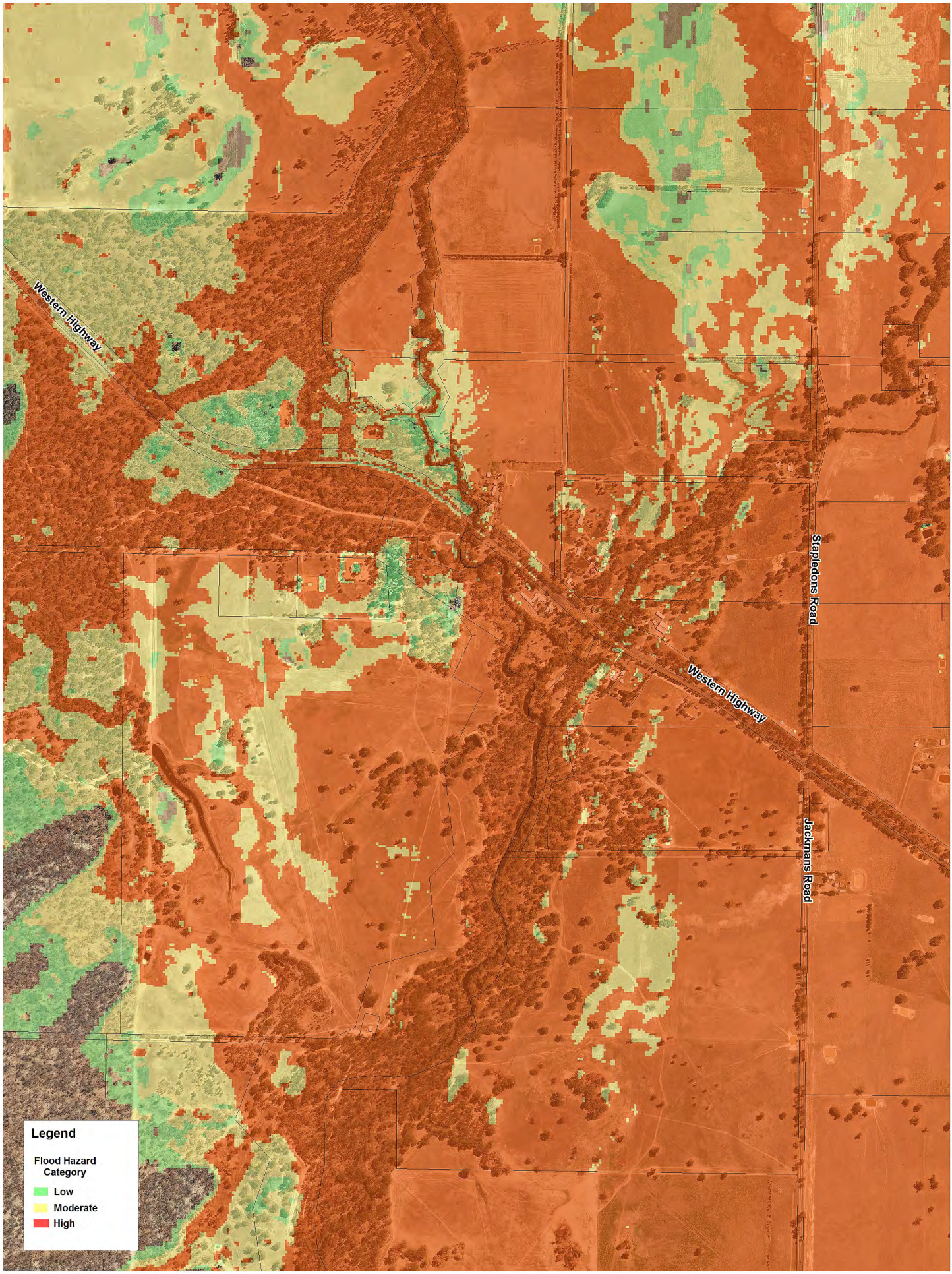
Rev: A

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-25_E01_PMP_047_Haz_catch_RevA.WOR



Title:

Mount William Creek Flood Investigation
Probable Maximum Flood Hazards - Dadswells Bridge

Figure: **B-26**

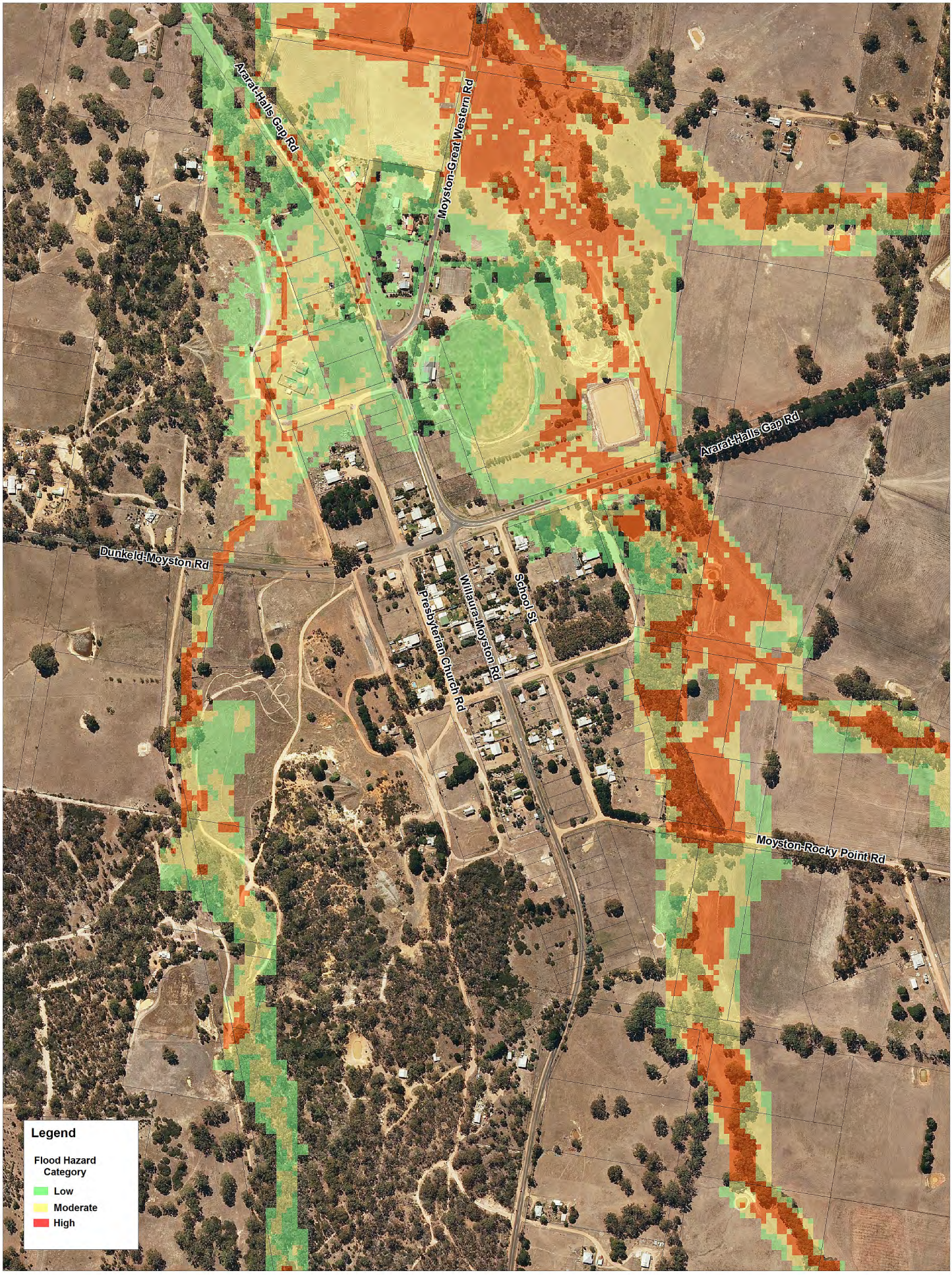
Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-26_E01_PMP_047_Haz_Dad_RevA.WOR



Title:

Mount William Creek Flood Investigation
Probable Maximum Flood Hazards - Moyston

Figure: **B-27**

Rev: **A**

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N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-27_E01_PMP_047_Haz_Moy_RevA.WOR

Title:

Mount William Creek Flood Investigation
Probable Maximum Flood Hazards - Pomonal

Figure: **B-28**

Rev: **A**

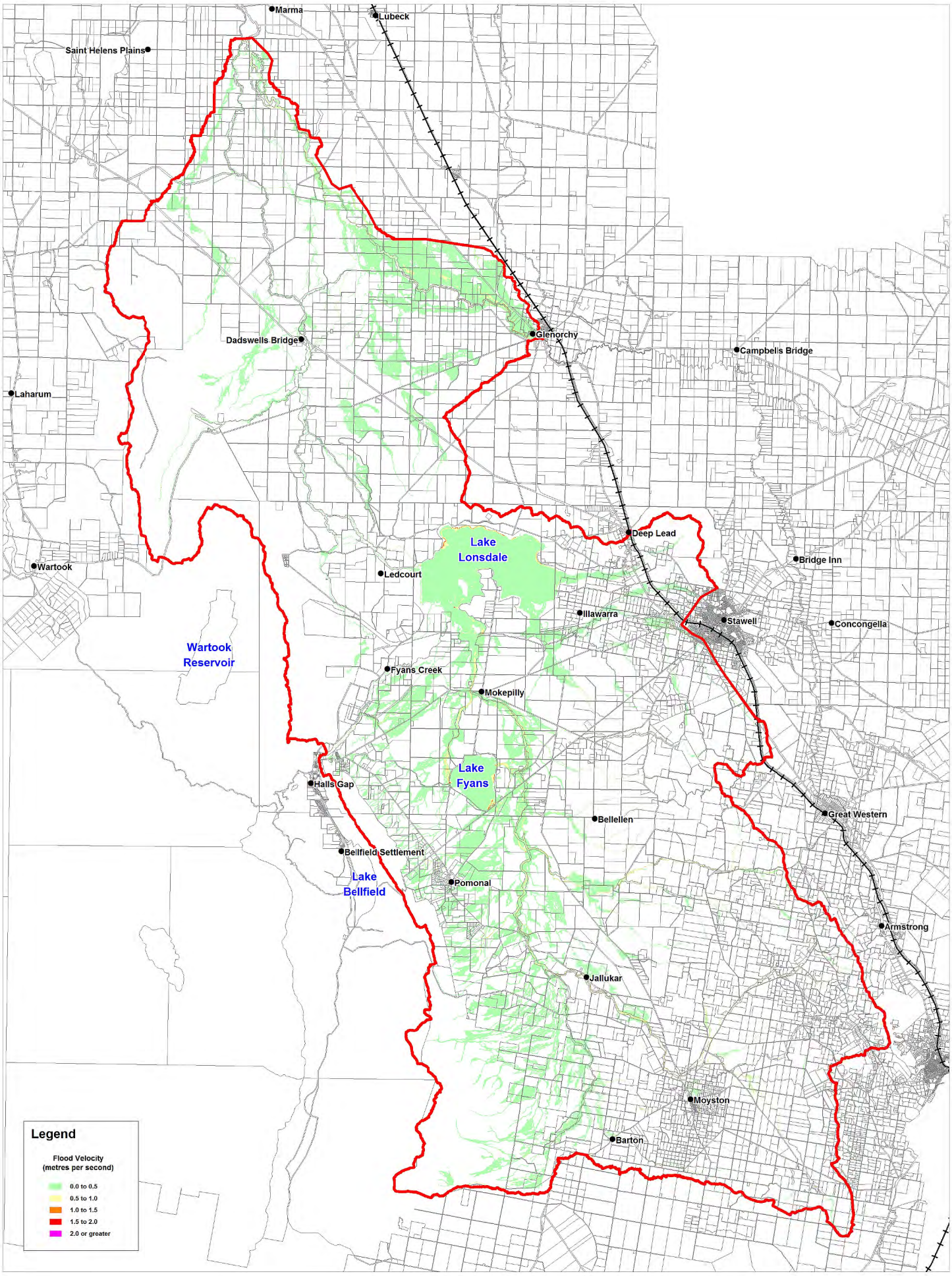
N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigB-28_E01_PMP_047_Haz_Pom_RevA.WOR

Appendix C Flood Velocity Mapping



Title:

Mount William Creek Flood Investigation
1 in 5 Year ARI Flood Velocities - Whole of Catchment

Figure: C-1

Rev: A

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-1_E01_5yr_047_vMax_catch_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 5 Year ARI Flood Velocities - Dadswells Bridge

Figure: **C-2**

Rev: **A**

N

0 250 500m

Approx. Scale

Wimmera Catchment Management Authority · Ararat Rural City · Northern Grampians Shire · Horsham Rural City Council · Australian Government · Victoria · BMT WBM

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-2_E01_5yr_047_vMax_Dad_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 5 Year ARI Flood Velocities - Moyston

Figure: C-3

Rev: A

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-3_E01_5yr_047_vMax_Moy_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 5 Year ARI Flood Velocities - Pomonal

Figure: C-4

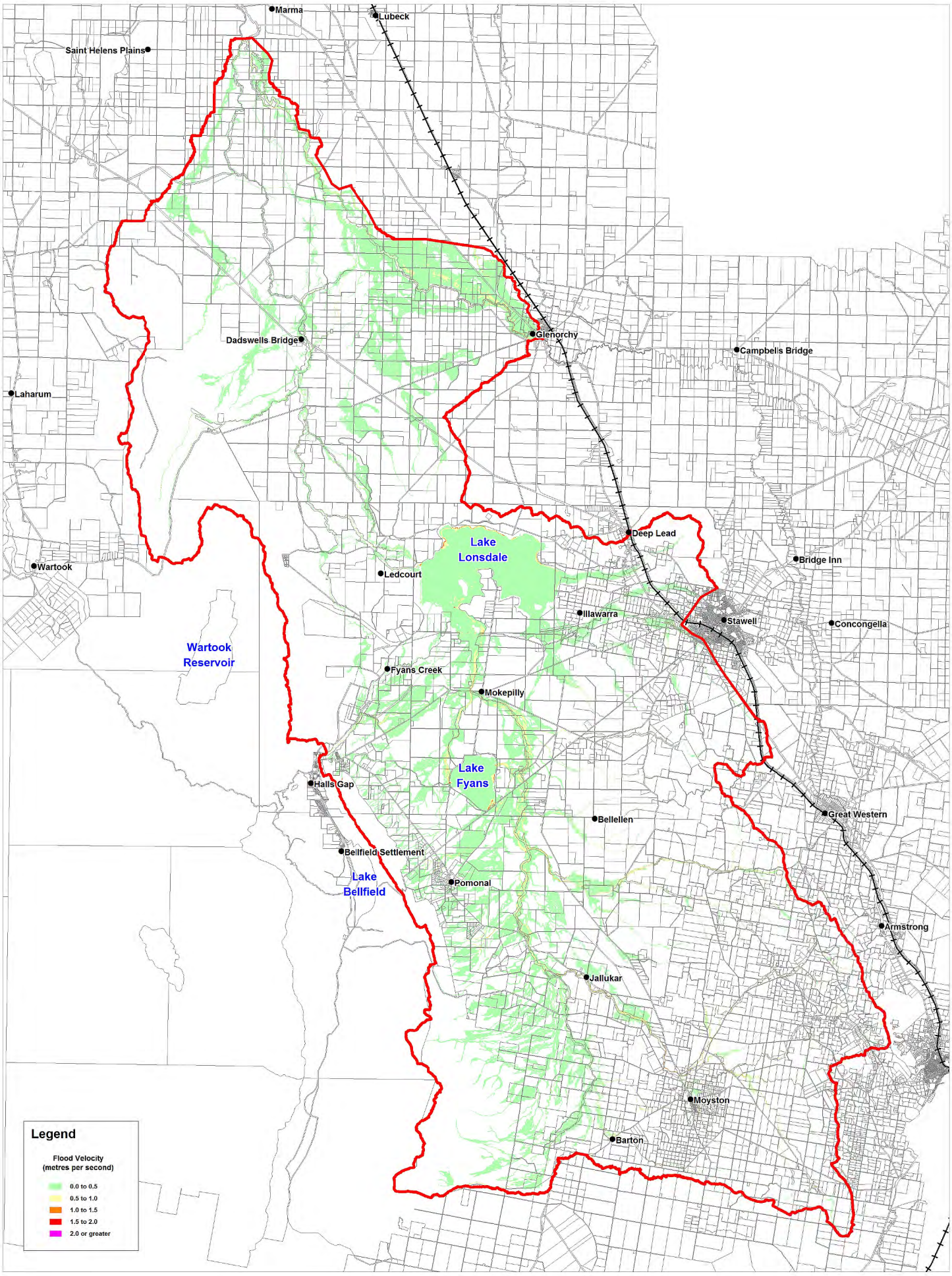
Rev: A

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-4_E01_5yr_047_vMax_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 10 Year ARI Flood Velocities - Whole of Catchment

Figure: C-5

Rev: A

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-5_E01_10yr_047_vMax_catch_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 10 Year ARI Flood Velocities - Dadswells Bridge

Figure: **C-6**

Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-6_E01_10yr_047_vMax_Dad_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 10 Year ARI Flood Velocities - Moyston

Figure: C-7

Rev: A

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-7_E01_10yr_047_vMax_Moy_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 10 Year ARI Flood Velocities - Pomonal

Figure: C-8

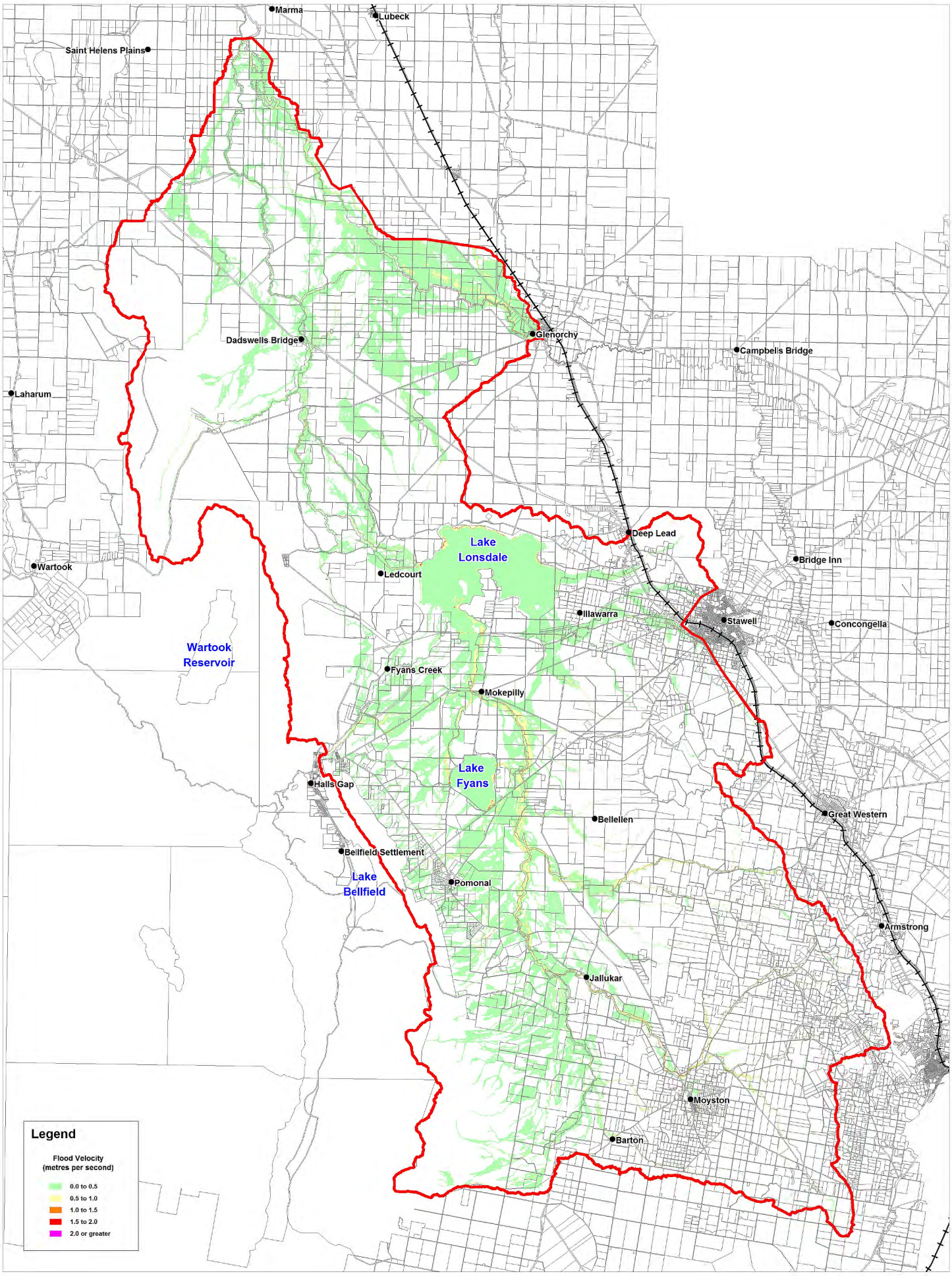
Rev: A

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-8_E01_10yr_047_vMax_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 20 Year ARI Flood Velocities - Whole of Catchment

Figure: C-9

Rev: A

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-9_E01_20yr_047_vMax_catch_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 20 Year ARI Flood Velocities - Dadswells Bridge

Figure: **C-10**

Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-10_E01_20yr_047_vMax_Dad_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 20 Year ARI Flood Velocities - Moyston

Figure: C-11

Rev: A

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-11_E01_20yr_047_vMax_Moy_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 20 Year ARI Flood Velocities - Pomonal

Figure: C-12

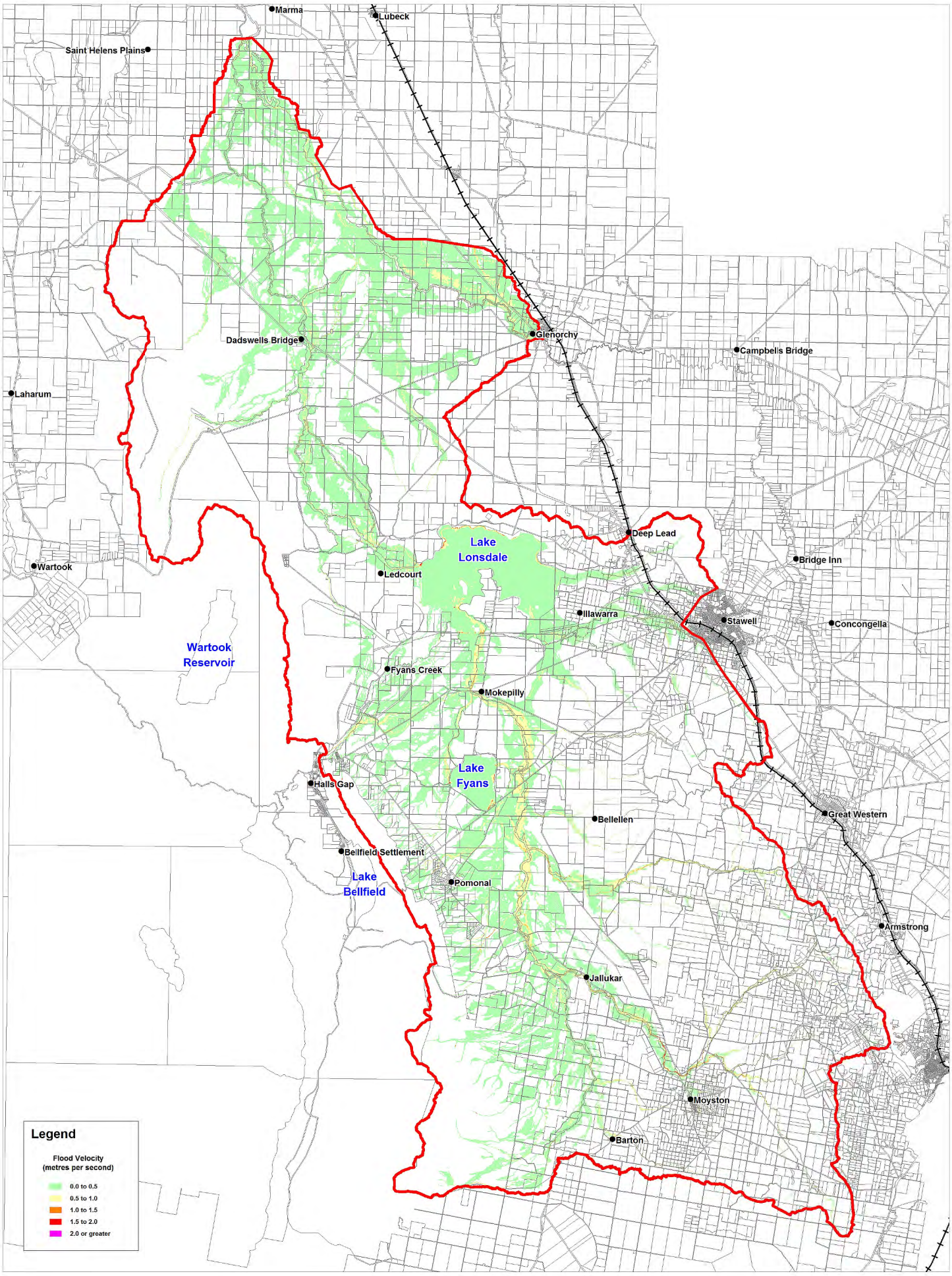
Rev: A

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-12_E01_20yr_047_vMax_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 50 Year ARI Flood Velocities - Whole of Catchment

Figure: C-13

Rev: A

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-13_E01_50yr_047_vMax_catch_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 50 Year ARI Flood Velocities - Dadswells Bridge

Figure: C-14

Rev: A

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-14_E01_50yr_047_vMax_Dad_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 50 Year ARI Flood Velocities - Moyston

Figure: C-15

Rev: A

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-15_E01_50yr_047_vMax_Moy_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 50 Year ARI Flood Velocities - Pomonal

Figure: C-16

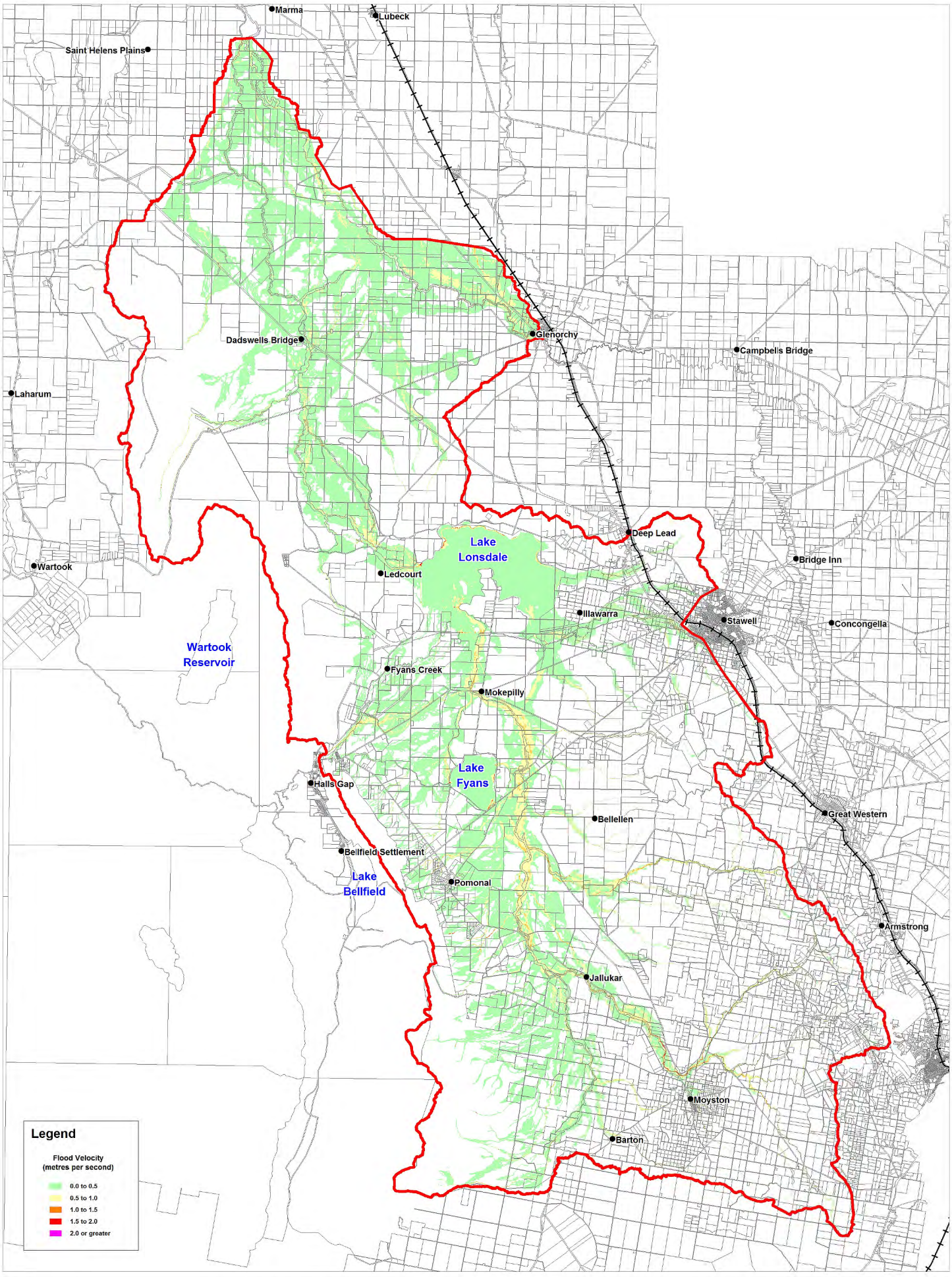
Rev: A

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-16_E01_50yr_047_vMax_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 100 Year ARI Flood Velocities - Whole of Catchment

Figure: C-17

Rev: A

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-17_E01_100yr_047_vMax_catch_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 100 Year ARI Flood Velocities - Dadswells Bridge

Figure: C-18

Rev: A

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-18_E01_100yr_047_vMax_Dad_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 100 Year ARI Flood Velocities - Moyston

Figure: **C-19**

Rev: **A**

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-19_E01_100yr_047_vMax_Moy_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 100 Year ARI Flood Velocities - Pomonal

Figure: C-20

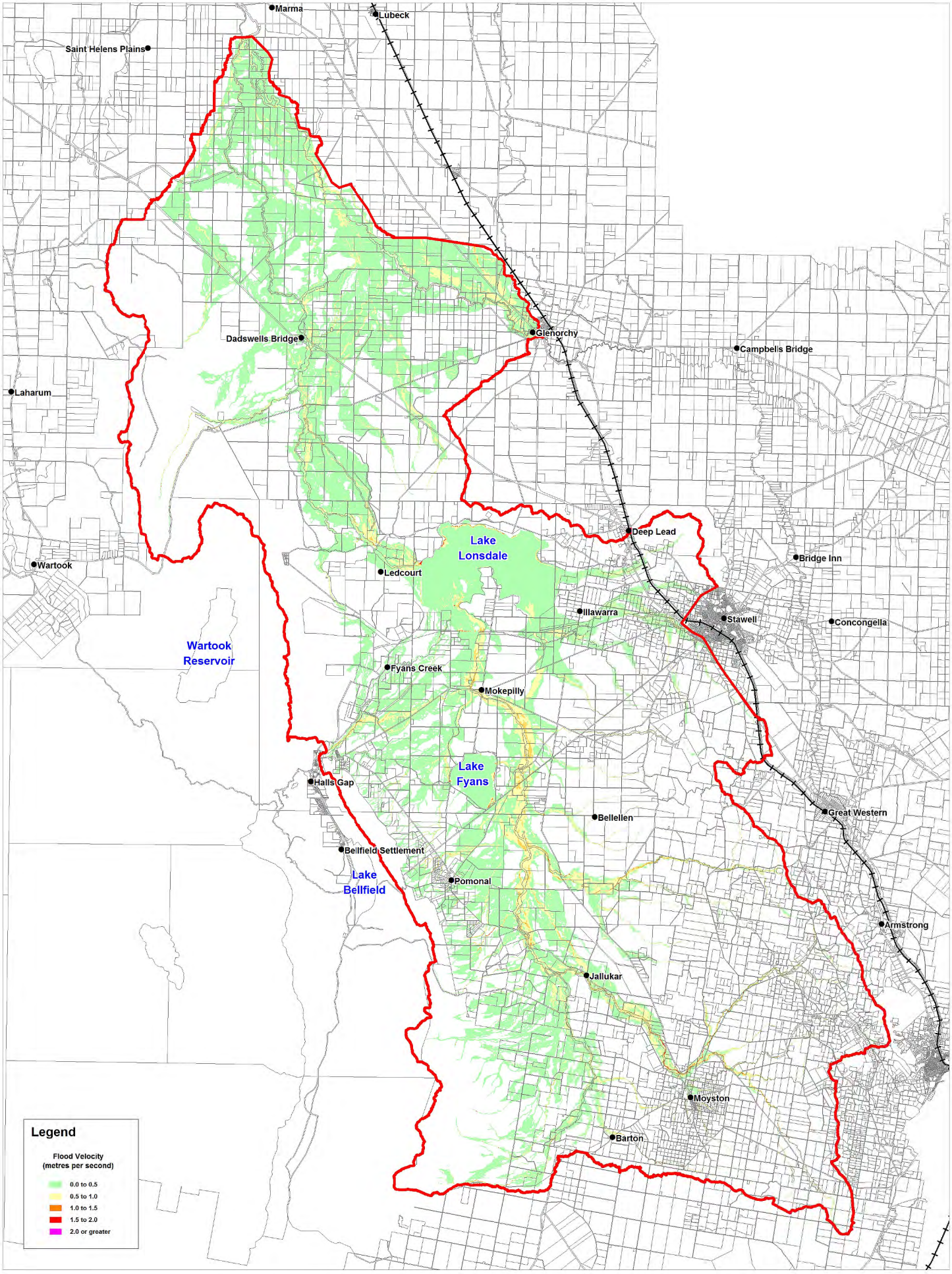
Rev: A

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-20_E01_100yr_047_vMax_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
1 in 200 Year ARI Flood Velocities - Whole of Catchment

Figure: C-21

Rev: A

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-21_E01_200yr_047_vMax_catch_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 200 Year ARI Flood Velocities - Dadswells Bridge

Figure: **C-22**

Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-22_E01_200yr_047_vMax_Dad_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 200 Year ARI Flood Velocities - Moyston

Figure: C-23

Rev: A

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-23_E01_200yr_047_vMax_Moy_RevA.WOR

Title:

Mount William Creek Flood Investigation
1 in 200 Year ARI Flood Velocities - Pomonal

Figure: C-24

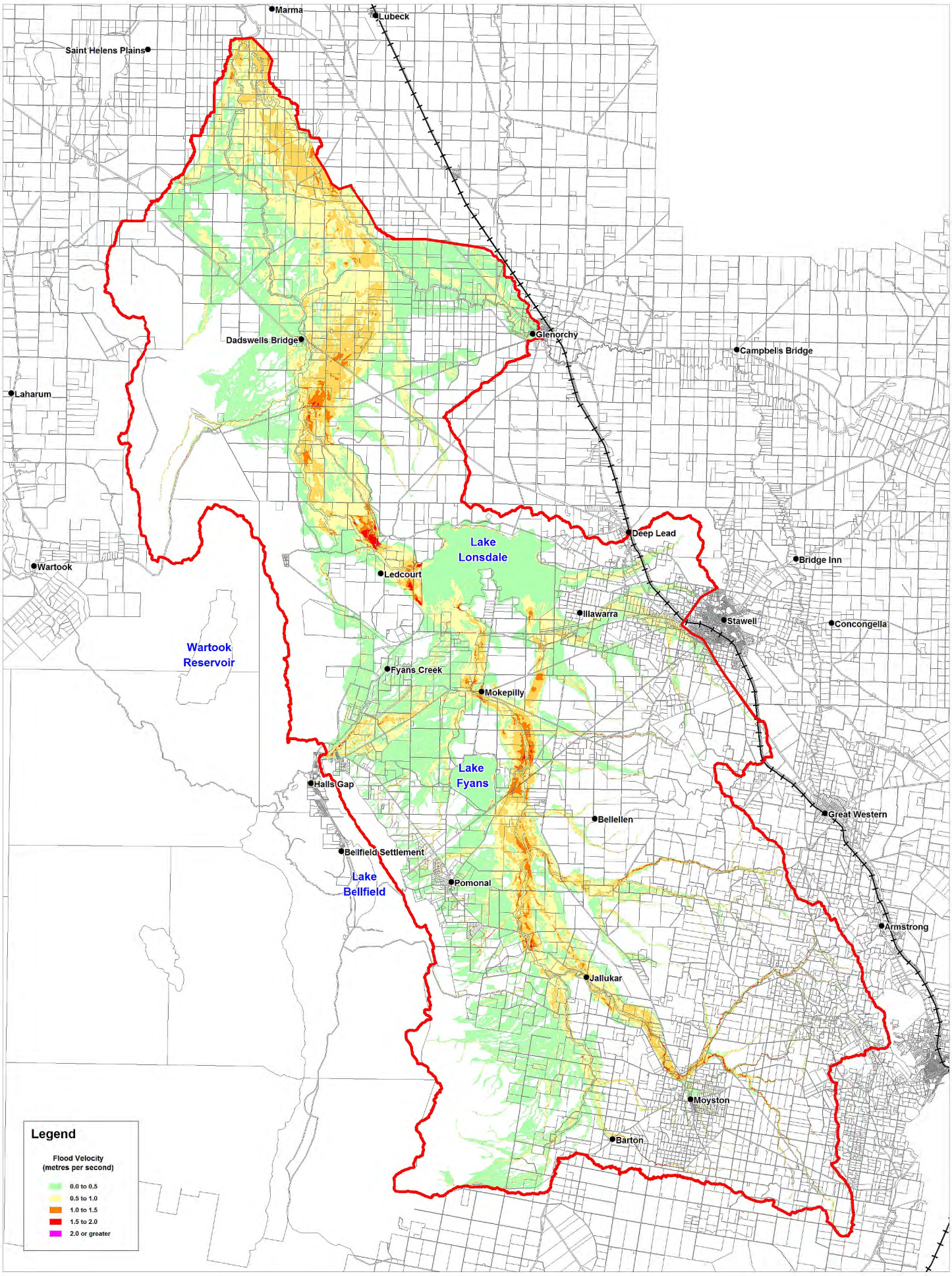
Rev: A

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-24_E01_200yr_047_vMax_Pom_RevA.WOR



Title:

Mount William Creek Flood Investigation
Probable Maximum Flood Velocities - Whole of Catchment

Figure: C-25

Rev: A

N

0 3.75 7.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-25_E01_PMP_047_vMax_catch_RevA.WOR

Title:

Mount William Creek Flood Investigation
Probable Maximum Flood Velocities - Dadswells Bridge

Figure: **C-26**

Rev: **A**

N

0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-26_E01_PMP_047_vMax_Dad_RevA.WOR

Title:

Mount William Creek Flood Investigation
Probable Maximum Flood Velocities - Moyston

Figure: **C-27**

Rev: **A**

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-27_E01_PMP_047_vMax_Moy_RevA.WOR

Title:

Mount William Creek Flood Investigation
Probable Maximum Flood Velocities - Pomonal

Figure: C-28

Rev: A

N

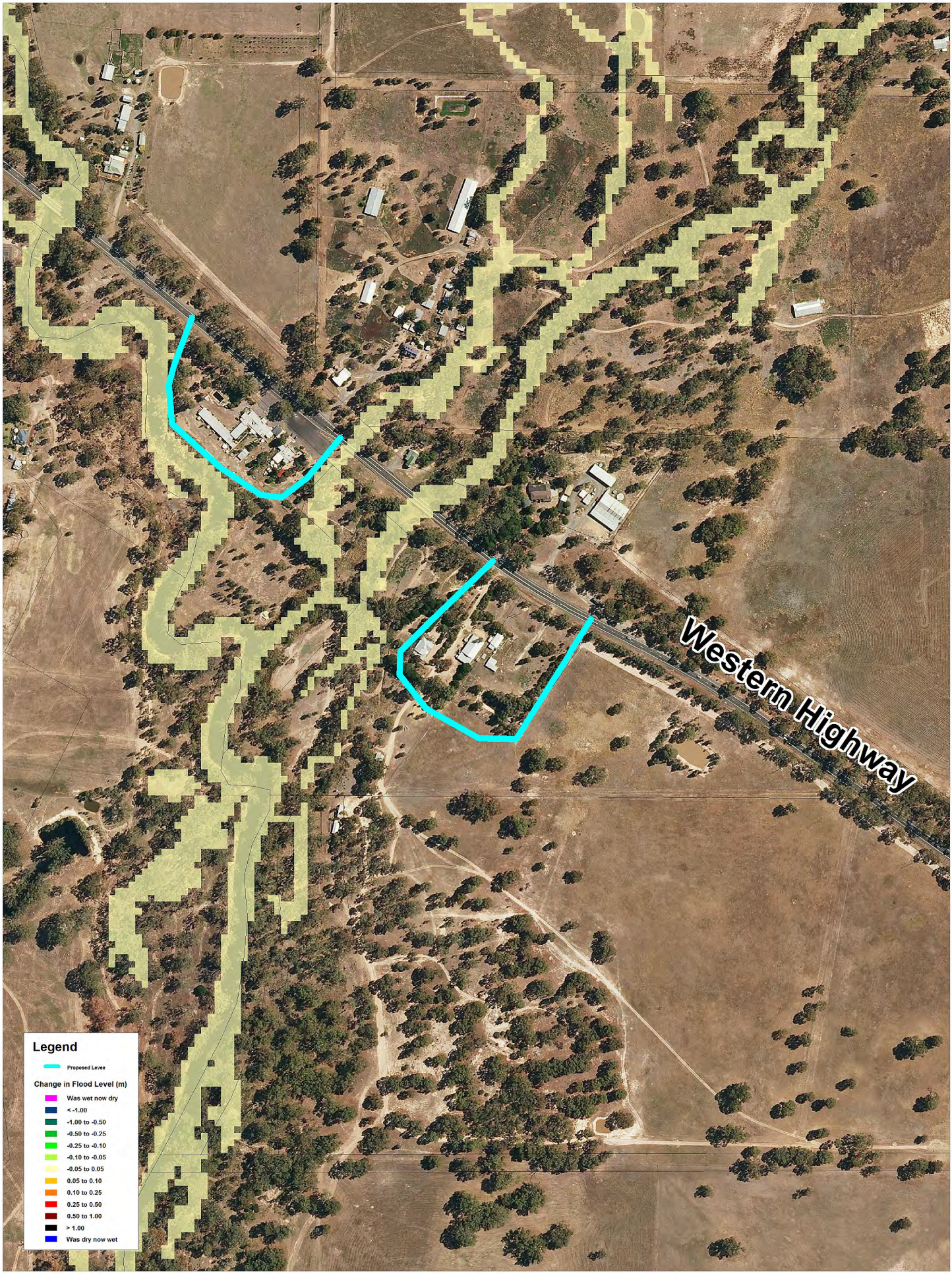
0 250 500m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigC-28_E01_PMP_047_vMax_Pom_RevA.WOR

Appendix D Mitigation Scenarios – Flood Impact Assessment

D.1 Mitigation Assessment Scenario 1 – Dadswells Bridge Levees



Title:

Mount William Creek Flood Investigation Mitigation Option 1
1 in 5 Year ARI Flood Impacts

Figure: **D-1**

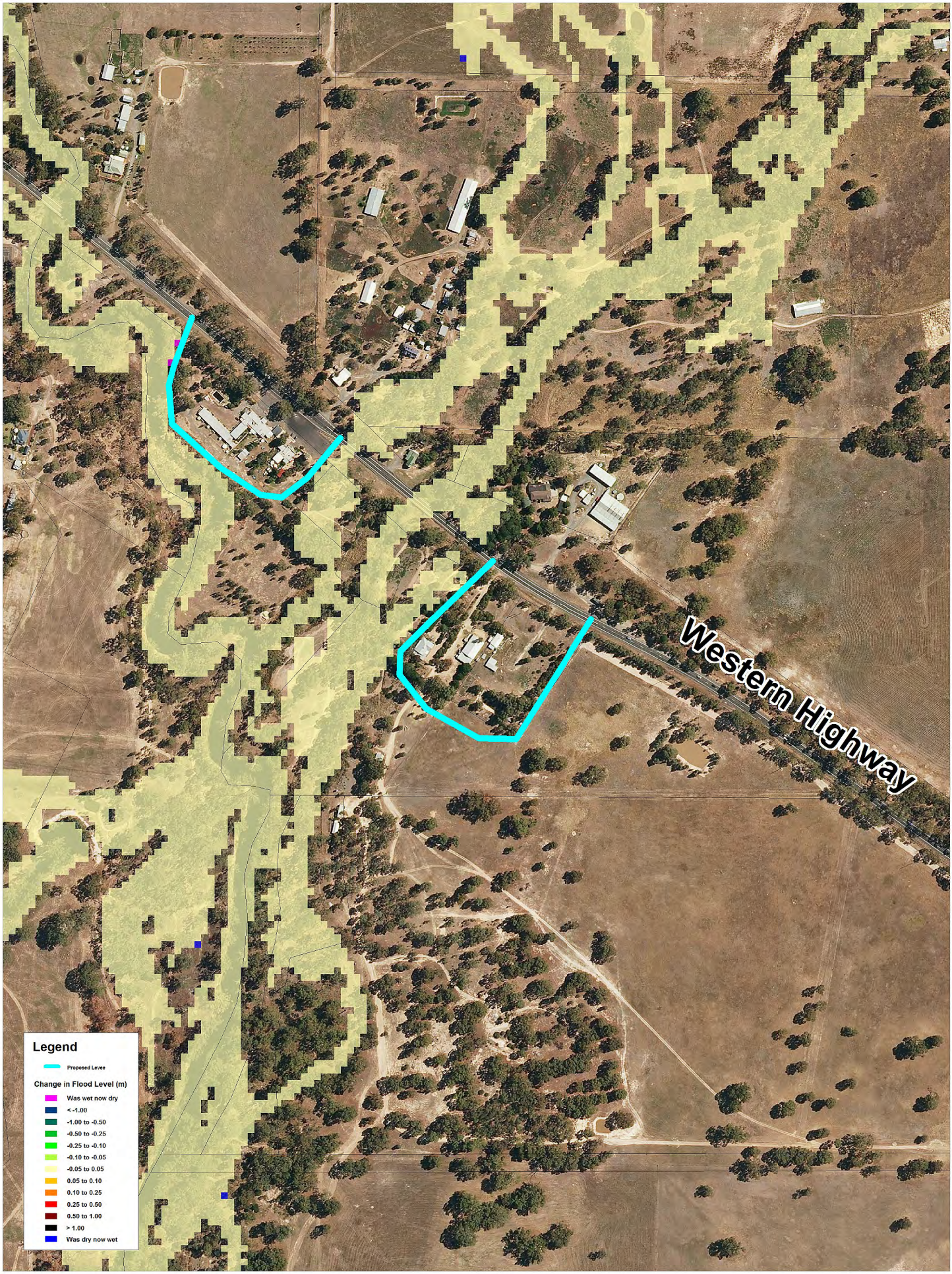
Rev: **A**

N

0 100 200m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-1_Dif_hMax_M01_5yr_047_Dads_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 1
1 in 10 Year ARI Flood Impacts

Figure: **D-2**

Rev: **A**

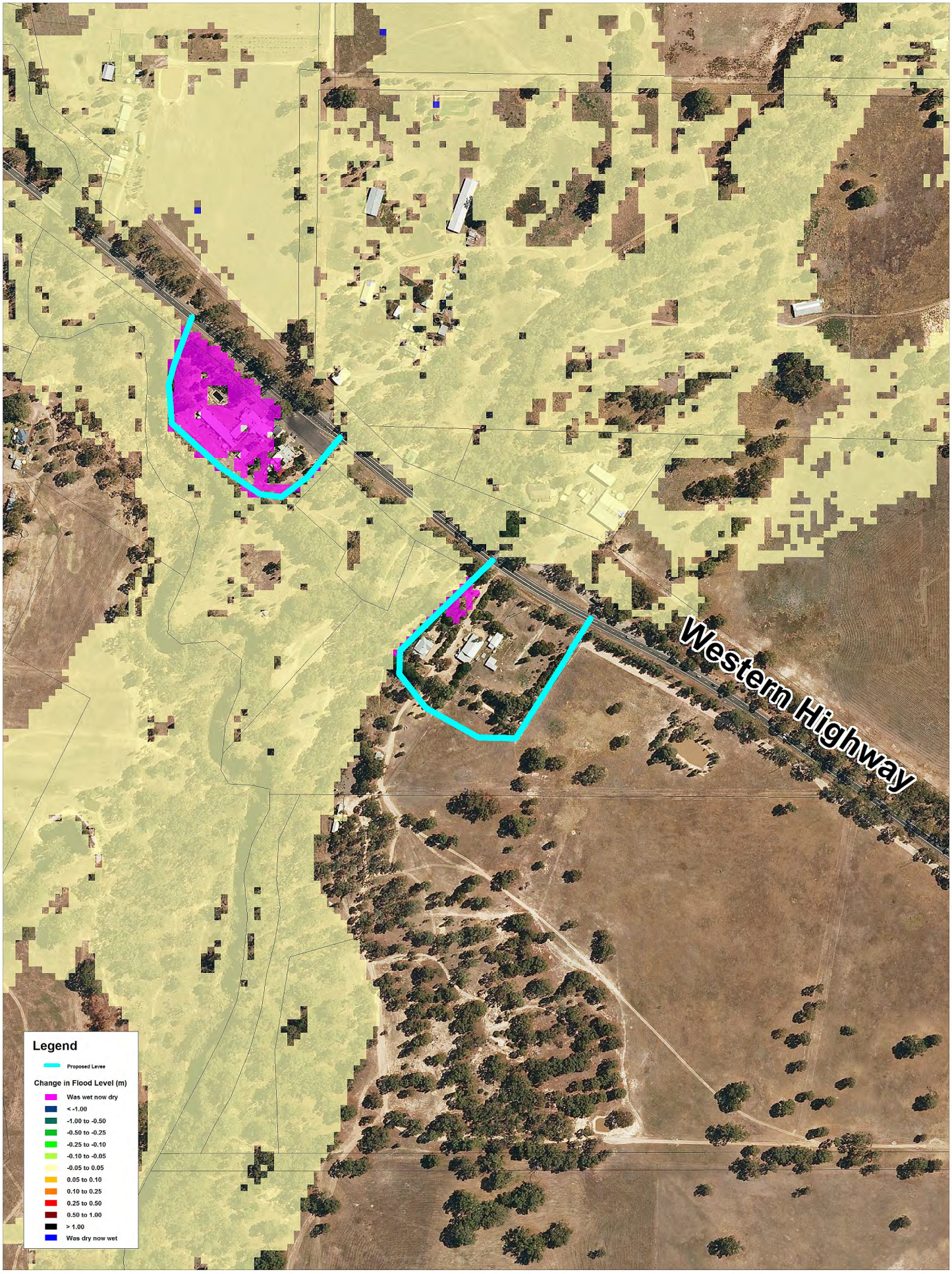
N

0 100 200m

Approx. Scale

Wimmera Catchment Management Authority | Ararat Rural City | Northern Grampians Shire | Horsham Rural City Council | Australian Government | Victoria | BMT WBM

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-2_Dif_hMax_M01_10yr_047_Dads_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 1
1 in 20 Year ARI Flood Impacts

Figure: D-3

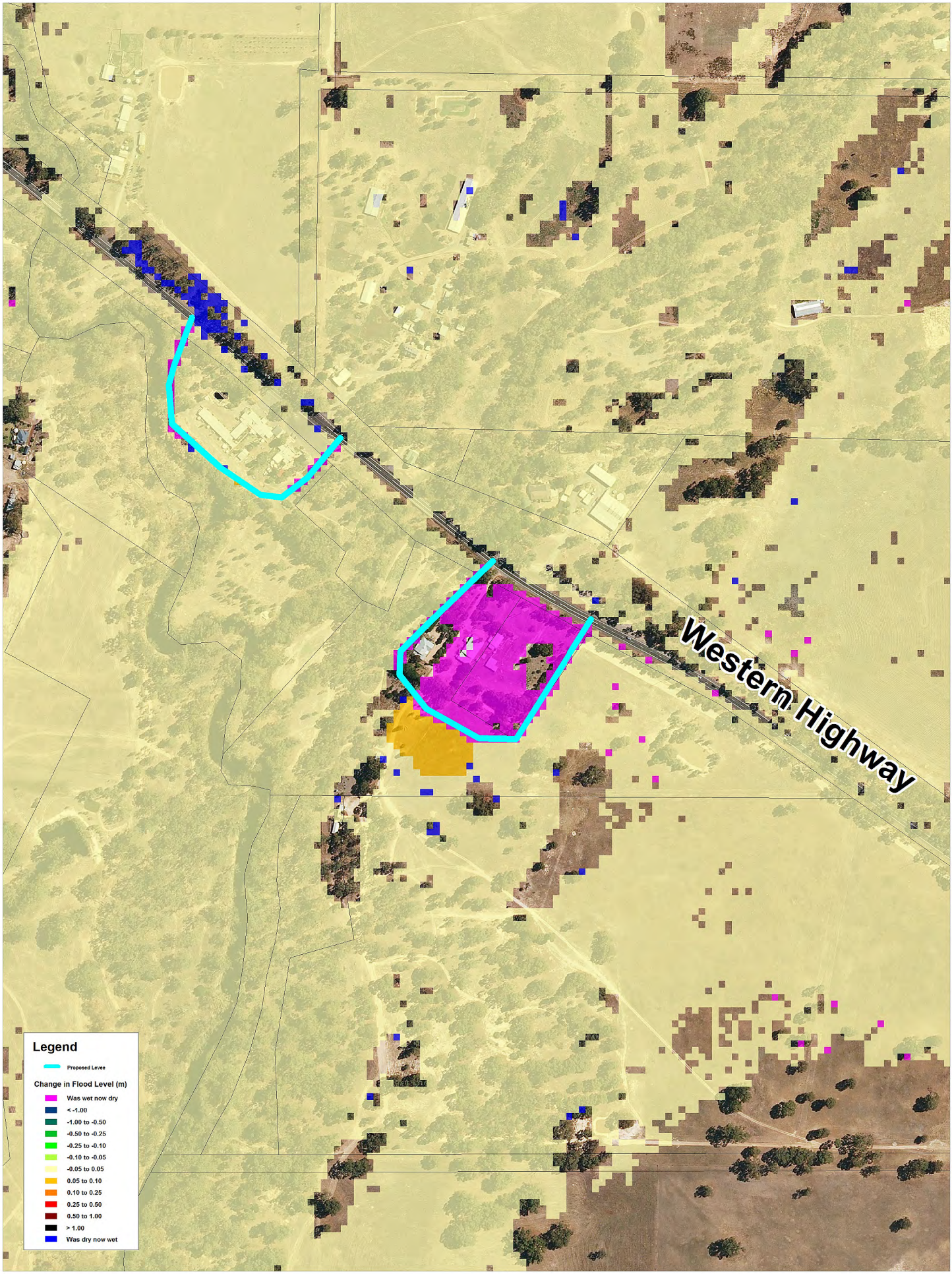
Rev: A

N

0 100 200m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-3_Dif_hMax_M01_20yr_047_Dads_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 1
1 in 50 Year ARI Flood Impacts

Figure: **D-4**

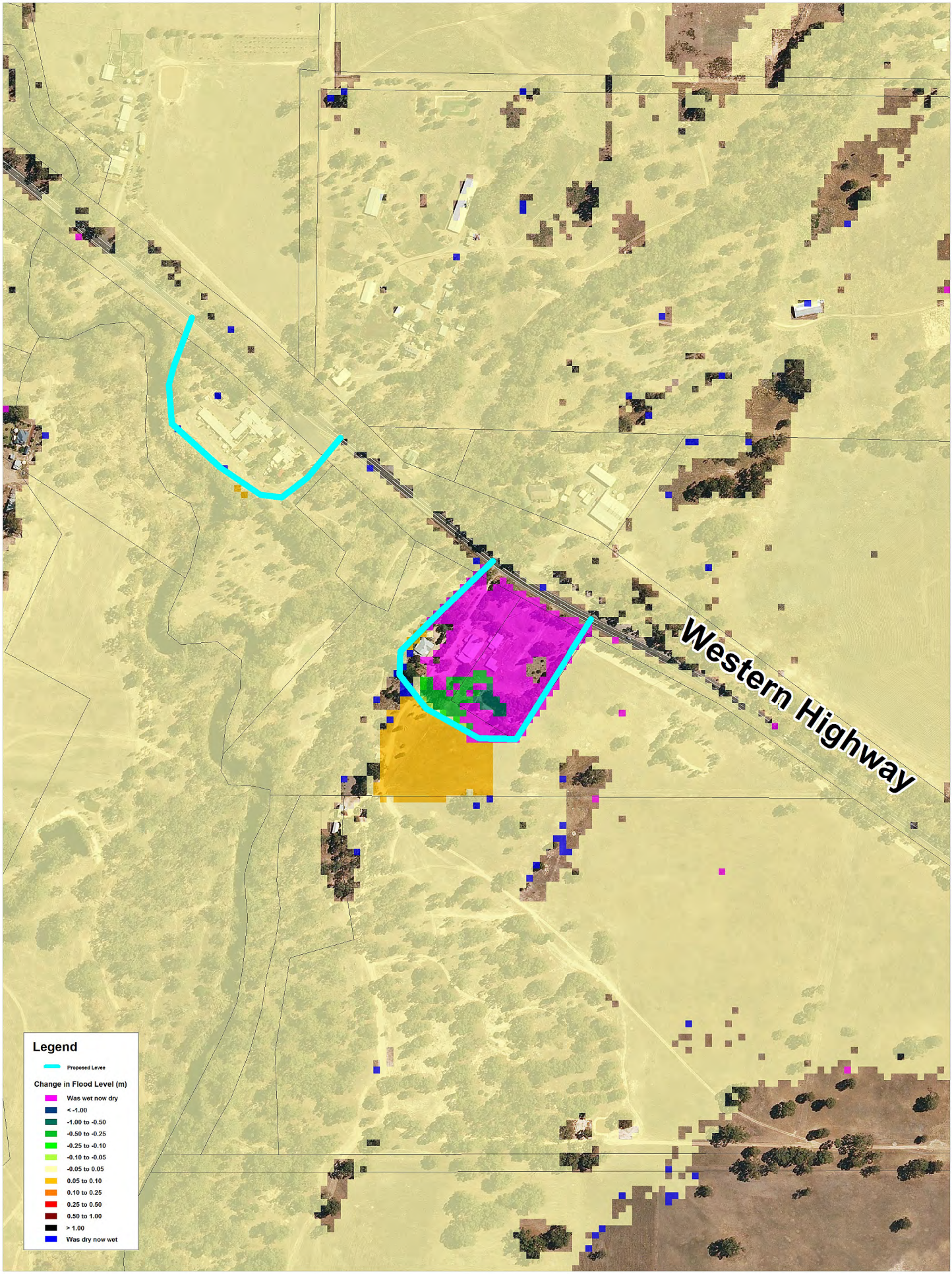
Rev: **A**

N

0 100 200m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-4_Dif_hMax_M01_50yr_047_Dads_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 1
1 in 100 Year ARI Flood Impacts

Figure: **D-5**

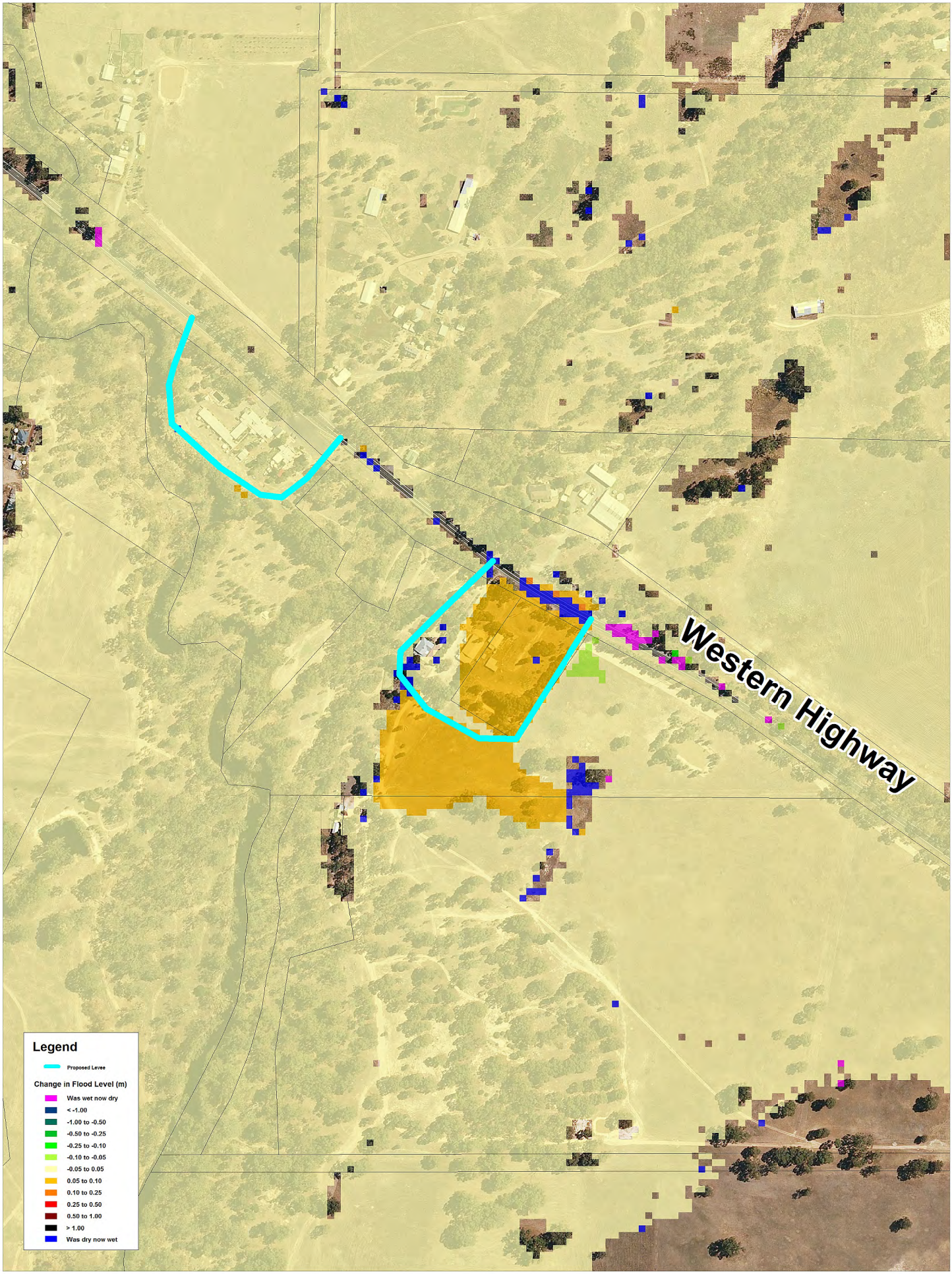
Rev: **A**

N

0 100 200m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-5_Dif_hMax_M01_100yr_047_Dads_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 1
1 in 200 Year ARI Flood Impacts

Figure: **D-6**

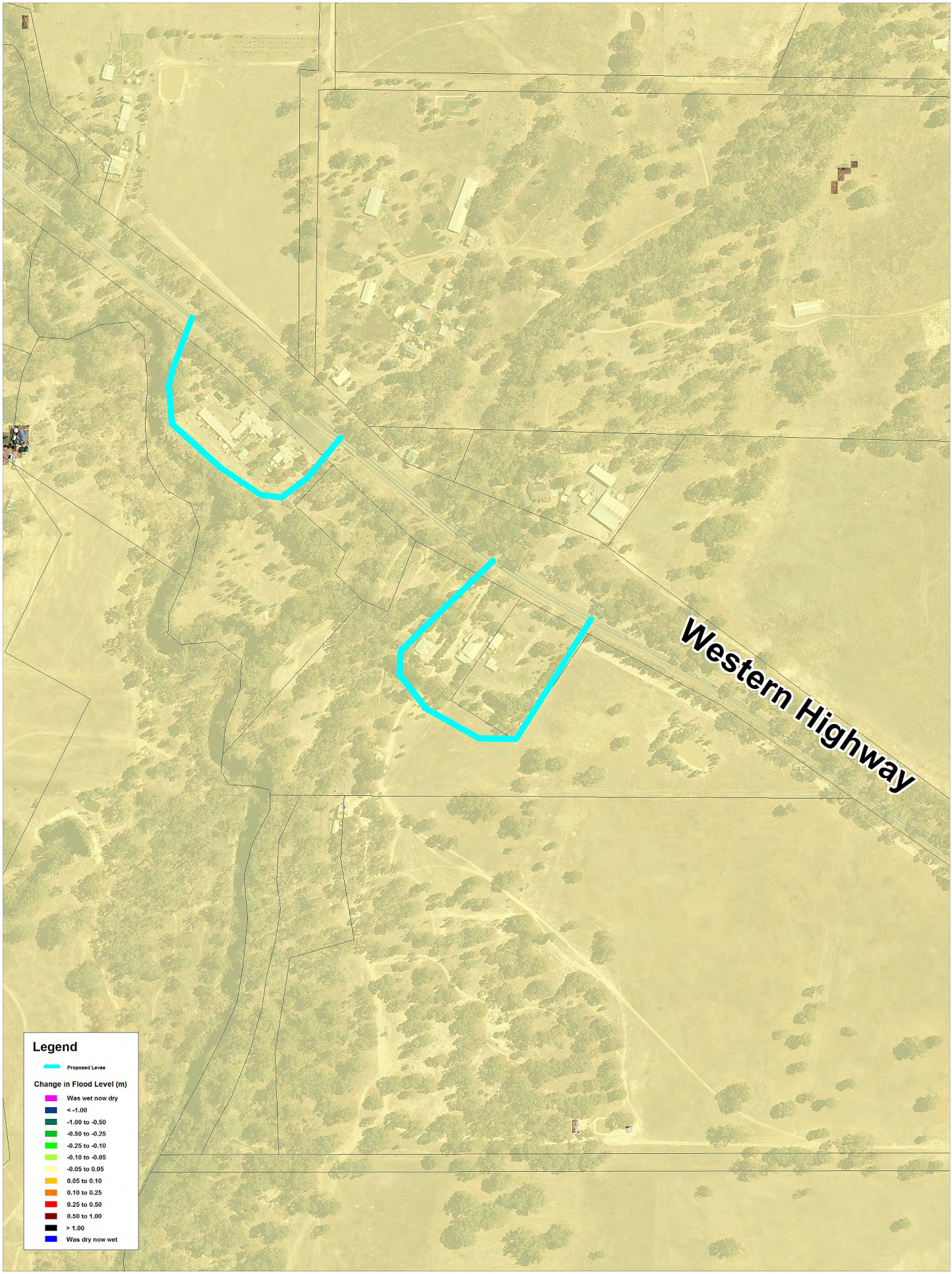
Rev: **A**

N

0 100 200m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-6_Dif_hMax_M01_200yr_047_Dads_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 1
Probable Maximum Flood Flood Impacts

Figure: D-7

Rev: A

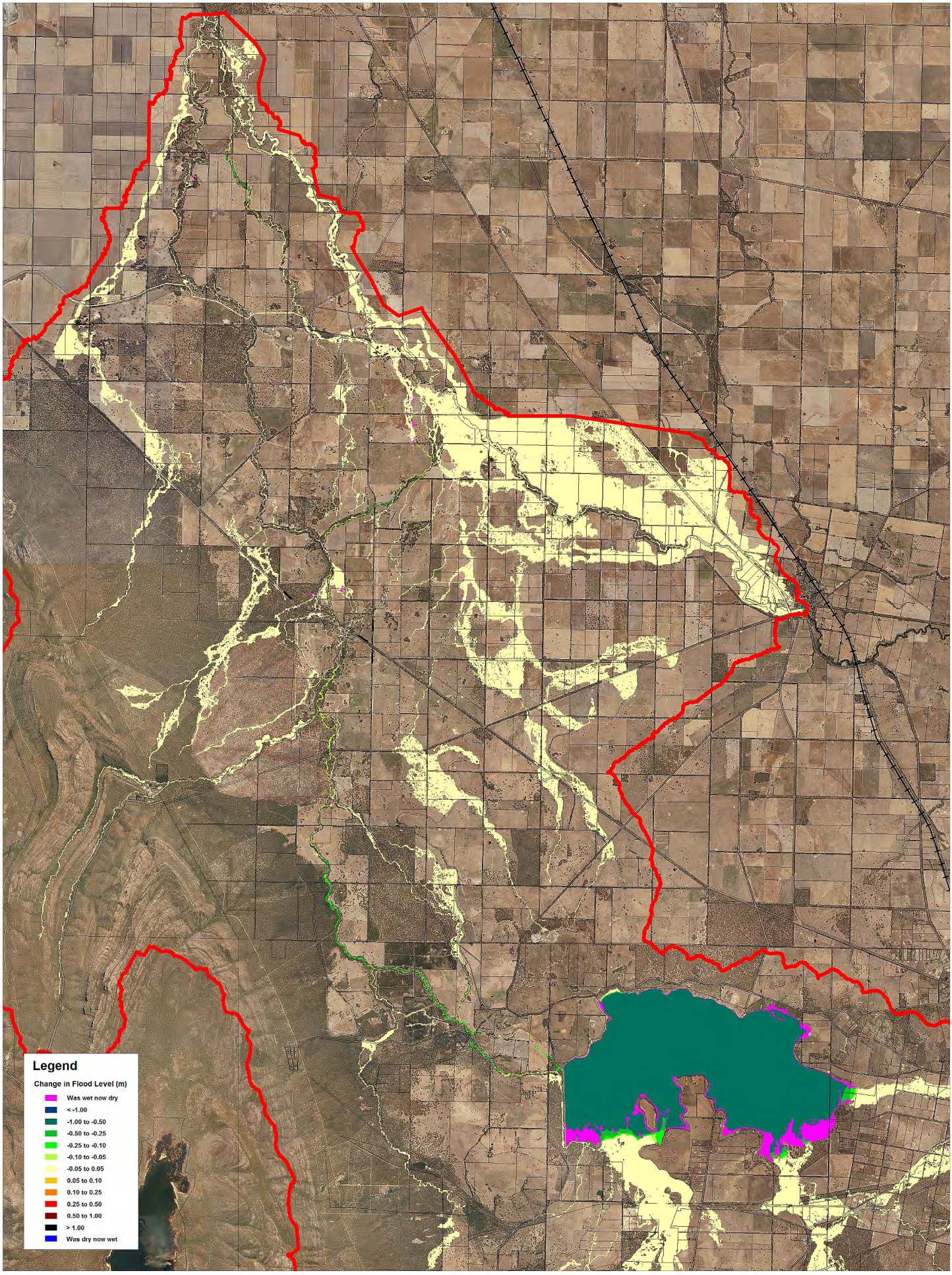
N

0 100 200m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-7_Dif_hMax_M01_PMP_047_Dads_RevA.WOR

D.2 Mitigation Assessment Scenario 2 – Reduced Lake Lonsdale Level and Stawell Works



Title:

Mount William Creek Flood Investigation Mitigation Option 2
1 in 5 Year ARI Flood Impacts - Lake Lonsdale

Figure: **D-8**

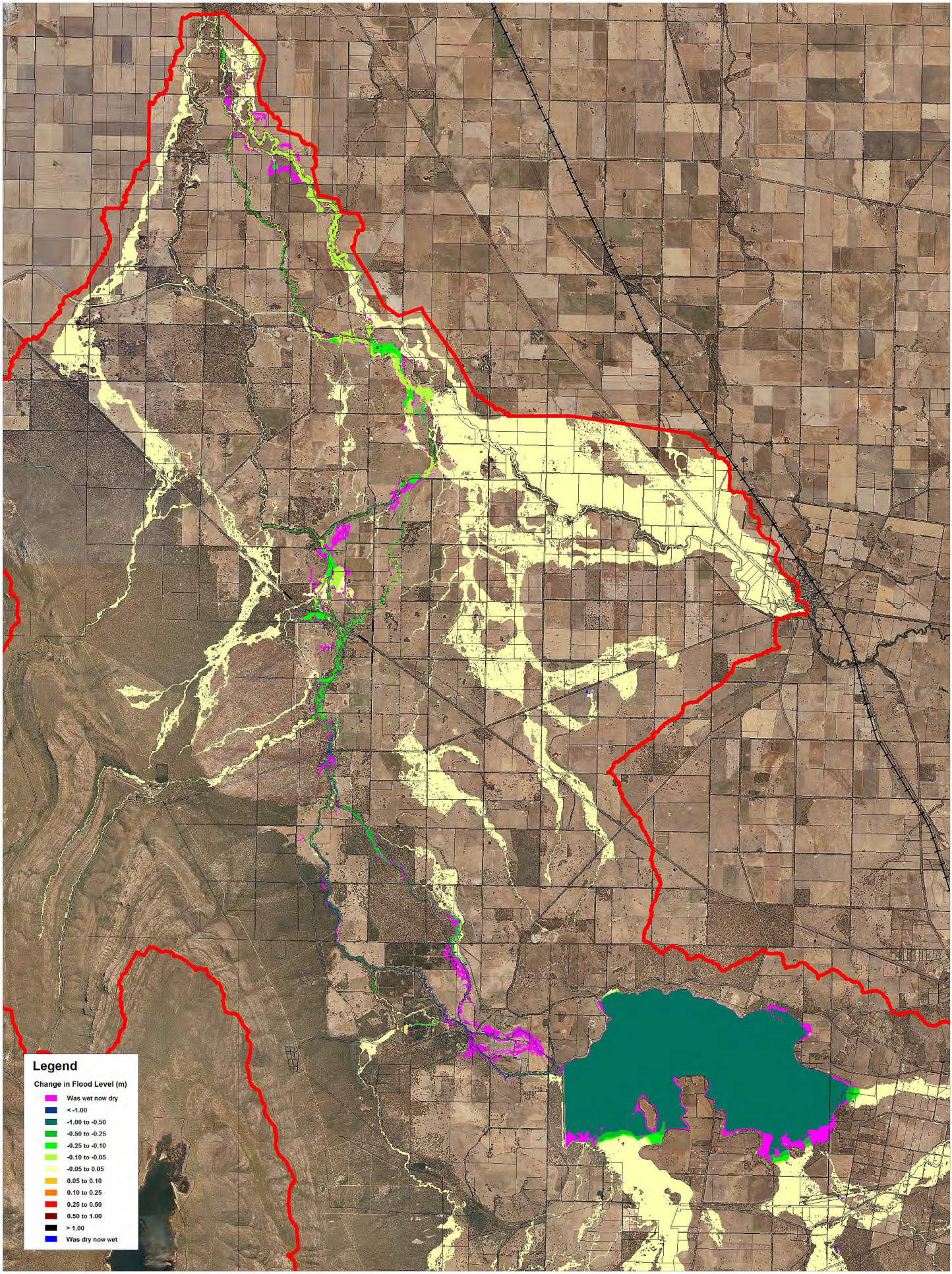
Rev: **A**

N

0 2.5 5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-8_Dif_hMax_M02_5yr_046_Lake_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 2
1 in 10 Year ARI Flood Impacts - Lake Lonsdale

Figure: **D-9**

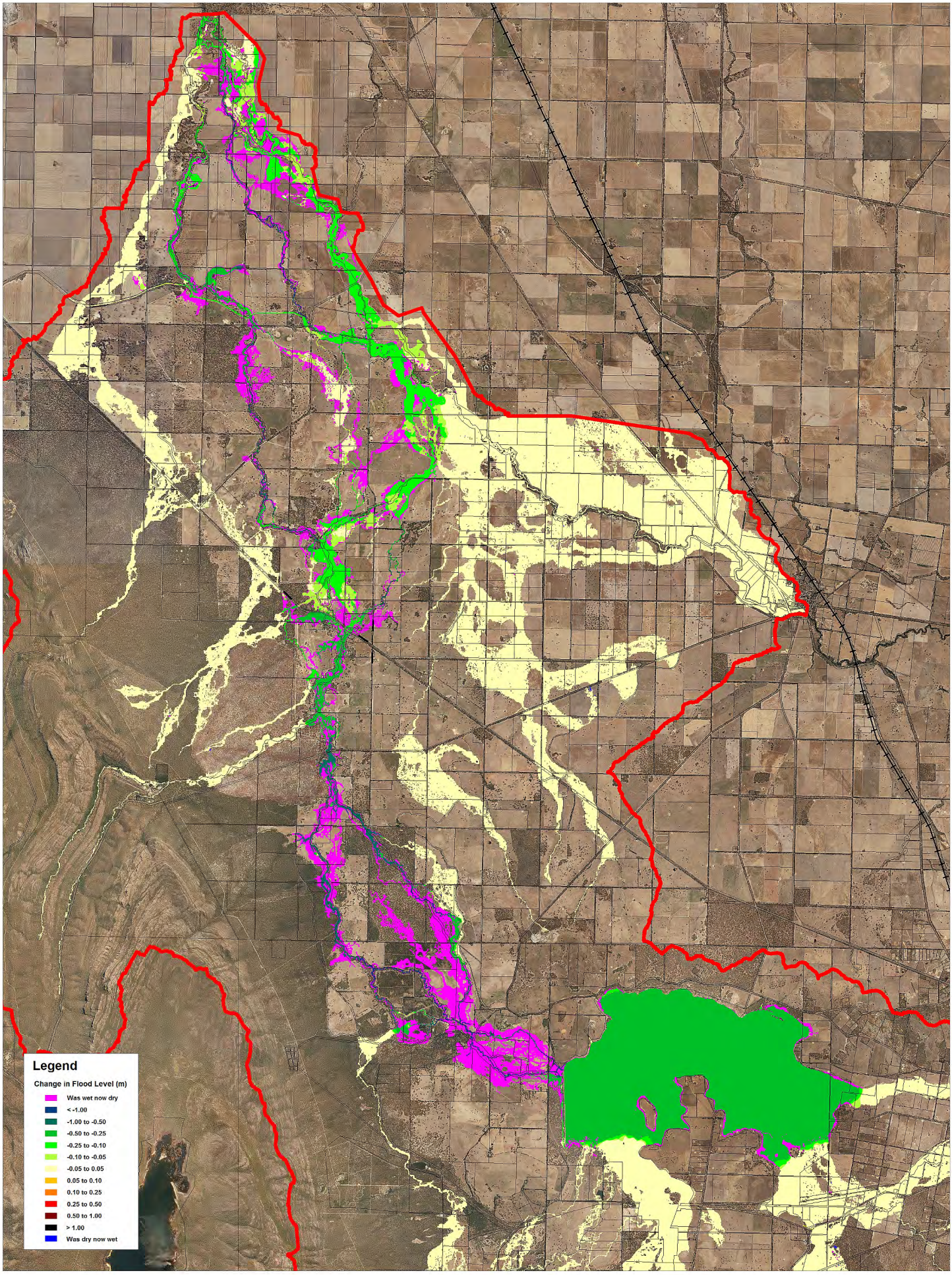
Rev: **A**

N

0 2.5 5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-9_Dif_hMax_M02_10yr_046_Lake_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 2
1 in 20 Year ARI Flood Impacts - Lake Lonsdale

Figure: **D-10**

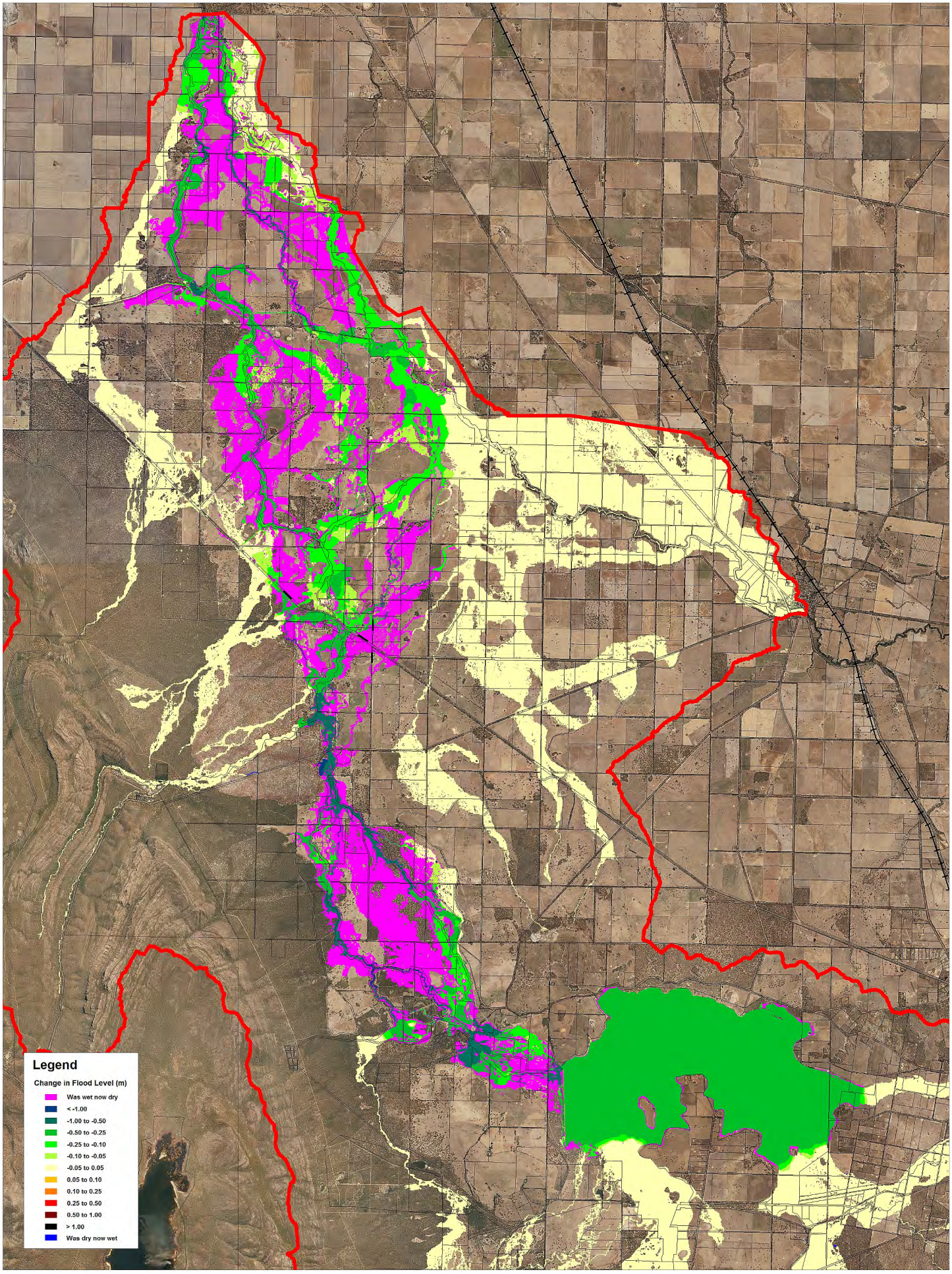
Rev: **A**

N

0 2.5 5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-10_Dif_hMax_M02_20yr_046_Lake_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 2
1 in 50 Year ARI Flood Impacts - Lake Lonsdale

Figure: **D-11**

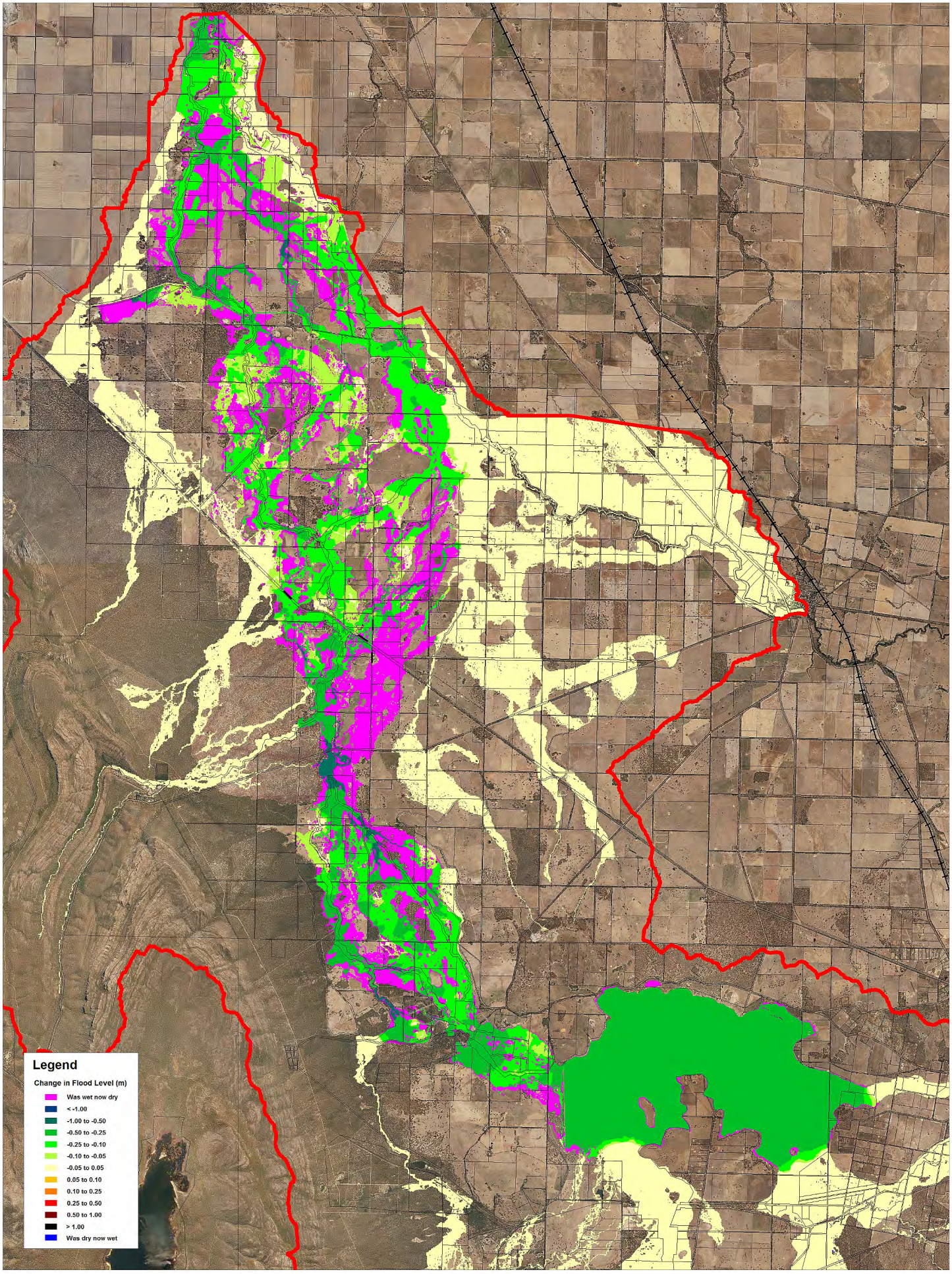
Rev: **A**

N

0 2.5 5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-11_Dif_hMax_M02_50yr_046_Lake_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 2
1 in 100 Year ARI Flood Impacts - Lake Lonsdale

Figure: D-12

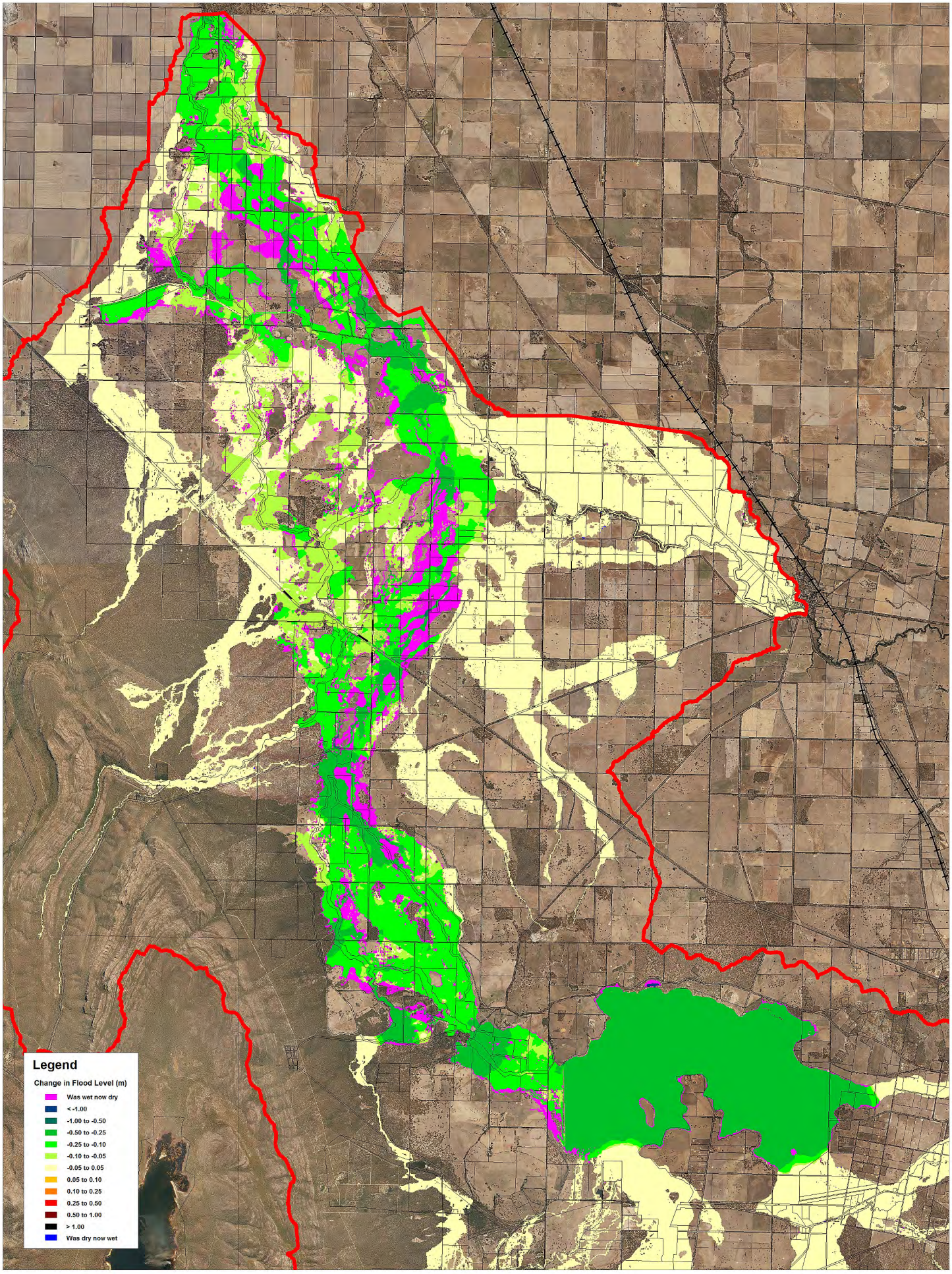
Rev: A

N

0 2.5 5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-12_Dif_hMax_M02_100yr_046_Lake_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 2
1 in 200 Year ARI Flood Impacts - Lake Lonsdale

Figure: **D-13**

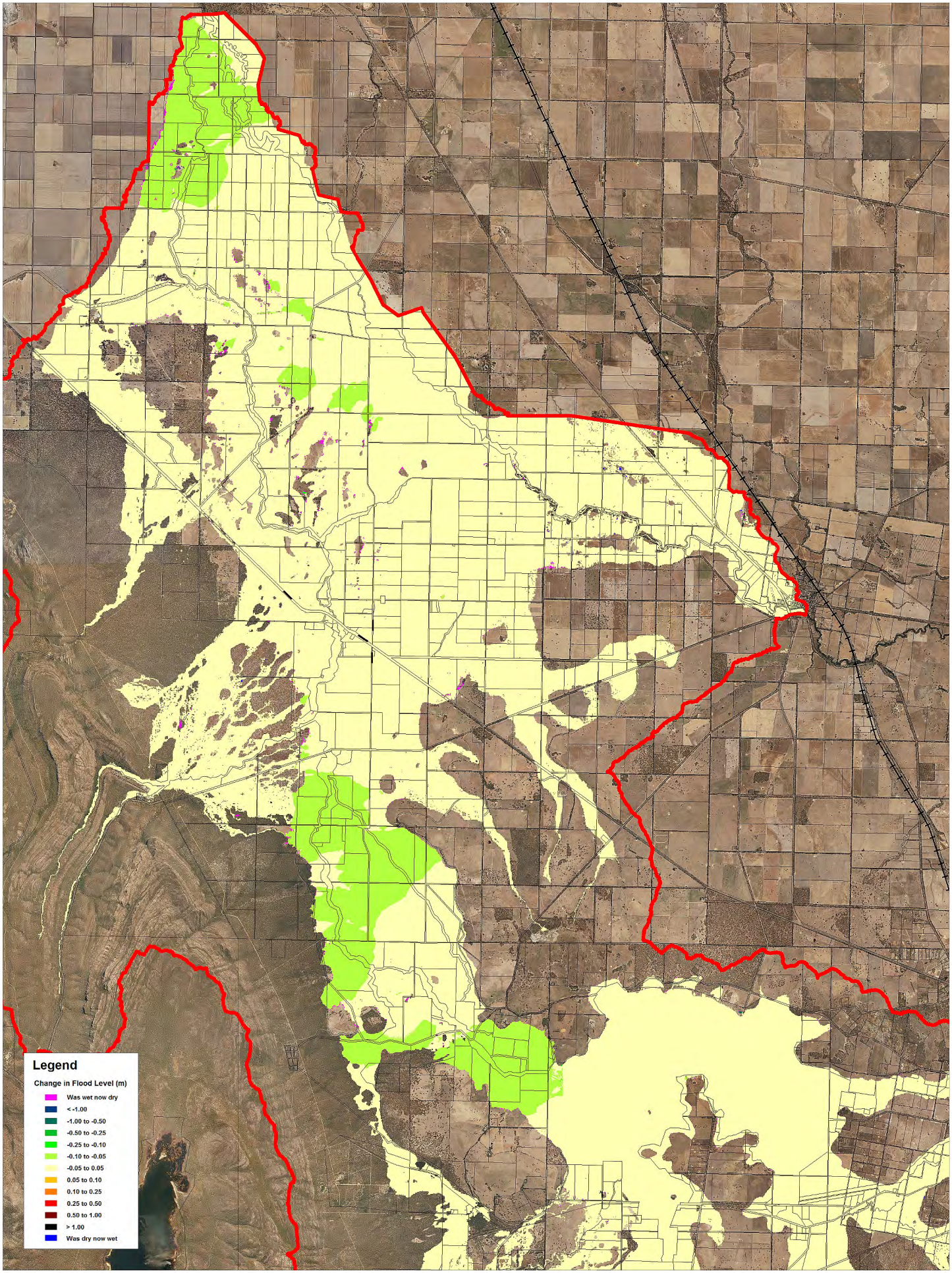
Rev: **A**

N

0 2.5 5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-13_Dif_hMax_M02_100yr_046_Lake_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 2
Probable Maximum Flood Flood Impacts - Lake Lonsdale

Figure: **D-14**

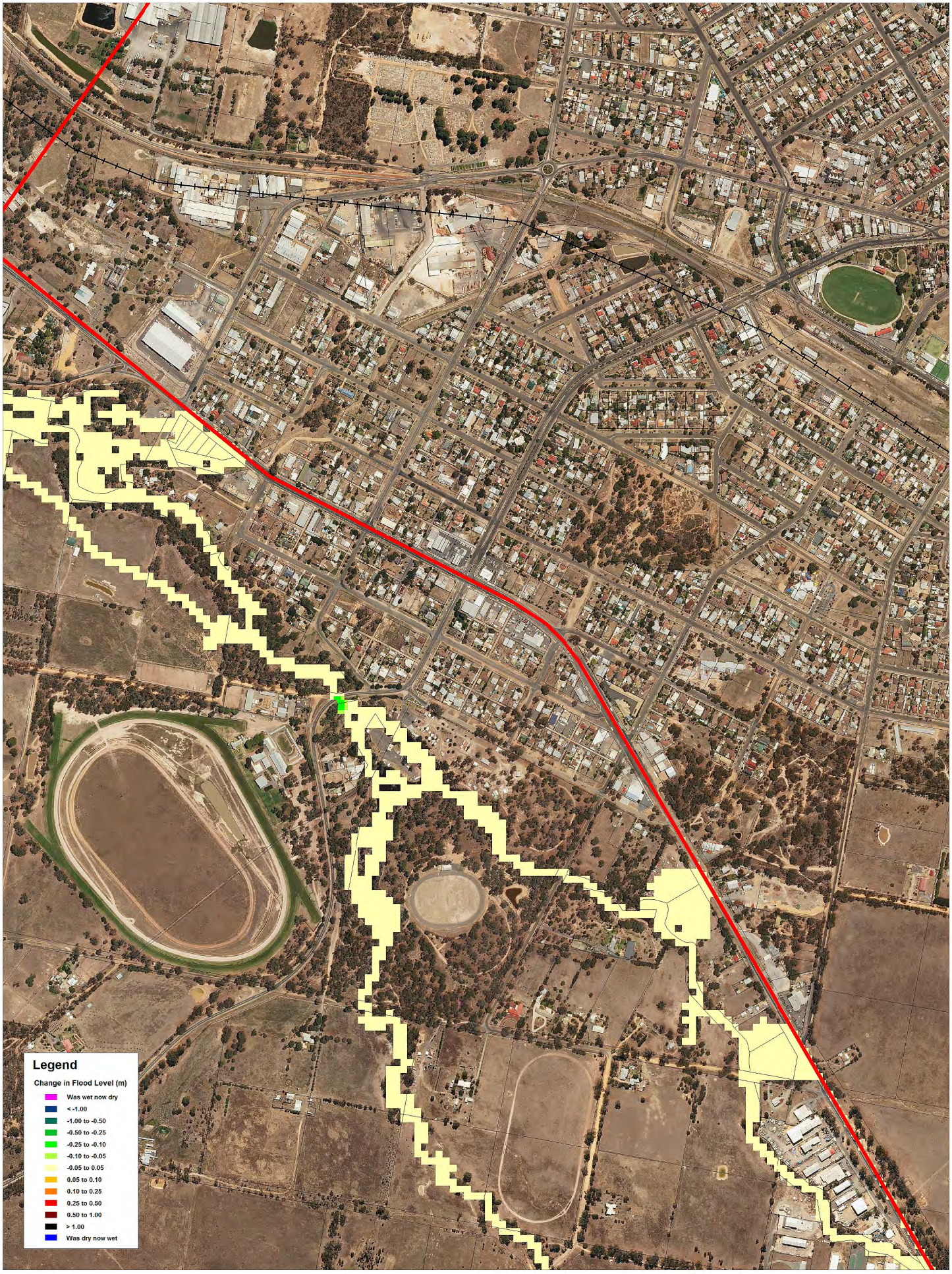
Rev: **A**

N

0 2.5 5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-14_Dif_hMax_M02_PMP_047_Lake_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 2
1 in 5 Year ARI Flood Impacts - Stawell Works

Figure: D-15

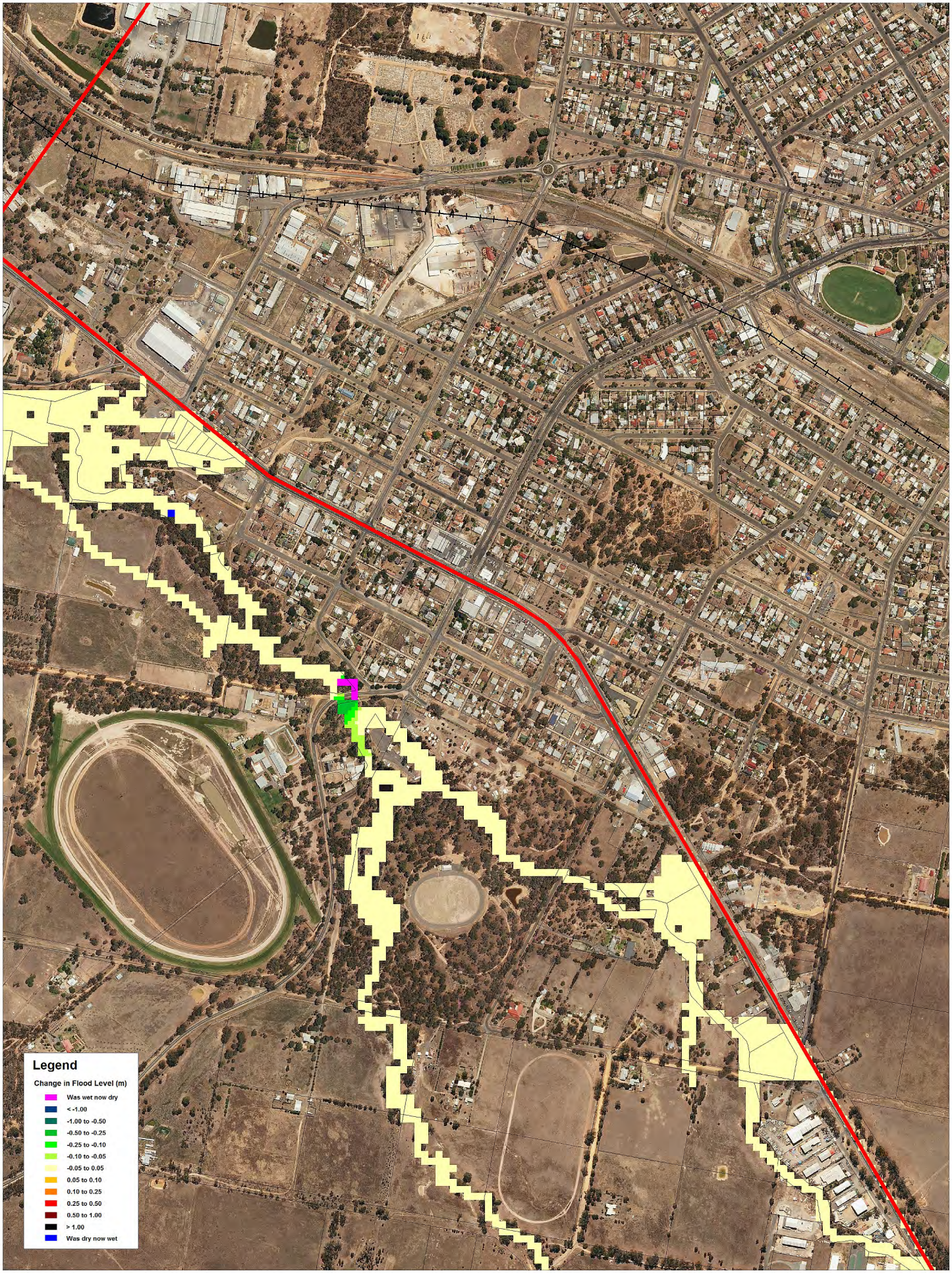
Rev: A

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-15_Dif_hMax_M02_5yr_046_Stawell_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 2
1 in 10 Year ARI Flood Impacts - Stawell Works

Figure: D-16

Rev: A

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-16_Dif_hMax_M02_10yr_046_Stawell_RevA.WOR

Title:

Mount William Creek Flood Investigation Mitigation Option 2
1 in 20 Year ARI Flood Impacts - Stawell Works

Figure: D-17

Rev: A

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-17_Dif_hMax_M02_20yr_046_Stawell_RevA.WOR

Title:

Mount William Creek Flood Investigation Mitigation Option 2
1 in 50 Year ARI Flood Impacts - Stawell Works

Figure: D-18

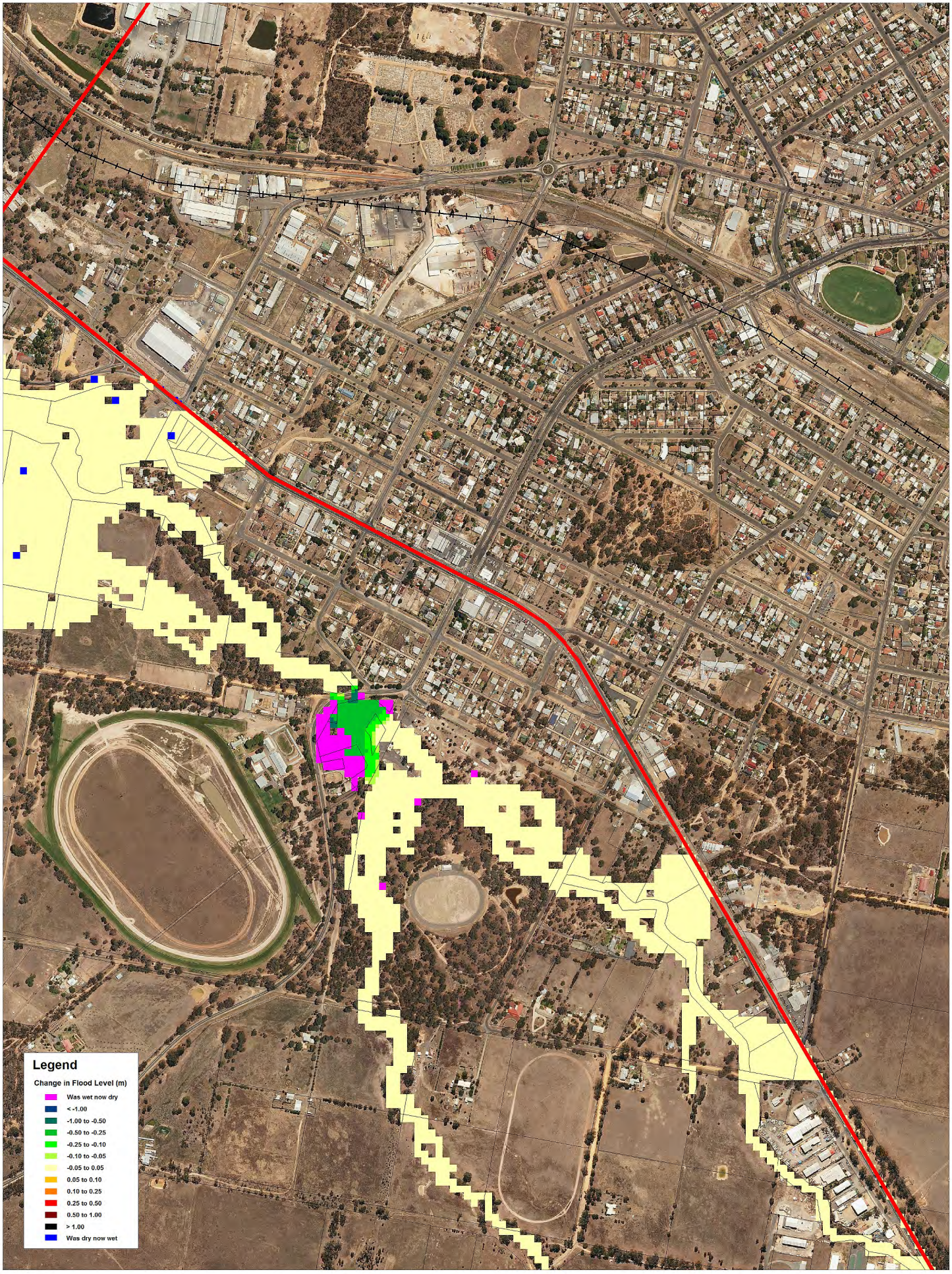
Rev: A

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-18_Dif_hMax_M02_50yr_046_Stawell_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 2
1 in 100 Year ARI Flood Impacts - Stawell Works

Figure: D-19

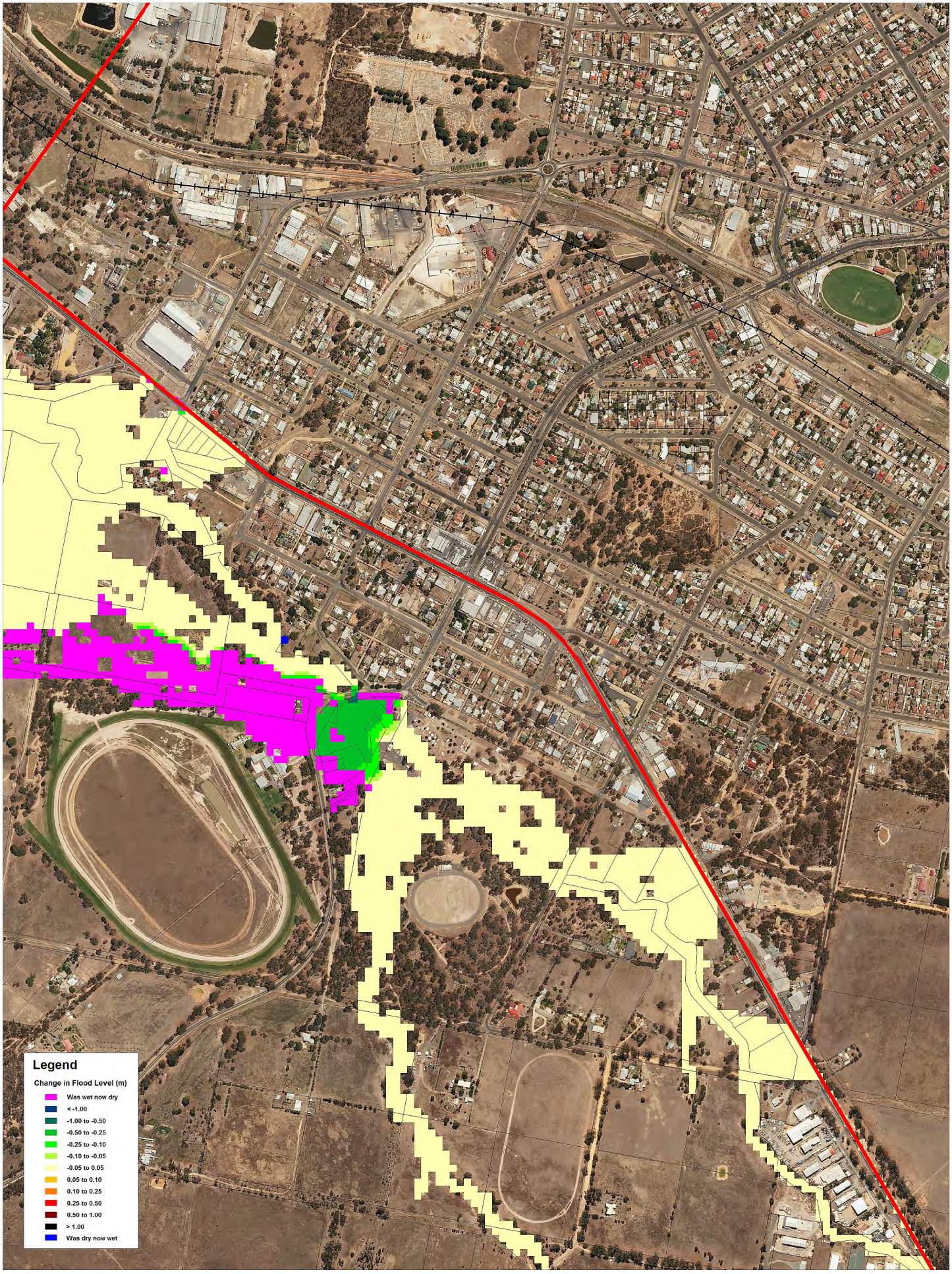
Rev: A

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-19_Dif_hMax_M02_100yr_046_Stawell_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 2
1 in 200 Year ARI Flood Impacts - Stawell Works

Figure: D-20

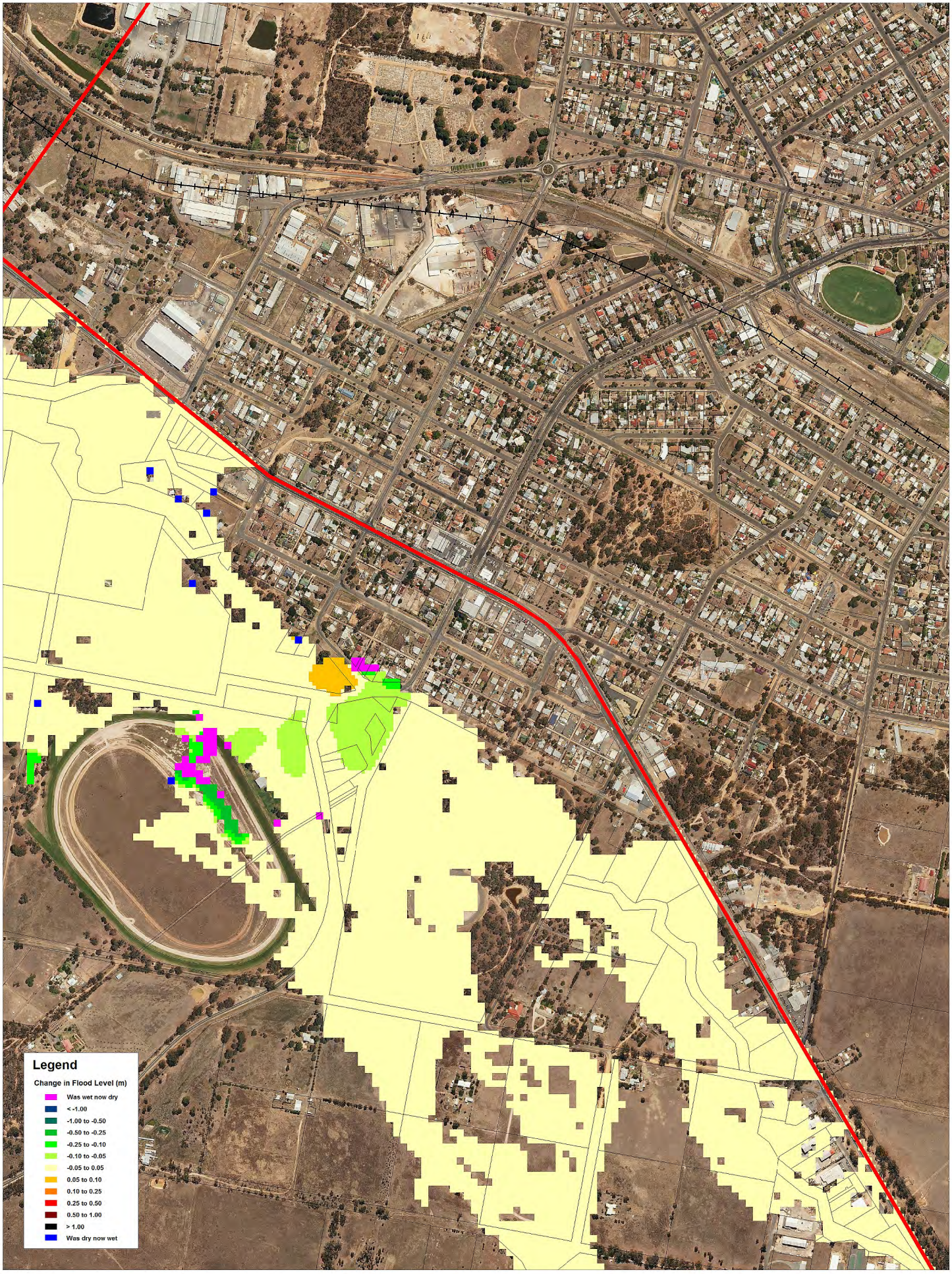
Rev: A

N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-20_Dif_hMax_M02_100yr_046_Stawell_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 2
Probable Maximum Flood Flood Impacts - Stawell Works

Figure: D-21

Rev: A

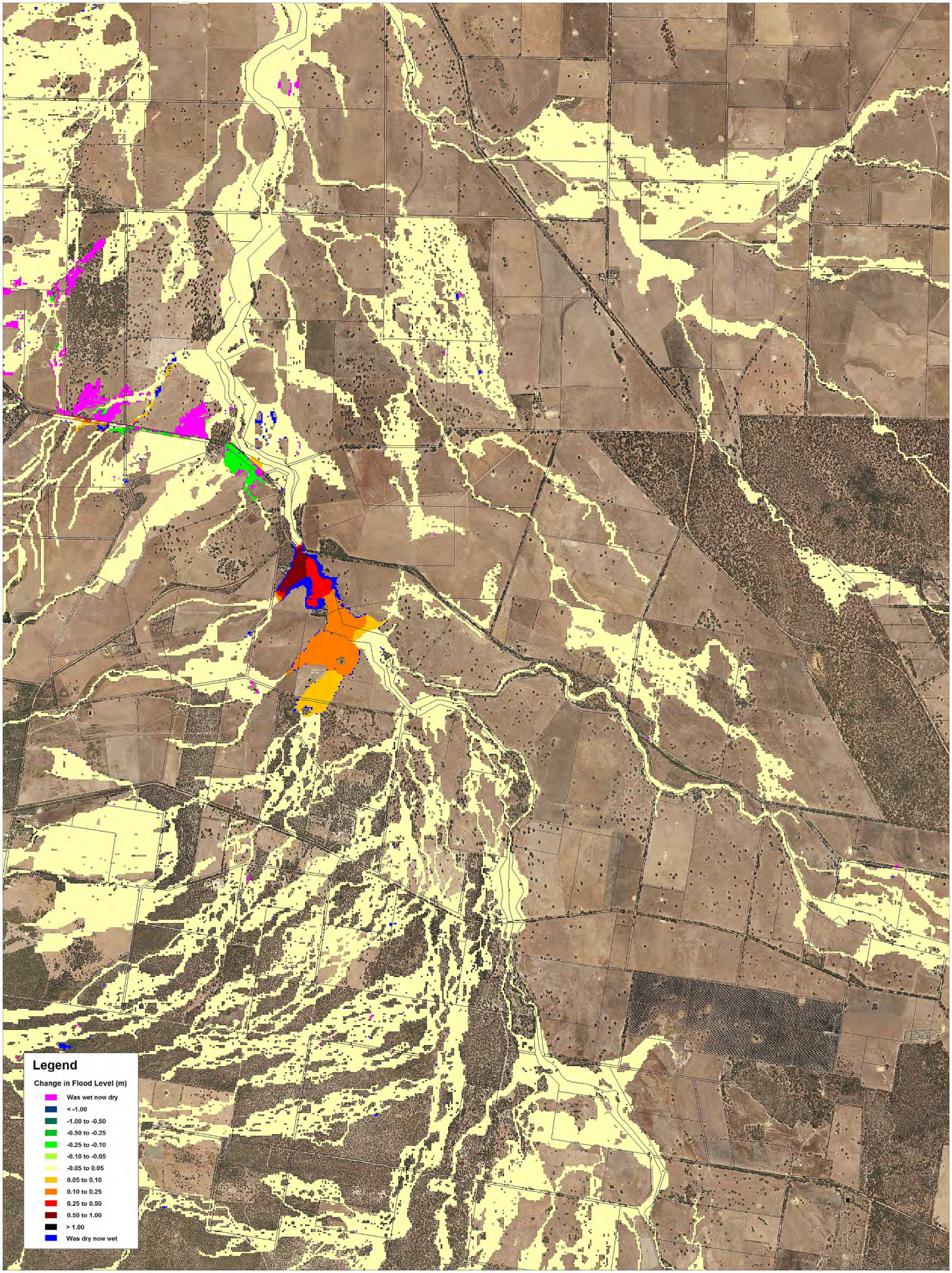
N

0 125 250m

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-21_Dif_hMax_M02_PMP_047_Stawell_RevA.WOR

D.3 Mitigation Assessment Scenario 3 – Whole of Catchment Access



Title:

Mount William Creek Flood Investigation Mitigation Option 3
1 in 5 Year ARI Flood Impacts - Road Upgrades

Figure: **D-22**

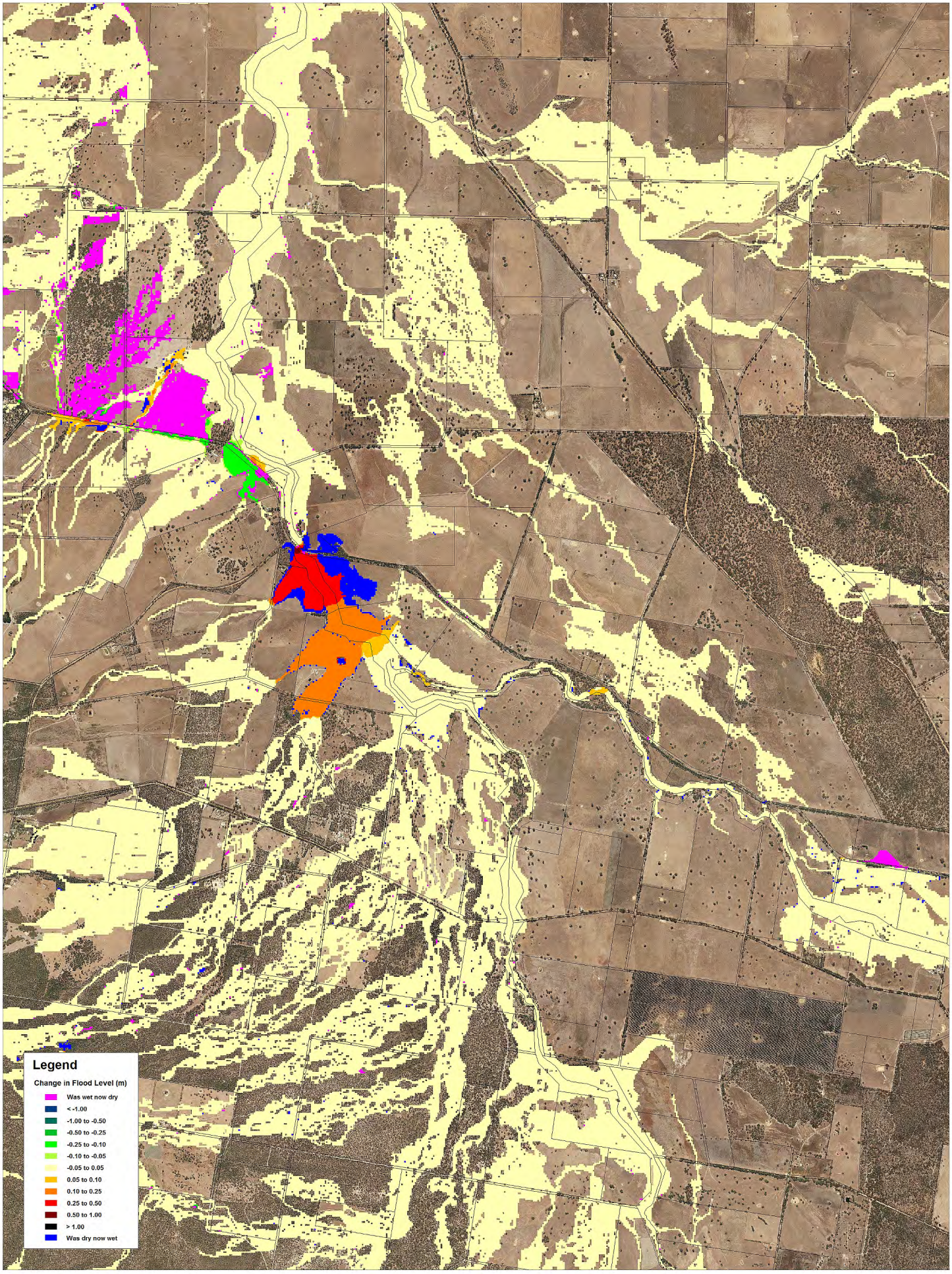
Rev: **A**

N

0 0.75 1.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-22_Dif_hMax_M03_5yr_047_UpgRd_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 3
1 in 10 Year ARI Flood Impacts - Road Upgrades

Figure: **D-23**

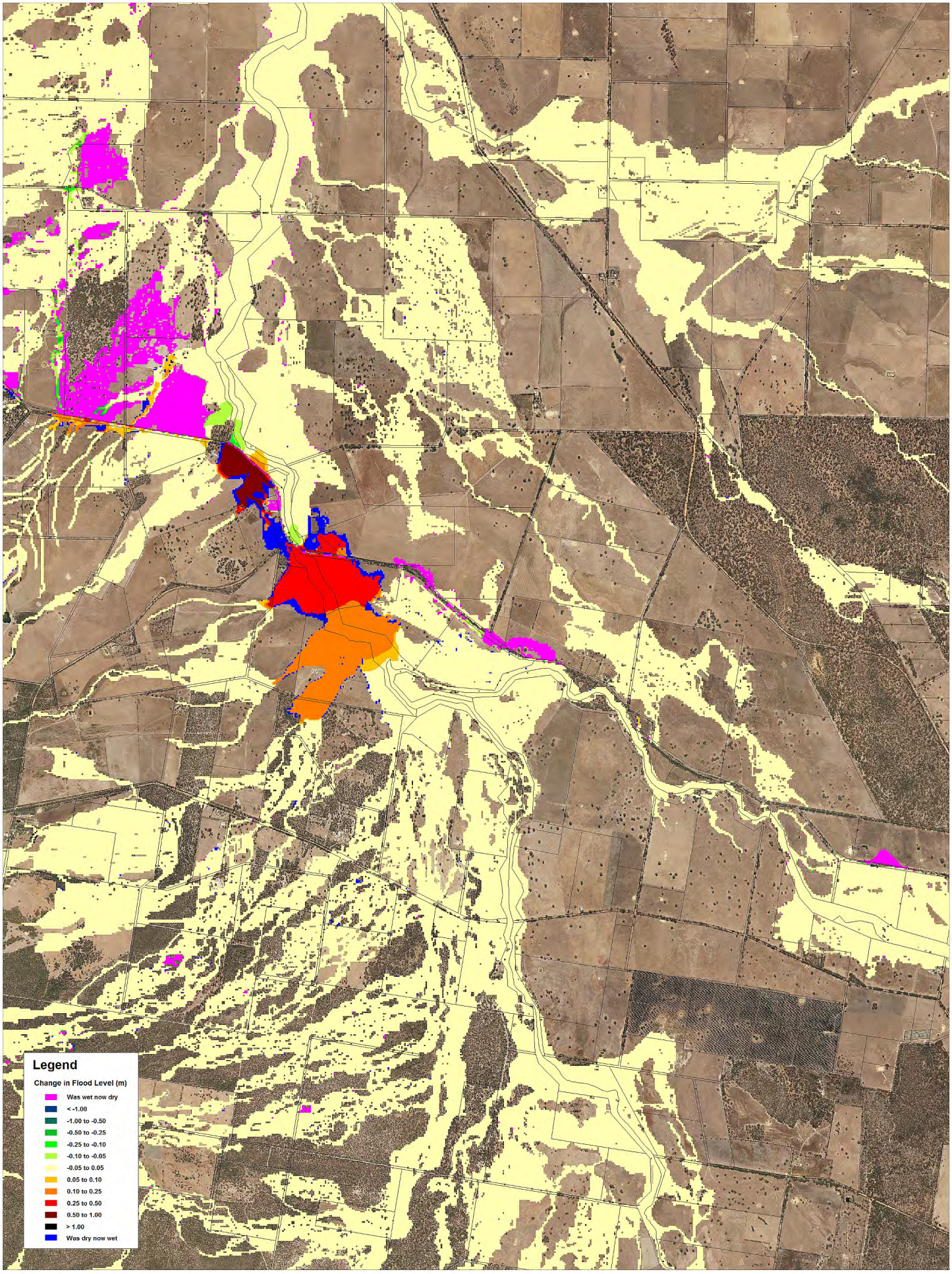
Rev: **A**

N

0 0.75 1.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-23_Dif_hMax_M03_10yr_047_UpgRd_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 3
1 in 20 Year ARI Flood Impacts - Road Upgrades

Figure: **D-24**

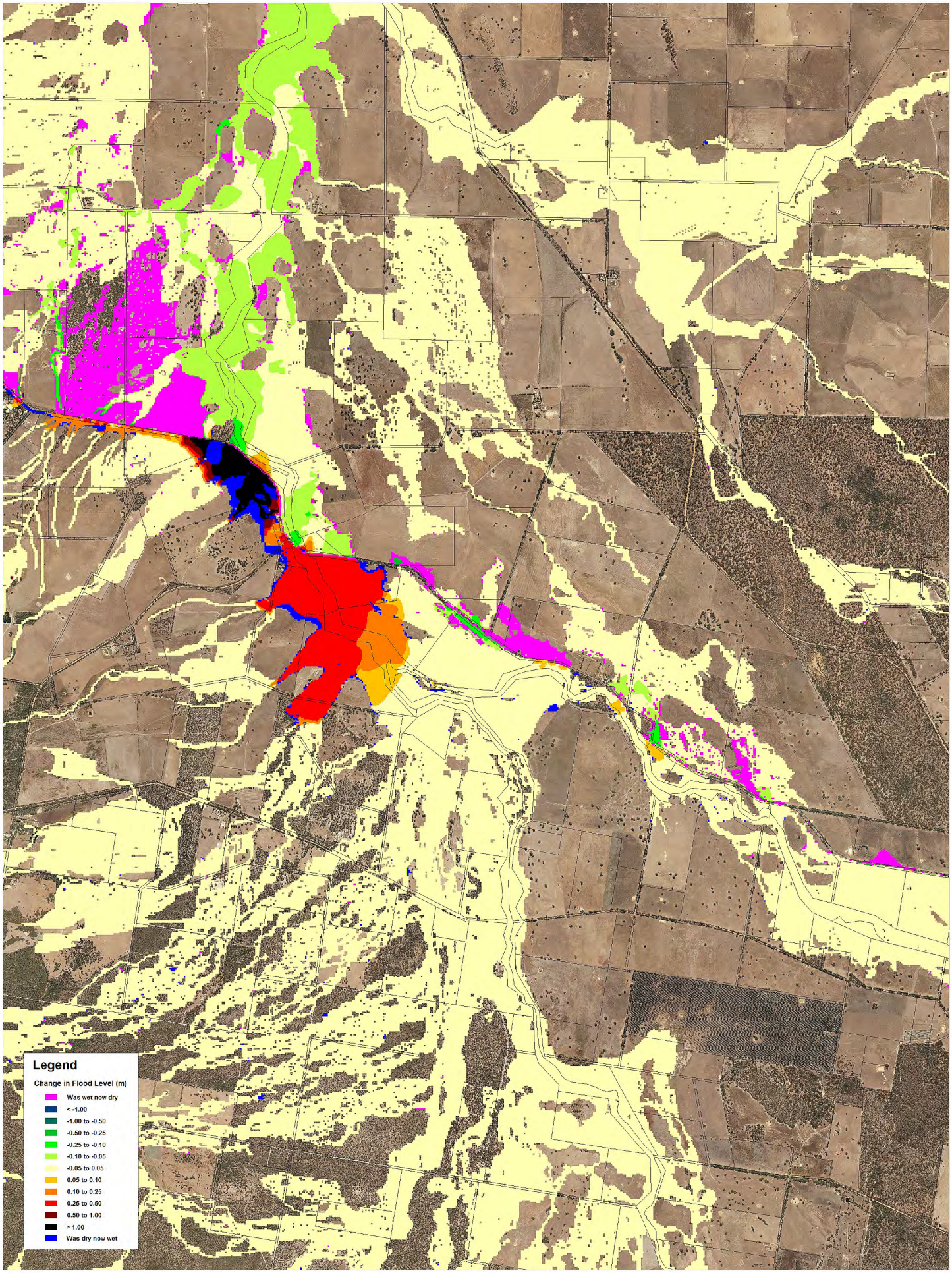
Rev: **A**

N

0 0.75 1.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-24_Dif_hMax_M03_20yr_047_UpgRd_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 3
1 in 50 Year ARI Flood Impacts - Road Upgrades

Figure: **D-25**

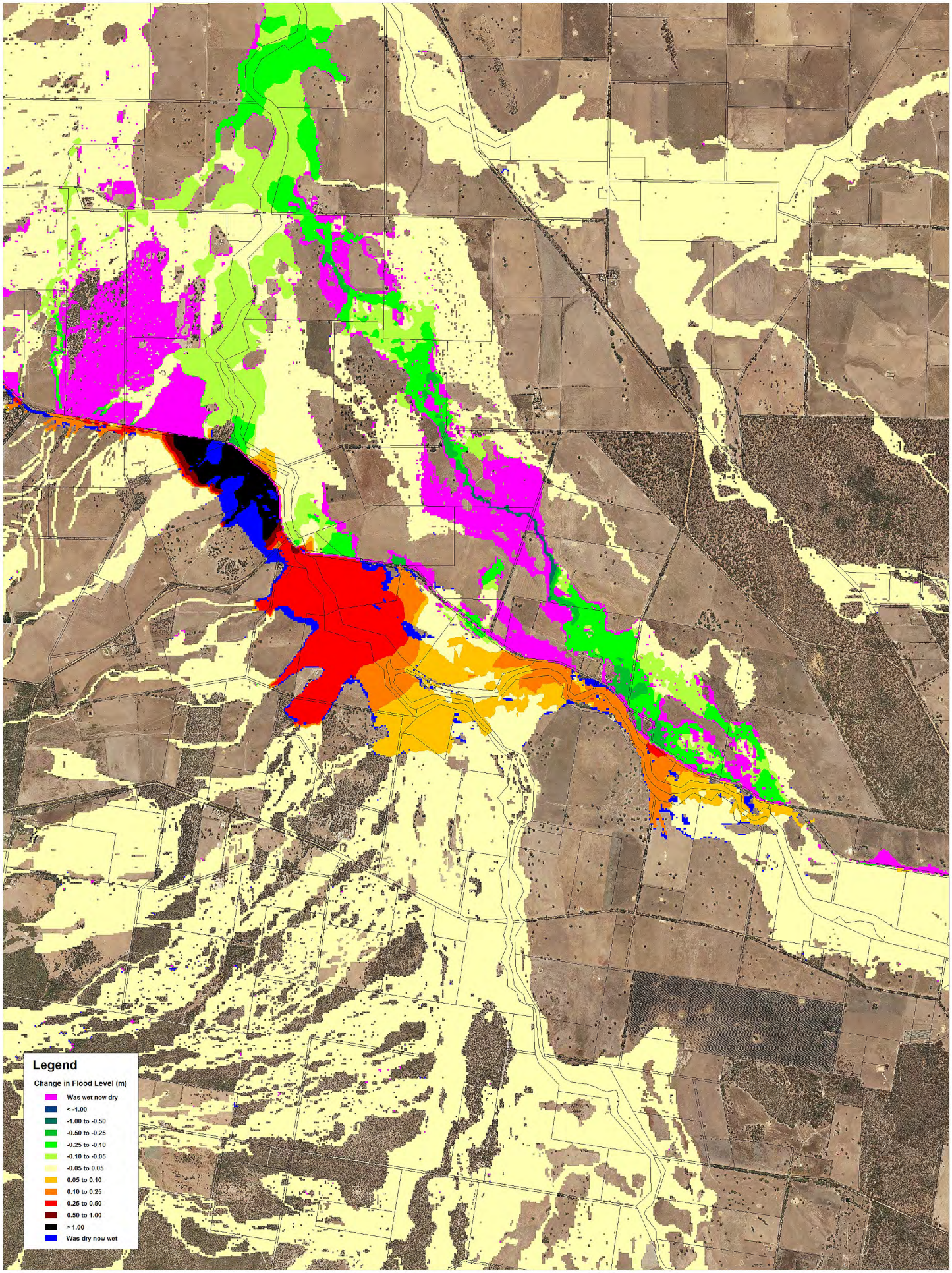
Rev: **A**

N

0 0.75 1.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-25_Dif_hMax_M03_50yr_047_UpgRd_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 3
1 in 100 Year ARI Flood Impacts - Road Upgrades

Figure: **D-26**

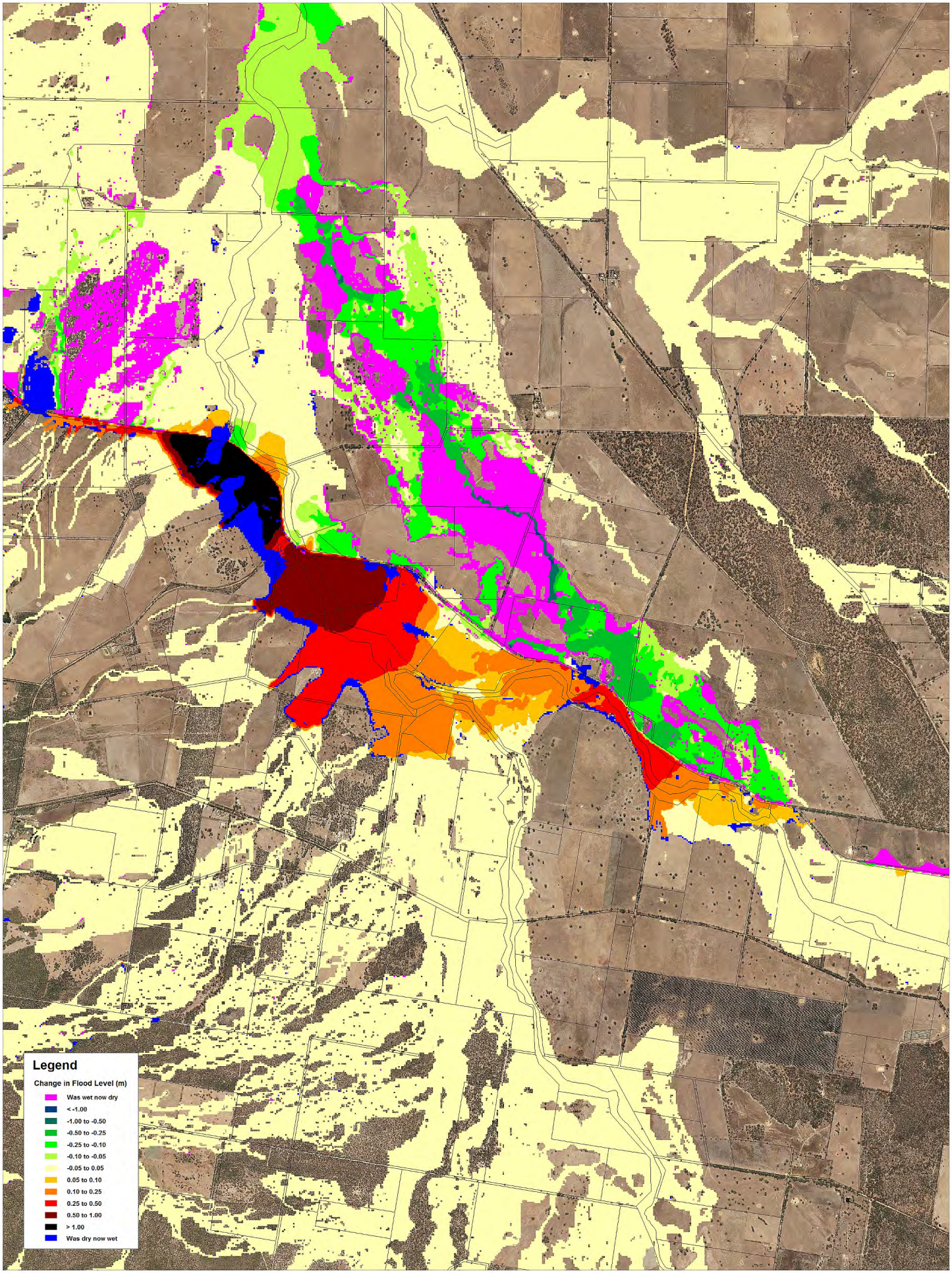
Rev: **A**

N

0 0.75 1.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-26_Dif_hMax_M03_100yr_047_UpgRd_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 3
1 in 200 Year ARI Flood Impacts - Road Upgrades

Figure: **D-27**

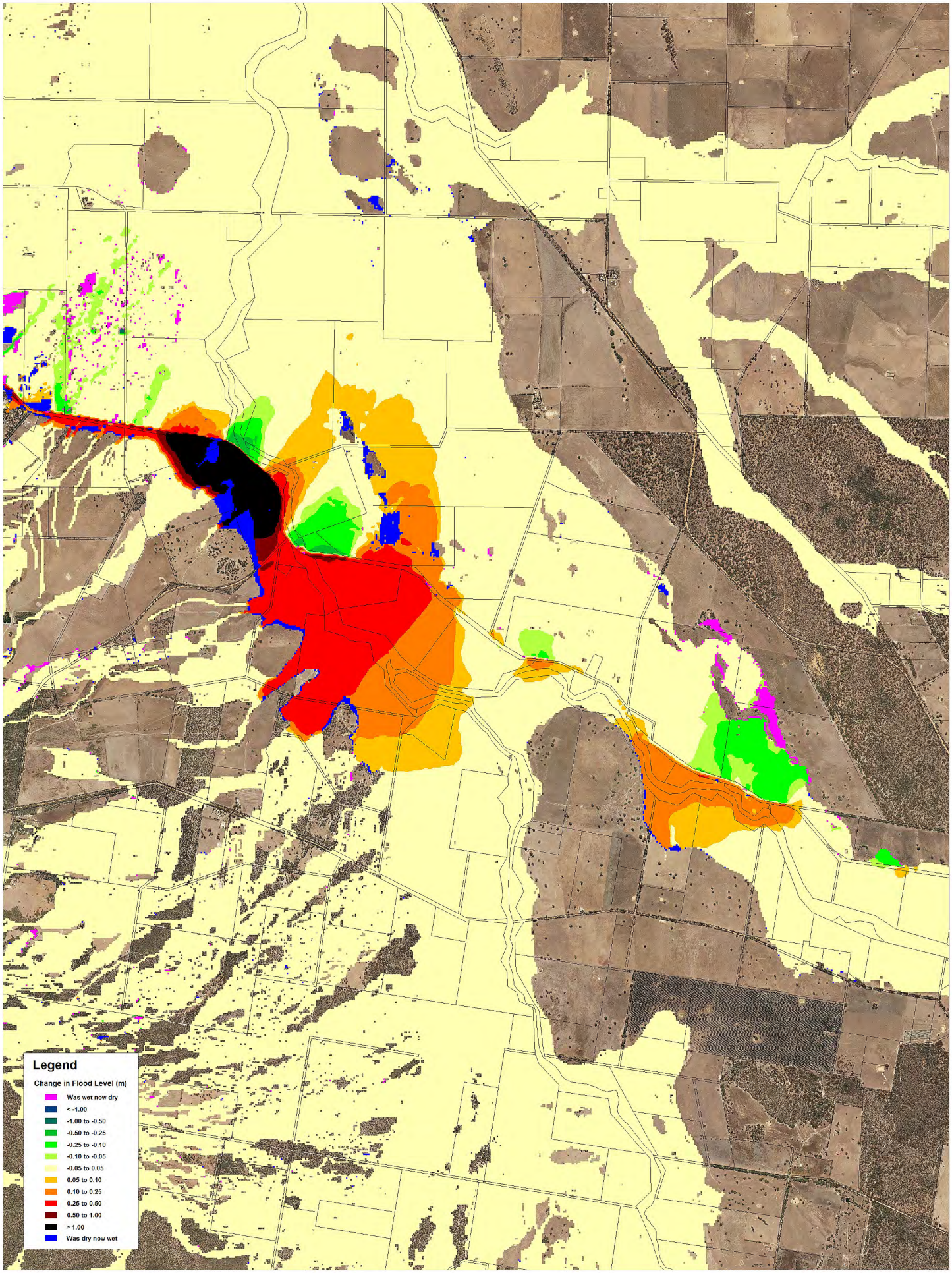
Rev: **A**

N

0 0.75 1.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-27_Dif_hMax_M03_200yr_047_UpgRd_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 3
Probable Maximum Flood Flood Impacts - Road Upgrades

Figure: **D-28**

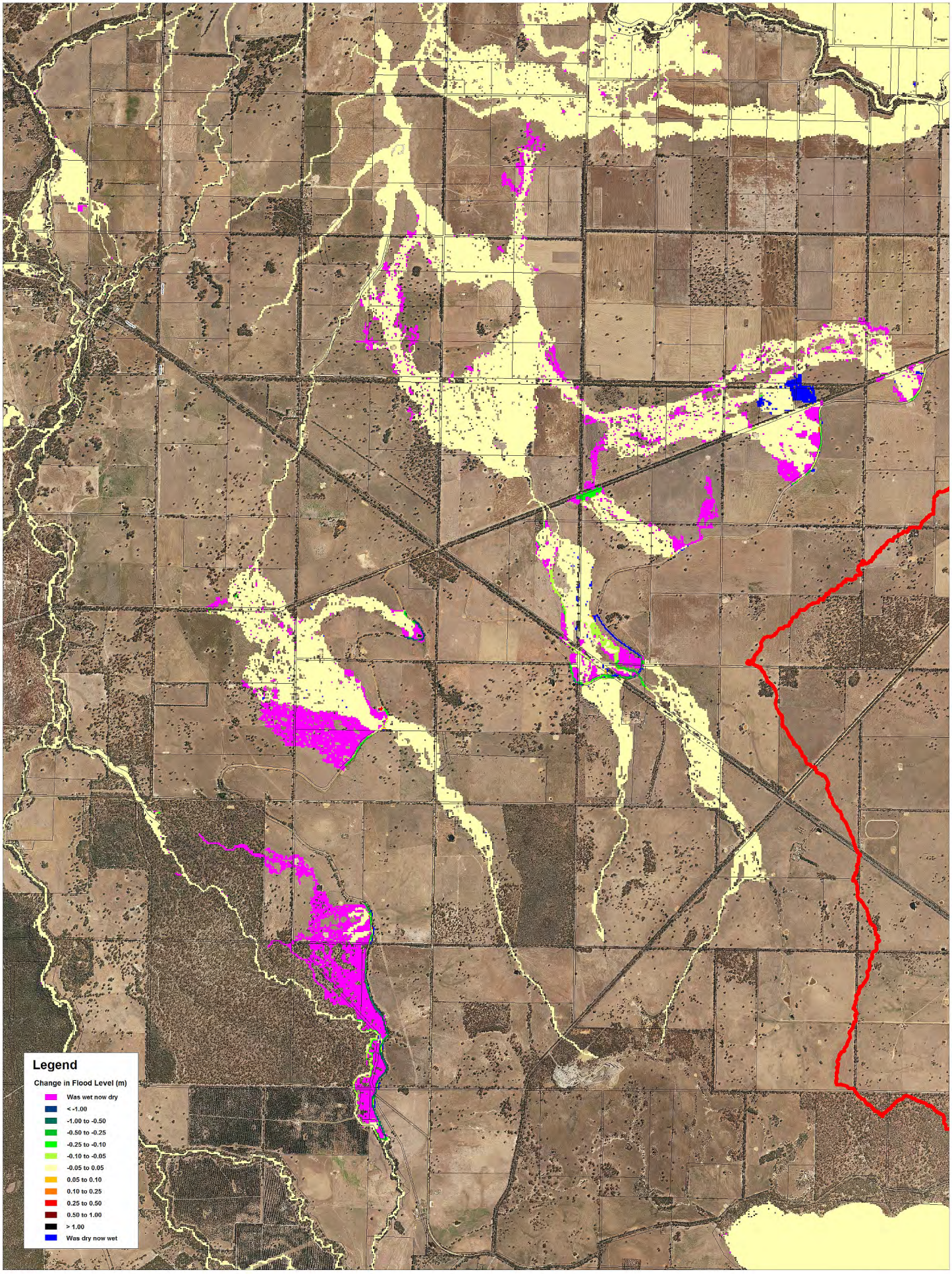
Rev: **A**

N

0 0.75 1.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-28_Dif_hMax_M03_PMP_047_UpgRd_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 3
1 in 5 Year ARI Flood Impacts - Channel Reinstatement

Figure: **D-29**

Rev: **A**

N

0 0.75 1.5km

Approx. Scale

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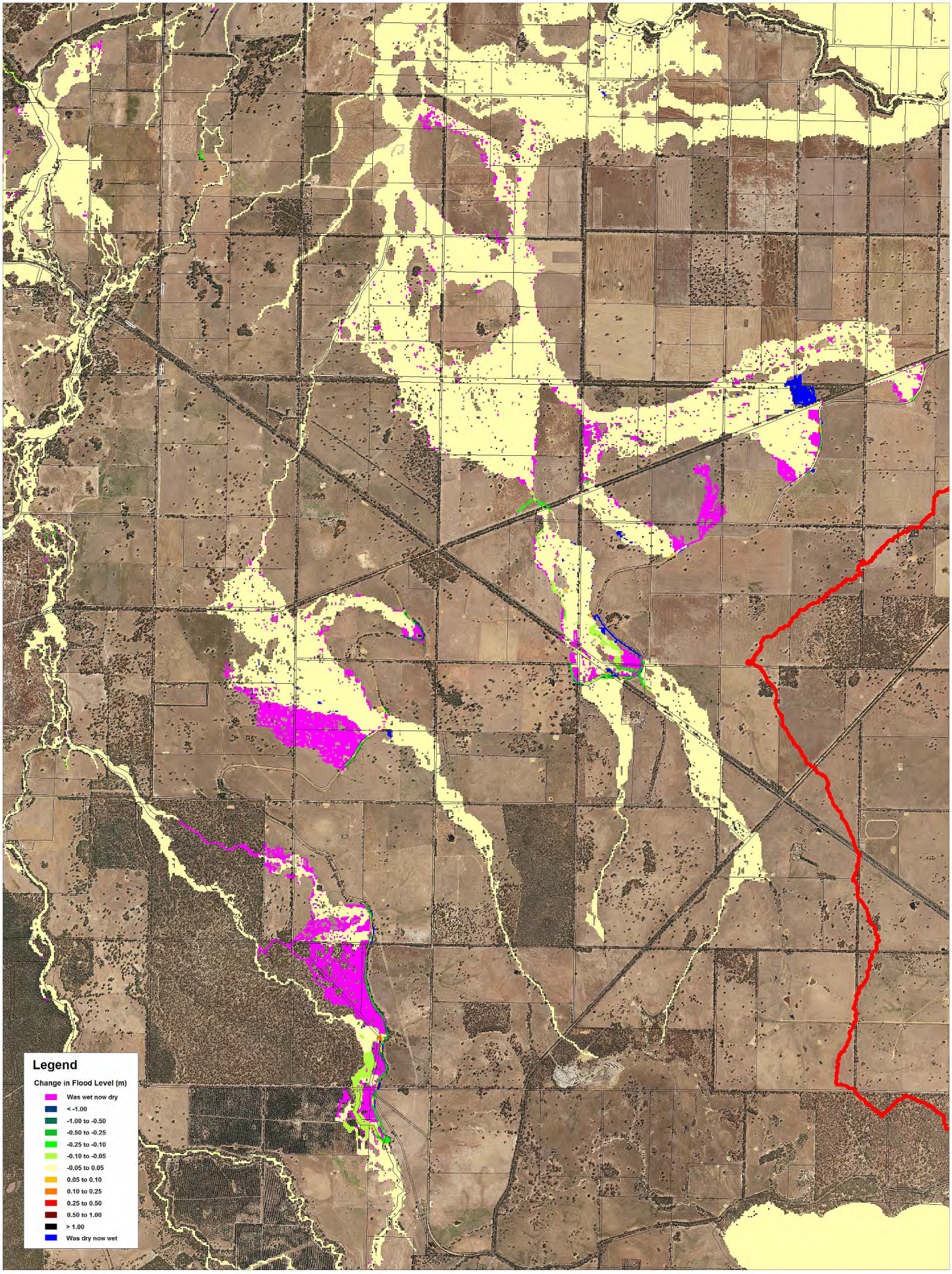

Title:

Mount William Creek Flood Investigation Mitigation Option 3
1 in 10 Year ARI Flood Impacts - Channel Reinstatement

Figure: **D-30**

Rev: **A**

N

0 0.75 1.5km

Approx. Scale

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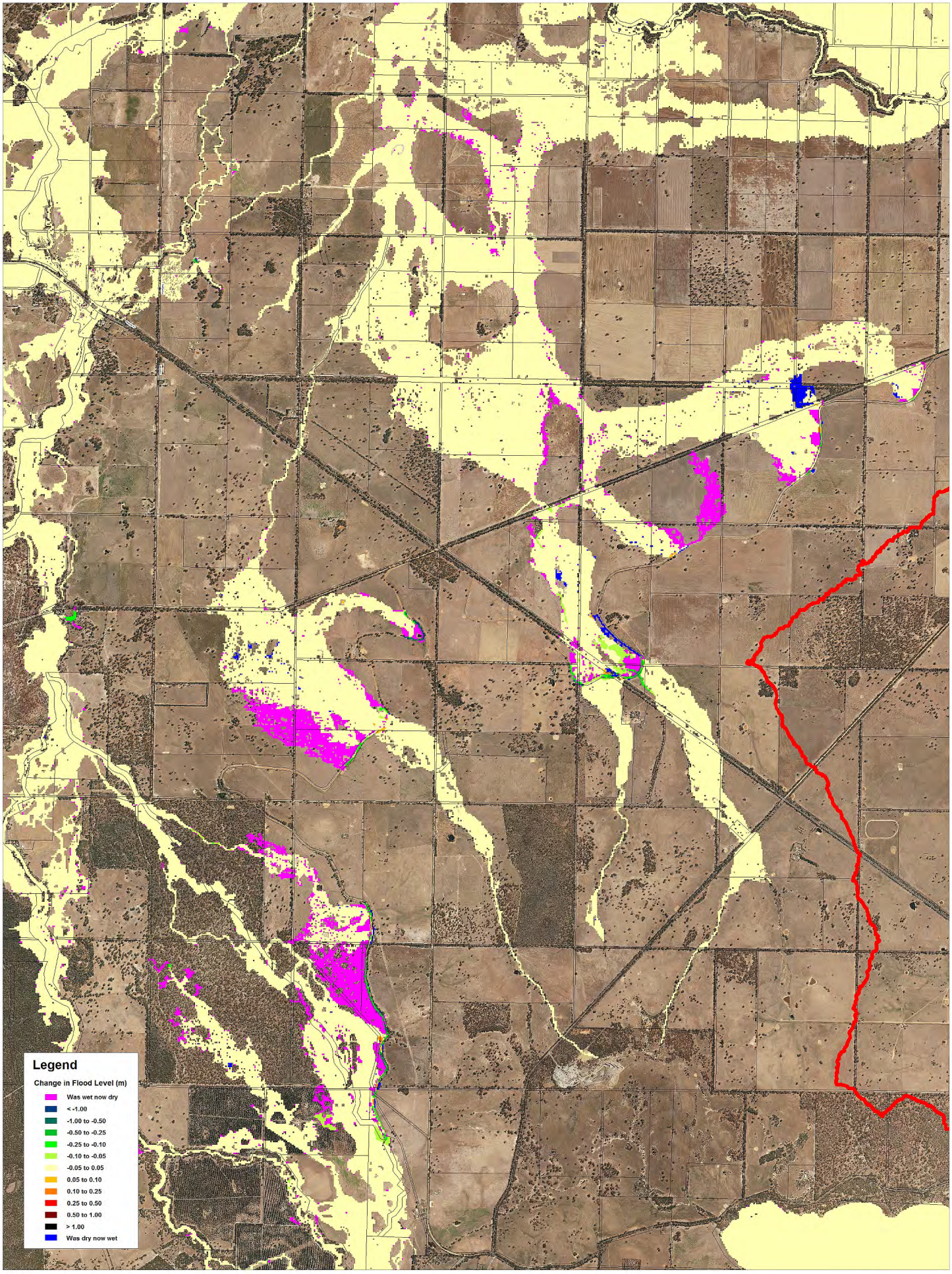

Title:

Mount William Creek Flood Investigation Mitigation Option 3
1 in 20 Year ARI Flood Impacts - Channel Reinstatement

Figure: **D-31**

Rev: **A**

N

0 0.75 1.5km

Approx. Scale

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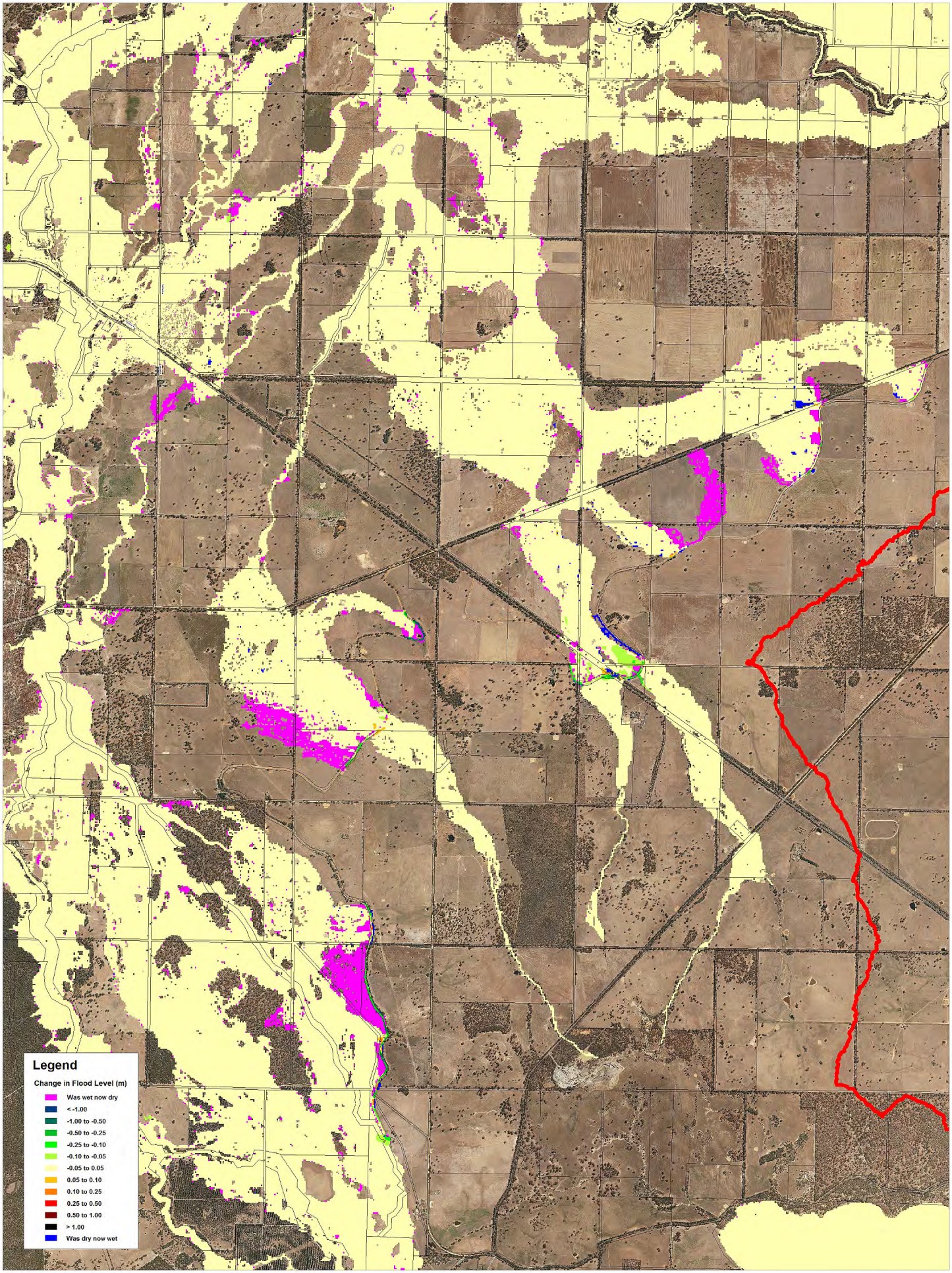


Title:

Mount William Creek Flood Investigation Mitigation Option 3
1 in 50 Year ARI Flood Impacts - Channel Reinstatement

Figure: **D-32**

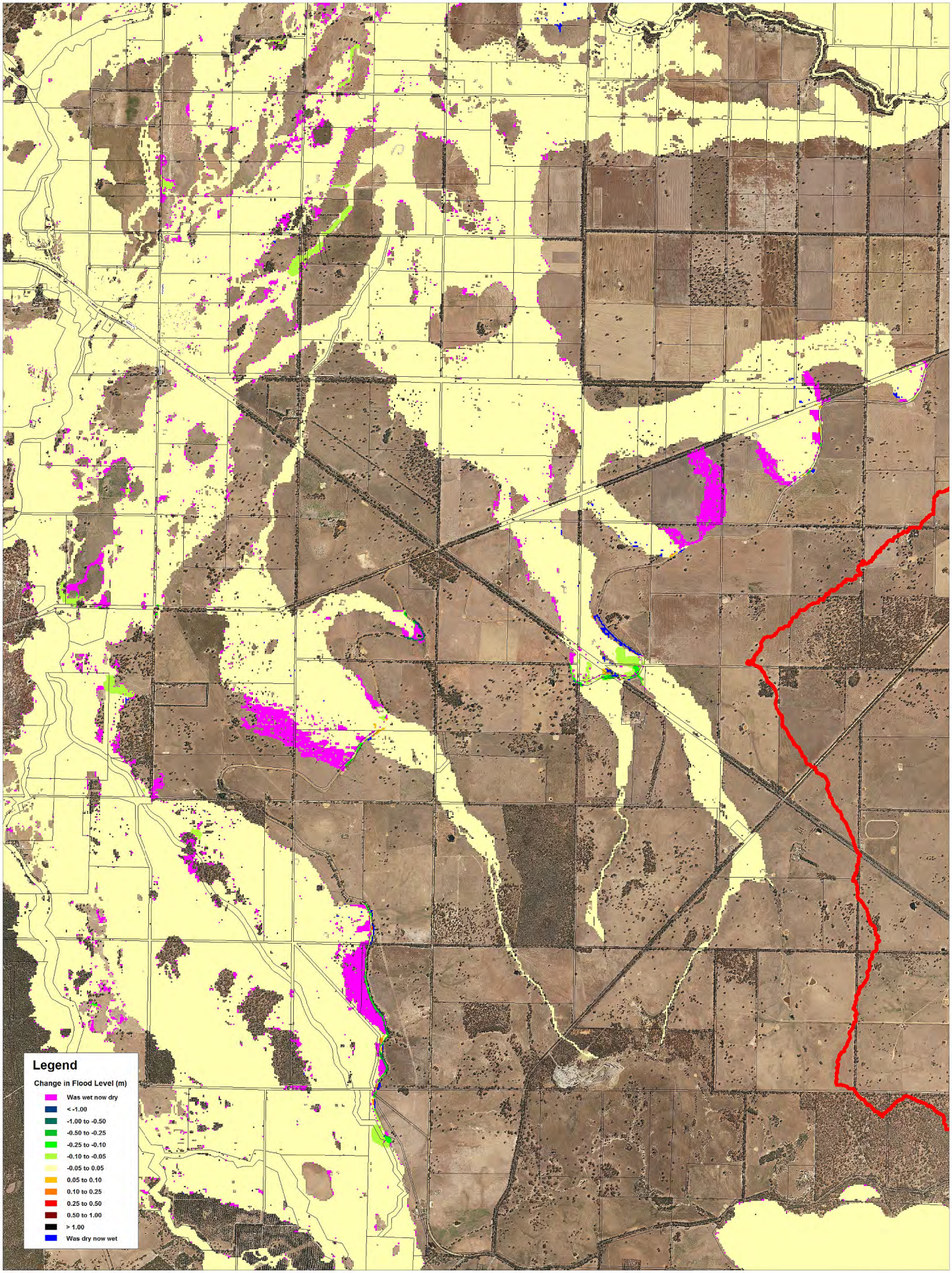
Rev: **A**

N

0 0.75 1.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-32_Dif_hMax_M03_50yr_047_Channel_RevA.WOR



Title:

Mount William Creek Flood Investigation Mitigation Option 3
1 in 100 Year ARI Flood Impacts - Channel Reinstatement

Figure: **D-33**

Rev: **A**

N

0 0.75 1.5km

Approx. Scale

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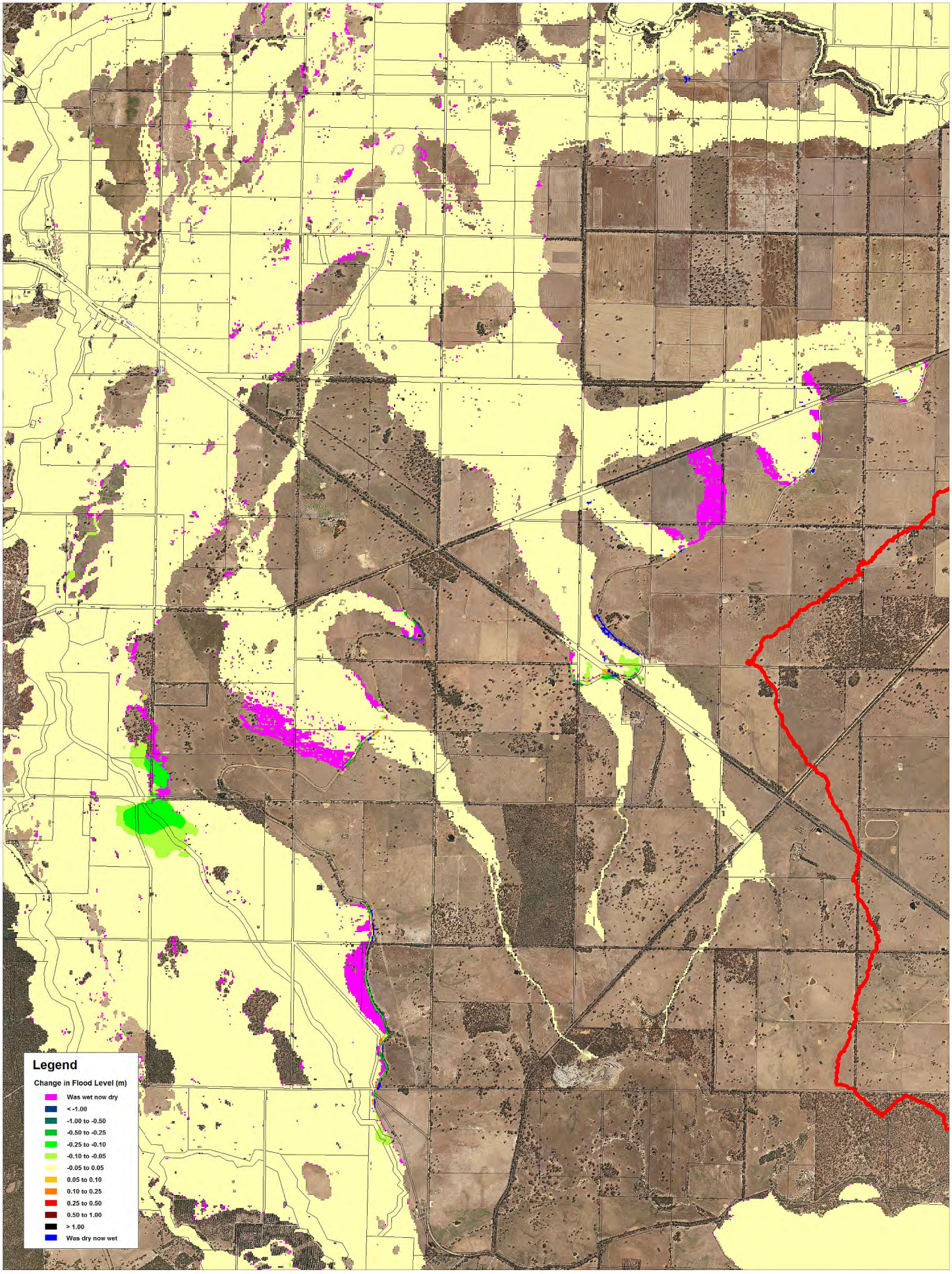

Title:

Mount William Creek Flood Investigation Mitigation Option 3
1 in 200 Year ARI Flood Impacts - Channel Reinstatement

Figure: **D-34**

Rev: **A**

N

0 0.75 1.5km

Approx. Scale

Wimmera Catchment Management Authority · Ararat Rural City · Northern Grampians Shire · Horsham Rural City Council · Australian Government · Victoria · BMT WBM

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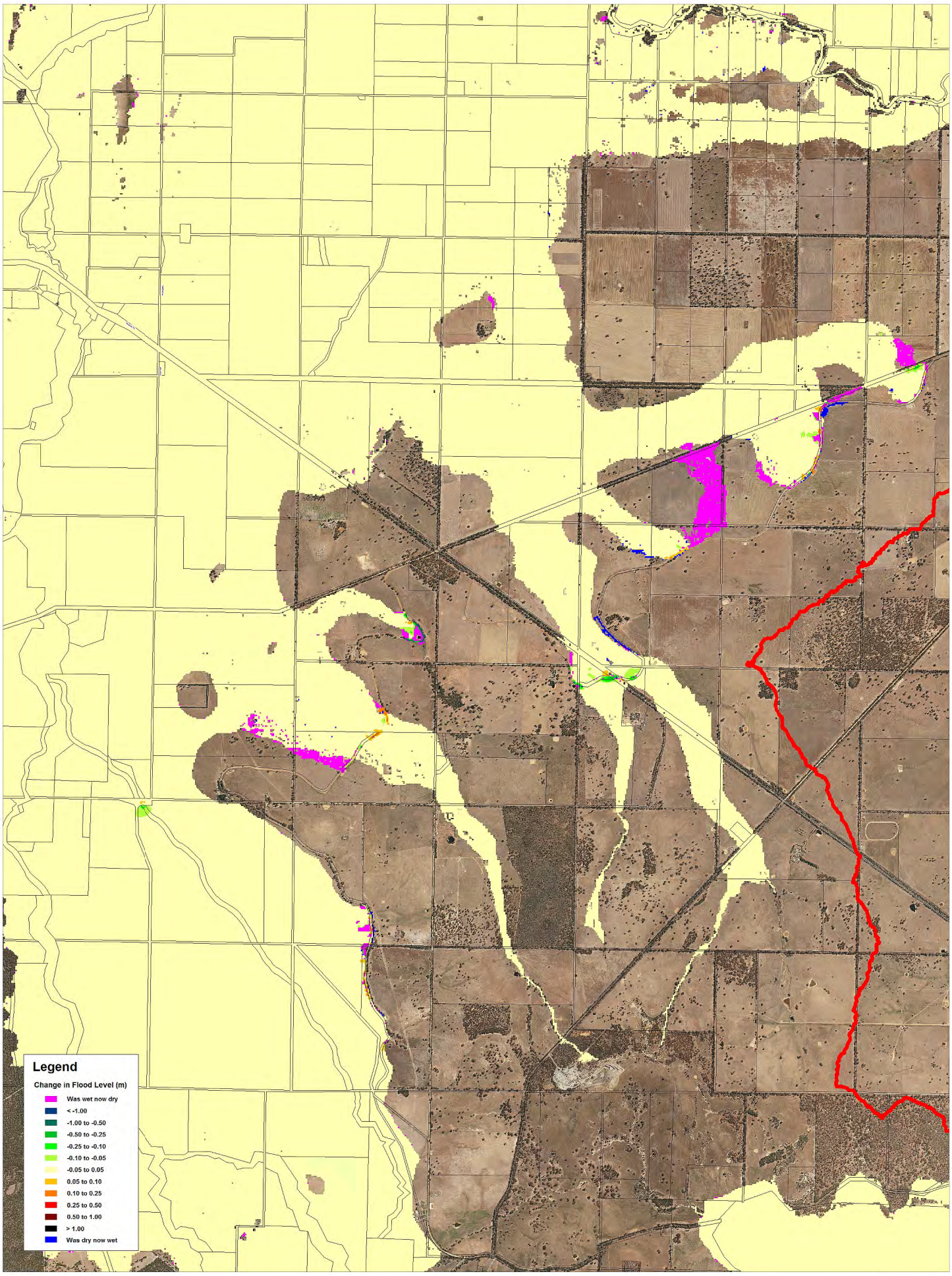


Title:

Mount William Creek Flood Investigation Mitigation Option 3
Probable Maximum Flood Flood Impacts - Channel Reinstatement

Figure: **D-35**

Rev: **A**

N

0 0.75 1.5km

Approx. Scale

Filepath : T:\M20045.JL.MtWilliamCkFS\MapInfo\Drawings\R.M20045.007.01.FinalReport\MtW_FigD-35_Dif_hMax_M03_PMP_047_Channel_RevA.WOR

Appendix E The Flood Warning Service Provided by BOM

E.1 OVERVIEW OF FLOOD WARNING SERVICES PROVIDED BY BoM

E.1.1 Flood Warning Products

Flood Warning products and Flood Class Levels can be found on the BoM website. Flood Warning products include Severe Thunderstorm Warnings, Severe Weather Warnings, Flood Watches and Flood Warnings.

E.1.2 Severe Thunderstorm and Severe Weather Warnings

The BoM can forecast the environment in which severe thunderstorms or small scale weather systems that are locally intense and slow moving may occur and provides a generalised service to that effect. However, it is not yet scientifically possible to predict individual flash flooding events except on time scales of tens of minutes at the very best.

The BoM issues warnings of flash flooding when it becomes apparent that an event has commenced which may lead to flash flooding or when flash flooding has commenced.

E.1.3 Flood Watches

Flood watches are issued by the BoM to notify communities and other stakeholders within broad areas (rather than specific catchments) of the potential flood threat from a developing weather situation. They provide a 'heads up' of likely flooding.

Flood watches are based on an assessment of the developing weather situation and indicators of current catchment wetness. They provide generalised statements about expected forecast rainfall totals, the current state of the catchments within the target area and the streams at risk from flooding. Instructions for obtaining rain and stream level observations and access to updated Watches and Warnings are also included.

Normally, the BoM would issue a Flood Watch 24 to 36 hours in advance of any likely flooding and issue updates as required. If at any time during that period there was an imminent threat of floods occurring within an area covered by the formal flood forecast and warning service, the Flood Watch would be upgraded to a Flood Warning.

E.1.4 Flood Warnings

Flood Warnings are firm predictions of flooding based on actual rainfall and river height information. They are produced by the application of a range of models that include simple relationships between upstream and downstream water levels through to complex stream flow based models of catchment behaviour that take account of antecedent conditions (i.e. the 'wetness' of the catchment, storage levels within dams, etc) and likely future rainfall. Releases from dams are an essential input to such models.

To assist the description of the service it provides, BoM are in the process of categorising the locations where river height data is obtained into three types as follows.

- **Forecast locations:** BoM provides a forecast of future water level as the class of predicted flooding ('minor', 'moderate' or 'major' - see BoM website for an explanation of these terms and current flood class levels) or as a predicted level and associated class of flooding for these locations.
- **Information locations:** BoM does not provide a forecast for these locations but as flood class levels are defined, does provide current water levels and trends (i.e. a now-cast).
- **Data locations:** BoM only provides data for these locations: no forecasts and no indication of the class (or severity) of flooding.

These locations will be further designated as either "key" or "secondary" in relation to flood forecasting activities.

- **Key locations:** may be a forecast location and the real-time data collected at site are critical to the provision of a flood forecasting service to a downstream site.
- **Secondary locations:** data from these sites are used to support hydrological modelling and flood prediction activities although their loss during an event is considered unlikely to affect BoM ability to provide a flood forecasting service.

Flood forecasts provided by the BoM are categorised as either:

- **Qualitative:** the forecast includes information about the expected class of flooding ('minor', 'moderate' or 'major' - see BoM website for an explanation of these terms and current flood class levels) and the timing of expected flooding at the location. The forecast may also include information about the expected class of flooding during the peak.
- **Quantitative:** the forecast includes the expected class of flooding ('minor', 'moderate' or 'major' - see BoM website for an explanation of these terms and current flood class levels) together with more specific information about the height and time of future water levels at the location.
- **Generalised:** the forecast comprises generalised statements advising that flooding is expected and are usually issued for areas where no locations exist for which quantitative or qualitative forecasts are provided, in the developing stages of a flood and / or when there is insufficient data available to make a specific prediction.

Generally flood warnings are issued by the BoM to the media, VICSES, Council and other stakeholder agencies and organisations. VICSES promptly alerts and disseminates such warnings to other agencies and organisations. Stakeholder agencies and organisations, including Council, are responsible for onward dissemination of the warning details.

Flood warnings usually include:

- Rainfall amounts for selected locations within and adjacent to the subject catchment;
- River heights and trends (rising, steady, falling) at key locations within the subject catchment;
- Outflows (in ML/d) from any major storages within the catchment;
- Forecasts of the height and time of flood peaks at key locations;
- A weather outlook and the likely impact of expected rainfall on flooding; and

- A warning re-issue date and time.

Note 1: The term "local flooding" and "flash flooding" may be used for localised flooding resulting from intense rainfall over a small area.

Note 2: The term "significant rises" may be used in the early stages of an event when it is clear that river levels will rise but it is too early to say whether they will reach flood level.

Additional information (e.g. weather radar and satellite images as well as updated rain and river level information) can also be obtained from the Bureau's website (www.bom.gov.au/hydro/flood/vic) or for the cost of a local call on ☎ 1300 659 217.

E.1.5 Flood Class Levels

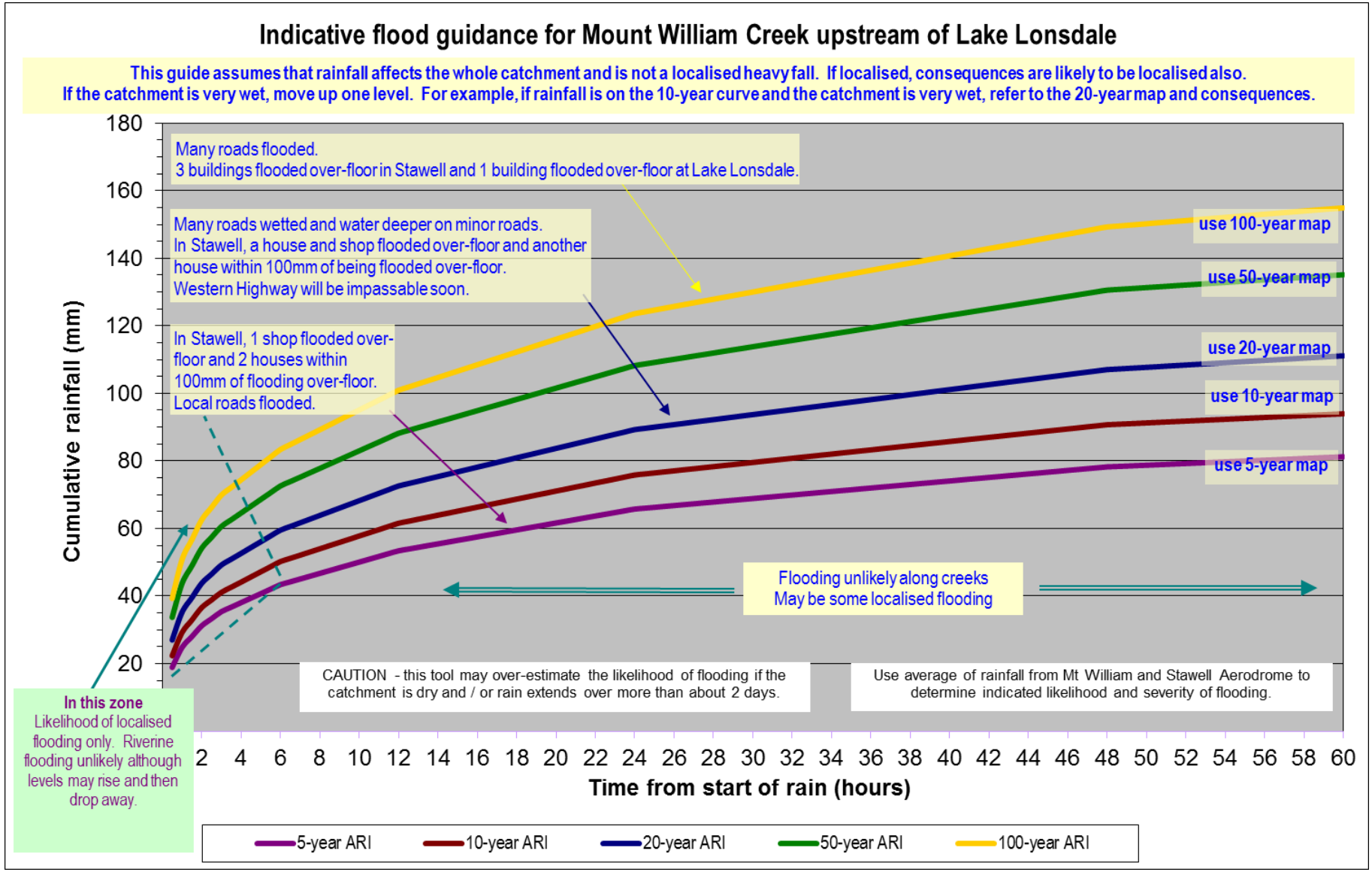
Not all sites for which flood class levels exist will automatically be provided with a quantitative flood forecast by the BoM in the future. It is understood that sites will be classified on the basis of flood risk and consequence. The lower rated sites will receive a quantitative warning service only. For these sites, BoM will issue warnings that advise only of the actual exceedance (or likely exceedance) of flood class levels along with the class of flooding expected: a detailed flood forecast will not be provided.

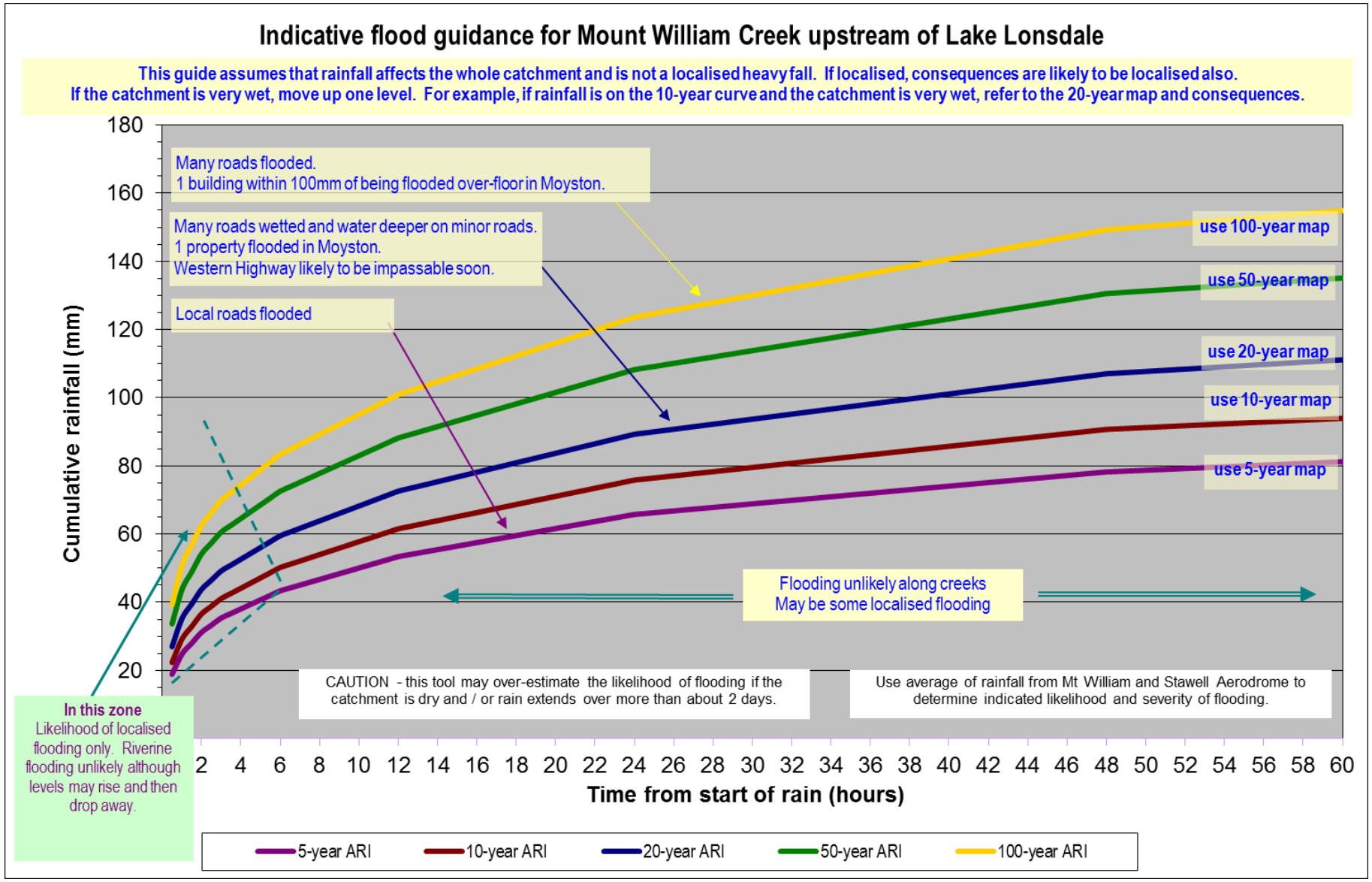
The occurrence of a certain class of flooding at one point in a catchment will not necessarily lead to the same class of flooding at other points – for example along the main river and its tributary creeks or along a drainage network's overland flow paths. This is because the floodplain physiography and use (and thus flood impact) varies along the river or flow path and also because antecedent conditions combined with where and how rainfall occurs (both in time and space) will drive how a flood develops and progresses.

It is emphasised that the flood class levels refer to that part of the watercourse where the flood effects can be related to the gauge reading.

It is important to remember that flood impact is dependent on more than the peak height or flow. The rate of rise, duration, extent and season of flooding are also important. For this reason, flood class levels can only be considered as a guide to flood severity.

Appendix F Indicative Flood/No Flood Tools for Mount William Creek


Indicative flood guidance for Mount William Creek upstream of Lake Lonsdale
This guide assumes that rainfall affects the whole catchment and is not a localised heavy fall. If localised, consequences are likely to be localised also.
If the catchment is very wet, move up one level. For example, if rainfall is on the 10-year curve and the catchment is very wet, refer to the 20-year map and consequences.
Cumulative rainfall (mm)
180
160
140
120
100
80
60
40
20
Many roads flooded.
3 buildings flooded over-floor in Stawell and 1 building flooded over-floor at Lake Lonsdale.
Many roads wetted and water deeper on minor roads.
In Stawell, a house and shop flooded over-floor and another house within 100mm of being flooded over-floor.
Western Highway will be impassable soon.
In Stawell, 1 shop flooded over-floor and 2 houses within 100mm of flooding over-floor.
Local roads flooded.
use 100-year map
use 50-year map
use 20-year map
use 10-year map
use 5-year map
Flooding unlikely along creeks
May be some localised flooding
CAUTION - this tool may over-estimate the likelihood of flooding if the catchment is dry and / or rain extends over more than about 2 days.
Use average of rainfall from Mt William and Stawell Aerodrome to determine indicated likelihood and severity of flooding.
In this zone
Likelihood of localised flooding only. Riverine flooding unlikely although levels may rise and then drop away.
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
Time from start of rain (hours)
5-year ARI
10-year ARI
20-year ARI
50-year ARI
100-year ARI


Indicative flood guidance for Mount William Creek upstream of Lake Lonsdale
This guide assumes that rainfall affects the whole catchment and is not a localised heavy fall. If localised, consequences are likely to be localised also.
If the catchment is very wet, move up one level. For example, if rainfall is on the 10-year curve and the catchment is very wet, refer to the 20-year map and consequences.
Many roads flooded.
1 building within 100mm of being flooded over-floor in Moyston.
Many roads wetted and water deeper on minor roads.
1 property flooded in Moyston.
Western Highway likely to be impassable soon.
Local roads flooded
use 100-year map
use 50-year map
use 20-year map
use 10-year map
use 5-year map
Flooding unlikely along creeks
May be some localised flooding
CAUTION - this tool may over-estimate the likelihood of flooding if the catchment is dry and / or rain extends over more than about 2 days.
Use average of rainfall from Mt William and Stawell Aerodrome to determine indicated likelihood and severity of flooding.
In this zone
Likelihood of localised flooding only. Riverine flooding unlikely although levels may rise and then drop away.
Cumulative rainfall (mm)
180
160
140
120
100
80
60
40
20
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
Time from start of rain (hours)
5-year ARI
10-year ARI
20-year ARI
50-year ARI
100-year ARI

Appendix G Estimated costs for TFWS for Mount William Creek

Table G-1 provides indicative costs associated with the implementation and on-going operation of each of the TFWS elements proposed for Mount William Creek and Dadswells Bridge as discussed above.

Table G-1 Estimated cost associated with the Flood Warning System Options

Item	Estimated cost as at July 2014 (excl GST)	Comments
In-kind estimates developed using at-cost (not commercial) rates for time, consumables, etc		
1. Data Collection and Collation		
Establish an agreement between the Rural City of Horsham and WCMA / DEPI that (up to) 2 x PALS will be available when required and that comprehensively addresses the issue of who pays for equipment installation, operation and recovery.	In-kind estimate ~$3,000 total	Will need to be led by Council. It is important that this matter is addressed with some priority and certainly before the next flood.
Install staff gauges at the primary and alternative PALS locations at Dadswells Bridge, check gauge zeroes and location coordinates, and adjust install locations as and if required.	Capital ~$3,000 total	Will need to be led by Council but start dependent on availability of capital and on-going funding.
Input from BoM, comprising assistance with site selection, radio path testing and advice on necessary and appropriate equipment for the ERTS river (and rain?) station at Dadswells Bridge and rain only station in the upper catchment – see below.	In-kind estimate ~$4,000 total	Scope and timing of input likely to be subject to operational and other workloads.
If Dadswells Bridge is classified as a key river level and quantitative flood forecast location, install an ERTS river (perhaps with rain) gauge at the primary PALS location upstream of the Western Highway Bridge. Includes steel instrument housing, ERTS canister, logger, solar panel, antenna, cabling.	$15,000 est for river only without logger.	Costs cover supply, installation, and commissioning of equipment plus warranty / maintenance period. Issue of who pays capital and on-going costs will need to be resolved through DEPI with BoM but is likely to be Council.
1 x ERTS rain only installation at a location to be decided, but probably in the vicinity of Moyston, if required. Includes steel instrument housing, BoM spec TBRG, ERTS canister, logger, solar panel, antenna, cabling.	$14,000 per site	Capital and on-going costs will reduce if the logger is omitted.
Recurrent costs: Staff gauge site.	$1,000/year/site	Indicative costs only and dependent on the work scope, whether a logger is installed,

Item	Estimated cost as at July 2014 (excl GST)	Comments
ERTS rain only site. ERTS river only site ERTS rain / river site	$2,000/year/site $2,000/year/site $3,000/year/site	whether a rating table needs to be verified and whether the sites are brought into the Surface Water Monitoring Partnership.[12]
Secure telemetry access for BoM to rainfall and river level data from the Mount William Creek at Mokepilly site. If existing partners agree to share data, there are likely to be recurrent costs.	In-kind estimate ~$500 Recurrent costs allow $1,000/year	Rural City of Horsham to approach the Surface Water Monitoring Partnership and negotiate access.
BoM to accommodate additional data in display tables and maps accessible via the BoM website. Will need to be able to display data from an expanded data collection network.	In-kind estimate ~$1,500	Data needs to be easily accessible to the Mount William Creek communities.
Establish a commercial arrangement between Council and a service provider for maintenance of staff gauges, ERTS equipment and sites.		Ideally this would be through the Surface Water Monitoring Partnership as this will also ensure that all data is QA'ed and archived and equipment included on the asset management register.
2. Flood Detection and Prediction		
The indicative "quick look" tools together with the MFEP enable those at risk to determine the likelihood and scale of possible flooding in the upper and middle reaches of the catchment and at Dadswells Bridge.	In-kind estimate ~$3,000/flood	MFEP intelligence will need to be updated by Council and VICSES following flooding in the catchment. Council to maintain the tools. This could be done by plotting flood producing rainfall events and resulting flooding as well as flood peak levels and dates on the tools along with the event date. This may allow some refinement of the tools over time.
Confirm proposed flood class levels for Dadswells Bridge and formally request, through DEPI, that BoM adopt and publish these flood class levels.	In-kind estimate ~$1,000	Council with input and support from VICSES and WCMA. Request through WCMA to DEPI.
Resolve classification of Dadswells Bridge with BoM as: Key river level site / location; and Quantitative flood forecast location.	In-kind estimate ~$3,000 to setup	On both matters, will require a formal request from Council and others through WCMA to DEPI. DEPI will liaise with BoM.

[12] Increased costs arise because logged data needs to be downloaded and quality controlled before being loaded to archive.

Estimated costs for TFWS for Mount William Creek

Item	Estimated cost as at July 2014 (excl GST)	Comments
BoM develop rainfall–runoff model for Mount William Creek to provide quantitative flood forecasts for Dadswells Bridge.	In-kind estimate ~$8,000 to setup[13]	No indication of likely timetable for this.
3. Interpretation		
Make relevant parts of the MFEP and flood inundation and related mapping available to the Mount William Creek communities.	In-kind estimate ~$3,000	Councils to work with communities on how best to achieve access.
The indicative "quick look" tools together with the MFEP enable those at risk to determine the likelihood and scale of possible flooding in the upper and middle reaches of the catchment and at Dadswells Bridge with some lead time.	As costed above, in-kind estimate ~$3,000/flood	MFEP intelligence will need to be updated by Councils and VICSES following flooding in the catchment. Council to maintain the tools.
4. Message Construction and Dissemination		
Council and VICSES to determine what information can and should be disseminated and with what authority. As part of this, determine the role and distribution of the quick look tools.	In-kind estimate $5,000 to set up ~$500/y ongoing per Council	Councils together with VICSES will need to clearly establish what information will be made available and how best to do that.
5. Response		
MEMPCs to sign-off on the MFEPs.	Part of normal business	Will allow the MFEPs to be operationalised.
Councils to share relevant parts of the MFEP with the Mount William Creek communities.	In-kind estimate ~$500 to set up per Council	Will assist the implementation of an informed local response when it next floods.
Establish arrangements for the supply of sandbags and sand within Dadswells Bridge with sufficient lead time to enable non-weatherboard buildings and / or buildings at risk of minimal over-floor flooding to be sandbagged / protected.	In-kind estimate ~$1,000 to set up	Arrangements established in conjunction with Council and VICSES should be detailed in the MFEP.
Encourage and assist residents and businesses to develop individual flood response plans.	In-kind estimate $500 to promote	VICSES and Councils.
Initiate a community engagement program to communicate how the FWS will work.	In-kind estimate ~$3,000 to start ~$1,000 to repeat	VICSES with assistance from Councils. Will need to be repeated as the system matures.
6. Review and Keeping the System Alive		
Develop review and update protocols => who	In-kind estimate	Could be led by Councils in

[13] Indications are that BoM will consider the provision of a flood forecast service to Dadswells Bridge as a "new" service (pers comm with Elma Kazazic and Karen Hudson at BoM on 8 July 2014). This means that cost recovery principles are likely to be applied to any work by BoM associated with the development and implementation of a flood forecast model. Guidance on how such costs will be determined is not available as at the date of this report. It is therefore suggested that BoM is approached regarding costs and timescales before a budget for any work relating to the development of a flood forecasting service for Dadswells Bridge is firmed up.

Item	Estimated cost as at July 2014 (excl GST)	Comments
does what when and process to be followed to update material consistently across all parts of the flood warning and response system, including the MFEP.	~$3,000	conjunction with VICSES.
Post-event review and on-going maintenance of the system in order to keep it alive within the community (e.g. exercises to test procedures, website maintenance, asset replacement, operational costs, and so on). Assuming that replacement spares were purchased as part of the initial capital investment, asset replacement expenses are considered to be included in site recurrent costs.	In-kind estimate ~$2,000/year for activities while operational costs are absorbed into incident management activities.	Costs will vary year to year and will depend on rainfall and seasonal conditions.
7. Community Flood Awareness		
Prepare Local Flood Guides for Dadswells Bridge and for the Mount William Creek catchment that are consistent with: • Flood intelligence included in the Council MFEPs • The flood warning system for Mount William Creek / Dadswells Bridge • Updates to the data collection network and data availability.	Up to $8,000 including printing but expected to be covered by other funding through VICSES	Cost will depend on how much of the work is out-sourced and how much is done by VICSES as an in-kind contribution.
Develop, print and distribute property-specific flood depth charts for properties within the Mount William Creek catchment.	$5,000	Cost will depend on how much of chart build is out-sourced.
Load and maintain flood related material (including the MFEPs) to Councils' websites.	In-kind estimate per Council ~$1,000 to cover initial load ~$500 ongoing	
Install flood depth indicator boards at key locations in and around the catchment.	~$600/board	Locations to be determined from hazard maps.

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