

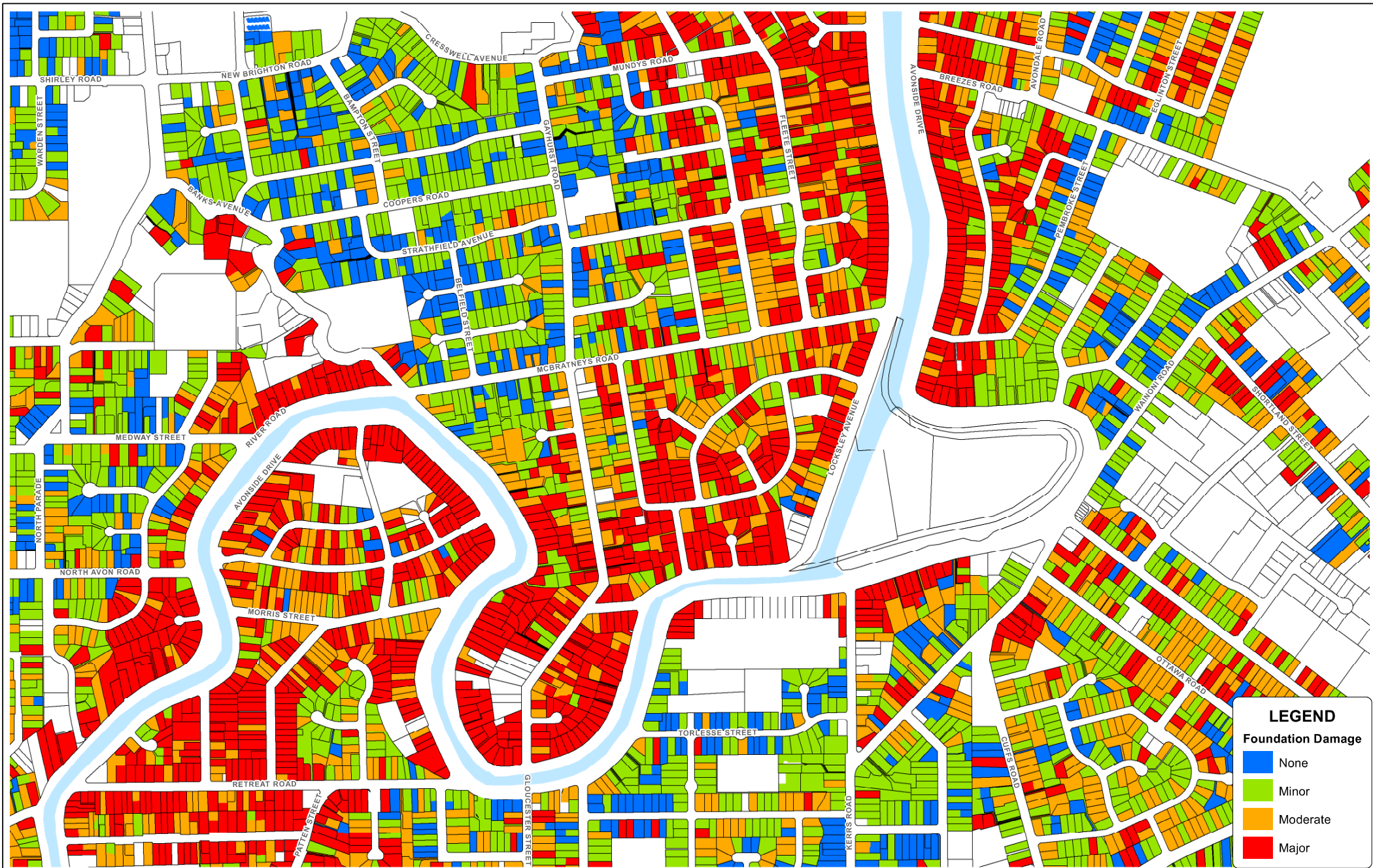
Appendix M: Avonside study area - lateral spreading

ENVIRONMENTAL AND ENGINEERING CONSULTANTS



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A3 SCALE 1:7,500

0 0.1 0.2 0.3 0.4 0.5 (km)



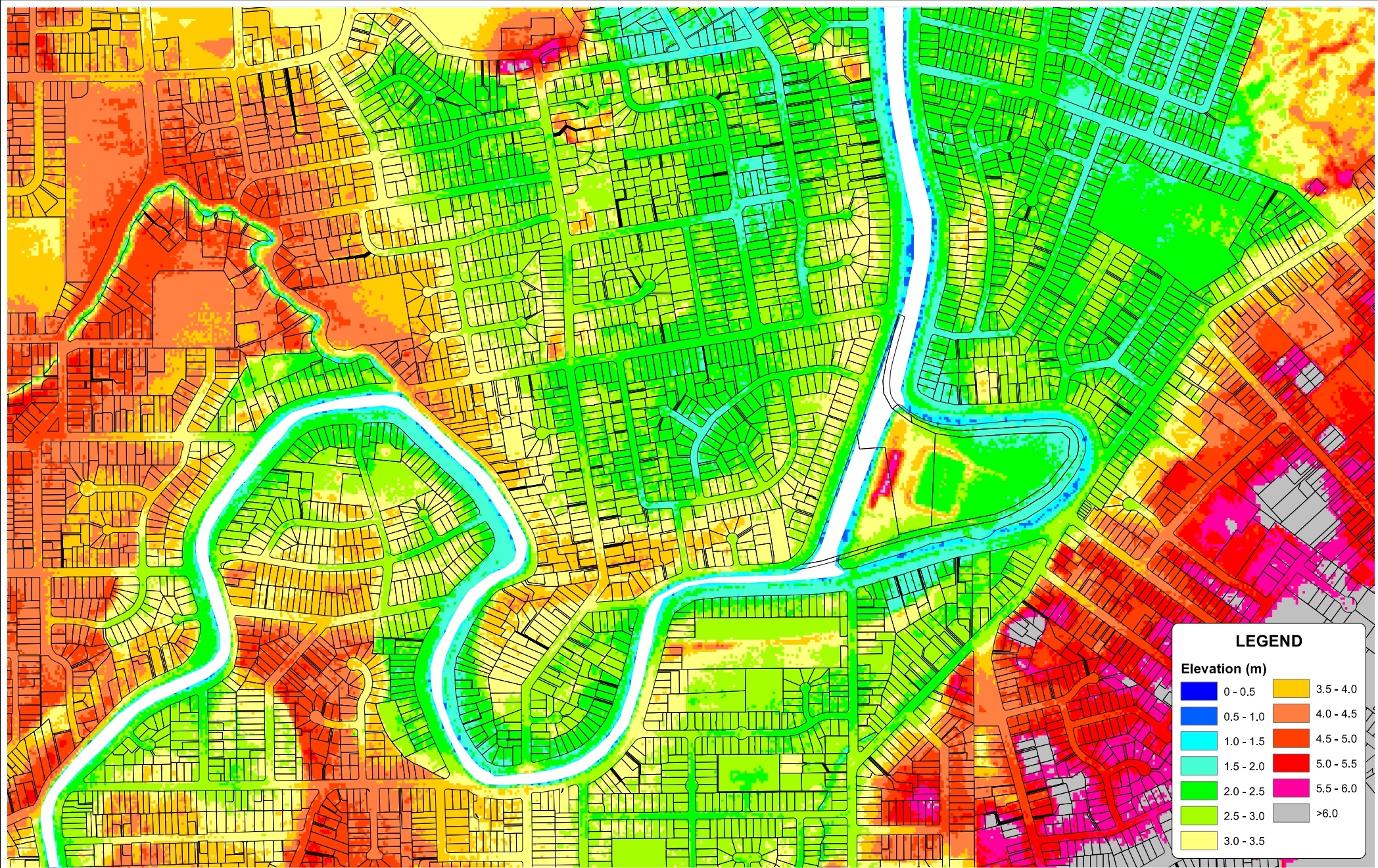
EQC
EARTHQUAKE COMMISSION
Kōhira Rūhenua

DRAWN	CXP	Feb,13
CHECKED		
APPROVED		
ARCFILE 52020-0200-BDF26		
SCALE (AT A3 SIZE) 1:7,500		
Prepared By Tonkin & Taylor Ltd Ref: 52020.0200		

EARTHQUAKE COMMISSION
AVONSIDE, CHRISTCHURCH CITY
Observed Foundation Damage (Worst Recorded
Damage Between September 2010 to Present)

FIGURE No. Figure M1

Rev. 0



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A3 SCALE 1:7,500

0 0.1 0.2 0.3 0.4 0.5 (km)



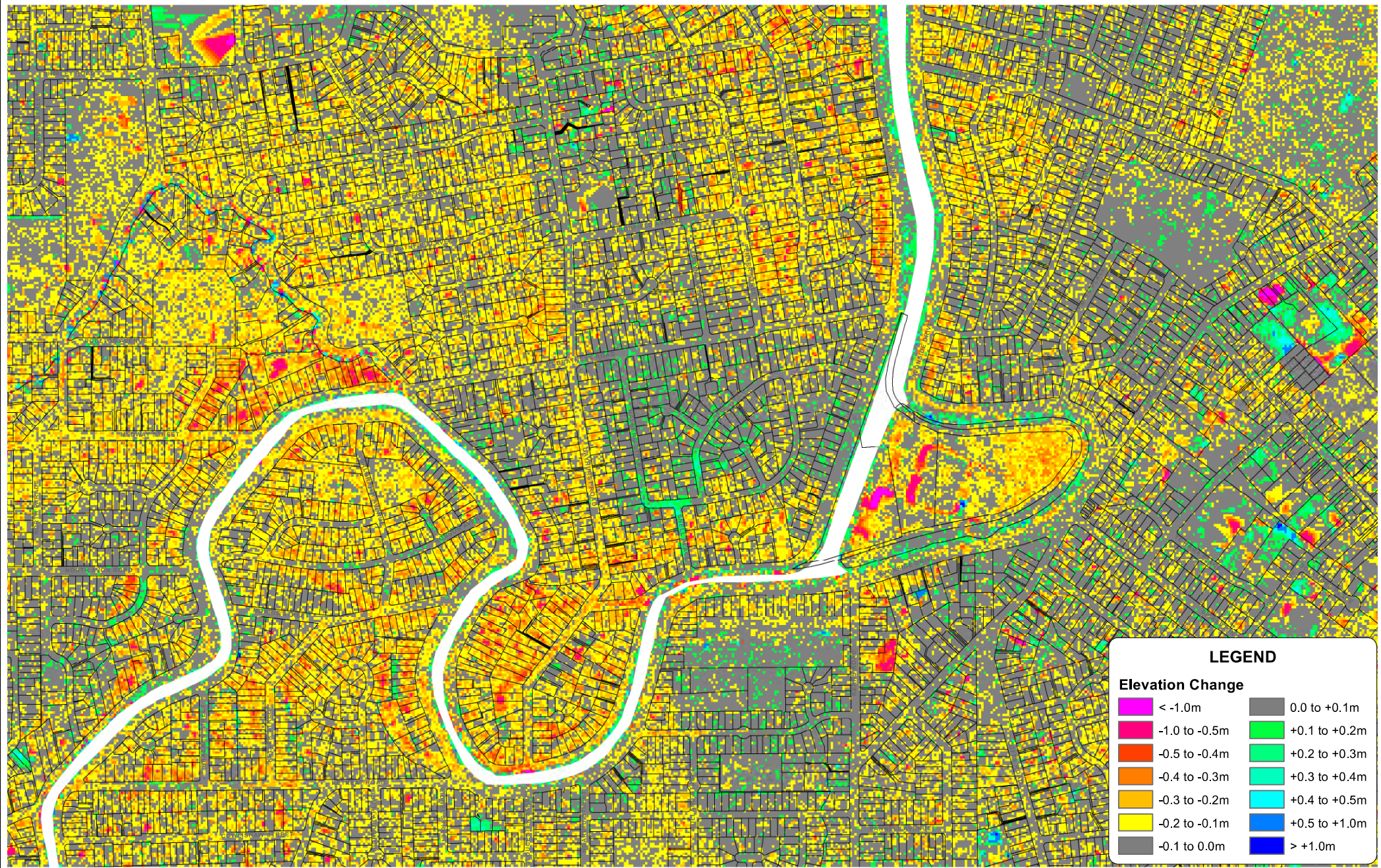
EQC
EARTHQUAKE COMMISSION
Kōhirauna Rūwhenua

DRAWN	JSD	Feb,13
CHECKED		
APPROVED		
ARCFILE	52020-0200-LSE06	
SCALE (AT A3 SIZE)	1:7,500	
Prepared by	Tonkin & Taylor Ltd	
Ref:	52020.0200	

EARTHQUAKE COMMISSION
AVONSIDE, CHRISTCHURCH CITY
LiDAR Elevation
(Pre September 2010)

FIGURE No. **Figure M2**

Rev. **0**

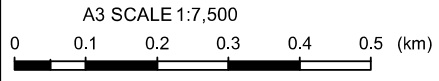


LEGEND

Elevation Change

 < -1.0m	 0.0 to +0.1m
 -1.0 to -0.5m	 +0.1 to +0.2m
 -0.5 to -0.4m	 +0.2 to +0.3m
 -0.4 to -0.3m	 +0.3 to +0.4m
 -0.3 to -0.2m	 +0.4 to +0.5m
 -0.2 to -0.1m	 +0.5 to +1.0m
 -0.1 to 0.0m	 > +1.0m

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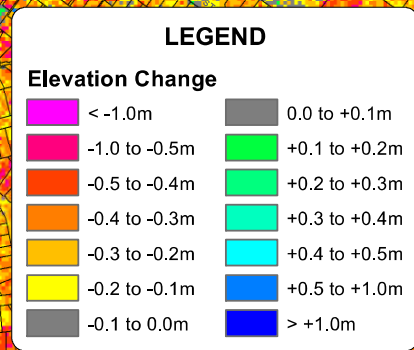
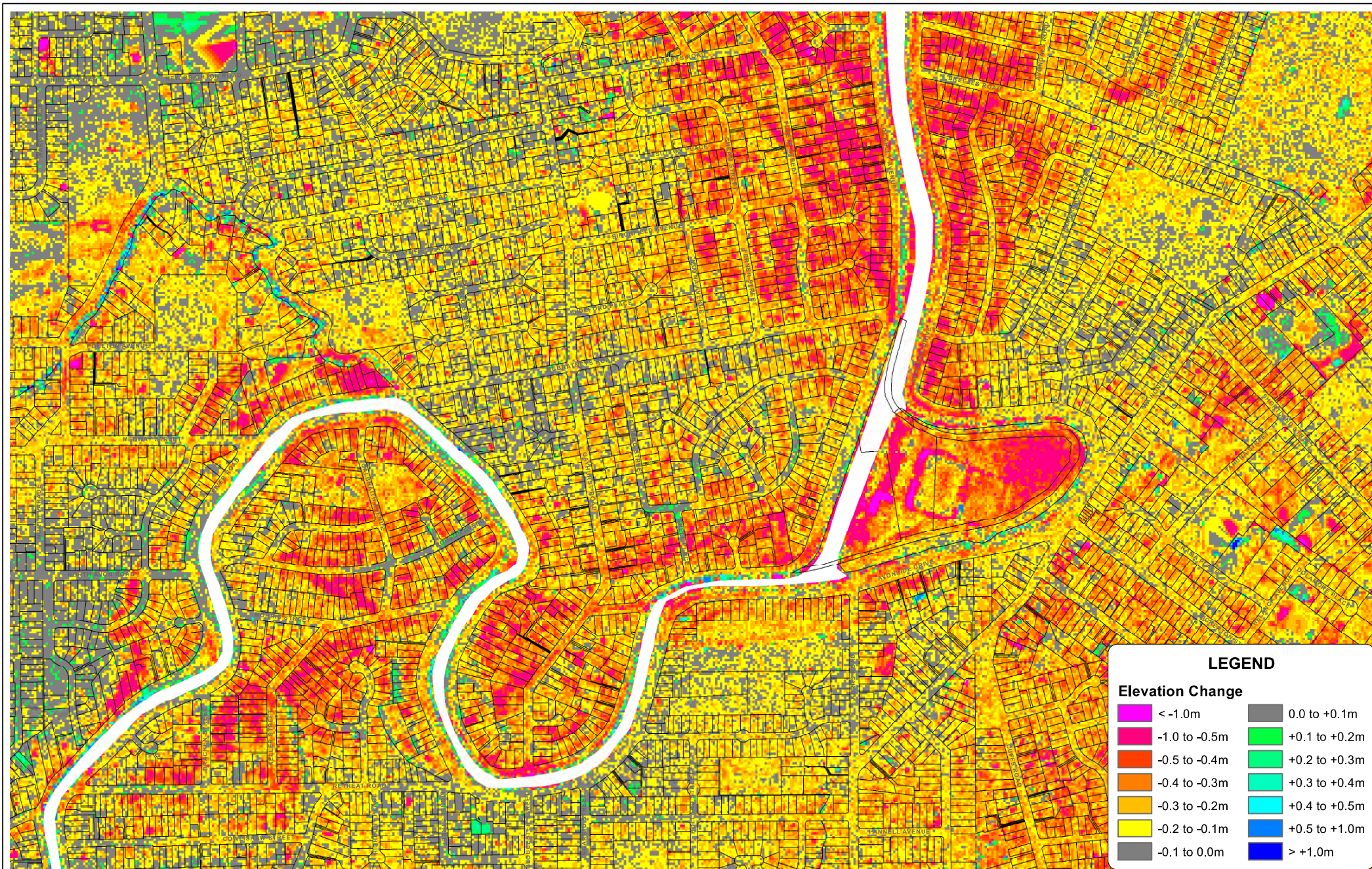


DRAWN	JSD	Mar,13
CHECKED		
APPROVED		
ARCFILE 52020-0200-LEC12		
SCALE (AT A3 SIZE) 1:7,500		
Prepared by Tonkin & Taylor Ltd		
Ref: 52020.0200		

EARTHQUAKE COMMISSION
AVONSIDE, CHRISTCHURCH CITY
Liquefaction Related Elevation Change
(Pre September 2010 to Post September 2010)

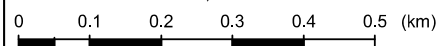
FIGURE No. **Figure M3**

Rev. **0**



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A3 SCALE 1:7,500

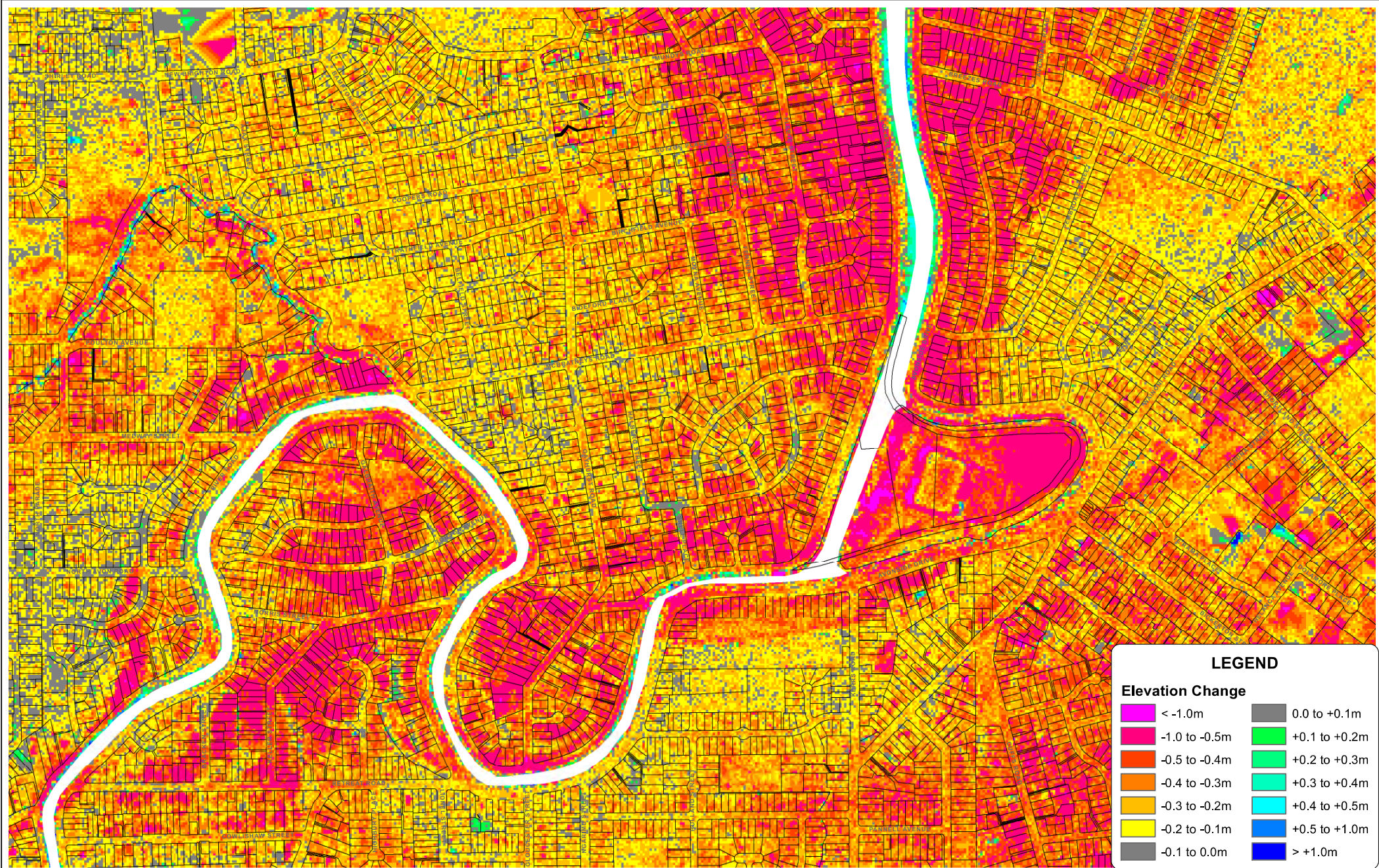


DRAWN	CXP	Mar,13
CHECKED		
APPROVED		
ARCFILE	52020-0200-LEC10	
SCALE (AT A3 SIZE)	1:7,500	
Prepared by Tonkin & Taylor Ltd		
Ref:	52020.0200	

EARTHQUAKE COMMISSION
AVONSIDE, CHRISTCHURCH CITY
Liquefaction Related Elevation Change
(Pre September 2010 to Post February 2011)

FIGURE No. **Figure M4**

Rev. **0**



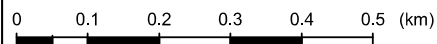
LEGEND

Elevation Change

	< -1.0m		0.0 to +0.1m
	-1.0 to -0.5m		+0.1 to +0.2m
	-0.5 to -0.4m		+0.2 to +0.3m
	-0.4 to -0.3m		+0.3 to +0.4m
	-0.3 to -0.2m		+0.4 to +0.5m
	-0.2 to -0.1m		+0.5 to +1.0m
	-0.1 to 0.0m		> +1.0m

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A3 SCALE 1:7,500



DRAWN	JSD	Mar,13
CHECKED		
APPROVED		
ARCFILE	52020-0200-LEC11	
SCALE (AT A3 SIZE)	1:7,500	
Prepared by Tonkin & Taylor Ltd		
Ref:	52020.0200	

EARTHQUAKE COMMISSION
AVONSIDE, CHRISTCHURCH CITY
Liquefaction Related Elevation Change
(Pre September 2010 to Post June 2011)

FIGURE No. Figure M5

Rev. 0



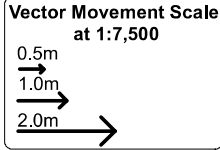
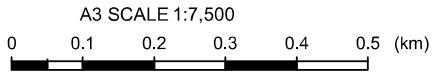
LEGEND

Horizontal Movement

→ Observed

→ Tectonic

Notes: Aerial Imagery Supplied by New Zealand Aerial Mapping Ltd.



DRAWN	CXP	Feb.13
CHECKED		
APPROVED		
ARCFILE	52020-0200-LCV13	
SCALE (AT A3 SIZE)	1:7,500	
Prepared By	Tonkin & Taylor Ltd	
Ref:	52020.0200	

EARTHQUAKE COMMISSION
CHRISTCHURCH CITY & KAIAPOI
Horizontal Movement Vectors
(Pre September 2010 - Post December 2011)

FIGURE No. **Figure M6**

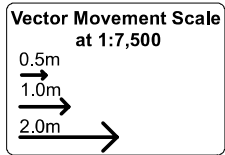
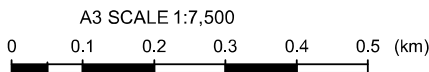


LEGEND

Horizontal Movement
Resultant

Observed Crack Locations Pre February & Post February 2011 (LDE)
Width
— >200mm
— 50 to 200mm
— 10 to 50mm
— <10mm
— Unclassified

Notes: Aerial Imagery Supplied by New Zealand Aerial Mapping Ltd.

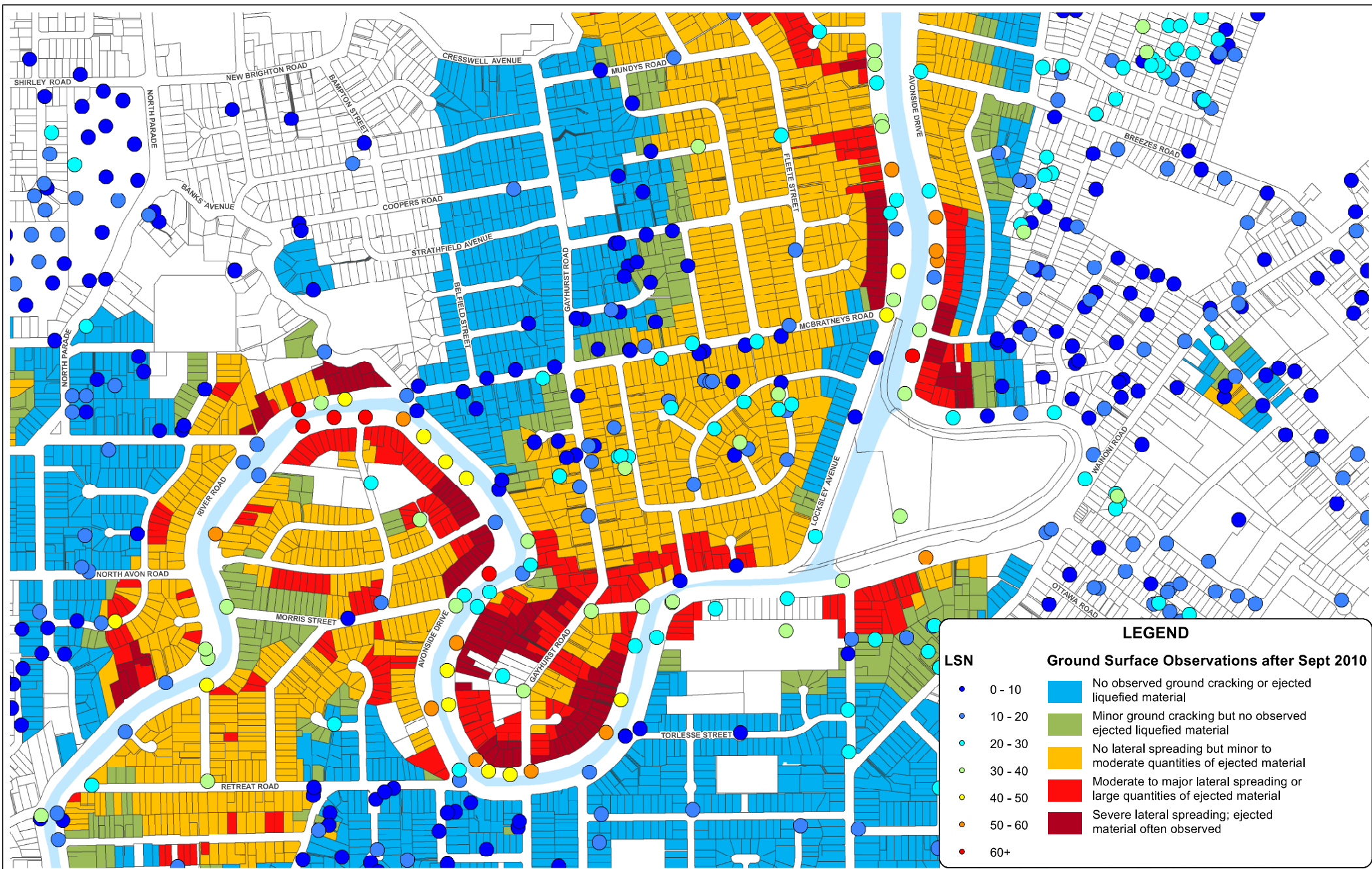


DRAWN	CXP	Feb.13
CHECKED		
APPROVED		
ARCFILE	52020-0200-LCV14	
SCALE (AT A3 SIZE)	1:7,500	
Prepared By	Tonkin & Taylor Ltd	
Ref:	52020.0200	

EARTHQUAKE COMMISSION
CHRISTCHURCH CITY & KAIAPOI
Horizontal Movement Vectors and Crack Locations
(Pre September 2010 - Post December 2011)

FIGURE No. **Figure M7**

Rev. **0**



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A3 SCALE 1:7,500

0 0.1 0.2 0.3 0.4 0.5 (km)

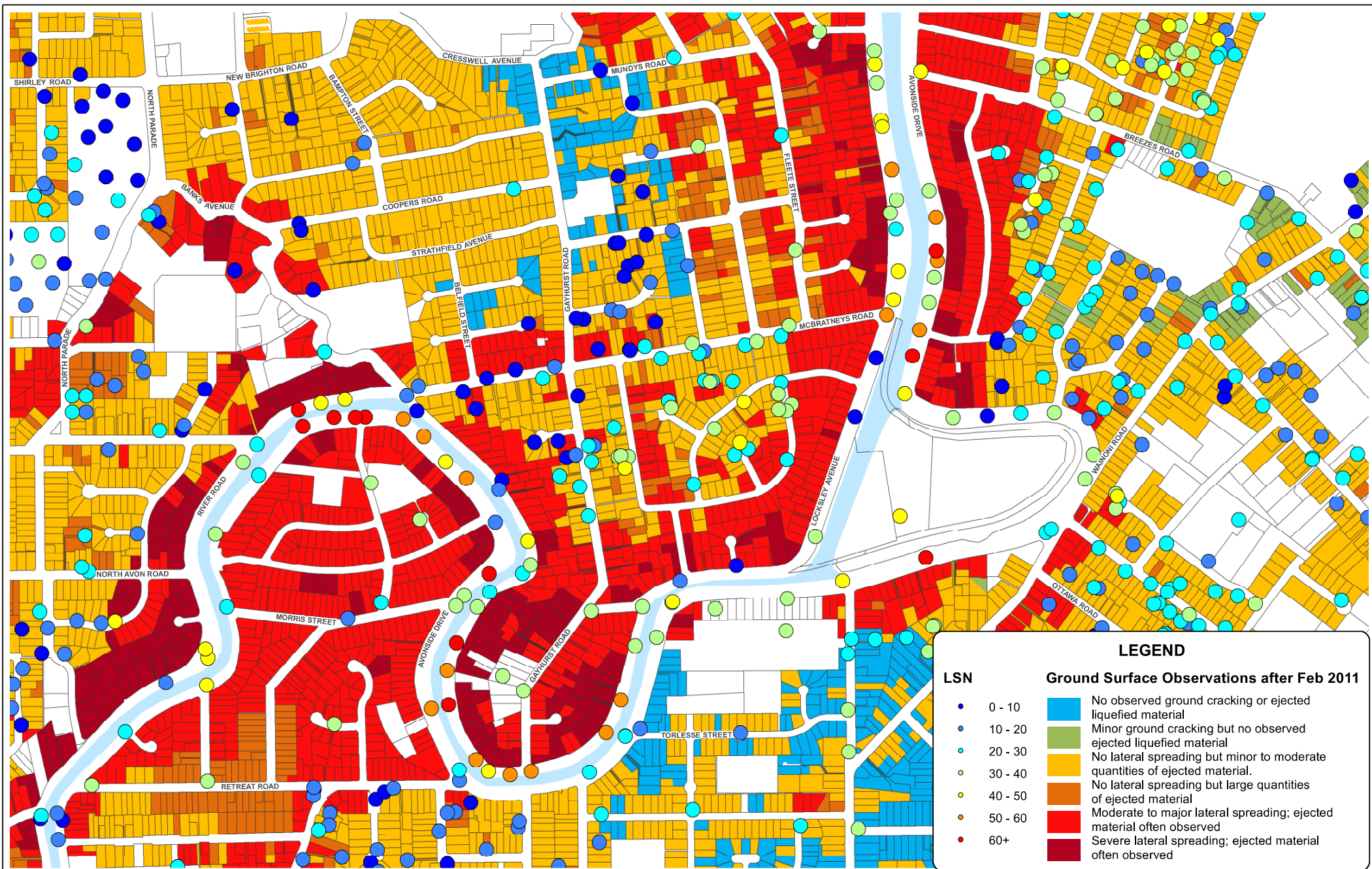


DRAWN	CXP	Feb.13
CHECKED		
APPROVED		
ARCFILE		
52020-0200-LSN223		
SCALE (AT A3 SIZE)		
1:7,500		
Prepared by Tonkin & Taylor Ltd.		
Ref: 52020-0200		

EARTHQUAKE COMMISSION
AVONSIDE, CHRISTCHURCH CITY
LSN, September 2010
(Using UoC PGA)

FIGURE No. **Figure M8**

Rev. **0**



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A3 SCALE 1:7,500

0 0.1 0.2 0.3 0.4 0.5 (km)

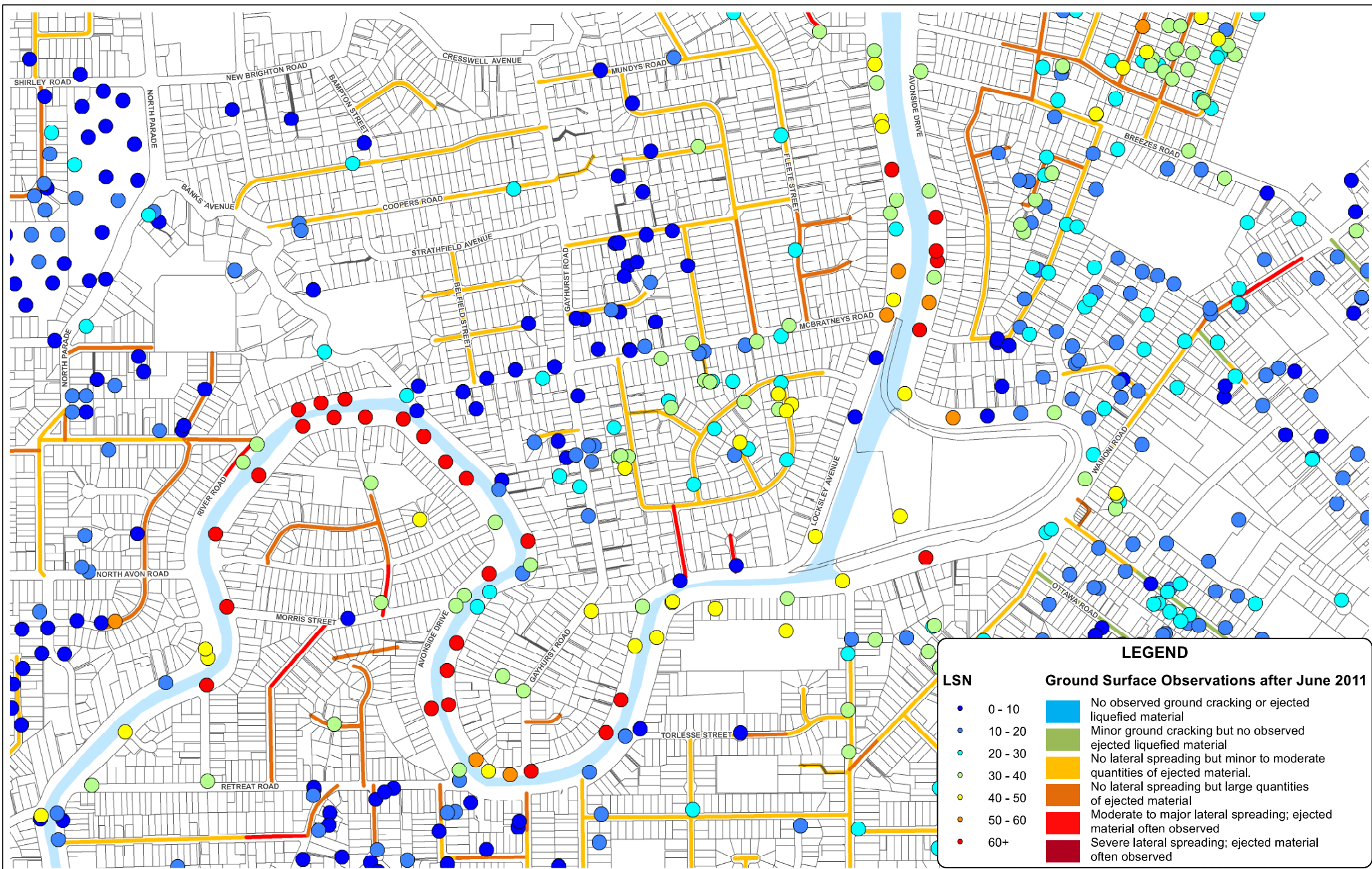


DRAWN	CXP	Feb.13
CHECKED		
APPROVED		
ARCFILE	52020-0200-LSN224	
SCALE (AT A3 SIZE)	1:7,500	
Prepared by	Tonkin & Taylor Ltd.	
Ref:	52020.0200	

EARTHQUAKE COMMISSION
AVONSIDE, CHRISTCHURCH CITY
LSN, February 2011
(Using UoC PGA)

FIGURE No. **Figure M9**

Rev. **0**



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A3 SCALE 1:7,500

0 0.1 0.2 0.3 0.4 0.5 (km)

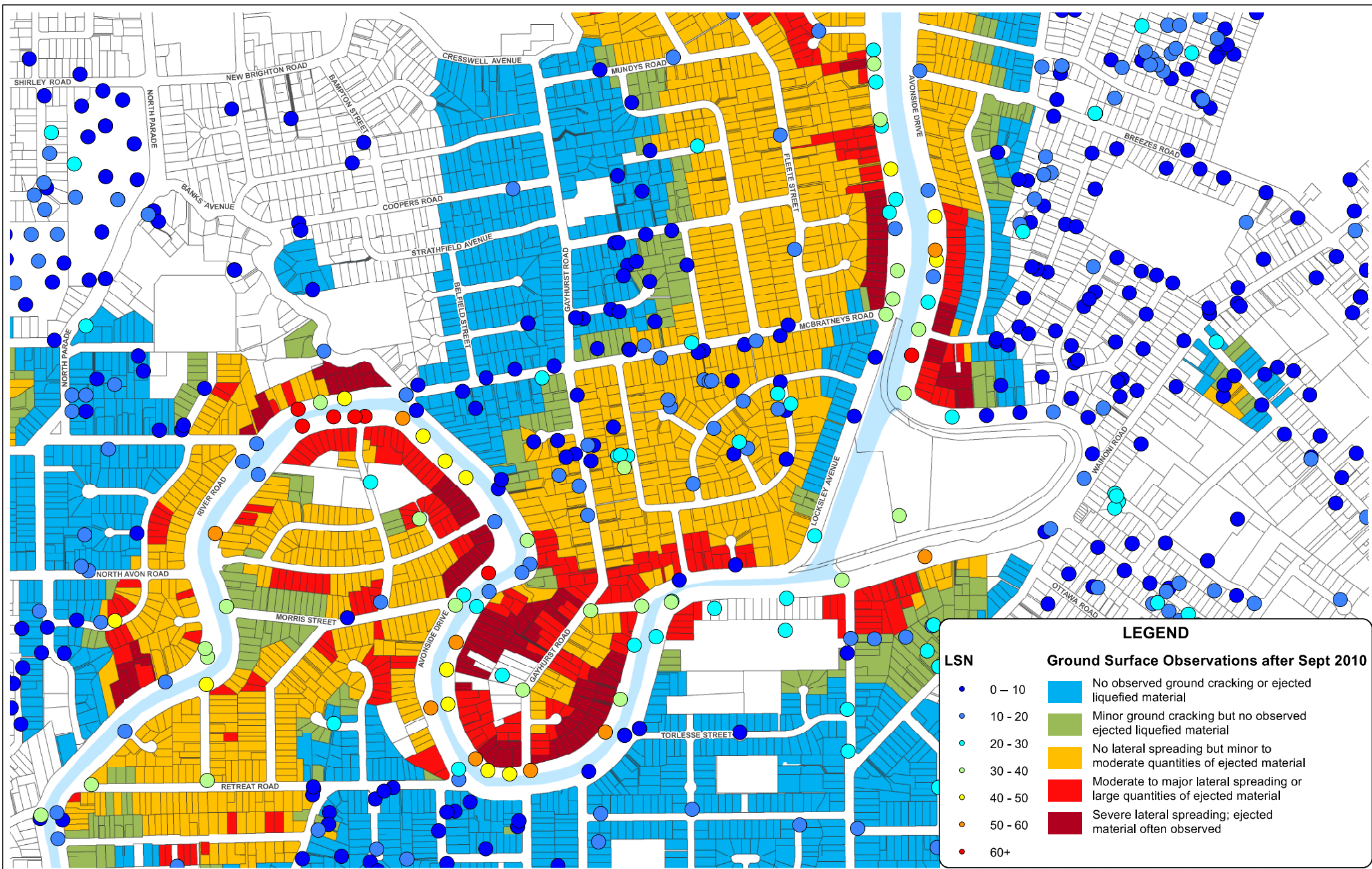


DRAWN	CXP	Feb.13
CHECKED		
APPROVED		
ARCFILE		
52020-0200-LSN225		
SCALE (AT A3 SIZE)		
1:7,500		
Prepared by Tonkin & Taylor Ltd.		
Ref: 52020-0200		

EARTHQUAKE COMMISSION
AVONSIDE, CHRISTCHURCH CITY
LSN, June 2011
(Using UoC PGA)

FIGURE No. Figure M10

Rev. 0



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A3 SCALE 1:7,500

0 0.1 0.2 0.3 0.4 0.5 (km)

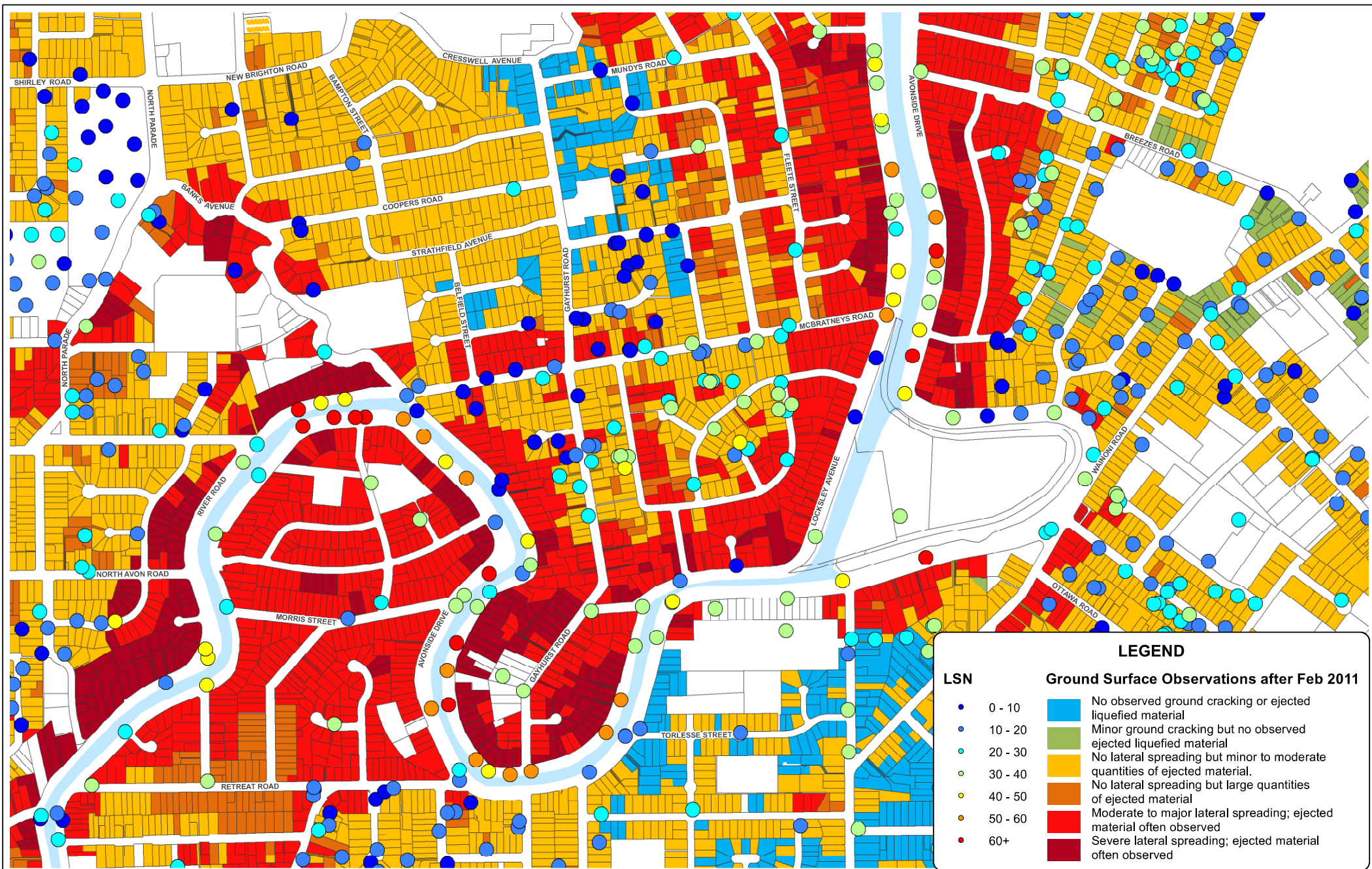


DRAWN	CXP	Feb.13
CHECKED		
APPROVED		
ARCFILE		
52020-0200-LSN226		
SCALE (AT A3 SIZE)		
1:7,500		
Prepared by Tonkin & Taylor Ltd.		
Ref: 52020-0200		

EARTHQUAKE COMMISSION
AVONSIDE, CHRISTCHURCH CITY
LSN, September 2010
(Using Cornell PGA)

FIGURE No. **Figure M11**

Rev. **0**



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A3 SCALE 1:7,500

0 0.1 0.2 0.3 0.4 0.5 (km)

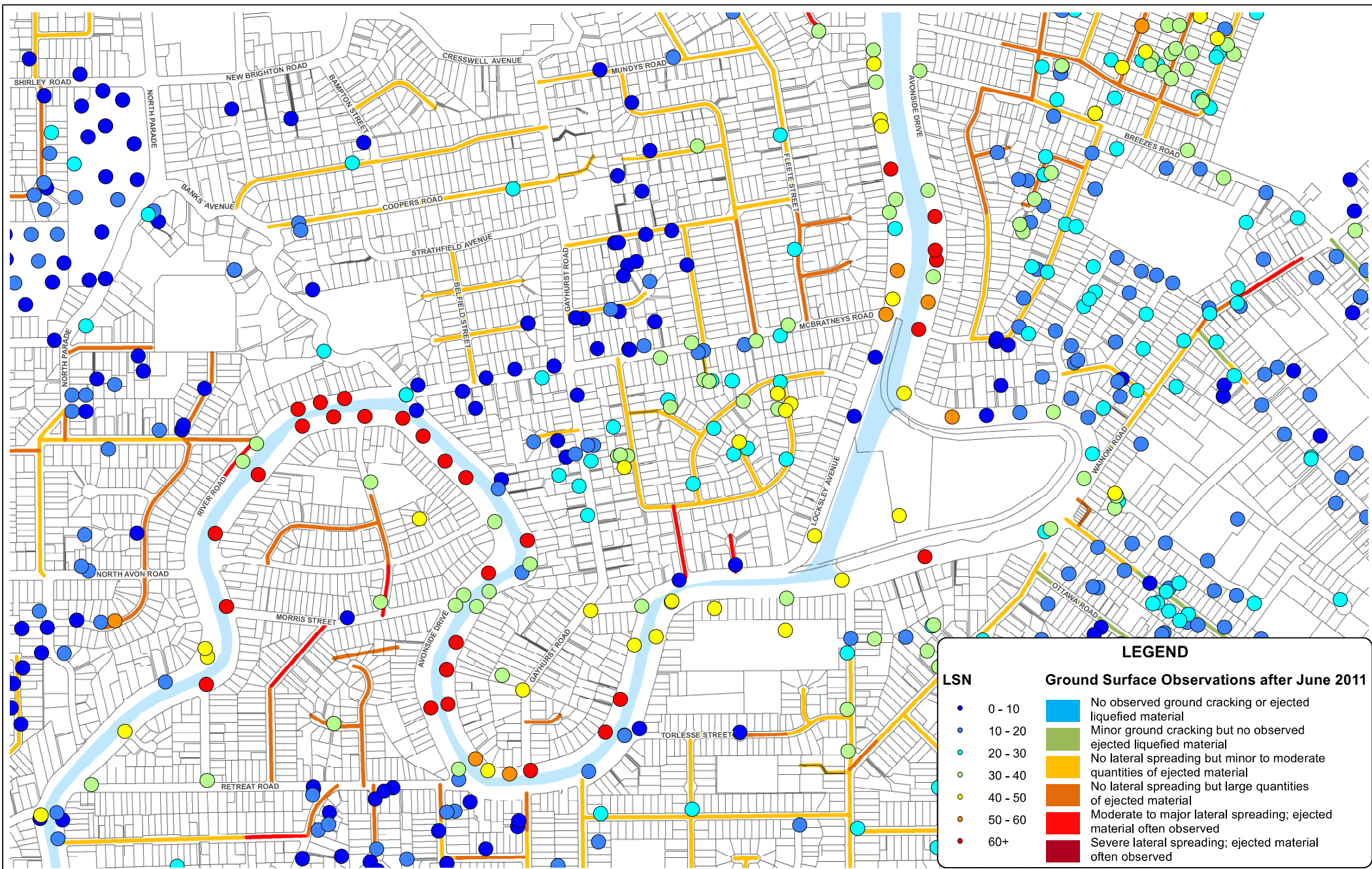


DRAWN	CXP	Feb.13
CHECKED		
APPROVED		
ARCFILE	52020-0200-LSN227	
SCALE (AT A3 SIZE)	1:7,500	
Prepared by	Tonkin & Taylor Ltd.	
Ref:	52020.0200	

EARTHQUAKE COMMISSION
AVONSIDE, CHRISTCHURCH CITY
LSN, February 2011
(Using Cornell PGA)

FIGURE No. **Figure M12**

Rev. **0**



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A3 SCALE 1:7,500

0 0.1 0.2 0.3 0.4 0.5 (km)



DRAWN	CXP	Feb.13
CHECKED		
APPROVED		
ARCFILE		
52020-0200-LSN228		
SCALE (AT A3 SIZE)		
1:7,500		
Prepared by Tonkin & Taylor Ltd.		
Ref: 52020-0200		

EARTHQUAKE COMMISSION
AVONSIDE, CHRISTCHURCH CITY
LSN, June 2011
(Using Cornell PGA)

FIGURE No. Figure M13

Rev. 0