

APPENDIX H. FLOOD MODIFICATION OPTIONS SUBJECT TO DETAILED ASSESSMENT

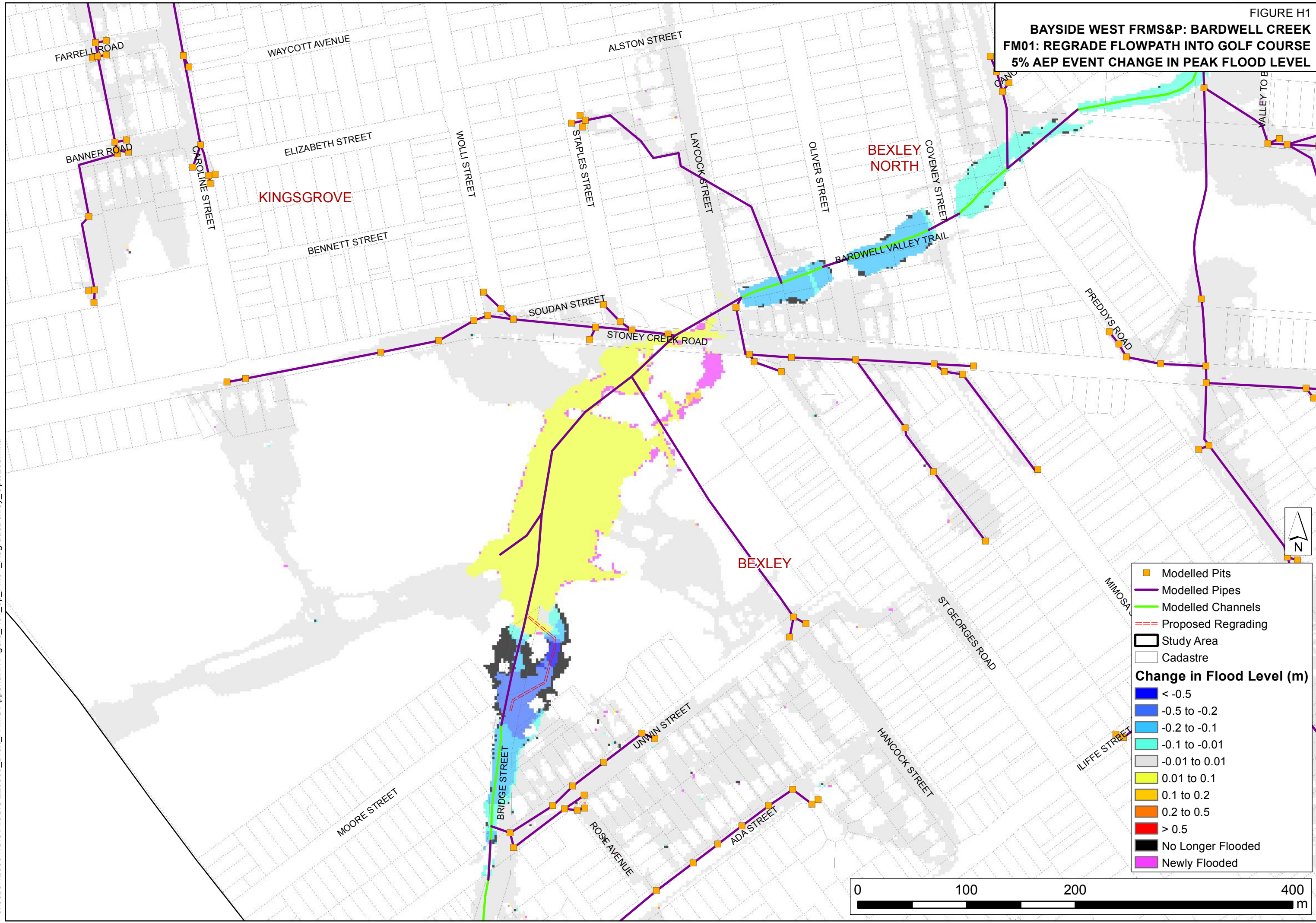
Figure H1: FM01 Regrade of Bexley Golf Course 5% AEP Flood Impact
Figure H2: FM01 Regrade of Bexley Golf Course 1% AEP Flood Impact
Figure H3: FM02 Dowsett Park Detention Basin 5% AEP Flood Impact
Figure H4: FM02 Dowsett Park Detention Basin 1% AEP Flood Impact
Figure H5: FM03 Kingsland Road South Overflow Management 5% AEP Flood Impact
Figure H6: FM03 Kingsland Road South Overflow Management 1% AEP Flood Impact
Figure H7: FM04 Powys Avenue Blockage Prevention 5% AEP Flood Impact
Figure H8: FM04 Powys Avenue Blockage Prevention 1% AEP Flood Impact
Figure H9: FM05 SWSOOS Flow Path 5% AEP Flood Impact
Figure H10: FM05 SWSOOS Flow Path 1% AEP Flood Impact
Figure H11: FM06 Bexley Road Upgrade 5% AEP Flood Impact
Figure H12: FM06 Bexley Road Upgrade 1% AEP Flood Impact
Figure H13: FM07 Bardwell Park Station Levee 5% AEP Flood Impact
Figure H14: FM07 Bardwell Park Station Levee 1% AEP Flood Impact
Figure H15: FM08 Guess Avenue Storage Tank 5% AEP Flood Impact
Figure H16: FM08 Guess Avenue Storage Tank 1% AEP Flood Impact
Figure H17: FM09 Queen Victoria Street Drainage Diversion 5% AEP Flood Impact
Figure H18: FM09 Queen Victoria Street Drainage Diversion 1% AEP Flood Impact
Figure H19: FM10 Seaforth Park Detention Basin 5% AEP Flood Impact
Figure H20: FM10 Seaforth Park Detention Basin 1% AEP Flood Impact
Figure H21: FM11 Subway Road Drainage Upgrade 5% AEP Flood Impact
Figure H22: FM11 Subway Road Drainage Upgrade 1% AEP Flood Impact
Figure H23: FM12 Mutch Avenue Drainage Line 5% AEP Flood Impact
Figure H24: FM12 Mutch Avenue Drainage Line 1% AEP Flood Impact
Figure H25: FM13 Alice Street Drainage Line 5% AEP Flood Impact
Figure H26: FM13 Alice Street Drainage Line 1% AEP Flood Impact
Figure H27: FM16 Duplicate Stormwater Network: Bardwell Creek 5% AEP Flood Impact
Figure H28: FM16 Duplicate Stormwater Network: Bardwell Creek 1% AEP Flood Impact
Figure H29: FM16 Duplicate Stormwater Network: Bonnie Doon 5% AEP Flood Impact
Figure H30: FM16 Duplicate Stormwater Network: Bonnie Doon 1% AEP Flood Impact
Figure H31: FM16 Duplicate Stormwater Network: Muddy Creek 5% AEP Flood Impact
Figure H32: FM16 Duplicate Stormwater Network: Muddy Creek 1% AEP Flood Impact
Figure H33: FM16 Duplicate Stormwater Network: Sans Souci 5% AEP Flood Impact
Figure H34: FM16 Duplicate Stormwater Network: Sans Souci 1% AEP Flood Impact
Figure H35: FM18 Filling of Low-Lying Land: Sans Souci 1% AEP Flood Impact
Figure H36: FM18 Filling of Low-Lying Land: Sans Souci 1% AEP Flood + 0.9m Sea Level Rise Impact



Appendix H

**BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM01: REGRADE FLOWPATH INTO GOLF COURSE
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

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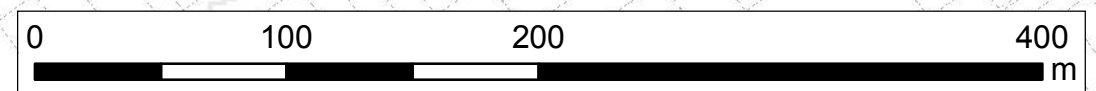


Legend:

- Modelled Pits
- Modelled Pipes
- Modelled Channels
- Proposed Regrading
- Study Area
- Cadastre

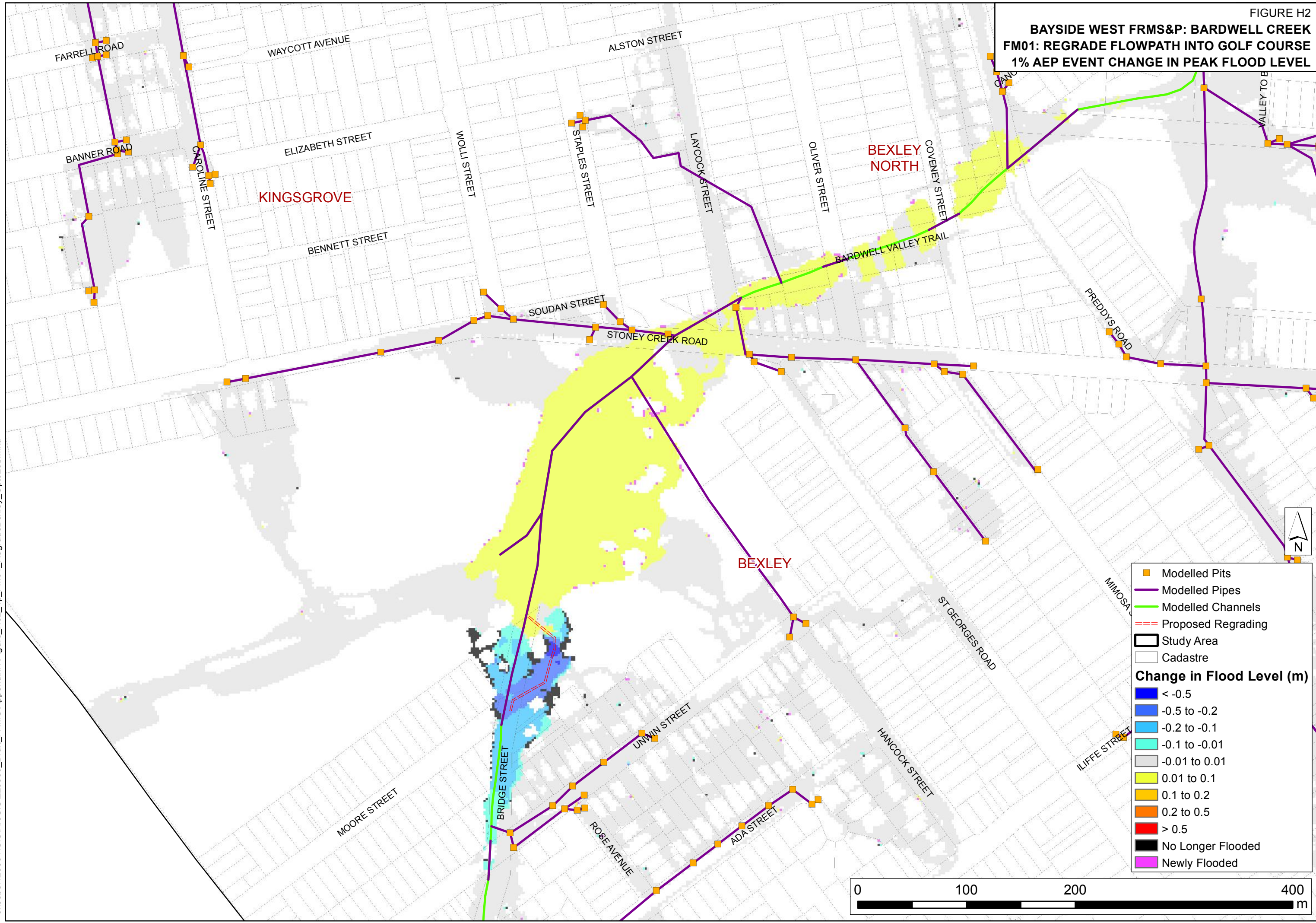
Change in Flood Level (m)

- < -0.5
- 0.5 to -0.2
- 0.2 to -0.1
- 0.1 to -0.01
- 0.01 to 0.01
- 0.01 to 0.1
- 0.1 to 0.2
- 0.2 to 0.5
- > 0.5
- No Longer Flooded
- Newly Flooded



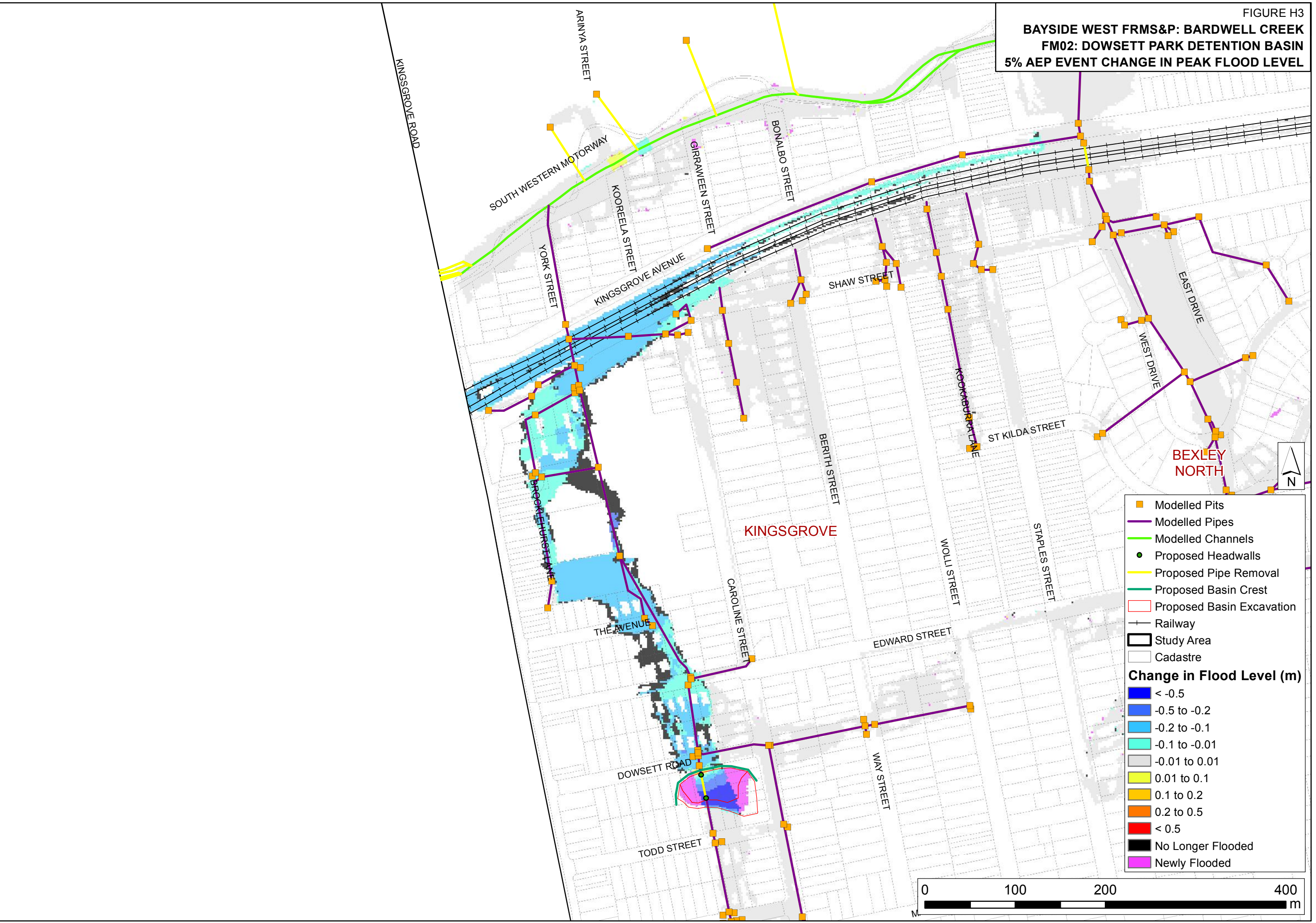
**BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM01: REGRADE FLOWPATH INTO GOLF COURSE
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

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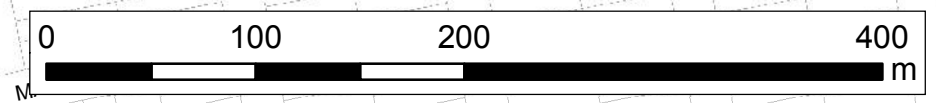


**BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM02: DOWSETT PARK DETENTION BASIN
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

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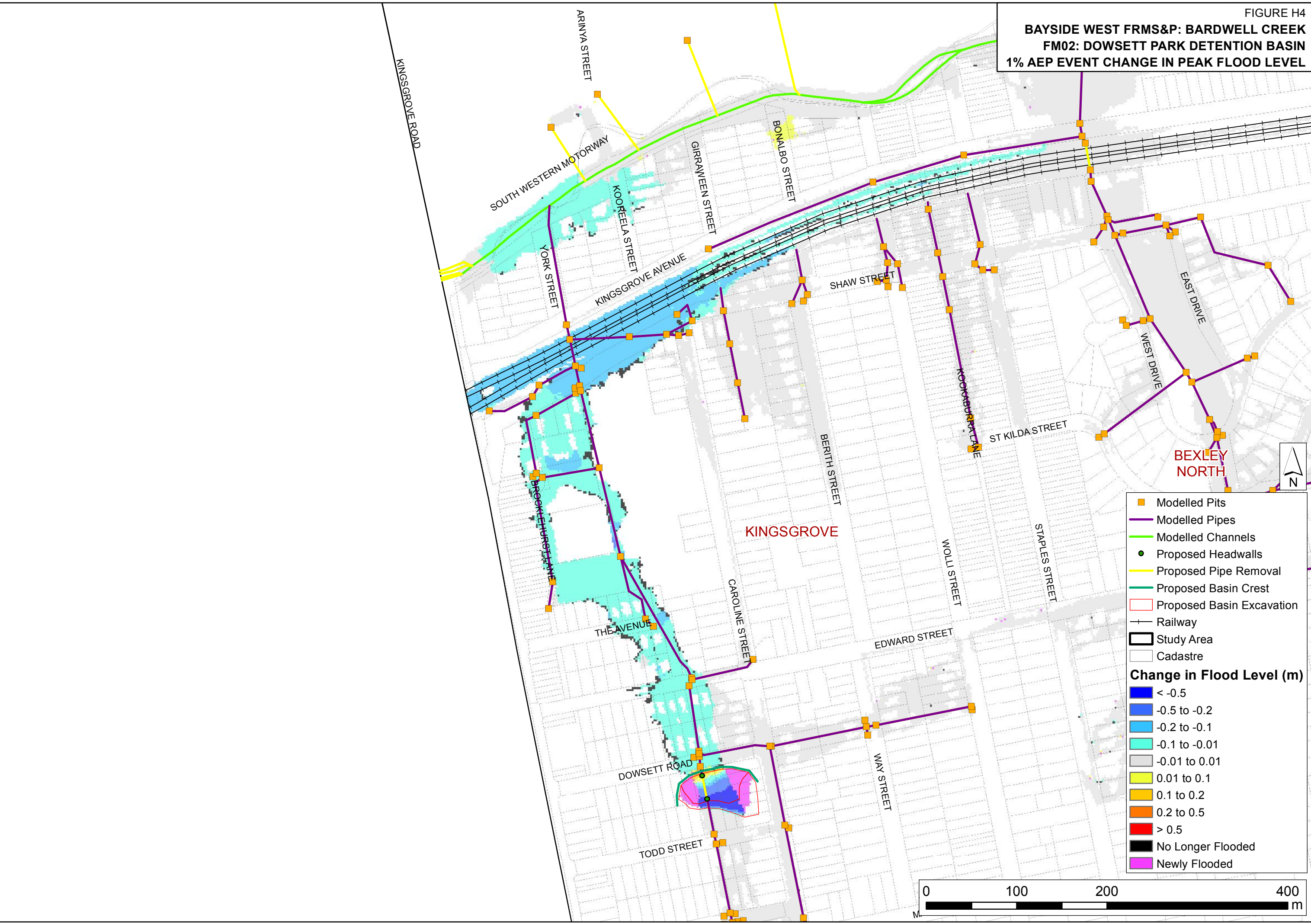


- Modelled Pits
 - Modelled Pipes
 - Modelled Channels
 - Proposed Headwalls
 - Proposed Pipe Removal
 - Proposed Basin Crest
 - ▭ Proposed Basin Excavation
 - + Railway
 - ▭ Study Area
 - ▭ Cadastre
- Change in Flood Level (m)**
- < -0.5
 - -0.5 to -0.2
 - -0.2 to -0.1
 - -0.1 to -0.01
 - -0.01 to 0.01
 - 0.01 to 0.1
 - 0.1 to 0.2
 - 0.2 to 0.5
 - < 0.5
 - No Longer Flooded
 - Newly Flooded

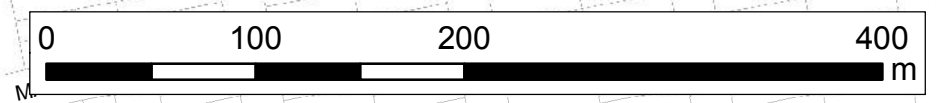


**BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM02: DOWSETT PARK DETENTION BASIN
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

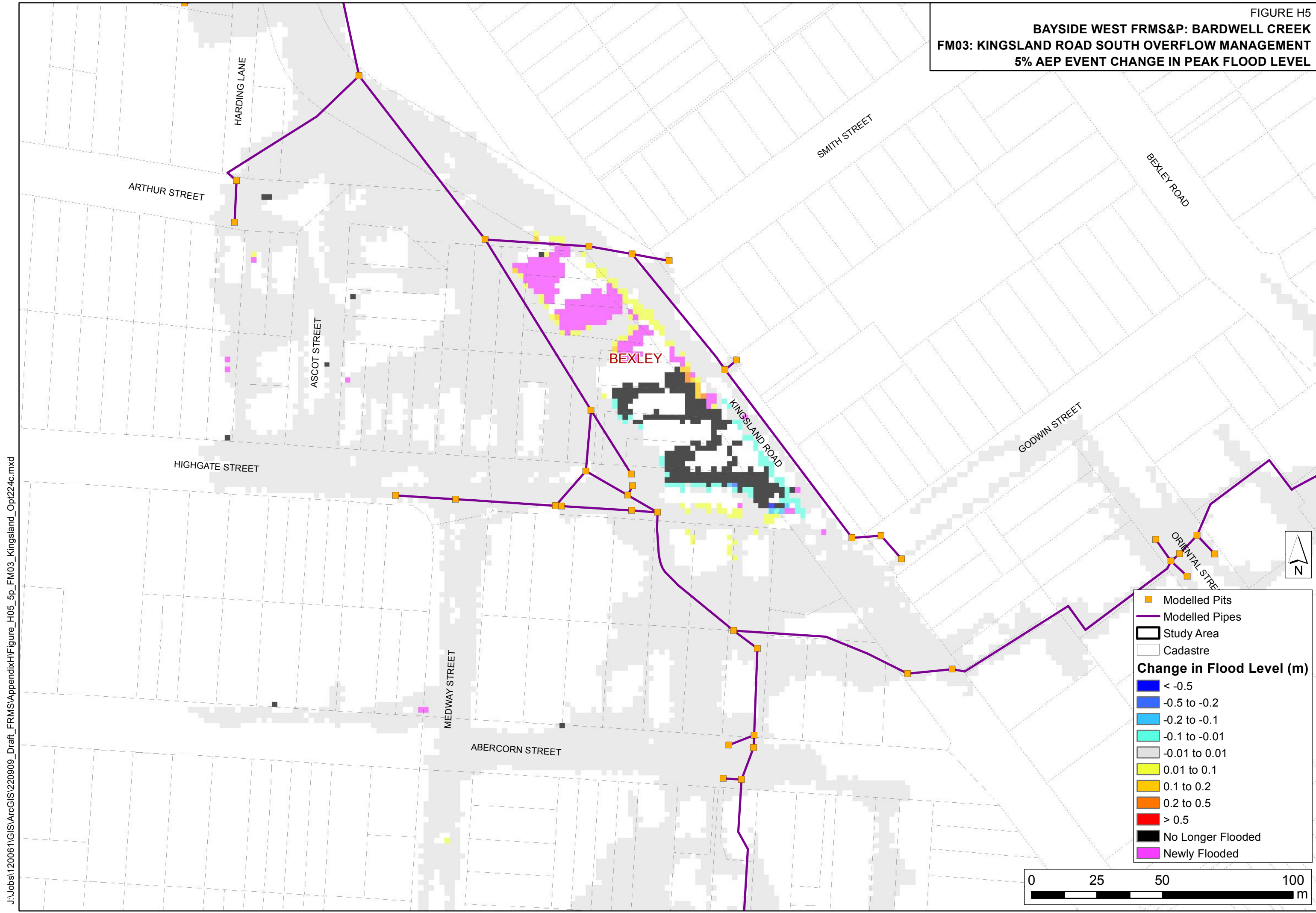
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- Modelled Pits
 - Modelled Pipes
 - Modelled Channels
 - Proposed Headwalls
 - Proposed Pipe Removal
 - Proposed Basin Crest
 - Proposed Basin Excavation
 - Railway
 - Study Area
 - Cadastre
- Change in Flood Level (m)**
- < -0.5
 - -0.5 to -0.2
 - -0.2 to -0.1
 - -0.1 to -0.01
 - -0.01 to 0.01
 - 0.01 to 0.1
 - 0.1 to 0.2
 - 0.2 to 0.5
 - > 0.5
 - No Longer Flooded
 - Newly Flooded

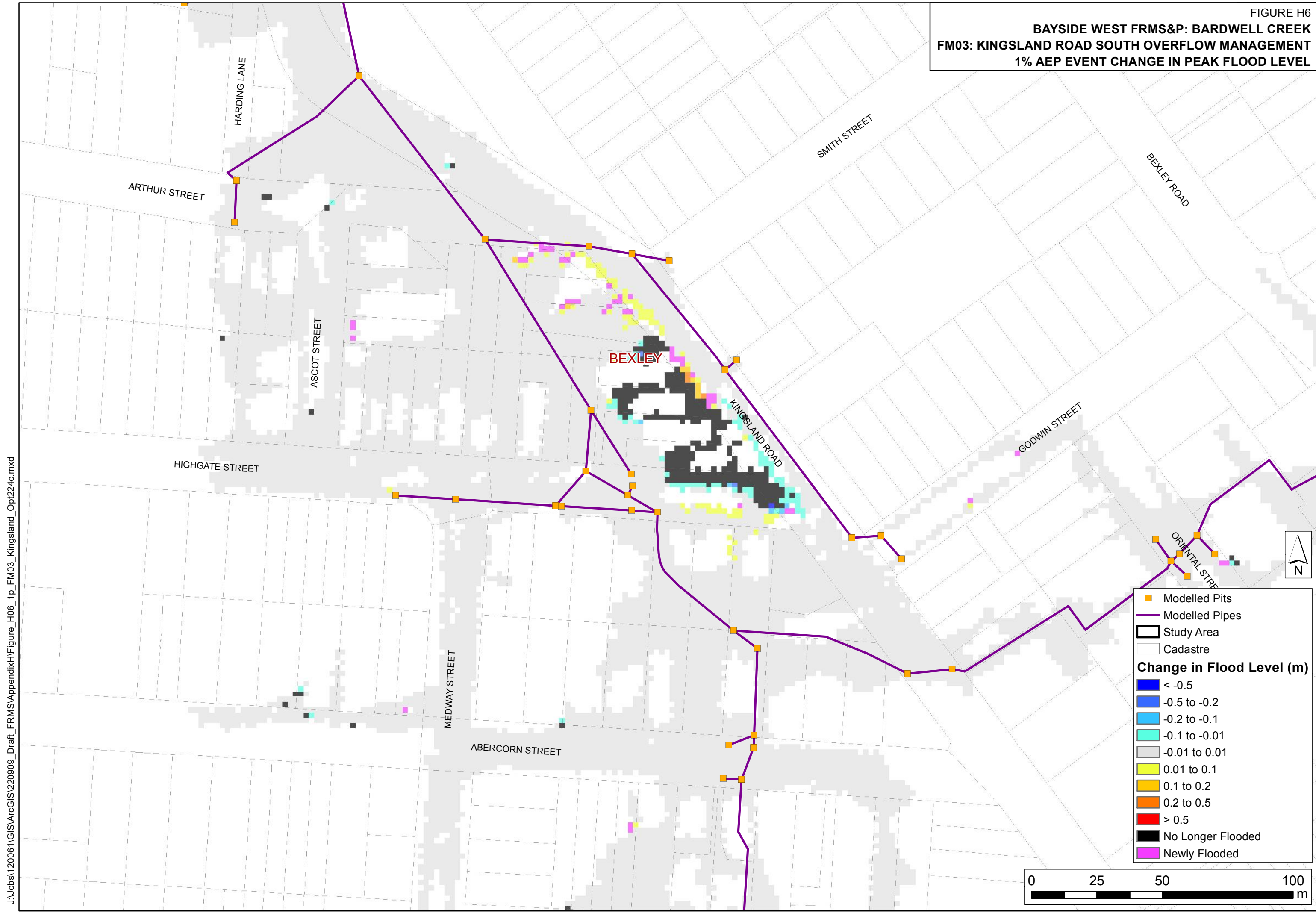


**BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM03: KINGSLAND ROAD SOUTH OVERFLOW MANAGEMENT
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**



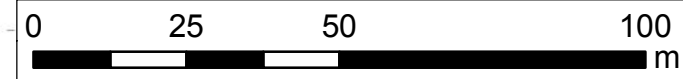
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BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM03: KINGSLAND ROAD SOUTH OVERFLOW MANAGEMENT
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL



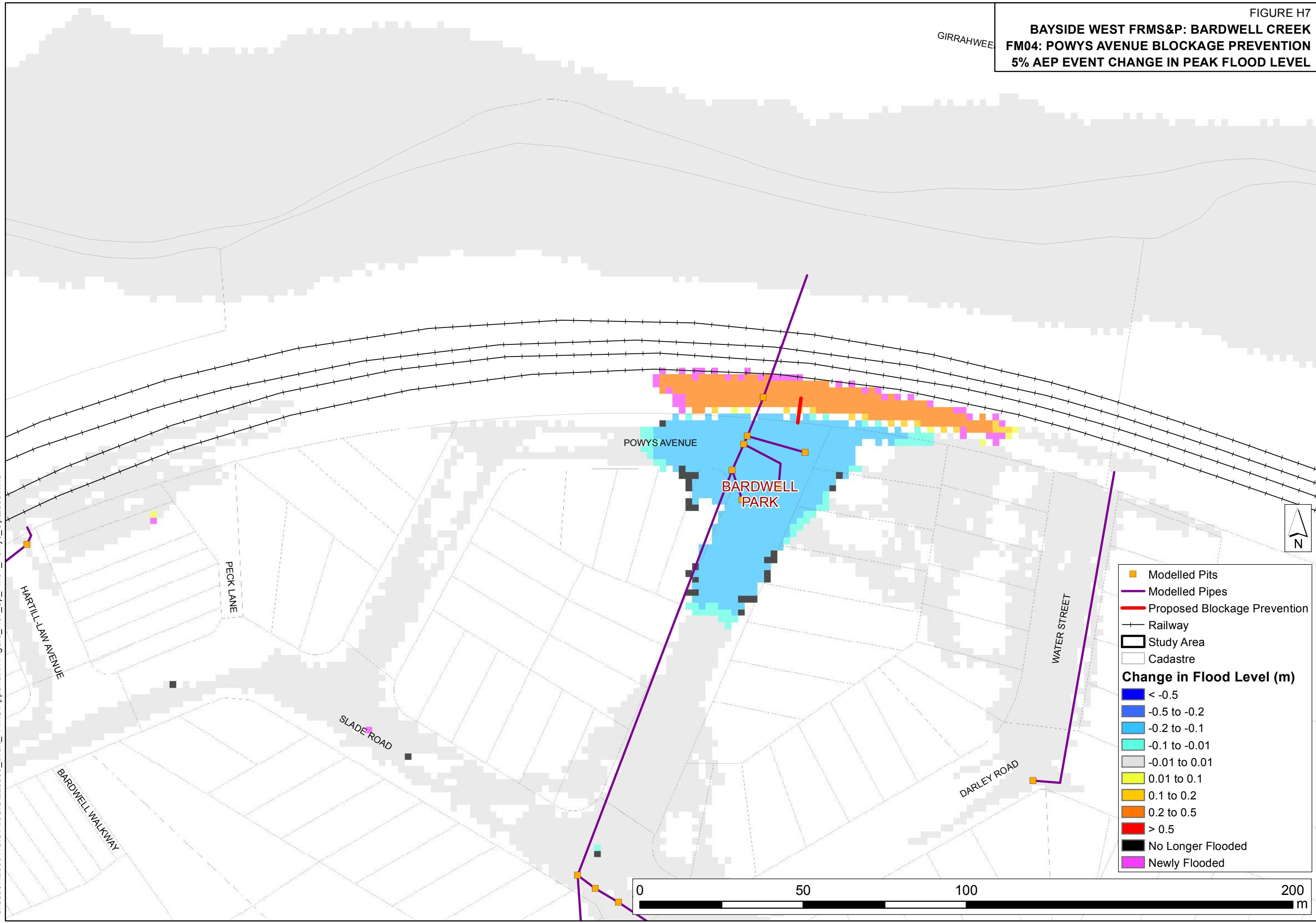
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- Modelled Pits
- Modelled Pipes
- Study Area
- Cadastr
- Change in Flood Level (m)**
- < -0.5
- 0.5 to -0.2
- 0.2 to -0.1
- 0.1 to -0.01
- 0.01 to 0.01
- 0.01 to 0.1
- 0.1 to 0.2
- 0.2 to 0.5
- > 0.5
- No Longer Flooded
- Newly Flooded



**BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM04: POWYS AVENUE BLOCKAGE PREVENTION
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

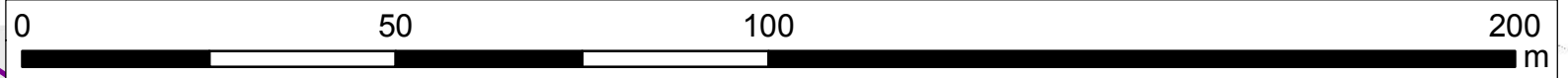
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- Modelled Pits
- Modelled Pipes
- Proposed Blockage Prevention
- + + + Railway
- Study Area
- Cadastre

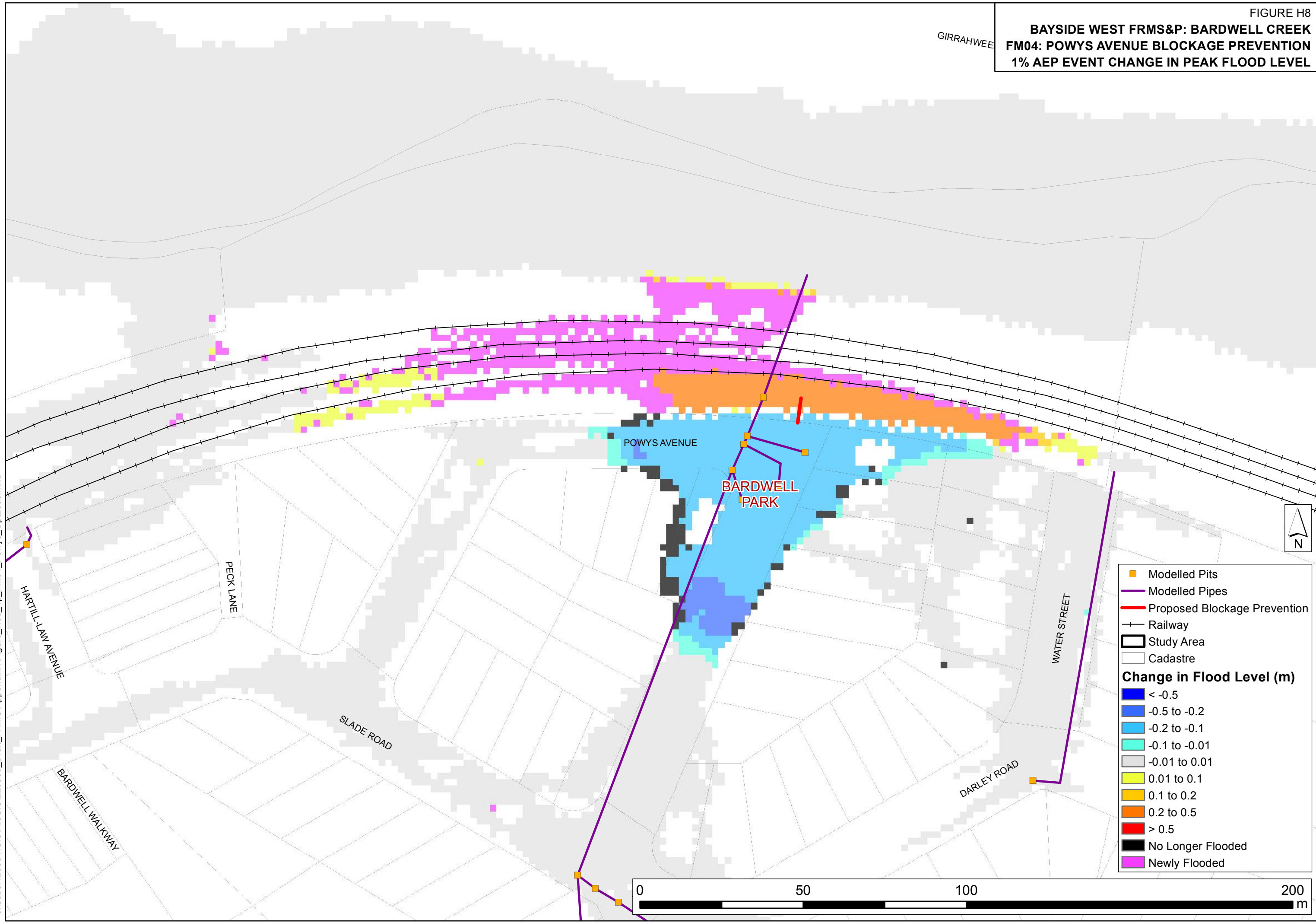
Change in Flood Level (m)

- < -0.5
- -0.5 to -0.2
- -0.2 to -0.1
- -0.1 to -0.01
- -0.01 to 0.01
- 0.01 to 0.1
- 0.1 to 0.2
- 0.2 to 0.5
- > 0.5
- No Longer Flooded
- Newly Flooded

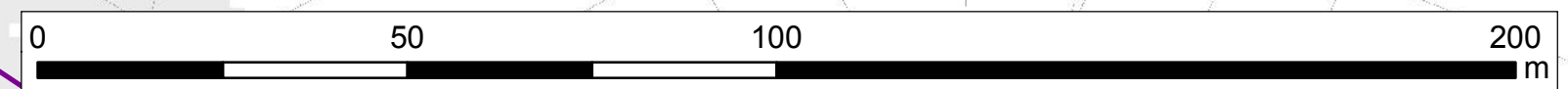


**BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM04: POWYS AVENUE BLOCKAGE PREVENTION
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

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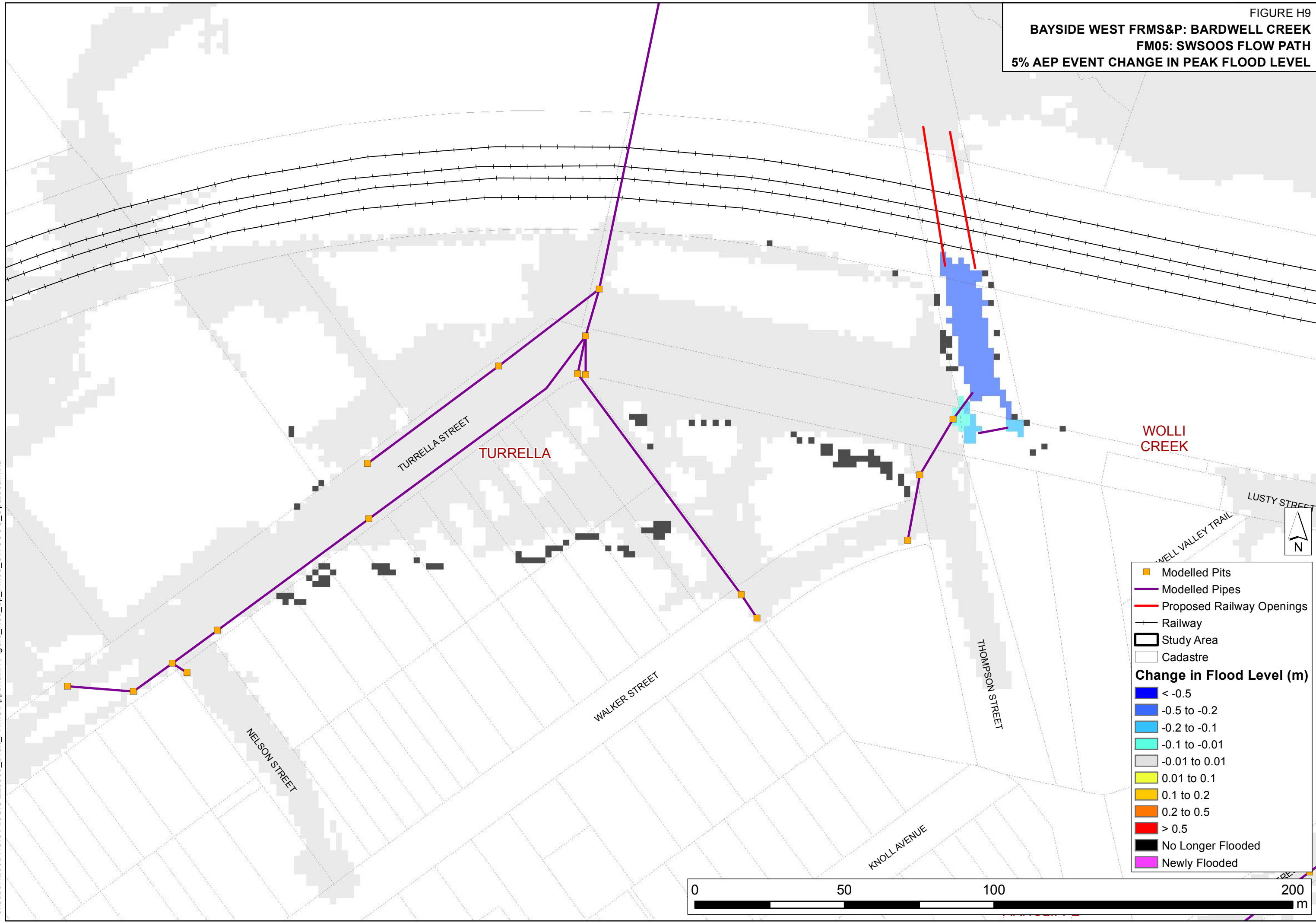


- Modelled Pits
 - Modelled Pipes
 - Proposed Blockage Prevention
 - +— Railway
 - Study Area
 - Cadastre
- Change in Flood Level (m)**
- < -0.5
 - -0.5 to -0.2
 - -0.2 to -0.1
 - -0.1 to -0.01
 - -0.01 to 0.01
 - 0.01 to 0.1
 - 0.1 to 0.2
 - 0.2 to 0.5
 - > 0.5
 - No Longer Flooded
 - Newly Flooded



BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM05: SWSOOS FLOW PATH
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL

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WOLLI CREEK

TURRELLA STREET

TURRELLA

WALKER STREET

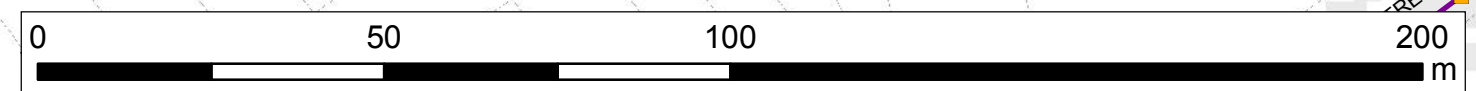
KNOLL AVENUE

THOMPSON STREET

NELSON STREET

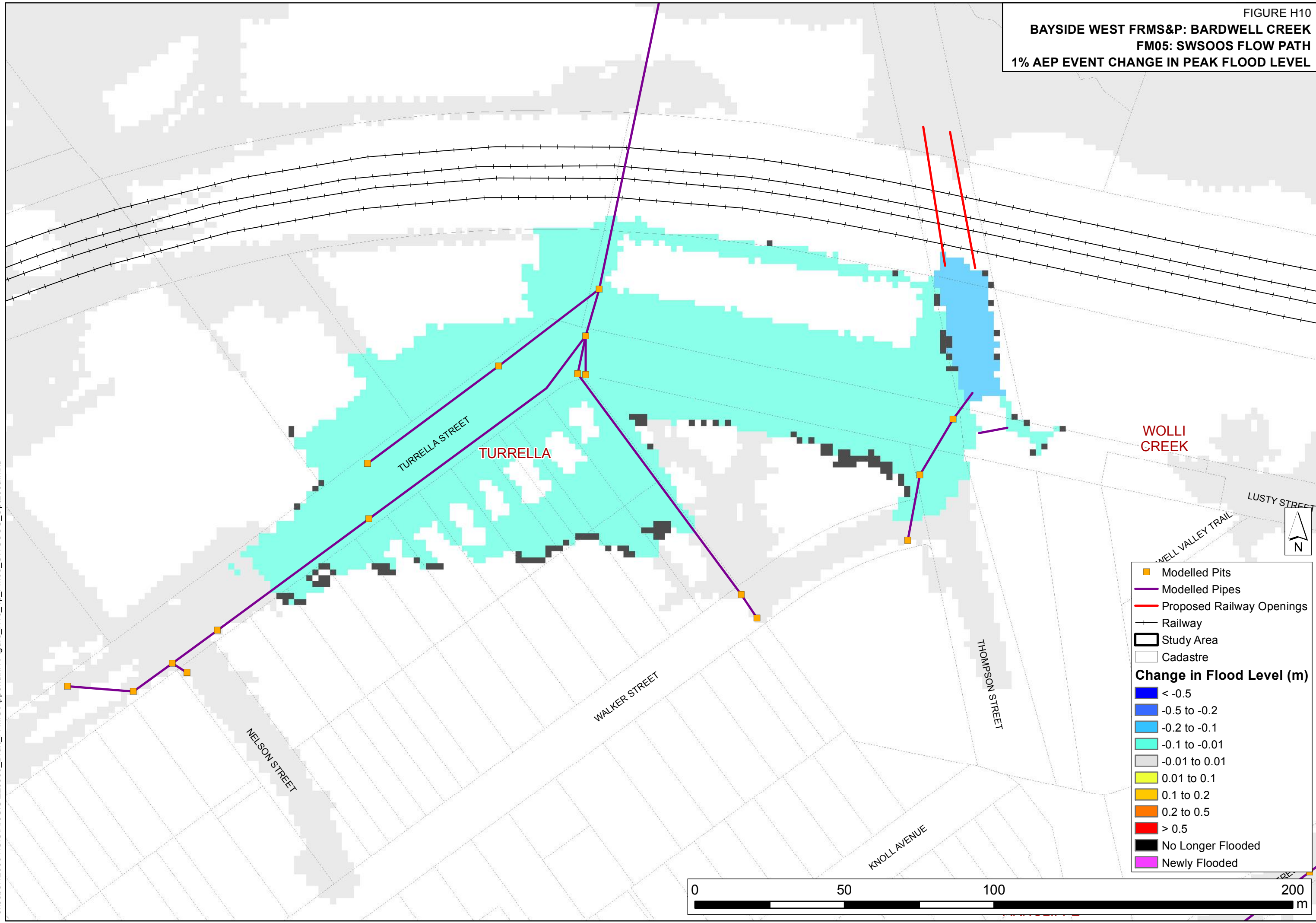
WELL VALLEY TRAIL

LUSTY STREET

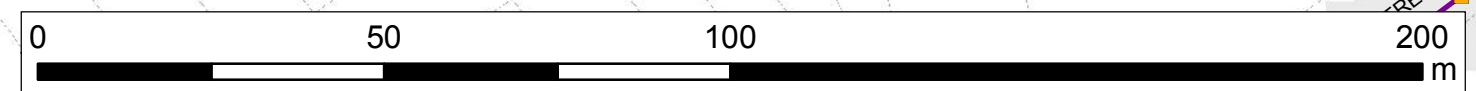


BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM05: SWSOOS FLOW PATH
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL

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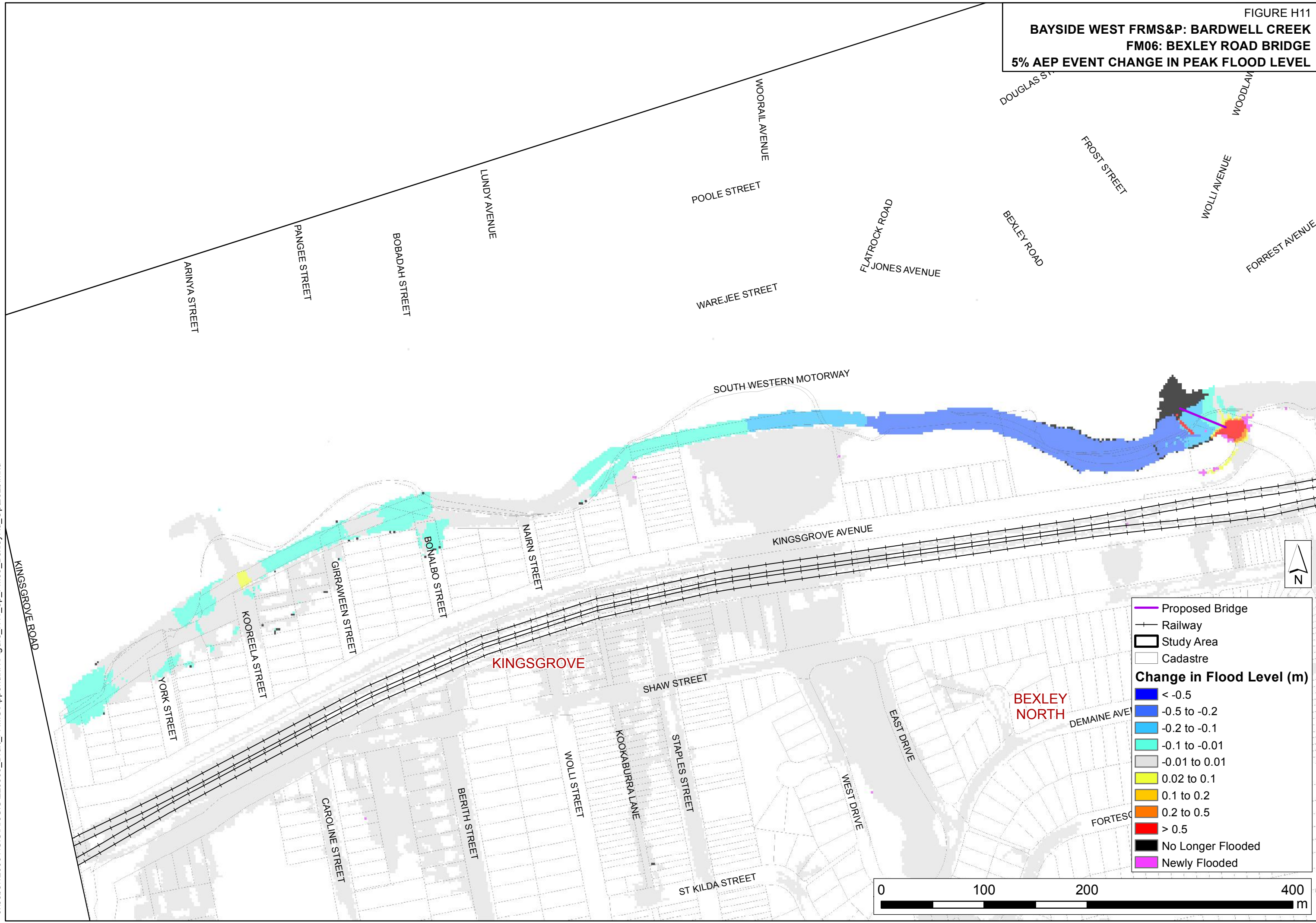


- Modelled Pits
 - Modelled Pipes
 - Proposed Railway Openings
 - Railway
 - Study Area
 - Cadastre
- Change in Flood Level (m)**
- < -0.5
 - 0.5 to -0.2
 - 0.2 to -0.1
 - 0.1 to -0.01
 - 0.01 to 0.01
 - 0.01 to 0.1
 - 0.1 to 0.2
 - 0.2 to 0.5
 - > 0.5
 - No Longer Flooded
 - Newly Flooded



**BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM06: BEXLEY ROAD BRIDGE
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

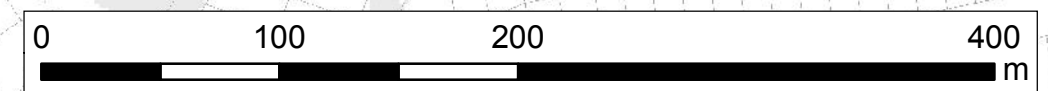
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— Proposed Bridge
 + Railway
 □ Study Area
 □ Cadastre

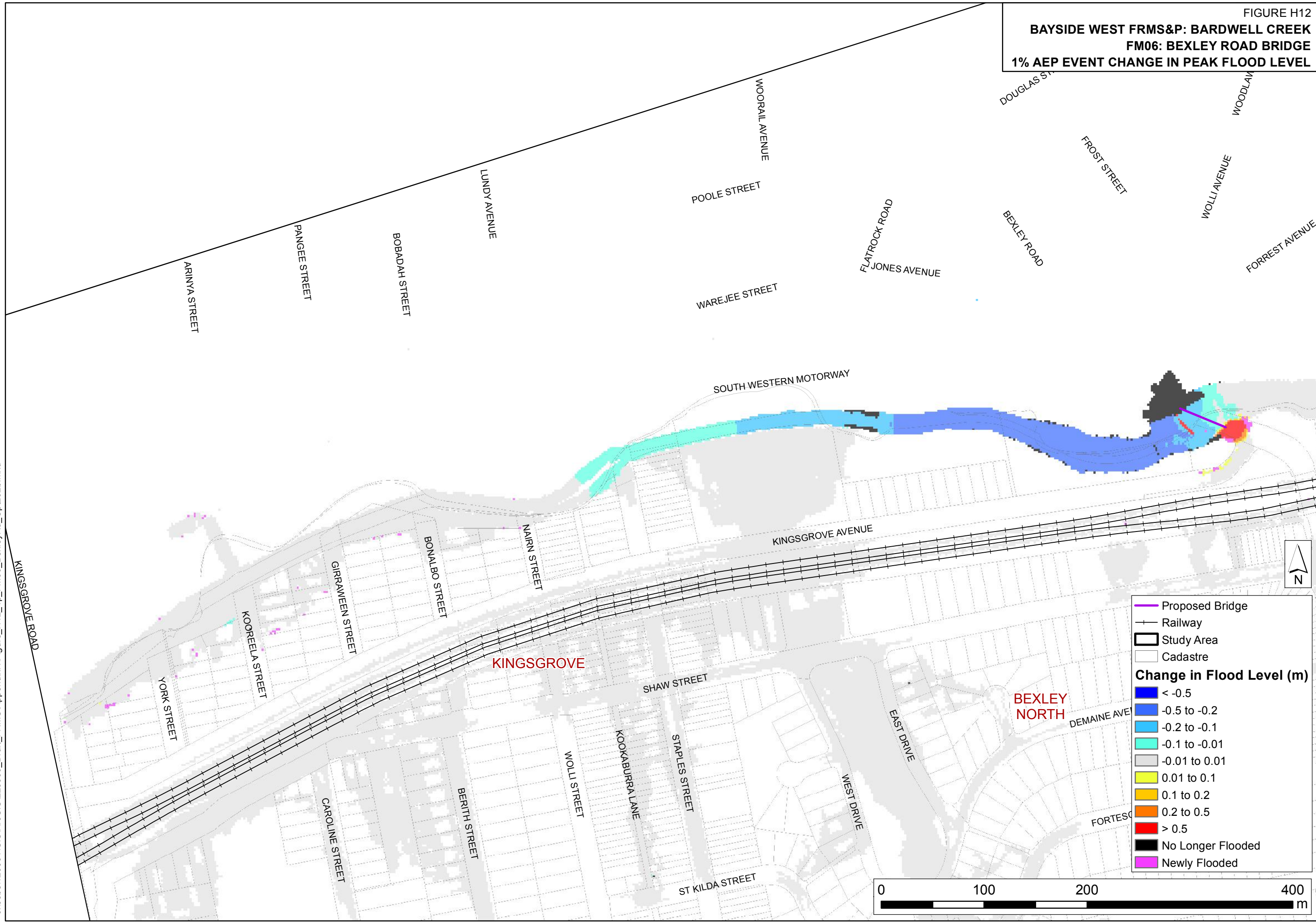
Change in Flood Level (m)

- < -0.5
- -0.5 to -0.2
- -0.2 to -0.1
- -0.1 to -0.01
- -0.01 to 0.01
- 0.02 to 0.1
- 0.1 to 0.2
- 0.2 to 0.5
- > 0.5
- No Longer Flooded
- Newly Flooded



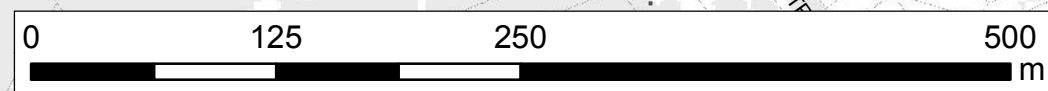
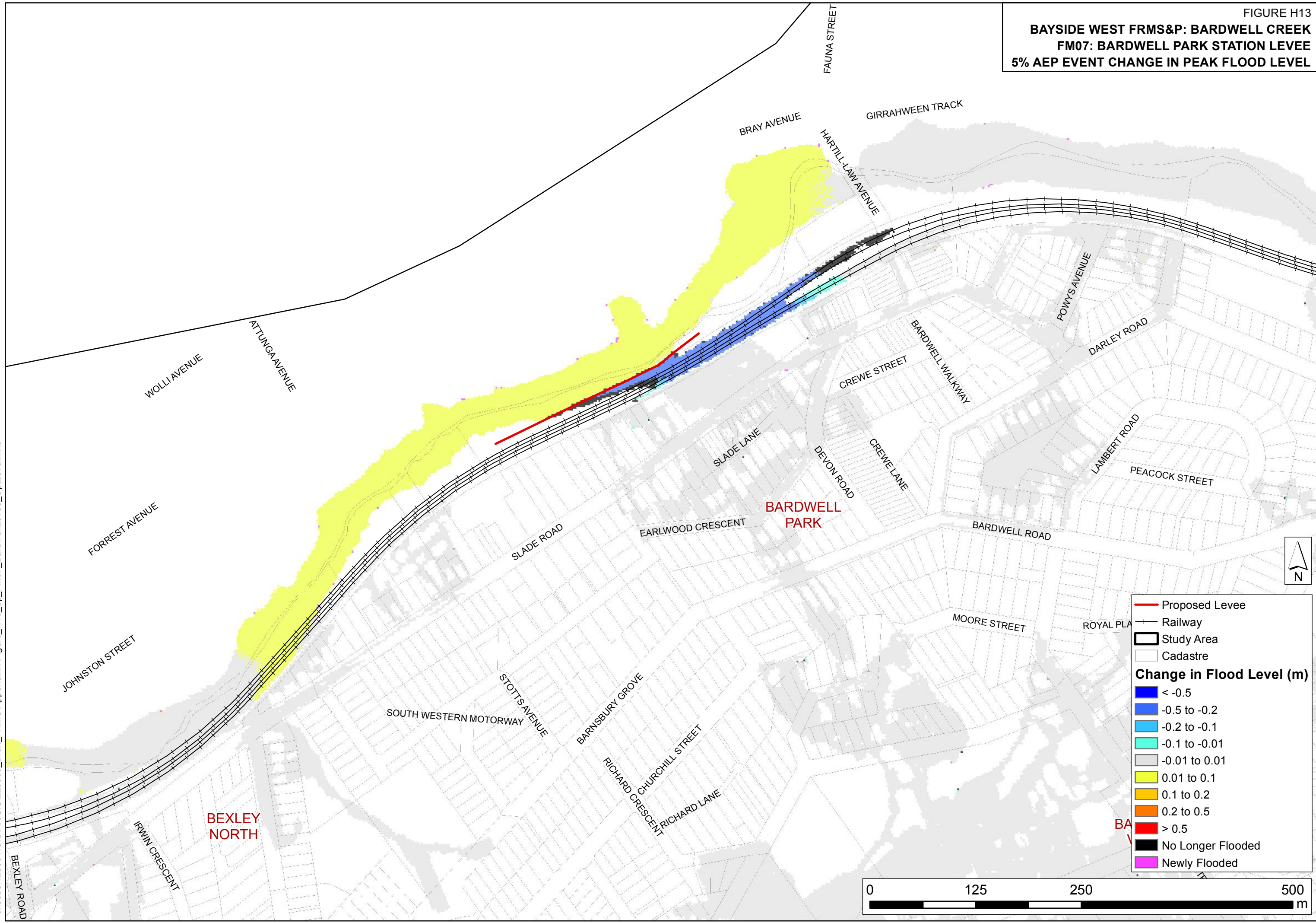
**BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM06: BEXLEY ROAD BRIDGE
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

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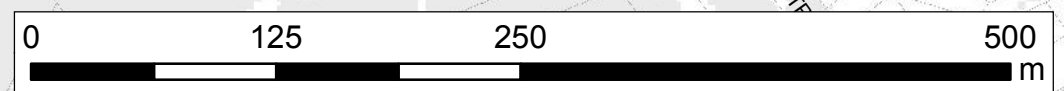
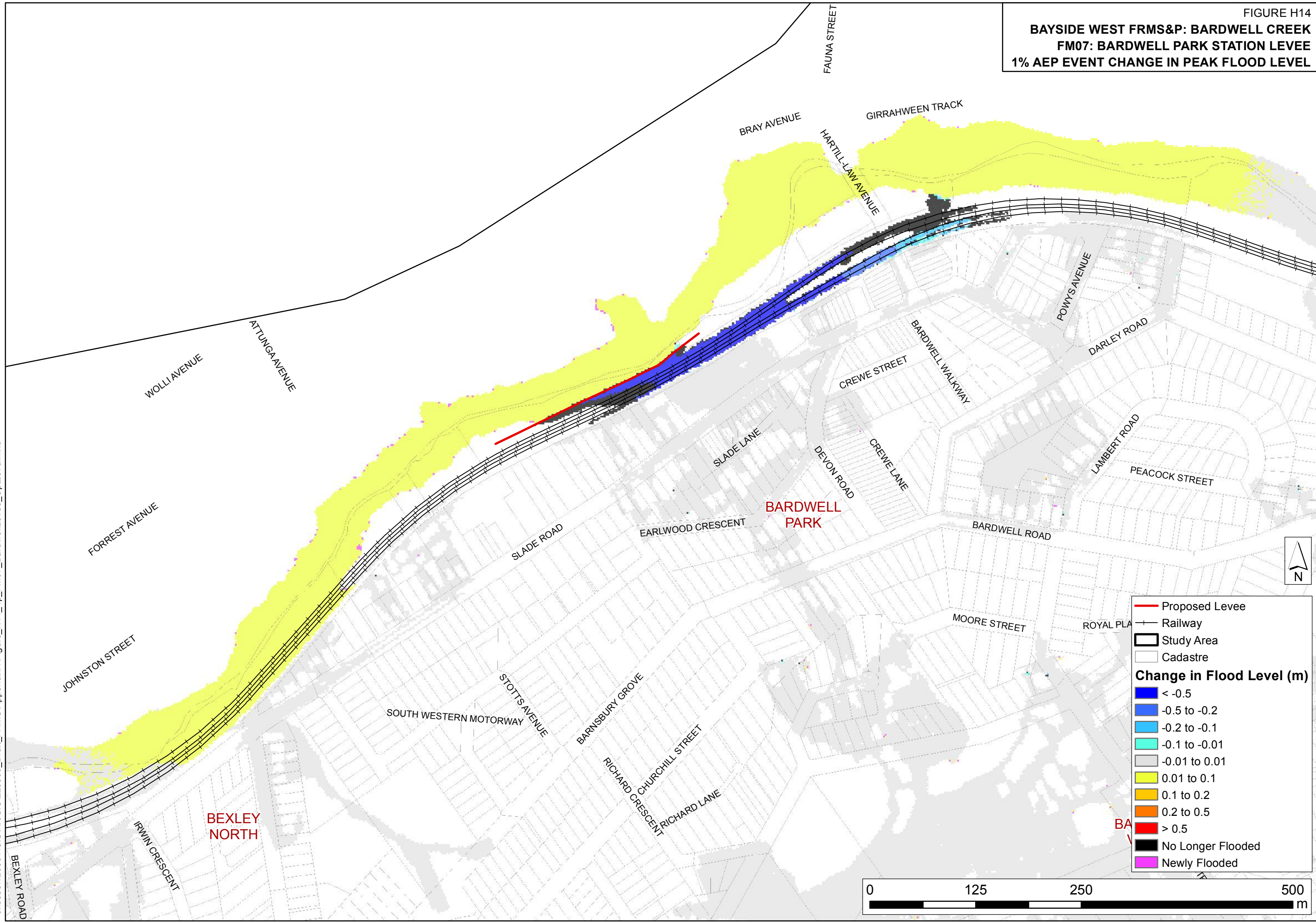
**BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM07: BARDWELL PARK STATION LEVEL
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

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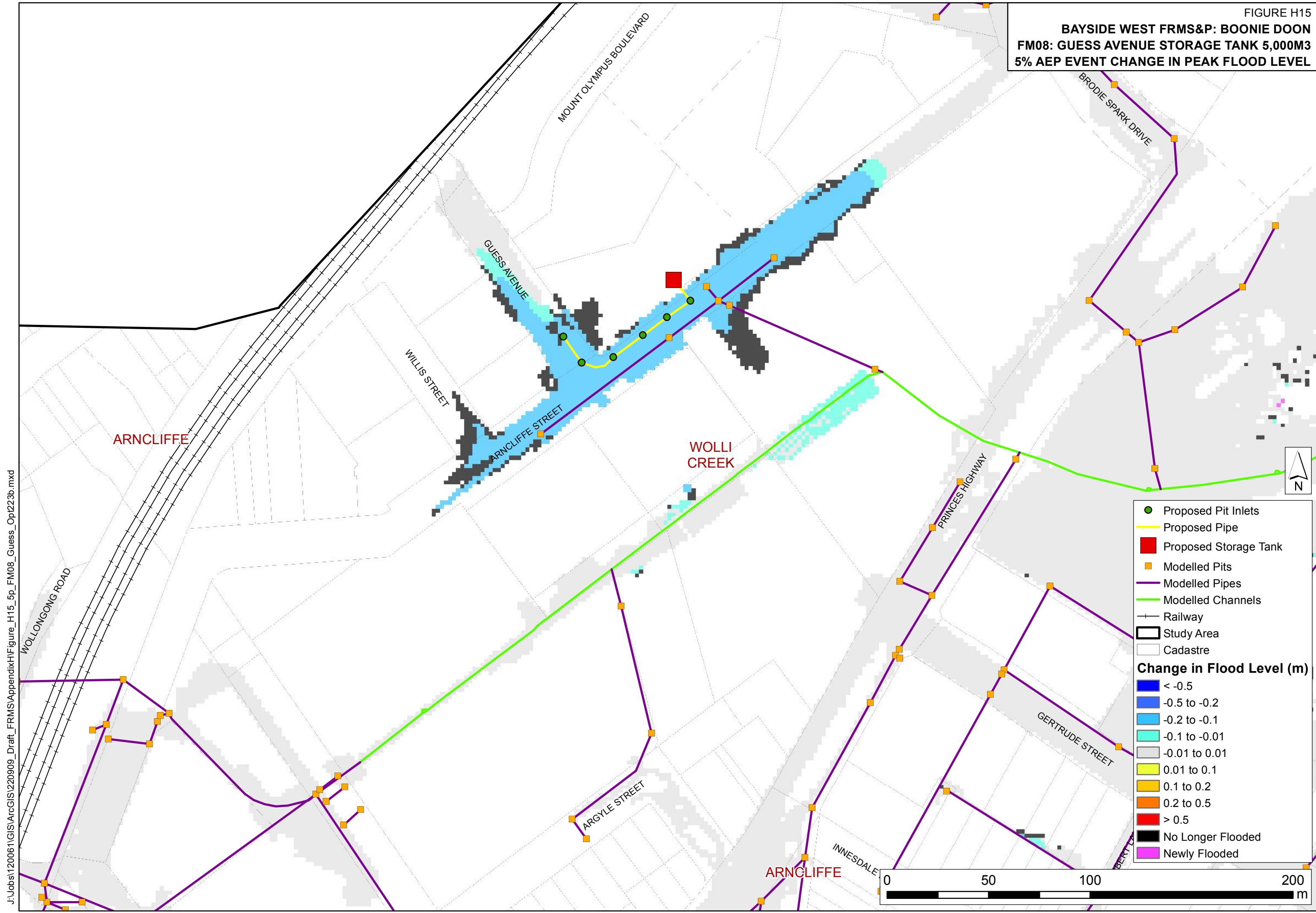


**BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM07: BARDWELL PARK STATION LEVEL
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

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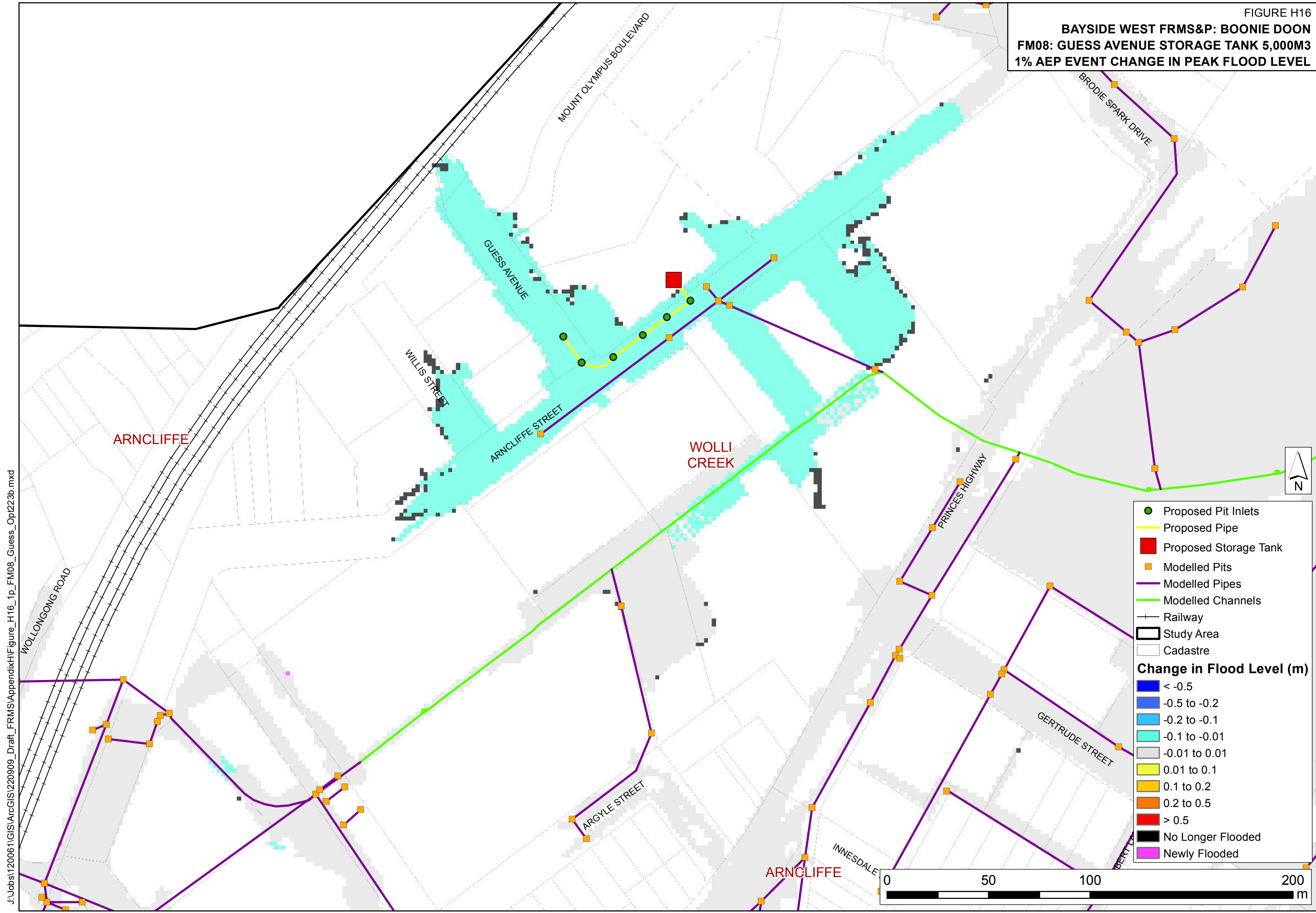


BAYSIDE WEST FRMS&P: BOONIE DOON
FM08: GUESS AVENUE STORAGE TANK 5,000M3
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL



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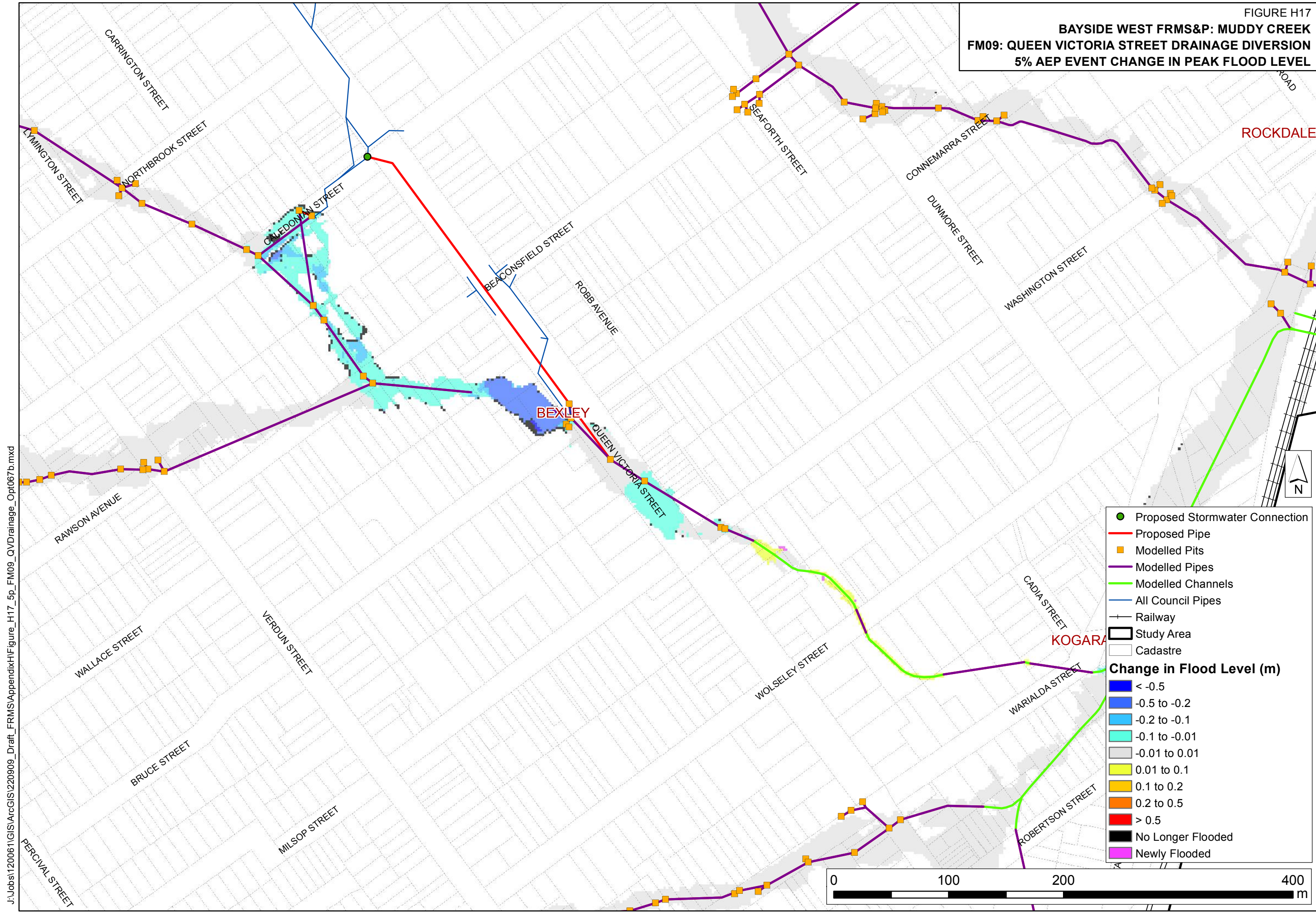
BAYSIDE WEST FRMS&P: BOONIE DOON
FM08: GUESS AVENUE STORAGE TANK 5,000M3
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL



- Proposed Pit Inlets
 - Proposed Pipe
 - Proposed Storage Tank
 - Modelled Pits
 - Modelled Pipes
 - Modelled Channels
 - + Railway
 - ▭ Study Area
 - ▭ Cadastre
- Change in Flood Level (m)**
- < -0.5
 - -0.5 to -0.2
 - -0.2 to -0.1
 - -0.1 to -0.01
 - -0.01 to 0.01
 - 0.01 to 0.1
 - 0.1 to 0.2
 - 0.2 to 0.5
 - > 0.5
 - No Longer Flooded
 - Newly Flooded

J:\Jobs\120061\GIS\ArcGIS\220909_Draft_FRMS\AppendixH\Figure_H16_1p_FM08_Guess_Op223b.mxd

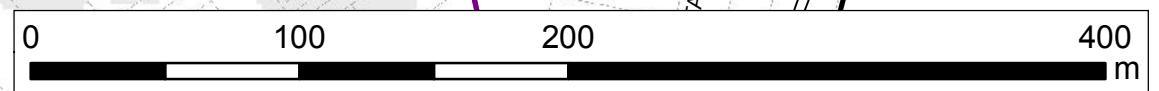
**BAYSIDE WEST FRMS&P: MUDDY CREEK
FM09: QUEEN VICTORIA STREET DRAINAGE DIVERSION
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**



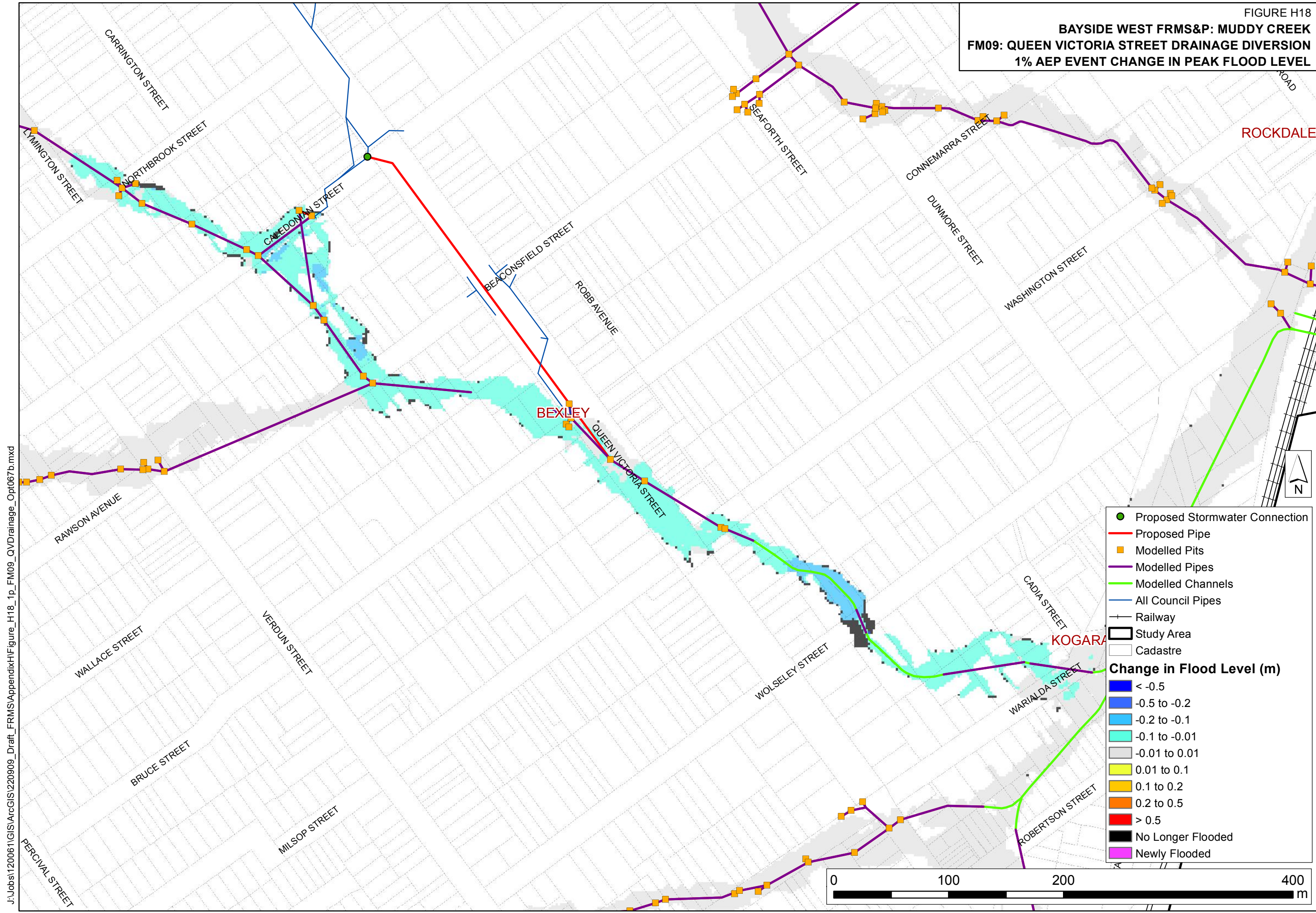
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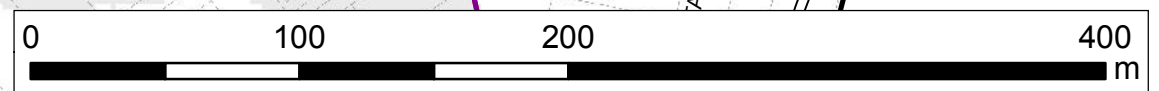
- Proposed Stormwater Connection
- Proposed Pipe
- Modelled Pits
- Modelled Pipes
- Modelled Channels
- All Council Pipes
- Railway
- ▭ Study Area
- ▭ Cadastral
- Change in Flood Level (m)**
- < -0.5
- -0.5 to -0.2
- -0.2 to -0.1
- -0.1 to -0.01
- -0.01 to 0.01
- 0.01 to 0.1
- 0.1 to 0.2
- 0.2 to 0.5
- > 0.5
- No Longer Flooded
- Newly Flooded



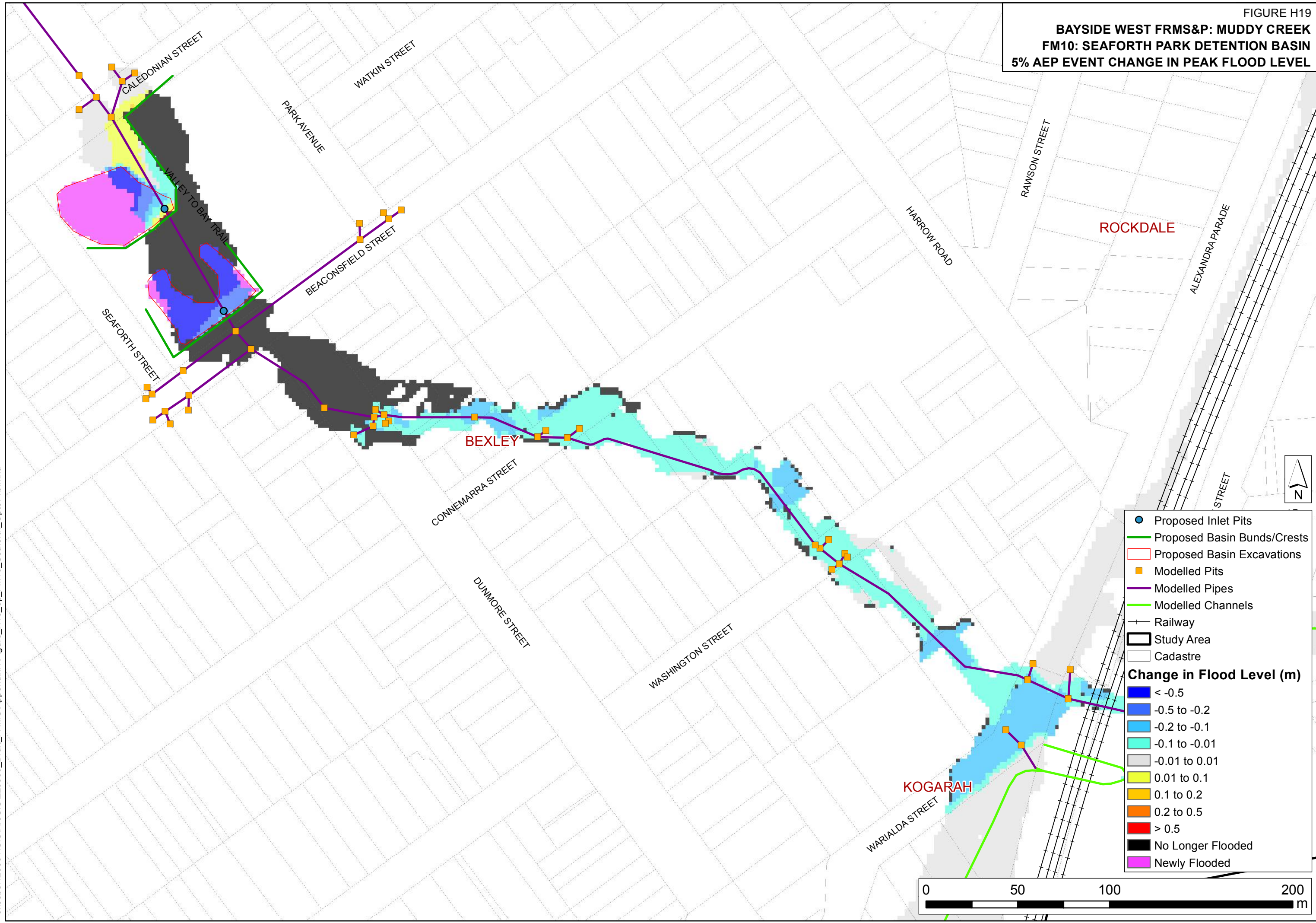
**BAYSIDE WEST FRMS&P: MUDDY CREEK
FM09: QUEEN VICTORIA STREET DRAINAGE DIVERSION
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**



- Proposed Stormwater Connection
 - Proposed Pipe
 - Modelled Pits
 - Modelled Pipes
 - Modelled Channels
 - All Council Pipes
 - Railway
 - Study Area
 - Cadastre
- Change in Flood Level (m)**
- < -0.5
 - -0.5 to -0.2
 - -0.2 to -0.1
 - -0.1 to -0.01
 - -0.01 to 0.01
 - 0.01 to 0.1
 - 0.1 to 0.2
 - 0.2 to 0.5
 - > 0.5
 - No Longer Flooded
 - Newly Flooded

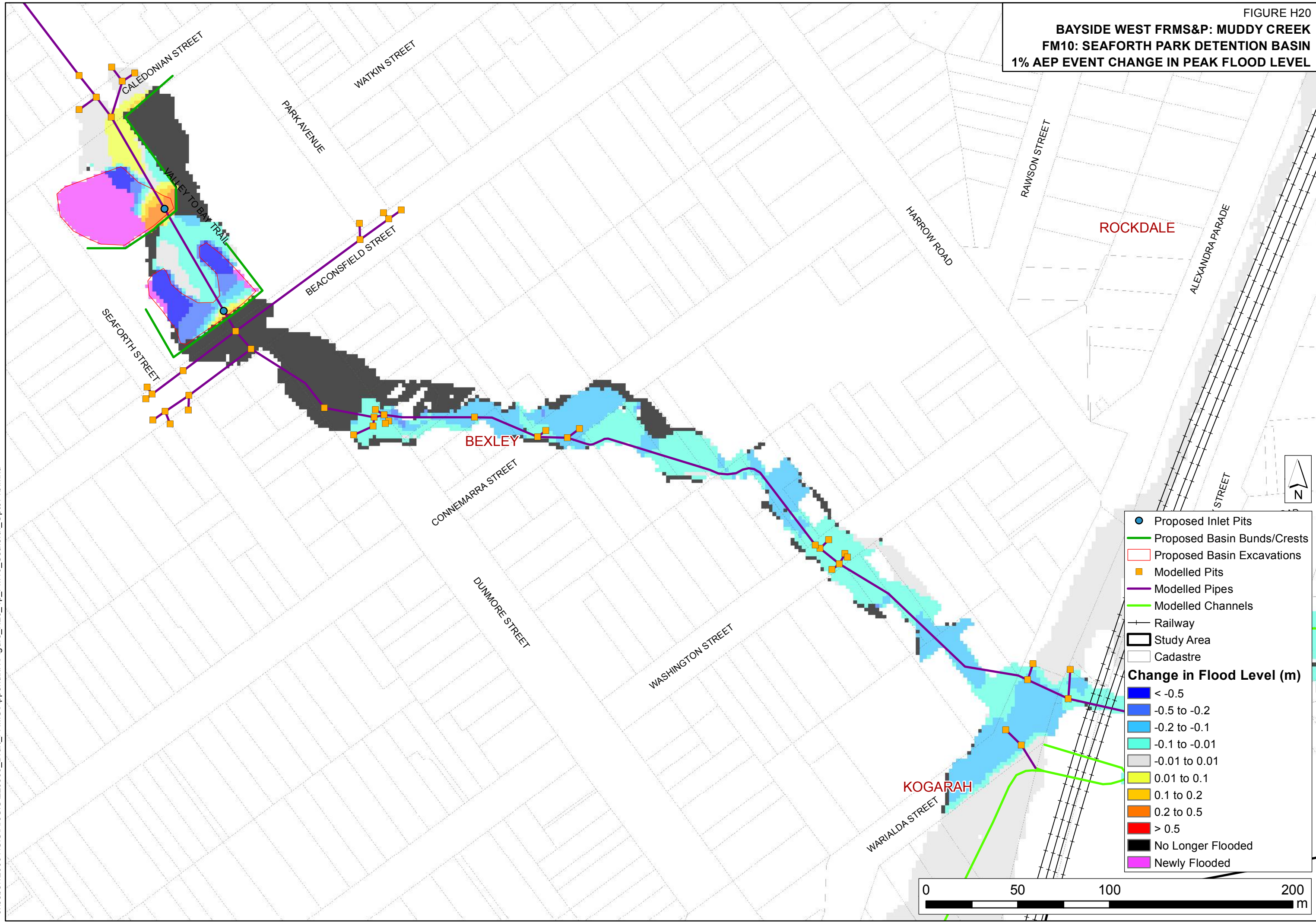


**BAYSIDE WEST FRMS&P: MUDDY CREEK
FM10: SEAFORTH PARK DETENTION BASIN
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

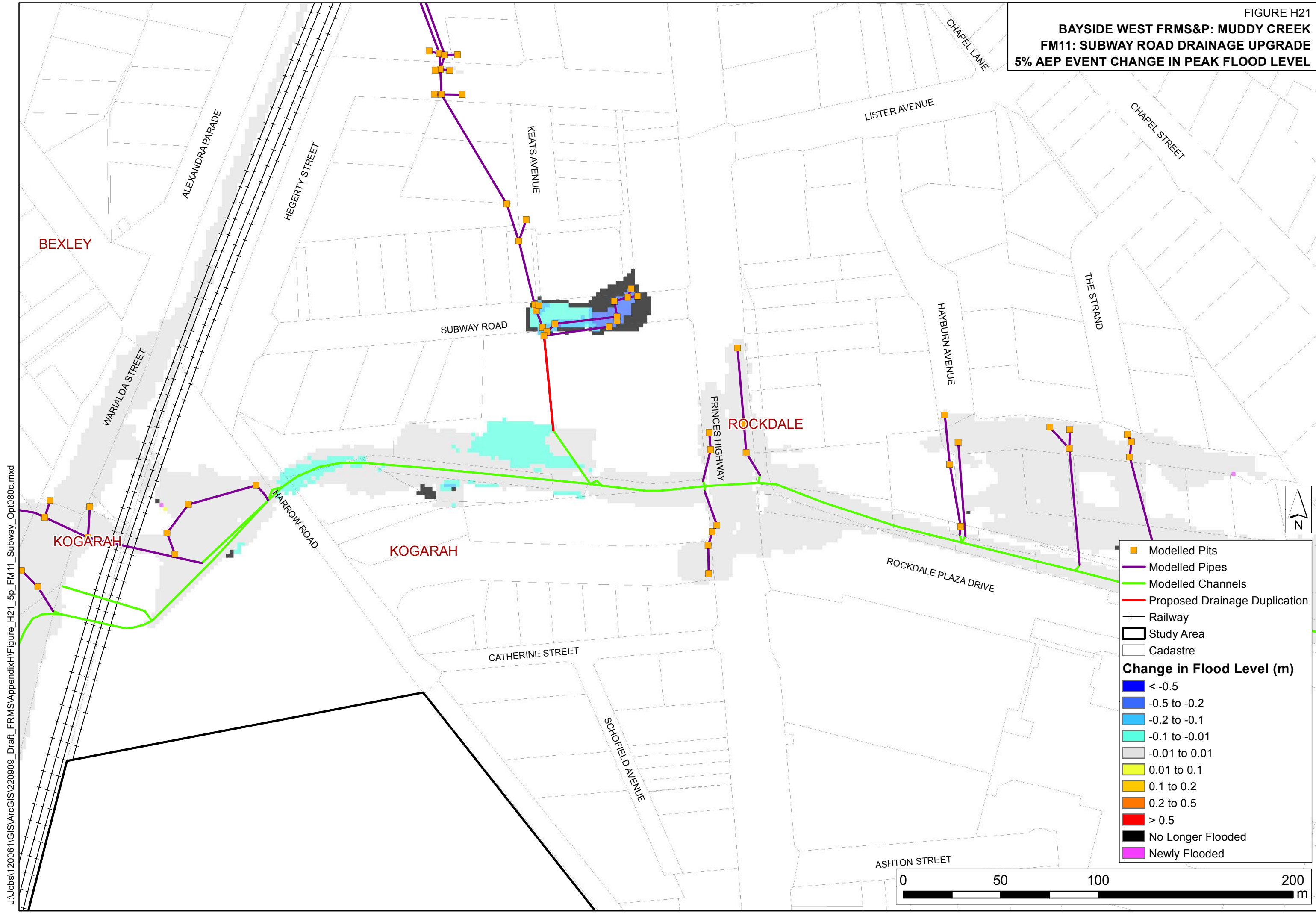


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**BAYSIDE WEST FRMS&P: MUDDY CREEK
FM10: SEAFORTH PARK DETENTION BASIN
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

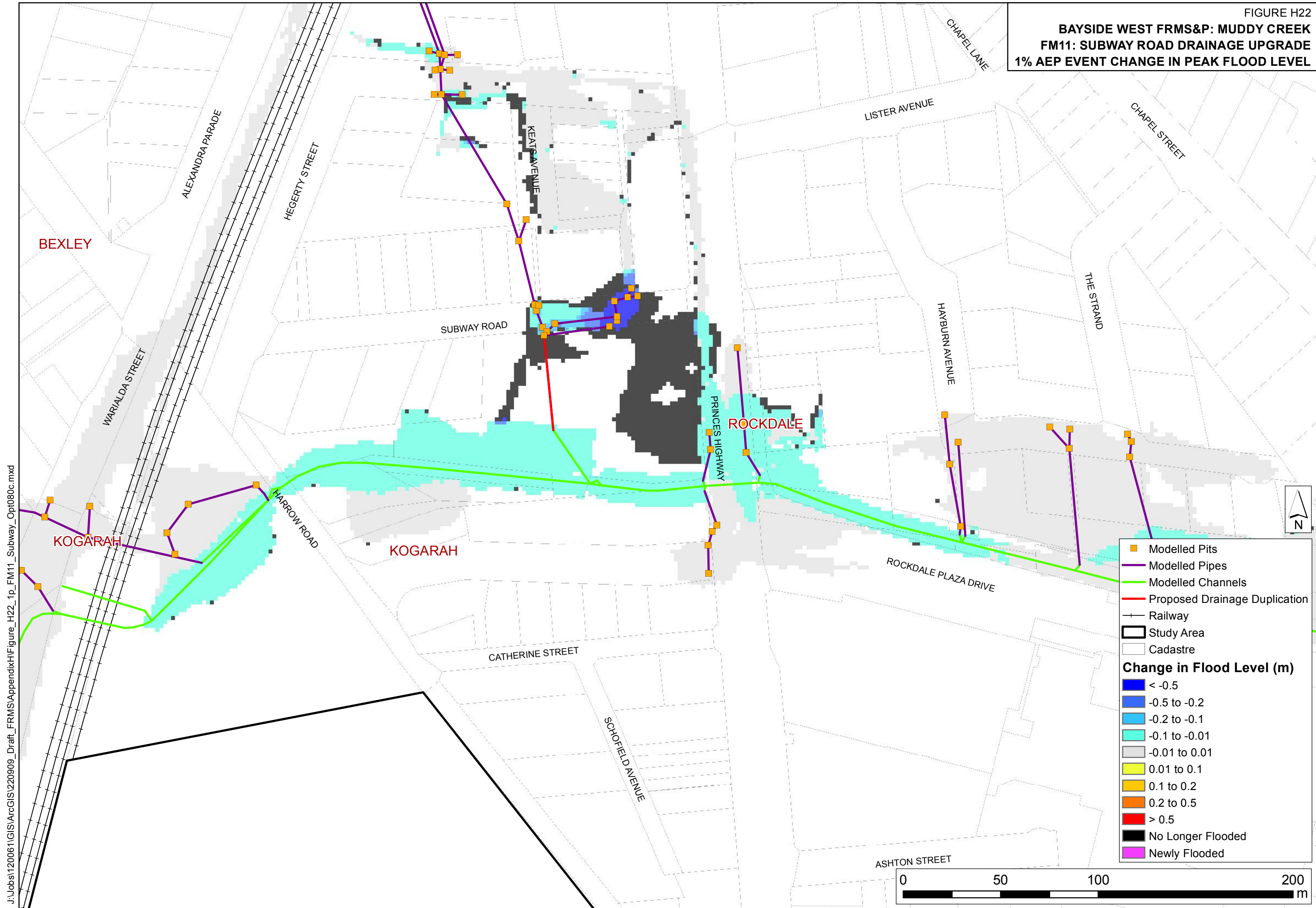


**BAYSIDE WEST FRMS&P: MUDDY CREEK
FM11: SUBWAY ROAD DRAINAGE UPGRADE
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**



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**BAYSIDE WEST FRMS&P: MUDDY CREEK
FM11: SUBWAY ROAD DRAINAGE UPGRADE
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**



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**BAYSIDE WEST FRMS&P: MUDDY CREEK
FM12: MUTCH AVENUE DRAINAGE LINE
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

ARNCLIFFE

KYEEMAGH

MUTCH AVENUE

TANCREDAVENUE

OWEN AVENUE

JACOB

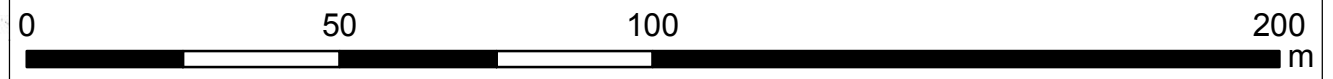
OCCUPATION ROAD

COOK PARK TRAIL

- Proposed Inlet Pits
- Proposed Drainage Line
- Modelled Pits
- Modelled Pipes
- Study Area
- Cadastre

Change in Flood Level (m)

- < -0.5
- 0.5 to -0.2
- 0.2 to -0.1
- 0.1 to -0.01
- 0.01 to 0.01
- 0.01 to 0.1
- 0.1 to 0.2
- 0.2 to 0.5
- > 0.5
- No Longer Flooded
- Newly Flooded



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**BAYSIDE WEST FRMS&P: MUDDY CREEK
FM12: MUTCH AVENUE DRAINAGE LINE
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

ARNCLIFFE

KYEEMAGH

MUTCH AVENUE







TANCREDAVENUE

OWEN AVENUE












OCCUPATION ROAD

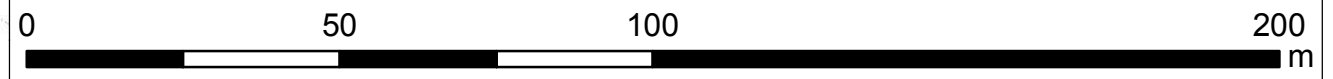
COOK PARK TRAIL

JACOB

-  Proposed Inlet Pits
-  Proposed Drainage Line
-  Modelled Pits
-  Modelled Pipes
-  Study Area
-  Cadastre

Change in Flood Level (m)

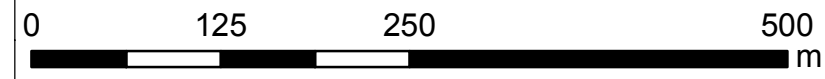
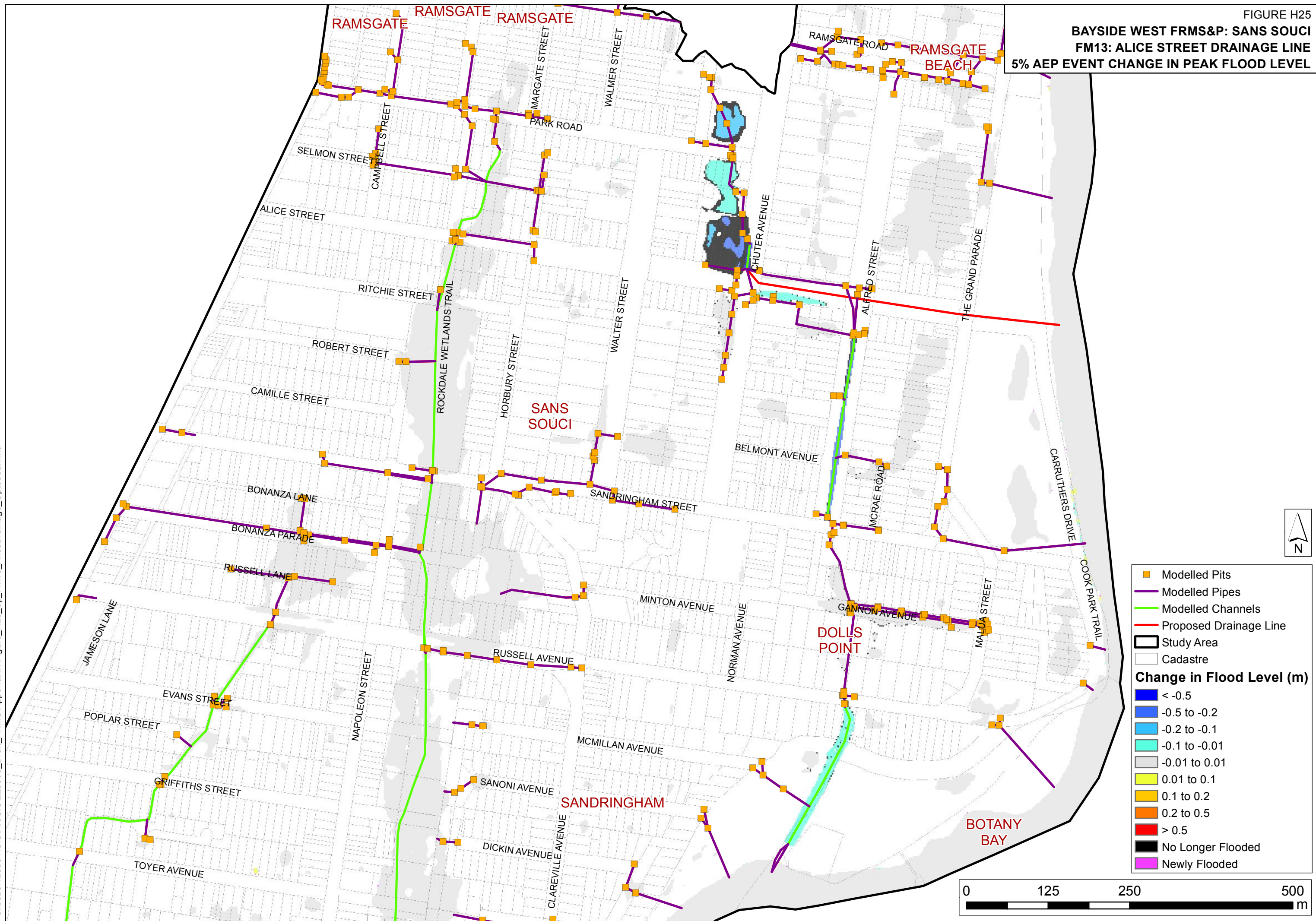
-  < -0.5
-  -0.5 to -0.2
-  -0.2 to -0.1
-  -0.1 to -0.01
-  -0.01 to 0.01
-  0.01 to 0.1
-  0.1 to 0.2
-  0.2 to 0.5
-  > 0.5
-  No Longer Flooded
-  Newly Flooded



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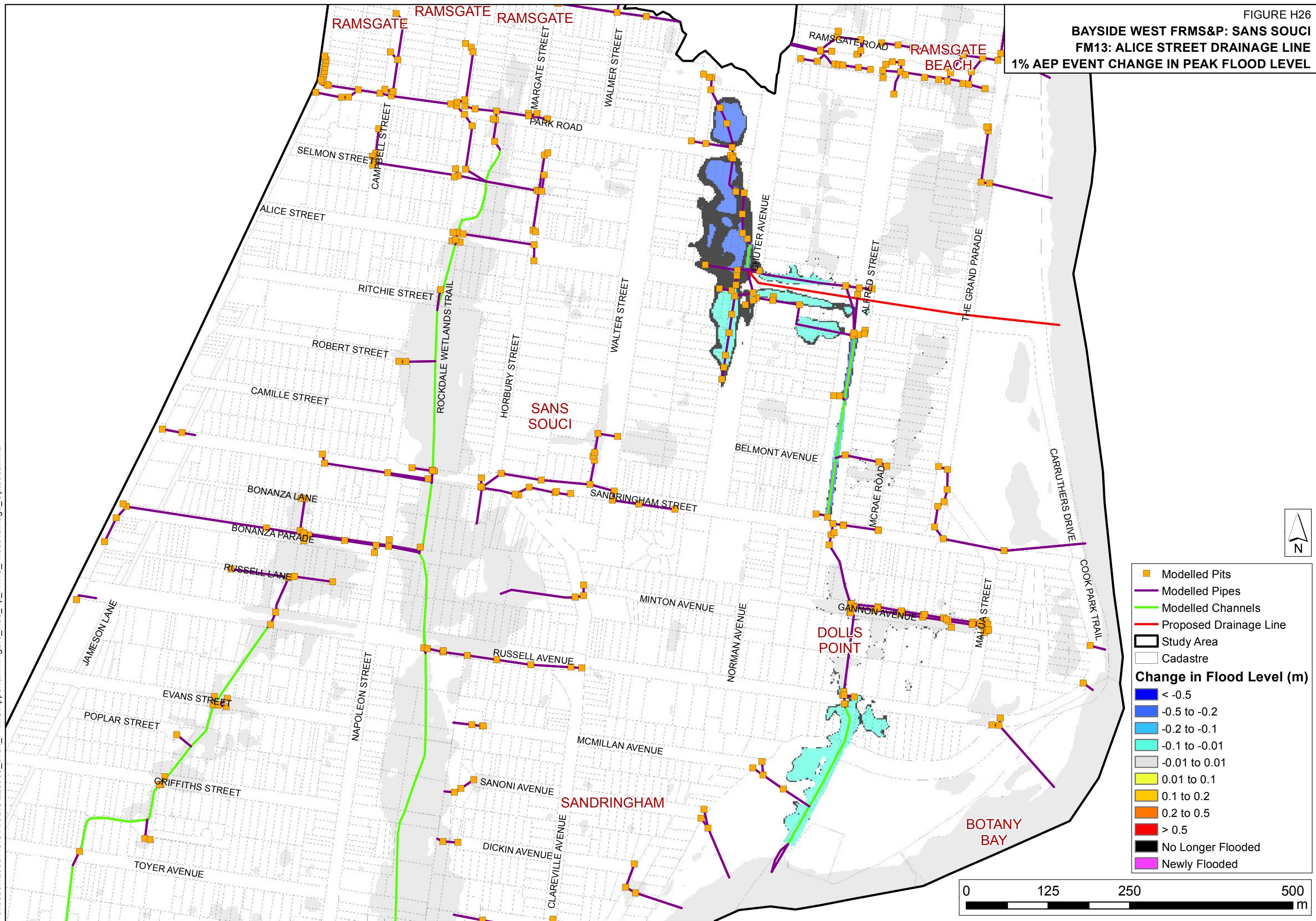
**BAYSIDE WEST FRMS&P: SANS SOUCI
FM13: ALICE STREET DRAINAGE LINE
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

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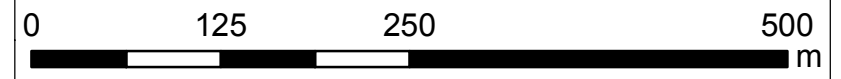


**BAYSIDE WEST FRMS&P: SANS SOUCI
FM13: ALICE STREET DRAINAGE LINE
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

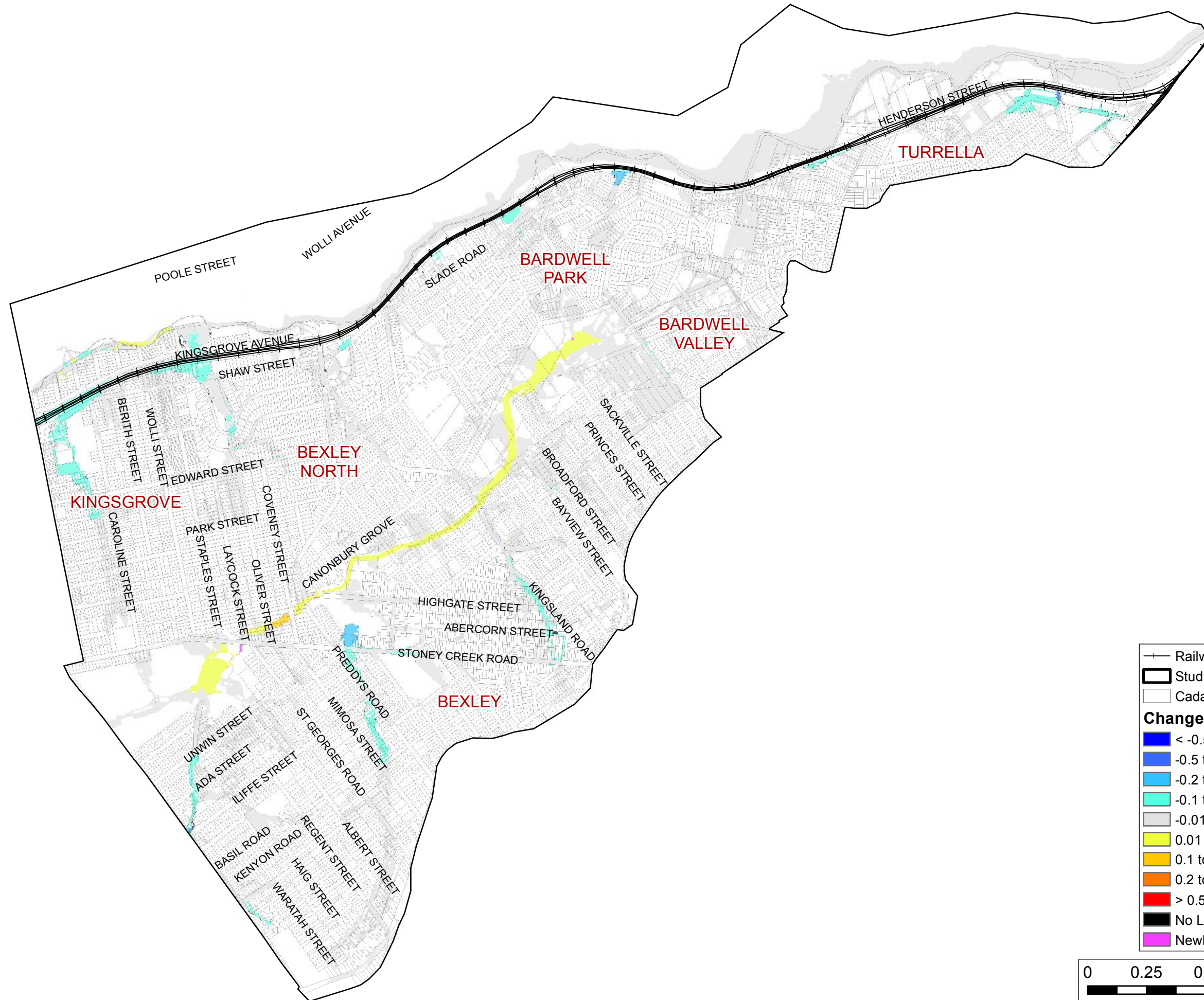
J:\Jobs\120061\GIS\ArcGIS\220909_Draft_FRMS\AppendixH\Figure_H26_1p_FM13_AliceDrainage_Opt090a.mxd



- Modelled Pits
 - Modelled Pipes
 - Modelled Channels
 - Proposed Drainage Line
 - ▭ Study Area
 - ▭ Cadastre
- Change in Flood Level (m)**
- < -0.5
 - -0.5 to -0.2
 - -0.2 to -0.1
 - -0.1 to -0.01
 - -0.01 to 0.01
 - 0.01 to 0.1
 - 0.1 to 0.2
 - 0.2 to 0.5
 - > 0.5
 - No Longer Flooded
 - Newly Flooded



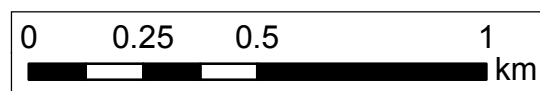
**BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM16: DUPLICATE STORMWATER NETWORK
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**



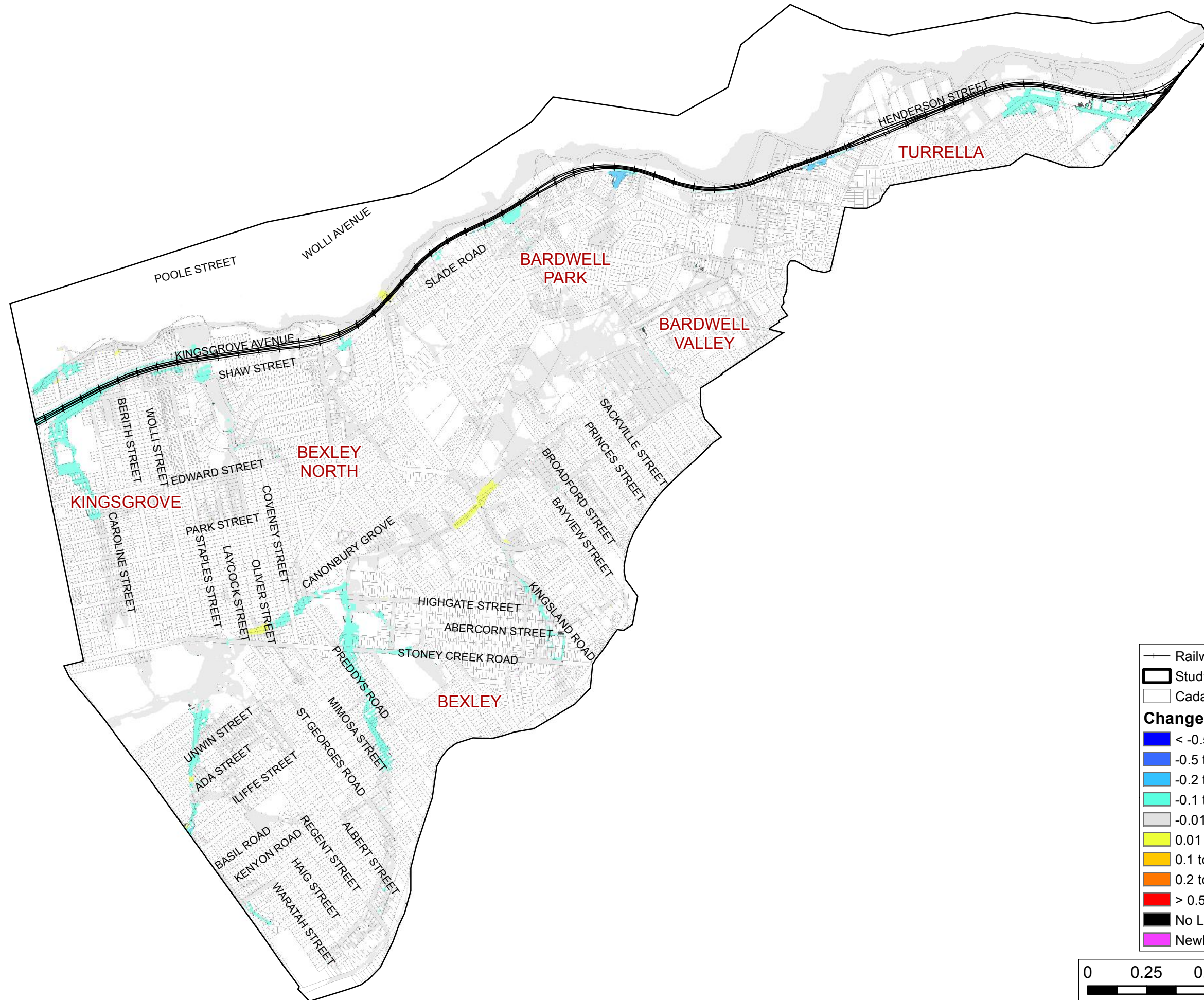
—+— Railway
▭ Study Area
▭ Cadastre

Change in Flood Level (m)

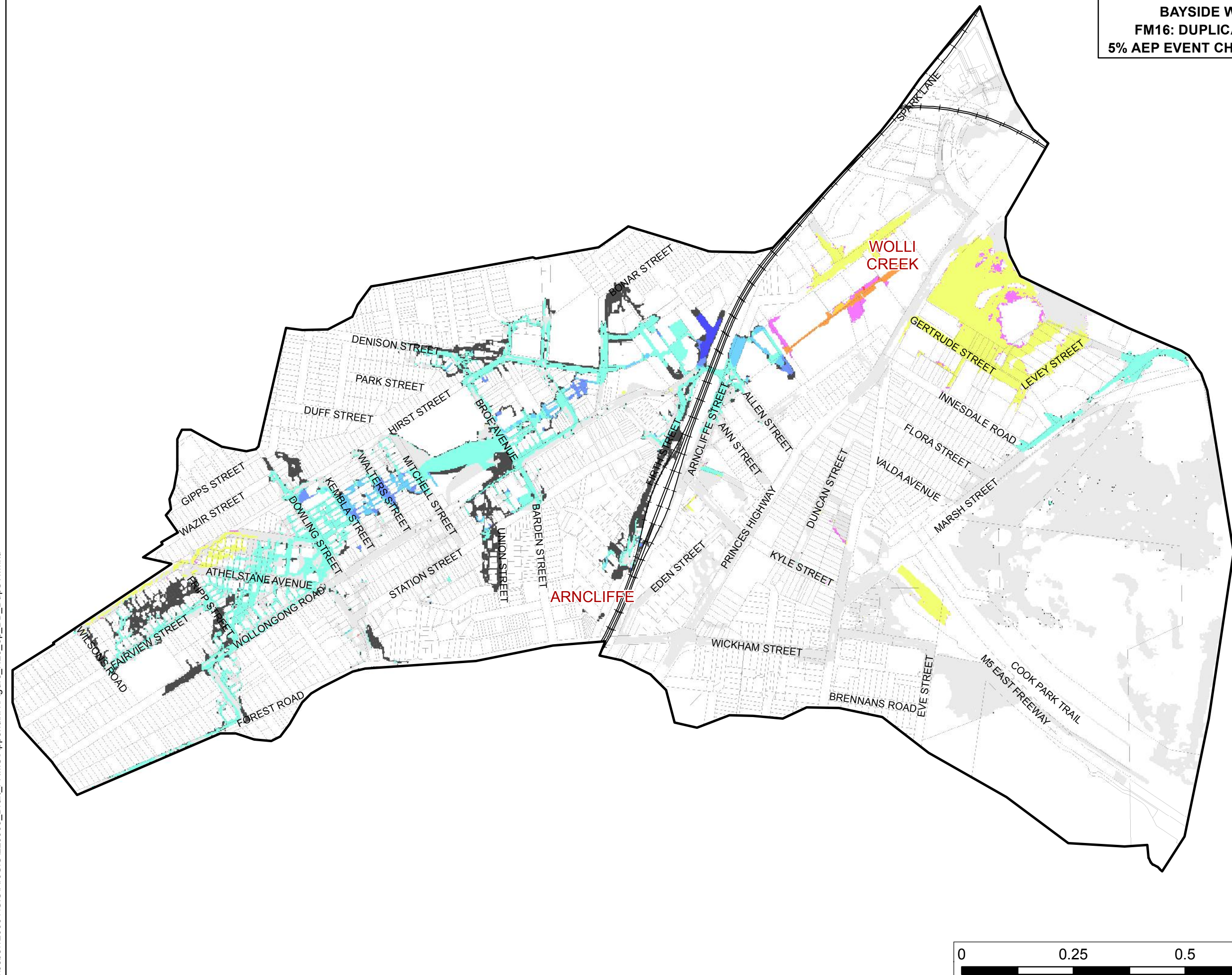
- < -0.5
- 0.5 to -0.2
- 0.2 to -0.1
- 0.1 to -0.01
- 0.01 to 0.01
- 0.01 to 0.1
- 0.1 to 0.2
- 0.2 to 0.5
- > 0.5
- ▭ No Longer Flooded
- ▭ Newly Flooded



**BAYSIDE WEST FRMS&P: BARDWELL CREEK
FM16: DUPLICATE STORMWATER NETWORK
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**



**BAYSIDE WEST FRMS&P: BOONIE DOON
FM16: DUPLICATE STORMWATER NETWORK
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

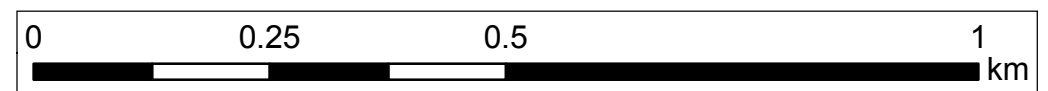


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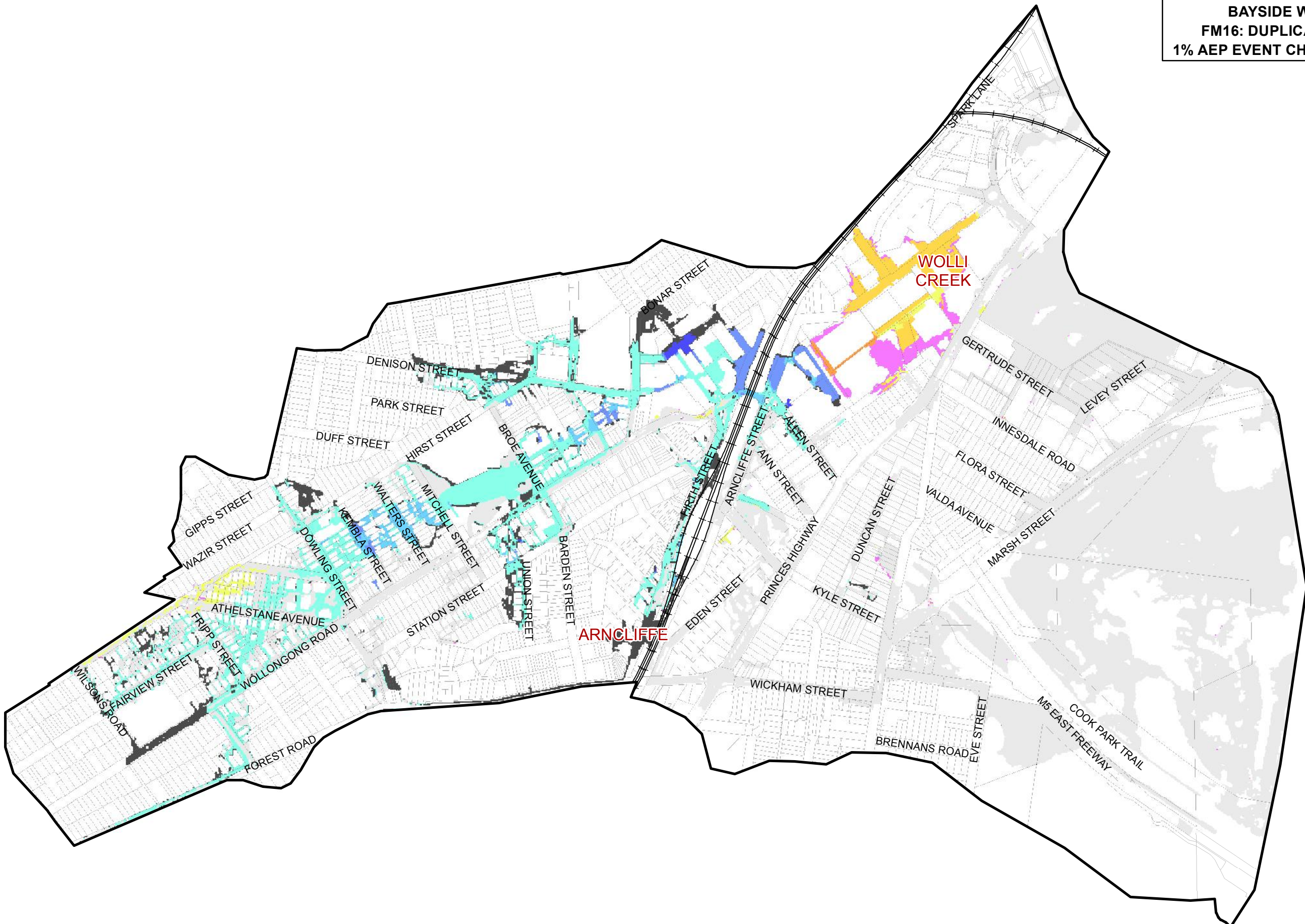
- Railway
- ▭ Study Area
- ▭ Cadastre

Change in Flood Level (m)

- Dark Blue: < -0.5
- Blue: -0.5 to -0.2
- Light Blue: -0.2 to -0.1
- Cyan: -0.1 to -0.01
- Light Grey: -0.01 to 0.01
- Yellow: 0.01 to 0.1
- Orange: 0.1 to 0.2
- Red: > 0.5
- Black: No Longer Flooded
- Pink: Newly Flooded



BAYSIDE WEST FRMS&P: BOONIE DOON
FM16: DUPLICATE STORMWATER NETWORK
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL

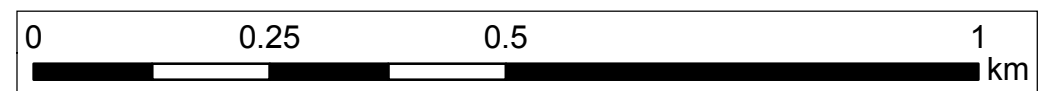


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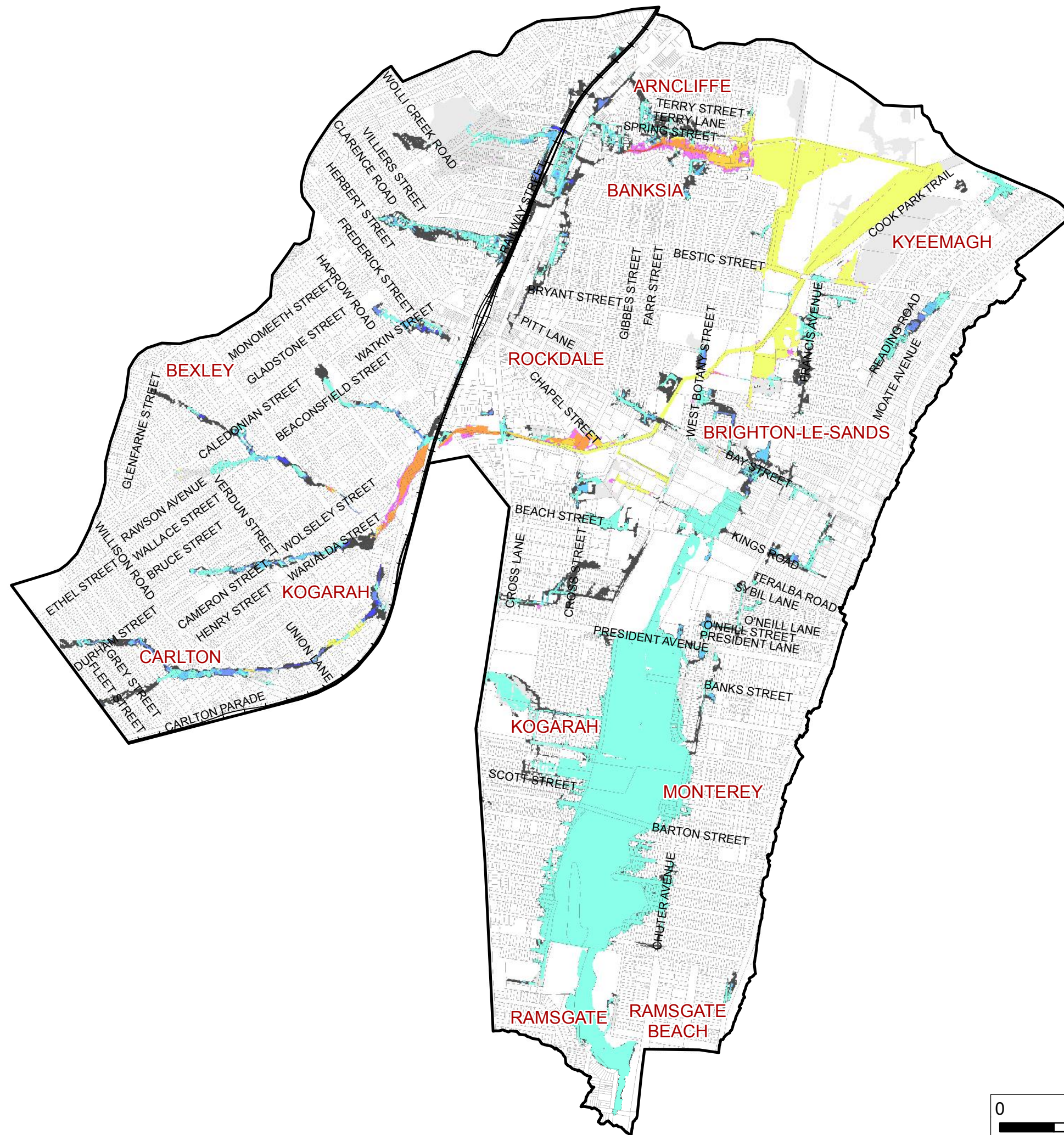
- Railway
- ▭ Study Area
- ▭ Cadastre

Change in Flood Level (m)

- < -0.5
- 0.5 to -0.2
- 0.2 to -0.1
- 0.1 to -0.01
- 0.01 to 0.01
- 0.01 to 0.1
- 0.1 to 0.2
- 0.2 to 0.5
- > 0.5
- No Longer Flooded
- Newly Flooded



**BAYSIDE WEST FRMS&P: MUDDY CREEK
FM16: DUPLICATE STORMWATER NETWORK
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

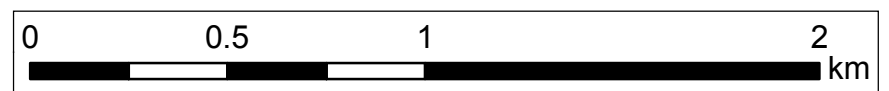


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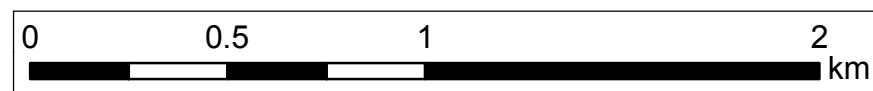
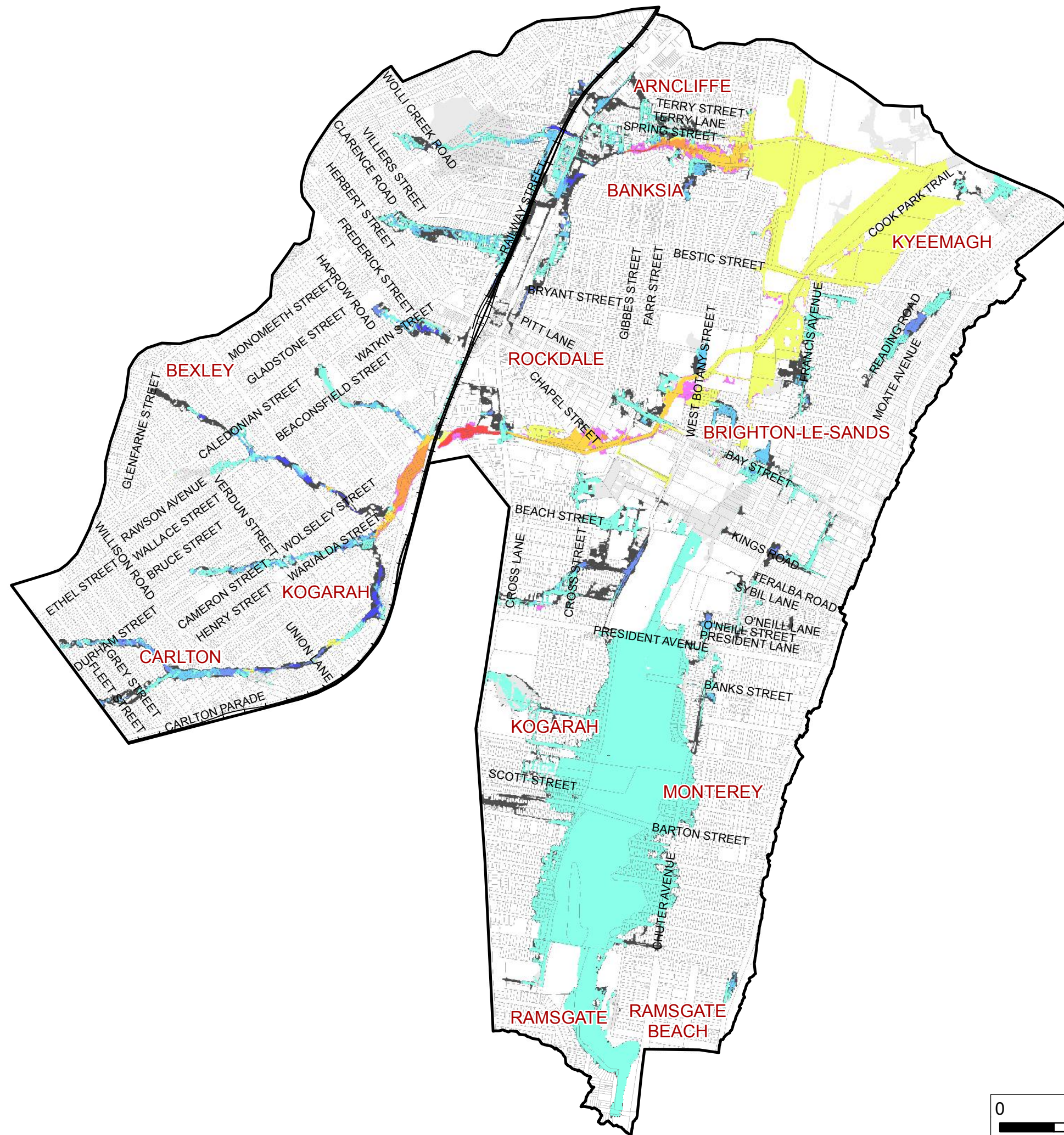
- Railway
- ▭ Study Area
- ▭ Cadastre

Change in Flood Level (m)

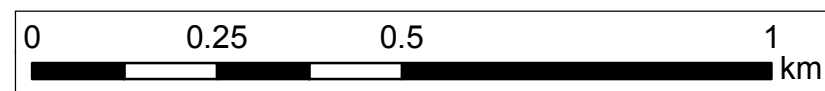
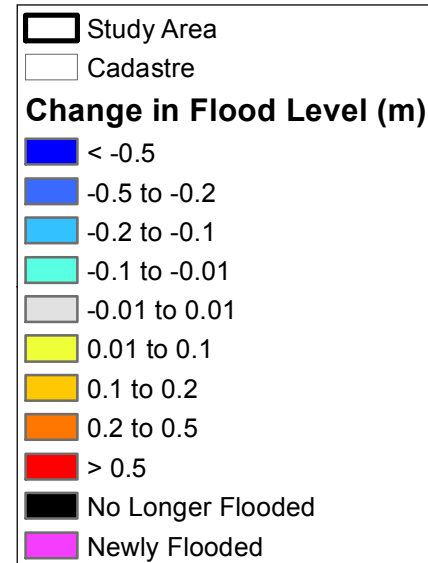
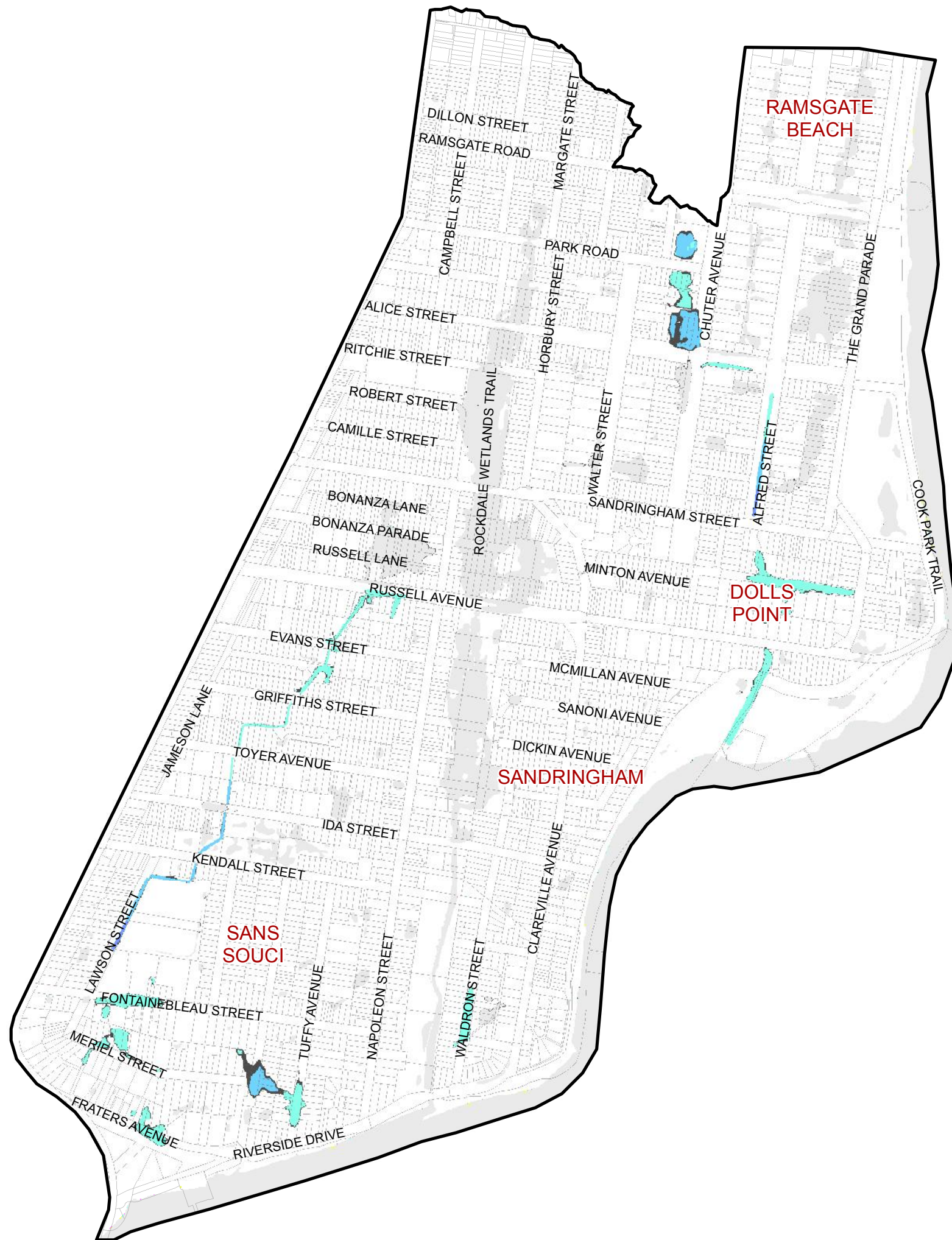
- < -0.5
- 0.5 to -0.2
- 0.2 to -0.1
- 0.1 to -0.01
- 0.01 to 0.01
- 0.01 to 0.1
- 0.1 to 0.2
- 0.2 to 0.5
- > 0.5
- ▭ No Longer Flooded
- ▭ Newly Flooded



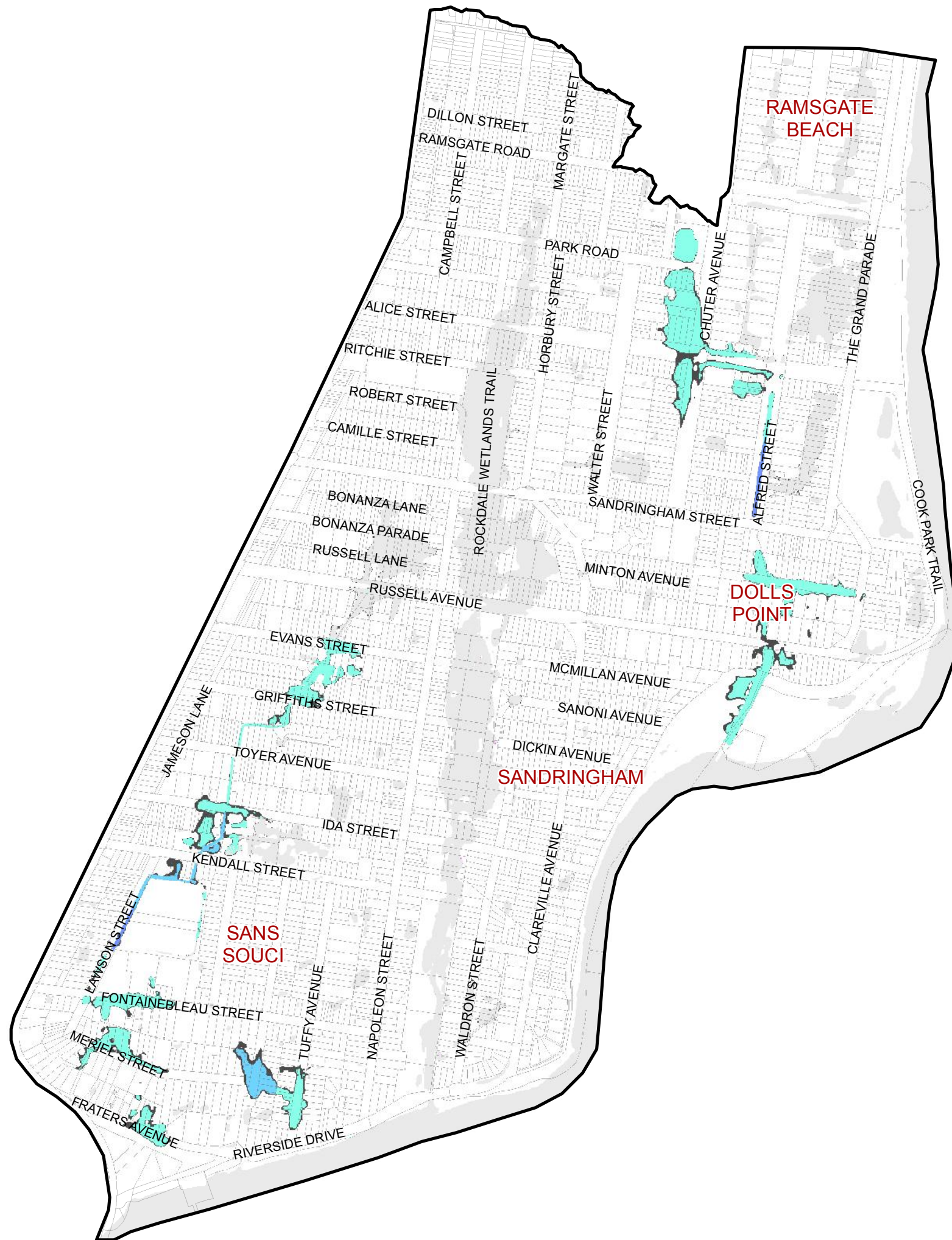
**BAYSIDE WEST FRMS&P: MUDDY CREEK
FM16: DUPLICATE STORMWATER NETWORK
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**



**BAYSIDE WEST FRMS&P: SANS SOUCI
FM16: DUPLICATE STORMWATER NETWORK
5% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**



**BAYSIDE WEST FRMS&P: SANS SOUCI
FM16: DUPLICATE STORMWATER NETWORK
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**

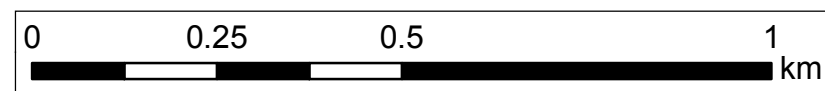


Study Area

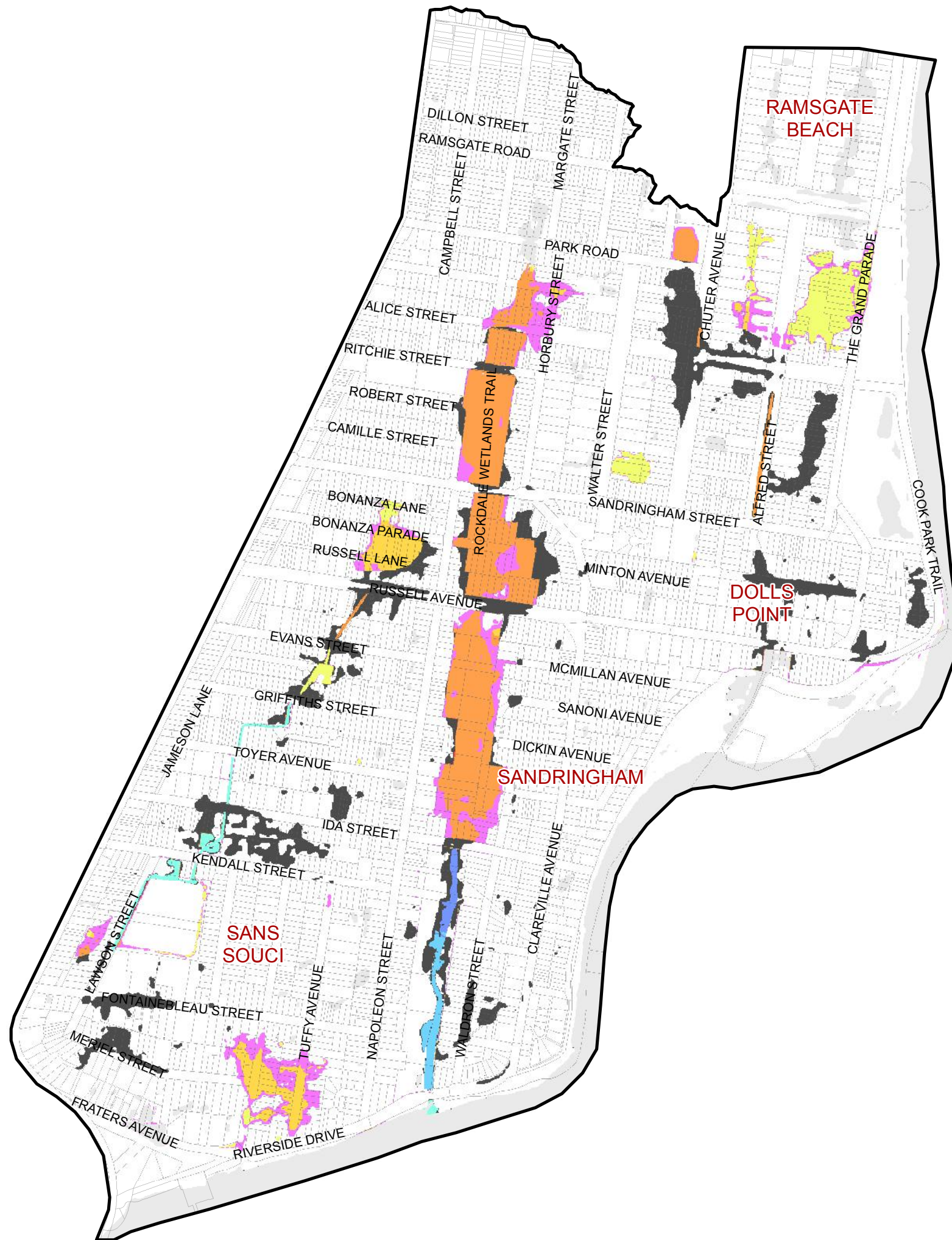
- Study Area
- Cadastre

Change in Flood Level (m)

- < -0.5
- 0.5 to -0.2
- 0.2 to -0.1
- 0.1 to -0.01
- 0.01 to 0.01
- 0.01 to 0.1
- 0.1 to 0.2
- 0.2 to 0.5
- > 0.5
- No Longer Flooded
- Newly Flooded

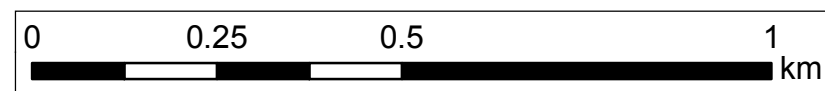
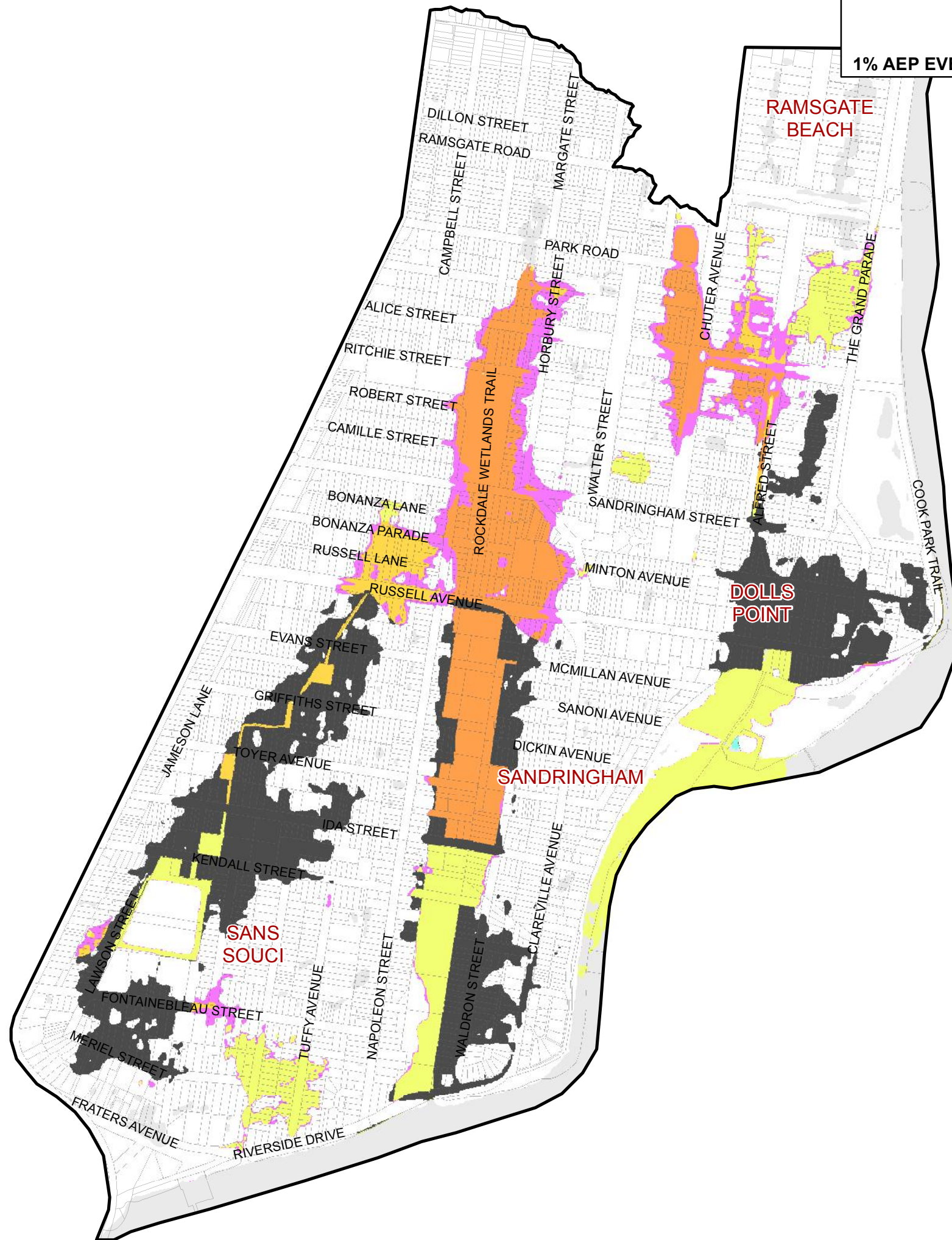


**BAYSIDE WEST FRMS&P: SANS SOUCI
FM18: FILLING OF LOW-LYING LAND
1% AEP EVENT CHANGE IN PEAK FLOOD LEVEL**



BAYSIDE WEST FRMS&P: SANS SOUCI
FM18: FILLING OF LOW-LYING LAND

1% AEP EVENT + 0.9M SEA LEVEL RISE CHANGE IN PEAK FLOOD LEVEL



APPENDIX I. COSTS

FLOOD MODIFICATION OPTION



Appendix I

Bayside West FRMS&P Cost Database

Task	Description	Unit	Raw Rate	Factored Rate	Source	
Construction Preliminaries	Establishment (Project Inception, Management and Coordination)	ea	\$	10,000.00	Estimation of Council Costs	
	Preparation and Implementation of preliminaries (e.g. CEMP, SMP, TCP,	ea	\$	20,000.00	Estimation	
	Survey and set out works	day	\$ 1,200.00	\$ 1,200.00	Estimation \$150/h	
	Temporary Access Track	m	\$ 100.00	\$ 100.00	Estimation	
	Temporary Fencing (light duty site mesh)	m	\$ 10.00	\$ 11.00	Rawlinsons 2018 Australian Construction Handbook	
	Temporary Fencing (chainwire)	m	\$ 40.00	\$ 43.98	Rawlinsons 2018 Australian Construction Handbook	
	Temporary Signage	ea	\$ 500.00	\$ 500.00	Estimation	
	Portable Toilet	week	\$ 70.00	\$ 76.97	Rawlinsons 2018 Australian Construction Handbook	
	Silt fence	m	\$ 21.00	\$ 21.00	Bayside Council	
	Silt sausage	m	\$ 4.20	\$ 4.62	Rawlinsons 2018 Australian Construction Handbook	
	Geotech during construction	day	\$ 1,200.00	\$ 1,200.00	Estimation \$150/h	
	Traffic Control - Road closure	day	\$ 300.00	\$ 300.00	Estimation with signage of closure (VMS) and detours in place	
	Traffic Control	day	\$ 1,776.00	\$ 1,776.00	Estimation with 2 controllers, 2 VMS, plus management	
	Site Clearance	Land clearing (medium vegetation)	m ²	\$ 0.53	\$ 0.58	Rawlinsons 2018 Australian Construction Handbook
		Breakup and remove reinforced concrete in trenches	m ³	\$ 300.00	\$ 329.87	Rawlinsons 2018 Australian Construction Handbook
		Break up and remove bitumen paving with basecourse under	m ²	\$ 3.45	\$ 3.79	Rawlinsons 2018 Australian Construction Handbook
		Remove bitumen	m ²	\$ 22.00	\$ 22.00	Bayside Council
Remove kerbs		m	\$ 34.00	\$ 34.00	Bayside Council	
Remove Pipes		m	\$ 120.00	\$ 120.00	Bayside Council	
Remove Pits		ea	\$ 566.00	\$ 566.00	Bayside Council	
Take down and remove timber fence		m	\$ 6.00	\$ 6.60	Rawlinsons 2018 Australian Construction Handbook	
Take down and remove chain link fence		m	\$ 6.00	\$ 6.60	Rawlinsons 2018 Australian Construction Handbook	
Take down and remove spear head security fence		m	\$ 20.00	\$ 20.00	Estimation (Bayside Council = \$18)	
Remove retaining wall		m	\$ 55.00	\$ 55.00	Bayside Council	
Remove signage		ea	\$ 36.00	\$ 36.00	Bayside Council	
Dismantle large sign		ea	\$ 2,000.00	\$ 2,000.00	Estimation	
Excavate over site to reduce levels in light soil		m ³	\$ 21.90	\$ 24.08	Rawlinsons 2018 Australian Construction Handbook	
Excavate trenches (up to 1m deep in light soil, incl backfilling)		m ³	\$ 50.40	\$ 55.42	Rawlinsons 2018 Australian Construction Handbook	
Excavate trenches (up to 2m deep in light soil, incl backfilling)		m ³	\$ 57.40	\$ 63.11	Rawlinsons 2018 Australian Construction Handbook	
Excavate trenches (beyond 2m deep in light soil, incl backfilling)		m ³	\$ 65.00	\$ 65.00	Estimation	
Detailed excavation around pits		m ³	\$ 155.00	\$ 155.00	Bayside Council	
Dewatering deep system with 150mm header pipe, 1500mm well point c		m ²	\$ 57.50	\$ 63.22	Rawlinsons 2018 Australian Construction Handbook	
Balance cut and fill (0.5/1m deep) in light soil		m ³	\$ 11.20	\$ 12.32	Rawlinsons 2018 Australian Construction Handbook	
Cart excavated material		per 5km per m ³	\$ 30.00	\$ 32.99	Rawlinsons 2018 Australian Construction Handbook	
Dispose of demolition material - mixed		t	\$ 350.00	\$ 384.84	Rawlinsons 2018 Australian Construction Handbook	
Dispose of clean fill		t	\$ 190.00	\$ 208.92	Rawlinsons 2018 Australian Construction Handbook	
Dispose of contaminated soil (low level, assumed ASS)		t	\$ 350.00	\$ 384.84	Rawlinsons 2018 Australian Construction Handbook	
Dispose of contaminated soil (high level)		t	\$ 700.00	\$ 769.69	Rawlinsons 2018 Australian Construction Handbook	
Stormwater Management		Concrete pipe to AS 4058-1992 Class 4 600mm dia	m	\$ 340.00	\$ 373.85	Rawlinsons 2018 Australian Construction Handbook
		Concrete pipe to AS 4058-1992 Class 4 750mm dia	m	\$ 490.00	\$ 538.78	Estimation - Interpolation
		Concrete pipe to AS 4058-1992 Class 4 900mm dia	m	\$ 630.00	\$ 692.72	Rawlinsons 2018 Australian Construction Handbook
		Concrete pipe to AS 4058-1992 Class 4 1050mm dia	m	\$ 850.00	\$ 934.62	Estimation - Interpolation
		Concrete pipe to AS 4058-1992 Class 4 1200mm dia	m	\$ 1,050.00	\$ 1,154.53	Rawlinsons 2018 Australian Construction Handbook
		Concrete pipe to AS 4058-1992 Class 4 1500mm dia	m	\$ 1,450.00	\$ 1,594.36	Rawlinsons 2018 Australian Construction Handbook
		Precast headwall for 600mm diameter culvert	ea	\$ 801.00	\$ 880.74	Rawlinsons 2018 Australian Construction Handbook
	Precast headwall for 900mm diameter culvert	ea	\$ 1,500.00	\$ 1,500.00	Estimation, checked with Holcim/Humes/Rocla Quotes	
	Precast headwall for 1050mm diameter culvert	ea	\$ 2,000.00	\$ 2,000.00	Estimation, checked with Holcim/Humes/Rocla Quotes	
	Precast headwall for 1200mm diameter culvert	ea	\$ 3,000.00	\$ 3,000.00	Estimation, checked with Holcim/Humes/Rocla Quotes	
	Precast headwall for 1500mm diameter culvert	ea	\$ 5,000.00	\$ 5,000.00	Estimation, checked with Holcim/Humes/Rocla Quotes	
	Precast Concrete Box Culvert (375 x 225)	m	\$ 240.00	\$ 263.89	Rawlinsons 2018 Australian Construction Handbook	
	Precast Concrete Box Culvert (450 x 600)	m	\$ 457.00	\$ 502.50	Rawlinsons 2018 Australian Construction Handbook	
	Precast Concrete Box Culvert (750 x 600)	m	\$ 634.00	\$ 697.12	Rawlinsons 2018 Australian Construction Handbook	
	Precast Concrete Box Culvert (1200 x 1200)	m	\$ 2,000.00	\$ 2,000.00	Estimation, checked with Holcim/Humes/Rocla Quotes	
	Precast Concrete Box Culvert (1800 x 1800)	m	\$ 3,000.00	\$ 3,000.00	Estimation, checked with Holcim/Humes/Rocla Quotes	
	Precast Concrete Box Culvert (2700 x 900)	m	\$ 2,825.00	\$ 2,825.00	Bayside Council	
	Cast in-situ concrete culvert	m	\$ 6,675.00	\$ 6,675.00	Bayside Council	
	Cast in-situ concrete pit (900 x 900 x 900)	ea	\$ 1,650.00	\$ 1,814.27	Rawlinsons 2018 Australian Construction Handbook	
	Additional pit depth beyond 900mm	per 100mm	\$ 150.00	\$ 164.93	Rawlinsons 2018 Australian Construction Handbook	
	Precast concrete pit (1200 x 1200 x 1200)	ea	\$ 2,200.00	\$ 2,200.00	Estimation (Bayside Stormwater Risers = \$2,300)	
	Precast concrete pit (2400 x 2400 x 2400)	ea	\$ 4,000.00	\$ 4,000.00	Estimation	
	Concrete covers (900 x 900 trafficable)	ea	\$ 340.00	\$ 373.85	Rawlinsons 2018 Australian Construction Handbook	
	Grate (762 x 762 class D sump grate)	ea	\$ 985.00	\$ 1,083.06	Rawlinsons 2018 Australian Construction Handbook	
	Grate (2m x 2m)	ea	\$ 2,000.00	\$ 2,000.00	Estimation	
	2.4m lintel and grate	ea	\$ 1,600.00	\$ 1,600.00	Estimation, checked with Holcim/Humes/Rocla Quotes	
	4.2m lintel and grate	ea	\$ 3,500.00	\$ 3,500.00	Estimation	
	HumeGard GPT 600mm	ea	\$ 29,500.00	\$ 32,436.89	Rawlinsons 2018 Australian Construction Handbook	
	HumeGard GPT 900mm	ea	\$ 61,000.00	\$ 67,072.89	Rawlinsons 2018 Australian Construction Handbook	
	HumeGard GPT 1200mm	ea	\$ 95,000.00	\$ 104,457.78	Rawlinsons 2018 Australian Construction Handbook	
	50mm sand bed laid in trenches	m ²	\$ 3.55	\$ 3.90	Rawlinsons 2018 Australian Construction Handbook	
	Compaction of foundation trenches	m ²	\$ 3.45	\$ 3.79	Rawlinsons 2018 Australian Construction Handbook	
	Preparation of culvert base	m ²	\$ 385.00	\$ 385.00	Bayside Council	
	Backfill of culvert	m ³	\$ 221.00	\$ 221.00	Bayside Council	
	Break into existing pit	ea	\$ 600.00	\$ 600.00	Estimation	
	Bridge (2 lane conventional, reinforced concrete spans, safety rails, excl :	m ²	\$ 1,850.00	\$ 2,034.18	Rawlinsons 2018 Australian Construction Handbook	
	Pipe Jacking Excavations (2)	ea	\$ 19,500.00	\$ 19,500.00	Gold Coast Water 2008, factored by 1.3 for current price	
	Pipe Jacking 1050mm/1200mm dia	m	\$ 6,555.00	\$ 6,555.00	Estimation based on Gold Coast Water 2008, incl pipe cost, fac	
	Reinforced Concrete 25 MPa in slabs thickening on fill	m ³	\$ 330.00	\$ 362.85	Rawlinsons 2018 Australian Construction Handbook	
	Outlet scour protection - reno mattress	m ²	\$ 500.00	\$ 500.00	Estimation	
	Land Acquisition/Easement Costs	m ²				
	Rehabilitation	200mm crushed rock base	m ²	\$ 22.10	\$ 24.30	Rawlinsons 2018 Australian Construction Handbook
		Hot bituminous concrete incl track coat 50mm	m ²	\$ 25.90	\$ 28.48	Rawlinsons 2018 Australian Construction Handbook
		Cast in-situ 250mm x 1500mm kerb	m	\$ 92.20	\$ 101.38	Rawlinsons 2018 Australian Construction Handbook
		Kerb and gutter	m	\$ 158.00	\$ 158.00	Bayside Council
		Pavement	m ²	\$ 300.00	\$ 300.00	Bayside Council (Pavement 300 Select + 200 DGB20 + 40 AC14 :
		Composite Road 8m suburban with kerb	m	\$ 530.00	\$ 582.76	Rawlinsons 2018 Australian Construction Handbook
Footpath 1500mm wide		m	\$ 89.50	\$ 98.41	Rawlinsons 2018 Australian Construction Handbook	
Footpath		m ²	\$ 304.00	\$ 304.00	Bayside Council	
Line marking (100mm wide)		m	\$ 1.75	\$ 1.92	Rawlinsons 2018 Australian Construction Handbook	
Guard Rail		m	\$ 120.00	\$ 131.95	Rawlinsons 2018 Australian Construction Handbook	
F-Type concrete barrier 970mm high		m	\$ 390.00	\$ 428.83	Rawlinsons 2018 Australian Construction Handbook	
Prepare ground - rotary hoe		m ²	\$ 0.46	\$ 0.51	Rawlinsons 2018 Australian Construction Handbook	
Top soil spread and levelled 300mm thick		m ²	\$ 17.85	\$ 19.63	Rawlinsons 2018 Australian Construction Handbook	
Turf laid, rolled and watered - couch		m ²	\$ 9.00	\$ 9.90	Rawlinsons 2018 Australian Construction Handbook	
Level, seed, fertilise and water playing field		ha	\$ 8,500.00	\$ 9,346.22	Rawlinsons 2018 Australian Construction Handbook	
Pine bark chips		m ³	\$ 74.50	\$ 81.92	Rawlinsons 2018 Australian Construction Handbook	
Ground cover and planting		m ²	\$ 7.00	\$ 7.70	Rawlinsons 2018 Australian Construction Handbook	
Sign 450mm x 600mm		ea	\$ 400.00	\$ 439.82	Rawlinsons 2018 Australian Construction Handbook	
Reconstruct large sign		ea	\$ 10,000.00	\$ 10,000.00	Estimation	
Bollard removal and reinstatement		ea	\$ 212.00	\$ 212.00	Bayside Council	
Keystone retaining wall		m	\$ 1,086.00	\$ 1,086.00	Bayside Council	
Blockwork retaining wall (composite, reinforced)		m ²	\$ 355.00	\$ 390.34	Rawlinsons 2018 Australian Construction Handbook	
Install timber fence 1.8m high		m	\$ 71.00	\$ 78.07	Rawlinsons 2018 Australian Construction Handbook	
Install metal pool type fence 1.4m round top	m	\$ 121.00	\$ 133.05	Rawlinsons 2018 Australian Construction Handbook		
Install metal security fence 2m spear head	m	\$ 191.00	\$ 210.02	Rawlinsons 2018 Australian Construction Handbook		
Install metal chain mesh fence 1.8m high	m	\$ 62.00	\$ 68.17	Rawlinsons 2018 Australian Construction Handbook		
Pre-construction costs	Design (includes Survey, Investigation Design, Geotech, REF, Concept & I	15%	of construction costs	Estimation		
	Project Management of Design	15%	of design costs	Estimation		
	Pre-construction contingency	40%	of total pre-construction costs	Estimation		
Additional construction costs	Construction management/supervision	15%	of construction costs	Estimation		
	Construction contingency	40%	of total construction costs	Estimation		

Bayside West FRMS - Option Costs**PRELIMINARY PROJECT COST ESTIMATE FOR FLOOD MITIGATION WORKS**

FM01: Regrade Bexley Golf Course

Date of Estimate:

Apr-22

Involves the following construction works:

- Regrade an overland flow path into the golf course from Bridge Street

ITEM DESCRIPTION	QTY	UNIT	RATE	SUB-TOTAL
1 Construction Preliminaries				
1.1 Establishment (Project Inception, Management and Coordination)	1	ea	\$ 10,000.00	\$ 10,000
1.2 Preparation and implementation of preliminaries (e.g. CEMP, SMP, TCP, QMP)	1	ea	\$ 20,000.00	\$ 20,000
1.3 Survey and set out works	1	day	\$ 1,200.00	\$ 1,200
1.4 Temporary Fencing (light duty site mesh)	252	m	\$ 11.00	\$ 2,771
1.5 Temporary Signage	1	ea	\$ 500.00	\$ 500
1.6 Portable Toilet	6	week	\$ 76.97	\$ 462
1.7 Silt fence	50	m	\$ 21.00	\$ 1,050
2 Site Clearance				
2.1 Land clearing (medium vegetation)	1,200	m2	\$ 0.58	\$ 699
2.2 Balance cut and fill (0.5/1m deep) in light soil	1,200	m3	\$ 12.32	\$ 14,778
3 Rehabilitation				
3.1 Pavement	150	m2	\$ 300.00	\$ 45,000
3.2 Turf laid, rolled and watered - couch	1,200	m2	\$ 9.90	\$ 11,875
3.3 Ground cover and planting	120	m2	\$ 7.70	\$ 924
TOTAL PRELIMINARY CONSTRUCTION COSTS				\$ 109,259
4 Pre-construction costs				
Design (includes Survey, Investigation Design, Geotech, REF, Concept & Detail Design)			15%	\$ 16,389
Project Management of Design			15%	\$ 2,458
Pre-construction sub-total				<u>\$ 18,847</u>
Pre-construction contingency			40%	\$ 7,539
TOTAL PRE-CONSTRUCTION COSTS				\$ 26,386
5 Additional construction costs				
Preliminary construction cost				\$ 109,259
Construction management/supervision			15%	\$ 16,389
Construction sub-total				<u>\$ 125,648</u>
Construction contingency			40%	\$ 50,259
TOTAL CONSTRUCTION COSTS				\$ 175,907
TOTAL PROJECT ESTIMATE				\$ 202,293

Bayside West FRMS - Option Costs

PRELIMINARY PROJECT COST ESTIMATE FOR FLOOD MITIGATION WORKS



FM02: Dowsett Park Detention Basin

Date of Estimate: **Apr-22**

Involves the following construction works:

- Excavation of basin and formation of bund/crest
- Removal of 900mm pipe in park, with headwalls at each end

ITEM	DESCRIPTION	QTY	UNIT	RATE	SUB-TOTAL
1	Construction Preliminaries				
1.1	Establishment (Project Inception, Management and Coordination)	1	ea	\$ 10,000.00	\$ 10,000
1.2	Preparation and implementation of preliminaries (e.g. CEMP, SMP, TCP, QMP)	1	ea	\$ 20,000.00	\$ 20,000
1.3	Survey and set out works	5	day	\$ 1,200.00	\$ 6,000
1.4	Temporary Fencing (light duty site mesh)	320	m	\$ 11.00	\$ 3,519
1.5	Temporary Signage	3	ea	\$ 500.00	\$ 1,500
1.6	Portable Toilet	26	week	\$ 76.97	\$ 2,001
1.7	Silt sausage	20	m	\$ 4.62	\$ 92
2	Site Clearance				
2.1	Land clearing (medium vegetation)	4,000	m2	\$ 0.58	\$ 2,331
2.2	Excavate over site to reduce levels in light soil	5,906	m3	\$ 24.08	\$ 142,218
2.3	Balance cut and fill (0.5/1m deep) in light soil	53	m3	\$ 12.32	\$ 653
2.4	Cart excavated material	5,853	per 5km per m3	\$ 32.99	\$ 193,071
2.5	Dispose of clean fill	9,365	t	\$ 208.92	\$ 1,956,452
2.6	Remove Pipes	27	m	\$ 120.00	\$ 3,240
3	Stormwater Management				
3.1	Precast headwall for 900mm diameter culvert	2	ea	\$ 1,500.00	\$ 3,000
3.2	Grate (2m x 2m)	1	ea	\$ 2,000.00	\$ 2,000
4	Rehabilitation				
4.1	Turf laid, rolled and watered - couch	4,000	m2	\$ 9.90	\$ 39,584
4.2	Ground cover and planting	400	m2	\$ 7.70	\$ 3,079
4.3	Pine bark chips	40	m3	\$ 81.92	\$ 3,277
4.4	Sign 450mm x 600mm	2	ea	\$ 439.82	\$ 880
TOTAL PRELIMINARY CONSTRUCTION COSTS					\$ 2,392,896
5	Pre-construction costs				
	Design (includes Survey, Investigation Design, Geotech, REF, Concept & Detail Design)			15%	\$ 358,934
	Project Management of Design			15%	\$ 53,840
	Pre-construction sub-total				<u>\$ 412,775</u>
	Pre-construction contingency			40%	\$ 165,110
TOTAL PRE-CONSTRUCTION COSTS					\$ 577,884
6	Additional construction costs				
	Preliminary construction cost				\$ 2,392,896
	Construction management/supervision			15%	\$ 358,934
	Construction sub-total				<u>\$ 2,751,831</u>
	Construction contingency			40%	\$ 1,100,732
TOTAL CONSTRUCTION COSTS					\$ 3,852,563
TOTAL PROJECT ESTIMATE					\$ 4,430,448

Bayside West FRMS - Option Costs

PRELIMINARY PROJECT COST ESTIMATE FOR FLOOD MITIGATION WORKS

**FM03: Kingsland Road South Overflow Management**Date of Estimate: **Apr-22**

Involves the following construction works:
 - Formation of flowpath to Highgate Street
 - Barrier along Kingsland Road South

ITEM	DESCRIPTION	QTY	UNIT	RATE	SUB-TOTAL
1	Construction Preliminaries				
1.1	Establishment (Project Inception, Management and Coordination)	1	ea	\$ 10,000.00	\$ 10,000
1.2	Preparation and implementation of preliminaries (e.g. CEMP, SMP, TCP, QMP)	0	ea	\$ 20,000.00	\$ -
1.3	Survey and set out works	1	day	\$ 1,200.00	\$ 1,200
1.4	Temporary Fencing (light duty site mesh)	36	m	\$ 11.00	\$ 396
1.5	Temporary Signage	1	ea	\$ 500.00	\$ 500
1.6	Portable Toilet	1	week	\$ 76.97	\$ 77
1.7	Silt sausage	20	m	\$ 4.62	\$ 92
2	Site Clearance				
2.1	Remove bitumen	45	m2	\$ 22.00	\$ 990
2.2	Remove kerbs	5	m	\$ 34.00	\$ 170
2.3	Take down and remove spear head security fence	55	m	\$ 20.00	\$ 1,100
3	Rehabilitation				
3.1	Footpath 1500mm wide	15	m	\$ 98.41	\$ 1,476
3.2	Cast in-situ 250mm x 1500mm kerb	5	m	\$ 101.38	\$ 507
3.3	F-Type concrete barrier 970mm high	55	m	\$ 428.83	\$ 23,585
TOTAL PRELIMINARY CONSTRUCTION COSTS					\$ 40,094
4	Pre-construction costs				
	Design (includes Survey, Investigation Design, Geotech, REF, Concept & Detail Design)			15%	\$ 6,014
	Project Management of Design			15%	\$ 902
	Pre-construction sub-total				<u>\$ 6,916</u>
	Pre-construction contingency			40%	\$ 2,766
TOTAL PRE-CONSTRUCTION COSTS					\$ 9,683
5	Additional construction costs				
	Preliminary construction cost				\$ 40,094
	Construction management/supervision			15%	\$ 6,014
	Construction sub-total				<u>\$ 46,108</u>
	Construction contingency			40%	\$ 18,443
TOTAL CONSTRUCTION COSTS					\$ 64,551
TOTAL PROJECT ESTIMATE					\$ 74,233

Bayside West FRMS - Option Costs**PRELIMINARY PROJECT COST ESTIMATE FOR FLOOD MITIGATION WORKS**

Date of Estimate: Apr-22

FM04: Powys Avenue Blockage Prevention

Involves the following construction works:

- Installation of sloped culvert screens
- Regular clearing and maintenance

ITEM	DESCRIPTION	QTY	UNIT	RATE	SUB-TOTAL
1	Construction Preliminaries				
1.1	Establishment (Project Inception, Management and Coordination)	1	ea	\$ 10,000.00	\$ 10,000
2	Stormwater Management				
3.2	Grate (762 x 762 class D sump grate)	9	ea	\$ 1,083.06	\$ 9,748
TOTAL PRELIMINARY CONSTRUCTION COSTS					\$ 19,748
3	Pre-construction costs				
	Design (includes Survey, Investigation Design, Geotech, REF, Concept & Detail Design)			15%	\$ 2,962
	Project Management of Design			15%	\$ 444
	Pre-construction sub-total				<u>\$ 3,406</u>
	Pre-construction contingency			40%	\$ 1,363
TOTAL PRE-CONSTRUCTION COSTS					\$ 4,769
4	Additional construction costs				
	Preliminary construction cost				\$ 19,748
	Construction management/supervision			15%	\$ 2,962
	Construction sub-total				<u>\$ 22,710</u>
	Construction contingency			40%	\$ 9,084
TOTAL CONSTRUCTION COSTS					\$ 31,794
TOTAL PROJECT ESTIMATE					\$ 36,563

Bayside West FRMS - Option Costs**PRELIMINARY PROJECT COST ESTIMATE FOR FLOOD MITIGATION WORKS**Date of Estimate: **Apr-22****FM05: SWSOOS Openings under railway line**

Involves the following construction works:

- Removal of concrete walls
- Clearing and fencing of openings

ITEM	DESCRIPTION	QTY	UNIT	RATE	SUB-TOTAL
1	Construction Preliminaries				
1.1	Establishment (Project Inception, Management and Coordination)	1	ea	\$ 10,000.00	\$ 10,000
1.2	Preparation and implementation of preliminaries (e.g. CEMP, SMP, TCP, QMP)	0	ea	\$ 20,000.00	\$ -
1.3	Temporary Fencing (light duty site mesh)	30	m	\$ 11.00	\$ 330
1.4	Portable Toilet	2	week	\$ 76.97	\$ 154
2	Site Clearance				
2.1	Breakup and remove reinforced concrete in trenches	20	m3	\$ 329.87	\$ 6,597
2.2	Dispose of demolition material - mixed	48	t	\$ 384.84	\$ 18,473
3	Rehabilitation				
3.1	Install metal chain mesh fence 1.8m high	20	m	\$ 68.17	\$ 1,363
TOTAL PRELIMINARY CONSTRUCTION COSTS					\$ 36,917
4	Pre-construction costs				
	Design (includes Survey, Investigation Design, Geotech, REF, Concept & Detail Design)			15%	\$ 5,538
	Project Management of Design			15%	\$ 831
	Pre-construction sub-total				\$ 6,368
	Pre-construction contingency			40%	\$ 2,547
TOTAL PRE-CONSTRUCTION COSTS					\$ 8,915
5	Additional construction costs				
	Preliminary construction cost				\$ 36,917
	Construction management/supervision			15%	\$ 5,538
	Construction sub-total				\$ 42,455
	Construction contingency			40%	\$ 16,982
TOTAL CONSTRUCTION COSTS					\$ 59,437
TOTAL PROJECT ESTIMATE					\$ 68,352

Bayside West FRMS - Option Costs**PRELIMINARY PROJECT COST ESTIMATE FOR FLOOD MITIGATION WORKS**

FM09: Queen Victoria Street Drainage Diversion

Date of Estimate:

Apr-22

Involves the following construction works:

- New 900mm diameter pipe down Queen Victoria Street

ITEM	DESCRIPTION	QTY	UNIT	RATE	SUB-TOTAL
1	Construction Preliminaries				
1.1	Establishment (Project Inception, Management and Coordination)	1	ea	\$ 10,000.00	\$ 10,000
1.2	Preparation and implementation of preliminaries (e.g. CEMP, SMP, TCP, QMP)	1	ea	\$ 20,000.00	\$ 20,000
1.3	Traffic Control	80	day	\$ 1,776.00	\$ 142,080
1.4	Survey and set out works	5	day	\$ 1,200.00	\$ 6,000
1.5	Temporary Fencing (light duty site mesh)	350	m	\$ 11.00	\$ 3,848
1.6	Temporary Signage	3	ea	\$ 500.00	\$ 1,500
1.7	Portable Toilet	26	week	\$ 76.97	\$ 2,001
1.8	Silt sausage	50	m	\$ 4.62	\$ 231
2	Site Clearance				
2.1	Remove bitumen	490	m2	\$ 22.00	\$ 10,780
2.2	Remove kerbs	350	m	\$ 34.00	\$ 11,900
2.3	Remove Pipes	109	m	\$ 120.00	\$ 13,080
2.4	Remove Pits	7	ea	\$ 566.00	\$ 3,962
2.5	Excavate trenches (up to 2m deep in light soil, incl backfilling)	980	m3	\$ 63.11	\$ 61,852
2.6	Cart excavated material	490	per 5km per m3	\$ 32.99	\$ 16,163
2.7	Dispose of demolition material - mixed	784	t	\$ 384.84	\$ 301,718
3	Stormwater Management				
3.1	Concrete pipe to AS 4058-1992 Class 4 900mm dia	350	m	\$ 692.72	\$ 242,452
3.2	Preparation of culvert base	490	m2	\$ 385.00	\$ 188,650
3.3	Precast concrete pit (1200 x 1200 x 1200)	4	ea	\$ 2,200.00	\$ 8,800
3.4	2.4m lintel and grate	4	ea	\$ 1,600.00	\$ 6,400
3.5	Break into existing pit	2	ea	\$ 600.00	\$ 1,200
4	Rehabilitation				
4.1	Pavement	490	m2	\$ 300.00	\$ 147,000
4.2	Kerb and gutter	350	m	\$ 158.00	\$ 55,300
4.3	Line marking (100mm wide)	350	m	\$ 1.92	\$ 673
TOTAL PRELIMINARY CONSTRUCTION COSTS					\$ 1,255,592
5	Pre-construction costs				
	Design (includes Survey, Investigation Design, Geotech, REF, Concept & Detail Design)			15%	\$ 188,339
	Project Management of Design			15%	\$ 28,251
	Pre-construction sub-total				<u>\$ 216,590</u>
	Pre-construction contingency			40%	\$ 86,636
TOTAL PRE-CONSTRUCTION COSTS					\$ 303,225
6	Additional construction costs				
	Preliminary construction cost				\$ 1,255,592
	Construction management/supervision			15%	\$ 188,339
	Construction sub-total				<u>\$ 1,443,930</u>
	Construction contingency			40%	\$ 577,572
TOTAL CONSTRUCTION COSTS					\$ 2,021,503
TOTAL PROJECT ESTIMATE					\$ 2,324,728

Bayside West FRMS - Option Costs**PRELIMINARY PROJECT COST ESTIMATE FOR FLOOD MITIGATION WORKS****FM10: Seaforth Park Detention Basins**Date of Estimate: **Apr-22**

Involves the following construction works:

- Excavation of two basins and formation of bund/crest
- Minor works on Caledonian Street to direct overland flows to basins
- Connect both basins to existing 600mm diameter pipe

ITEM DESCRIPTION	QTY	UNIT	RATE	SUB-TOTAL
1 Construction Preliminaries				
1.1 Establishment (Project Inception, Management and Coordination)	1	ea	\$ 10,000.00	\$ 10,000
1.2 Preparation and implementation of preliminaries (e.g. CEMP, SMP, TCP, QMP)	1	ea	\$ 20,000.00	\$ 20,000
1.3 Survey and set out works	5	day	\$ 1,200.00	\$ 6,000
1.4 Temporary Fencing (light duty site mesh)	400	m	\$ 11.00	\$ 4,398
1.5 Temporary Signage	4	ea	\$ 500.00	\$ 2,000
1.6 Portable Toilet	26	week	\$ 76.97	\$ 2,001
1.7 Silt sausage	50	m	\$ 4.62	\$ 231
2 Site Clearance				
2.1 Land clearing (medium vegetation)	3,020	m2	\$ 0.58	\$ 1,760
2.2 Excavate over site to reduce levels in light soil	5,435	m3	\$ 24.08	\$ 130,876
2.3 Balance cut and fill (0.5/1m deep) in light soil	352	m3	\$ 12.32	\$ 4,335
2.4 Cart excavated material	5,083	per 5km per m3	\$ 32.99	\$ 167,671
2.5 Dispose of clean fill	8,133	t	\$ 208.92	\$ 1,699,068
3 Stormwater Management				
3.1 Cast in-situ concrete pit (900 x 900 x 900)	2	ea	\$ 1,814.27	\$ 3,629
3.2 Grate (762 x 762 class D sump grate)	2	ea	\$ 1,083.06	\$ 2,166
3.3 Break into existing pit	4	ea	\$ 600.00	\$ 2,400
4 Rehabilitation				
4.1 Turf laid, rolled and watered - couch	3,020	m2	\$ 9.90	\$ 29,886
4.2 Ground cover and planting	302	m2	\$ 7.70	\$ 2,324
4.3 Pine bark chips	30	m3	\$ 81.92	\$ 2,474
4.4 Sign 450mm x 600mm	2	ea	\$ 439.82	\$ 880
4.5 Kerb and gutter	50	m	\$ 158.00	\$ 7,900
4.6 Footpath	90	m2	\$ 304.00	\$ 27,360
TOTAL PRELIMINARY CONSTRUCTION COSTS				\$ 2,127,360
5 Pre-construction costs				
Design (includes Survey, Investigation Design, Geotech, REF, Concept & Detail Design)			15%	\$ 319,104
Project Management of Design			15%	\$ 47,866
Pre-construction sub-total				\$ 366,970
Pre-construction contingency			40%	\$ 146,788
TOTAL PRE-CONSTRUCTION COSTS				\$ 513,757
6 Additional construction costs				
Preliminary construction cost				\$ 2,127,360
Construction management/supervision			15%	\$ 319,104
Construction sub-total				\$ 2,446,464
Construction contingency			40%	\$ 978,585
TOTAL CONSTRUCTION COSTS				\$ 3,425,049
TOTAL PROJECT ESTIMATE				\$ 3,938,806

Bayside West FRMS - Option Costs

PRELIMINARY PROJECT COST ESTIMATE FOR FLOOD MITIGATION WORKS



FM11: Subway Road Drainage Upgrade

Date of Estimate: Apr-22

Involves the following construction works:

- New 1.8m x 1m box culvert from Subway Road to Muddy Creek

ITEM	DESCRIPTION	QTY	UNIT	RATE	SUB-TOTAL
1 Construction Preliminaries					
1.1	Establishment (Project Inception, Management and Coordination)	1	ea	\$ 10,000.00	\$ 10,000
1.2	Preparation and implementation of preliminaries (e.g. CEMP, SMP, TCP, QMP)	1	ea	\$ 20,000.00	\$ 20,000
1.3	Traffic Control	24	day	\$ 1,776.00	\$ 42,624
1.4	Survey and set out works	2	day	\$ 1,200.00	\$ 2,400
1.5	Temporary Fencing (light duty site mesh)	170	m	\$ 11.00	\$ 1,869
1.6	Temporary Signage	1	ea	\$ 500.00	\$ 500
1.7	Portable Toilet	13	week	\$ 76.97	\$ 1,001
1.8	Silt sausage	30	m	\$ 4.62	\$ 139
1.9	Silt fence	30	m	\$ 21.00	\$ 630
2 Site Clearance					
2.1	Remove bitumen	285	m2	\$ 22.00	\$ 6,270
2.2	Remove kerbs	10	m	\$ 34.00	\$ 340
2.3	Excavate trenches (beyond 2m deep in light soil, incl backfilling)	855	m3	\$ 65.00	\$ 55,575
2.4	Cart excavated material	428	per 5km per m3	\$ 32.99	\$ 14,102
2.5	Dispose of demolition material - mixed	684	t	\$ 384.84	\$ 263,234
3 Stormwater Management					
3.1	Precast Concrete Box Culvert (1800 x 1800)	75	m	\$ 3,000.00	\$ 225,000
3.2	Preparation of culvert base	285	m2	\$ 385.00	\$ 109,725
3.3	Precast concrete pit (2400 x 2400 x 2400)	1	ea	\$ 4,000.00	\$ 4,000
3.4	Break into existing pit	2	ea	\$ 600.00	\$ 1,200
4 Rehabilitation					
4.1	Pavement	285	m2	\$ 300.00	\$ 85,500
4.2	Kerb and gutter	10	m	\$ 158.00	\$ 1,580
TOTAL PRELIMINARY CONSTRUCTION COSTS					\$ 845,688
5 Pre-construction costs					
	Design (includes Survey, Investigation Design, Geotech, REF, Concept & Detail Design)			15%	\$ 126,853
	Project Management of Design			15%	\$ 19,028
	Pre-construction sub-total				<u>\$ 145,881</u>
	Pre-construction contingency			40%	\$ 58,352
TOTAL PRE-CONSTRUCTION COSTS					\$ 204,234
6 Additional construction costs					
	Preliminary construction cost				\$ 845,688
	Construction management/supervision			15%	\$ 126,853
	Construction sub-total				<u>\$ 972,541</u>
	Construction contingency			40%	\$ 389,016
TOTAL CONSTRUCTION COSTS					\$ 1,361,557
TOTAL PROJECT ESTIMATE					\$ 1,565,791

Bayside West FRMS - Option Costs**PRELIMINARY PROJECT COST ESTIMATE FOR FLOOD MITIGATION WORKS**

Date of Estimate: Apr-22

FM12: Mutch Avenue Drainage Line

Involves the following construction works:

- New 900mm diameter pipe from Mutch Avenue to Cooks River

ITEM	DESCRIPTION	QTY	UNIT	RATE	SUB-TOTAL
1	Construction Preliminaries				
1.1	Establishment (Project Inception, Management and Coordination)	1	ea	\$ 10,000.00	\$ 10,000
1.2	Preparation and implementation of preliminaries (e.g. CEMP, SMP, TCP, QMP)	1	ea	\$ 20,000.00	\$ 20,000
1.3	Traffic Control - Road closure	14	day	\$ 300.00	\$ 4,200
1.4	Survey and set out works	2	day	\$ 1,200.00	\$ 2,400
1.5	Temporary Fencing (light duty site mesh)	120	m	\$ 11.00	\$ 1,319
1.6	Temporary Signage	1	ea	\$ 500.00	\$ 500
1.7	Portable Toilet	4	week	\$ 76.97	\$ 308
1.8	Silt sausage	5	m	\$ 4.62	\$ 23
1.9	Silt fence	20	m	\$ 21.00	\$ 420
2	Site Clearance				
2.1	Remove bitumen	5	m2	\$ 22.00	\$ 110
2.2	Remove kerbs	5	m	\$ 34.00	\$ 170
2.3	Excavate trenches (beyond 2m deep in light soil, incl backfilling)	238	m3	\$ 65.00	\$ 15,438
2.4	Cart excavated material	119	per 5km per m3	\$ 32.99	\$ 3,917
2.5	Dispose of contaminated soil (low level, assumed ASS)	190	t	\$ 384.84	\$ 73,120
3	Stormwater Management				
3.1	Concrete pipe to AS 4058-1992 Class 4 900mm dia	50	m	\$ 692.72	\$ 34,636
3.2	Preparation of culvert base	95	m2	\$ 385.00	\$ 36,575
3.3	Precast concrete pit (2400 x 2400 x 2400)	2	ea	\$ 4,000.00	\$ 8,000
3.4	Precast headwall for 900mm diameter culvert	1	ea	\$ 1,500.00	\$ 1,500
4	Rehabilitation				
4.1	Pavement	5	m2	\$ 300.00	\$ 1,500
4.2	Kerb and gutter	5	m	\$ 158.00	\$ 790
4.3	Footpath	3	m2	\$ 304.00	\$ 866
4.4	Turf laid, rolled and watered - couch	95	m2	\$ 9.90	\$ 940
TOTAL PRELIMINARY CONSTRUCTION COSTS					\$ 216,733
5	Pre-construction costs				
	Design (includes Survey, Investigation Design, Geotech, REF, Concept & Detail Design)			15%	\$ 32,510
	Project Management of Design			15%	\$ 4,876
	Pre-construction sub-total				<u>\$ 37,386</u>
	Pre-construction contingency			40%	\$ 14,955
TOTAL PRE-CONSTRUCTION COSTS					\$ 52,341
6	Additional construction costs				
	Preliminary construction cost				\$ 216,733
	Construction management/supervision			15%	\$ 32,510
	Construction sub-total				<u>\$ 249,243</u>
	Construction contingency			40%	\$ 99,697
TOTAL CONSTRUCTION COSTS					\$ 348,940
TOTAL PROJECT ESTIMATE					\$ 401,281

PRELIMINARY PROJECT COST ESTIMATE FOR FLOOD MITIGATION WORKS



FM13: Alice Street Drainage Line

Date of Estimate: Apr-22

Involves the following construction works:
 - New 1.8m x 1.2m box culvert from cnr Alice Street/Chuter Avenue to Botany Bay

ITEM	DESCRIPTION	QTY	UNIT	RATE	SUB-TOTAL
1 Construction Preliminaries					
1.1	Establishment (Project Inception, Management and Coordination)	1	ea	\$ 10,000.00	\$ 10,000
1.2	Preparation and implementation of preliminaries (e.g. CEMP, SMP, TCP, QMP)	1	ea	\$ 20,000.00	\$ 20,000
1.3	Traffic Control	72	day	\$ 1,776.00	\$ 127,872
1.4	Survey and set out works	10	day	\$ 1,200.00	\$ 12,000
1.5	Temporary Fencing (light duty site mesh)	510	m	\$ 11.00	\$ 5,608
1.6	Temporary Signage	3	ea	\$ 500.00	\$ 1,500
1.7	Portable Toilet	26	week	\$ 76.97	\$ 2,001
1.8	Silt sausage	50	m	\$ 4.62	\$ 231
1.9	Silt fence	50	m	\$ 21.00	\$ 1,050
2 Site Clearance					
2.1	Remove bitumen	1,036	m2	\$ 22.00	\$ 22,792
2.2	Remove kerbs	370	m	\$ 34.00	\$ 12,580
2.3	Excavate trenches (beyond 2m deep in light soil, incl backfilling)	4,200	m3	\$ 65.00	\$ 273,000
2.4	Cart excavated material	2,100	per 5km per m3	\$ 32.99	\$ 69,272
2.5	Dispose of demolition material - mixed	3,360	t	\$ 384.84	\$ 1,293,077
3 Stormwater Management					
3.1	Precast Concrete Box Culvert (1800 x 1800)	500	m	\$ 3,000.00	\$ 1,500,000
3.2	Preparation of culvert base	1,400	m2	\$ 385.00	\$ 539,000
3.3	Precast concrete pit (2400 x 2400 x 2400)	4	ea	\$ 4,000.00	\$ 16,000
3.4	Break into existing pit	1	ea	\$ 600.00	\$ 600
3.5	Precast headwall for 1500mm diameter culvert	1	ea	\$ 5,000.00	\$ 5,000
3.6	Outlet scour protection - reno mattress	10	m2	\$ 500.00	\$ 5,000
4 Rehabilitation					
4.1	Pavement	1,036	m2	\$ 300.00	\$ 310,800
4.2	Kerb and gutter	370	m	\$ 158.00	\$ 58,460
4.3	Turf laid, rolled and watered - couch	364	m2	\$ 9.90	\$ 3,602
4.4	Ground cover and planting	36	m2	\$ 7.70	\$ 280
4.5	Pine bark chips	4	m3	\$ 81.92	\$ 298
TOTAL PRELIMINARY CONSTRUCTION COSTS					\$ 4,285,843
5 Pre-construction costs					
	Design (includes Survey, Investigation Design, Geotech, REF, Concept & Detail Design)			15%	\$ 642,876
	Project Management of Design			15%	\$ 96,431
	Pre-construction sub-total				\$ 739,308
	Pre-construction contingency			40%	\$ 295,723
TOTAL PRE-CONSTRUCTION COSTS					\$ 1,035,031
6 Additional construction costs					
	Preliminary construction cost				\$ 4,285,843
	Construction management/supervision			15%	\$ 642,876
	Construction sub-total				\$ 4,928,720
	Construction contingency			40%	\$ 1,971,488
TOTAL CONSTRUCTION COSTS					\$ 6,900,207
TOTAL PROJECT ESTIMATE					\$ 7,935,239

APPENDIX J. COMMUNITY CONSULTATION



Table J1: Summary of Public Exhibition Submissions

No.	Submitter	Summary of Submission	Summary of Outcome
1	Local Resident	<p>The potential underground drainage system proposed for 2-4 Guess Avenue should be a high priority for council as Arncliffe Street is one of the worst affected roads in Bayside and is a key thoroughfare for pedestrians and cars. Especially with the current one-way system, the severe flooding here means cars are left traversing dangerously high floodwaters with no alternative route.</p>	<p>Arncliffe Street is a known flood hot spot and was one of the key areas for investigating options. A number of options were investigated at this location, but unfortunately, due to the low-lying nature of the street, proximity to the Bonnie Doon channel that is affected by tide and the catchment that drains to this location, there is little that can be done to achieve a reasonable benefit. As discussed in Section 10.2.4.11, there would need to be a flood storage tank of at least 5,000 m³ to obtain any substantial benefit in large flood events. This is a very large storage tank that would cost a lot of money. The tangible benefit would primarily be to vehicles, which by their nature can avoid damage by being moved. In addition, benefits would be seen mostly for the frequent short-duration storm event. In a major flood event which has a longer storm duration e.g. 9 to 12 hours, there would be nil benefit. While it is understood that this is a key flood risk location, a storage tank does not solve all the issues and it is recommended that response modification options be adopted as the priority measure.</p> <p>The fast response of the catchment means that flash flooding can occur with very little warning, but risk to vehicles is currently managed by manual road closures. Response Modification Measure RM04 - improvements to driver safety, and in particular the installation of flood signs and depth markers is a high priority action, with Arncliffe Street being one of the key locations where this is recommended for the future management of risk to vehicles on Arncliffe Street.</p>

No.	Submitter	Summary of Submission	Summary of Outcome
2	Local Resident	<p>FM08 - 10.2.4.11 - Guess Avenue Storage Tank. Please up the priority of this one, it is the perfect opportunity with the park coming to 4 Guess Avenue.</p> <p>2 Guess Avenue, no chance, that truck company wants too much money, my assumption because that site would of been developed already.</p>	<p>In addition to response 1: The issue with the park at 4 Guess Avenue is the capture and diversion of water into a storage tank. The park itself, being located at a higher elevation than Arncliffe Street, only captures a portion of the catchment runoff contributing to flooding on Arncliffe Street. The cost of implementing such a storage tank outweighs the small benefit that it would provide on Arncliffe Street.</p>
3	Local Resident	<p>I'm please to see FM08 Guess Avenue storage tank is being thought of. The intersection of Guess Avenue and Arncliffe Street is a constant issue when a reasonable amount of rain happens quickly. There is literally nowhere for it to go. Perhaps City of Sydney's approach to the Zetland "wetland" issue on Joynton Avenue might give some guidance also?</p>	<p>In addition to response 1: WMAwater has been involved in the flooding issues of Joynton Avenue. While flood storage options were historically investigated for Zetland, trunk drain upgrades have been proposed instead of detention basins. These trunk drain options are viable as there is grade available to convey floodwaters to Alexandra Canal. At Arncliffe Street, due to its low-lying nature, trunk drain upgrades are of minimal benefit due to the downstream constraints in the Bonnie Doon channel.</p>
4	Local Resident	<p>Option FM06; page 142: Wolli Creek at Bexley Road is mapped as Key Fish Habitat by NSW Fisheries. Any works in this area must consider impacts to Key Fish Habitat as per the Fisheries Management Act 1994. If works proposed are within or adjacent to the watercourse, any designs should consider the Guidelines for Controlled Activities under the Water Management Act 2000.</p> <p>Flood Modification Option 7; page 146: Levee at Bardwell Park needs to consider possibility of increased downstream flooding, and erosion of Wolli Creek banks downstream or on the opposite bank. If levee is built above the 1% AEP, it is</p>	<p>The options that are affected by the Fisheries Management Act 1994 are noted and additional text has been included in the report to this effect. The Guidelines for Controlled Activities on Waterfront Land has also been noted and included in the report.</p> <p>For the Bardwell Park Levee Option (FM07), it is agreed that the increase in downstream flooding and erosion should be considered in a detailed investigation. As a preliminary check, the change in the 1% AEP velocity is less than 0.05m/s, or approximately 3% of the in-channel velocity. In addition to this, the increase in peak water level for the 5% AEP and 1% AEP</p>

No.	Submitter	Summary of Submission	Summary of Outcome
		<p>noted to raise peak flood levels in Wollie Creek. Consider impacts on ecology and geomorphology of Wollie Creek as a result of the increase in flood levels.</p> <p>Flood Modification Option 12; page 168: If a new outlet pipe is built to discharge water into the Cooks River, the outlet must be designed as per Guidelines for Controlled Activities on Waterfront Land, as well as considerations under the Fisheries Management Act 1994.</p>	<p>events are shown in Figures H13 and H14, respectively. These indicate that the increase in peak water level is no more than 0.06m, although a detailed investigation should confirm the material impact on the banks of the creek (vegetation, erosion, etc.).</p>
5	Bexley Golf Club	<p>Bexley Golf Club requested for new dams in the golf course to reduce flooding in the road, golf course and to re-use water in the golf course. Photos and videos of flooding were provided in an email correspondence.</p>	<p>Bardwell Creek essentially runs through Bexley Golf Course. The overland flow path will be activated when the capacity of the trunk drain underneath the golf course reaches capacity. The flooding within the golf course is understandable from this perspective.</p> <p>This option was previously investigated in the previous Wollie Creek, Bardwell Creek, Bonnie Doon Channel and Eve Street/Cahill Park Catchments Floodplain Management Study and Plan (1998). This option (BC1) consisted of 2 or 3 shallow basins in Bexley Golf Course with a wall at Stoney Creek Road. This option was marked as a high priority for investigation in the study. This was re-assessed as part of the current Bayside West Floodplain Risk Management Study and Plan, and it was determined that the shallow basins were unlikely to provide a significant downstream benefit. An alternative configuration was proposed in the previous study that consists of restricting the outflow via the culverts and purposefully flooding the golf course, making flooding worse</p>

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			<p>within the golf course (within designed basins) and reducing flooding downstream.</p> <p>Water is stored within the golf course in all design events, however, it only spills onto Stoney Creek Road in the 2% AEP event and larger. In these large events, there is already a significant amount of water stored within the golf course. By simply constructing a wall at Stoney Creek Road, the golf course could be turned into a large dam that reduces flooding over Stoney Creek Road and downstream (up to 0.5m reduction in the 1% AEP flood level). This, however, would provide limited benefit to properties and would worsen flooding within the golf course. Trying to contain this water within designed basins while considering the existing golf course use would be difficult to achieve.</p> <p>There are several constraints to a basin:</p> <ol style="list-style-type: none"> 1. Area. A large area would be required for the placement of the dam, that would most likely require removal of some holes or a rearrangement of the course. 2. Depth. As indicated in the previous study, it is likely that only shallow basins would be viable, and as such the benefit that they provide would be minimal. 3. Configuration. The configuration of the basin would need to be considered - whether it would act as a 'wet basin' (i.e. a pond), or 'dry basin' (fills only in flood events). A wet basin with permanent water would have very little influence on downstream flood levels, as the basin would likely be full prior

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			<p>to a storm burst that causes flooding. It is assumed that if water re-use is proposed, that a wet basin would be required. A dry basin would require a low flow outlet to the existing culvert under the golf course, which is possible.</p> <p>Noting this, there is opportunity to formalise basins within the golf course to better manage the overland flows and for the re-use within the golf course. This can be undertaken in consultation with Bayside Council. While this would not be expected to have any significant benefit to downstream flooding, it may better manage surface flows within the golf course. Flood modelling would be able to inform the design of such basins. The proposed option FM01, involving the regrading of the golf course, had minor downstream impacts to Preddys Road, in the order of 0.05m. It was recommended that additional works be investigated in conjunction with the design of the flow path, and these works could involve the formalisation of basins within the golf course that could offset downstream impacts and provide the amenity sought by the golf course owner.</p>
6	SES	<p>Several issues were raised:</p> <ol style="list-style-type: none"> 1. Identification of rainfall gauges aligned to the appropriate IFD tables would assist in providing triggers for response actions. 2. Include details of time range to overtop or fill behind levees and duration of flooding. 3. Provision of all data related to the study. 4. Location of properties inundated above floor and in which 	<p>WMAwater addressed these issues:</p> <ol style="list-style-type: none"> 1. Details of rainfall gauges is presented in each relevant flood study, and an IFD table is provided in Table 4. WMAwater will not assign specific triggers and actions. 2. Diagram 8, Diagram 9 and Diagram 10 have been added showing a water level time series for the range of design flood events at each levee. 3. At the completion of the study, all modelling files and

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		<p>event this occurs.</p> <ol style="list-style-type: none"> 5. Shelter-in-place is only supported for existing development where evacuation is not possible, and is not supported for new development. 6. Evacuation plans should not be used as a condition for consent. 	<p>results will be provided in the correct format for upload to the SES Flood Data Portal.</p> <ol style="list-style-type: none"> 4. WMAwater have now provided maps (Figure 27 to Figure 30) with colour-coded markers indicating the AEP event in which above floor flooding is estimated to first occur. 5. SES has provided guidance on their 'shelter-in-place' strategy, and hence reference to this has been removed. 6. It has been recommended that for evacuation, that the DCP align with the 'shelter-in-place' guideline (Reference 52) when they are finalised.

Project Report

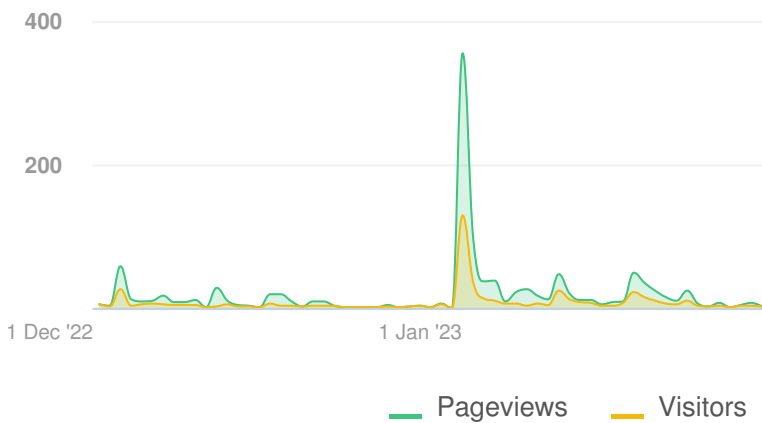
30 November 2022 - 31 January 2023

Have Your Say Bayside

Bayside West Floodplain Risk Management Study and Plan



Visitors Summary

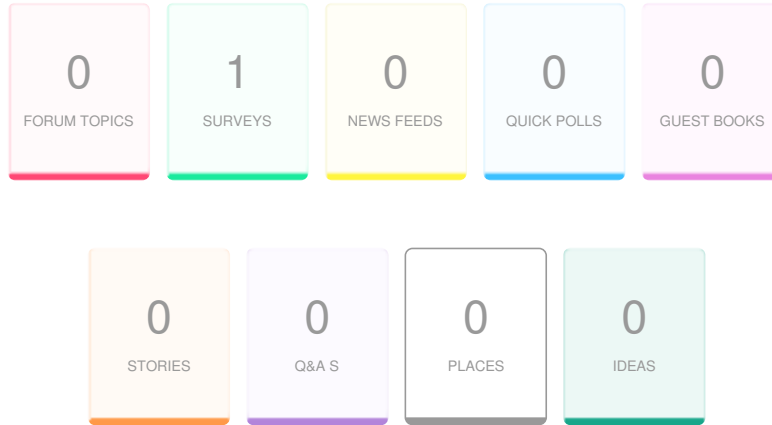


Highlights

TOTAL VISITS	548	MAX VISITORS PER DAY	129
NEW REGISTRATIONS	0		
ENGAGED VISITORS	5	INFORMED VISITORS	207
		AWARE VISITORS	443

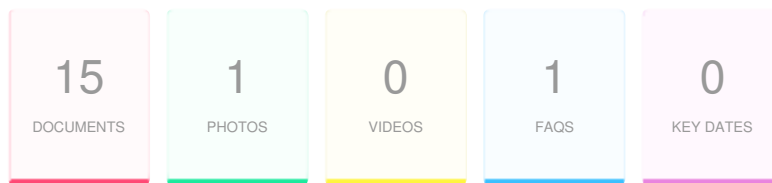
Aware Participants	443	Engaged Participants	5		
Aware Actions Performed	Participants	Engaged Actions Performed	Registered	Unverified	Anonymous
Visited a Project or Tool Page	443	Contributed on Forums	0	0	0
Informed Participants	207	Participated in Surveys	0	0	5
Informed Actions Performed	Participants	Contributed to Newsfeeds	0	0	0
Viewed a video	0	Participated in Quick Polls	0	0	0
Viewed a photo	22	Posted on Guestbooks	0	0	0
Downloaded a document	189	Contributed to Stories	0	0	0
Visited the Key Dates page	0	Asked Questions	0	0	0
Visited an FAQ list Page	7	Placed Pins on Places	0	0	0
Visited Instagram Page	0	Contributed to Ideas	0	0	0
Visited Multiple Project Pages	166				
Contributed to a tool (engaged)	5				

ENGAGEMENT TOOLS SUMMARY



Tool Type	Engagement Tool Name	Tool Status	Visitors	Contributors		
				Registered	Unverified	Anonymous
Survey Tool	Floodplain Risk Management Study & Plans for four Catchme...	Archived	6	0	0	5

INFORMATION WIDGET SUMMARY



Widget Type	Engagement Tool Name	Visitors	Views/Downloads
Document	Bayside West Flood Risk Management Study - Public Exhibition Summary	175	228
Document	Flood Modification Options - Bayside West	12	12
Document	Bayside West FRMS Draft Public Exhibition Report	12	13
Document	Draft Bayside West Flood Risk Management Study and Plan - Complete ...	10	18
Document	Bayside West FRMS Draft Public Exhibition Figures	7	7
Document	Bayside West FRMS Draft Public Exhibition Attachment A	5	6
Document	Bayside West FRMS Draft Public Exhibition Appendix B	5	6
Document	Bayside West FRMS Draft Public Exhibition Appendix H	4	5
Document	Bayside West FRM Draft Public Exhibition Appendix C	4	5
Document	Bayside West FRMS Draft Public Exhibition Appendix A	4	6
Document	Bayside West FRMS Draft Public Exhibition Appendix I	3	3
Document	Bayside West FRMS Draft Public Exhibition Appendix G	2	2
Document	Bayside West FRMS Draft Public Exhibition Appendix F	2	2
Document	Bayside West FRMS Draft Public Exhibition Appendix E	2	2
Document	Bayside West FRMS Draft Public Exhibition Appendix D	2	2
Photo	Four catchment areas included in the Study	22	22
Faqs	faqs	7	7
Key Dates	Key Date	0	0

INFORMATION WIDGET SUMMARY

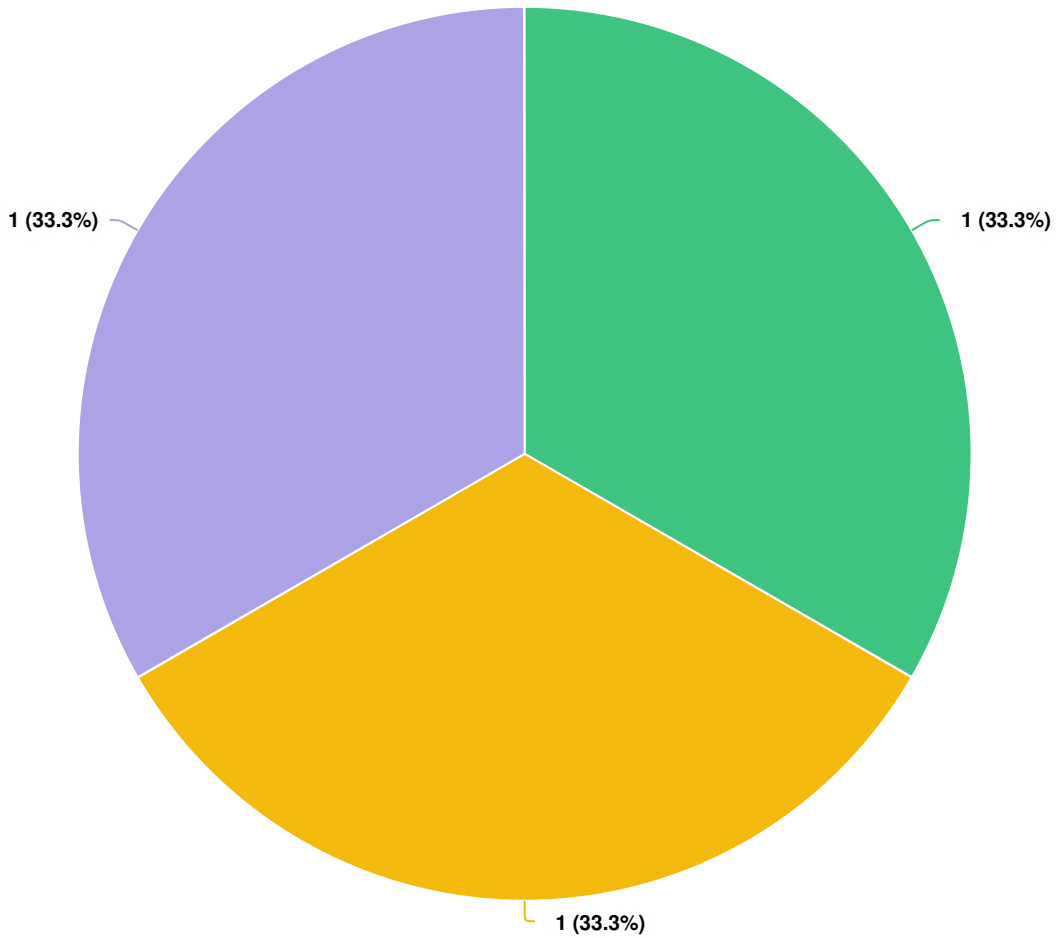
Widget Type	Engagement Tool Name	Visitors	Views/Downloads
Key Dates	Key Date	0	0

ENGAGEMENT TOOL: SURVEY TOOL

Floodplain Risk Management Study & Plans for four Catchments in Bayside West

Visitors 6	Contributors 5	CONTRIBUTIONS 5
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What is your age?



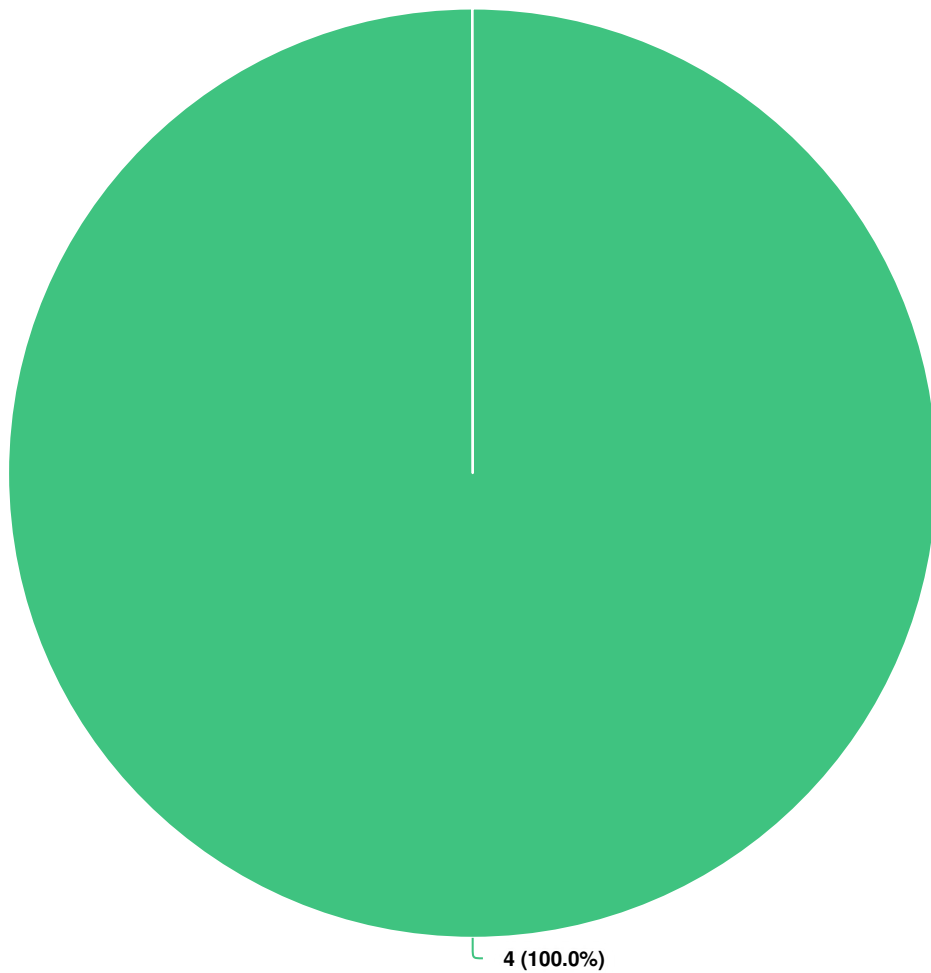
Question options

- 25-34 years
- 45-54 years
- 65-74 years

Optional question (3 response(s), 2 skipped)

Question type: Radio Button Question

Are you Aboriginal or Torres Strait Islander?



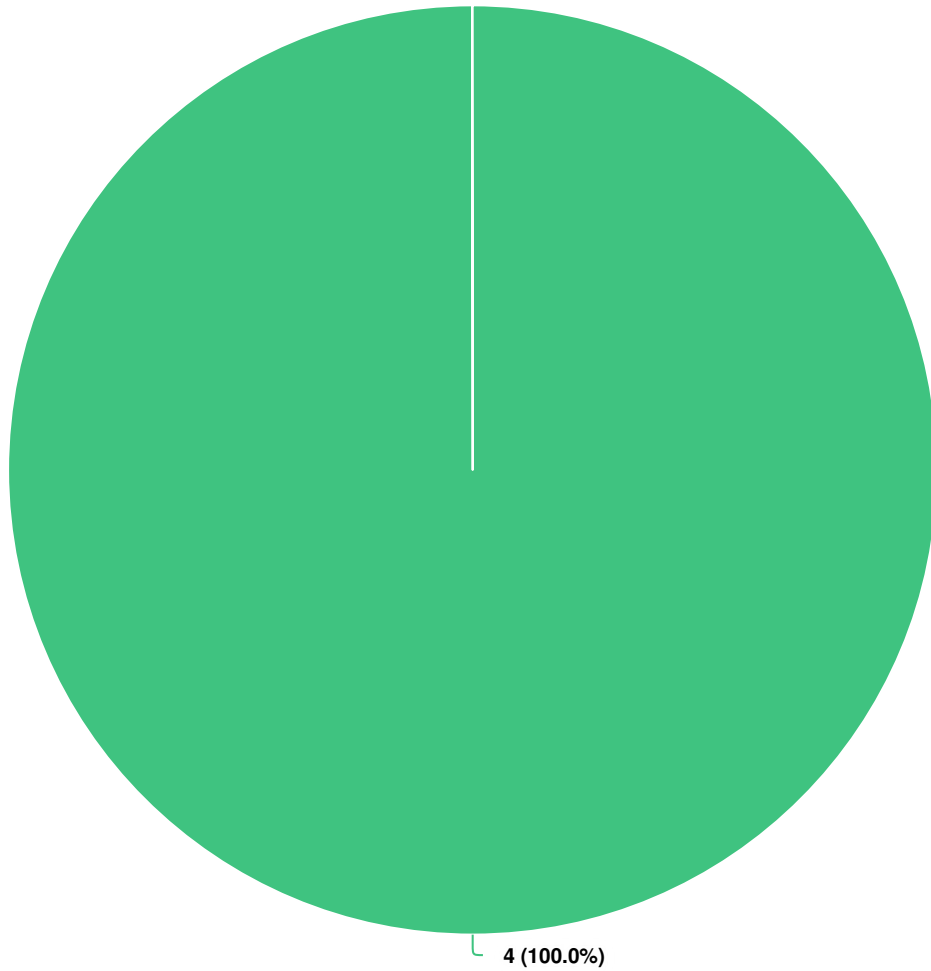
Question options

- No

Optional question (4 response(s), 1 skipped)

Question type: Radio Button Question

Do you have a disability?



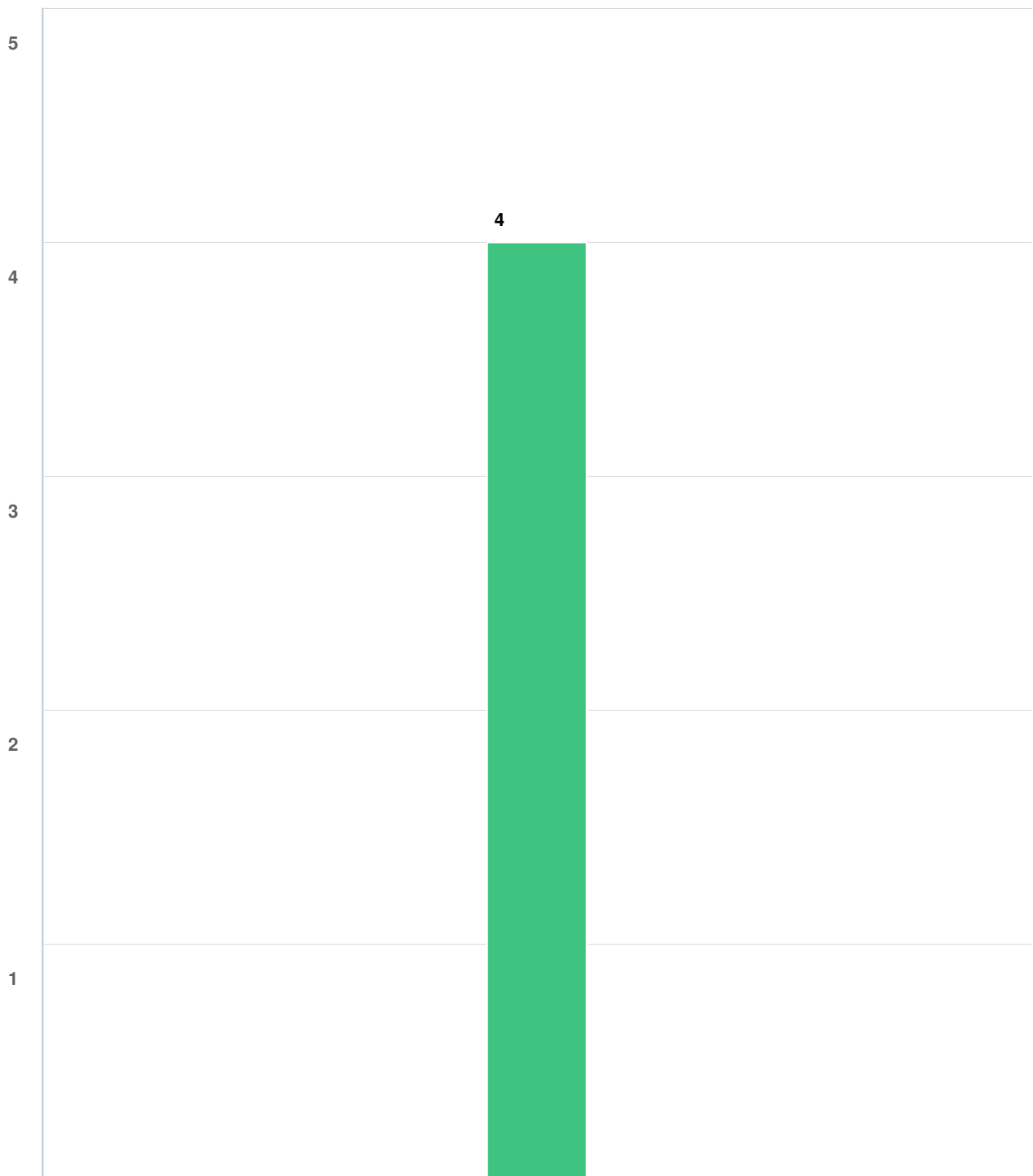
Question options

- No

Optional question (4 response(s), 1 skipped)

Question type: Radio Button Question

What language do you speak at home?



Question options

- English

Optional question (4 response(s), 1 skipped)

Question type: Checkbox Question