

Appendices

Appendix A – Photographs



Figure A.1 Cooks River near Hurlstone Park



Figure A.2 Rail bridge over Cooks River



Figure A.3 Cooks River near rail crossing (looking upstream)



Figure A.4 Upper reaches of Salt Pan Creek



Figure A.5 Tidal reaches of Salt Pan Creek near Riverwood



Figure A.6 Wetland area near Riverwood



Figure A.7 Western Channel south east of Marrickville Station on Myrtle Street



Figure A.8 Culvert under rail corridor near Belmore Sportsground



Figure A.9 Rail culvert structure west of Lakemba Station



Figure A.10 One of the culvert structures passing beneath the rail corridor at Wiley Park Station

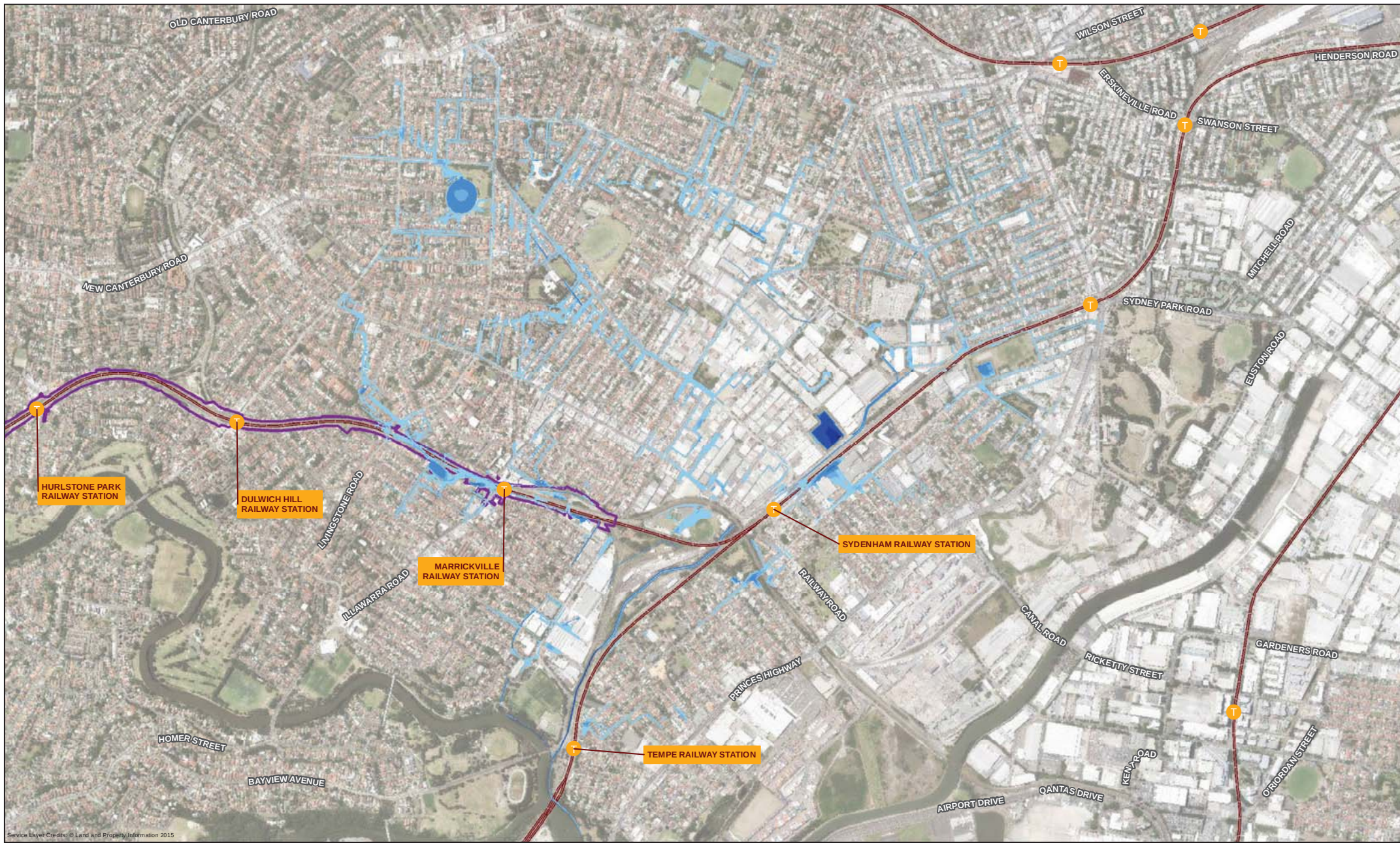


Figure A.11 Upper reaches of Coxs Creek



Figure A.12 Confluence of Coxs Creek and Cooks River near South Strathfield

Appendix B – Flood Maps





Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- Train station
- Railway

Depth (m)
0.00 - 0.05
0.05 - 0.30

0.30 - 0.50
0.50 - 1.00
1.01 - 1.50
1.50 - 2.00
2.00 - 2.50
>2.50



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Job Number 21-25273
Revision A
Date 22 May 2017

Existing 39% AEP flood depth

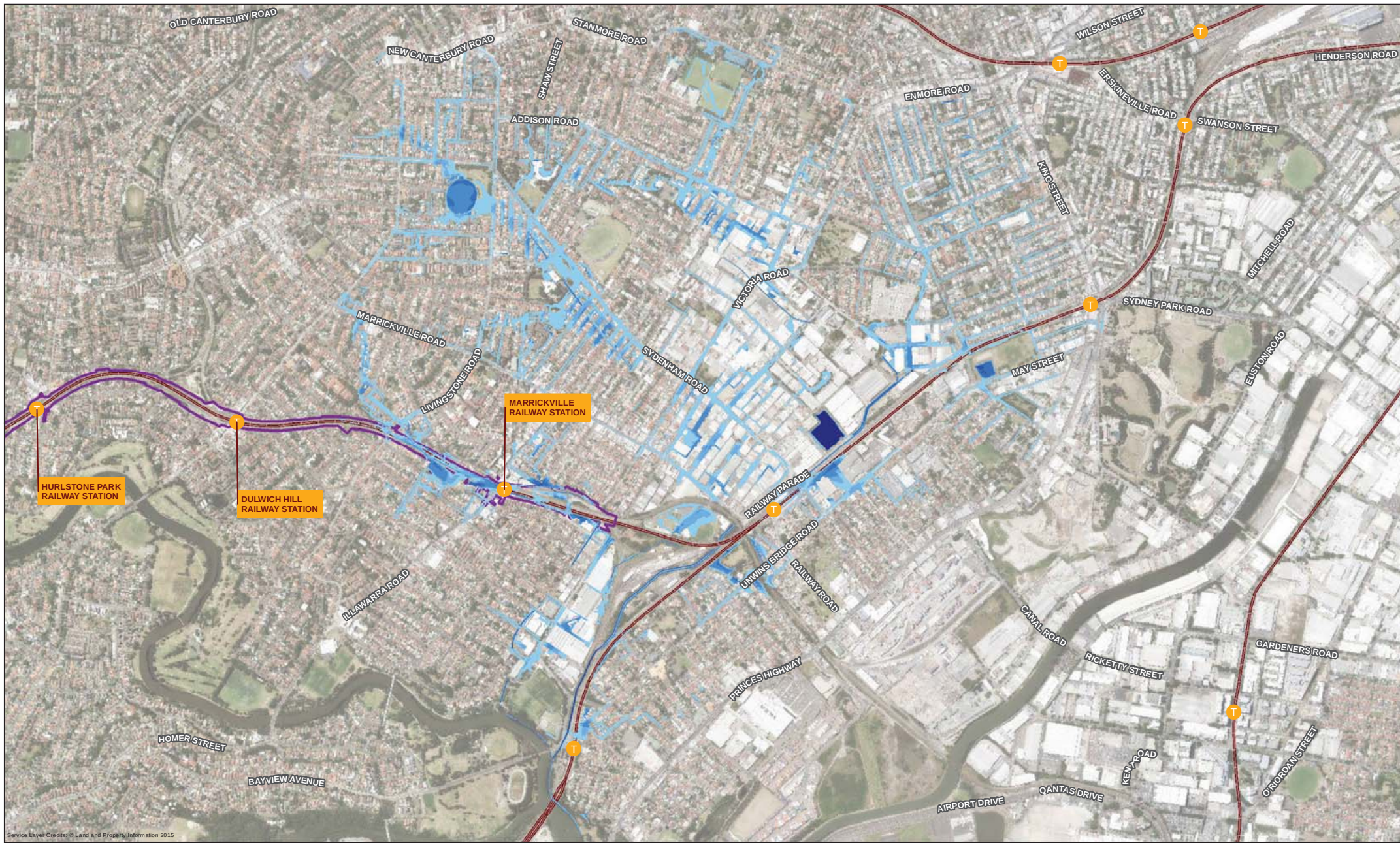
Figure B.2

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydney@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015

Paper Size A3

0 100 200 400

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

LEGEND

 Project area

T Train station

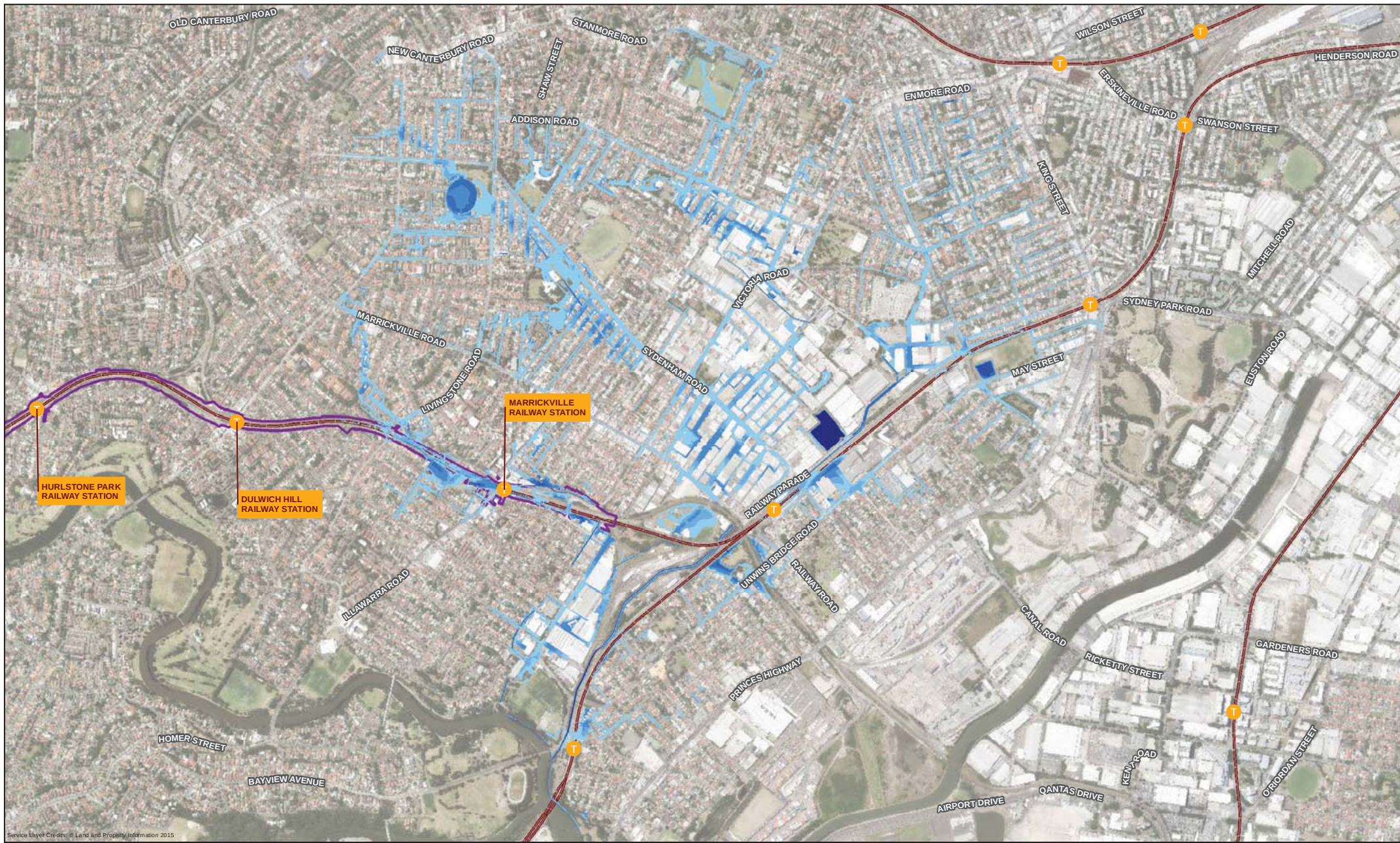
Railway

Depth (m)

	0.00 - 0.05		0.30 - 0.50		1.50 - 2.00
	0.05 - 0.30		0.50 - 1.00		2.00 - 2.50
	1.01 - 1.50		>2.50		

Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Job Number 21-25273
Revision A
Date 22 May 2017



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Depth (m)

- 0.00 - 0.05
- 0.05 - 0.30
- 0.30 - 0.50
- 0.50 - 1.00
- 1.01 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- >2.50



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Job Number 21-25273
Revision A
Date 22 May 2017

Existing 10% AEP flood depth

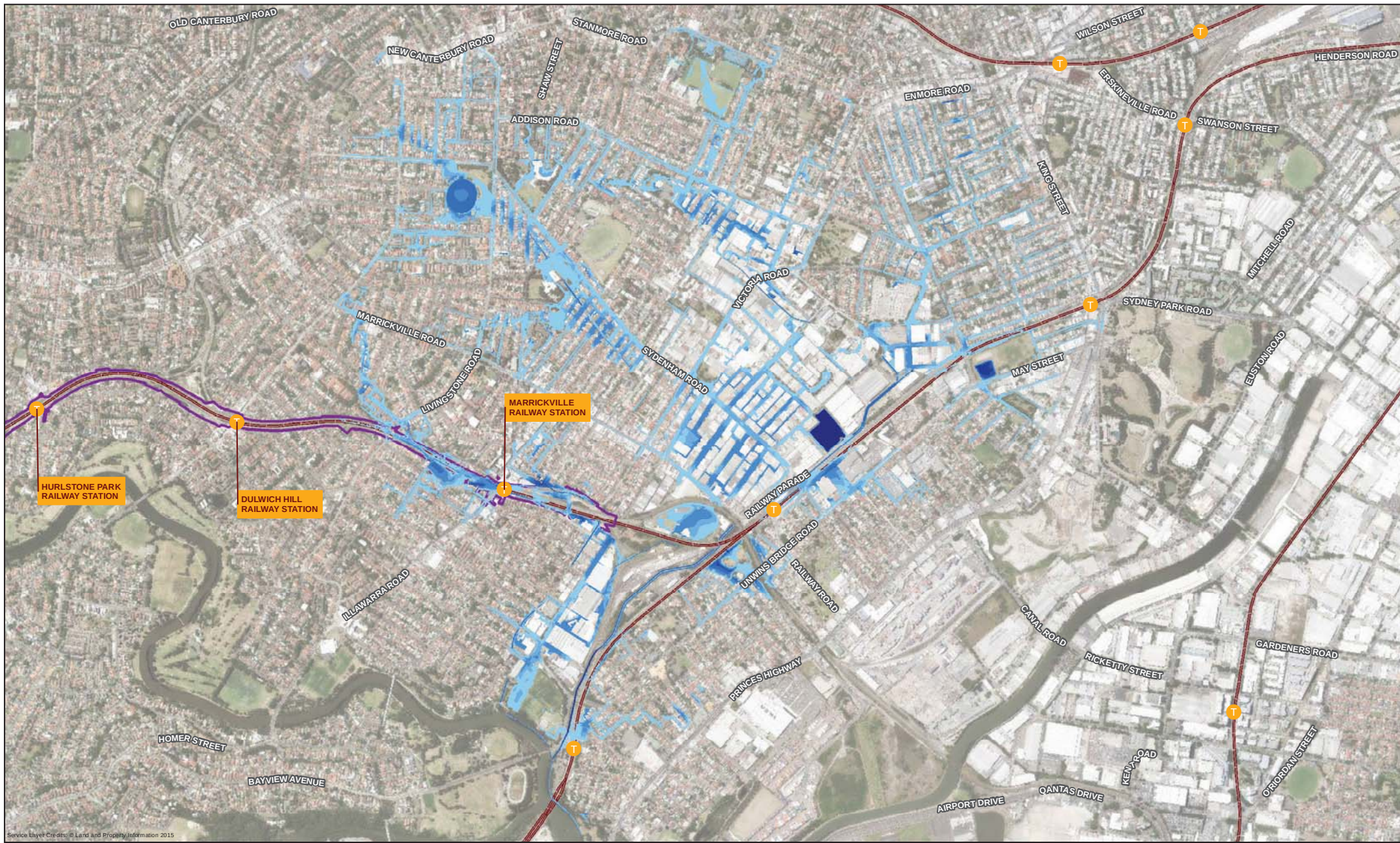
Figure B.4

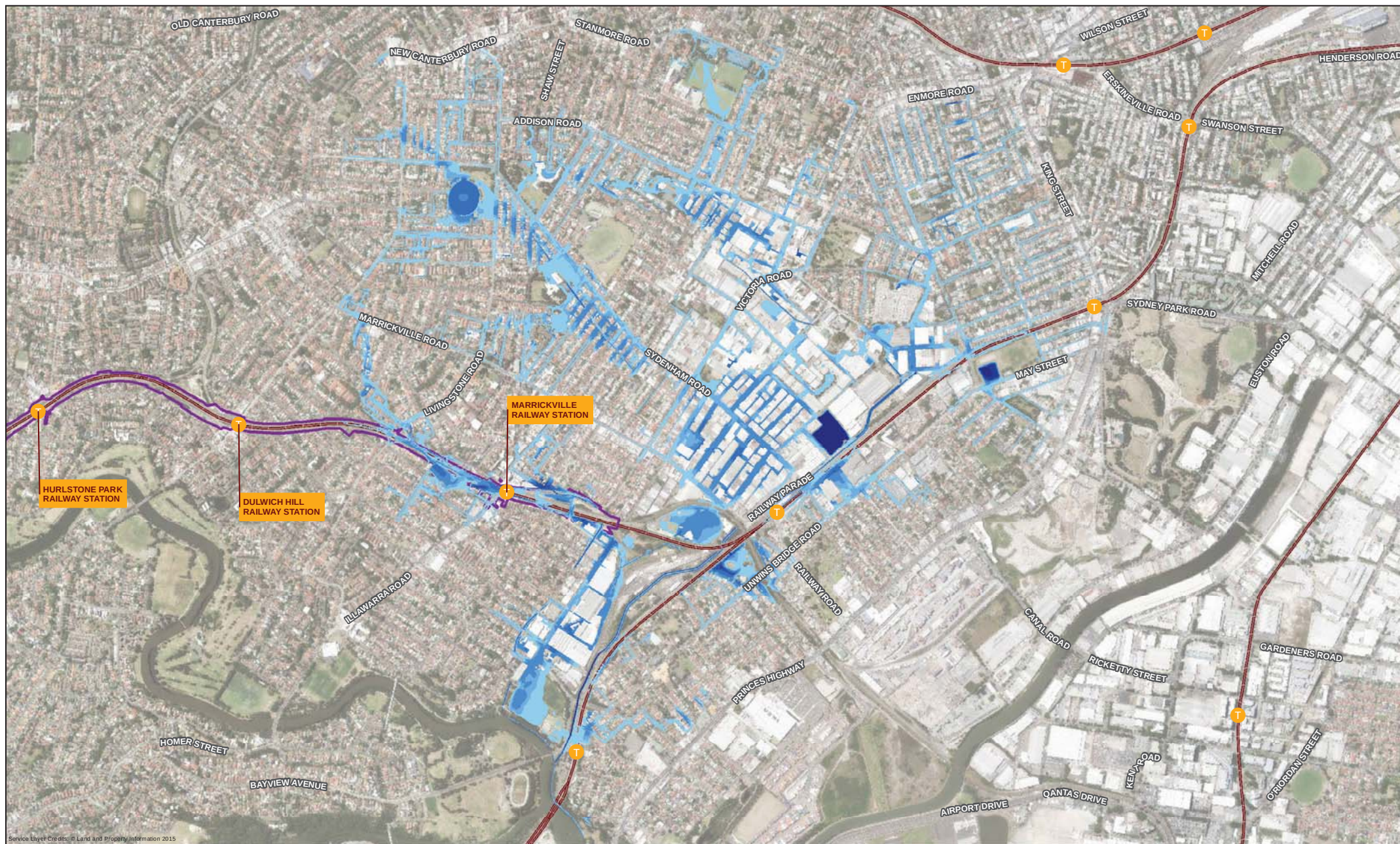
G:\21\25273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au





Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

Project area	0.30 - 0.50	1.50 - 2.00
Train station	0.00 - 0.05	2.00 - 2.50
Railway	0.05 - 0.30	>2.50
	0.50 - 1.00	
	1.01 - 1.50	



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Job Number 21-25273
Revision A
Date 22 May 2017

Existing 2% AEP flood depth

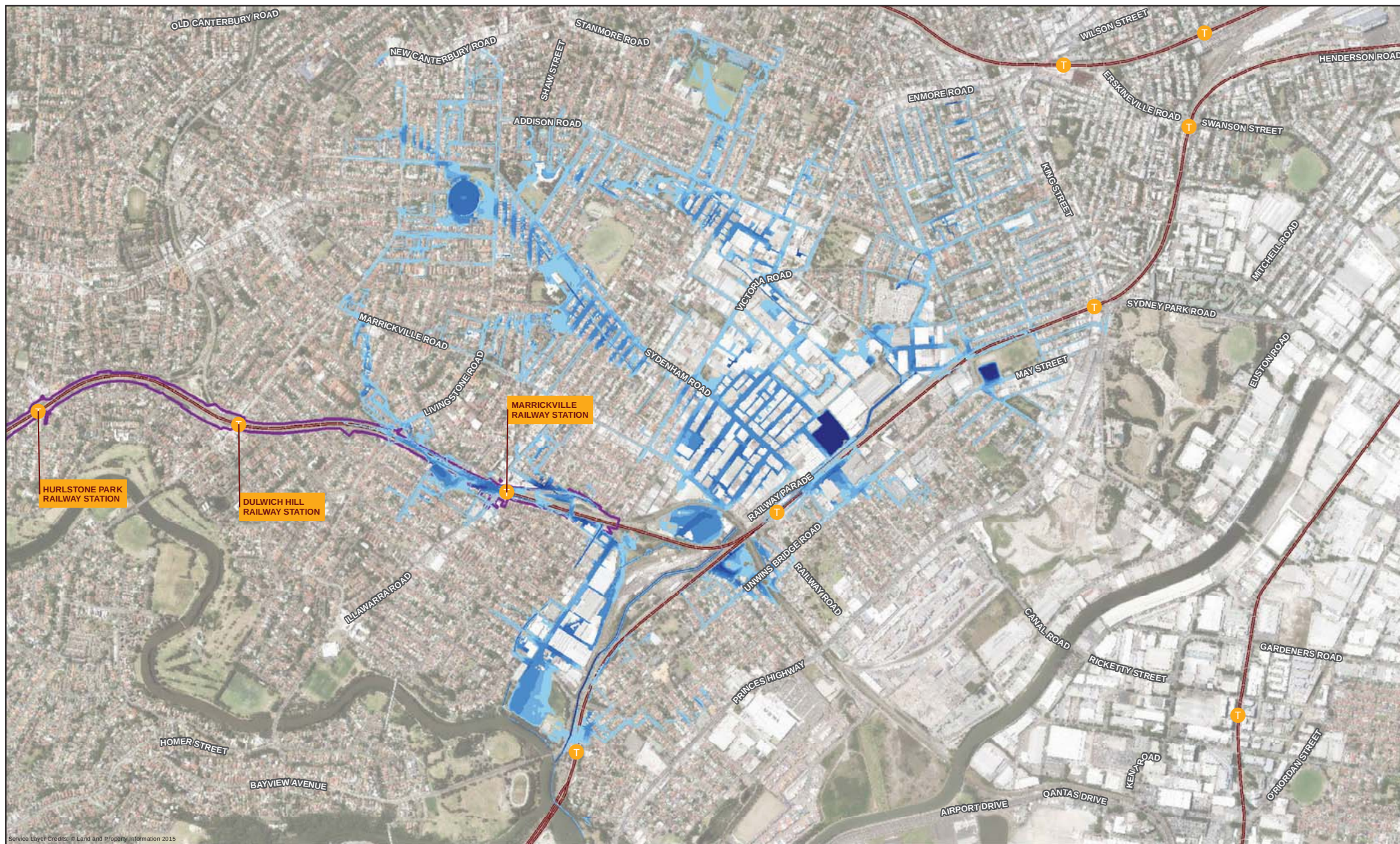
Figure B.6

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydney@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Depth (m)

- 0.00 - 0.05
- 0.05 - 0.30

 0.30 - 0.50	 1.50 - 2.00
 0.50 - 1.00	 2.00 - 2.50
 1.01 - 1.50	 >2.50



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Job Number	21-25273
Revision	A
Date	22 May 2017

Existing 1% AEP flood depth

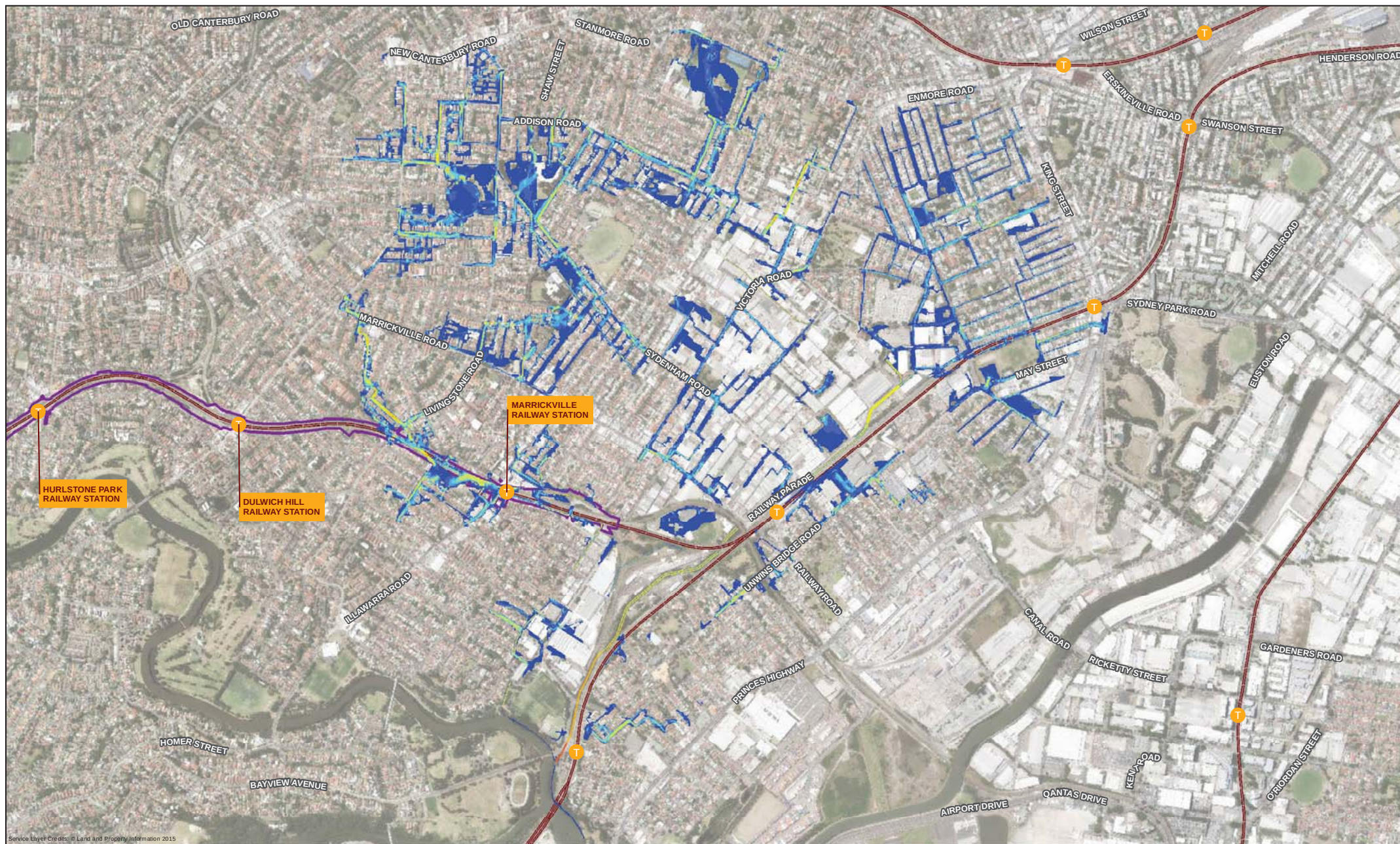
Figure B.7

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydney@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Velocity (m/s)

	0 to 0.2		0.6 to 0.8		2.0 to 3.0
	0.2 to 0.4		0.8 to 1.0		3.0 to 5.0
	0.4 to 0.6		1.0 to 1.5		Greater than 5.0
			1.5 to 2.0		



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Job Number 21-25273
Revision A
Date 22 May 2017

Existing 63% AEP flood velocity

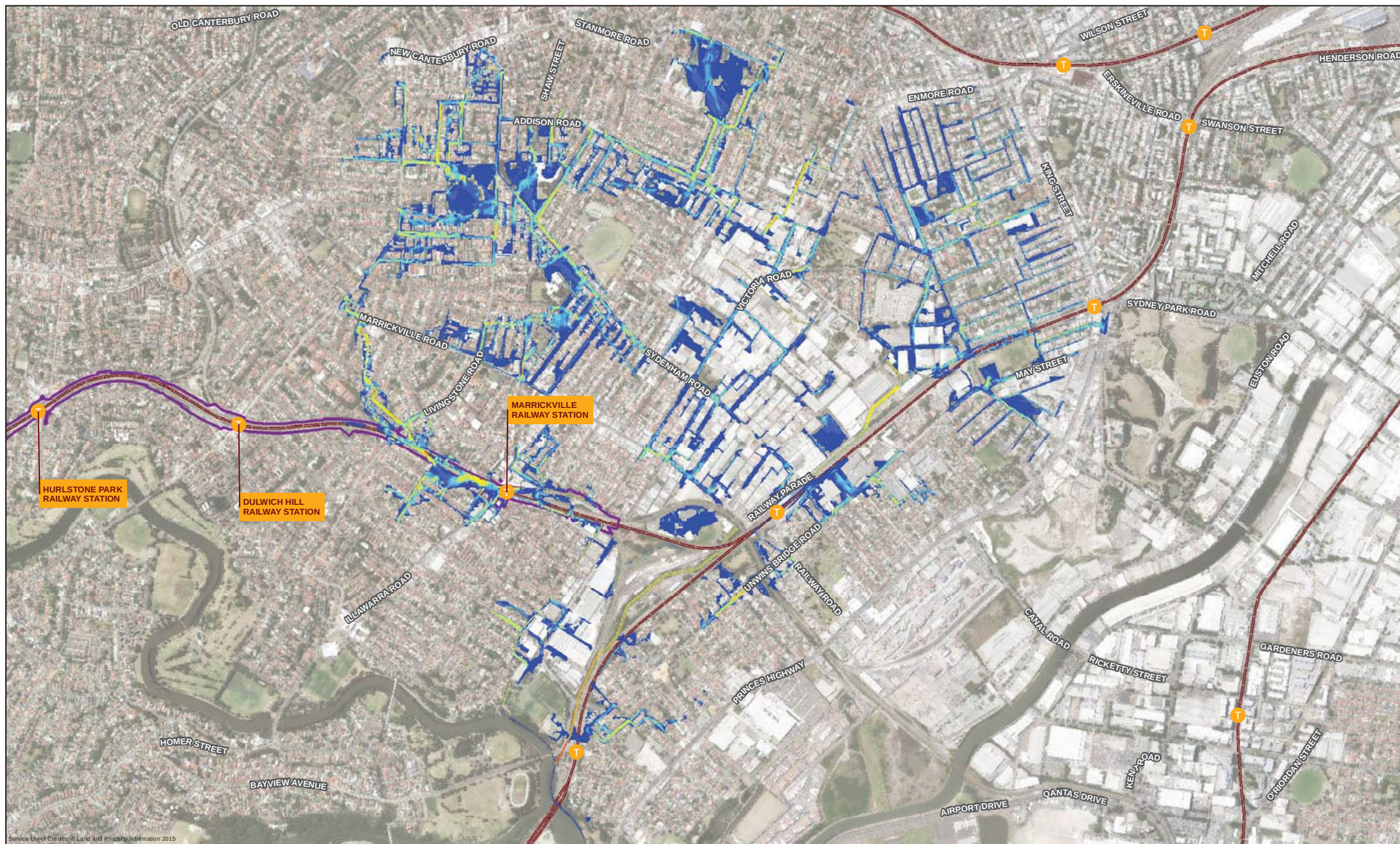
Figure B.8

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Velocity (m/s)

	0 to 0.2		0.6 to 0.8		2.0 to 3.0
	0.2 to 0.4		0.8 to 1.0		3.0 to 5.0
	0.4 to 0.6		1.0 to 1.5		Greater than 5.0
	1.5 to 2.0				



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Job Number 21-25273
Revision A
Date 22 May 2017

Existing 39% AEP flood velocity

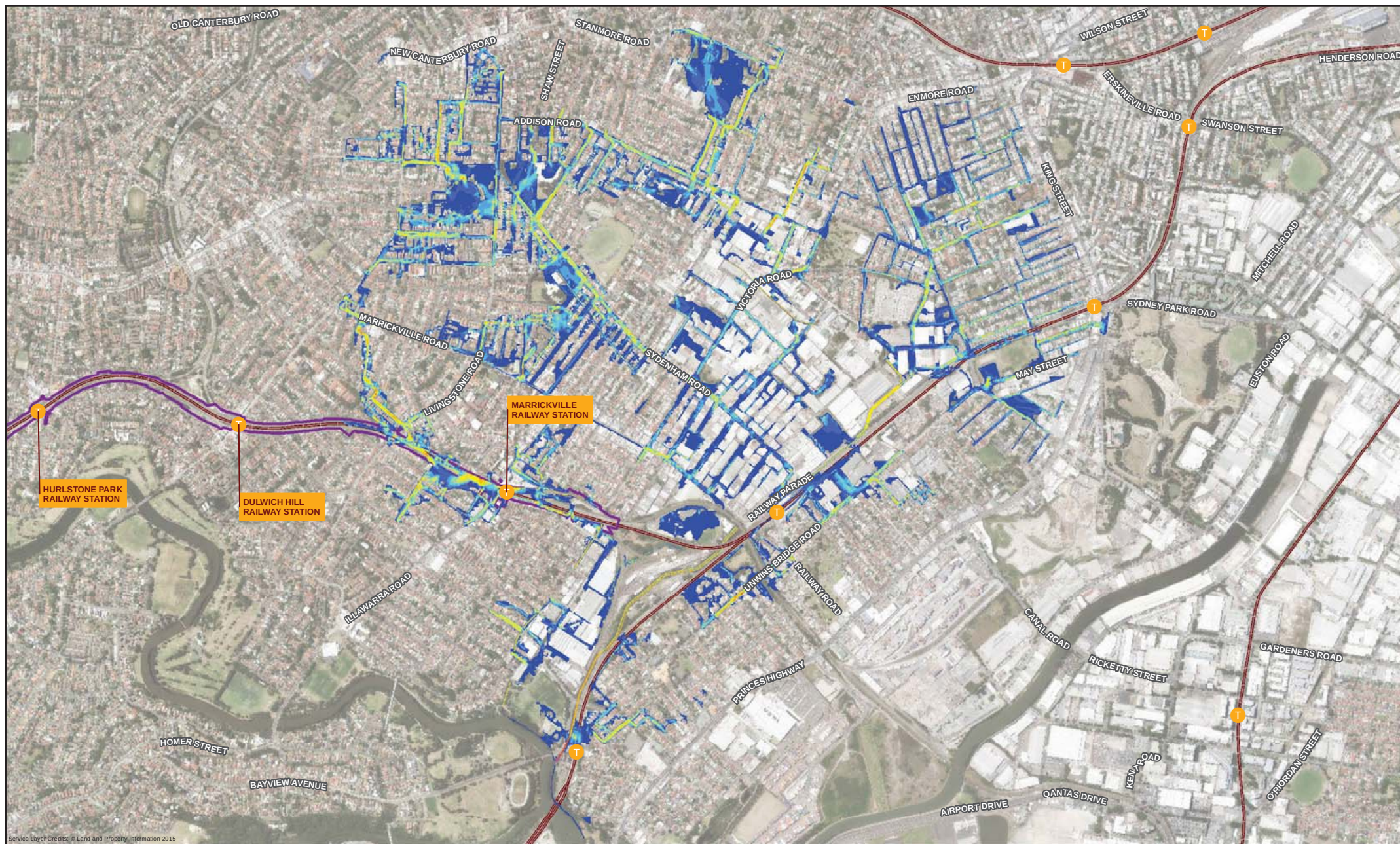
Figure B.9

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Velocity (m/s)

	0 to 0.2		0.6 to 0.8		2.0 to 3.0
	0.2 to 0.4		0.8 to 1.0		3.0 to 5.0
	0.4 to 0.6		1.0 to 1.5		Greater than 5.0
			1.5 to 2.0		



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

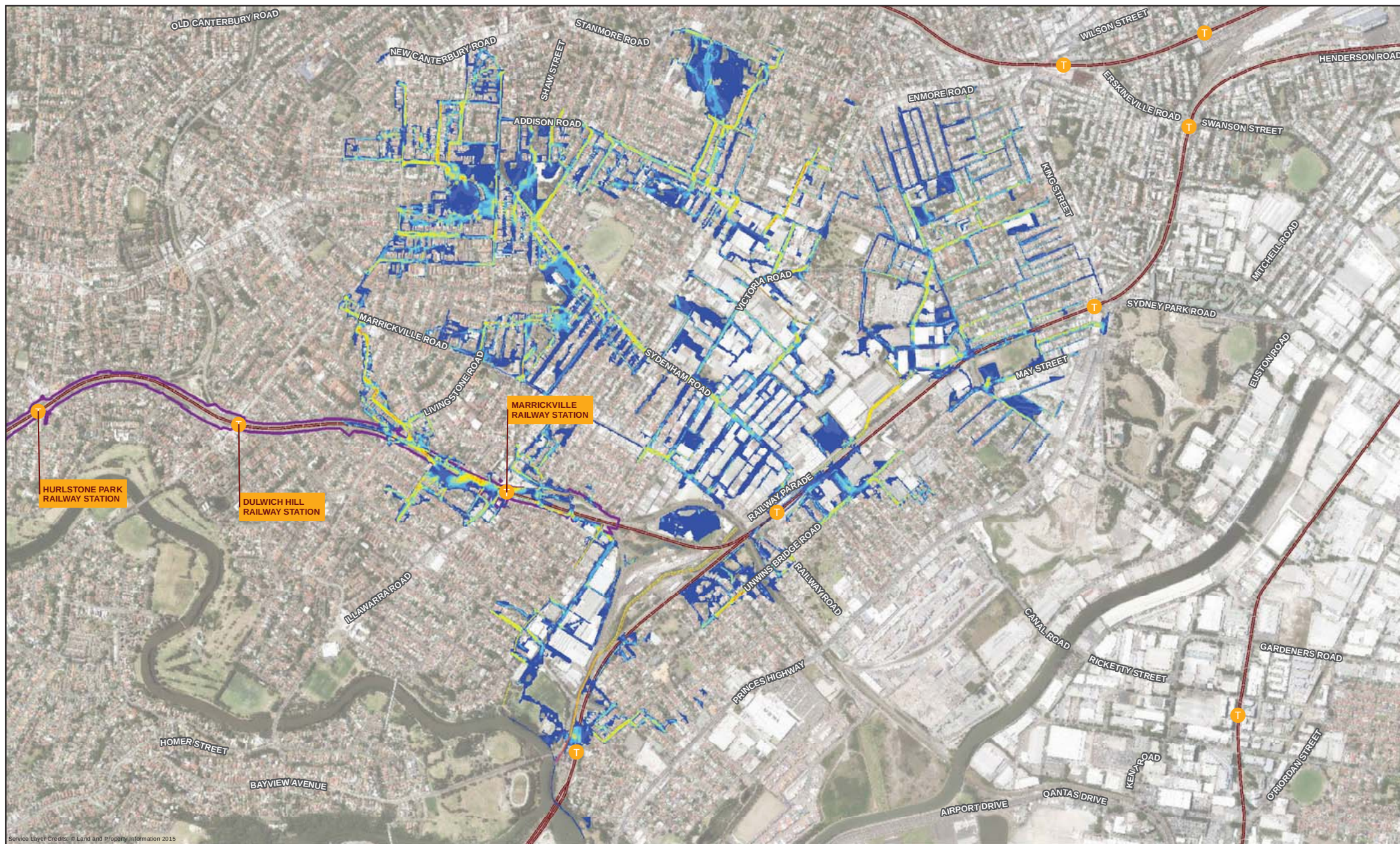
Job Number 21-25273
Revision A
Date 22 May 2017

Existing 18% AEP flood velocity

Figure B.10

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Velocity (m/s)

 0 to 0.2	 0.6 to 0.8	 2.0 to 3.0
 0.2 to 0.4	 0.8 to 1.0	 3.0 to 5.0
 0.4 to 0.6	 1.0 to 1.5	 Greater than 5.0
 1.5 to 2.0		



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Job Number 21-25273
Revision A
Date 22 May 2017

Existing 10% AEP flood velocity

Figure B.11

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmal@ghd.com.au W www.ghd.com.au

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Velocity (m/s)

	0 to 0.2		0.6 to 0.8		2.0 to 3.0
	0.2 to 0.4		0.8 to 1.0		3.0 to 5.0
	0.4 to 0.6		1.0 to 1.5		Greater than 5.0
	1.5 to 2.0				



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Job Number 21-25273
Revision A
Date 22 May 2017

Existing 2% AEP flood velocity

Figure B.13

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Velocity (m/s)

	0 to 0.2		0.6 to 0.8		2.0 to 3.0
	0.2 to 0.4		0.8 to 1.0		3.0 to 5.0
	0.4 to 0.6		1.0 to 1.5		Greater than 5.0
			1.5 to 2.0		



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Job Number 21-25273
Revision A
Date 22 May 2017

Existing 1% AEP flood velocity

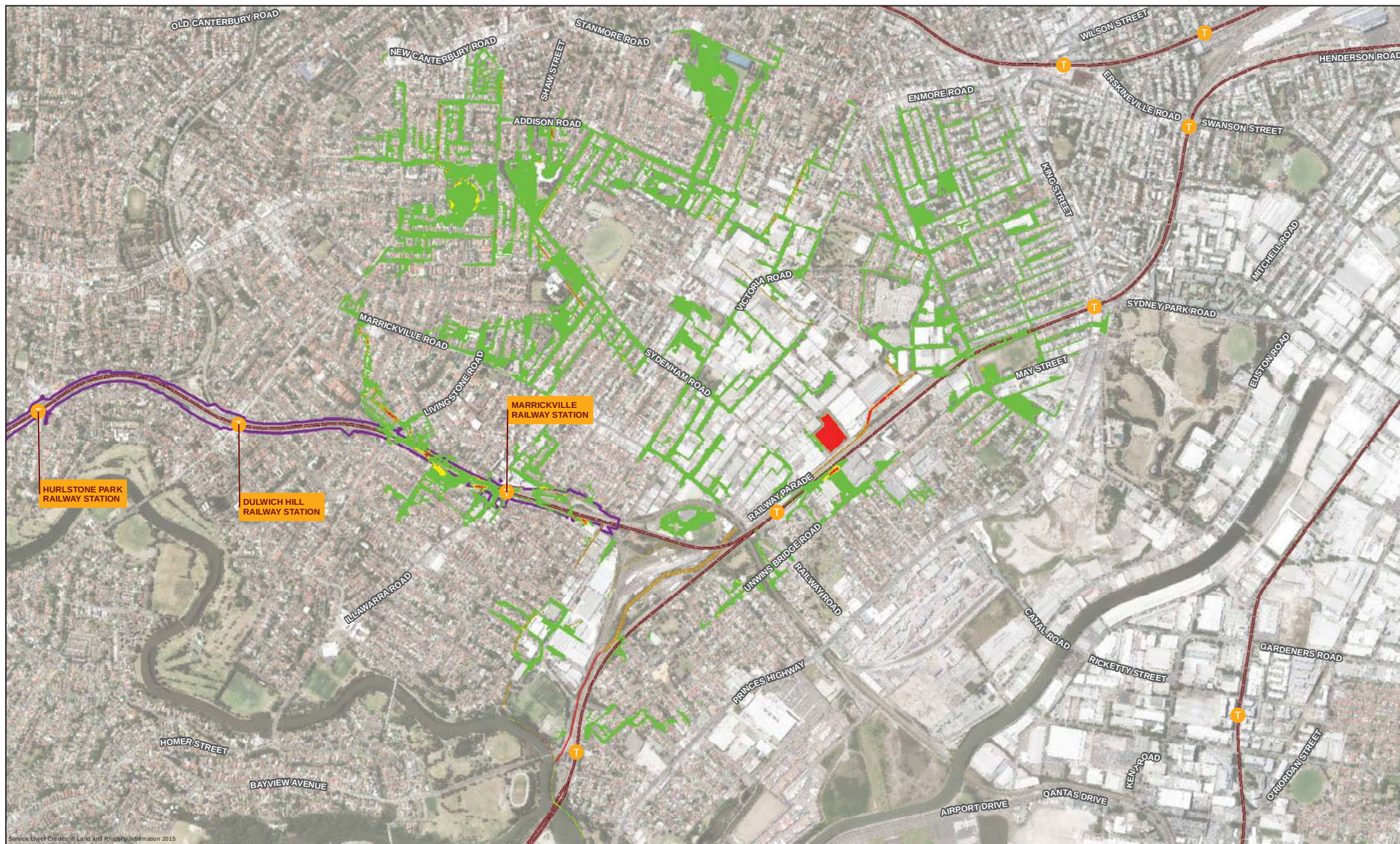
Figure B.14

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

- Provisional Hazard Category**
- 1 - Low Hazard
 - 2 - Transitional Hazard
 - 3 - High Hazard



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

**Existing 63% AEP
provisional flood hazard**

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.15

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Provisional Hazard Category

- 1 - Low Hazard
- 2 - Transitional Hazard
- 3 - High Hazard



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Existing 39% AEP
provisional flood hazard

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.16

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTD 2012. Created by:afoddy



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Provisional Hazard Category

- 1 - Low Hazard
- 2 - Transitional Hazard
- 3 - High Hazard



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Existing 18% AEP
provisional flood hazard

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.17

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmal@ghd.com.au W www.ghd.com.au

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Provisional Hazard Category

- 1 - Low Hazard
- 2 - Transitional Hazard
- 3 - High Hazard



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Existing 10% AEP
provisional flood hazard

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.18

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Provisional Hazard Category

- 1 - Low Hazard
- 2 - Transitional Hazard
- 3 - High Hazard



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Existing 5% AEP
provisional flood hazard

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.19

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- Train station
- Railway

Provisional Hazard Category

- 1 - Low Hazard
- 2 - Transitional Hazard
- 3 - High Hazard



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Existing 2% AEP
provisional flood hazard

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.20

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Provisional Hazard Category

- 1 - Low Hazard
- 2 - Transitional Hazard
- 3 - High Hazard



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

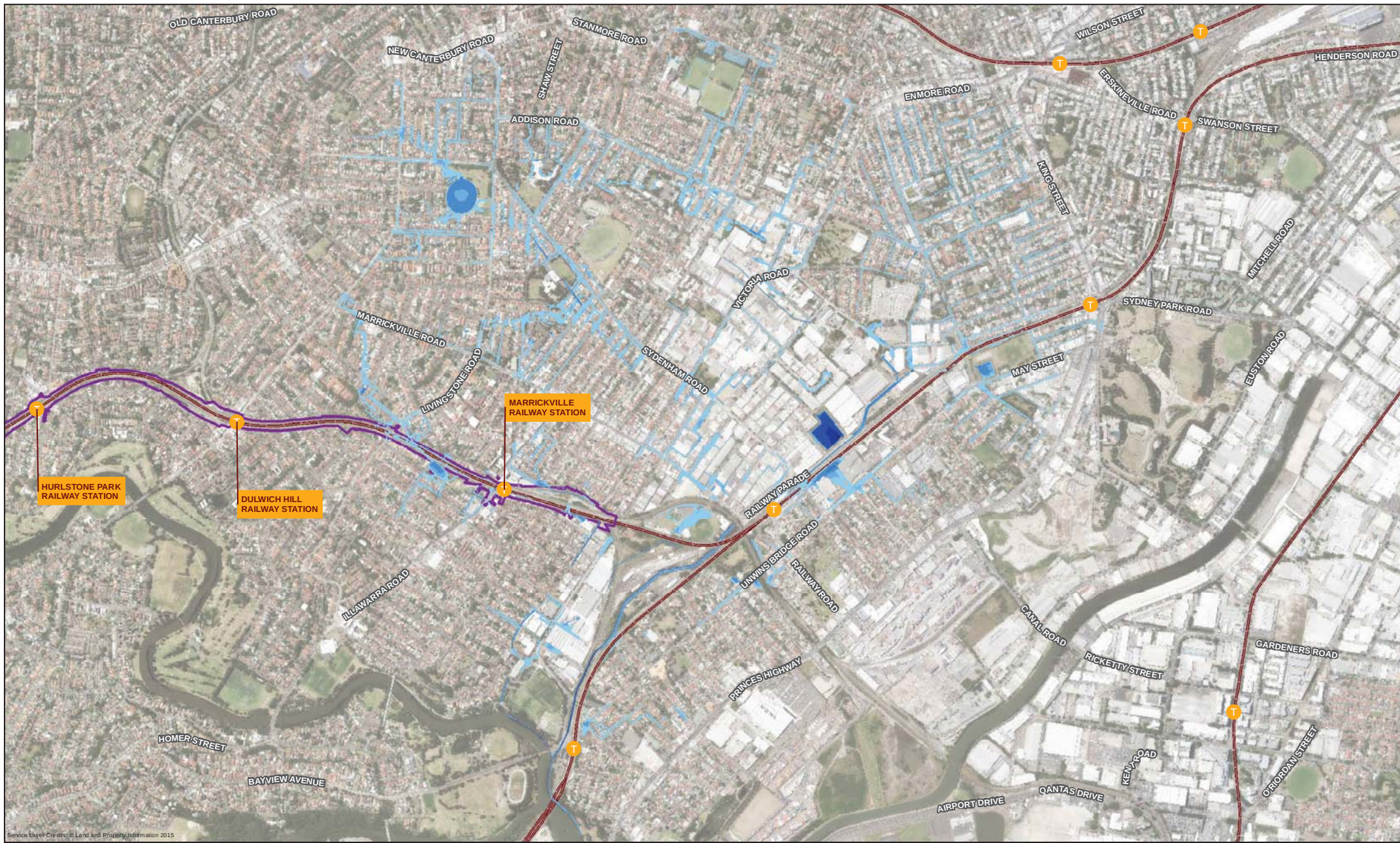
Existing 1% AEP
provisional flood hazard

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.21

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- Train station
- Railway

Depth (m)

0.00 - 0.05	0.30 - 0.50	1.50 - 2.00
0.05 - 0.30	0.50 - 1.00	2.00 - 2.50
	1.01 - 1.50	>2.50



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 63% AEP flood depth

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.22

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- Train station
- Railway

Depth (m)
0.00 - 0.05
0.05 - 0.30

0.30 - 0.50
0.50 - 1.00
1.01 - 1.50
1.50 - 2.00
2.00 - 2.50
>2.50



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 39%
AEP flood depth

Job Number 21-25273
Revision A
Date 22 May 2017

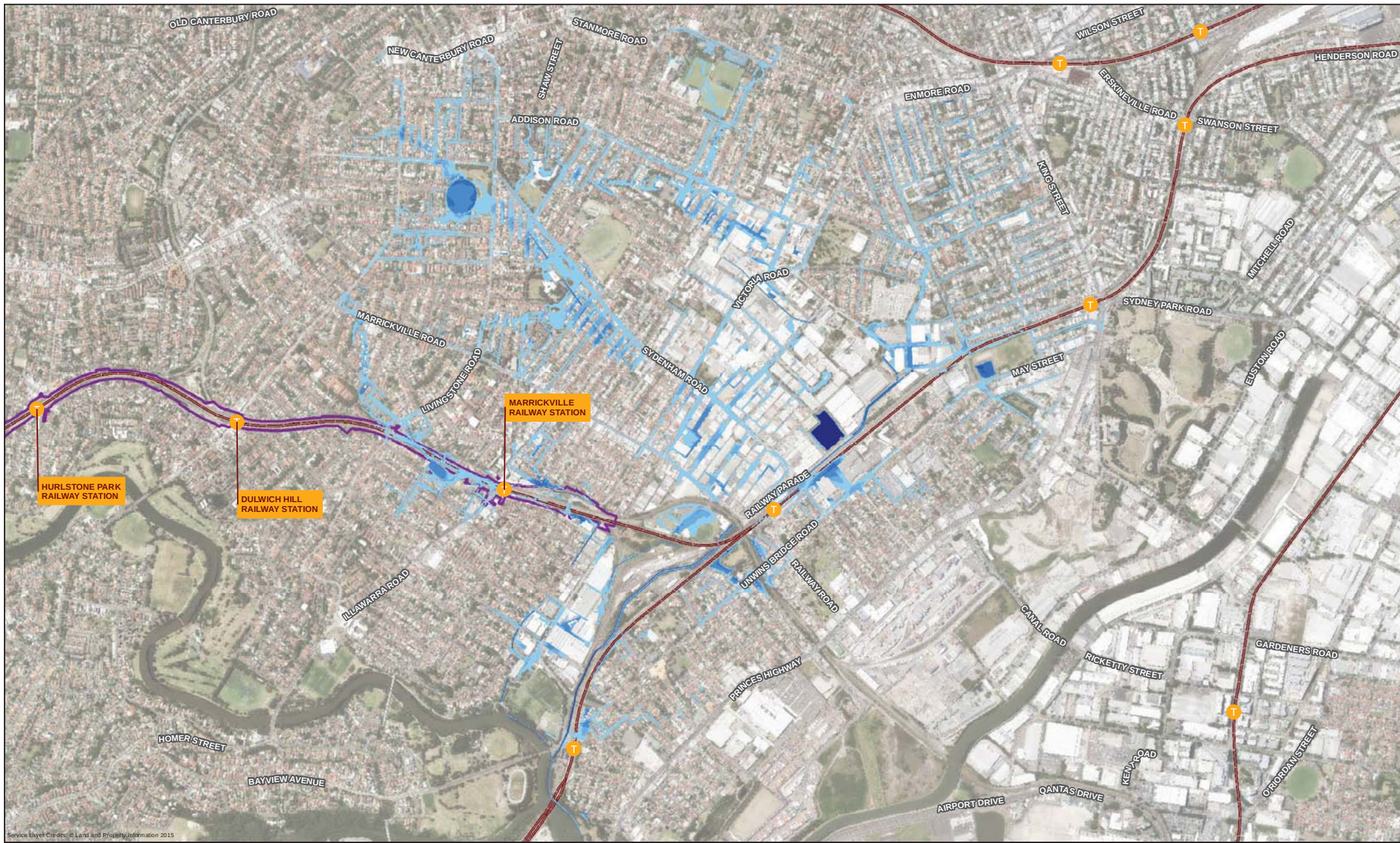
Figure B.23

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

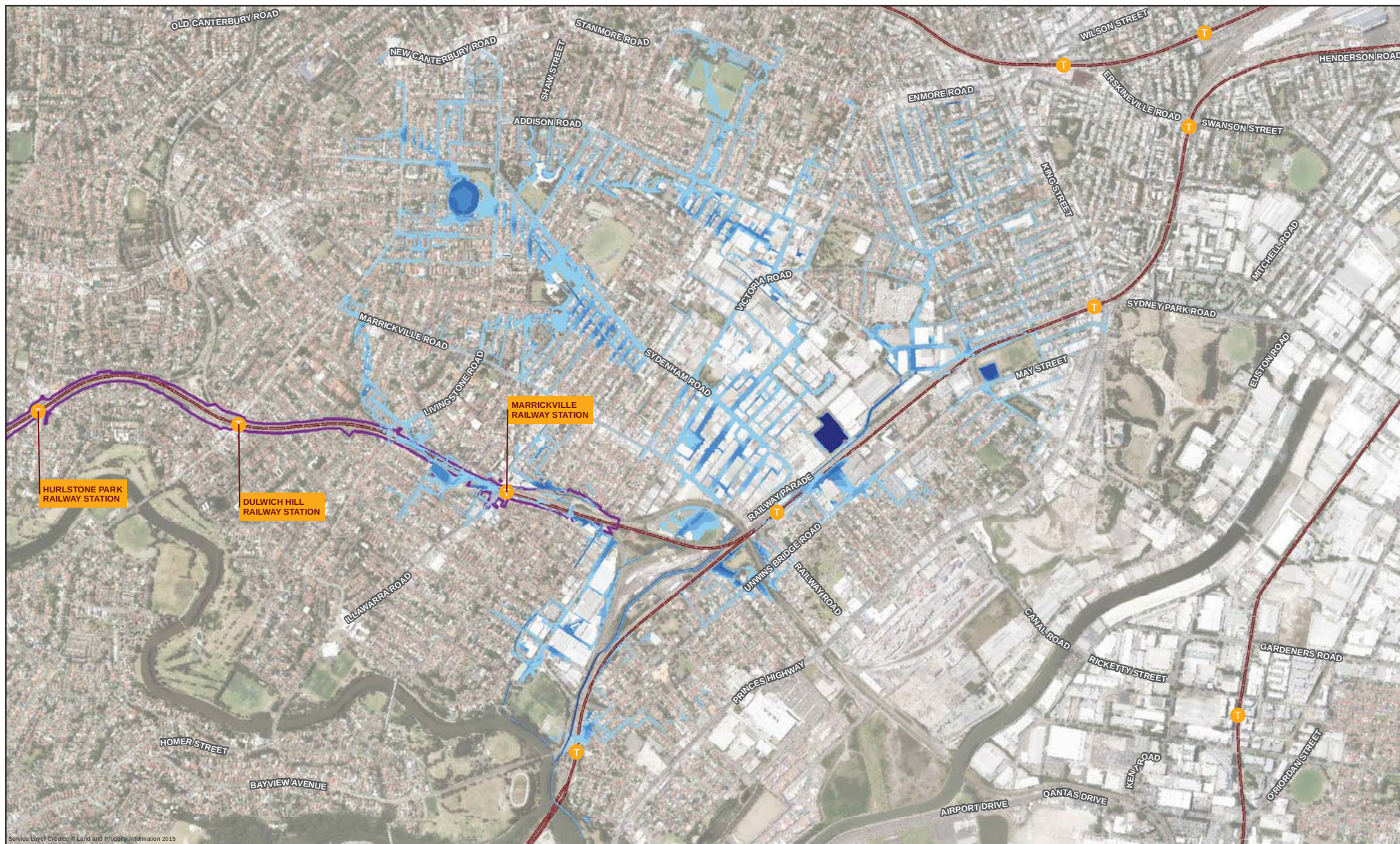
Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015

Paper Size A3 0 100 200 400 Metres Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56		LEGEND	Project area Train station Railway	Depth (m) 0.00 - 0.05 0.05 - 0.30	0.30 - 0.50 0.50 - 1.00 1.01 - 1.50	1.50 - 2.00 2.00 - 2.50 >2.50		Transport for NSW Sydney Metro - Sydenham to Bankstown upgrade Surface Water Assessment Post-developed 18% AEP flood depth	Job Number 21-25273 Revision A Date 22 May 2017
--	--	---------------	--	--	---	--	--	---	--

Figure B.24



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

Project area	Depth (m)	0.30 - 0.50	1.50 - 2.00
Train station	0.00 - 0.05	0.50 - 1.00	2.00 - 2.50
Railway	0.05 - 0.30	1.01 - 1.50	>2.50



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 10%
AEP flood depth

Job Number 21-25273
Revision A
Date 22 May 2017

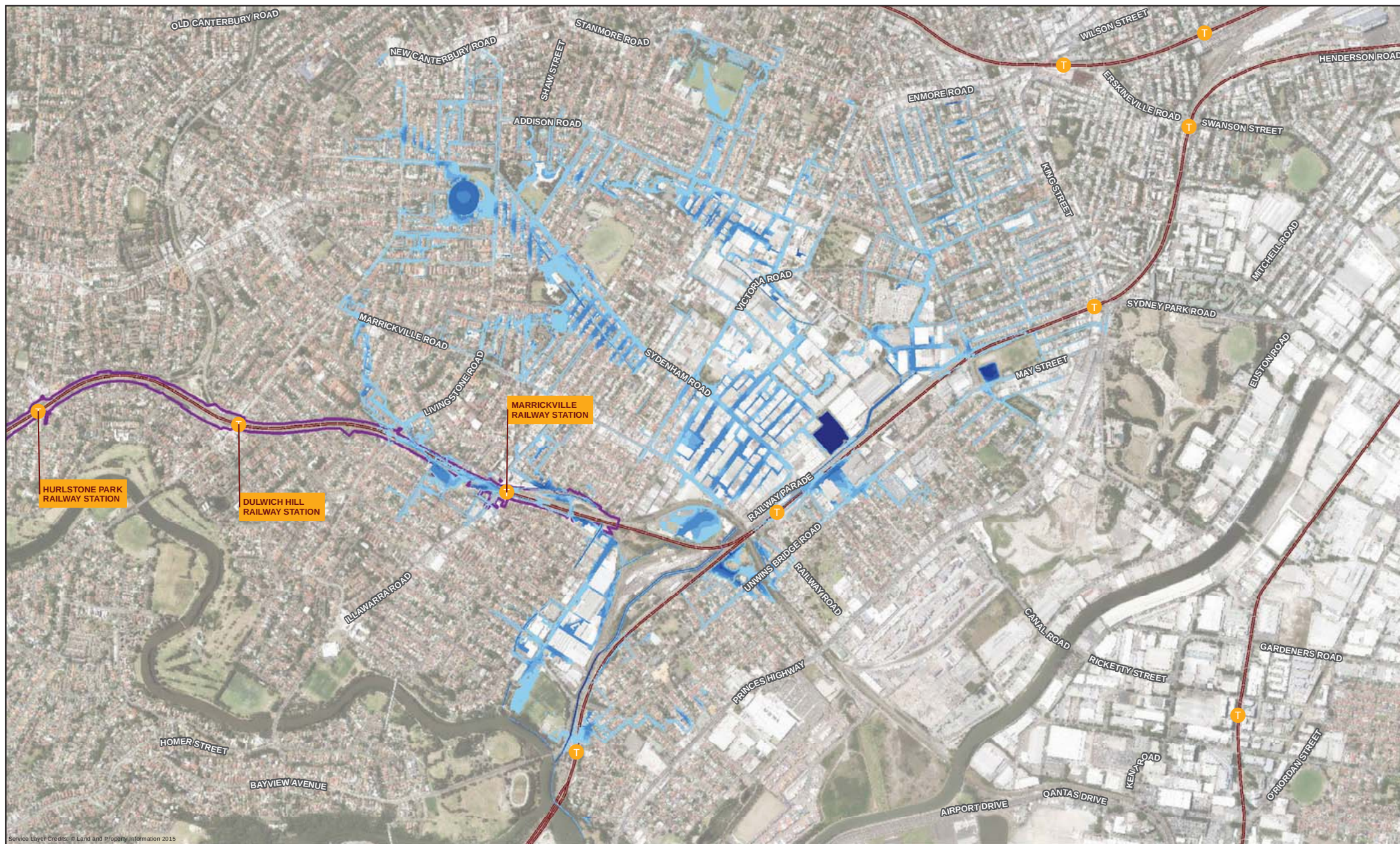
Figure B.25

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTD 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Depth (m)

 0.00 - 0.05	 0.30 - 0.50	 1.50 - 2.00
 0.05 - 0.30	 0.50 - 1.00	 2.00 - 2.50
 1.01 - 1.50	 >2.50	



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 5% AEP flood depth

Job Number 21-25273
Revision A
Date 22 May 2017

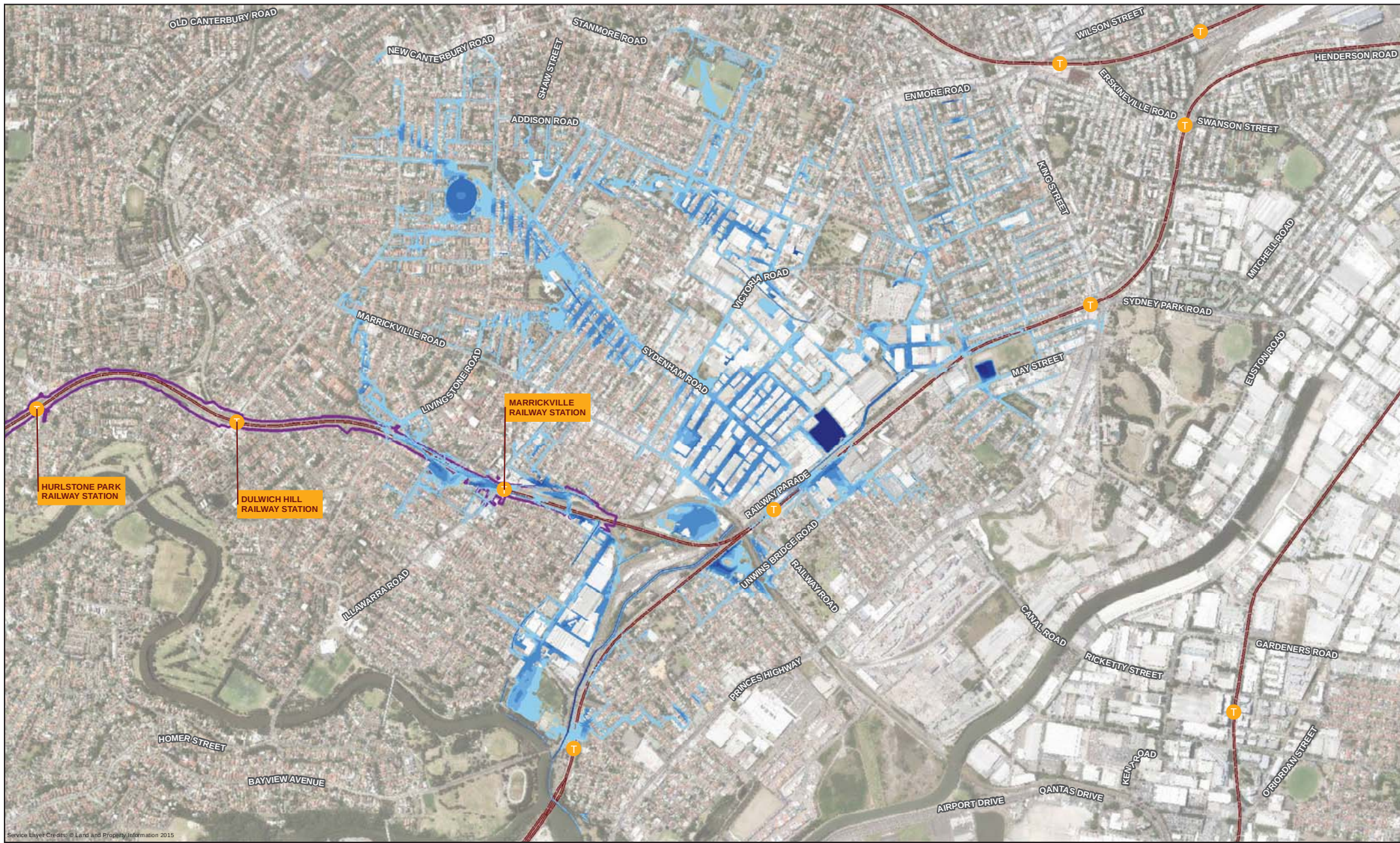
Figure B.26

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- Train station
- Railway

Depth (m)

0.00 - 0.05	0.30 - 0.50	1.50 - 2.00
0.05 - 0.30	0.50 - 1.00	2.00 - 2.50
	1.01 - 1.50	>2.50



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 2% AEP flood depth

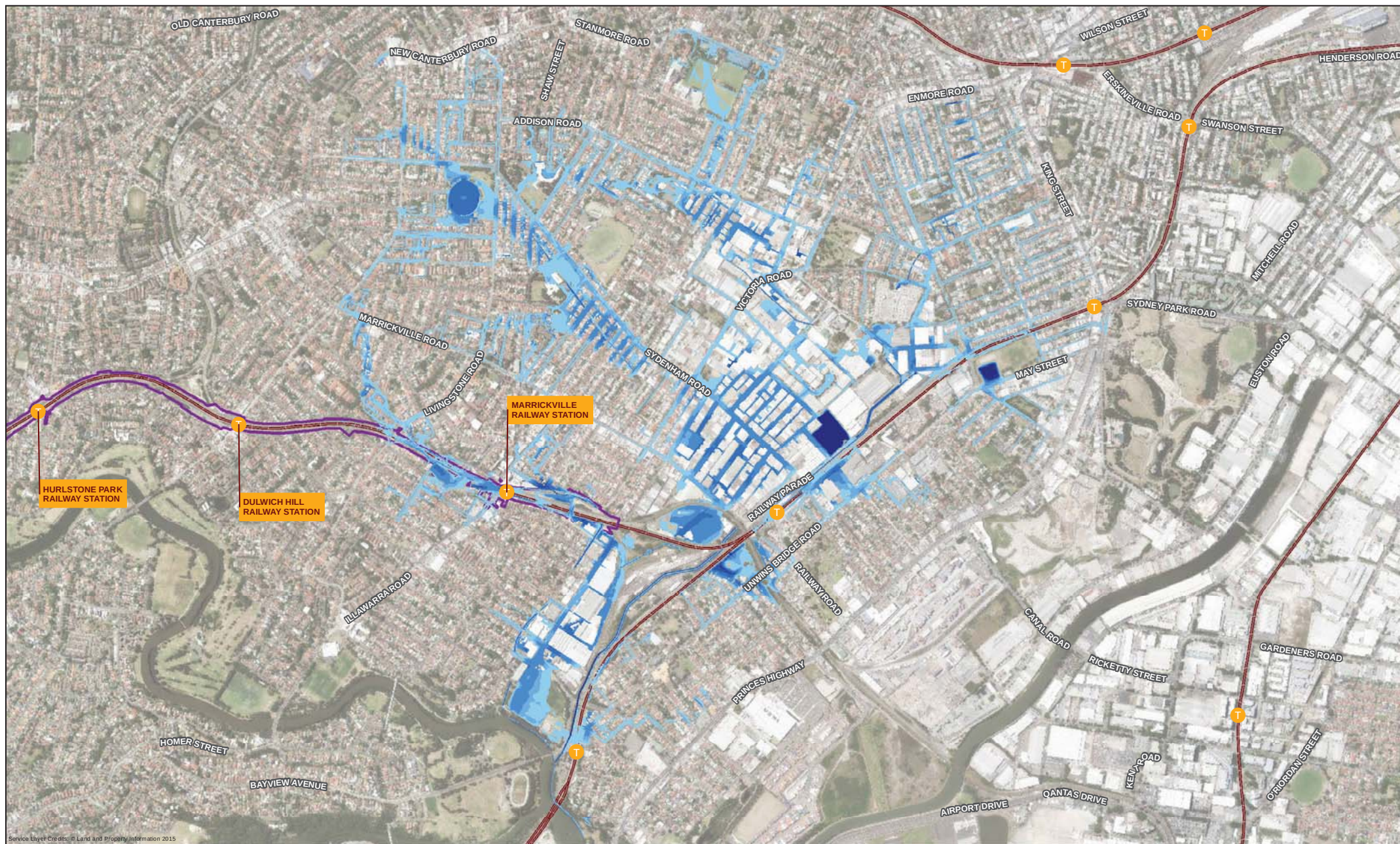
Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.27

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Depth (m)

- 0.00 - 0.05
- 0.05 - 0.30
- 0.30 - 0.50
- 0.50 - 1.00
- 1.01 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- >2.50



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 1%
AEP flood depth

Job Number 21-25273
Revision A
Date 22 May 2017

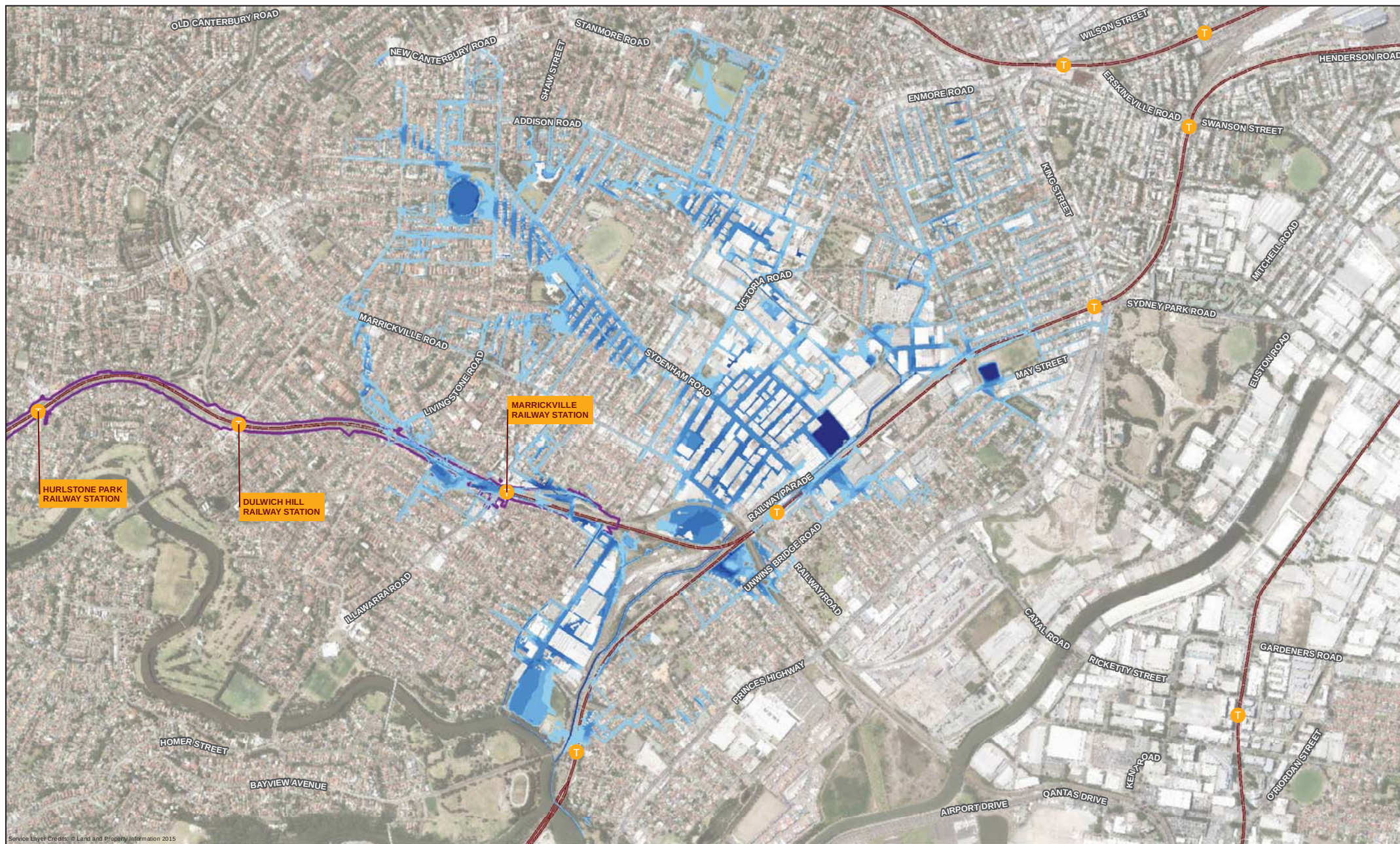
Figure B.28

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Depth (m)

 0.00 - 0.05	 0.30 - 0.50	 1.50 - 2.00
 0.05 - 0.30	 0.50 - 1.00	 2.00 - 2.50
 1.01 - 1.50	 >2.50	



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 1% AEP + 10%
climate change flood depth

Job Number 21-25273
Revision A
Date 22 May 2017

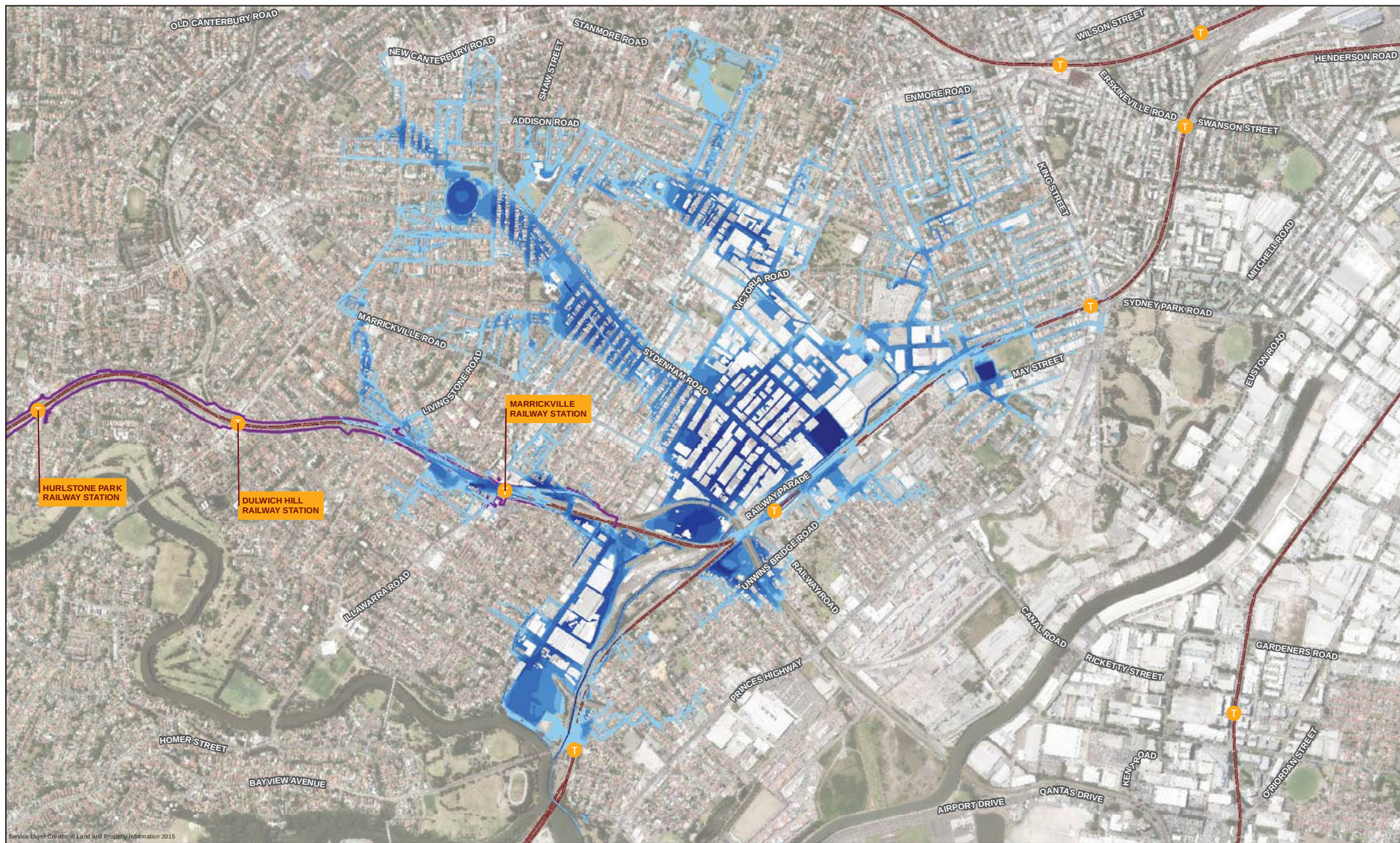
Figure B.29

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Depth (m)

 0.00 - 0.05	 0.30 - 0.50	 1.50 - 2.00
 0.05 - 0.30	 0.50 - 1.00	 2.00 - 2.50
 1.01 - 1.50	 >2.50	



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Job Number 21-25273
Revision A
Date 22 May 2017

Post-developed PMF flood depth

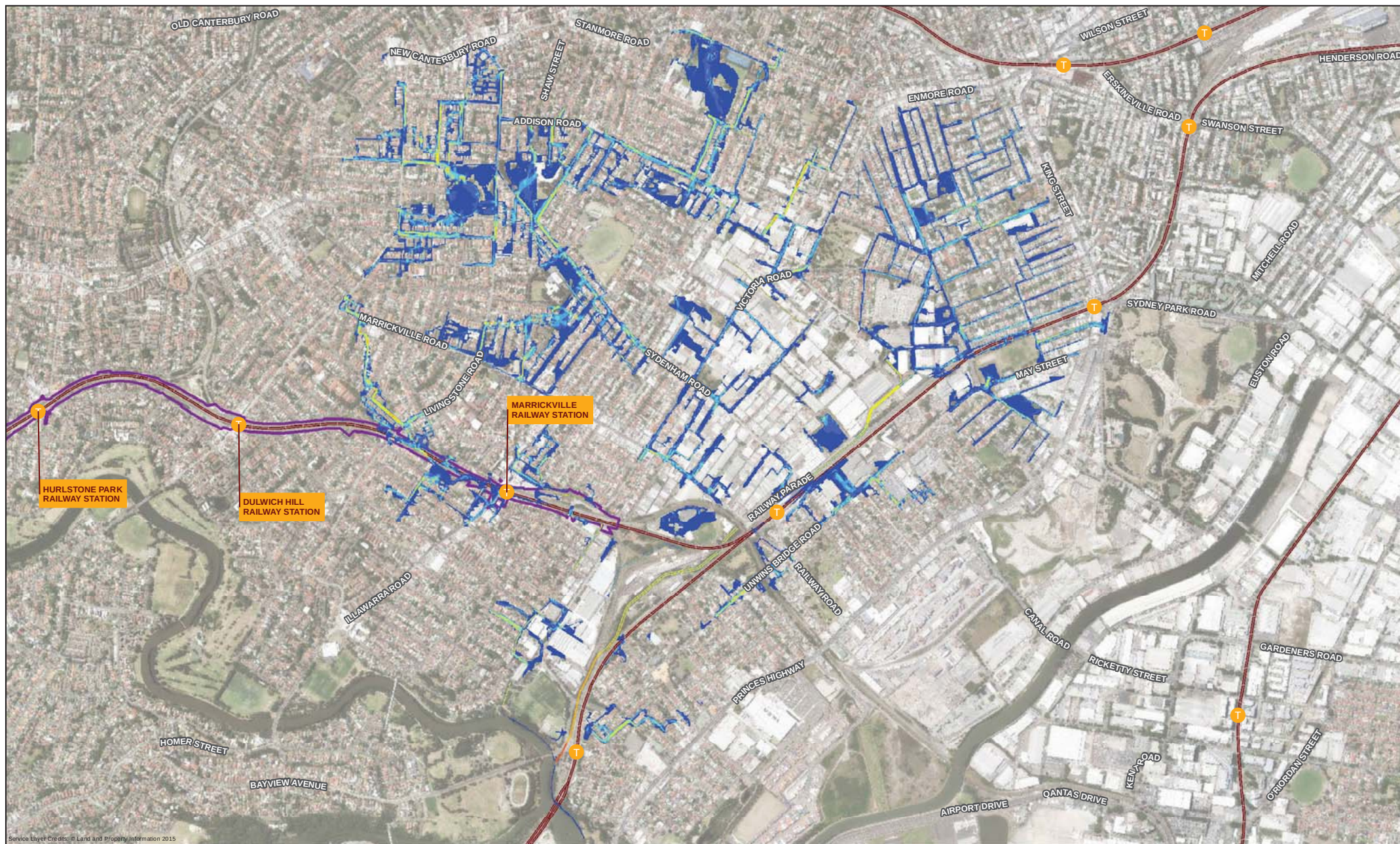
Figure B.30

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Velocity (m/s)

- | | | |
|---|--|--|
| 0 to 0.2 | 0.8 to 1.0 | 2.0 to 3.0 |
| 0.2 to 0.4 | 1.0 to 1.5 | 3.0 to 5.0 |
| 0.4 to 0.6 | 1.5 to 2.0 | Greater than 5.0 |



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 63% AEP flood velocity

Job Number 21-25273
Revision A
Date 22 May 2017

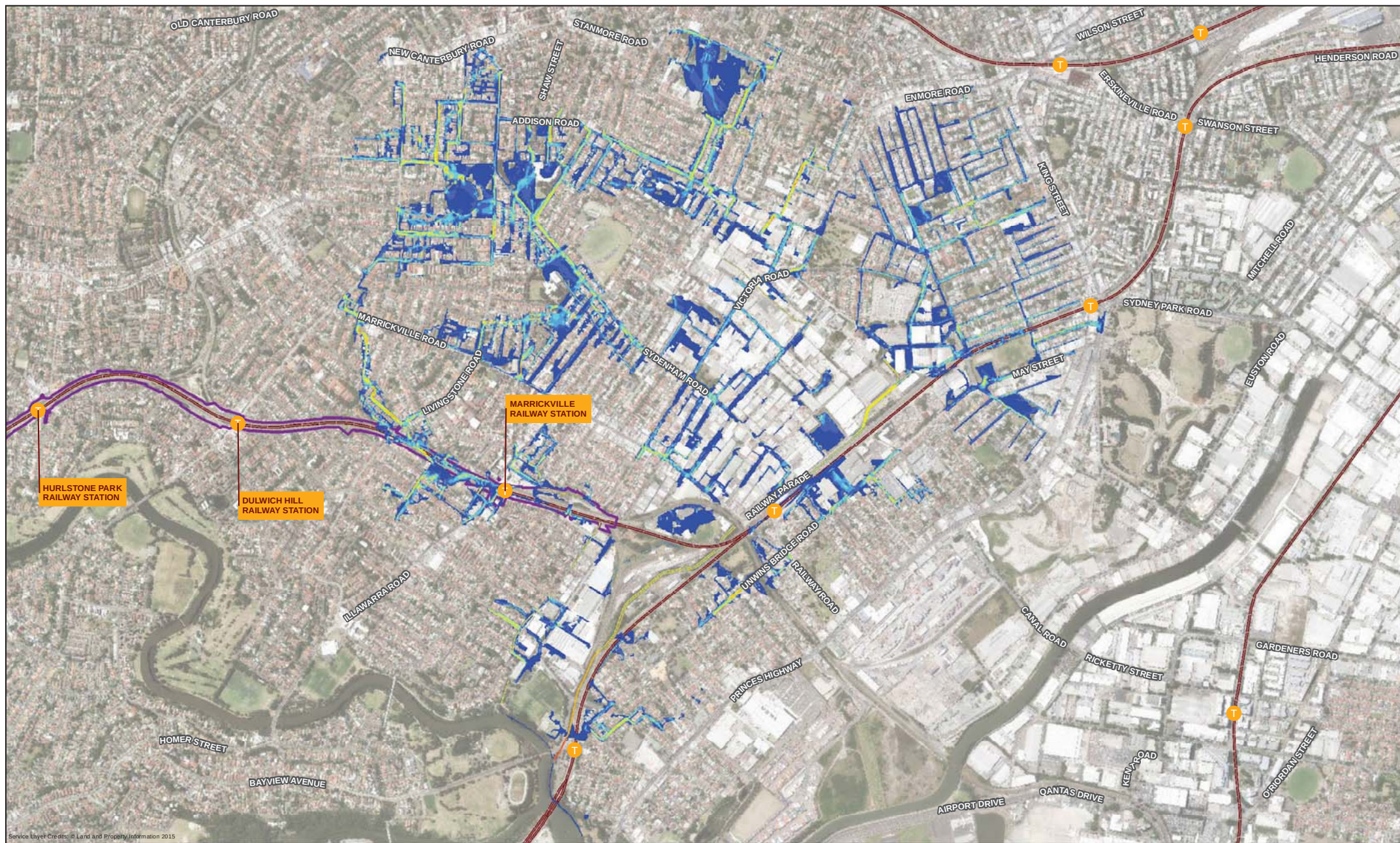
Figure B.31

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Velocity (m/s)

	0 to 0.2		0.8 to 1.0		2.0 to 3.0
	0.2 to 0.4		1.0 to 1.5		3.0 to 5.0
	0.4 to 0.6		1.5 to 2.0		Greater than 5.0

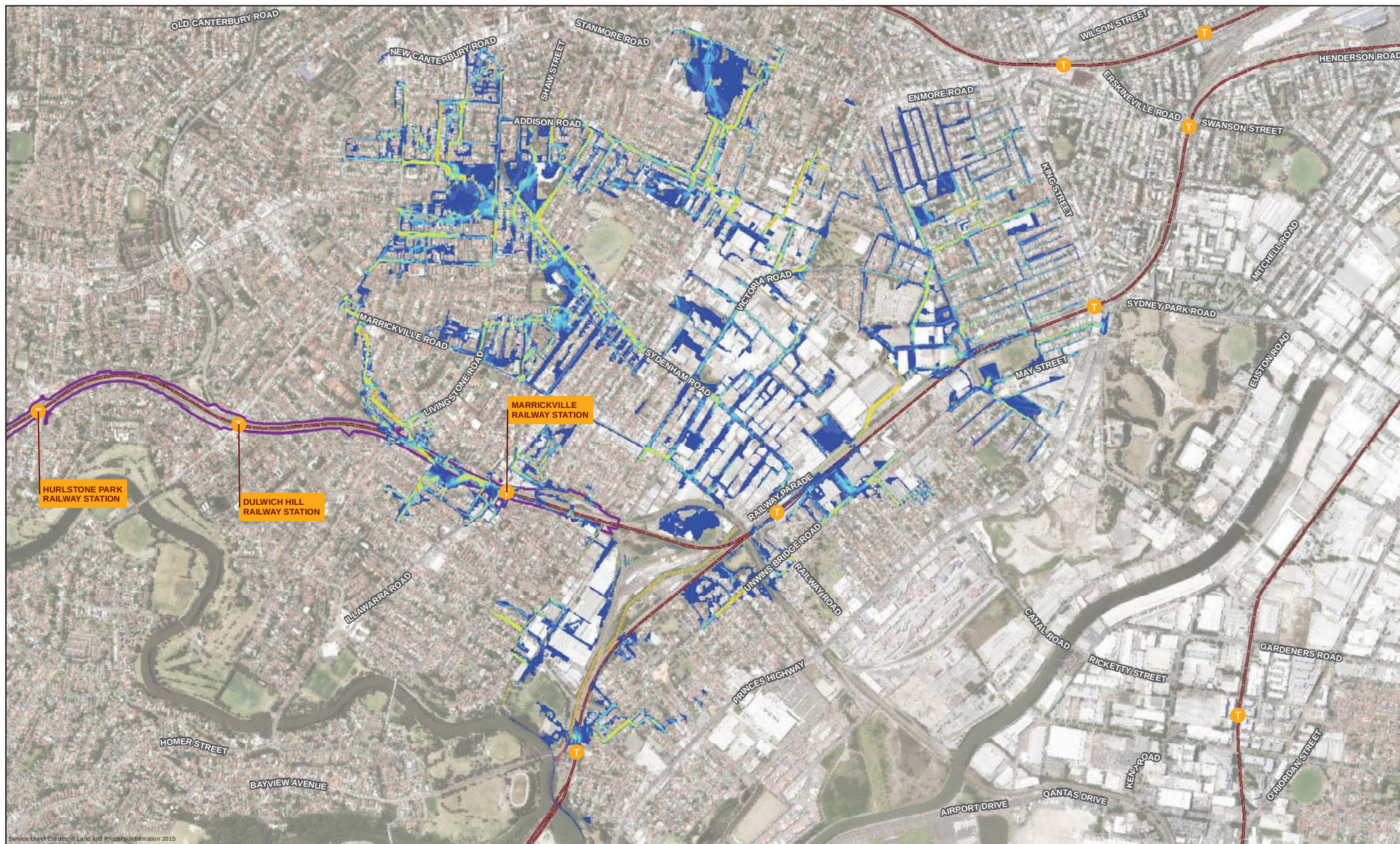


Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 39%
AEP flood velocity

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.32



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Velocity (m/s)

	0 to 0.2		0.6 to 0.8		2.0 to 3.0
	0.2 to 0.4		0.8 to 1.0		3.0 to 5.0
	0.4 to 0.6		1.0 to 1.5		Greater than 5.0
			1.5 to 2.0		



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 18% AEP flood velocity

Job Number 21-25273
Revision A
Date 22 May 2017

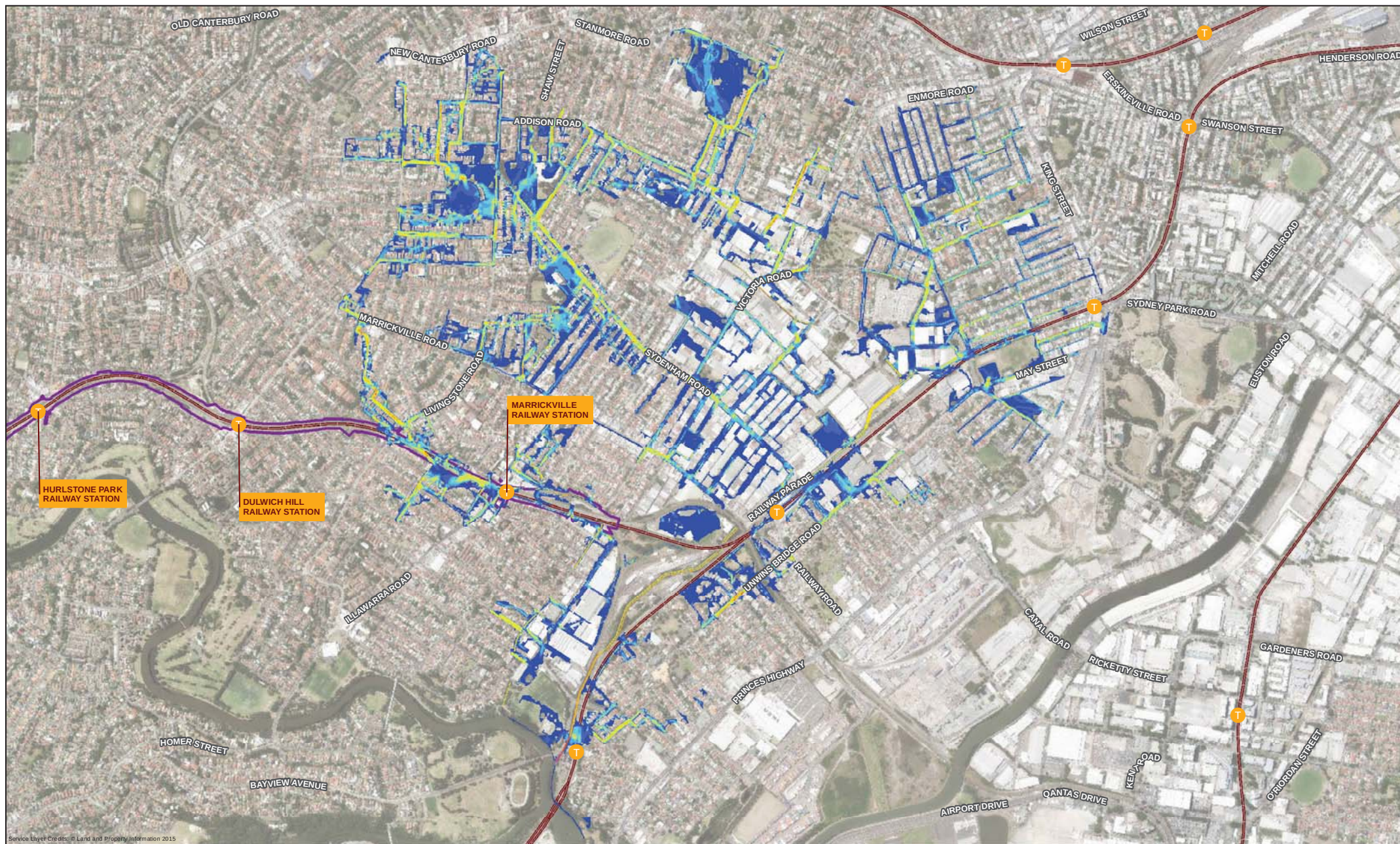
Figure B.33

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND



Velocity (m/s)

0 to 0.2	0.6 to 0.8	2.0 to 3.0
0.2 to 0.4	0.8 to 1.0	3.0 to 5.0
0.4 to 0.6	1.0 to 1.5	Greater than 5.0
	1.5 to 2.0	



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 10%
AEP flood velocity

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.34

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Velocity (m/s)

	0 to 0.2		0.6 to 0.8		2.0 to 3.0
	0.2 to 0.4		0.8 to 1.0		3.0 to 5.0
	0.4 to 0.6		1.0 to 1.5		Greater than 5.0
			1.5 to 2.0		



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 5% AEP flood velocity

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.35

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Velocity (m/s)

	0 to 0.2		0.6 to 0.8		2.0 to 3.0
	0.2 to 0.4		0.8 to 1.0		3.0 to 5.0
	0.4 to 0.6		1.0 to 1.5		Greater than 5.0
	1.5 to 2.0				



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 2% AEP flood velocity

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.36

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Velocity (m/s)

	0 to 0.2		0.6 to 0.8		2.0 to 3.0
	0.2 to 0.4		0.8 to 1.0		3.0 to 5.0
	0.4 to 0.6		1.0 to 1.5		Greater than 5.0
			1.5 to 2.0		



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 1% AEP flood velocity

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.37

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Velocity (m/s)

	0 to 0.2		0.6 to 0.8		2.0 to 3.0
	0.2 to 0.4		0.8 to 1.0		3.0 to 5.0
	0.4 to 0.6		1.0 to 1.5		Greater than 5.0
			1.5 to 2.0		



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 1% AEP + 10%
climate change flood velocity

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.38

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Velocity (m/s)

	0 to 0.2		0.6 to 0.8		2.0 to 3.0
	0.2 to 0.4		0.8 to 1.0		3.0 to 5.0
	0.4 to 0.6		1.0 to 1.5		Greater than 5.0
			1.5 to 2.0		



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

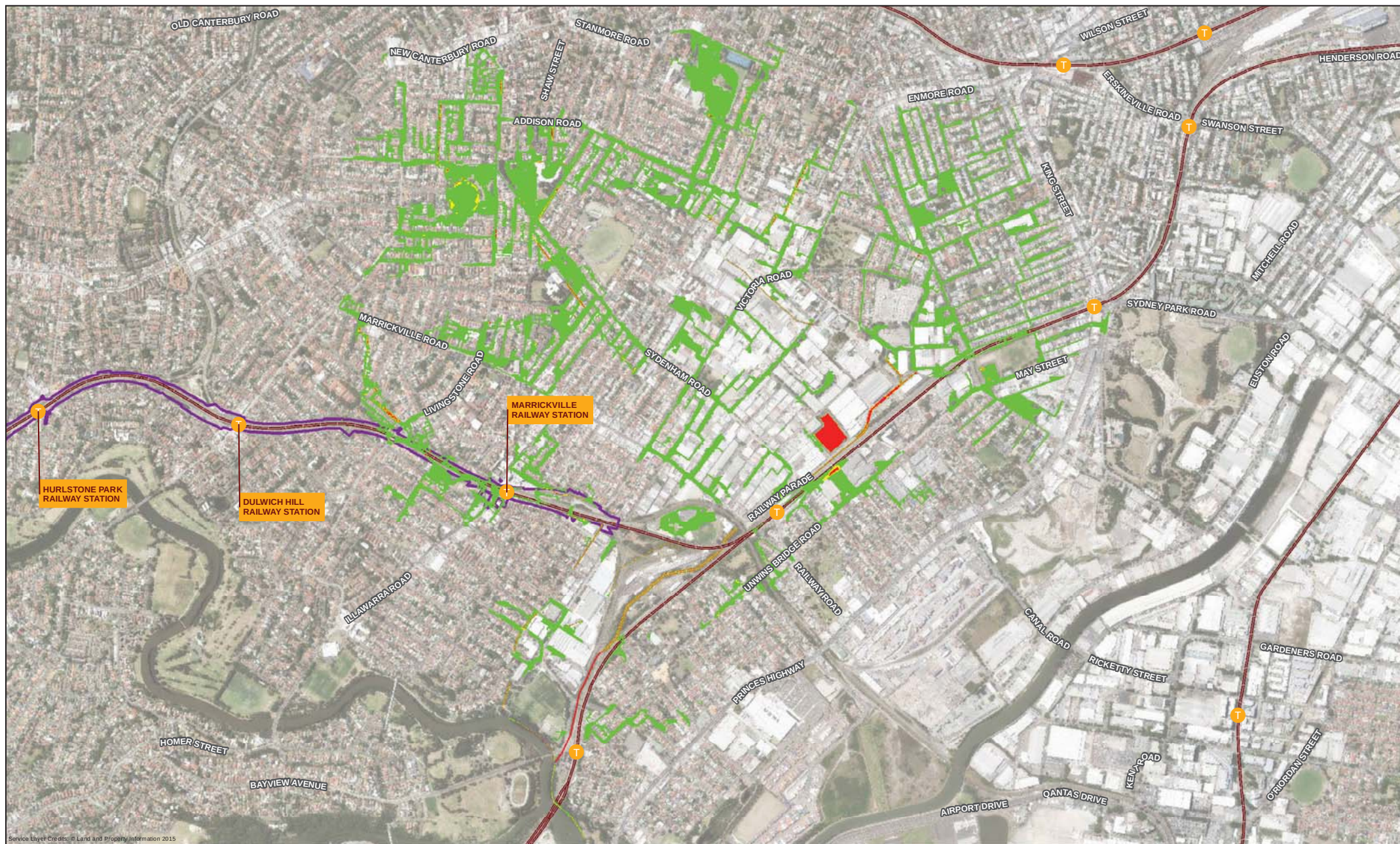
Job Number 21-25273
Revision A
Date 22 May 2017

Post-developed PMF flood velocity

Figure B.39

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Provisional Hazard Category

- 1 - Low Hazard
- 2 - Transitional Hazard
- 3 - High Hazard



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 63% AEP provisional flood hazard

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.40

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Provisional Hazard Category

- 1 - Low Hazard
- 2 - Transitional Hazard
- 3 - High Hazard



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 39% AEP provisional flood hazard

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.41

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Provisional Hazard Category

- 1 - Low Hazard
- 2 - Transitional Hazard
- 3 - High Hazard



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 18% AEP provisional flood hazard

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.42

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Provisional Hazard Category

- 1 - Low Hazard
- 2 - Transitional Hazard
- 3 - High Hazard



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 10% AEP provisional flood hazard

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.43

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Provisional Hazard Category

- 1 - Low Hazard
- 2 - Transitional Hazard
- 3 - High Hazard



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 5% AEP provisional flood hazard

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.44

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Provisional Hazard Category

- 1 - Low Hazard
- 2 - Transitional Hazard
- 3 - High Hazard



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 2%
AEP provisional flood hazard

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.45

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Provisional Hazard Category

- 1 - Low Hazard
- 2 - Transitional Hazard
- 3 - High Hazard



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

Post-developed 1% AEP provisional flood hazard

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.46

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydney@ghd.com.au W www.ghd.com.au

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Change in Flood Level (m)

- <-0.3m
- 0.3m - -0.2m
- 0.2m - -0.15m
- 0.15m - -0.1m
- 0.1m - -0.05m
- 0.05m - +0.05m
- +0.05m - +0.1m
- +0.1m - +0.15m
- +0.15m - +0.2m
- +0.2m - +0.3m
- +0.3m - +0.4m
- +0.4m - +0.5m
- > 0.5m

- Was wet now dry
- Was dry now wet



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

**63% AEP
flood level change**

Job Number 21-25273
Revision A
Date 22 May 2017

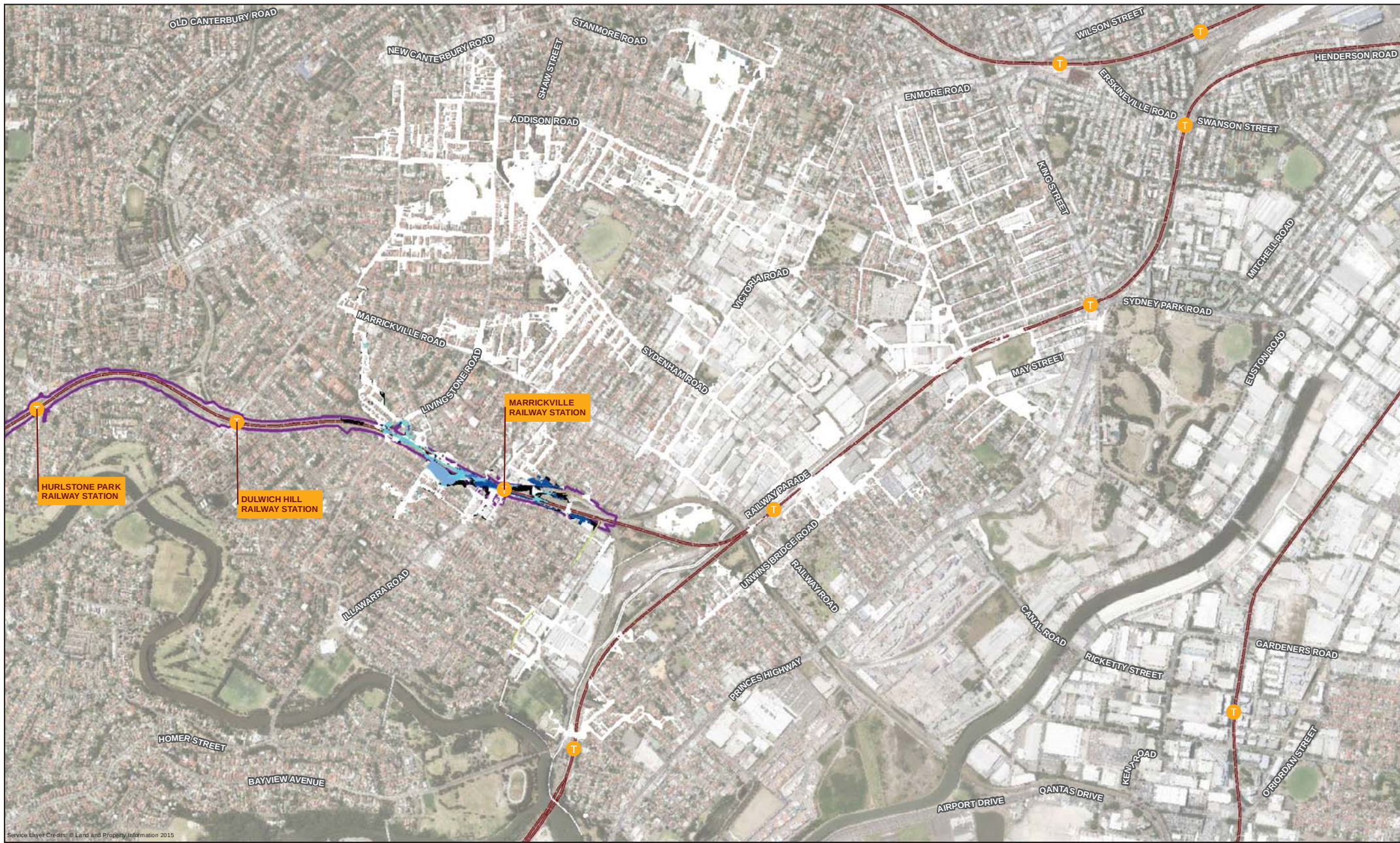
Figure B.47

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

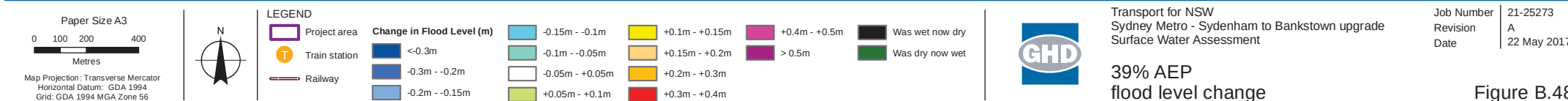
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015



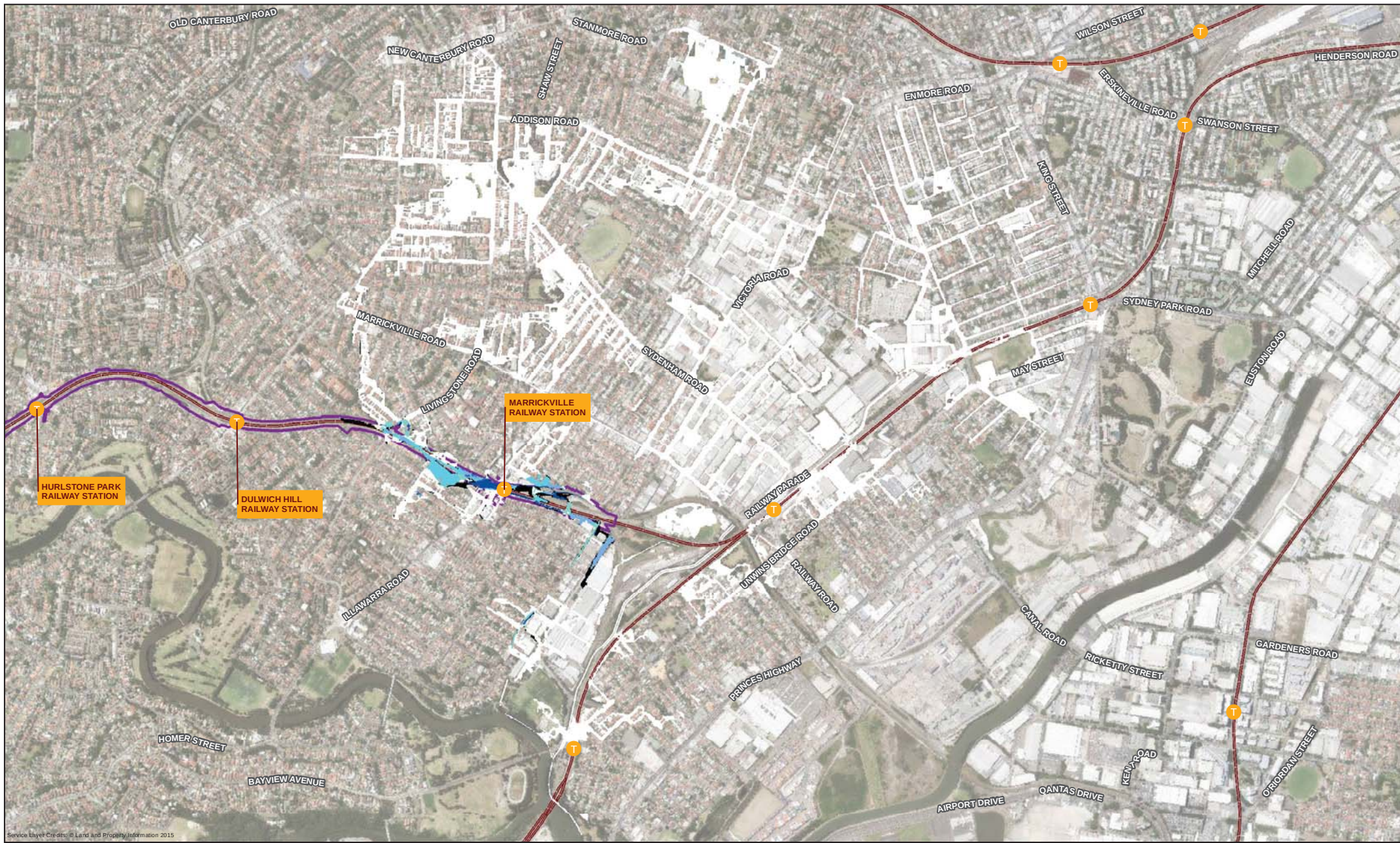
G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

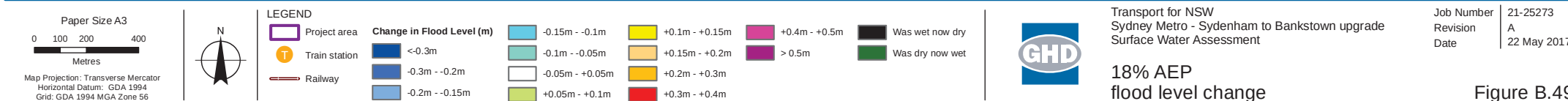
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au

Figure B.48



Service Layer Credits: © Land and Property Information 2015



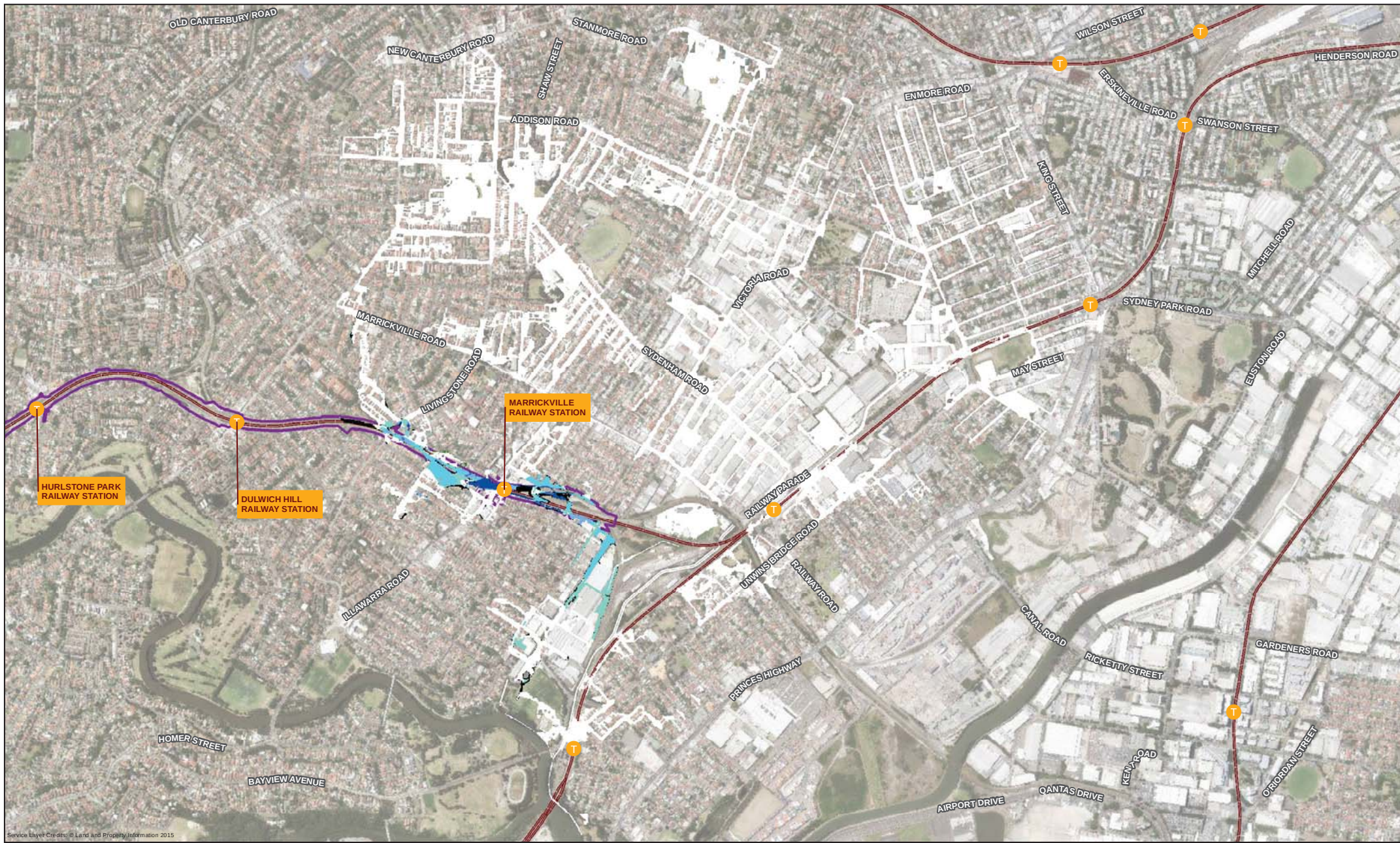
G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

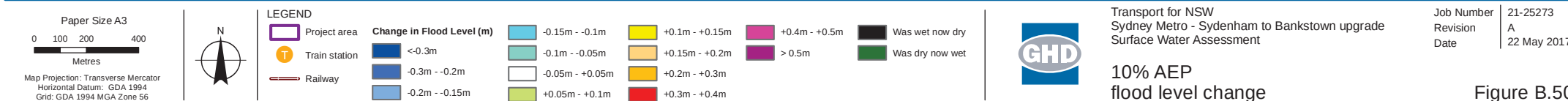
Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au

Figure B.49



Service Layer Credits: © Land and Property Information 2015



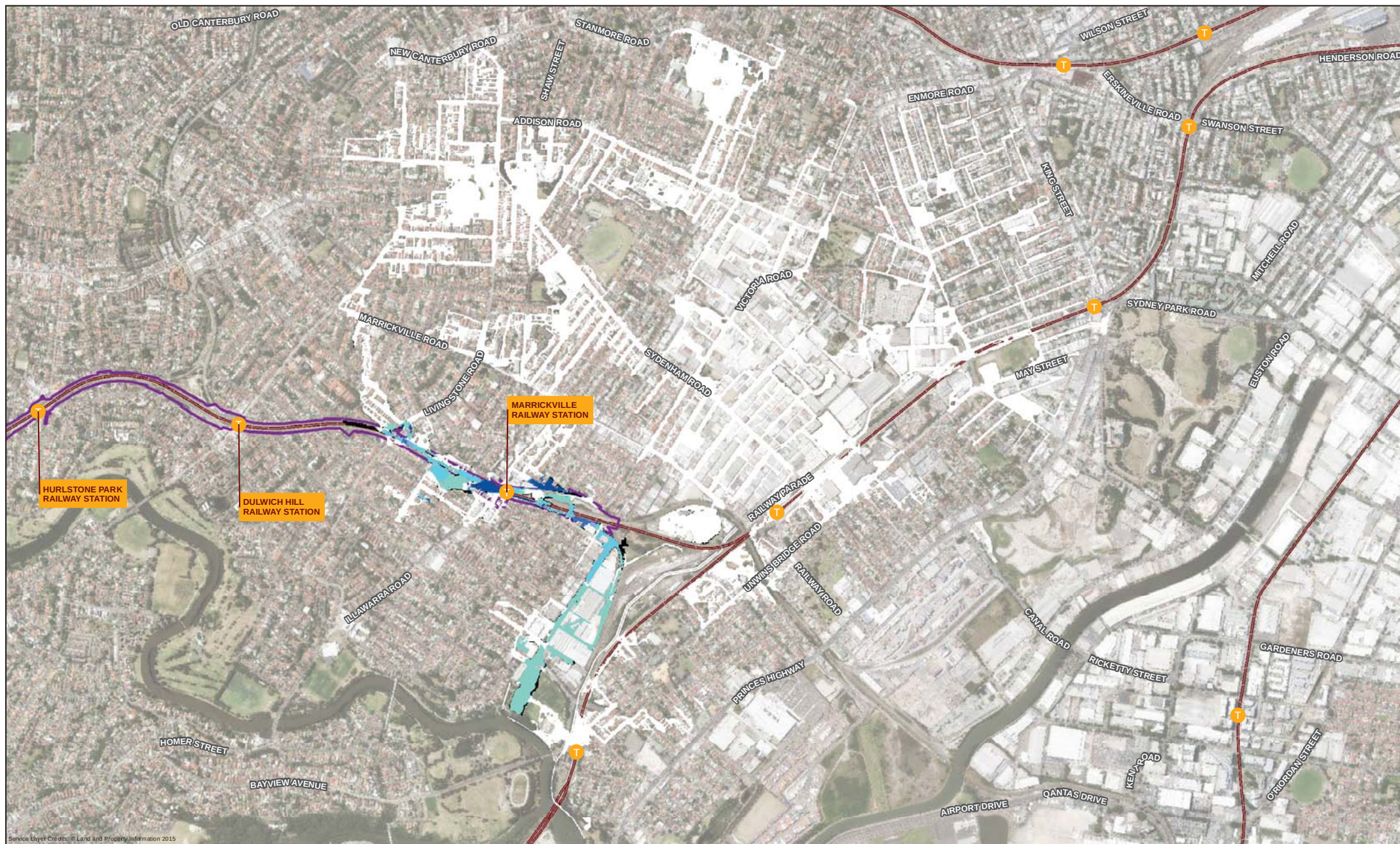
G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au

Figure B.50



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Change in Flood Level (m)

- <-0.3m
- 0.3m - -0.2m
- 0.2m - -0.15m
- 0.15m - -0.1m
- 0.1m - -0.05m
- 0.05m - +0.05m
- +0.05m - +0.1m
- +0.1m - +0.15m
- +0.15m - +0.2m
- +0.2m - +0.3m
- +0.3m - +0.4m
- +0.4m - +0.5m
- > 0.5m
- Was wet now dry
- Was dry now wet



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

**5% AEP
flood level change**

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.51

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmal@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- T Train station
- Railway

Change in Flood Level (m)

- <-0.3m
- 0.3m - -0.2m
- 0.2m - -0.15m
- 0.15m - -0.1m
- 0.1m - -0.05m
- 0.05m - +0.05m
- +0.05m - +0.1m
- +0.1m - +0.15m
- +0.15m - +0.2m
- +0.2m - +0.3m
- +0.3m - +0.4m
- +0.4m - +0.5m
- > 0.5m

- Was wet now dry
- Was dry now wet



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

2% AEP
flood level change

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.52

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015

Paper Size A3

0 100 200 400

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

LEGEND

 Project area

T Train station

Railway

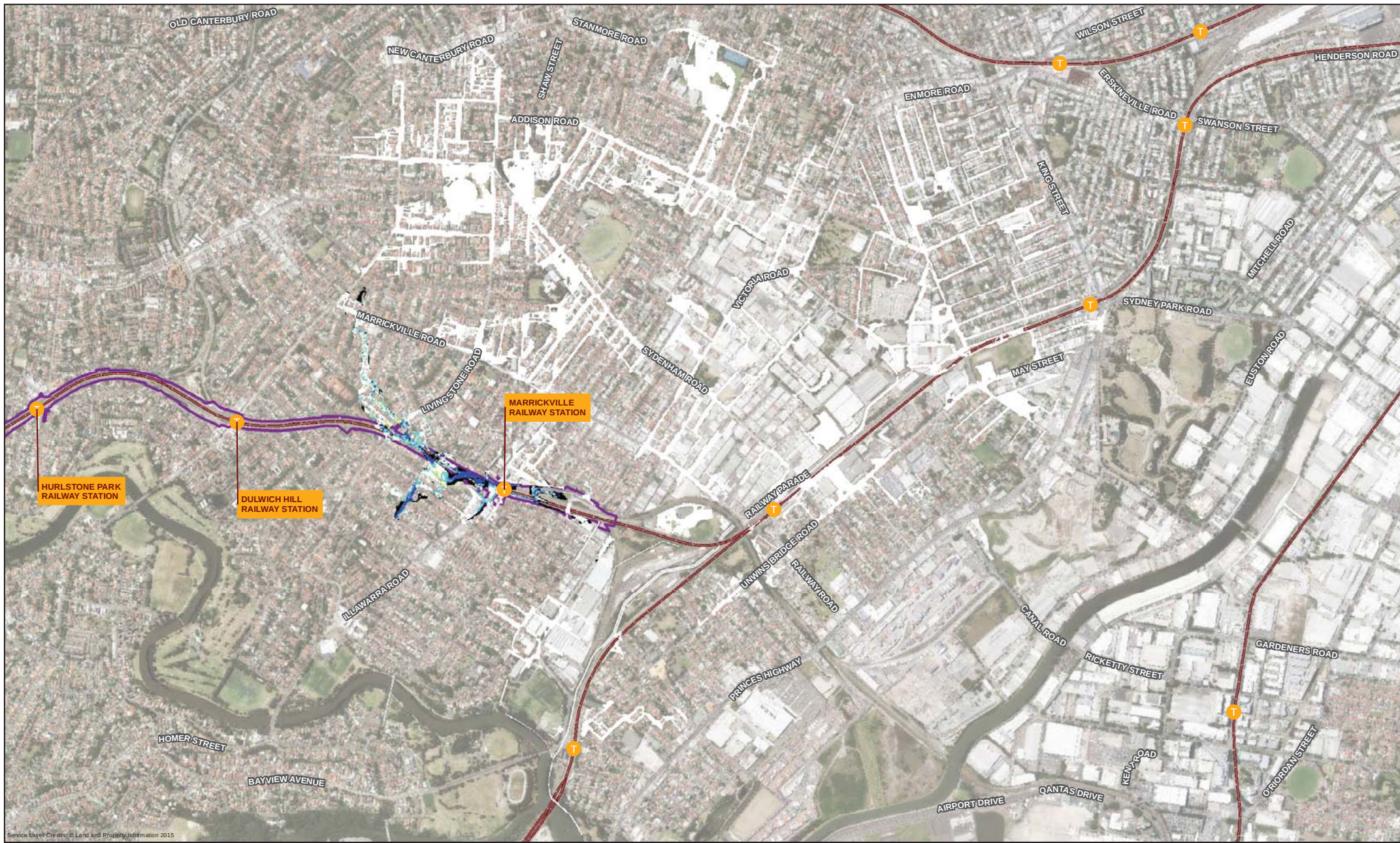
Change in Flood Level (m)

<-0.3m	-0.3m - -0.2m	-0.2m - -0.15m
-0.15m - -0.1m	-0.1m - -0.05m	-0.05m - +0.05m
+0.05m - +0.1m	+0.1m - +0.15m	+0.15m - +0.2m
+0.2m - +0.3m	+0.3m - +0.4m	+0.4m - +0.5m
> 0.5m	Was wet now dry	Was dry now wet

Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

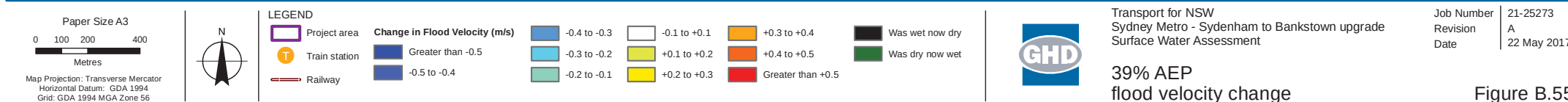
**1% AEP
flood level change**

Job Number 21-25273
Revision A
Date 22 May 2017





Service Layer Credits: © Land and Property Information 2015



G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au

Figure B.55



Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- Train station
- Railway

Change in Flood Velocity (m/s)

- Greater than -0.5
- 0.5 to -0.4
- 0.4 to -0.3
- 0.3 to -0.2
- 0.2 to -0.1
- 0.1 to +0.1
- +0.1 to +0.2
- +0.2 to +0.3
- +0.3 to +0.4
- +0.4 to +0.5
- Greater than +0.5
- Was wet now dry
- Was dry now wet



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

18% AEP
flood velocity change

Job Number 21-25273
Revision A
Date 22 May 2017

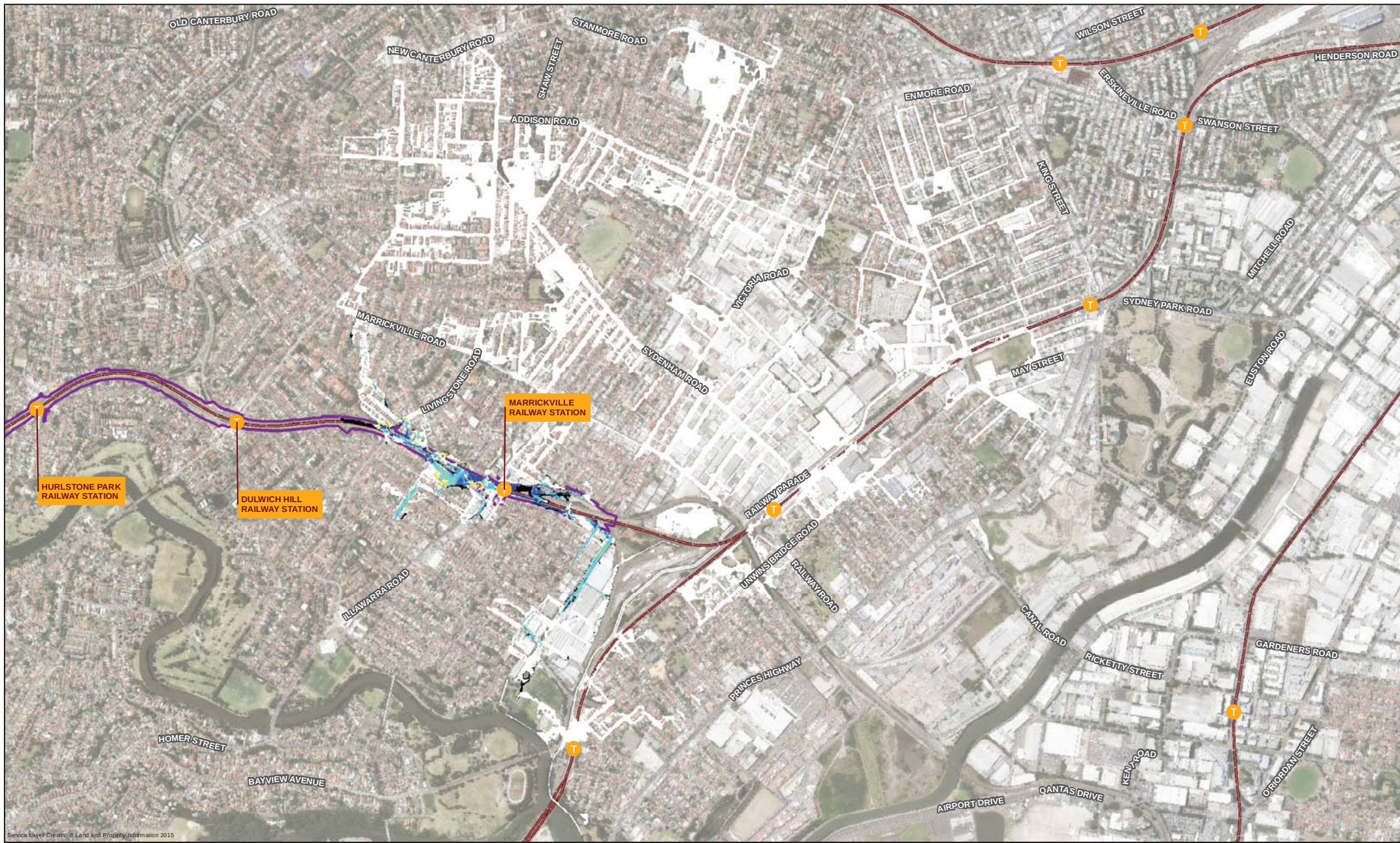
Figure B.56

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- Train station
- Railway

Change in Flood Velocity (m/s)

- | | | | | |
|-------------------|--------------|--------------|-------------------|-----------------|
| Greater than -0.5 | -0.4 to -0.3 | -0.1 to +0.1 | +0.3 to +0.4 | Was wet now dry |
| -0.5 to -0.4 | -0.3 to -0.2 | +0.1 to +0.2 | +0.4 to +0.5 | Was dry now wet |
| | -0.2 to -0.1 | +0.2 to +0.3 | Greater than +0.5 | |



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

10% AEP
flood velocity change

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.57

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015

Paper Size A3
0 100 200 400
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

- Project area
- Train station
- Railway

Change in Flood Velocity (m/s)

- | | | | |
|-------------------|--------------|--------------|-------------------|
| Greater than -0.5 | -0.4 to -0.3 | -0.1 to +0.1 | +0.3 to +0.4 |
| -0.5 to -0.4 | -0.3 to -0.2 | +0.1 to +0.2 | +0.4 to +0.5 |
| | -0.2 to -0.1 | +0.2 to +0.3 | Greater than +0.5 |

- Was wet now dry
- Was dry now wet



Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

5% AEP
flood velocity change

Job Number 21-25273
Revision A
Date 22 May 2017

Figure B.58

G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

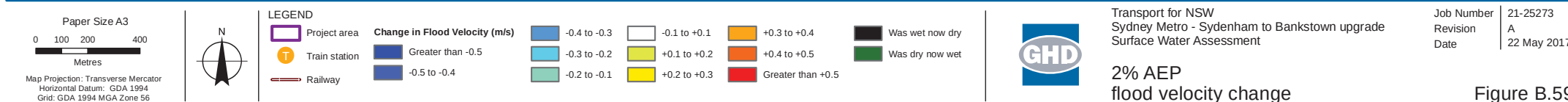
© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au



Service Layer Credits: © Land and Property Information 2015



G:\2125273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au

Figure B.59



Service Layer Credits: © Land and Property Information 2015

Paper Size A3

0 100 200 400
Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

LEGEND

 Project area

T Train station

Railway

Change in Flood Velocity (m/s)

	-0.4 to -0.3		-0.1 to +0.1		+0.3 to +0.4		Was wet now dry
	Greater than -0.5		-0.3 to -0.2		+0.1 to +0.2		Was dry now wet
	-0.5 to -0.4		-0.2 to -0.1		+0.2 to +0.3		Greater than +0.5

Transport for NSW
Sydney Metro - Sydenham to Bankstown upgrade
Surface Water Assessment

**1% AEP
flood velocity change**

Job Number 21-25273
Revision A
Date 22 May 2017

G:\21\25273\GIS\Maps\Deliverables\SurfaceWater\SMA.mxd

© 2017. Whilst every care has been taken to prepare this map, GHD (and sixmaps 2016, NSW Department of Lands) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012. Created by:afoddy

Figure B.60

Appendix C – Culverts Summary

Appendix C: Culvert Summary - comparison of design flows and velocities under existing and post-development conditions

Culvert No.	Culvert Name in Sydney Trains Chainage (Down Metro chainage)	Existing Culvert Dimensions	100 year ARI existing condition flow (m³/s)	Existing condition velocity (m/s)	100 year ARI Post-development flow (m³/s)	Post-development velocity (m/s)	Existing culvert capacity
1	6.183 (6.810)	Box culvert 3.0m x 1.8m					not determined
2	6.187 (6.830)	Box culvert 1.6m x 1.8m					not determined
3	6.699 (7.320)	Concrete arch culvert 1.4m x 1.8m	2.630	1.440	4.05	2.2	not determined
4	6.990 (7.600)	Circular 1.5m-dia.	3.28	1.8	3.28	1.8	not determined
5	7.665 (8.280)	Box culvert 658mmx576mm (under the ARTC tracks), 2000mmx800mm (under the ST tracks)	0.960	0.600	1.3	2	1 in 2-year ARI (both) (39% AEP)
6	8.093 (8.725)	Brick arch culvert 1.91mx1.98m	Low risk catchment, rail alignment is in fill at this location and more than 3.0m higher than the local road at the culvert location. No additional modelling has been done at concept stage.				not determined
7	9.000 (9.600)	Brick arch culvert 1.84mx1.96m	Low risk catchment, rail alignment is in fill at this location and more than 6.0m higher than the local council area at the culvert location. No additional modelling has been done at concept stage.				1 in 100 year ARI (1% AEP)
8	9.384 (10.000)	Brick arch culvert 1.525mx1.57m	Low risk catchment, rail alignment is in fill at this location and more than 5.0m higher than the local council area at the culvert location. No additional modelling has been done at concept stage.				1 in 100 year ARI (1% AEP)
9	9.617 (10.250)	Box culvert 750mmx800mm	1.270	6	1.270	6	1 in 100 year ARI +10% (1% AEP + 10% climate change)
10	9.883 South (10.500)	Box culvert 1500mmx500mm	1.500	2.500	2.2	2.2	1 in 10 year ARI (10% AEP)
11	11.187 (11.800)	Circular 420mm-dia.	Long drainage culvert*				not determined
12	11.846 (12.480)	Box culvert 1.52m x 1.52m, and four cells of box culverts alongside at 870mm x 590mm each	5.800	1.900	5.71	2.5	less than 1 in 10 year ARI (10% AEP)
13	12.332 (12.950)	Box culvert 1.1mx0.7m	1.760	5.000	1.4	4.8	limited by downstream capacity of less than 1 in 2 year ARI (39% AEP)
14	12.669 (13.325)	Box culvert 1.5mx1.5m	Low risk catchment, rail alignment is in fill at this location and more than 4.0m higher than the local council area at the culvert location. No additional modelling have been done at concept stage.				1 in 2 year ARI (39% AEP)
15	12.815 (13.440)	Brick arch culvert 1.9mx1.7m	Low risk catchment, rail alignment is in fill at this location and more than 4.0m higher than the local council area at the culvert location. No additional modelling have been done at concept stage.				1 in 2 year ARI (39% AEP)
16	13.550 (14.170)	Box culvert 900mm x 900mm	3.100	3.500	3.100	3.500	Less than 1 in 5-year ARI (18% AEP)
17	14.099 (14.725)	Concrete arch culvert 0.9mx0.9m	1.750	4.800	1.750	4.800	Less than 1 in 20-year ARI (5% AEP)
18	14.171 (14.800)	Concrete arch culvert 0.9mx0.9m	2.200	4.600	2.200	4.600	not determined
19	14.725 (15.350)	Brick arch culvert 1.2mx1.2m	Low risk catchment, rail alignment is in fill at this location and more than 6.0m higher than the local road at the culvert location. No additional modelling has been done at concept stage.				Less than 1 in 5-year ARI (18% AEP)
20	14.734 (15.360)	Brick arch culvert 1.2mx1.2m	Low risk catchment, rail alignment is in fill at this location and more than 6.0m higher than the local road at the culvert location. No additional modelling has been done at concept stage.				Less than 1 in 5-year ARI (18% AEP)

21	15.558 (16.180)	Concrete arch culvert 1.4mx1.4m	Low risk catchment, rail alignment is in fill at this location and more than 6.0m higher than the local road at the culvert location. No additional modelling has been done at concept stage.				Less than 1 in 5-year ARI (18% AEP)
22	15.579 (16.200)	Concrete arch culvert 1.2mx1.2m	Low risk catchment, rail alignment is in fill at this location and more than 6.0m higher than the local road at the culvert location. No additional modelling has been done at concept stage.				Less than 1 in 5-year ARI (18% AEP)
23	15.595 (16.215)	Concrete arch culvert 1.2mx1.2m	Low risk catchment, rail alignment is in fill at this location and more than 6.0m higher than the local road at the culvert location. No additional modelling has been done at concept stage.				Less than 1 in 5-year ARI (18% AEP)
24	15.973 (16.600)	Pipe culvert 0.9m diameter	1.900	5.300	1.900	5.300	Less than 1 in 5-year ARI (18% AEP)
25	16.310 (16.925)	Pipe culvert 0.9m diameter	1.700	4.800	1.700	4.800	Less than 1 in 50-year ARI (2% AEP)
26	16.361 (16.980)	Pipe culvert 0.75m diameter	1.400	3.200	1.400	3.200	Less than 1 in 20-year ARI (5% AEP)
27	16.722 (17.350)	Pipe culvert 0.9m diameter	1.500	3.500	1.6	3.7	1 in 100 year + 10% ARI (1% AEP + 10% climate change)
28	17.139 (17.750)	Concrete arch culvert 0.9mx0.9m	3.450	5.400	3.450	5.400	1 in 100 year + 10% ARI (1% AEP + 10% climate change)
29	17.333 (17.950)	Concrete arch culvert 0.9mx0.9m	2.030	1.400	2.030	1.400	1 in 100 year + 10% ARI (1% AEP + 10% climate change)
30	17.607 (18.240)	Concrete arch culvert 0.9mx0.9m	1.130	2.000	1.130	2.000	1 in 100 year + 10% ARI (1% AEP + 10% climate change)
31	17.941 East (18.550)	Concrete arch culvert 1.2mx1.2m	Low risk catchment, rail alignment is in fill at this location and more than 2.5m higher than the local council area at the culvert location. No additional modelling has been done at concept stage.				less than 1 in 20 year ARI (5% AEP)
32	17.941 West (18.550)	Concrete arch culvert 1.2mx1.2m	Same culvert as above				less than 1 in 20 year ARI (5% AEP)
33	18.375 (19.000)	Box culvert 1000mmx950mm	Low risk catchment, rail alignment is in fill at this location and more than 2.5m higher than the local council area at the culvert location. No additional modelling has been done at concept stage.				less than 1 in 20 year ARI (5% AEP)
34	18.458 East U (19.070)	Twin box culverts (Sydney Water Culverts)	Low risk catchment, rail alignment is in fill at this location and more than 2.5m higher than the local council area at the culvert location. No additional modelling has been done at concept stage.				not determined
35	18.458 East D (19.070)						not determined
36	19.147 East (Beyond Metro chainage)	Two box culverts at 0.6m x 0.5m each	Low risk catchment, rail alignment is in fill at this location and more than 4.0 m higher than the local council area at the culvert location. No additional modelling has been done at concept stage.				not determined

Notes: The culvert locations are shown in Figures 3-9 to 3-14 in the main body of the report

* the location of this longitudinal culvert (No. 11) is not shown

GHD

133 Castlereagh St Sydney NSW 2000

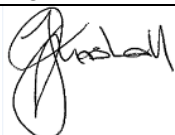
T: +61 2 9239 7100 F: +61 2 9239 7199 E: sydmail@ghd.com.au

© GHD 2017

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

G:\21\25273\WP\216232_surface water report.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Rev 0	R Kwan	N.Bailey		G Marshall		06.09.17

www.ghd.com



SYDENHAM TO BANKSTOWN
ENVIRONMENTAL IMPACT STATEMENT

> Technical Paper 8 – Hydrology, flooding and water quality assessment