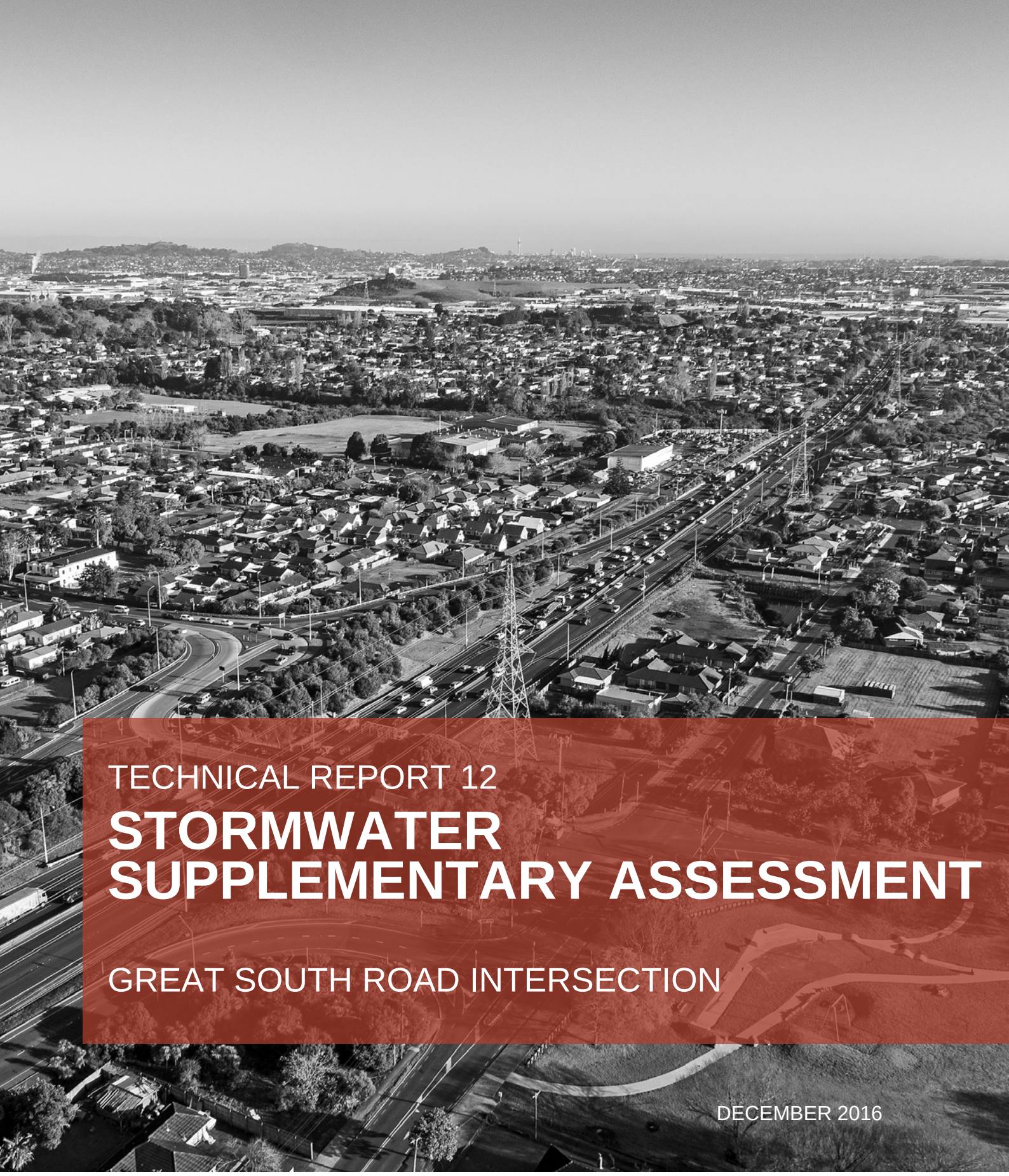

TECHNICAL REPORT 12

STORMWATER SUPPLEMENTARY ASSESSMENT

GREAT SOUTH ROAD INTERSECTION

DECEMBER 2016

NZ TRANSPORT AGENCY WAKA KOTAHI

East West Link

Quality Assurance Statement	
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Revision schedule					
Rev. Nº	**Date**	**Description**	**Prepared by**	**Reviewed by**	**Approved by**
0	December 2016	Final for Lodgement	Tony Cain	Stephen Priestley	Patrick Kelly

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Executive Summary

The assessment of the Proiect's stormwater effects outlined in Technical Report 12 (TR12) remains largely unchanged as a result of the revised design of the Great South Road intersection.

In Sectors 3 and 4, the Project including the revised Great South Road intersection will result in an additional 2.3 ha of impervious area discharging to Anns Creek when compared to the existing environment.

The total impervious area for this part of the Project discharging to Anns Creek is approximately 7.7 ha of which an area of approximately 5.4 ha of impervious surfaces currently exists. The revised intersection design involves an increase of approximately 0.5ha of impervious surface compared with the previous at grade design.

This revised design and increase in impermeable area has necessitated design changes to ensure the provision of appropriately sized stormwater treatment and stormwater conveyance systems to achieve 75% Total Suspended Solids (TSS) removal on an annual average basis for any new or modified impervious area.

Overall, with these design changes, there is no change to the assessment of effects provided in TR12 for Sectors 3 and 4 except for the assessment of flood risk.

In relation to flood risk, the properties at 20-24 Sylvia Park Road face increased risk. However, these buildings are to be acquired and the existing buildings removed. There is also a beneficial effect for one property (at 19-21 Sylvia Park Road) as a result of diversion of overland flow paths. Recommendations in relation to flood risk are outlined in TR12. No additional measures are required.

The erosion and sediment control methodology proposed in Section 6.3 of TR12 and shown on Plan Set 10: Erosion and Sediment Controls will adequately address any effects during construction of the Great South Road Intersection.

Contents

Appendices

1 Introduction

1.1 Purpose and scope of supplementary assessment

The purpose of this Technical Report 12 – Stormwater Supplementary Assessment is to assess the stormwater effects associated with the revised design of the East West Link (EWL)/Great South Road/Sylvia Park Road intersection. The original Technical Report 12 – Stormwater Assessment was completed in November 2016. Engagement with stakeholders and the wider community has continued in parallel, including design review in response to matters raised.

As a progression of the work to date, the design of the EWL/Great South Road/Sylvia Park Road intersection has been revised from the at grade design originally proposed, to a grade separated design. Grade separation of the east west through movements at this intersection will provide improved reliability and future resilience.

This supplementary assessment describes the potential and actual stormwater effects associated with construction and operation of the revised intersection design at Great South Road. The assessment considers whether the type or scale of effects on the existing environment have changed as a result of the revised design and where necessary recommends additional management and mitigation measures.

This supplementary assessment should be read in conjunction with Technical Report 12. Where this assessment supersedes and/or updates information in Technical Report 12, this has been expressly noted.

This supplementary assessment forms part of the suite of technical reports that inform the Assessment of Effects on the Environment (AEE) and supports the Notice of Requirement for a new designation, alteration to an existing designation, and resource consent applications for the Project.

1.2 Revised Great South Road intersection

The revised intersection design at Great South Road is described in Section 6 of the AEE. Key features of the revised intersection design include:

- Extending the Anns Creek viaduct by about 330m over Great South Road. The viaduct would grade down to Sylvia Park Road, approximately 200m east of Great South Road.
- Altered through movements and connections to local roads at the intersection –
  - Through movements on EWL would occur on the elevated structure above Great South Road
  - Movements to and from EWL to Sylvia Park Road and Great South Road would be at grade providing connectivity to the local street network
  - North and south movements on Great South Road would remain unchanged, passing under the elevated EWL structure.
- A grade separated pedestrian and cycle crossing for east west movements on the southern side of the Anns Creek viaduct.
- Changes to the EWL/Hugo Johnston Drive intersection.
- Associated urban design and landscape treatments.

The revised intersection design is hereafter referred to in this supplementary assessment as “the revised intersection design at Great South Road”, or “the revised design”. The previously proposed layout (as assessed in Technical Report 12) is referred to as the “at grade intersection design at Great South Road”, or “the at grade design”.

The geographical extent of the Project assessed in this supplementary assessment report is from Hugo Johnston Drive to Mt Wellington Highway.

2 Assessment Methodology and Existing Environment

2.1 Assessment Methodology

No change to the assessment methodologies applied in TR12 is required to assess effects arising from the revised Great South Road intersection. The assessment methodologies used to assess the potential stormwater effects during construction and operation of the Project have therefore also been applied to the assessment of the revised Great South Road intersection. With respect to stormwater effects, the only sectors of the Project affected by this design change are Sectors 3 and 4.

As outlined in TR12 the design objective for stormwater quality has been to design treatment devices to achieve 75% Total Suspended Solids (TSS) removal on an annual average basis for any new or modified impervious area. Accordingly the design change for the Great South Road intersection has necessitated amendments to the proposed stormwater treatment and conveyance system design between Hugo Johnston Drive and Mount Wellington Highway (including additional stormfilter cartridges, relocation of some treatment devices and some upgrading of existing systems). These changes have required amendments to the tables in Appendix D of TR12:

- Table 1-9-1 lists the stormwater treatment devices by sector and refers to their discharge locations (by reference to the relevant drawing in the AEE Volume 2: Drawing Set);
- Table 2-9-2 summarises existing and new stormwater discharges for the Project.

These two tables have been updated and are provided in Appendix A of this supplementary assessment. Figures that have changed are shown in bold type. These changes only arise in Sectors 3 and 4.

This supplementary assessment assesses the effects of the revised Great South Road intersection and those design changes.

No additional site visits were required for the preparation of this supplementary assessment.

2.2 Existing environment

The existing environment in relation to the revised design of the Great South Road intersection has not altered from that outlined in TR12.

3 Assessment of Effects

3.1 Potential effects

The potential stormwater effects of the revised Great South Road intersection are the same as those identified and described in TR12. The effects are assessed under the following headings:

- Water quality
- Stream erosion
- Flood risk
- Construction erosion and sedimentation.

3.2 Assessment of Operational effects

3.2.1 Stormwater quality

The change in the design of the Great South Road intersection has increased the area of roadway that would discharge to Anns Creek at Great South Road which could, without appropriately designed stormwater treatment systems being provided, increase the level of pollutants such as those discussed in Section 6.1.1 of TR12.

The existing catchment area draining to Anns Creek at the Great South Road intersection is approximately 133 ha. This consists of two catchments with areas of approximately 106 ha from the north and 27 ha from the east of the existing intersection.

To the east (Sylvia Park Road) the catchment is fully developed and the Project will replace approximately 5.4 ha of the existing surfaces (roads, car parks, roofs and grass berms) with an equivalent 5.4 ha area of impermeable road surfaces. As a result there is no net increase in impermeable area discharging to Anns Creek from the east.

However, the construction of the structures above Anns Creek, to the west of the Great South Road intersection, will result in an additional area of approximately 2.3 ha of new road surface which will discharge, via stormwater treatment systems, to Anns Creek at the Great South Road intersection.

The Project will not increase the impermeable areas to the north, east or south of the Great South Road intersection. Therefore the Project will result in an overall net increase in impermeable area of 2.3 ha which will discharge to Anns Creek at the Great South Road intersection resulting in an overall catchment area of approximately 135 ha.

The overall catchment areas discharging to Anns Creek are summarised in the following table:

	Catchment Areas Discharging to Anns Creek at the Great South Road Intersection (ha)				
	North	East	West	South	Total
Existing	106	27	0	0	133 ha
Proposed	106	27	2.3	0	135.3 ha

The additional road pavement and impermeable areas arising from the revised intersection design were input into the MUSIC model. The revised modelling confirms that the target of 75% removal of TSS in each sector can still be achieved with the updated treatment and conveyance systems.

3.2.2 Stream erosion effects

Anns Creek is the only freshwater environment that could potentially be affected by the revised Great South Road intersection design. As explained in Section 3.2.1, there would be a net increase in impervious area discharging to Anns Creek of 2.3 ha, which is attributed to the proposed structures between Hugo Johnston Drive and Great South Road.

Anns Creek and the upstream catchment discharging to Anns Creek are not identified by Auckland Council as requiring detention of new discharges under the “Stormwater Management Area: Flow” overlay in the Auckland Unitary Plan.

Hence the potential for additional runoff to affect stream erosion is considered low and no stormwater runoff detention is provided in the stormwater treatment devices. The potential for localised erosion at discharge locations can be managed through appropriate outfall design.

3.2.3 Flood risk effects

The revised Great South Road intersection would result in three existing identified overland flow paths being impeded and could potentially increase flood risk to the properties at 20-24 Sylvia Park Road.

It is however, noted that it is intended to acquire these properties to facilitate the construction of the Great South Road intersection, hence with the properties being acquired and the buildings being removed, the risk of flooding to the existing buildings is also removed.

The proposed stormwater design in this location makes allowance for the diversion of these overland flow paths through the provision of a network of inlets and underground pipework which would be constructed beneath the existing Great South Road and would discharge to Anns Creek at the existing outfall location. The new stormwater system will have sufficient capacity to cater for the expected overland flows whilst not increasing the flood risk at this location.

The positive effect of diverting these overland flow paths from their current route would result in a reduction in overland flows reaching 19-21 Sylvia Park Road (Stratex Site) and hence would have the effect of reducing the flood risk at this location.

However, it should be noted that residual flood risks would remain with the reliance on inlet structures and underground piped systems. The probability and consequence of failure or blockage of these systems will be further managed throughout the design development and minimised through appropriate operations and maintenance requirements at these locations. Recommendations in relation to these requirements are outlined in TR12. No additional measures are required.

It should also be noted that this residual flooding risk is currently present within the existing environment.

3.3 Assessment of Construction Stormwater Runoff Effects (Erosion and Sediment Control)

As noted in TR 12, construction activity within Anns Creek includes the establishment of a construction yard, and the construction of bridge piers. There is no change to the size or location of the construction yard in Anns Creek as a result of the revised design of the Great South Road intersection and therefore further assessment beyond that carried out in TR12 is not required.

There will be an increase in the number of bridge piers (by approximately 30%) required for the construction of the main East West Link and the eastbound and westbound connections at Great South Road and the size and location of the temporary staging platforms would change slightly. However, the construction methodology discussed in TR12 would remain the same.

The preliminary erosion and sediment control measures that have been developed for the Project are explained in Section 6.3 of TR12 and shown on Plan Set 10: Erosion and Sediment Control in AEE Volume 2: Drawing Set.

The proposed erosion and sediment control methodology will adequately address any effects from an increased construction footprint associated with the revised intersection design.

4 Recommended mitigation

While the revised intersection could result in additional water quality, flood risk and erosion and sediment control effects, these have been mitigated in the design as follows:

- Provision of appropriately sized stormwater treatment systems;
- Relocation of a number of the stormwater treatment systems to cater for the revised road alignment;

- Provision for the existing overland flow paths by including new stormwater conveyance systems discharging to Anns Creek; and,
- Adjustments to the line and location of the existing underground stormwater conveyance system along Sylvia Park Road.

With respect to construction stormwater effects, the proposed erosion and sediment control measures will provide adequate mitigation to minimise effects as far as practicable and no additional mitigation measures would be required.

5 Conclusion

The revised Great South Road intersection will result in an additional 2.3 ha of impervious area discharging to Anns Creek when compared to the existing environment.

The revised design of the Great South Road intersection also includes appropriately sized stormwater treatment and conveyance systems. Overall, with these design changes, there is no change to the assessment provided in TR12 for Sectors 3 and 4 except for the assessment of flood risk.

For flood risk there will be additional effects on the properties identified in Section 3.2.3 as follows:

- 20-24 Sylvia Park Road - The construction of the revised Great South Road Intersection would have the result of impeding overland flows paths from the north of Sylvia Park Road, which would have the potential to increase flooding at this location. However, these properties will be acquired and removed as part of the Project, consequently removing the flood risk to the existing buildings.

The provision of new stormwater infrastructure required as part of the project will be designed to accommodate these overland flows paths. This will have beneficial effects in terms of flood risk at 19-21 Sylvia Park Road as the construction of the proposed stormwater infrastructure, to cater for the existing overland flow paths which flow through 20-24 Sylvia Park Road, will result in the reduction of the flood flows entering 19-21 Sylvia Park Road and there will be a reduction in flood risk at this location.

A residual flood risk would however remain due to the reliance on inlet structures and underground piped systems as opposed to open channels. The probability and consequence of failure or blockage of these systems would be further assessed and managed throughout the design development and minimised through appropriate operations and maintenance requirements at these locations. Recommendations in relation to these requirements are outlined in TR12. No additional measures are required as a result of the revised design of the Great South Road intersection. It is also noted that this residual flood risk is currently present within the existing environment.

The erosion and sediment control methodology proposed in Section 6.3 of TR12 and shown on Plan Set 10: Erosion and Sediment Control in AEE Volume 2: Drawing Set will adequately address any additional effects during construction.

Appendix A

Stormwater Treatment Devices and Project Discharge Locations

Table1-9-1 stormwater treatment devices*

Sector	Device Ref	DWG Ref	Catchment area (ha)			Type of treatment device	Device Area (m2)	Level of Treatment
			Total	Project	Out-of-Project			
1	S1A	AEE-SW-101	0.3	0.3	0.0	Stormfilter (7 Cartridges)	NA	75% TSS
	S1B	AEE-SW-101	0.6	0.6	0.0	Wetland	1,700	75% TSS
	S1D	AEE-SW-101	0.3	0.3	0.0	Stormfilter (8 Cartridges)	NA	75% TSS
	S1E	AEE-SW-101	0.4	0.4	0.0	Stormfilter (10 Cartridges)	NA	75% TSS
	S1G	AEE-SW-102	5.2	5.2	0.0	Wetland	2,500	75% TSS
	S1H	AEE-SW-102	1.0	1.0	0.0	Stormfilter (22 Cartridges)	NA	75% TSS
	S1I	AEE-SW-102	0.3	0.3	0.0	Stormfilter (7 Cartridges)	NA	75% TSS
	S1J	AEE-SW-102	0.9	0.9	0.0	Stormfilter (23 Cartridges)	NA	75% TSS
	S1K	AEE-SW-103	0.7	0.0	0.7	Stormfilter (15 Cartridges)	NA	75% TSS
	S1L	AEE-SW-103	1.5	0.0	1.5	Stormfilter (37 Cartridges)	NA	75% TSS
	S1M	AEE-SW-103	1.6	0.4	1.2	Stormfilter (34 Cartridges)	NA	75% TSS
2	Galway Street Treatment Area	AEE-SW-103	64.5	Approx. 1% out-of-Project	64.5	Sediment forebay and biofiltration system	2000	75% TSS
	Landform 1 Treatment Area	AEE-SW-104	81.55	Approx. 2% out-of-Project	80.2	Sediment forebays and combined wetland / biofiltration system	6150	
	Landform 2 Treatment Area	AEE-SW-104	81.4	Approx. 4% out-of-Project	81.4	Sediment forebays and combined wetland / biofiltration system	7525	
	Landform 3 Treatment Area	AEE-SW-106	326.5	Approx. 1% out-of-Project	326.5	Sediment forebays and combined wetland / biofiltration system	31690	
	Miami Stream Treatment Area	AEE-SW-105	43.8	Approx. 2-4% out-of-Project	43.8	Sediment forebays and combined wetland / biofiltration system	4550	
3	S3A	AEE-SW-107	2.3	1.7	0.6	Wetland	6,000	75% TSS
	S3B	AEE-SW-107	0.2	0.2	0.0	Stormfilter (6 Cartridges)	NA	75% TSS

Sector	Device Ref	DWG Ref	Catchment area (ha)			Type of treatment device	Device Area (m2)	Level of Treatment
			Total	Project	Out-of-Project			
	S3C	AEE-SW-107	<0.1	<0.1	0.0	Stormfilter (1 Cartridges)	NA	75% TSS
	S3D	AEE-SW-107	<0.1	<0.1	0.0	Stormfilter (1 Cartridges)	NA	75% TSS
	S3E	**AEE-SW-108**	**3.5**	**3.2**	**0.3**	**Stormfilter (83 Cartridges)**	**NA**	**75% TSS**
	S3G	AEE-SW-108	0.4	0.4	0.0	Stormfilter (10 Cartridges)	NA	75% TSS
4	**S4A**	**AEE-SW-108**	**0.7**	**0.7**	**0.0**	**Stormfilter (18 Cartridges)**	**NA**	**75% TSS**
	S4B	**AEE-SW-108**	**1.4**	**1.1**	**0.3**	**Stormfilter (35 Cartridges)**	**NA**	**75% TSS**
	S4C	**AEE-SW-109**	**1.2**	**1.2**	**0.0**	**Stormfilter (28 Cartridges)**	**NA**	**75% TSS**
	S4D	AEE-SW-109	8.1	0.0	8.1	Stormfilter (147 Cartridges)	NA	75% TSS
	S4E	**AEE-SW-109**	**1.5**	**1.5**	**0.0**	**Stormfilter (36 Cartridges)**	**NA**	**75% TSS**
	S4F	**AEE-SW-110**	**0.2**	**0.2**	**0.0**	**Stormfilter (4 Cartridges)**	**NA**	**75% TSS**
	S4G	AEE-SW-110	3.3	3.3	0.0	Stormfilter (76 Cartridges)	NA	75% TSS
5	S5A	AEE-SW-110	2.0	1.9	0.1	Stormfilter (45 Cartridges)	NA	75% TSS
	S5B	AEE-SW-111	4.0	1.4	2.6	Stormfilter (78 Cartridges)	NA	75% TSS
	S5C	AEE-SW-111	0.2	0.2	0.0	Stormfilter (4 Cartridges)	NA	75% TSS
	S5D	AEE-SW-112	6.7	2.2	4.5	Stormfilter (133 Cartridges)	NA	75% TSS
	S5E	AEE-SW-112	4.7	2.7	2.0	Stormfilter (103 Cartridges)	NA	75% TSS
	S5F	AEE-SW-113	0.2	0.2	0.0	Stormfilter (4 Cartridges)	NA	75% TSS
	S5G	AEE-SW-113	5.5	3.4	2.1	Wetland	1,200	75% TSS
	S4I	AEE-SW-113	0.1	0.1	0.0	Stormfilter (4 Cartridges)	NA	75% TSS
	S4J	AEE-SW-113	0.1	0.1	0.0	Stormfilter (4 Cartridges)	NA	75% TSS

*Items in bold type have been adjusted as part of the revised design of the Great South Road Intersection

Table 2-9-2 Project discharge locations*

Sector	Outfall Reference	Chainage	Drawing Reference	Catchment Area (Ha)			Flood Flows (m3/s)		Pipe Diameter (mm)	Existing or New Outfall
				Total	Project	Out-of-Project	Q_{10}	Q_{100}		
1	S1A	N/A	AEE-SW-101	0.3	0.3	0.0	0.1	0.1	TBC	New
	S1B	N/A	AEE-SW-101	0.6	0.6	0.0	0.1	0.2	TBC	New - connection to existing open drain
	S1C	MC00 50	AEE-SW-101	101.8	0.0	101.8	11.5	0.2	TBC	Existing - connection to existing open drain
	S1D	N/A	AEE-SW-101	0.3	0.3	0.0	0.1	0.1	TBC	New Connection to new open drain
	S1E	N/A	AEE-SW-101	0.4	0.4	0.0	0.1	0.2	375 (TBC)	New
	S1F	N/A	AEE-SW-102	102.7	1.0	101.8	11.7	0.3	1350 & 900	Existing with new outfall structures
	S1G	MC00 400	AEE-SW-102	5.2	5.2	0.0	0.9	1.7	1050 (TBC)	Existing with new outfall structure
	S1H	MC00 450	AEE-SW-102	1.0	1.0	0.0	0.3	0.4	525 (TBC)	New
	S1I	MC00 525	AEE-SW-102	0.3	0.3	0.0	0.1	0.1	300 (TBC)	New
	S1J	MC00 850	AEE-SW-102	0.9	0.9	0.0	0.3	0.4	525 (TBC)	New
	S1K	MC00 800	AEE-SW-103	0.7	0.0	0.7	0.2	0.3	TBC	Existing connection to existing pipe
	S1L	MC00 950	AEE-SW-103	1.5	0.0	1.5	0.4	0.7	600 (TBC)	New
	S1M	MC00 980	AEE-SW-103	1.6	0.4	1.2	0.4	0.6	600 (TBC)	New
	S1N	MC00 960	AEE-SW-103	64.5	Approx. 1% out-of-project area	64.5	6.4	10.3 *	APPROX 900 (TBC)	New
	S1O	MC00 1120	AEE-SW-103						APPROX 2100 (TBC)	New
2	S2 A (C4)	MC00 1350	AEE-SW-103	35.3	Approx. 2% out of project area	35.3 (excl. reclamation)	4.50	8.3 *	APPROX 1800 (TBC)	New
	S2 LF1B	N/A	AEE-SW-104	46.3		46.3	3.7	5.7 *	APPROX 1800	New

Sector	Outfall Reference	Chainage	Drawing Reference	Catchment Area (Ha)			Flood Flows (m3/s)		Pipe Diameter (mm)	Existing or New Outfall
				Total	Project	Out-of-Project	Q_{10}	Q_{100}		
						(excl. reclamation)			(TBC)	
	S2 LF1A	N/A	AEE-SW-103				N/A - low flow		APPROX 450 (TBC)	New
	S2 LF2A	N/A	AEE-SW-104	81.4	Approx. 4% out-of-project area	81.4 (excl. reclamation)	N/A - low flow		APPROX 450 (TBC)	New
	S2 LF2B	N/A	AEE-SW-104				5.41	13.3 *	APPROX 1800 (TBC)	New
	S2G (C7)	MC 2710	AEE-SW-105	43.8	Approx. 2-4 % out-of-project area	43.8	5.2	16.9 *	APPROX 1200 (TBC)	New
	S2 LF3A	N/A	AEE-SW-105	286.3	Approx. 1% out-of-project area	286.3 (excl. reclamation)	22.7	36.1 *	APPROX 2100 (TBC)	New
	S2 LF3B	N/A	AEE-SW-105						APPROX 2100 (TBC)	New
	S2 LF3C	N/A	AEE-SW-106	40.2		40.2 (excl. reclamation)	N/A - low flow		APPROX 525 (TBC)	New
	S2 LF3E	N/A	AEE-SW-106				N/A - low flow		APPROX 525 (TBC)	New
	S2 LF3D	N/A	AEE-SW-106				6.8	10.2 *	APPROX 1500 (TBC)	New
	S2 LF3F	N/A	AEE-SW-106						APPROX 2100 (TBC)	New
3	S3A	MC00 4200	AEE-SW-107	2.3	1.7	0.6	0.6	0.9	TBC	New connection to existing open drain
	S3B	MC00 4350	AEE-SW-107	0.2	0.2	0.0	0.1	0.1	TBC	New connection to new open drain
	S3C	MC00 4450	AEE-SW-107	0.0	0.0	0.0	<0.1	<0.1	TBC	New connection to existing open drain

Sector	Outfall Reference	Chainage	Drawing Reference	Catchment Area (Ha)			Flood Flows (m3/s)		Pipe Diameter (mm)	Existing or New Outfall
				Total	Project	Out-of-Project	Q_{10}	Q_{100}		
	S3D	MC00 4500	AEE-SW-107	0.0	0.0	0.0	<0.1	<0.1	TBC	New connection to existing network
	S3E	**MC00 4970**	**AEE-SW-108**	**3.5**	**3.5**	**0.0**	**1.1**	**1.6**	**900 (TBC)**	**New**
	S3F	MC00 5060	AEE-SW-108	131.3	3.6	127.7	15.8	17.8	2 x 2500 (TBC)	Existing to be extended
	S3G	MC00 5080	AEE-SW-108	0.4	0.4	0.0	0.1	0.2	TBC	New connection to existing network
4	**S4A**	**MC00 5200**	**AEE-SW-108**	**0.7**	**0.7**	**0.0**	**0.2**	**0.3**	**TBC**	**New connection to proposed network**
	S4B	**MC00 5350**	**AEE-SW-108**	**1.4**	**1.1**	**0.3**	**0.4**	**0.7**	**TBC**	**New connection to proposed network**
	S4C	**MC00 5550**	**AEE-SW-109**	**1.2**	**1.2**	**0.0**	**0.4**	**0.5**	**TBC**	**New connection to proposed network**
	S4D	MC00 5650	AEE-SW-109	8.1	0.0	8.1	1.9	2.9	TBC	New connection to existing network
	S4E	**MC00 5710**	**AEE-SW-109**	**1.5**	**1.5**	**0.0**	**0.4**	**0.7**	**TBC**	**New connection to proposed network**
	S4F	**MC00 6270**	**AEE-SW-110**	**0.1**	**0.1**	**0.0**	**<0.1**	**0.1**	**TBC**	**New connection to existing modified open drain**
	S4G	MC00 6550	AEE-SW-110	3.3	3.3	0.0	1.0	1.5	TBC	New connection to proposed box culvert
	S4H	MC00 6300	AEE-SW-110	42.5	6.6	35.9	4.6	9.2	5.3 x 1 (TBC)	Existing connection to existing modified open drain
	S4I	MC00 6275	AEE-SW-110	12.3	0.0	12.3	2.2	3.2	1200	Existing connection to existing modified open drain
	S4J	MC00 6150	AEE-SW-110	58.7	6.9	51.8	8.7	11.7	2 x 1650 (TBC)	Existing
5	S5A	MC00 6750	AEE-SW-110	2.0	1.9	0.1	1.4	5.1	1350 & 2 x 300 (TBC)	New to modified existing open drain
	S5B	MC00 7200	AEE-SW-111	4.0	1.4	2.6	0.7	1.6	1350 (TBC)	New connection to proposed network
	S5C	MC00 7150	AEE-SW-111	0.2	0.2	0.0	0.1	0.1	TBC	New connection to existing network
	S5D	MC00 7900	AEE-SW-112	6.7	2.2	4.5	1.3	2.1	525 & 300 (TBC)	New

Sector	Outfall Reference	Chainage	Drawing Reference	Catchment Area (Ha)			Flood Flows (m3/s)		Pipe Diameter (mm)	Existing or New Outfall
				Total	Project	Out-of-Project	Q_{10}	Q_{100}		
	S5E	MC00 8050	AEE-SW-112	4.7	2.7	2.0	1.0	2.9	675 & 300 (TBC)	New
	S5F	MC00 8340	AEE-SW-113	0.2	0.2	0.0	<0.1	0.1	TBC	Connection to existing pipe
	S5G	MC00 8360	AEE-SW-113	5.5	3.4	2.1	1.0	0.9	900 (TBC)	Connection to existing open drain
	S5H	MC00 8450	AEE-SW-113	5.5	3.4	2.1	1.0	0.9	TBC	Connection to proposed wetland
	S5I	MC00 8590	AEE-SW-113	0.1	0.1	0.0	<0.1	0.1	TBC	Connection to existing pipe
	S5J	MC00 8750	AEE-SW-113	0.1	0.1	0.0	<0.1	0.1	TBC	Connection to existing pipe

*Items in bold type have been adjusted as part of the revised design of the Great South Road Intersection