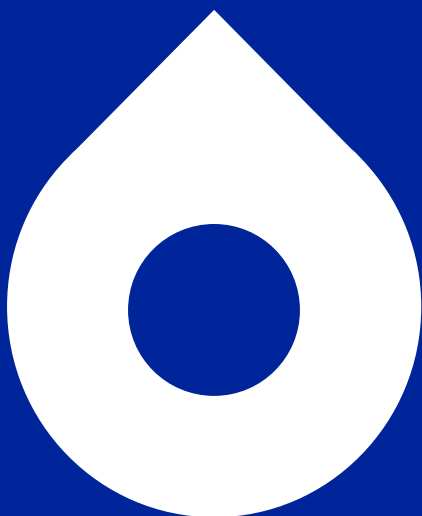


Wet Weather Infiltration Monitoring Program

For the sewer network connected to the Badu Yarragul
Water Resource Recovery Facility (BYWRRF)





Acknowledgement of Country

Sydney Water respectfully acknowledges the Traditional Custodians of the land and waters on which we work, live and learn. We pay respect to Elders past and present.



Version Control

Date	Revision	Comments	Prepared by	Approved by
23/10/2024	Draft 1	Preparation of draft WWIMP document	Nerisha Stanley	Cheryl Cahill
12/11/2024	Draft 1	Provided to internal team to input technical information	Pradip Saha	
13/02/2025	Draft 2	Input technical information from flow monitoring plan	Cheryl Cahill	
04/03/2025	Draft 3	Incorporated project team comments and format for issue to EPA	Cheryl Cahill	Dimi Shortland
16/06/2025	Draft 4	Update to incorporate EPA comments, MOD3 and revisions to flow monitoring plan	Nerisha Stanley	
05/08/2025	Rev 1	Issue to DPHI	Cheryl Cahill	Dimi Shortland
15/09/2025	Rev 2	Response to DPHI RFI	Pradip Saha/ Cheryl Cahill	Dimi Shortland

1....Introduction	7
1.1 Project and Catchment Background	7
1.2 WRRF Process	7
1.3 System Description	8
1.4 Purpose of this plan	10
2...Wet Weather Infiltration and Flow Monitoring	11
2.1 Flow Monitor installation for Infiltration Evaluation	11
2.2 Proposed actions in the event of high infiltration	11
2.3 Other Flow Infiltration Mitigation	12
2.4 Licence Reporting	12
3...Licence and Project Gauging Protocol in the Existing System	13
3.1 Background	13
3.2 Licence Flow Monitors	13
3.3 Project Flow Monitors	14
4 ..Flow Monitor Selection Methodology and Assumptions	16

5 .. Flow Monitor Selection for Individual Catchments	17
5.1 Cosgrove & Agribusiness Catchments	17
5.2 Badgerys Creek Catchment	20
5.3 Mamre Road Catchment	22
5.4 South Creek and Thompsons Creek Catchments.	24
5.5 Kemps Creek (Austral Leppington) Catchment	27
5.6 Lowes Creek Catchment	30
6.... Customer Complaints	33
7.... Summary and Recommendations	34
8.... References	38
Appendix 1- Consultation Summary Report	39

Figures

Figure 1: Upper South Creek Catchment Layout, Proposed Sewers and Proposed Gauging Locations	9
Figure 2: Layout of Proposed Sewers and Proposed Gauging Locations for Cosgrove Catchment	18
Figure 3: Layout of Proposed Sewers and Proposed Gauging Locations for Agribusiness Catchment	19
Figure 4: Layout of Proposed Sewers and Proposed Gauging Locations for Badgerys Creek Catchment.....	21
Figure 5: Layout of Proposed Sewers and Proposed Gauging Locations for Mamre Road Catchment.....	23
Figure 6: Layout of Proposed Sewers and Proposed Gauging Locations for South Creek Catchment.....	25
Figure 7: Layout of Proposed Sewers and Proposed Gauging Locations for Thompsons Creek Catchment	26
Figure 8: Layout of Proposed Sewers and Proposed Gauging Locations for Kemps Creek Catchment.....	29
Figure 9: Layout of Proposed Sewers and Proposed Gauging Locations for Lowes Creek Catchment.....	32
Figure 10: Upper South Creek Catchment Layout, Proposed Sewers and Proposed Gauging Locations	36

Tables

Table 1: SPSs and their Catchment of Location.....	8
Table 2: Condition Related to the development of this WWIMP	10
Table 3: Pollution Reduction Program Protocols.....	13
Table 4: Detail Information on Cosgrove - Agribusiness Catchment.....	17
Table 5: Detail Information on Badgerys Creek Catchment	20
Table 6: Detail Information on Mamre Road Catchment	22
Table 7: Detail Information on South Creek and Thompsons Creek Catchment.....	24
Table 8: Detail Information on Kemps Creek Catchment	28
Table 9: Detail Information on Lowes Creek Catchment.....	31
Table 10: Summary Information for Equivalent Population (EP) at Each Planning Horizons in Each Catchment.....	35
Table 11: Information on Proposed Gauge Locations	37

1 Introduction

1.1 Project and Catchment Background

The South-West Growth Area (SWGA) and Western Sydney Aerotropolis Growth Area (WSAGA) Sub-Regional Plan (2020) identified the need for new wastewater treatment plant. The Badu Yarragul Water Resource Recovery Facility (BYWRRF) (the project), formerly known as the Upper South Creek (USC) Advanced Water Recycling Centre (AWRC), is currently under construction. It will support the population growth and economic development of the WSAGA and SWGA area of about 25,000 hectares include 43,000 equivalent population (EP) in 2026 and 550,000 EP in 2056 condition (refer to Table 10).

When operational, the BYWRRF will provide wastewater services to Western Sydney to produce high-quality treated water for non-drinking reuse and for release to local waterways. The project comprises the following components:

- A new Water Resource Recovery Facility (WRRF) to collect wastewater from businesses and homes and treat it with advanced technology, producing high-quality treated water, renewable energy and biosolids for beneficial reuse
- A new green space area around the BYWRRF, adjacent to South Creek and Kemps Creek, to support the ongoing development of a green spine through Western Sydney
- New infrastructure from the BYWRRF to South Creek, to release excess treated water during significant wet weather events, estimated to occur about 3 – 14 days each year
- A new treated water pipeline from the BYWRRF to Nepean River at Wallacia Weir, to release high-quality treated water to the river during normal weather conditions
- A new brine pipeline from the BYWRRF to connect into Sydney Water's existing Northern Georges River submain (NGRS) at Lansdowne to transport brine to the Malabar Wastewater Treatment Plant for further treatment
- A range of ancillary infrastructure.

The USC catchment is divided into eight sub-catchments namely Cosgrove Catchment, Agribusiness Catchment, Badgerys Creek Catchment, Mamre Road Catchment, South Creek Catchment, Thompsons Creek Catchment, Kemps Creek Catchment and Lowes Creek Catchment.

Initial stages of sewers have been laid in the Kemps Creek Catchment and Lowes Creek Catchment to service Austral, Leppington, Oran Park and Catherine Fields PAP catchments. Sewers in the rest of the growth area are to be delivered progressively between 2026-2036. While the wastewater collection network is outside the scope of the BYWRRF project, the network impacts have been considered in the development of this plan in accordance with the requirements of condition E121.

1.2 WRRF Process

The BYWRRF Stage 1 has been designed to provide wastewater treatment for up to 35 megalitres per day (MLD). A future Stage 2 upgrade (currently planned 2035+) will provide wastewater treatment for up to 70 MLD. Sydney Water will remain flexible on the size and timing of these future upgrades to accommodate changes in population projections over time within the USC catchment. Future stages will be subject to further environmental assessment and an amended EPL.

The BYWRRF will produce treated water at three different quality levels including:

- advanced (very high-quality) treated water
- tertiary (high-quality) treated water
- wet weather quality (lowest level of treatment – preliminary treatment and disinfection).

1.3 System Description

The USC Wastewater Network Options Assessment Report identified options to service growth and transfer flows to the new BYWRRF. The catchment is a new growth area bounded by St Marys System in the North East, West Camden System in the South and the Hoxton Park catchment network that drains to the Liverpool WRFF in the east and open land to the west. Figure 1 shows the USC catchment area, existing and proposed sewers and identified sewer flow monitors at strategic locations.

Parts of the sewers have been laid in the Kemps Creek Catchment (also known as Austral Leppington catchment) and the Lowes Creek Catchment. Sewers in the rest of the area would be delivered progressively in 2026, 2028, 2031 and 2036. The new BYWRRF will be operational from 2026.

When developed, the USC wastewater system will accommodate about 13 Sewerage Pumping Stations (SPSs) and associated connecting sewers in these Catchments. Refer the Figure 1 and Table 1 for the location of these SPSs. SP1246 from the Cosgrove Catchment, SP1211/ SP1239 from the Kemps Creek Catchment, SP1222 from the Mamre Road Catchment and SP1243 from the South Creek Catchment would transfer flow to BYWRRF directly.

Table 1: SPSs and their Catchment of Location

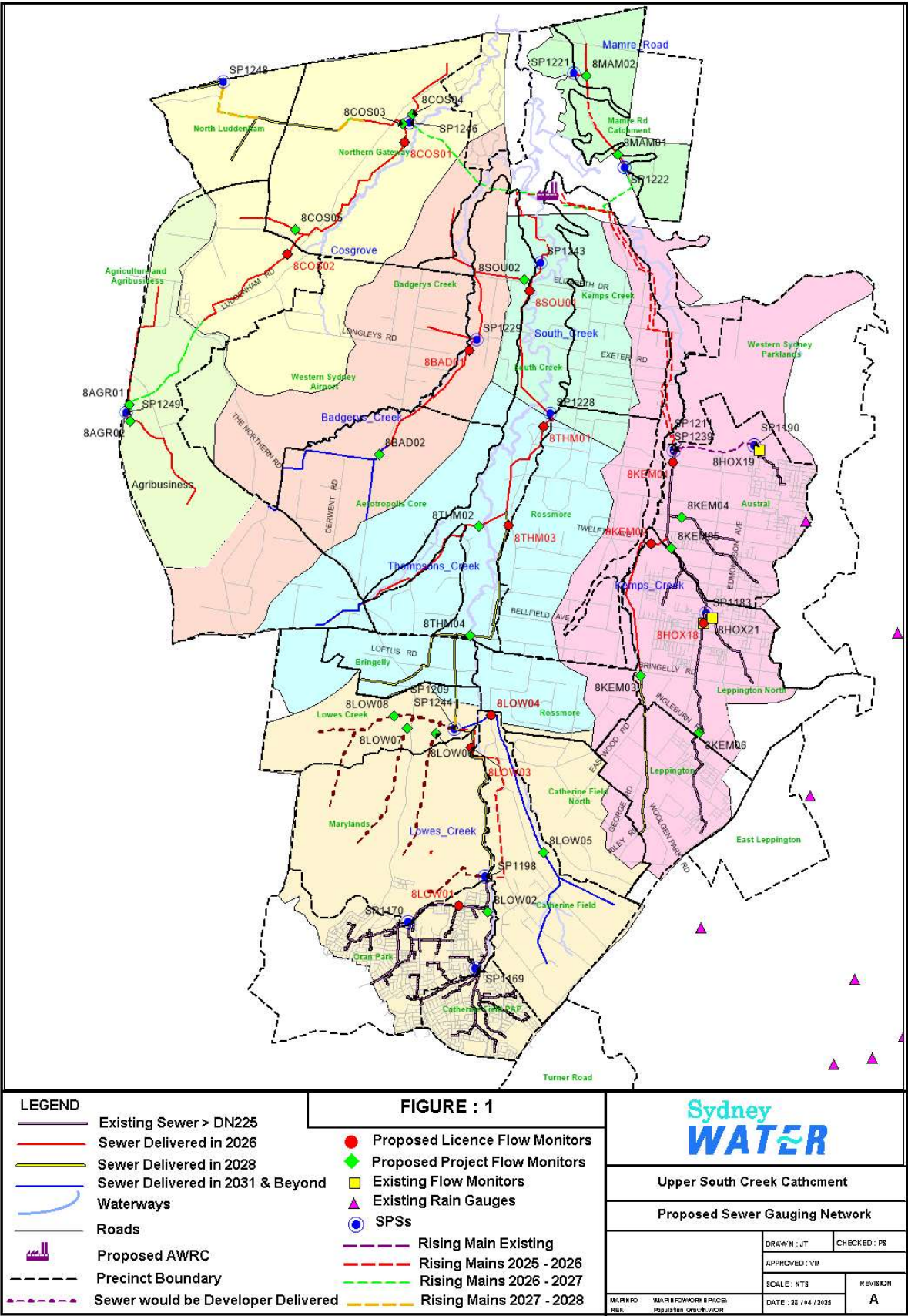
No	SPS	Catchment	Upstream Pump(s)	Comment
1	SP1246	Cosgrove Catchment	SP1248 and SP1249	SP1246 will deliver to the BYWRRF
2	SP1248	Cosgrove Catchment	-	
3	SP1249	Agribusiness Catchment	-	
4	SP1221	Mamre Road Catchment	-	
5	SP1222	Mamre Road Catchment	SP1221	SP1222 will deliver to the BYWRRF
6	SP1229	Badgerys Creek Catchment	-	
7	SP1198	Lowes Creek Catchment	-	
8	SP1209/SP1244	Lowes Creek Catchment	SP1198	
9	SP1228	South Creek Catchment	SP1209/SP1244	
10	SP1243	South Creek Catchment	SP1228	SP1243 will deliver to the BYWRRF
11	SP1183	Kemps Creek Catchment	-	
12	SP1190	Kemps Creek Catchment	-	
13	SP1211/SP1239	Kemps Creek Catchment	SP1183 and SP1190	SP1211/SP1239 will deliver to the BYWRRF

SP1246 (Cosgrove Catchment) would receive flows from Agribusiness Catchment via SP1248 and SP1249. SP1243 would receive flows from South Creek Catchment, Badgerys Creek Catchment via SP1229 and Thompsons Creek Catchment via SP1228. Thompsons Creek Catchment would receive flows from the Lowes Creek Catchment via SP1244 in the year 2028.

SP1198 in the Lowes Creek Catchment is transferring flow to West Camden system in the interim until 2028/29 and then flow will be directed to the BYWRRF via SP1244 and other downstream SPSs. SP1190 is servicing part of Austral catchment by transferring flow to Liverpool WRFF. In 2026, when the BYWRRF is commissioned, this SPS shall be directed to the BYWRRF via SP1221/SP1239. SP1183 is servicing part of Austral, Leppington North and Leppington Precinct in the interim until 2026 by transferring flow to Liverpool WRFF. This pumping station shall be decommissioned and transfer flow to the operational BYWRRF in 2026.

The treated effluent from the BYWRRF would be discharged into the Nepean River and the Brine flow would be transferred to the Malabar WWTP. For further information, refer to Section 5 of this report.

Figure 1: Upper South Creek Catchment Layout, Proposed Sewers and Proposed Gauging Locations



1.4 Purpose of this plan

The purpose of this report is to develop a Wet Weather Infiltration Monitoring Program (WWIMP) to assess flows associated with the USC Catchment as a part of the Department of Planning, Housing and Infrastructure (DPHI) requirement to meet the obligation of the conditions, as noted in Table 2 below.

Table 2: Condition Related to the development of this WWIMP

Condition/ Measure	Condition Requirement	Where addressed in plan
E121	The Proponent must develop and implement a monitoring program to assess wet weather infiltration into the sewer network connected to the Advanced Water Recycling Centre (AWRC). The program must include:	This Plan
121	a) monitoring of sewer infiltration rates throughout the AWRC sewer catchment from the commencement of operation onward.	Section 5
121	b) proposed investigative actions and potential remedial actions for wet weather infiltration in the sewer network if high wet weather infiltration is identified; and	Sections 3, 5 and 6
121	c) reporting requirements for the program to the EPA.	Section 2.4 and Section 3
E122	The monitoring program required under Condition E121 must be submitted to the EPA for review at least 18 months prior to the commencement of operation of Stage 1 of the critical State significant infrastructure (CSSI) and submitted to the Planning Secretary for information at least one year prior to the commencement of operation of Stage 1 of the CSSI.	Appendix C – A9 consultation summary report

Flow monitoring data would be used for the future Model Calibration and system performance evaluation include wet weather infiltration in the sewer network connected to the BYWRRF.



2 Wet Weather Infiltration and Flow Monitoring

As noted in the EIS, stormwater and groundwater can enter the wastewater collection network from several sources, including infiltration through damaged pipes or other infrastructure or illegal stormwater connections. This typically occurs in wet weather. This additional water ultimately ends up at wastewater treatment plants or can contribute to overflows from the wastewater collection network if the pipeline volume is exceeded.

To reduce this risk, the wastewater collection network should be designed to reduce the wet weather flow volumes entering it (and therefore reaching the BYWRRF) as far as practical. This is the most efficient and cost-effective approach to managing wet weather flows, though it can never be fully reliable. Wastewater collection network design always requires designing overflow points within the system as a contingency, so wastewater does not back up into houses and businesses if capacity is exceeded. This is a standard global approach to wastewater system design and Sydney Water also aligns with several Water Services Association of Australia (WSAA) codes and standards such as the Water Supply Code of Australia (WSA 03).

2.1 Flow Monitor installation for Infiltration Evaluation

Flow monitor installation and data capturing would be carried out by the Sydney Water Hydrometric Team. This team will also install several more rain gauges to their current network within the USC Catchment at safe and strategic locations to help gather rain data with a good coverage over the catchment. Once the Gauges are installed, the gauges would be field calibrated according to the quality procedures adopted. Data would be captured at 15 minutes interval and the raw data then be loaded on to the standard Database "HYDSYS". The data would be then reviewed and Quality Coded and made available for others' usage in a standard format.

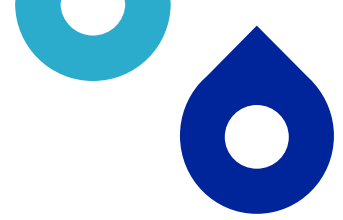
2.2 Proposed actions in the event of high infiltration

Trenchless sewers and leak tight sewers have been proposed within this development area. In accordance with the planning criteria, 2% rain ingress into the sewer during the wet weather was assumed. Initially, there may be instances where the wet weather flows entering the system may be little higher, as the gully traps at the properties may be opened during construction periods. Flow records will be carefully monitored during the model calibration periods (annually). If the rain ingress does not stabilise to 2% or less and is observed to be increasing at any gauge, additional flow monitors may be proposed within the specific gauged catchment to identify/narrow down the problem area for any remedial actions.

Once the problem area is identified, a source control program will be initiated by Sydney Water within the catchment. Potential options to alleviate the issue could take in the form of:

- Sewer amplification / duplication
- Flow Diversion
- New Emergency Relief Structure (ERS)
- Relocation or modification of existing ERS (weir levels and/or lengths)
- Modification of upstream/downstream pump stations.
- Property specific solution (Non return valve, Property pump etc)
- Temporary storage via online or offline storage
- Source Control on Sydney Water assets.
- Combination of the above.

A short-list of options, including costs for each option (including life cycle cost), and a risk assessment would be presented at a meeting with stakeholders to select the preferred option to address the issue. The preferred option would be selected based on life cycle cost, environmental factors, constructability, hydraulic performance and customers impact, etc.



2.3 Other Flow Infiltration Mitigation

Other mitigation measures to reduce additional water entering the new network during wet weather and reduce overflows to the environment include:

- Pump stations - typically proposed outside the 1% AEP flood level to reduce the likelihood of flood flows into the station.
- Pipelines - typically constructed outside the 1% AEP flood level to reduce the likelihood of infiltration. While there are locations where the assets need to be under-bored beneath creeks, these sections are typically pressurised.
- Pressure wastewater systems - proposed where viable and where a gravity solution significantly increases the overall cost.
- Hydrostatic testing – carried out, as part of Sydney Water construction testing process. This is to ensure no leakage from pumps, pipework, casings and maintenance holes are detected.
- Section 73 Approval - Every new development requires approval from Sydney Water to connect into the wastewater network. This enables Sydney Water to accurately plan for the sewer load that will be processed within the system and ensure that our operating license is adhered to. Developers are required to engage with a Sydney Water-accredited water servicing coordinator to apply for the application on their behalf ensuring the correct design of the wastewater system to ensure there is no infiltration and capacity is adequate.

2.4 Licence Reporting

The Environmental Protection Authority (EPA) has issued Sewage Treatment System (STS) Licences, effective from 27 August 2021, for the period of 2021 to 2025. This contains a number of requirements related to hydraulic sewer system models and their applications and reports. They are:

- Limit Condition, L7.1 – Hydraulic sewer system model operation and maintenance.
- Limit Condition, L7.2 & L7.3 – Wet weather overflow limits
- Operating Condition, O4.7 and O4.8 – Wet weather overflow “No Deterioration” (for networks)
- Operating Condition, O4.9, O4.10 and 4.11– Wet weather partial treatment discharges and discharge exceeding disinfection capacity “no deterioration” for treatment plants
- Reporting Condition, R5.6 – Wet weather overflow abatement annual reporting
- PRP 302 – Wet weather overflow abatement Pollution Reduction Program.

Under Licence Condition L7.1, Sydney Water must maintain high quality hydraulic sewerage system models for each STS complying with Water Quality Management System (WWQMS).

As of Condition L7.1, Sydney Water established an annual Sewer Treatment System (STS) Licence Reporting Program since early 2000. Under this program, Sydney Water update and re-calibrate Hydraulic Models they maintain for all Sewerage Treatment Systems.

As a part of the model update and calibration, information (such as asset and operational changes), maintenance / rehabilitation program, growth information, customer complaints, rain and sewer gauge information over the reporting year would be gathered from all stakeholders from each operating area, to be used as input for the process. The calibrated models are then validated through Sydney Water established validation processes before the hydraulic models can be used for the wet weather overflow performance assessment and reporting.

Each STS Licence system performance is required to be reported to the EPA in an annual report. The above-mentioned process guarantees the models are suitable for use in assessing performance against requirement L7.2, L7.3, O4.7, O4.8, O4.9, O4.10 and O4.11.

The construction EPL (21800) for the BYWRRF was transferred from the Delivery Partner (JHG) to Sydney Water in mid 2025 and will be subject to a licence variation application (LVA) to include operational requirements, loads and limits. This EPL (after the LVA) will also be applicable to the USC Network.



3 Licence and Project Gauging Protocol in the Existing System

3.1 Background

Sewer flow monitoring is required by Sydney Water to meet the operational and planning (including system modelling) needs for provision of wastewater services. The monitoring involves measurement of flow, level and velocity within Sydney's wastewater networks. These services are currently undertaken by Sydney Water Monitoring Services (Hydrometrics).

To meet the sewer overflow abatement objectives of WaterPlan 21, it was necessary for Sydney Water to install a system of sewer flow monitors. The key objective of the gauging network is to provide Sydney Water with the information necessary to identify how each of the twenty-three sewer systems behaves during wet and dry weather conditions. Together with various modelling tools, this will enable Sydney Water to plan the rehabilitation and maintenance of each of the sewer systems.

As a part of the Pollution Reduction Program (PRP) September 2000, Sydney Water developed and submitted to the EPA a written Sewer Monitoring Protocol for the purpose of obtaining sufficient data from permanent and temporary sewer flow monitors within the reticulation system. This enabled ongoing verification of the accuracy of the hydraulic reticulation system model predictions and calculation of load-based fees.

A number of protocols were developed by the Pollution Reduction Program (PRP) and are detailed in Table 3.

Table 3: Pollution Reduction Program Protocols

PRP Protocol	PRP Reference
Generic Sewer Monitoring Protocol	PRP104
Sewer Monitoring Protocol	PRP104.2
System Specific Sewer Monitoring Proposal	PRP104.3
System Model Performance Indicators	PRP101.1
Generic Model Re-calibration Protocol	PRP101.2 2

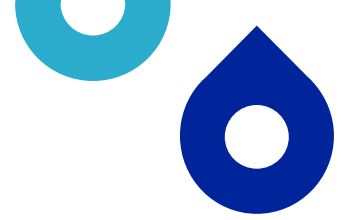
PRP 104.2 (the Sewer Monitoring Protocol) was developed to ensure that sufficient strategically located flow monitors are permanently retained to allow periodic checking of the trunk sewerage system models for calibration purposes. It was agreed that these permanent flow monitors would be referred to as licence flow monitors. Additional flow monitors, referred to as project flow monitors, would be installed on an "as-needs" basis to:

- re-calibrate trunk sewerage system models as required.
- develop specific sub-catchment system improvement projects; and
- investigate specific issues such as isolation of areas of high leakage and/or infiltration.

3.2 Licence Flow Monitors

To achieve the Pollution Reduction Program's objective of ongoing verification of the accuracy of the hydraulic reticulation system models, it was proposed that a set of permanent licence flow monitors be nominated under PRP 104.3 (System Specific Sewer Monitoring Proposal). Whilst the primary purpose of these flow monitors was to ensure model calibration is maintained; they will also be used to achieve the objectives detailed in Section 2. Licence (or permanent) flow monitors will be of two types, either sewer or overflow flow monitors.

Licence sewer flow monitors are flow monitors located within sewers to measure the depth and velocity of flow and so derive the flow rate. Licence overflow flow monitors are defined as flow monitors located on emergency relief structures (ERS) to determine the volume and time discharges occur. Data from these licence sewer flow monitors is used to



verify that SWC's trunk sewerage system models remain in calibration as required by PRP 101.1 (System Model Performance Indicators) and PRP101.2 (Generic Model Re-calibration Protocol).

In some trunk sewerage systems, it will be necessary to install additional sewer flow monitors to achieve the necessary verification of the system models. It is expected that non licence flow monitors can be re-located from the major systems to achieve this.

In applying the protocol for the selection of licence sewer gauging locations, the following assumptions are made:

- a) licence sewer monitor provides depth, velocity and flow information, i.e. HVQ type flow monitors will be used;
- b) this protocol does not apply to the selection of project sewer gauge locations; and
- c) the licence gauging program be affordable within the context of Sydney Water's business drivers.
- d) for those systems which currently do not have a sewer gauge, a suitable gauging location is to be identified as near as practical to the location nominated in accordance with PRP 104.3 (System Specific Monitoring Proposal);
- e) in reviewing the selections for licence gauge locations, monitoring locations must be spatially separated and cover a diverse geographic area, including a combination of flow monitors at the extremities of the major trunk and sub-mains within the systems;
- f) each sub-system with an average dry weather flow (ADWF) greater than 10 ML/d, has a licence sewer gauge;
- g) each major sewer sub-main has a minimum of one licence gauge, even if the flow is less than 10 ML/d where the contributing flow is significant to the system configuration modelling requirements;
- h) preferably the selected licence gauge is located in close proximity to the most frequently operating ERS, such that the gauge can be used to monitor depth of emergency relief structure; and
- i) hydraulic conditions at the gauging location must be sufficient to allow the specified gauge accuracy to be achieved as described in PRP 101.1.

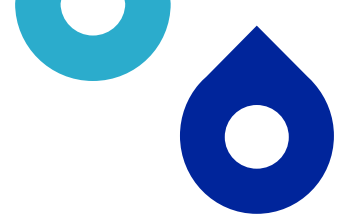
If the above criteria can be met for a comprehensive system of licence sewer flow monitors, then it will be possible to:

- a) identify long-term changes in system environmental performance (as measured by ERS frequency and volume).
- b) assist in the identification of system failures via the flow level, velocity and flow rate data derived from the licence flow monitors used in conjunction with the predictions of the trunk sewerage system hydraulic models.
- c) assist in the identification of leakage from the reticulation systems; and
- d) calibrate the trunk sewerage system hydraulic models to the acceptance performance criteria nominated in PRP 101.1 which will allow the models to be used for the calculation of Load Based Licence fees.

3.3 Project Flow Monitors

In addition to the nominated licence flow monitors, it is intended that a system of project flow monitors be operated. As the name implies, it is anticipated that these flow monitors will be located within the various trunk sewer systems on an "as-needs" basis. As individual project needs dictate, flow monitors will be installed at the necessary locations. At the completion of individual projects, it is anticipated that the flow monitors will be re-located to meet the needs of other catchment projects as they arise. The flow monitors will be installed for the short, medium or long-term as each individual project requirements dictate.

All other gauging locations are to be described as project flow monitors and installed at specific locations and not be included in review of licence performance. This will allow Sydney Water the flexibility to re-locate project flow monitors



and be able to respond to the requirements of future works programs and re-calibration projects. It was anticipated that future project gauging locations will be selected for the purposes of:

- a) Providing specific data to meet the objectives of projects.
- b) Providing data for re-calibration of trunk sewerage system models should recalibration be needed; and
- c) Providing data for any catchment improvement works, Sydney Water may undertake in the future. The methodology for locating and use of project flow monitors would be the same as that for the licence flow monitors, except that it would be applied over a smaller, more localised geographical area.



4 Flow Monitor Selection Methodology and Assumptions

Most of the eight sub catchments within the USC Catchment are much larger than a usual catchment size (500-1000Ha) assumed in the development of the Sewer Catchment Asset Management Plan (SCAMP).

Therefore, the selection of flow monitors for the SCAMP Catchments, as adapted in the Strategic Sewer Gauging Network Review, Re-Design and Consolidation (December 2021), was used to design the Flow Monitor Network for each of this newly developing sub catchments within the USC catchment.

All flow monitors assigned are HVQ (Depth, Velocity and Flow) flow monitors and are to include:

- All SCAMP outlets to be assigned a Sewer Flow Monitor.
- A second Flow Monitor along the Sewer Main if the main runs more than 3 km extending further 2-3 km.
- Any submains connecting to the main sewer with more than 1.5 ML/day flow to be assigned a Flow Monitor in the submains.
- Each main sewer has minimum of one Licence Flow Monitor even the flow is less than 10 ML/day where the contributing flow is significant to the system configuration modelling requirements.
- Monitoring locations must be spatially separated and cover a diverse geographic area.
- Preferably the selected Licence Flow Monitor is located in proximity to the most frequently operating ERS. (This proposed sewer system does not have any ERS in the Network. ERSs are located at the SPSs only. So, flow monitors near major SPSs are assigned as Licence flow monitors).
- flow monitors locations were identified from the Concept Design Drawings. The locations may be moved to in the field to be closer to nearby MHs based on the safety, accessibility and hydraulic conditions.
- Additional flow monitors may be proposed if required once the system is fully mobilised.
- Individual Flow Monitor needs for each developer delivered sewer network would be re-assessed based on the EP number and, any identified issues etc.

5 Flow Monitor Selection for Individual Catchments

5.1 Cosgrove & Agribusiness Catchments

The Cosgrove Creek catchment trunk mains include the precincts of North Luddenham, Northern Gateway, Dwyer Road and parts of Agribusiness. The catchment also includes Sydney Science Park.

There would be three SPSs in the catchment (SP1246, SP1248 and SP1249). SP1246 would be the major one delivering the total gravitated flow to the BYWRRF through a twin DN525 rising main. Refer to Figure 2 and Figure 3.

The Agribusiness area would be serviced by two DN400 and DN375 2.75 km and 2.6 km long sewers draining to SP1249 from the north and the south of the catchment. The flow from SP1249 would be pumped into the main Cosgrove Sewer, that would be about 7 km long, ranging from DN375 mm to DN600, draining to the SP1246.

Refer to Table 4, Figure 2 and Figure 3 for Sewer alignment, size, proposed sewer Flow Monitor locations, delivery timeframes of the sewer networks and flow monitor installation.

Table 4: Detail Information on Cosgrove - Agribusiness Catchment

No	Flow Monitor ID	Pipe Diam (DN)	MH Depth (m)	Chainage (m)	Sewer Section	Catchment	Sewer Delivery Time	Flow Monitor Inst. Time	Comments*
1	8COS01	600	4.03	480.86	CCGC01-01	Cosgrove	2026/27	2027	Lic. FM
2	8COS02	450	4.05	629.00	CCGC01-02	Cosgrove	2026/27	2027	Lic. FM
3	8COS03	525	2.82	267.87	CCGC04	Cosgrove	2026/27	2027	Proj FM
4	8COS04	450	3.46	50.98	CCGC03	Cosgrove	2026/27	2027	Proj FM
5	8COS05	375	1.77	234.14	CCGC02	Cosgrove	2026/27	2027	Proj FM
6	8AGR01	400	10.32	213.13	ABGC01	Cosgrove Agribusiness	2028	2029	Proj FM
7	8AGR02	375	1.87	180.83	ABGC02	Cosgrove Agribusiness	2028	2029	Proj FM

* Lic. FM – denotes Licence Flow Monitor and Proj FM denotes Project Flow Monitor

Figure 2: Layout of Proposed Sewers and Proposed Gauging Locations for Cosgrove Catchment

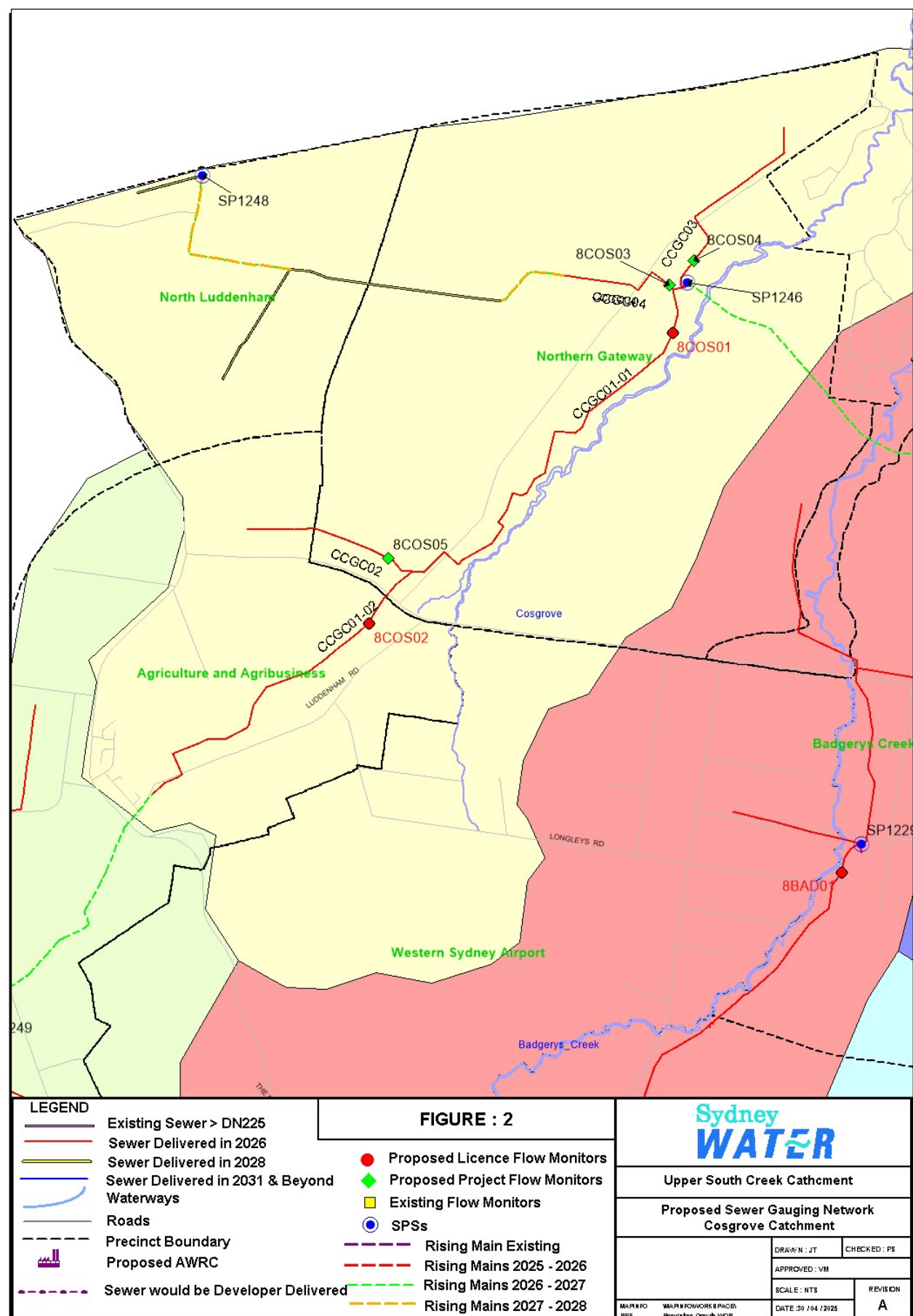
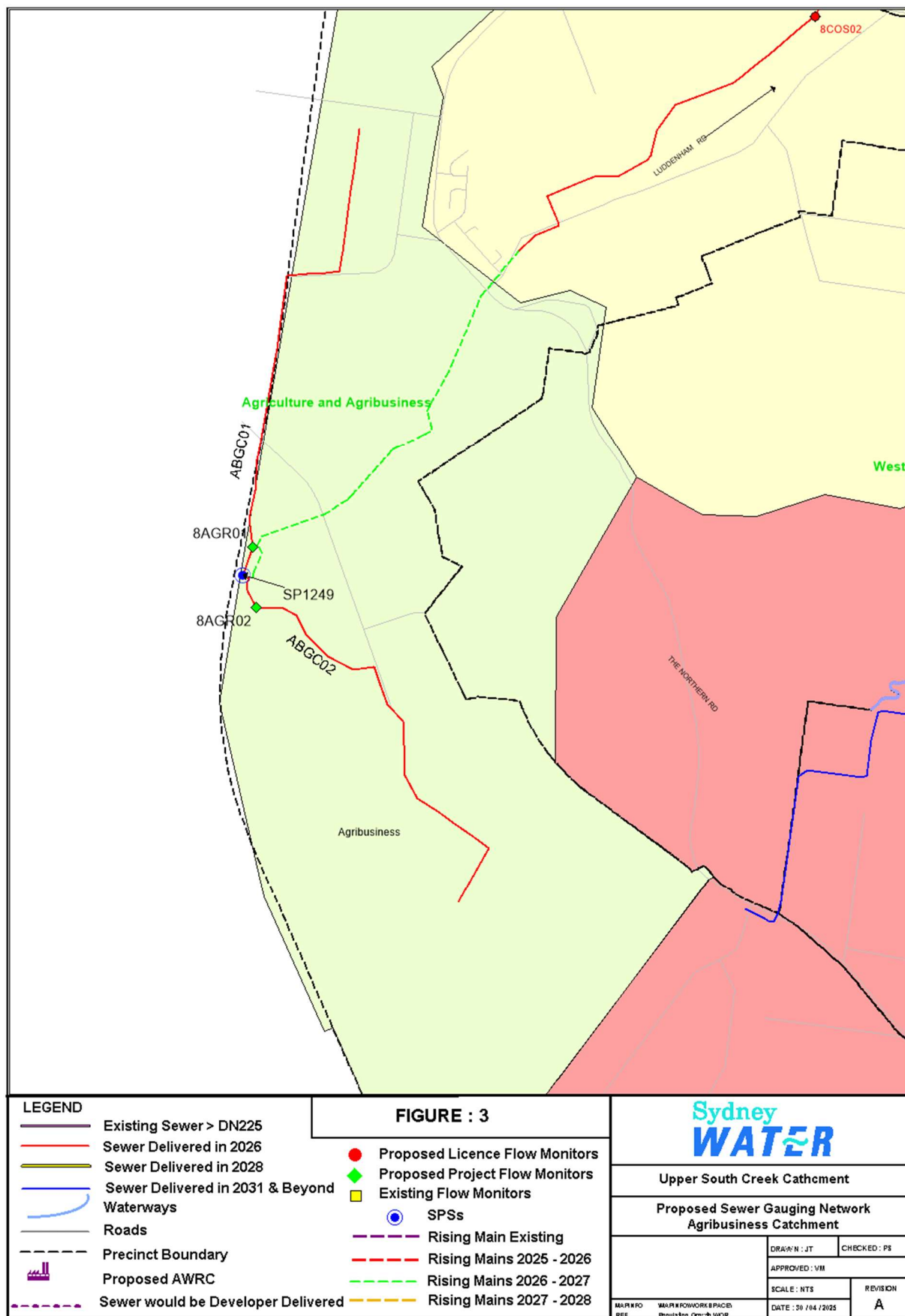


Figure 3: Layout of Proposed Sewers and Proposed Gauging Locations for Agribusiness Catchment



5.2 Badgerys Creek Catchment

The Badgerys Creek catchment trunk mains include the part of the precincts of Badgerys Creek, Dwyer Road, Agribusiness, Northern Gateway and Aerotropolis Core precincts as well as all the proposed Western Sydney Airport (WSA).

SP1229 would be a major pumping station in this catchment. This pump station would be serviced by a roughly 3 km sewer from the south varying from DN450 to DN525 by 2026. This sewer would be extended further by 2031. The north of the catchment would be serviced by gravity sewer that would be draining into SP1243 in the South Creek Catchment.

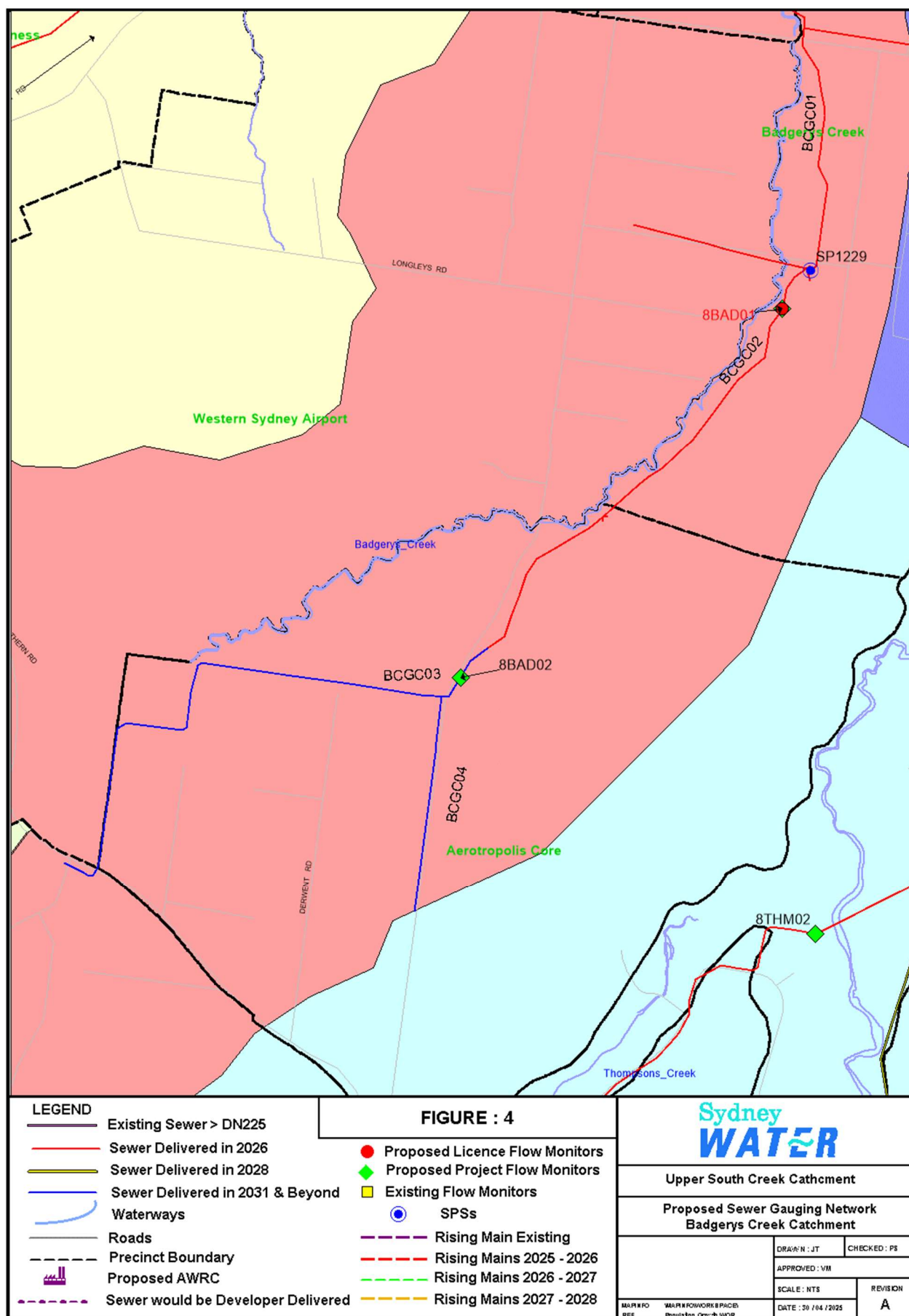
Refer to Table 5 and Figure 4 for Sewer alignment and the proposed sewer gauging locations for the Badgerys Creek Catchment.

Table 5: Detail Information on Badgerys Creek Catchment

No	Flow Monitor ID	Pipe Diam (DN)	MH Depth (m)	Chainage (m)	Sewer Section	Catchment	Sewer Delivery Time	Flow Monitor Inst. Time	Comments*
1	8BAD01	525	7.40	231.14	BCGC02	Badgerys Creek	2026	2027	Lic. FM
2	8BAD02	450	8.73	551.95	BCGC03 & BCGC04	Badgerys Creek	2027/28	2029	Proj FM

* Lic. FM – denotes Licence Flow Monitor and Proj FM denotes Project Flow Monitor

Figure 4: Layout of Proposed Sewers and Proposed Gauging Locations for Badgerys Creek Catchment



5.3 Mamre Road Catchment

Mamre Road Catchment is part of the Mamre Precinct. Two Sewer Pumping Stations, SP1221 and SP1222, would service this catchment from associated short gravity mains draining into these SPSs. SP1221 discharge into the gravity main leading to SP1222 by a 1400 m long DN355 mm diameter rising main. SP1222 will discharge directly to the BYWRRF. The remaining part of Mamre Precinct shall be serviced by the existing St Marys system. Gravity parts of the network draining to these SPSs would be serviced by sewer sections varying from DN375 to DN450, delivered between 2027-28.

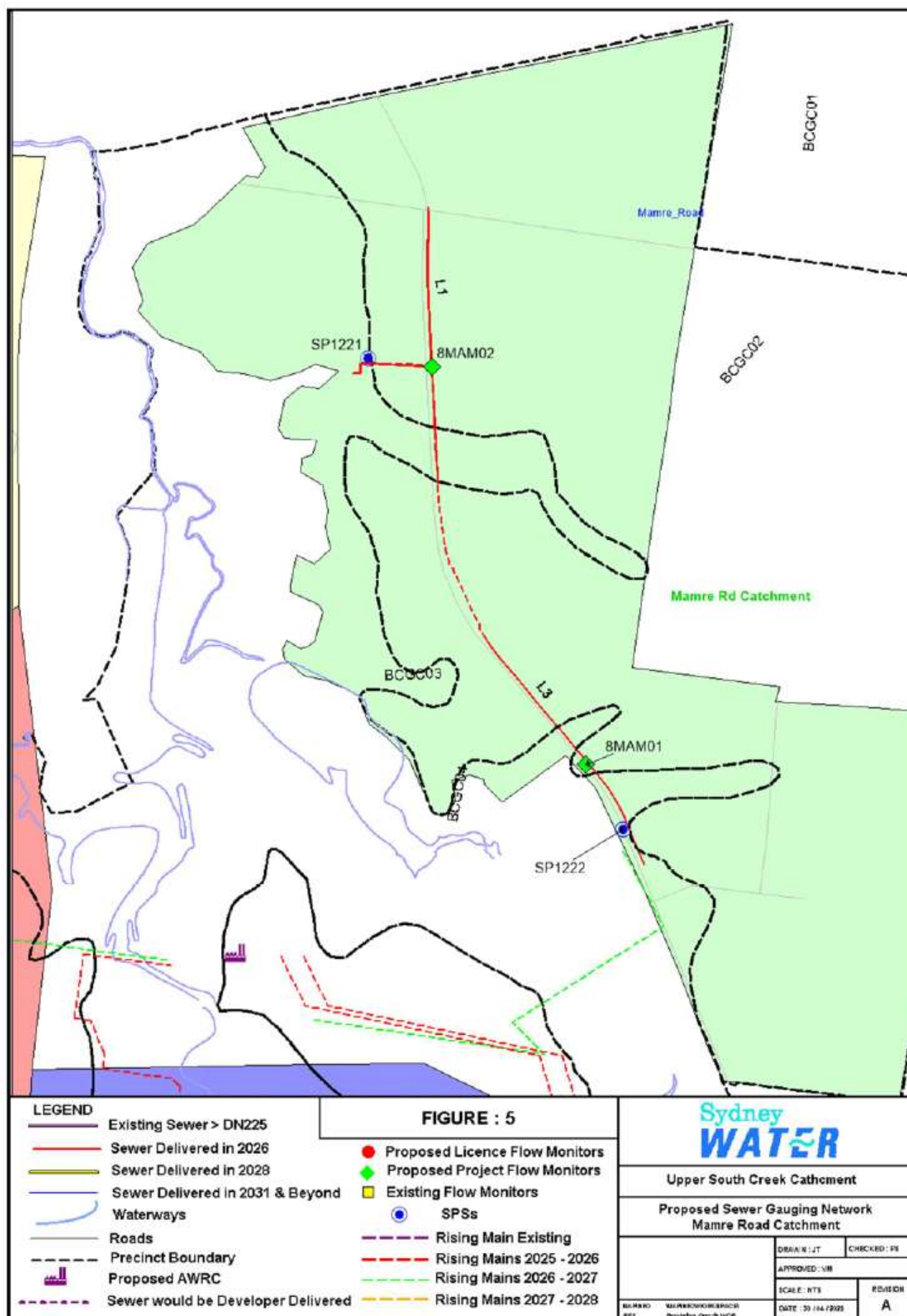
Refer to Table 6 and Figure 5 for Sewer alignment and the proposed sewer gauging locations for the Mamre Road Catchment.

Table 6: Detail Information on Mamre Road Catchment

No	Flow Monitor ID	Pipe Diam (DN)	MH Depth (m)	Chainage (m)	Sewer Section	Catchment	Sewer Delivery Time	Flow Monitor Inst. Time	Comments*
1	8MAM01	450	10.12	145.46	L3	Mamre Road	2027/28	2028	Proj FM
2	8MAM02	375	10.32	0.00	L1 (measuring L1 + L2)	Mamre Road	2027/28	2028	Proj FM

* Lic. FM – denotes Licence Flow Monitor and Proj FM denotes Project Flow Monitor

Figure 5: Layout of Proposed Sewers and Proposed Gauging Locations for Mamre Road Catchment



5.4 South Creek and Thompsons Creek Catchments.

Thompsons Creek catchment covers parts of Aerotropolis Core, Badgerys Creek, Wianamatta South Creek Precincts and parts of Rossmore Precincts. South Creek catchment covers part of Badgerys Creek and Wianamatta South Creek precincts and a part of Kemps Creek precinct.

SP1243 and SP1228 would be the two major SPSs in these Catchments.

Thompsons Creek will have roughly 6.3 km long main sewer (DN450-DN1200) delivered in Stage 1 by 2026-27. About 7.5 km sewers would be delivered in Stage 2 by 2028, of which about 5 km sewers would be a main sewer of DN1150-DN1250 to transfer flows from the Lowes Creek Catchment to SP1228 and to serve the local catchment.

South Creek would have about 1.7 km long DN1400 sewer, servicing as the transfer main from the Thompsons Creek/ Lowes Creek and the local catchment flow.

Refer to Table 7, Figure 6 and Figure 7 for sewer alignment, size the proposed sewer gauging locations, delivery timeframe for the South Creek and the Thompsons Creek Catchment.

Table 7: Detail Information on South Creek and Thompsons Creek Catchment

No	Flow Monitor ID	Pipe Diam (DN)	MH Depth (m)	Chainage (m)	Sewer Section	Local Catchment	Sewer Delivery Time	Flow Monitor Inst. Time	Comments
1	8SOU01	1400	14.50	560.56	SCGC01	South Creek	2026	2026	Lic. FM
2	8SOU02	900	11.91			South & Badgerys Creek	2026	2026	Proj. FM
3	8THM01	1250	14.63	279.76	TCGC01	Thompsons Creek	2026/27	2027	Lic. FM
4	8THM02	750	9.20	635.15	TCGC02	Thompsons Creek	2026/27	2027	Proj. FM
5	8THM03	1150	11.27	246.27	TCGC03	Thompsons Creek	2028	2028	Lic. FM
6	8THM04	1050	7.47	3083.14	TCGC03	Thompsons Creek	2028	2028	Proj. FM

* Lic. FM – denotes Licence Flow Monitor and Proj FM denotes Project Flow Monitor

Figure 6: Layout of Proposed Sewers and Proposed Gauging Locations for South Creek Catchment

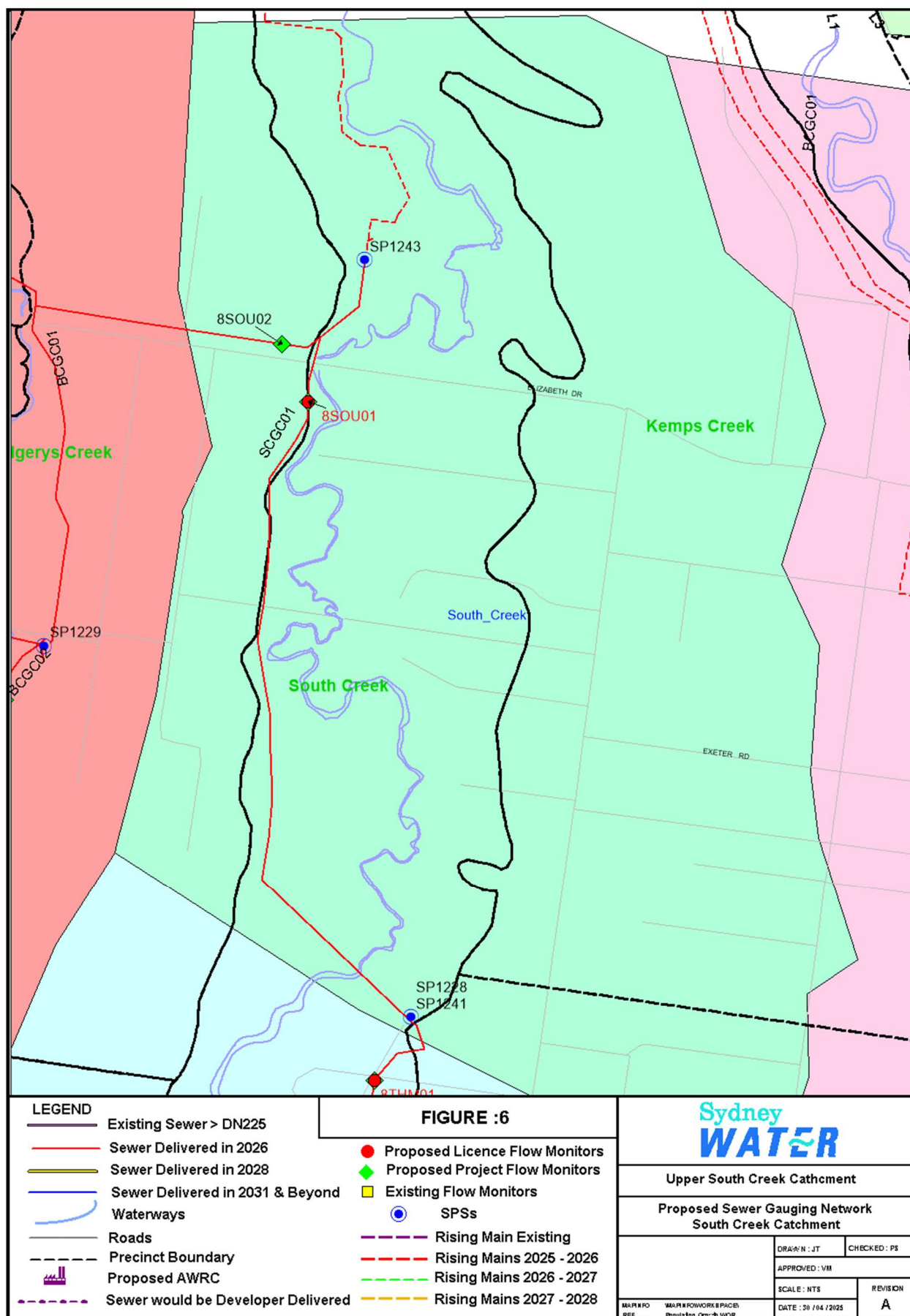
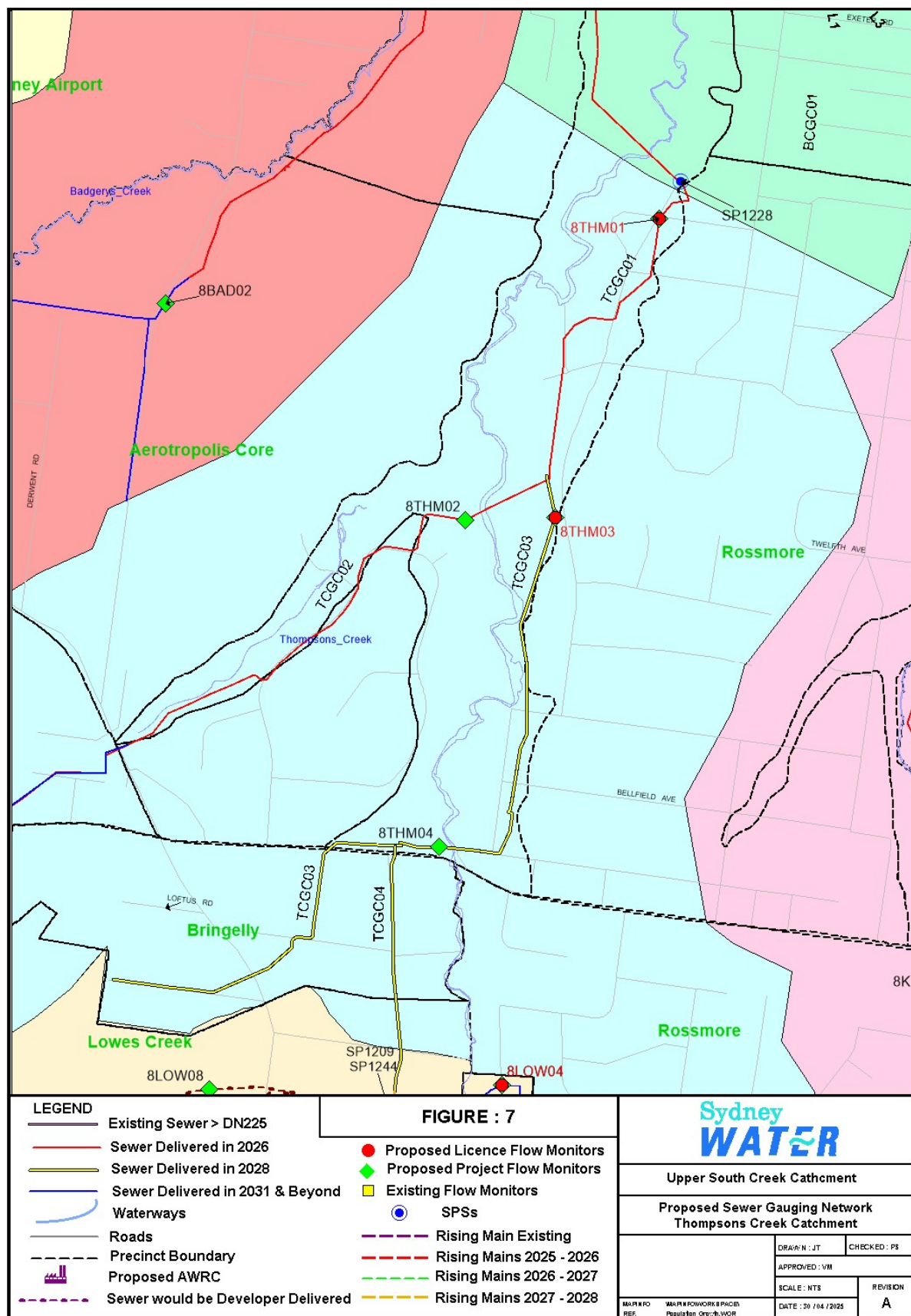


Figure 7: Layout of Proposed Sewers and Proposed Gauging Locations for Thompsons Creek Catchment





5.5 Kemps Creek (Austral Leppington) Catchment

This catchment located in the east of the SWGA, covers the Austral, Leppington and Leppington North Precincts. Initial development of the area is being serviced in the interim via Liverpool WRRF by sewer networks delivered between 2016-2023. This service shall be redirected to the BYWRRF permanently from 2026. Remaining developments shall be serviced starting from 2026 when the BYWRRF is commissioned, by delivering further sewer networks from 2026 to 2029.

There are three SPSs, SP1183, SP1190, SP1211(Initial) / SP1239 (Ultimate), in the Catchment.

Bonds Creek Carrier (DN600) and Bringelly Creek Carrier (DN450) are draining into the SP1183. SP1183 is an interim pumping station to transfer flow from part of Austral and Leppington North to Liverpool WRRF via SP1182. This pumping station shall be decommissioned in 2026, after which flows will be transferred to the BYWRRF.

SP1190 is servicing part of Austral by transferring flow to Liverpool WRRF via Hoxton Park networks. This station shall be redirected to project BYWRRF in 2026 via SP1211/SP1239.

SP1211 is an interim pumping station to service the local catchment (part of Austral and Leppington North Precincts) till 2028 and then this station shall be replaced by a permanent pumping station of larger capacity to service the full development of Austral, Leppington North and Leppington.

A large 1400mm main that receives flows from various submains, gravitates to SP1211 /SP1239. A 450 mm rising main that connects SP1211 and SP1190 could operate in two ways. Currently SP1211 pumps into the SP1190. Once the BYWRRF is commissioned, Interim Operating Plans (IOP) would cease and the SP1190 would pump into SP1211. Dual DN600 rising mains will deliver the flows from the SP1211 direct into the BYWRRF.

New Sewers DN675 – DN600 from Twelfth Avenue to Bringelly Road and DN600 – DN375, from Bringelly Road to Riley Road would be delivered by 2026 and 2028, respectively.

Refer to Table 8 and Figure 8 for Sewer alignment and the proposed sewer gauging locations for the Kemps Creek Catchment.

Table 8: Detail Information on Kemps Creek Catchment

NO	Flow Monitor No	MH_Asset ID	Pipe Diam (DN)	MH Depth (m)	Chainage (m)	Sewer Section	Sewer Main Name	Catchment	Sewer Delivery Time	Flow Monitor_Inst Time	Comments*
1	8HOX18	11016196	450	4.49			Bringelly Creek Carrier (SP1183)	Kemps Creek	Existing	Existing	Lic. FM
2	8HOX19	11053264	300	6.58			Feeder trunk main to SP1190	Kemps Creek	Existing	Existing	Proj. FM
3	8HOX21	11395419	600	6.24			Bonds Creek Carrier (SP1183)	Kemps Creek	Existing	Existing	Proj. FM
4	8KEM01	11700807	1400	12.44			Kemps Creek Carrier	Kemps Creek	Existing	2026	Lic. FM
5	8KEM02	TBC	675	9.97	372.41	KCGC01	No Name Yet (SP1211/1239)	Kemps Creek	2026	2026	Lic. FM
6	8KEM03	TBC	600	11.17	3072.66	KCGC01	No Name Yet (SP1211/1239)	Kemps Creek	2028	2028	Proj. FM
7	8KEM04	11710221	450	6.75			Austral Carrier 2	Kemps Creek	Existing	2026	Proj. FM
8	8KEM05	11713231	900	9.74			Bonds Creek	Kemps Creek	Existing	2026	Proj. FM
9	8KEM06	11016229	375	3.20			Bringelly Rd Creek Carrier (SP1183)	Kemps Creek	Existing	2026	Proj. FM

* Lic. FM – denotes Licence Flow Monitor and Proj FM denotes Project Flow Monitor

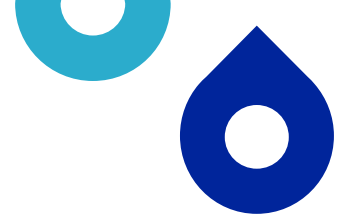
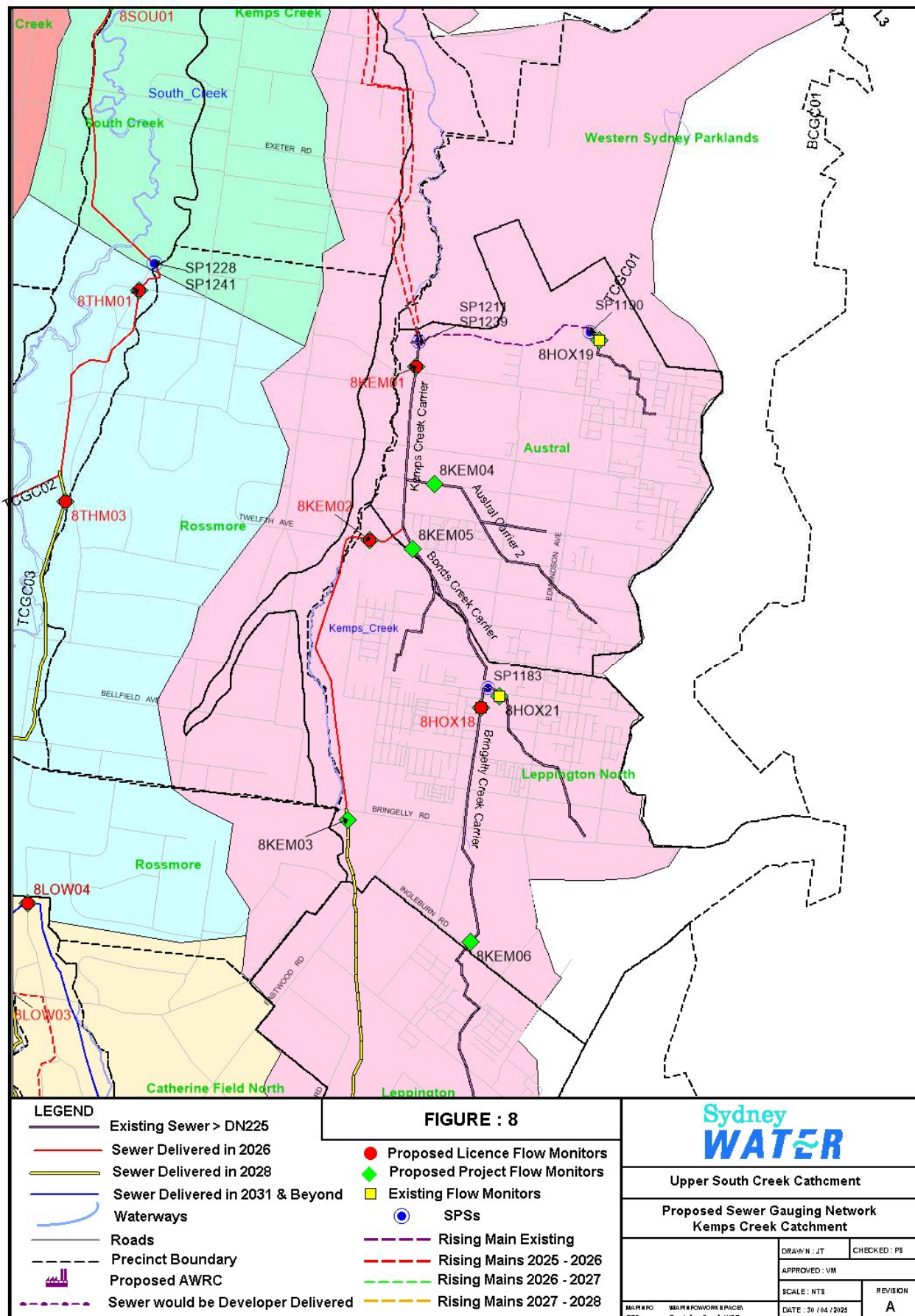
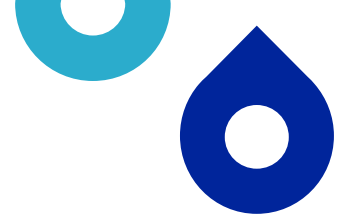


Figure 8: Layout of Proposed Sewers and Proposed Gauging Locations for Kems Creek Catchment





5.6 Lowes Creek Catchment

This Catchment, located in the South of the SWGA, covers the Lower Creek, South Creek West, Maryland Pondicherry, Oran Park, Catherine Fields Precincts.

Most of the main sewers in the Oran Park area and sections of the Catherine fields are laid and progressively growing. Sewers in these developed areas are draining into SP1198. As an interim measure, SP1198 is pumping into Clover Hill Crescent Branch to be treated at the West Camden WWTP.

A new SP1244, a gravity main to transfer the flows received at SP1198 and the Thompsons Creek second stage sewers would be delivered by 2028. By then, the IOP at SP1198 would cease and the flows from the Lowes Creek Catchment would be transferred to the BYWRRF.

As planned, additional sewers and developer delivered sewers would be delivered beyond 2028 within the Lowes Creek Catchment.

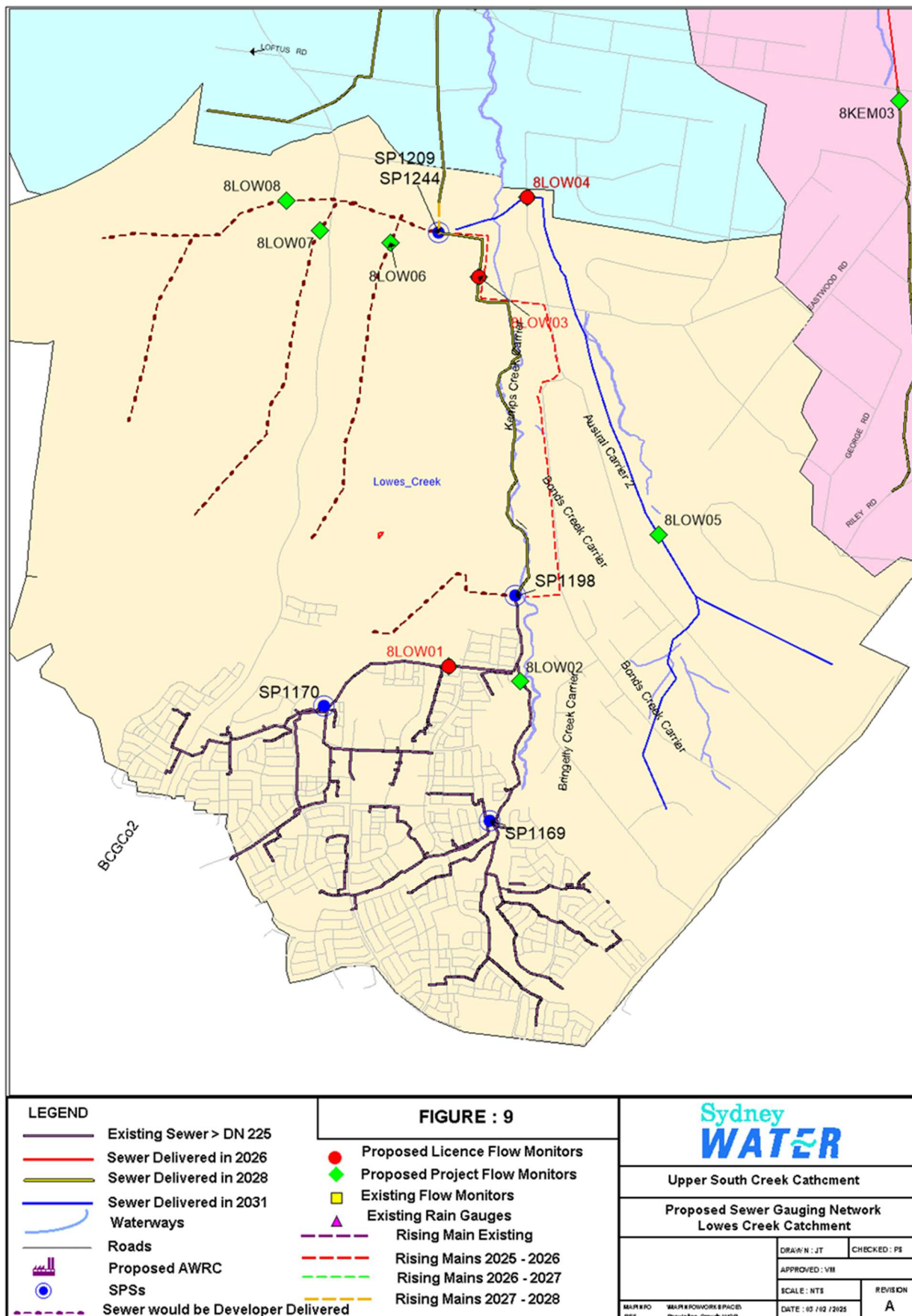
Refer to Table 9 and Figure 9 for Sewer alignment and the proposed sewer gauging locations for the Lowes Creek Catchment.

Table 9: Detail Information on Lowes Creek Catchment

No	Flow Monitor ID	MH_Asset ID	Pipe Diam (mm)	MH Depth (m)	Sewer Main Name	Catchment	Sewer Delivery Time	Flow Monitor Instal. Time	Comments*
1	8LOW01	11228502	450	7.79	Oran Park Branch (SP1198)	Lowes Creek	Existing	2026	Lic. FM
2	8LOW02	11228098	525	3.99	Catherine Fields Carrier	Lows Creek	Existing	2026	Proj. FM
3	8LOW03				Catherine Fields	Lowes Creek	2028/29	2029	Lic. FM
4	8LOW04				Rileys Creek Carrier	Lowes Creek	2031	2031	Lic. FM
5	8LOW05				Rileys Creek Carrier	Lowes Creek	2031	2031	Proj. FM
6	8LOW06				Developer delivery/name TBC	Lowes Creek	2026-28	2026-28	Proj. FM
7	8LOW07				Developer delivery/name TBC	Lowes Creek	2026-	2026-28	Proj. FM
8	8LOW08				Developer delivery/name TBC	Lowes Creek	2026-28	2026-28	Proj. FM

* Lic. FM – denotes Licence Flow Monitor and Proj FM denotes Project Flow Monitor

Figure 9: Layout of Proposed Sewers and Proposed Gauging Locations for Lowes Creek Catchment





6 Customer Complaints

Customer complaints in wet weather are generally related to internal surcharge and likely causes include:

- a plumbing defect or blockage on the customer's private sewer.
- a blockage along the sewer network typically caused from tree roots, silt, grease/fats, soft choke, or pipe collapse.
- insufficient hydraulic capacity of the Sydney Water sewer network in wet weather due to stormwater ingress.

Once a Customer Complaint is received, the Sydney Water Operation/Maintenance team will investigate the sewer network for the possible first two causes as explained above.

- If the cause of the issues is within the customer's private sewer (as in cause 1), the customer will be notified of the defect, who are then responsible for the repair.
- If the cause of the issue is in the Sydney Water sewer (as in cause 2), the Operation and Maintenance team will clear the blockage and or fix the sewer.
- If causes 1 and 2 are not identified, the operation team will pass the matter to the Sydney Water Planning team for the sewer hydraulic capacity assessment.

As of the EPA Limit Condition, L7.1 of the Operating Licence, Sydney Water must maintain Hydraulic Sewer System Model that is updated and re-calibrated or validated for Licence Reporting every year. The sewer gauging data will be used to calibrate and validate the System Hydraulic Model that will be used to investigate the hydraulic capacity of the sewer related to the Customer Complaint.

A feasible option will be developed and implemented to address the hydraulic capacity of the sewer network in consultation with impacted customers. Potential options to alleviate the issue could take in the form of:

- Sewer amplification / duplication
- Flow Diversion
- New Emergency Relief Structure (ERS)
- Relocation or modification of existing ERS (weir levels and/or lengths)
- Modification of upstream/downstream pump stations.
- Property specific solution (Non return valve, Property pump etc)
- Temporary storage via online or offline storage
- Source Control on Sydney Water assets
- Combination of the above.

A short-list of options, with costs of each option (including life cycle cost) and a risk assessment would be presented at a meeting with stakeholders to select the preferred option to address the issue. The preferred option would be selected based on the overall life cycle cost, environmental factors, constructability, hydraulic Performance, customers impact, etc. The preferred option would then move to design and delivery.



7 Summary and Recommendations

Figure 10 shows the catchment area, existing and proposed sewers and identified sewer flow monitors at strategic locations. Most of the sewers in the area are in the Concept Design stages, and hence, flow monitors were identified based on the Concept Design Drawings.

- Thirty-four strategic locations have been proposed as a part of the initial gauging network.
- Locations may be moved to the nearest proximity depending on the safety, access to the location and hydraulic condition at the proposed site.
- The number of flow monitors may grow higher based on project needs, once the sewer system is fully mobilised.

Refer to Figure 10 and Table 10 for the Number of flow monitors, installation period and type of flow monitor in each of the eight catchments.

Of the 34 flow monitors:

- Locations of the currently running three gauging sites in Kemps Creek Catchment would be assessed in 2026 and may be moved to better sites that are hydraulically stable. Flow Monitor 8HOX18 would be assigned as a Licence Flow Monitor.
- Twenty-one flow monitors would be installed in 2026 once the initial stage sewers are delivered.
- Eight flow monitors would be installed in 2028 and two flow monitors in 2031.
- Twelve of the above number of flow monitors would be classified as Licence flow monitors and the rest of them would be classified as Project flow monitors (Refer to Section 3).
- Nine of the Licence flow monitors would be in place in 2026, two of them would be in 2028 and one of them will be in place in 2031.
- Hydrometrics Team would be advised to install additional 3 -5 Rain Gauges at safe strategic locations over the catchment, once the major infrastructures are delivered in 2026-2027. This would help gather rain data with a good coverage within the catchment for the Model wet weather calibration and validation.

Refer to Figure 10 and Table 11 for detailed location of flow monitors, size of sewers, MH depth, chainage, and more information.

Sydney Water's Operation/ Maintenance team will investigate the sewer network to identify possible causes of the wet weather surcharge reported in Customer complaints.

A feasible option will be developed and implemented to address the hydraulic capacity of the sewer network in consultation with impacted customers.

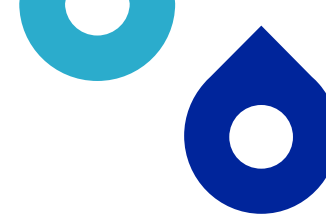


Table 10: Summary Information for Equivalent Population (EP) at Each Planning Horizons in Each Catchment

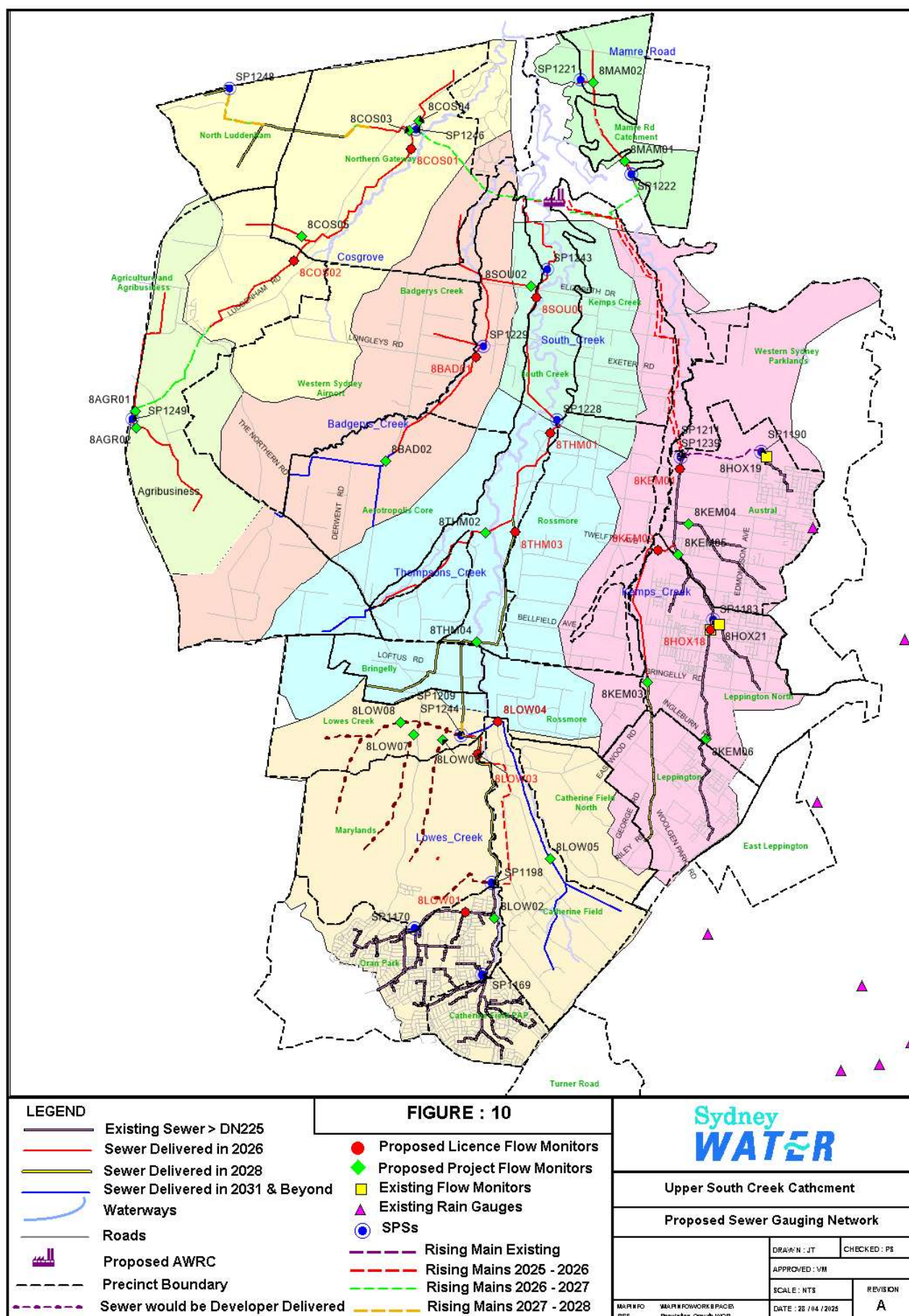
USC Wastewater Catchments	Number of Flow Monitors	Equivalent Population (EP)				Flow Monitor Type (HVQ) & Installation Period							
		Existing	2026	2036	2056	Licence				Project			
						Existing	2026	2028	2031	Existing	2026	2028	2031
Cosgrove Creek	5	-	6,738	36,925	54,002	-	2	-	-	-	3	-	-
Agribusiness	2	-	1,949	13,583	18,142	-	-	-	-	-	2	-	-
Badgerys Creek	2	-	111	29,184	34,848	-	1	-	-	-	-	1	-
Mamre Road	2	-	2,869	14,555	17,760	-	-	-	-	-	2	-	-
South Creek	2	-	183	3,335	17,448	-	1	-	-	-	1	-	-
Thompsons Creek	4	-	738	29,824	95,974	-	1	1	-	-	1	1	-
Kemps Creek	9	16,615 ¹	25,708	79,403	144,199	-	3	-	-	2 ³	3	1	-
Lowes Creek	8	20,814 ²	4,559	73,811	167,915	-	1	1	1	-	1	3	1
Total	34		43,853	280,620	550,288	0	9	2	1	2	13	6	1

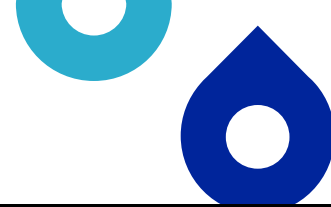
1 Existing EP in the Lowes Creek Catchment serviced by the SP1198 and be treated at the West Camden WWTP.

2 Additional EP to be serviced by SP1209, that would be pumped to the SP1198 to be treated at the West Camden WWTP.

3 One of the Existing Flow Monitors in the Kemps Creek Catchment would be assigned as a Licence Gauge in 2026.

Figure 10: Upper South Creek Catchment Layout, Proposed Sewers and Proposed Gauging Locations





NO	GAUGE ID	MH_Asset ID	Pipe Diam (DN)	MH Depth (m)	Chainage (m)	Sewer Section code	Sewer main Name	Drawing No	Catchment	Sewer Delivery Time	Gauge Install Time	COMMENTS
1	8COS01		600	4.03	480.86	CCGC01-01		P0000416-CCGC01-00-DRG-WW-0002	Cosgrove	2026	2026	Licence Gauge
2	8COS02		450	4.05	629.00	CCGC01-02		P0000416-CCGC01-00-DRG-WW-0015	Cosgrove	2026	2026	Licence Gauge
3	8COS03		525	2.82	267.87	CCGC04		P0000416-CCGC04-00-DRG-WW-0001	Cosgrove	2026	2026	Project Gauge
4	8COS04		450	3.46	50.98	CCGC03		P0000416-CCGC03-00-DRG-WW-0001	Cosgrove	2026	2026	Project Gauge
5	8COS05		375	1.77	234.14	CCGC02		P0000416-CCGC02-00-DRG-WW-0001	Cosgrove	2026	2026	Project Gauge
6	8AGR01		400	10.32	213.13	ABGC01		P0000416-ABGC01-00-DRG-WW-0001	Cosgrove_Agribusiness	2026	2026	Project Gauge
7	8AGR02		375	1.87	180.83	ABGC02		P0000416-ABGC02-00-DRG-WW-0001	Cosgrove_Agribusiness	2026	2026	Project Gauge
5	8BAD01		525	7.40	231.14	BCGC02		INDEX544/10	Badgerys Creek	2026	2026	Licence Gauge
9	8BAD02		450	8.73	551.95	BCGC03		INDEX544/22	Badgerys Creek	2028	2028	Project Gauge
10	8MAM01		450	10.12	145.46	L3		20038119-MRGS00-00-DRG-WW-0001	Mamre Road	2026	2026	Project Gauge
11	8MAM02		375	10.32	0.00	L1 (measuring L1 + L2)		20038119-MRGS00-00-DRG-WW-0000	Mamre Road	2026	2026	Project Gauge
12	8SOU01		1400	14.50	560.56	SCGC01		INDEX549/244 Sheet 4	South Creek	2026	2026	Licence Gauge
13	8SOU02		900	11.91					South Creek	2026	2026	Project Gauge
14	8THM01		1250	14.63	279.76	TCGC01		P0000364-TCGC01-00-DRG-WW-0001	Thompsons Creek	2026	2026	Licence Gauge
15	8THM02		720	9.20	635.15	TCGC02		P0000364-TCGC02-00-DRG-WW-0002	Thompsons Creek	2026	2026	Project Gauge
16	8THM03		1150	11.27	246.27	TCGC03		P0000364-TCGC03-00-DRG-WW-0001	Thompsons Creek	2028	2028	Licence Gauge
17	8THM04		1050	7.47	3083.14	TCGC03		P0000364-TCGC03-00-DRG-WW-0011	Thompsons Creek	2028	2028	Project Gauge
18	8HOX18	11016196	450	4.49			Bringelly Creek Carrier (SP1183)		Kemps Creek	Existing	Existing	Licence Gauge
19	8HOX19	11053264	300	6.58			No Name Yet (SP 1190)		Kemps Creek	Existing	Existing	Project Gauge
20	8HOX21	11395419	600	6.24			Bonds Creek Carrier (SP1183)		Kemps Creek	Existing	Existing	Project Gauge
21	8KEM01	11700807	1400	12.44			No Name Yet (SP1211/1239)		Kemps Creek	Existing	2026	Licence Gauge
22	8KEM02		675	9.97	372.41	KCGC01	No Name Yet (SP1211/1239)	521567-KCGC01-00-DRG-WW-0004	Kemps Creek	2026	2026	Licence Gauge
23	8KEM03			11.17	3072.66	KCGC01	No Name Yet (SP1211/1239)	521567-KCGC01-00-DRG-WW-0012	Kemps Creek	2028	2028	Project Gauge
24	8KEM04	11710221	450	6.75			No Name Yet (SP1211/1239)		Kemps Creek	Existing	2026	Project Gauge
25	8KEM05	11713231	900	9.74			No Name Yet (SP1211/1239)		Kemps Creek	Existing	2026	Project Gauge
26	8KEM06	11016229	375	3.20			Bringelly Creek Carrier (SP1183)		Kemps Creek	Existing	2026	Project Gauge
27	8LOW01	11228502	450	7.79			Oran Park Branch (SP1198)		Lowes Creek	Existing	2026	Licence Gauge
28	8LOW02	11228098	525	3.99			Catherine Fields Road Branch (SP1198)		Lowes Creek	Existing	2026	Project Gauge
29	8LOW03						Gravity Main (SP1244)		Lowes Creek	2028	2028	Licence Gauge
30	8LOW04						Gravity Main (SP1244)		Lowes Creek	2031	2031	Licence Gauge
31	8LOW05						Gravity Main (SP1244)		Lowes Creek	2031	2031	Project Gauge
32	8LOW06						Gravity Main (SP1244)		Lowes Creek	2028 (Developer Delivered)	2028	Project Gauge
33	8LOW07						Gravity Main (SP1244)		Lowes Creek	2028 (Developer Delivered)	2028	Project Gauge
34	8LOW08						Gravity Main (SP1244)		Lowes Creek	2028 (Developer Delivered)	2028	Project Gauge

Table 11: Information on Proposed Gauge Locations



8 References

Strategic Sewer Gauging Network Review, Re-Design, and Consolidation Report, December 2021

USC Catchment Flow Monitoring Plan 2025

Sewer Gauge Rationalisation Report 2014

Badgerys Creek Catchment Wastewater Network-Concept Design Report.

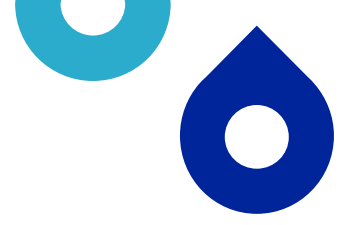
Thompsons and South Creek Catchment Wastewater Network-Concept Design Report.

Cosgrove and Agribusiness Catchment Wastewater Network- Concept Design Report.

Mamre Road Wastewater Network – Concept Design Report.

Kemps Creek Carrier Extension and SP1239 Pumping Station – Concept Design Report.

Lowes Creek Wastewater Network-Stage 2 – Early Design Report.

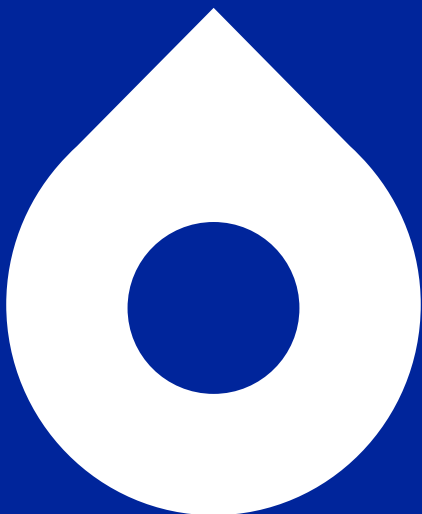


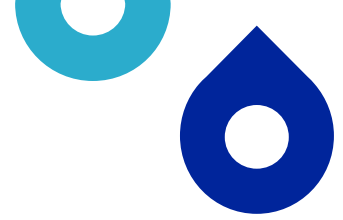
Appendix 1- Consultation Summary Report

Badu Yarragul Water Resource Recovery Facility (BYWRRF)

CoA A9 Consultation Summary Report

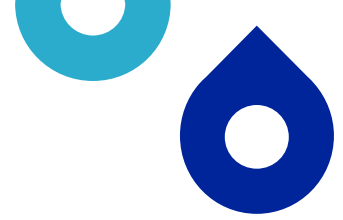
Wet Weather Infiltration Monitoring Program for the
sewer network connected to the BYWRRF





Version Control

Date	Revision	Comments	Prepared by
05/08/2025	01	Summary of consultation on WWIMP	Cheryl Cahill



Contents

1. Introduction	4
1.1 Background.....	4
1.2 Purpose of this Consultation Summary Report.....	4
1.3 CoA Compliance.....	5
1.4 Consultation Process.....	6
2. Stakeholder and Agency Consultation	7
2.1 EPA.....	7
Appendix 1 - EPA	9



1. Introduction

1.1 Background

The Badu Yarragul Water Resource Recovery Facility (BYWRRF) (the project), formerly known as the Upper South Creek (USC) Advanced Water Recycling Centre (AWRC), is currently under construction and will support the population growth and economic development of the Western Sydney Aerotropolis Growth Area (WSAGA or Aerotropolis), South West Growth Area (SWGA) and the new Western Sydney International Airport. When operational, the project will provide wastewater services to Western Sydney to produce high-quality treated water for non-drinking reuse and for release to local waterways.

The project comprises the following components:

- A new Water Resource Recovery Facility (WRRF) to collect wastewater from businesses and homes and treat it with advanced technology, producing high-quality treated water, renewable energy and biosolids for beneficial reuse
- A new green space area around the BYWRRF, adjacent to South Creek and Kemps Creek, to support the ongoing development of a green spine through Western Sydney
- New infrastructure from the BYWRRF to South Creek, to release excess treated water during significant wet weather events, estimated to occur about 3 – 14 days each year
- A new treated water pipeline from the BYWRRF to Nepean River at Wallacia Weir, to release high-quality treated water to the river during normal weather conditions
- A new brine pipeline from the BYWRRF to connect into Sydney Water's existing Northern Georges River submain (NGRS) at Lansdowne to transport brine to the Malabar Wastewater Treatment Plant for further treatment
- A range of ancillary infrastructure.

The Project is being constructed in stages with Stage 1 consisting of building and operating the BYWRRF to treat a daily wastewater flow, known as the average dry weather flow (ADWF), of up to 35 megalitres per day (ML/day). It also includes the construction of the treated water pipeline and brine pipeline to cater for up to 70 ML/day flow coming through the BYWRRF (but only operating them to transport and release volumes produced by Stage 1). Stage 1 of the Project is being undertaken by John Holland Group (JHG) (on behalf of Sydney Water) and construction is expected to be completed in 2025, and handover to Trility John Holland Operation and Maintenance Joint Venture (TJH OMC) in August 2026 following commissioning.

Stage 2 of the Project consists of an expansion of BYWRRF to treat wastewater flows up to 70 ML/day. Sydney Water (SWC) will remain flexible on the size and timing of these future upgrades to accommodate changes in population projections over time. Future stages will be subject to further environmental assessment. Further detail on Project staging is provided in the Project Environmental Impact Statement (EIS).

The Wet Weather Infiltration Monitoring Program (WWIMP) for the sewer network connected to the Badu Yarragul Water Resource Recovery Facility (BYWRRF), to which this consultation summary report applies, is applicable to Stage 1 only, and will potentially require further updates following approval of Stage 2.

1.2 Purpose of this Consultation Summary Report

This Consultation Summary Report has been prepared to meet the requirements of the CSSI approval, in particular Condition of Approval (CoA) A9. CoA A9 outlines the requirements for undertaking and documenting consultation undertaken during the preparation of approval documents, monitoring programs of other documentation required under relevant CoA for those documents. This Consultation Summary Report has been prepared to consolidate the consultation undertaken during the preparation of the WWIMP as required by CoA E121 and E122. See Table 1 for further consultation details.

Table 1 - Consultation Requirements

Reference	Document Name	Consultation Requirement
E122	Wet Weather Infiltration Monitoring Program	Environment Protection Authority (EPA)

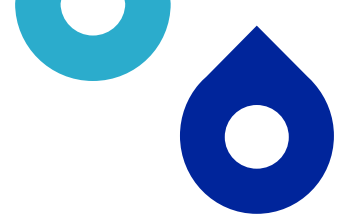
1.3 CoA Compliance

This section details the compliance of this Consultation Summary Report with the relevant CoA as applicable to consultation required to be undertaken during the development of the WWIMP.

Table 2 lists the applicable CoA, where and how they have been addressed in this Consultation Summary Report.

Table 2 – CoA relevant to WWIMP Consultation Summary Report

CoA ID	CoA Detail	How and Where Addressed
A9	Where the terms of this approval require consultation to be undertaken, evidence of the consultation undertaken must be submitted to the Planning Secretary and ER (as relevant) with the corresponding documentation. The evidence must include:	This document (Consultation Summary Report)
A9	a) documentation of the engagement with the party identified in the condition of approval that has occurred before submitting the document for approval;	Section 2 and Appendix 1 of Consultation Summary Report
A9	b) a log of the dates of engagement of attempted engagement with the identified party;	Section 2 and Appendix 1 of Consultation Summary Report
A9	c) documentation of the follow-up with the identified party where engagement has not occurred to confirm that they do not wish to engage or have not attempted to engage after repeated invitations.	Section 2 and Appendix 1 of Consultation Summary Report
A9	d) outline of the issues raised by the identified party and how they have been addressed	Section 2
A9	e) a description of the outstanding issues raised by the identified party and the reasons why they have not been addressed	Section 2
E121	The Proponent must develop and implement a monitoring program to assess wet weather infiltration into the sewer network connected to the Advanced Water Recycling Centre (AWRC). The program must include:	Refer to WWIMP
121	a) monitoring of sewer infiltration rates throughout the AWRC sewer catchment from the commencement of operation onward.	Refer to WWIMP
121	b) proposed investigative actions and potential remedial actions for wet weather infiltration in the sewer network if high wet weather infiltration is identified; and	Refer to WWIMP
121	c) reporting requirements for the program to the EPA.	Refer to WWIMP
E122	The monitoring program required under Condition E121 must be submitted to the EPA for review at least 18 months	Section 2 and Appendix 1 of Consultation Summary Report



CoA ID	CoA Detail	How and Where Addressed
	prior to the commencement of operation of Stage 1 of the critical State significant infrastructure (CSSI) and submitted to the Planning Secretary for information at least one year prior to the commencement of operation of Stage 1 of the CSSI.	

1.4 Consultation Process

Consultation with the EPA was undertaken using formal correspondence (emails), teams meetings, site visits and included input submitted via the CSSI- 8609189 Modification (MOD3) consultation process.

2. Stakeholder and Agency Consultation

This Section of the Consultation Summary Report provides detail of consultation undertaken with the EPA in the preparation of the WWIMP. It contains a consultation log that identifies:

- Consultation dates (actual and attempted)
- Form of consultation
- Whether responses and / or comments were received
- Summary of the issues raised, including how they have been addressed

Documentary evidence of all the correspondence received and sent through the consultation phase is contained in Appendix 1 at the end of this Report.

2.1 EPA

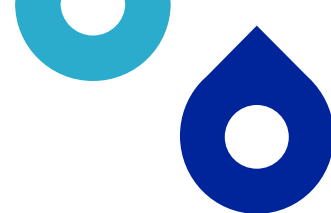
Consultation with the EPA regarding the development of the WWIMP commenced on 3 October 2024 and concluded on 24 July 2025.

Table 3 below includes the details of engagement between the EPA and Sydney Water regarding the WWIMP.

Table 4 includes a summary of the issues raised, how those were addressed and closed out. Full evidence of correspondence is in Appendix 1 of this report.

Table 3 - Engagement Log - EPA

Correspondence					
#	Date	Form/ Type	Purpose	From	Recipient
1	3/10/2024	MS teams meeting	Overview presentation of the project, EPL requirements, development of WWIMP, including timeframes and proposed modification	Sydney Water Project team	Matthew Hart Bronagh McGeown Laura Ansted
2	28/11/2024	Site Visit	Site visit to the BYWRRF to discuss project, as it relates to the future operation of the facility, including the development of supporting documents including the WWIMP	Sydney Water Project team	Matthew Hart Bronagh McGeown Laura Ansted
3	11/03/2025	Email	Issuing of the WWIMP and request for review and ultimate approval, prior to submission to DPHI (EPA approval was required under CoA E119/ E120 prior to determination of MOD3).	James McCulloch	Matthew Hart Bronagh McGeown Laura Ansted
4	7/05/2025	Letter	Response to Modification Report (MOD3), including recommendation to amend conditions to remove requirement for EPA approval of WWIMP.	Matthew Hart	Aaron Tan (DPHI)
5	16/06/2025	Email	Follow up on request for comment on WWIMP	James McCulloch	Laura Ansted Matthew Hart



Correspondence					
#	Date	Form/ Type	Purpose	From	Recipient
6	18/06/2025	Email	Acknowledging email and commitment to provide feedback	Laura Ansted	James McCulloch Cheryl Cahill
7	24/06/2025	Email	Follow up on request for comment on WWIMP	James McCulloch	Laura Ansted Matthew Hart
8	24/06/2025	Email	Provided comments on WWIMP	Laura Ansted	James McCulloch Cheryl Cahill

Table 4 - Summary of Issues – EPA

Document Section, CoA	Comment Raised	Date Raised	How Addressed/ Justification why not addressed
E121/E122	The EPA requests that Condition of Approval E120 (as well as Condition E122 in relation to the wet weather infiltration monitoring program) is amended to remove the requirement for the EPA's approval of these documents. The EPA encourages the development of such plans to ensure that proponents have determined how they will meet their statutory obligations and environmental objectives. However, we do not approve or endorse these documents as our role is to set environmental objectives for environmental management, not to be involved in developing strategies such as these plans to achieve those objectives.	7/05/2025	In the determination of MOD3 (20/06/25), DPHI amended condition E122 to remove the requirement for EPA to approve the WWIMP. The WWIMP had already been provided to EPA for comment on 11/03/25 and comments were provided on 24/06/25.
WWIMP	Sydney Water could consider including something regarding customer complaints about wet weather overflows and the response to those complaints	24/06/2025	Section 6 was added to the WWIMP to address EPA's comment



Appendix 1 - EPA