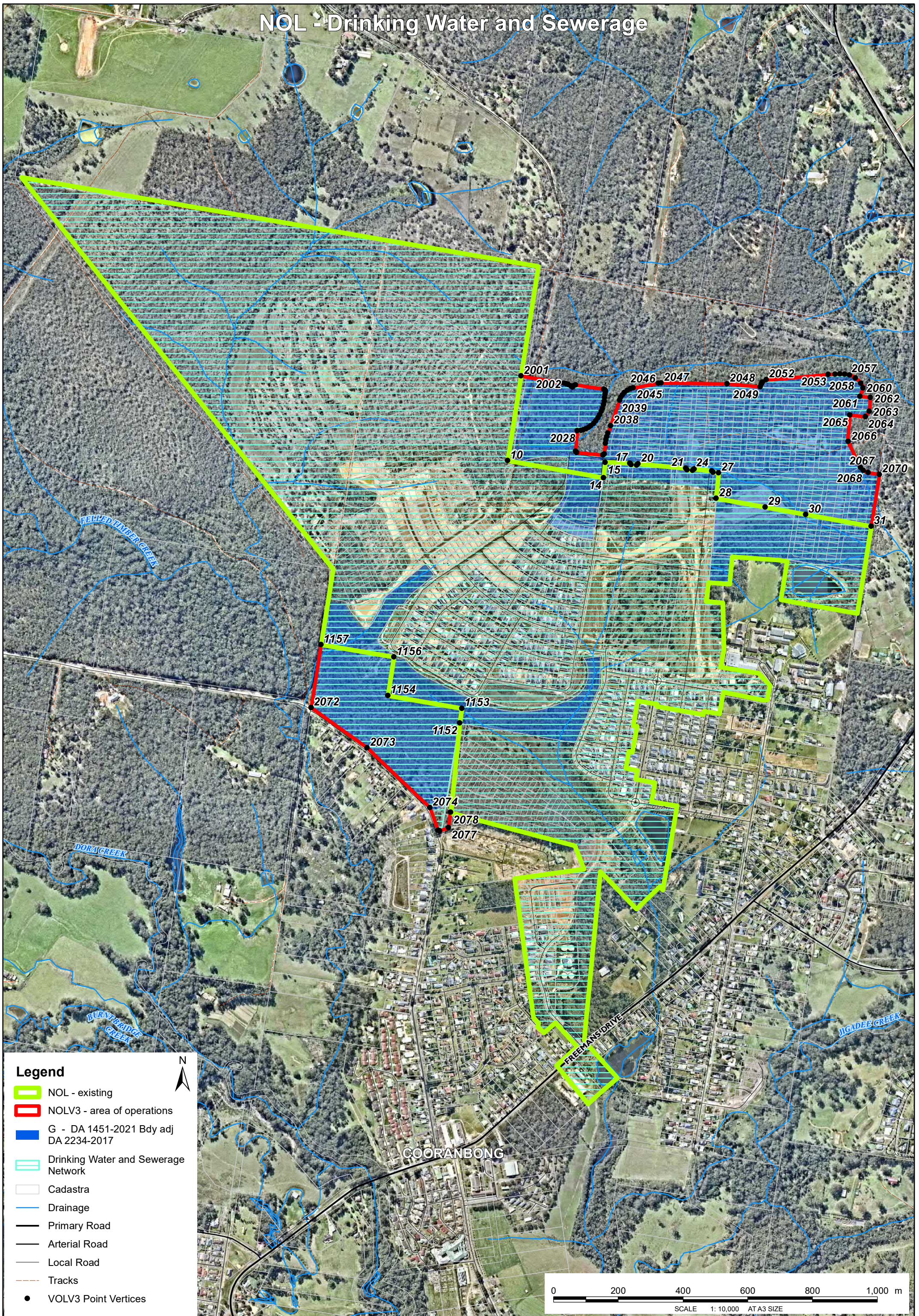


NOL - Drinking Water and Sewerage

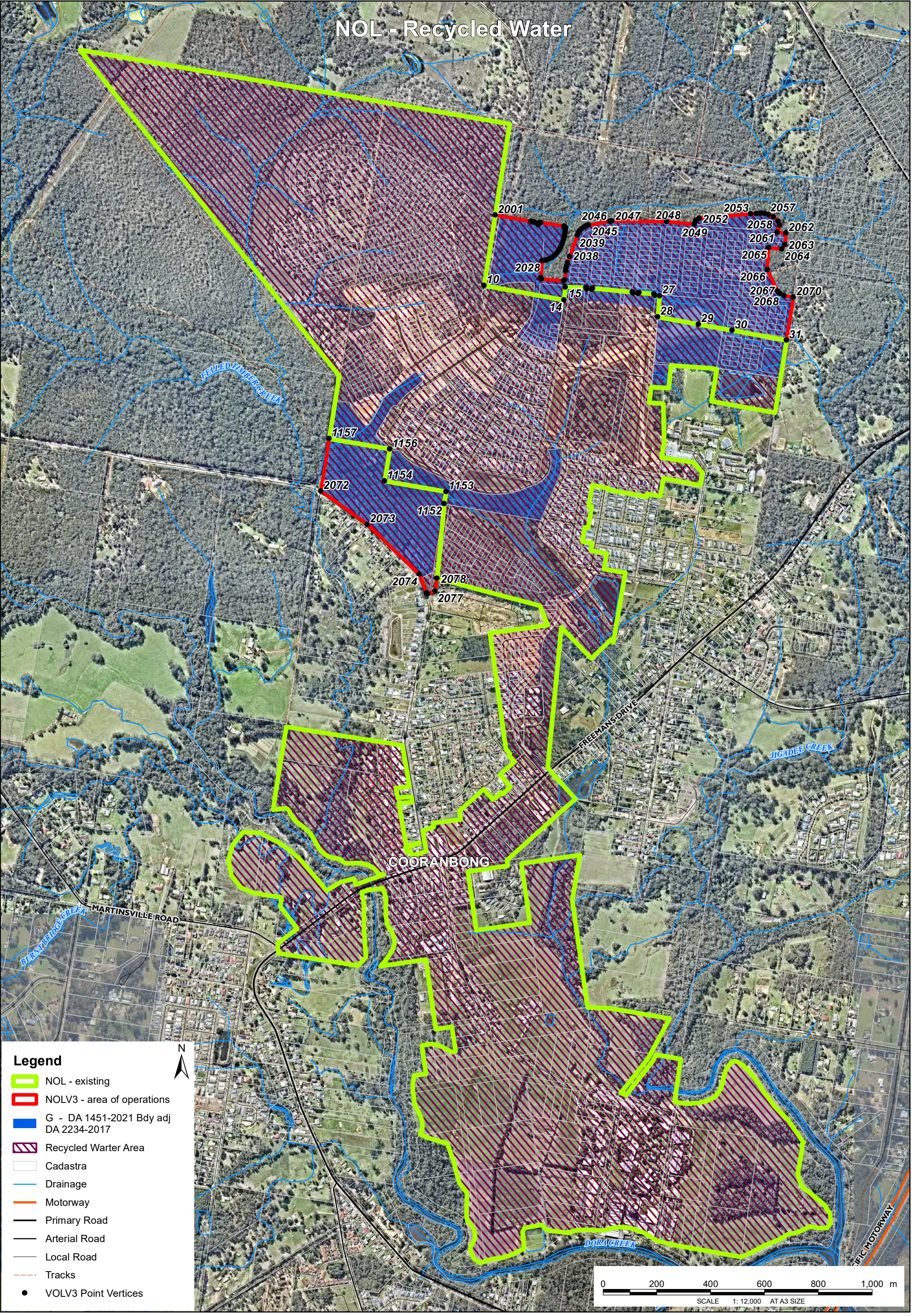


NOLV3 COORANBONG - NEW VERTICES_AREA OF OPERATIONS - DRINKING
WATER AND SEWERAGE

Vertex	Easting	Northing
10	355853.37	6341292.56
14	356150.06	6341238.76
15	356155.24	6341286.25
17	356230.93	6341284.36
18	356235.00	6341279.44
19	356251.89	6341277.87
20	356256.77	6341281.96
21	356403.68	6341268.30
22	356407.75	6341263.38
23	356424.69	6341261.76
24	356429.59	6341265.82
25	356484.44	6341260.58
26	356488.51	6341255.66
27	356505.46	6341254.04
28	356498.10	6341175.73
29	356649.65	6341148.31
30	356774.36	6341125.63
31	356976.80	6341088.99
1152	355705.06	6340481.79
1153	355712.11	6340526.71
1154	355483.38	6340566.36
1156	355502.26	6340685.07
1157	355277.23	6340723.27
2001	355894.60	6341554.08
2002	356027.76	6341530.73
2003	356034.29	6341529.21
2004	356041.24	6341526.70
2005	356048.96	6341522.63
2006	356053.92	6341519.16
2007	356060.82	6341525.54
2008	356063.08	6341525.99
2009	356150.83	6341512.74
2010	356153.73	6341511.06
2011	356155.66	6341508.03
2012	356156.02	6341505.15
2013	356154.98	6341497.54
2014	356153.56	6341487.38
2015	356151.97	6341476.21
2016	356149.65	6341464.94
2017	356146.08	6341452.91
2018	356143.11	6341445.09
2019	356137.78	6341433.74
2020	356132.58	6341424.69
2021	356126.09	6341415.23
2022	356119.16	6341406.98
2023	356111.21	6341399.85
2024	356104.30	6341395.10
2025	356095.51	6341390.53
2026	356086.91	6341387.44
2027	356080.24	6341385.83
2028	356068.89	6341384.54

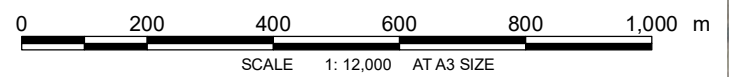
Vertex	Easting	Northing
2029	356063.14	6341321.47
2030	356066.76	6341317.11
2031	356148.34	6341309.30
2032	356148.34	6341309.30
2033	356152.68	6341312.90
2034	356155.71	6341346.16
2035	356157.41	6341356.99
2036	356159.65	6341365.85
2037	356163.44	6341377.03
2038	356171.46	6341399.78
2039	356199.37	6341478.97
2040	356203.24	6341487.65
2041	356208.04	6341495.04
2042	356214.37	6341502.09
2043	356223.45	6341509.12
2044	356233.09	6341513.99
2045	356241.48	6341516.57
2046	356319.27	6341530.99
2047	356327.64	6341531.98
2048	356531.22	6341529.60
2049	356634.35	6341519.74
2050	356637.97	6341529.73
2051	356641.03	6341534.10
2052	356652.25	6341542.37
2053	356843.85	6341558.35
2054	356864.79	6341559.41
2055	356880.38	6341560.11
2056	356895.01	6341559.42
2057	356909.60	6341556.85
2058	356927.55	6341547.46
2059	356944.89	6341531.28
2060	356951.17	6341516.34
2061	356941.69	6341490.52
2062	356974.56	6341486.98
2063	356970.99	6341444.73
2064	356959.43	6341427.89
2065	356910.76	6341432.84
2066	356905.84	6341351.56
2067	356943.73	6341271.45
2068	356952.60	6341262.34
2069	356967.52	6341255.17
2070	357002.27	6341248.93
2072	355246.25	6340528.64
2073	355419.51	6340404.59
2074	355612.78	6340219.75
2075	355638.65	6340149.89
2076	355643.84	6340147.60
2077	355670.97	6340158.07
2078	355678.51	6340204.00

NOL - Recycled Water



Legend

- NOL - existing
- NOLV3 - area of operations
- G - DA 1451-2021 Bdy adj
DA 2234-2017
- Recycled Warter Area
- Cadastra
- Drainage
- Motorway
- Primary Road
- Arterial Road
- Local Road
- Tracks
- VOLV3 Point Vertices



NOLV3 COORANBONG - NEW VERTICES_AREA OF OPERATIONS - RECYCLED WATER

Vertex	Easting	Northing
10	355853.37	6341292.56
14	356150.06	6341238.76
15	356155.24	6341286.25
17	356230.93	6341284.36
18	356235.00	6341279.44
19	356251.89	6341277.87
20	356256.77	6341281.96
21	356403.68	6341268.30
22	356407.75	6341263.38
23	356424.69	6341261.76
24	356429.59	6341265.82
25	356484.44	6341260.58
26	356488.51	6341255.66
27	356505.46	6341254.04
28	356498.10	6341175.73
29	356649.65	6341148.31
30	356774.36	6341125.63
31	356976.80	6341088.99
1152	355705.06	6340481.79
1153	355712.11	6340526.71
1154	355483.38	6340566.36
1156	355502.26	6340685.07
1157	355277.23	6340723.27
2001	355894.60	6341554.08
2002	356027.76	6341530.73
2003	356034.29	6341529.21
2004	356041.24	6341526.70
2005	356048.96	6341522.63
2006	356053.92	6341519.16
2007	356060.82	6341525.54
2008	356063.08	6341525.99
2009	356150.83	6341512.74
2010	356153.73	6341511.06
2011	356155.66	6341508.03
2012	356156.02	6341505.15
2013	356154.98	6341497.54
2014	356153.56	6341487.38
2015	356151.97	6341476.21
2016	356149.65	6341464.94
2017	356146.08	6341452.91
2018	356143.11	6341445.09
2019	356137.78	6341433.74
2020	356132.58	6341424.69
2021	356126.09	6341415.23
2022	356119.16	6341406.98
2023	356111.21	6341399.85
2024	356104.30	6341395.10
2025	356095.51	6341390.53
2026	356086.91	6341387.44
2027	356080.24	6341385.83
2028	356068.89	6341384.54

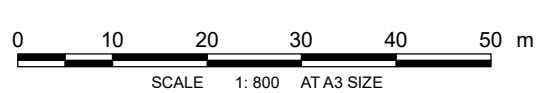
Vertex	Easting	Northing
2029	356063.14	6341321.47
2030	356066.76	6341317.11
2031	356148.34	6341309.30
2032	356148.34	6341309.30
2033	356152.68	6341312.90
2034	356155.71	6341346.16
2035	356157.41	6341356.99
2036	356159.65	6341365.85
2037	356163.44	6341377.03
2038	356171.46	6341399.78
2039	356199.37	6341478.97
2040	356203.24	6341487.65
2041	356208.04	6341495.04
2042	356214.37	6341502.09
2043	356223.45	6341509.12
2044	356233.09	6341513.99
2045	356241.48	6341516.57
2046	356319.27	6341530.99
2047	356327.64	6341531.98
2048	356531.22	6341529.60
2049	356634.35	6341519.74
2050	356637.97	6341529.73
2051	356641.03	6341534.10
2052	356652.25	6341542.37
2053	356843.85	6341558.35
2054	356864.79	6341559.41
2055	356880.38	6341560.11
2056	356895.01	6341559.42
2057	356909.60	6341556.85
2058	356927.55	6341547.46
2059	356944.89	6341531.28
2060	356951.17	6341516.34
2061	356941.69	6341490.52
2062	356974.56	6341486.98
2063	356970.99	6341444.73
2064	356959.43	6341427.89
2065	356910.76	6341432.84
2066	356905.84	6341351.56
2067	356943.73	6341271.45
2068	356952.60	6341262.34
2069	356967.52	6341255.17
2070	357002.27	6341248.93
2072	355246.25	6340528.64
2073	355419.51	6340404.59
2074	355612.78	6340219.75
2075	355638.65	6340149.89
2076	355643.84	6340147.60
2077	355670.97	6340158.07
2078	355678.51	6340204.00



Vertex	Easting	Northing
1	356067.97	6339806.43
2	356074.85	6339696.97
3	356074.03	6339690.36
4	356000.86	6339690.04
5	356000.88	6339694.54
6	355967.23	6339682.11
7	355965.20	6339688.29
8	355973.57	6339691.38
9	355970.90	6339699.47
10	356000.90	6339703.57
11	356001.10	6339778.29
12	355975.70	6339778.35
13	355984.63	6339791.26
14	356001.18	6339807.95
15	356001.15	6339797.30

Legend

- Cooranbong LWC
- Cadastra
- Local Road
- LWC Point Vertices



altogether.

Cooranbong Scheme Management Plan (Scheme MP)



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Water Scheme Management Plan (Scheme MP)

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Purpose

The purpose of undertaking the preliminary risk assessment was to:

- Identify potential risks that may impact the safe and reliable operation of the facility (and associated components), specifically focused on risks associated with the following:
 - Potential impacts to public health and/or water quality
 - Environmental impacts including noise, odour and general environmental impacts
 - Operational reliability and process performance
 - Financial viability
- Customer service
- Identify early, potential risk mitigation/control measures that can be incorporated into the design, construction and operation of the facility to sufficiently mitigate these risks
- Facilitate further dialogue with all key stakeholders to ensure all key risks associated with the project are identified and effectively controlled.

Methodology

A risk assessment was conducted for provision of the following services:

- Sewage
- Recycled water
- Drinking water

The assessment approach adopted for conducting the sewage and recycled water preliminary risk assessments was consistent with the recommendations in the Australian Guidelines for Water Recycling (AGWR). The assessment criteria are provided in Attachment A.

The assessment approach adopted for conducting the drinking water preliminary risk assessment was consistent with the recommendations in the Australian Drinking Water Guidelines (ADWG). The assessment criteria are provided in Attachment B.

Business risks, or risks leading to a loss of service or complaints, were assessed using the Altogether assessment criteria provided in Attachment C.

The preliminary risk assessment process included the following activities:

- Risk Identification – The identification of a range of risks related to the project (what might happen?)
- Risk Categorisation – The categorization of the risks into various types to aid understanding and to provide context.
- Risk Assessment – Determination of the likelihood and consequence of the unmitigated/uncontrolled risk (what is the likelihood and impact/consequence?)
- Managing the Risk/Risk Mitigation – the identification of appropriate controls to be further developed and implemented as appropriate should the project be approved to proceed (what can be done to stop it happening?)

- Post Mitigation Risk Assessment – the reassessment of the risk following implementation of appropriate controls to ensure that the risk is sufficiently mitigate (how effective do we anticipate the controls to be?)

Controls

Controls modify the likelihood or the impact of the risk (i.e. both the likelihood and consequence of a risk).

- Preventive controls apply at the beginning of a risk's life, at or near the root causes(s). As a device, they often act as a barrier to “nip it (the risk) in the bud”. They primarily reduce the likelihood of the risk occurring. Examples are system passwords, locked doors, machinery maintenance etc.
- Detective controls usually apply somewhere in the middle of the risk's life. Detective controls rely on the analysis of information in order to detect that a risk is “in motion”. Detective controls that are “early” in the risk's life usually modify likelihood and those that are “late” in the life, usually modify impact. Examples are online monitoring, inspections, complaints and incident monitoring etc.
- Reactive controls (sometimes also called Responsive or Corrective), apply towards the end of a risk's life when the impact is imminent or being felt. They are focused on modifying impact. Examples are plant shutdown, drinking water top up, incident and emergency response processes.

Risk Rating Before And After Controls

The risk rating after controls is a risk assessment with controls in place. As explained above, controls can modify both the likelihood and consequence of a risk.

The qualitative descriptions for consequence or impact contained in the recommendations of the AGWR and ADWG (refer to Attachments A and B), use a combination of the scale of the impact and the size of population or ecosystem affected. If the controls can reduce the scale of the impact or size of the population or ecosystem affected, then the overall risk rating can be reduced.

Examples include:

Drinking water - The risk of a low disinfection residual will lead to lower disinfection, but there will still be a level of disinfection, thereby reducing the scale of the impact and the size of the population affected.

Sewage – The risk of sewage overflow is mitigated by rapid response and isolation reducing the quantity of sewage released, and/or the flows to sensitive receiving environments being diverted, and therefore the scale and size of the ecosystems affected.

Recycled water - The risk of process failure is mitigated by a multi-barrier treatment approach and plant shutdown if critical control points are exceeded.

Outcomes

Sewage Risk Assessment

In undertaking the preliminary risk assessment, risks were identified across the following areas:

AREA	DESCRIPTIONS
The Catchment	Risks associated with the catchment area including consideration of items such as contamination, volume changes, public health incidents, storage requirements, illegal discharge to sewers etc.
The Sewer Network	Risks associate with the network itself including blockages, pipe or equipment failure, loss of power etc.
Management	General operation management issues risks that may impact operational reliability or supply surety.

Risks have been summarise at Attachment D as the detailed preliminary risk assessment contains information that is commercial in confidence.

Recycled Water Risk Assessment

In undertaking the preliminary risk assessment, risks were identified across the following areas:

AREA	DESCRIPTIONS
Local Water Centre	Consideration of the potential risk associated with the operation of the treatment facility including tank and/or equipment failure, odour, noise, process risks, capacity, power failure, telemetry, vandalism, operator error, flooding etc.
Recycled Water Reticulation and Use	Risks associated with the storage and distribution of recycled water to users and considered areas such as equipment failure, demand, unauthorized usage, water quality, security, power failure etc.
Management	General operation management issues risks that may impact operational reliability or supply surety.

Risks have been summarise at Attachment E as the detailed preliminary risk assessment contains information that is commercial in confidence.

Drinking Water Risk Assessment

In undertaking the preliminary risk assessment, risks were identified across the following areas:

AREA	DESCRIPTIONS
Supply	Consideration of the potential risk associated with the supply of drinking water from a public water authority
Potable Water Reticulation and Use	Risks associated with the storage and distribution of drinking water to users and considered areas such as equipment failure, demand, unauthorized usage, water quality, security, power failure etc.
Management	General operation management issues risks that may impact operational reliability or supply surety.

Risks have been summarise at Attachment F as the detailed preliminary risk assessment contains information that is commercial in confidence.

Attachment A Qualitative Risk Assessment Criteria as per the AGWR

Risk Matrix – Australian Guidelines for Water Recycling

Likelihood	A Almost certain		Low	Moderate	High	Very High	Very High
	B Likely		Low	Moderate	High	Very High	Very High
	C Possible		Low	Moderate	High	Very High	Very High
	D Unlikely		Low	Low	Moderate	High	Very High
	E Rare		Low	Low	Low	High	High
			Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Consequence							

Likelihood (qualitative measures)

Level	Descriptor	Example description
A	Almost certain	Is expected to occur, with probability of multiple occurrences within a year.
B	Likely	Will probably occur within a 1-5 year period.
C	Possible	Might occur or should be expected to occur within 5-10 year period.
D	Unlikely	Could occur within 20 years or in unusual circumstances.
E	Rare	May occur in exceptional circumstances; may occur once in 100 years.

Consequence or impact (qualitative measures)

Level	Descriptor	Example description
1	Insignificant	Insignificant impact or not detectable.
2	Minor	Health - minor impact for small population Environment - potentially harmful to local ecosystem with local impacts contained to site.
3	Moderate	Health - minor impact for large population Environment - potentially harmful to regional ecosystem with local impacts primarily contained on site.
4	Major	Health - major impact for small population Environment - potentially lethal to local ecosystem. Predominantly local, but potential for off-site impacts.
5	Catastrophic	Health - major impact for large population Environment - potentially lethal to regional ecosystem or threatened species. Widespread on-site and off-site impacts.

Note:

1. The levels used for "Likelihood" have been changed to be the same as the ADWG i.e. A = Almost certain. In the AGWR A = Rare

Attachment B Qualitative Risk Assessment Criteria as per the ADWG

Risk Matrix – Australian Drinking Water Guidelines

Likelihood	A Almost certain		Moderate	High	Very High	Very High	Very High
	B Likely		Moderate	High	High	Very High	Very High
	C Possible		Low	Moderate	High	Very High	Very High
	D Unlikely		Low	Low	Moderate	High	Very High
	E Rare		Low	Low	Moderate	High	High
			Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
			Consequence				

Likelihood (qualitative measures)

Level	Descriptor	Example description
A	Almost certain	Is expected to occur in most circumstances.
B	Likely	Will probably occur in most circumstances.
C	Possible	Might occur or should occur at some time.
D	Unlikely	Could occur at some time.
E	Rare	May occur only in exceptional circumstances.

Consequence or impact (qualitative measures)

Level	Descriptor	Example description
1	Insignificant	Insignificant impact, little disruption to normal operation, low increase in normal operation costs.
2	Minor	Minor impact for small population, some manageable operation design interruption, some increase in operating costs.
3	Moderate	Minor impact for large population, significant modification to normal operation but manageable, operation costs increased, increased monitoring.
4	Major	Major impact for small population, systems significantly compromised and abnormal operation if at all, high level of monitoring required.
5	Catastrophic	Major impact for large population, complete failure of system.

Attachment C Altogether's Qualitative Risk Assessment Criteria

Risk Matrix – Flow Systems

Likelihood	A Almost certain		Low	Medium	High	Very High	Very High
	B Likely		Low	Medium	High	Very High	Very High
	C Possible		Minimal	Low	Medium	High	Very High
	D Unlikely		Minimal	Minimal	Low	Medium	High
	E Rare		Minimal	Minimal	Low	Medium	High
			Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Consequence							

Attachment C Altogether's Qualitative Risk Assessment Criteria *cont*

Likelihood (qualitative measures)

Level	Descriptor	Example description (Flow)
A	Almost certain	Expected to occur in most circumstances. Greater than 90% chance of occurrence. More than once per year.
B	Likely	Will probably occur in most circumstances. 65%-90% chance of occurrence Once in 1-2 years
C	Possible	Might occur or should occur at some time. 35%-65% chance of occurrence Once in 2-5 years
D	Unlikely	Could occur in unusual circumstances. 10%-35% chance of occurrence. Once in 5- 20 years.
E	Rare	May occur only in exceptional circumstances. Less than 10% chance of occurrence. Once in 20 years

Consequence or impact (qualitative measures)

Level	Descriptor	Example description
1	Insignificant	No material financial consequence to Flow Cost <\$10k 1-2 customers impacted. Little disruption to normal operation, low increase in normal operation costs.
2	Minor	Some financial consequences to Flow Cost \$10k-100k. 2-10 customers or a whole street impacted. May require notification but no other extraordinary activities. Some manageable operation disruption, some increase in operating costs.
3	Moderate	Considerable financial consequences to Flow. Cost \$100k-\$250k. Subdivision of community or whole development stage impacted. Significant negative consequences requiring additional actions to rectify. Negative client / customer reaction but temporary. Significant modification to normal operation but manageable, operation costs increased, increased monitoring.
4	Major	Material financial consequences to Flow Cost \$250k-\$1 million. Whole community impacted. High likelihood of adverse client/ customer reaction (e.g. lawsuits). May lose some clients / customers permanently. Systems significantly compromised and abnormal operation if at all, high level of monitoring required.
5	Catastrophic	Such significant financial consequences to Flow that its ability to operate is threatened. Cost > \$1 million. More than one community impacted. Adverse client / customer reaction (e.g. lawsuits). Permanent loss of multiple clients / customers. Flow's key point of contact with IPART in the short term. Complete failure of systems.

Attachment D – Preliminary Risk Assessment Summary - Sewage

RISK ID	COMPONENT	POTENTIAL RISK	PRE-MITIGATION RISK	CONTROLS	POST-MITIGATION RISK (OR RESIDUAL RISK)
SW 1.1	Whole of system	Failure of overarching sewer management plan	Very High	<ul style="list-style-type: none">Additional controls as listed for each individual risk below.Preventive:Business Management System (BMS) independently verified to the International Standards ISO 9001 for quality management, ISO 14001 for environmental management and ISO 45001 for safety management.Regular audits by auditors from the regulator’s (IPART) independent panel of auditors.Regular internal process and compliance audits are a component of the Altogether BMS.Review of resource requirements as part of Altogether’s business planning and budgeting process.Annual review of BMS and water quality management plans.Regulator oversight and enforcement action.Skilled and trained operators.Competency based training system.Detective:Consumer complaints.Operator inspections.Reactive:Incident & Emergency Management Plan and associated processes to ensure a rapid and effective incident response and to prevent incident escalation.Incident Notification Protocol with NSW Health to ensure risks to public health are controlled quickly.Qualified contractors engaged to provide rapid response to faults and emergencies including sewage overflowsPollution incident notification as per POEO Act requirements.	Low
SDW 1.1	Delivery of developer works	Delays in construction and delivery of infrastructure by developer	Very High	<ul style="list-style-type: none">Compliance Certificate only issued when developer completes worksIf works delayed, developer pays bond to Altogether and Altogether will deliver infrastructureISO 9001 certified project management processes including project meetings, program updates, and reporting.Generators if delay related to connection to power.Other reactive contingency measures dependent on service i.e. : sewage tankering, drinking water tankering, deployment of extra pumps	Low
SDW 1.2	Delivery of Local Water Centre	Delays in construction and delivery of Local Water Centre by Altogether	Very High	<ul style="list-style-type: none">ISO 9001 certified project management processes to ensure timely delivery of infrastructureEarly identification of contingency measures through modelling.Project management processes including project meetings, program updates, and reporting.Sewage tankering	Low

				<ul style="list-style-type: none">Provision of drinking water through recycled water network.	
SC 1.1 SC 1.2	Collection System (On-lot)	Overflow from on-lot infrastructure	Very High	<ul style="list-style-type: none">NSW Office of Fair Trading inspections during installation to mitigate illegal sewer connectionsMonitoring of pump operation, sewage level and pumped volumes through telemetry and data collection to identify outliers in operations.Power to pressure sewer pumps designed with easy connection to generatorLower water usage in power outagesAt least 48 hours capacity of tanksAlarms linked through telemetryAbility to isolate mainsCustomer complaintsCustomer updates via SMSQualified contractors to manage wastewater spills	Low
SC 1.1b	Collection system (On-lot)	Builders allow occupancy before contacting Cooranbong Water to connect sewer	Very High	<ul style="list-style-type: none">Builder workshopsHome owner educationMessaging with DA Plan reviewTag on tankSocial media remindersRegular inspection of house building progressQualified contractors to manage wastewater spills	Low
SC 1.3	Collection system (Sewer main)	Sewage escape from sewer main due to third party damage	Very High	<ul style="list-style-type: none">Dial Before You Dig (DBYD)Pre-qualified licensed contractor responsible for maintenance48 hour storage in wastewater collection tanksPressure monitoring and alarms of networkIsolation of valves on reticulation to allow isolation of sectionsIncident and Emergency Management Plan and associated processes to ensure rapid response and mitigation.	Low
SC 1.4	Collection system (from customer connection to LWC)	Sewage leak or overflow	High	<ul style="list-style-type: none">Dial Before You Dig (DBYD)Isolation, bunding, and flushing of sewage spillsApproved contractor responsible for maintenance and management of spillsIsolation valves on reticulation to allow isolation of sectionsTelemetered on lot equipmentCustomer and community complaints and response processAd hoc operator drive bysCustomer communications via SMSIncident notification protocols with Public Health Unit and communication to determine appropriate public health response.	
SC 1.5	Collection system (Sewer main)	Odour from low flows at beginning (in initial stages of development)	High	<ul style="list-style-type: none">Regular flushing during early connection phaseDesign of air valveOdour scrubbing on systemSampling and validation of sewage influent qualityCustomer complaints program and customer updates via SMS	Minimal

SL 1.6 SL 1.10	Local Water Centre (Flow Balance Tank)	Overflow from tank	High	<ul style="list-style-type: none">Design, production, installation and testing by qualified contractors and quality assurance to AS3735 Water Retaining Structures.Monitoring and alarm systemsIncident and Emergency Management Plan and associated processes to ensure rapid response and mitigation.	Low
SL 1.8 SL 1.9 SL 1.10	Local Water Centre (Flow Balance Tank)	Operational failure	Very High	<ul style="list-style-type: none">Standard equipment type so spares easily available on short lead timesDuty / standby of equipmentInlet and product water buffer storageSpares of critical equipment on siteMonitoring, alarms and controlsProactive maintenance regimeExperienced operatorsOperator inspectionsIncident and Emergency Management Plan and associated processes to ensure rapid response and mitigation.Tankering company on emergency callout contract.Generator back-upAdditional network storage in on-lot wastewater collection tanks	Low
SL 1.11	Local Water Centre	Inability to service customers	Very High	<ul style="list-style-type: none">Standard equipment type so spares easily available on short lead timesDuty / standby of equipmentInlet and product water buffer storageSpares of critical equipment on siteMonitoring and controlsExperienced operatorsIncident and Emergency Management Plan and associated processes to ensure rapid response and mitigation.Tankering company on emergency callout contractGenerator back-upAdditional network storage in on-lot wastewater collection tanksDrinking water top up to recycled water tanks	Low

Attachment E – Preliminary Risk Assessment Summary – Recycled Water

RISK ID	COMPONENT	POTENTIAL RISK	PRE-MITIGATION RISK (OR	CONTROLS	POST-MITIGATION RISK (OR RESIDUAL RISK)
RW 1.1	Whole of system	Failure of overarching recycled water quality plan	Very High	<ul style="list-style-type: none">Refer to SW1.1	Low
RDW 1.1	Delivery of developer works	Delays in construction and delivery of infrastructure by developer	Very High	<ul style="list-style-type: none">Compliance Certificate only issued when developer completes worksIf works delayed, developer pays bond to Altogether and Altogether will deliver infrastructureISO 9001 certified project management processes including project meetings, program updates, and reportingGenerators if delay related to connection to powerOther reactive contingency measures dependent on service i.e. : sewage tankering, drinking water tankering, deployment of extra pumps	Low
RDW 1.2	Delivery of Local Water Centre	Delays in construction and delivery of Local Water Centre by Altogether	Very High	<ul style="list-style-type: none">ISO 9001 certified project management processes to ensure timely delivery of infrastructureEarly identification of contingency measures through modelling.Sewage tankeringProvision of drinking water through recycled water network.	Low
RC 1.1 RC 1.2 RC 1.3	Collection System	Raw sewage characteristics are outside of design influent parameters	Very High	<ul style="list-style-type: none">Design influent parameters based on industry guidelines for water efficient homes.Treatment process log reduction is greater than the minimum for required uses.Community education i.e. new owner information packs, newsletters, school experience programmes etc. used to inform the public on what can be disposed of down the sewer.Trade Waste Agreements with retail and commercial usersMultiple treatment barrier approachAutomatic plant shutdown when critical control points are breached.Key process parameters are monitored and alarms generated should these indicate a toxic event.	Low
RL 1.1 RL 1.6 RL 1.8 RL 1.13	Local Water Centre	Process equipment damage / failure	Very High	<ul style="list-style-type: none">Duty / standby of equipmentInlet and product water buffer storageSpares of critical equipment on siteMonitoring and controlsProactive maintenance regimeExperienced operatorsIncident and Emergency Management Plan and associated processes to ensure rapid response and mitigation.Tankering company on emergency callout contractSite security	Low
RL 1.2 RL 1.4 RL 1.7 RL 1.9 RL 1.12	Local Water Centre	Process performance outside operational parameters	Very High	<ul style="list-style-type: none">Duty / standby of equipmentInlet and product water buffer storageSpares of critical equipment on siteMonitoring and controlsProactive maintenance regimeExperienced operators	Low

				<ul style="list-style-type: none">Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation.Tankering company on emergency callout contract.	
RL 1.3 RL 1.5	Local Water Centre	Tank failure	Very High	<ul style="list-style-type: none">Design, production, installation and testing by qualified contractors and quality assurance to AS3735 Water Retaining Structures.Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation.	Low
RL 1.11 RL 1.14	Local Water Centre	Supply of chemicals is exhausted or degraded/poor quality	Very High	<ul style="list-style-type: none">Tanks sized for adequate storage but with regular ordering of small volumes due to degradation over timeRecycled water production will cease if chemicals are not available.Chemical supply contract with minimum and emergency supply provisions.Skilled operators with documented operational procedure.Chemical storage tanks are fitted with level devices to ensure levels are continuously monitored.	Low
RL 1.15	Local Water Centre	Chemical spill	Very High	<ul style="list-style-type: none">Chemicals stored within weatherproof, bunded area as per Australian standardsChemical loading area within bunded areaChemical delivery proceduresTrained and inducted delivery driversOperator inspectionsSpill response procedureTankering company on emergency callout contractIncident and Emergency Management Plan and processes	Low
RL 1.16	Local Water Centre	Incorrect chemical delivery	Very High	<ul style="list-style-type: none">Chemical supply agreements and operational proceduresChemical delivery proceduresTrained and inducted delivery driversTankering company on emergency callout contractIncident and Emergency Management Plan and processesMonitoring of treatment processes	Low
RL 1.17 RL 1.18 RL 1.19 RL 1.20 RL 1.21	Local Water Centre	Disaster Emergency such as fire, lightning, vandalism, theft, power failure and heat	Very High	<ul style="list-style-type: none">Restricted access to LWC with security system and alarmIn the event of power failure onsite back-up generator used to maintain key process units.Regular maintenance of back up generatorAbility to source an offsite generator as a backupIncident notification protocol with the public health unitUPS system installed to ensure control and access to the plant is still maintainedTop-up with drinking waterElectrical equipment in temperature controlled room with sufficient insulationFirefighting system for the LWC from both potable and recycled water systemCritical spares will maintained to allow quick turnaround in the event of a failureIncident and Emergency Management Plan and processes	Low

RL 1.23 RL 1.24	Local Water Centre	Poor aesthetics / Noise	Very High	<ul style="list-style-type: none">Local Water Centre has been designed to blend in with the local environment whilst not hiding its core activity.Building layout has been designed to facilitate scheduled visits from interested stakeholders.All odour generating equipment has been fitted with covers and odour treatment as required.Odour modelling has been undertaken to confirm that expected impact on surrounding stakeholders is negligible.All noise generating equipment has been fitted with acoustic covers. Further acoustic treatment has been provided on the Local Water Centre building.Noise modelling has been used to confirm that expected impact on surrounding stakeholders is negligible.Customer Complaints Program	Minimal
RL 1.25	Local Water Centre	PLC / SCADA failure	Very High	<ul style="list-style-type: none">Local Water Centre can continue operation in the event telemetry is lost.Automatic LWC shutdown on PLC failureOperating procedure to respond to PLC failureData capture will continue on the local SCADA and PLC.Plant would shut down if parameters were out of specification.Top up with drinking waterSoftware and hardware back upSupply agreement with telemetry with emergency response provision	Low
RD 1.1 RD 1.2	Recycled Water Distribution	Tank overflow / failure	Low	<ul style="list-style-type: none">Design, production, installation and testing by qualified contractors and quality assuranceIncident and Emergency Management Plan and associated processes to ensure rapid response and mitigationTankering company on emergency callout contract	Low
RD 1.3 RD 1.4	Recycled Water Distribution	Cross connection	Very High	<ul style="list-style-type: none">Recycled water kept at lower pressure than drinking water thereby mitigating recycled water entering the systemColour coded, different materials, labelled pipes and marker tapeQA inspections of house plumbing by NSW Office of Trading prior to handover / operationRisk assessment during designPlumbing inspections triggered by DA processOFT inspection and Altogether’s cross-connection plumbing check pre-conditions to Altogether’s connection of sewerageQA checks on reticulation installation prior to handover to Altogether (and Altogether’s issue of Certificate of Compliance)Home builder education (website, Builders Guide)Customer education (website, home owners guide, including translated services)Backflow prevention at each house connectionTelemetry monitoring of drinking and recycled water usage to identify anomalous use	Low

				<ul style="list-style-type: none">Incident notification protocolsIncident and Emergency Management Plan and processesHigh quality recycled water has low risk of health impact.	
RD 1.5	Recycled Water Distribution	Recycled water is used for unauthorized purposes	Very High	<ul style="list-style-type: none">Colour coded, different materials, labelled pipes and marker tapeInformation packs will be supplied to householders on initial connection or with change of ownership. These information packs will clearly define the authorised uses for the recycled water.Factsheets will be sent with billing information to householders reinforcing the authorised uses for the recycled water.Community education on recycled water / websiteSignage on recycled water tapsTelemetry monitoring of drinking and recycled water usage to identify anomalous use	Low
RD 1.6	Recycled Water Distribution	Process equipment damage / failure	High	<ul style="list-style-type: none">Pumps are installed duty / standby with automatic changeover.Maintenance contractor to be engaged under standard protocols to investigate cause of pump failure.Maintenance contractor to be engaged under emergency protocols to repair pump(s) or install temporary pump or repair leak.Standard equipment type so spares easily available on short lead timesSpares of critical equipment on siteWhere possible, recycled water storage located at high elevation to allow gravity feedPreventive maintenance on pumpsReticulation pipe work will be provided with a number of valves enabling isolation of parts of the network.	Low
RD 1.7	Recycled Water Distribution	Main break leading to discharge of recycled water	Moderate	<ul style="list-style-type: none">Reticulation pipe work will be provided with a number of valves enabling isolation of parts of the network.Maintenance contractor to be engaged under emergency protocols to repair leak.High quality recycled waterDial Before You Dig (DBYD)Automatic shut down on high flow*Looped reticulation design and constructionHighlighting of single supply mains as high priority on DBYD where looping not possiblePressure monitoring of the network for early alert of leaksMechanical vehicle protection on storage tanks (height restrictions, bollards)Detectable marker tape over all mains	Low
RD 1.9	Recycled Water Distribution	Demand exceeds supply	Moderate	<ul style="list-style-type: none">Recycled water storage sized at >5 days of average productionDrinking water used to maintain supply if the recycled water storage tank drops below a minimum levelMembrane tank over-sized to allow for the option of stormwater harvesting to supplement the source water supply	Minimal

RD 1.10	Recycled Water Distribution	Health impact from exposure to water features	Very High	<ul style="list-style-type: none">• Signage indicating use of recycled water in water features and proper use• High quality recycled water has low risk of health impact.• Colour coded, different materials, labelled pipes and marker tape• Community education on recycled water / website	Low
RD 1.11	Recycled Water Distribution	Supply exceeds demand	Very High	<ul style="list-style-type: none">• Implement Integrated Water Cycle Management (IWCM) Policy and regularly review scheme specific IWCM Plan.• Seek additional recycled water customers.• Monitor volumes, demands and trends and adjust operations to suit• Identify properties with higher than average sewer consumers and target for illegal connection studies.• Tankering• Construct additional storage	Low
RI 1.1 RI 1.2 RI 1.3 RI 1.4 RI 1.5 RI 1.6 RI 1.10 RI 1.11	Recycled Water Irrigation (by Altogether)	Irrigation affecting receiving environments (water, land)	Moderate	<ul style="list-style-type: none">• Altogether operates to ISO 14001 certified Environmental Management System• Recycled Water Irrigation Management Plan (RWIMP), irrigation policies, procedures and systems implemented by trained and skilled staff• High quality recycled water treated for licensed end-use• Irrigation not applied to buffer area around waterways• Water quality and soil monitoring in accordance with Altogether Monitoring and Sampling Plan/Program• Remote and in person monitoring of irrigation areas• Visual inspection of irrigation areas and irrigation infrastructure	Low
RI 1.7 RI 1.7a	Recycled Water Irrigation (by Altogether)	Poor irrigation practices	High	<ul style="list-style-type: none">• Altogether operates to ISO 14001 certified Environmental Management System• Recycled Water Irrigation Management Plan (RWIMP), irrigation policies, procedures and systems implemented by trained and skilled staff• Irrigation site selection criteria• Seasonal irrigation to meet water balance requirements• High quality recycled water treated for licensed end-use• Water quality and soil monitoring in accordance with Altogether Monitoring and Sampling Plan/ProgramRemote and in person monitoring of irrigation areas• Visual inspection of irrigation areas and irrigation infrastructure	Low
RI 1.8	Recycled Water Irrigation (by Altogether)	Water not suitable for irrigation	Moderate	<ul style="list-style-type: none">• Altogether operates to ISO 14001 certified Environmental Management System• Recycled Water Irrigation Management Plan (RWIMP), irrigation policies, procedures and systems implemented by trained and skilled staff• High quality recycled water treated for licensed end-use• Controls as listed above related to performance• Water quality monitoring	Low

RI 1.9	Recycled Water Irrigation (by Altogether)	Salinity increase in soils, groundwater and surface water	Moderate	<ul style="list-style-type: none">• Altogether operates to ISO 14001 certified Environmental Management System• Recycled Water Irrigation Management Plan (RWIMP), irrigation policies, procedures and systems implemented by trained and skilled staff• Water quality and soil monitoring in accordance with Altogether Monitoring and Sampling Plan/Program• High quality recycled water treated for licensed end-use• Controls as listed above related to performance• Appropriate site selection• Vegetation selection and maintenance• Receiving environment monitoring - water and soil quality• Gypsum application	Low
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Attachment F – Preliminary Risk Assessment Summary – Drinking Water

RISK ID	COMPONENT	POTENTIAL RISK	PRE-MITIGATION RISK (OR	CONTROLS	POST-MITIGATION RISK (OR RESIDUAL RISK)
DW 1.1	Whole of system	Failure of overarching drinking water quality plan	Very High	<ul style="list-style-type: none">Additional controls as listed for each individual risk below.Preventive:Business Management System (BMS) independently verified to the International Standards ISO 9001 for quality management, ISO 14001 for environmental management and ISO 45001 for safety managementRegular audits by auditors from the regulator’s (IPART) independent panel of auditors.Regular internal process and compliance audits are a component of the Altogether BMS.Review of resource requirements as part of Altogether’s business planning and budgeting process.Annual review of BMS and water quality management plans.Regulator oversight and enforcement action.Skilled and trained operators.Competency based training system.Detective:Consumer complaintsOperator inspectionsReactive:Incident & Emergency Management Plan and associated processes to ensure a rapid and effective incident response and to prevent incident escalation.Incident Notification Protocol with NSW Health to ensure risks to public health are controlled quicklyQualified contractors engaged to provide rapid response to faults and emergencies including sewage overflows.Pollution incident notification as per POEO Act requirementsWater Industry Competition Act’s Operator of Last Resort provisions and step in rights	Low
DDW 1.1	Delivery of developer works	Delays in construction and delivery of infrastructure by developer	Very High	<ul style="list-style-type: none">Compliance Certificate only issued when developer completes worksIf works delayed, developer pays bond to Altogether and Altogether will deliver infrastructureISO 9001 certified project management processes including project meetings, program updates, and reporting.Generators if delay related to connection to power.Early identification of contingency measures through modellingOther reactive contingency measures dependent on service i.e. : sewage tankering, drinking water tankering, deployment of extra pumps	Low
DC 1.1 DC 1.2	Catchment (Connection to Public Water Utility)	Out of specification drinking water quality supplied by Public Water Utility	Very High	<ul style="list-style-type: none">Utility Services Agreement with supplying water authority obliging the need to meet ADWG in supply waterAgreed communications protocols between local water utility and supplying water authority forming part of the USA	Low

				<ul style="list-style-type: none">Accredited laboratory water quality testing by Altogether Group (quarterly grab samples and upon incident notification)Incident and Emergency Management Plan and processesIncident notification protocols with Public Health Unit and determine appropriate public health response	
DC 1.4	Catchment (Connection to Public Water Utility)	Interruption to supply	Moderate	<ul style="list-style-type: none">Utility Services Agreement between local water utility and supplying water authorityAgreed communications protocols between local water utility supplying water authority forming part of the USAPressure monitoring at or near the bulk supply pointsProvide tankered / bottled waterIncident and Emergency Management Plan and processes	Low
DD 1.1 DD 1.2	Drinking Water Distribution	Main break	Very High	<ul style="list-style-type: none">Dial Before You Dig (DBYD)Mechanical vehicle protection on storage tanks (height restrictions, bollards)Detectable marker tape over all mainsSpare repair fittings kept on siteAs recycled water is supplied for up to 60% of home water demand, the consequence is already mitigatedIsolation valves on reticulation to allow isolation of sections	Low
DD 1.3 DD 1.4	Drinking Water Distribution	Recycled water cross connection	Very High	<ul style="list-style-type: none">Recycled water kept at lower pressure than drinking water thereby mitigating recycled water entering the systemColour coded, different materials, labelled pipes and marker tapeQA inspections of house plumbing by NSW Office of Trading prior to handover / operationPlumbing inspections triggered by DA processOFT inspection and Altogether’s cross-connection plumbing check pre-conditions to Altogether’s connection of sewerageQA checks on reticulation installation prior to handover to Altogether (and Altogether’s issue of Certificate of Compliance)Home builder education (website, Builders Guide)Customer education (website, home owners guide, including translated services)Backflow prevention at each house connectionTelemetry monitoring of drinking and recycled water usage to identify anomalous use	Low
DD 1.5	Drinking Water Distribution	Loss of supply / pressure	High	<ul style="list-style-type: none">Spare pumps kept locallyPump provided in duty / standbySupply recycled water to non-potable use (reduced impact on potable use)Tankered / bottled waterContinuous pressure monitoring	Low
DD 1.6 DD 1.7	Drinking Water Distribution	Chemical leaching into supply	Very High	<ul style="list-style-type: none">New system, new materials, PVC pipeworkPipework designed to Australian Standards AS4020:2005Commissioning testingAsset management and 6 monthly maintenance inspections	Low

				<ul style="list-style-type: none">Accredited laboratory water quality testing by Altogether Group (grab samples and upon incident notification)	
DS 1.1	Drinking Water Storage	Contamination of drinking water storage	Very High	<ul style="list-style-type: none">Enclosed storage to ADWG standardSecurity including fencing, CCTV, anti-climb measures, locked tank hatches and telemetry notification immediatelyRoutine inspection of storageWater quality monitoringOnline analysing and automatic top up of chlorine residual	Low
DS 1.2 DS 1.3	Drinking Water Storage	Chlorine dosing duty and standby pump fail and chlorine for residual can not be dosed	Very High	<ul style="list-style-type: none">Chlorine dosing for disinfection pumps are installed duty / standby. If duty pump fails then standby pump will automatically start.Key spare parts kept on site to facilitate local / rapid repair.Manually dose until pumps repairedOnline monitoring of chlorine residual	Low
DS 1.4 DS 1.5	Drinking Water Storage	Supply of chemicals is exhausted or degraded/poor quality	Very High	<ul style="list-style-type: none">Tanks sized for adequate storage but with regular ordering of small volumes due to degradation over timeChemical supply contract with minimum and emergency supply provisions.Skilled operators with documented operational procedure.Chemical storage tanks are fitted with level devices to ensure levels are continuously monitored.	Low
DS 1.6	Drinking Water Storage	Incorrect chemical delivery and out of specification chemicals	Very High	<ul style="list-style-type: none">Colour coded and labelled intake nozzles for chemical tanksChemical supply agreements and operational proceduresChemical delivery proceduresTrained and inducted delivery driversTankering company on emergency callout contractIncident and Emergency ManagHement Plan and processes	Low