IPART
Independent Pricing and Regulatory Tribunal
New South Wales

New South Wales

Water Industry Competition Act 2006

Notice of approval to bring new infrastructure into commercial operation

The Independent Pricing and Regulatory Tribunal of NSW (the **Tribunal**) approves Pitt Town Water Pty Ltd (ACN 141 705 660) (**Pitt Town Water**) to bring into commercial operation, all new infrastructure which:

1. is infrastructure to which Pitt Town Water's network operator's licence (licence no. 10_014) (**Licence**) applies;
2. existed as at 9 March 2020; and
3. is of the kind described in Table 1.2 of the Licence.

The Tribunal has considered the request from Pitt Town Water for this approval, as well as the following report, which was prepared by an 'approved auditor' within the meaning of the Regulation: "New Infrastructure Audit Pitt Town Water", dated 1 May 2020 (included as **Attachment A**).

The Tribunal is satisfied that the report indicates that the new infrastructure:

1. complies with the requirements of the *Water Industry Competition (General) Regulation 2008* (NSW) (**Regulation**) and the conditions of the Licence; and
2. is capable of operating safely and in accordance with Pitt Town Water's infrastructure operating plan and water quality plan.

The Tribunal grants this approval under clause 2 of Schedule 1 to the Regulation, as a delegate of the Minister administering the *Water Industry Competition Act 2006*. The Minister's functions under that clause were delegated to the Tribunal with effect from 28 February 2019.

21/05/2020

X

Paul Paterson
Chair
Signed by: Paul Paterson

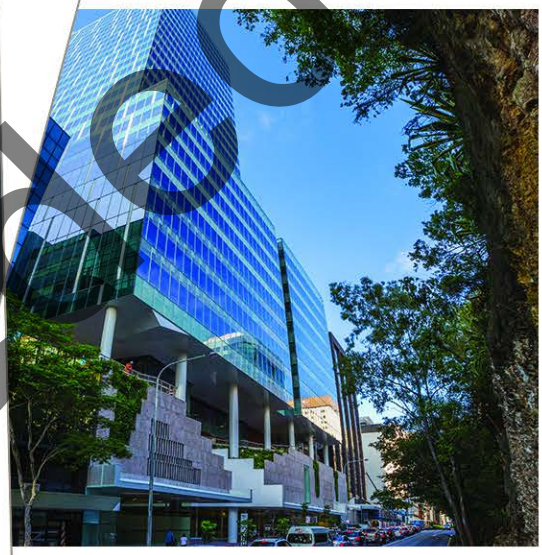
Dated this 21 day of May 2020

ATTACHMENT A

New Infrastructure Audit

Pitt Town Water

3607-98



Prepared for

Pitt Town Water Pty Ltd

1 May 2020

Cardno

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Version	Effective Date	Description of Revision	Prepared by	Reviewed by
1	10/03/2020	Draft for review and comment	J. Edwards	P. Lamb
2	20/04/2020	Updated for IPART comments	J. Edwards	P. Lamb
3	01/05/2020	Updated for Viridis comments	J. Edwards	P. Lamb

Executive Summary

Auditor declaration

The audit was undertaken by Viridis Consultants Pty Ltd, in association with Cardno (QLD) Pty Ltd, for the Independent Pricing and Regulatory Tribunal (IPART).

The audit team confirms that:

- the auditors have seen sufficient evidence on which to base their conclusions
- the audit findings accurately reflect the professional opinion of the auditors
- the lead auditor and team members have conducted the audit, determined audit findings and prepared this report in accordance with the requirements of the Audit Guideline – Water Industry Competition Act 2006 (September 2018) and the Request for Quote.
- the audit findings have not been unduly influenced by the utility and/or any of its associates.

Overview

This report presents the findings of an independent external audit of the Pitt Town Water scheme's compliance with the legislative requirements under the *Water Industry Competition Act 2006.* The audit scope was limited to the new non-potable (recycled) water infrastructure that has been installed at the facility between September – December 2019, specifically,

- the off-spec pipe downstream of the chlorine contact tank and upstream of the recycled water storage
- the new chlorinated water temperature sensor
- the treated water total chlorine sensor
- SCADA migration of chlorination and recycled water systems.

The Pitt Town Water Local Water Centre (LWC) Process Flow Diagram for Phase 2, plus the piping and instrumentation diagrams (P&IDs) for the chlorine disinfection process showing the mark-ups of the new infrastructure and changes to the previous pipework are provided in Appendix B.

The new infrastructure was inspected on 9 March 2020.

The scheme is operated under Network Operator's Licence No: 10_014; the Licensee is Pitt Town Water Pty Ltd (*the Licensee*) (ACN 141 705 660).

Under the provisions of *Water Industry Competition Act 2006*, the *Water Industry Competition (General) Regulation 2008* and the Network Operators Licence, the Licensee is required to demonstrate the adequacy of any new infrastructure prior to it being introduced into service. Pitt Town Water's compliance with the various relevant provisions of the *Water Industry Competition Act 2006*, the *Water Industry Competition (General) Regulation 2008* and the Network Operators Licence has been assessed against the relevant criteria.

Major findings

Based on the finding of our audit, Pitt Town Water's infrastructure was assessed as being compliant with the various relevant provisions of the *Water Industry Competition Act 2006*, the *Water Industry Competition (General) Regulation 2008* and the Network Operators Licence in relation to the new water infrastructure it has installed and which is the focus of this audit.

Therefore, we consider that the Licensee, (Pitt Town Water Pty Ltd) was found to have designed and constructed and to be able to safely operate and maintain the audited infrastructure in compliance with the assessed criteria.

A summary of findings is presented in Table 1.

Table 1 Summary of audit findings

Clause/Obligation	Audit Grade/Comment
WIC Reg (General) Sched 1 cl.2(1)	Complaint
WIC Reg (General) Sched 1 cl2(2)(b)	Compliant

Clause/Obligation	Audit Grade/Comment
WIC Reg (General) Sched 1 cl.2(2)(b)	Compliant
WIC Reg (General) Sched 1 cl.3(a) and (b)	Compliant
WIC Reg (General) Sched 1 cl.3(c)	Compliant
Network Operator Licence cl.S1.1 and S3.1	Compliant
Network Operator Licence cl.B4	Compliant

Recommendations

No recommendations have been made in respect of Pitt Town Water's requirements to meet the obligations that have been audited.

Improvement opportunities

No opportunities for improvement have been identified based on the documentation that has been reviewed during the audit or from observations that were made during the site inspection.

We note that the current version of the Pitt Town Water Operations and Maintenance (O&M) Manual has not been updated to include the new infrastructure that has been installed. Flow Systems have not yet agreed to the timeframe or drafted the checklist to cover the handover of the documentation for the new infrastructure that has been installed between Flow Systems' Project Delivery and Operations teams. We would expect the Operation and Maintenance Manual to be updated within three months after the new infrastructure that has been installed has been brought into operation. IPART has provided notification that it will seek an addendum to this report to confirm that this has been completed prior to granting commercial operation.

Acronyms

CCP	Critical Control Point
CEMP	Construction Environmental Management Plan
CSMP	Construction Safety Management Plan
HSE	Health and Safety Executive
IOP	Infrastructure Operating Plan
IPART	Independent Pricing and Regulatory Tribunal
IPART	Independent Pricing and Regulatory Tribunal
LWC	Local Water Centre
MMS	Maintenance Management System
MOS	Membrane Operating System
OEMP	Operational Environment Management Plan
P&ID	Piping and instrumentation diagram
SCADA	Supervisory Control and Data Acquisition
SOP	Standard Operating Procedure
SWMS	Safe Work Method Statement
UV	Ultraviolet
WAS	Waste Activated Sludge
WHS	Workplace Health and Safety
WICA	Water Industry Competition Act 2006
WSAA	Water Services Association of Australia

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Appendices

Tables

1 Introduction

1.1 Objectives

The objectives of the audit were to assess:

- Compliance of the new infrastructure that has been installed at the Pitt Town Recycled Water Scheme as part of the Stage 2 upgrade works since the previous New Infrastructure Audit with the licence, licence plans and relevant regulation.
- That the infrastructure is capable of operating safely and in accordance with the licence plans.

Specifically, the new infrastructure that has been installed and which is the focus of the audit is:

- the off-spec pipe downstream of the chlorine contact tank and upstream of the recycled water storage,
- the new chlorinated water temperature sensor
- the treated water total chlorine sensor
- SCADA migration of chlorination and recycled water systems.

1.2 Licensee's infrastructure and systems

Pitt Town is a land and housing development located in Pitt Town, a historic suburb of Sydney, in New South Wales. Pitt Town is 59 kilometres north-west of Sydney CBD.

Pursuant to a network operator's licence obtained under WICA, Pitt Town Water Pty Ltd (PTW), a wholly-owned subsidiary of Flow Systems Pty Ltd operates and maintains the Pitt Town sewage and recycled water systems. Flow Systems Pty Ltd trading as Pitt Town Water Pty Ltd provides the retail sewage management service and recycled water supply to the customers within the scheme under the powers and obligations of its Retail Supplier's licence (13_001R).

The Pitt Town Local Water Centre (LWC) development is split into 2 stages:

- Stage 1 – 150 kL/day biological capacity, commissioned July 2012.
- Stage 2 –600 kL/day biological capacity, commissioned June 2018.

The Pitt Town development is a master-planned community catering for 952 lots, a primary school, a children's playground and a community centre.

Sewage is collected from each customer via a pressure sewer system. The pressure sewer system consists of on-lot infrastructure and a reticulation network that transfers the sewage to the collection and treatment facility within the development. The on-lot infrastructure typically consists of a 900 litre wastewater collection tank, boundary kit (valve assembly), pump set (complete with grinder and macerator), control panel and link to telemetry for remote monitoring and control. The house sewer is connected to the wastewater collection tank via a gravity pipe installed by the house builder's plumber from the house plumbing.

Sewage is collected from the reticulation network in a flow balance tank to buffer the peaks of sewage entering the Pitt Town LWC. The Pitt Town LWC, which is located on part of Lot 1062 DP 1131838, is a tertiary treatment system designed to treat up to an ultimate flow of 600 kL/d (following the Stage 2 upgrade) of sewage from the development.

The sewage is treated to provide recycled water plumbed into houses for authorised non-potable purposes under its network licence of irrigation, toilet flushing, car washing, wash down of hard surfaces, and supply of cold water to washing machine. The treatment process to achieve this is as follows:

- inlet screening
- membrane bioreactor
- ultraviolet disinfection
- chlorination.

The development of water and sewage infrastructure has been developed in the following stages:

- Sewage Management:

- The Stage 1 of the recycling facility entered Commercial Operations in July 2012. This Stage 1 facility comprised of a mobile steel bioreactor and had a biological treatment capacity of 150 KL/day of sewage. With one MBR cassette installed in the membrane tank, the facility could hydraulically process up to 300 KL/day. It was always intended that the LWC would be built in 2 stages to align with the slow build out of the development. Stage 1 was only intended for the first 350 houses approximately, however the building was designed with Stage 2 in mind to allow a smooth transition into the Stage 2 upgrade.
- The Stage 2 Upgrade of the recycling facility was required to provide the capacity of 600 kL/day for the full development of 952 Lots. The Stage 2 upgrade maintained all 3 CCPs throughout the process thereby ensuring water quality. The equipment being incorporated in all 3 CCPs are pre-validated, to confirm that sufficient log removals are achieved throughout the multi barrier approach.

> On-lot Infrastructure:

- Phase 1 on-lot Infrastructure - Phase 1 on-lot infrastructure is installed by the developer as part of the pressure sewer reticulation network.
- Phase 2 on-lot Infrastructure - This comprises of the sewage pump, level sensor and control panel. It is installed, commissioned and connected to Pitt Town Water's telemetry system via a data management unit by Pitt Town Water once the customer has completed construction of their home.

1.3 Overview of licensee's and systems and procedures

Flow Systems Pty Ltd (the parent company of Pitt Town Water Pty Ltd and named 'Authorised Persons' under the Network Operator's Licence) has adopted a business management documentation system for all of the schemes it operates, comprising generic management plans which must be read in conjunction with a scheme specific Scheme Management Plan.

The requirements that must be addressed under the provisions of the W*ater Industry Competition Act 2006* and/or the *Water Industry Competition (General) Regulation 2008* are jointly addressed by the Scheme Management Plan and the appropriate management plan.

The Pitt Town Scheme Management Plan (Scheme MP) - Revision 6, 15/11//2019 is the overall scheme-specific management plan for the Pitt Town infrastructure. The generic management plans that support the scheme management plan are:

> Recycled Water Quality Plan
> Monitoring and Sampling Plan
> Sewage Management Plan
> Infrastructure Operating Plan
> Asset Management Plan
> Incident Management Plan
> Recycled Water Irrigation Management Plan
> Retail Supply Management Plan.

1.4 Audit method

1.4.1 Audit scope

The scope of the audit comprised a New Infrastructure Audit for a number of assets that have been installed as part of the Stage 2 upgrade of the Pitt Town LWC. The scope of the audit has been confirmed by IPART as including:

> the off-spec pipe downstream of the chlorine contact tank and upstream of the recycled water storage
> the new chlorinated water temperature sensor
> the treated water total chlorine sensor
> SCADA migration of chlorination and recycled water systems

A New Infrastructure Audit is required prior to commencing commercial operation of the new infrastructure.

The overall audit scope was confirmed by IPART for this audit in an email dated 10 December 2019. Based on the reduced audit scope to cover only the new infrastructure that has been installed at the Pitt Town LWC, the auditors have excluded the clauses listed in Table 1-1 from the audit as a result of not being applicable to the scope of the audit, having been included in previous audits of the scheme or being covered in a separate Licence Plan Audit conducted at the same time as this New Infrastructure Audit.

Table 1-1 Clauses excluded from the audit of the new Pitt Town Water LWC infrastructure

Clause	Reason for exclusion from audit
WIC Act s10(4)(a) & s13(2)(a) and Network Operator cl.B1	The Licensee's technical, financial and organisational capacity to carry out the activities authorised by the Network Operator licence has been previously assessed.
WIC Reg (General) Sched 1 cl6(2)(a)	The implementation and review of the Infrastructure Operating Plan and that the licensee's activities are carried out in accordance with that Plan has been assessed in the Licence Plan Audit[1] carried out in conjunction with this New Infrastructure Audit.
WIC Reg (General) Sched 1 cl.8	The new infrastructure that has been installed does not include any water meter connections to the licensee's water mains.
WIC Reg (General) Sched 1 cl.11	Customer connections are not relevant to the new infrastructure that has been installed.
Network Operator Licence cl.B2.1(a), (b) & (c) and B3.1, B3.2, B3.3 and B3.4	Requirements for obtaining appropriate insurance for operating the Pitt Town Water infrastructure has previously been addressed as part of the original approval process for commencing commercial operation.
Network Operator Licence cl.B7	The new infrastructure that has been installed has not initiated any changes that require reporting in relation to the Register of Licences.
Network Operator Licence cl.B10.1, B10.2, B10.3 and B10.5	Code of Conduct requirements are not relevant to the new infrastructure that has been installed.

1.4.2 Audit standards

The audit has been conducted in accordance with the *IPART Audit Guideline Water Industry Competition Act 2006 (September 2018)* (the Audit Guideline).

In addition, *ISO 19011:2018 Guidelines for auditing management systems* has been taken into consideration throughout the audit to ensure good auditing practices.

1.4.3 Audit steps

The audit was undertaken in accordance with the methodology outlined in IPART's *Audit Guideline – Water Industry Competition Act (September 2018)*. The audit steps and responsible party are outlined in Table 1-2.

Table 1-2 Audit steps

Step Description	Responsibility
Initiate audit	Flow Systems
Engage auditor	Flow Systems
Submit audit proposal	Viridis/Cardno
Audit proposal approval	IPART
Opening meeting	Viridis/Cardno, IPART and Flow Systems
Interviews	Viridis/Cardno, IPART and Flow Systems

[1] Viridis/Cardno, Licence Plan Audit – Pitt Town Recycled Water Scheme, April 2020

Step Description	Responsibility
Draft audit report	Viridis/Cardno
Final audit report	Viridis/Cardno
Follow-up	IPART

The opening meeting, site visit and interviews were undertaken on Monday 9 March 2020.

The audit process involved seeking objective evidence that the Licensee's infrastructure complies with its licence conditions and the WIC Regulations, including whether it is capable of operating safely and in accordance with its Licence Plans. The auditors collected evidence through interviews with key licensee staff, document review and site inspections. The audit was conducted and has been reported in accordance with IPART's *Water Industry Competition Act 2006 Audit Guidelines (September 2018)*.

1.4.4 Audit team

The audit team comprised of the following:

- James Howey – Team Leader
- Justin Edwards – Lead Auditor for the New Infrastructure Audit

1.4.5 Acknowledgements

The audit team notes, and greatly appreciates:

- the work and effort put in by those audited, including all Flow Systems staff, particularly Kirsten Evans, Audrey Killeen, Mark Spliger and Robert Hill.

1.4.6 Audit grades

Audit grades have been awarded in accordance with the guidance presented in IPART's *Audit Guideline – Water Industry Competition Act (September 2018)*. Table 1-3 identifies the compliance grades for the audit.

Table 1-3 Compliance grades

Step Description	Responsibility
Compliant	Sufficient evidence is available to confirm that the requirements have been met.
Non-compliant (non-material)	Sufficient evidence is not available to confirm that the requirements have been met and the deficiency does not adversely impact the ability of the licensee to achieve defined objectives or assure controlled processes, products or outcomes.
Non-compliant (material)	Sufficient evidence is not available to confirm the requirements have been met and the deficiency does adversely impact the ability of the licensee to achieve defined objectives or assure controlled processes, products or outcomes.
No Requirement	There is no requirement for the licensee to meet this criterion within the audit period.

1.5 Regulatory regime

Under the *Water Industry Competition Act 2006* (WICA) a corporation that is not a public water utility must obtain a licence to construct, maintain or operate any water industry infrastructure, to supply potable or non-potable water or provide sewerage services by way of any water industry infrastructure.

The network licence for the Pitt Town scheme is held by Pitt Town Water Pty Ltd (ACN 141 705 660), meaning that Pit Town Water is licensed to construct, operate and maintain the water industry infrastructure. However, Pitt Town Water does not have any employees and relies on Flow Systems Pty Ltd (ACN 136 272 298) for resources and financial support. Pitt Town Water Pty Ltd is a subsidiary company of Flow Systems Pty Ltd. Pitt Town Water is responsible for the maintenance and operation of the on-site water supply (non-potable) and sewerage infrastructure for the Pitt Town development but this is carried out by Flow Systems Pty Ltd.

Flow Systems are responsible for the maintenance and operation of the on-site water supply (non-potable) and sewerage infrastructure for the Pitt Town LWC and associated infrastructure. The following licences are required:

- network operator – non-potable water and sewerage infrastructure (Licence no. 10_104)

- retail supplier – non potable water and provision of sewerage services (only required when recycled water is to be exported). The retail supplier licence (Licence No. 13_001R) is held by Flow Systems Pty Ltd and covers all of the schemes that it operates.

A number of components of the licensing regime are subject to audit. The IPART Audit Guideline – Water Industry Competition Act (September 2018) (Audit Guidelines) identifies the audits that must be undertaken prior to the commencement of commercial operation. The audits need to be undertaken by an independent auditor, who has approval from IPART to conduct the audits.

1.6 Quality Assurance Process

Cardno has developed and maintains a quality management system for the provision of professional and management consultancy services which is applied to a broad range of physical and social infrastructure projects.

The Quality Management System is implemented to achieve the following objectives:

- to control our work, minimise risk and confirm the effectiveness of the planning and management of each project in meeting our obligations to clients;
- to achieve deliverables consistently on time, within budget and in a manner which meets the client requirements while providing a technically appropriate and socially responsible solution conforming to contractual and regulatory requirements;
- to maintain a high level of client satisfaction;
- to ensure our corporate objective to provide quality outcomes and ensure safety in project delivery through a process of continuous improvement;
- to ensure the QMS continues to support the company's growth and diversification strategies;
- to maintain ISO 9001 certification to existing sites;
- to extend ISO 9001 certification to other sites and merger partners where appropriate;
- to use auditing and corrective actions to improve business processes; and
- to ensure corrective actions are monitored and acted upon promptly in a manner to promote continued improvement.

The assurance of quality is integral to all work undertaken by Cardno and is practised by all staff in their daily activities with a focus on delivering outstanding outcomes for our clients.

2 New Infrastructure Audit Findings

2.1 Summary of findings

Under the provisions of *Water Industry Competition Act 2006*, the *Water Industry Competition (General) Regulation 2008* and the Network Operators Licence, the Licensee is required to demonstrate the adequacy of any new infrastructure before it can be brought into service.

Based on the finding of our audit, Pitt Town Water's infrastructure was assessed as being compliant with the provisions described above in relation to the new non-potable (recycled) water infrastructure that has been installed and which is the focus of this audit.

In accordance with Schedule 1, Part 1, Clause 2 of the *Water Industry Competition (General) Regulation 2008,* we consider that Pitt Town Water Pty Ltd's Infrastructure:

a. complies with the requirements of this Regulation and the appropriate licence conditions, and

b. is capable of operating safely and in accordance with its infrastructure operating plan and its recycled water quality management plan (including all supplementary materials as outlined in Section 1.3) .

2.2 Recommendations

No recommendations have been made in respect of Pitt Town Water's requirements to meet the obligation that have been audited.

2.3 Opportunities for improvement

No opportunities for improvement have been identified based on the documentation that has been reviewed during the audit or from observations that were made during the site inspection.

We note that current version of the Pitt Town Water O&M Manual has not been updated to include the new infrastructure that has been installed. Flow Systems have not yet agreed the timeframe or drafted the checklist to cover the handover of the documentation for the new infrastructure that has been installed between Flow Systems' Project Delivery and Operations teams. We would expect the Operation and Maintenance Manual to be updated within three months after the new infrastructure that has been installed has been brought into operation. IPART has provided notification that it will seek an addendum to this report to confirm that this has been completed prior to granting commercial operation.

APPENDIX

A

DETAILED AUDIT FINDINGS

Table A1: WIC Reg (General) Sched 1 cl.2(1)

Sub-clause	Requirement	Compliance Grade
WIC Reg (General) Sched 1 cl.2(1)	The licensee must not bring any new water or sewerage infrastructure into commercial operation without the written approval of the Minister.	**Compliant**

Risk	Target for Full Compliance
This presents a high operational risk. The Minister's written approval is only provided when the Licensee has demonstrated that the infrastructure complies and can be operated in accordance with the relevant requirements. Accordingly, the absence of the Minister's written approval may mean that the infrastructure has not been so assessed.	Evidence that the Licensee has obtained the written approval of the Minister prior to bringing any new water or sewerage infrastructure into commercial operation.

Evidence sighted

- Interviews with Flow Systems Operations personnel on 9 March 2020
- Site inspection of infrastructure on 9 March 2020
- Flow Systems, Pitt Town Scheme Management Plan (Scheme MP), Revision 11, 10/07/2019
- Flow Systems, Infrastructure Operating Plan (IOP), Revision 12, 20/11/2018
- Flow Systems, Pitt Town LWC – Stage 2 – Phase 4 – Management of Change Plan, 19/07/2019

Summary of reasons for grade

At the time of the audit, the Licensee had not brought the new infrastructure that has been installed, and which is the subject of this audit, into commercial operation without the Minister's written approval.

As a result, we consider that the Licensee is compliant with the requirements of this obligation.

Discussion and notes

During the discussions with the Licensee, it advised that no infrastructure included in the scope of this audit had been brought into commercial operation at the time of the audit.

Although the Pitt Town LWC is operating, the additional instrumentation, valves and pipework have been installed but the process control functionality has been disabled during the scheduled commissioning and testing of the new infrastructure. This enables the Pitt Town LWC to continue operating until Pitt Town Water receives approval from the Minister to bring these new assets into commercial operation, at which point the new process control functionality will be enabled.

As additional safeguards, Pitt Town Water has also mechanically isolated the devices by padlocking the manual Chlorination Divert isolation valve closed and disconnecting the air supply to the actuated Chlorination Divert valve. These isolations will only be removed after approval to commence commercial operation is granted.

During the site inspection we confirmed that the new infrastructure is physically functional but has not been used in any control sense. We observed that data is being logged by the new sensors but confirmed that the controls are disabled.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

Table A2: WIC Reg (General) Sched 1 cl.2(2)(b)

Sub-clause	Requirement	Compliance Grade
WIC Reg (General) Sched 1 cl.2(2)(b)	The infrastructure is capable of being operated safely	**Compliant**

Risk	Target for Full Compliance
This presents a high operational risk. The risk is generally managed by the implementation of an asset management system/framework that outlines the basis for the ongoing management of the infrastructure assets.	Demonstration that the infrastructure is capable of operating safely

Evidence sighted

- Interviews with Flow Systems personnel on 9 March 2020
- Site inspection of infrastructure on 9 March 2020
- Flow Systems, Pitt Town Scheme Management Plan (Scheme MP), Revision 11, 10/07/2019
- Flow Systems, Infrastructure Operating Plan (IOP), Revision 12, 20/11/2018
- Flow Systems, Pitt Town LWC – Stage 2 – Phase 4 – Management of Change Plan, 19/07/2019
- Flow Systems, Pitt Town – Control Points (PT-WAT-NSW-PL-OPS-1291, Revision 2), 21 November 2019
- Flow Systems, Pitt Town Process Flow Diagram, Recycled Water and Sewerage Phase 2, Rev 1 (PT-WAT-NSW-DR-OPS-1409), 10/09/2019
- Flow Systems, Operations, Process and Instrumentation Diagrams (Drawings 9268-3001 to 9268-3011)
- Flow Systems, Pitt Town LWC – Operation and Maintenance Manual, Version 1, 30/05/2018
- Flow Systems, Commissioning Check Sheet – Pitt Town LWC – CCP3 (revised for validation of chlorine divert) – checklists cover control point tests for high pH, low temperature and low c.t factor, 16/12/2019
- Flow Systems – Temperature Sensor Test Sheet - TS8101 CCT Outlet Temperature Switch, 28/11/2019
- Flow Systems Operational Monitoring Corrective Actions (FS-WAT-NSW-PR-OPS-2722), Revision 1.0, 18/07/2019
- Flow Systems, Water Quality Incident Management, Reporting and Investigation Procedure (FS-WAT-NSW-PR-INC-2561), Revision 1, 17/12/2018
- Acrulog Calibration Certificate, H2S Logger, 20/08/2019
- Flow Systems, Analytical Instrument Test Sheet, AIT8016 CCT Analytical Transmitter, 28/11/2019
- Flow Systems, Analytical Instrument Test Sheet, AIT9062 Treated Water Total Chlorine Analyser, 28/11/2019
- Flow Systems, Analytical Instrument Test Sheet, AIT9060 Treated Water Analytical Transmitter, 28/11/2019
- Endress+Hauser, Disinfection Sensor (CCS120D) Calibration Certificate, 13/08/2019
- Endress+Hauser, Liquiline (CM442) Calibration Certificate, 14/08/2019
- Flow Systems, Pitt Town Water, Functional Description: Addendum 1: Chlorination and Recycled Water, 21/11/2019
- Flow Systems, PD to Ops/Retail Handover Checklist (FS-WAT-AUS-FM-PRD-2032)
- Flow Systems, HSE Workspace Inspection Checklist
- Flow Systems, WHS Incident Report and Investigation Form

Summary of reasons for grade

Based on the review of Flow Systems' documentation, site observations and discussions with key licensee personnel, we consider that the Licensee has demonstrated that the new Pitt Town scheme infrastructure that has been installed correctly, and which is the focus of this audit, is capable of being operated safely.

We confirmed during our site inspection that the new infrastructure that forms the scope of this audit has been appropriately installed. We also confirmed the construction of the diversion pipe that returns the off-spec water from the chlorine contact tank back to the old balance tank to allow it to be retreated through the plant was in accordance with the details outlined in the Management of Change Plan[2] and the P&ID mark-ups[3]. Construction has been completed in accordance with the relevant design standards.

Safety is referenced in key documents such as the Pitt Town Scheme Management Plan and Operations and Maintenance Manual. Flow Systems' Business Management System is certified as compliant with both OSHAS 18001

[2] Flow Systems, Pitt Town LWC – Stage 2 – Phase 4 – Management of Change Plan, 19/07/2019
[3] Flow Systems Constructions, P&ID markups for the changes to the inlet works (drawing no. 9268-3000) and chlorine disinfection system (drawing no. 9268-3004)

and AS 4801. The design and construction of the new infrastructure that is the focus of this audit is considered to adhere to appropriate national codes and standards.

We confirmed that each new asset had been individually commissioned. During the site inspection a number of simulations were run to test the new infrastructure and we confirmed that these tests showed that the infrastructure was capable of operating safely, diverting off-spec water when critical alarms were activated.

As a result, we consider that the Licensee has demonstrated compliance with the requirements of WIC Reg (General) Sched 1 cl.2(2)(b).

Discussion and notes

Overview:

The infrastructure that is now proposed to be brought into service, and is the subject of this New Infrastructure Audit, comprises the following:

- Installation of an off-spec pipe downstream of the chlorine contact tank and upstream of the recycled water storage (to recirculate water that doesn't meet the chlorine disinfection CCP requirements through the treatment process).
- Connecting the chlorinated water and treated water pH sensors to the control system.
- Installation of a new Chlorinated Water temperature sensor and a new Treated Water Total Chlorine sensor.

The ability of the infrastructure to operate safely and reliably is dependent upon:

- the infrastructure having been properly designed and constructed
- appropriate resources being available to operate and maintain the infrastructure
- systems and procedures for operation and maintenance of the infrastructure being available.

Each of these aspects is discussed in the following sections. In addition, further comments related to the design and construction, safe and reliable operation and proper maintenance of the infrastructure have been included in Table A.5.

Design:

The Infrastructure Operating Plan[4] identifies the standards to which the infrastructure is to be designed and constructed.

The Pitt Town Scheme Management Plan details the proposed arrangements in relation to the recycled water treatment plant and associated infrastructure.[5] This includes:

- an overview describing the key components, architectural design and landscape design of the LWC[6]
- details of the treatment process, which will incorporate inlet screening, membrane bioreactor, ultra-violet (UV) disinfection and chlorination processes.[7]
- the proposed staging of development of the facility.[8] The design capacity of the recycled water infrastructure, including the LWC, are broadly set out in the Infrastructure Operating Plan and in greater detail for the Pitt Town infrastructure in the Scheme Management Plan. Stage 2, upgrading the LWC to 600 kL/day biological capacity, was commissioned in June 2018.

The details for the Chlorination treatment process note that:

"*CT factor, pH and temperature are monitored online for this Critical Control Point. If any of these parameters exceeds the critical limit, the chlorinated water is sent back to the head of the LWC to be retreated*."

The overall arrangement of the infrastructure, taking into account the new infrastructure, is shown in the Process Flow Diagram for Stage 2.[9] More specific design details are included in the specific Process and Instrumentation Diagrams (P&IDs).[10] Where relevant, the P&IDs have been updated to Revision B (all dated 10/01/2020) with an amendment description of "Chlorine Divert Added". We confirmed that these updated P&IDs reflect the installation of the off-spec pipe downstream of the chlorine contact tank and upstream of the recycled water storage to recirculate water that doesn't meet the chlorine disinfection CCP requirements through the treatment process and the sensors that have been installed.

[4] Flow Systems, Infrastructure Operating Plan, Section 2.3
[5] Flow Systems, Pitt Town Scheme Management Plan (Scheme MP), Sections 3 and 4
[6] Flow Systems, Pitt Town Scheme Management Plan (Scheme MP), Section 3.4
[7] Flow Systems, Pitt Town Scheme Management Plan (Scheme MP), Section 4.1.3
[8] Flow Systems, Pitt Town Scheme Management Plan (Scheme MP), Section 4.2
[9] Flow Systems, Pitt Town Process Flow Diagram, Recycled Water and Sewerage Phase 2, Rev 1 (PT-WAT-NSW-DR-OPS-1409), 10/09/2019
[10] Flow Systems Operations, Process and Instrumentation Diagrams (Drawings 9268-3001 to 9268-3011)

The installation of the new infrastructure has brought the Pitt Town LWC in line with other LWCs that Flow Systems operates. The design and installation replicates the infrastructure at other Flow Systems sites rather than being a new design.

The driver for the changes and the new infrastructure being installed was that Flow Systems identified a process improvement that could be achieved by automatically diverting the water when starting up the plant after a shut-down. Without the automatic diversion, a manual process was used to achieve the chlorine contact time factor. However, this manual start-up process required an operator to follow a procedure and take a sample, and, therefore, there were some inherent risks ensuring that the process was completed correctly when required. By removing the manual process and streamlining the start-up of the plant after shut-down, the process has been streamlined and the risks mitigated.

Construction:

The Scheme Management Plan provides a very high level overview for the arrangements for construction of the treatment plant and associated infrastructure. The construction details included in the Infrastructure Operating Plan only provide an outline for the construction of the reticulation networks and not the construction of the LWC.

As evidence of the arrangements in place to ensure that the new LWC Stage 2 Phase 4 infrastructure that has been installed has been constructed in accordance with the design and appropriate standards, Flow Systems provided copies of:

- The Pitt Town LWC – Stage 2 – Phase 4 – Management of Change Plan[11], which sets out the scope of works for the new infrastructure and assesses the WICA requirements, implementation (including required tasks, estimated duration and responsibilities), risk management requirements and changes, impacts on commercial operation of the installation of the new infrastructure, a detailed change checklist, and a Gantt chart program of works for installation, approvals and the required audit work.
- the CCP Commissioning Check Sheet, which provides sets out the infrastructure to be commissioned in the current stage of the construction and the methodology for commissioning these assets and systems, and sign-off for the validation of the sensors installed for the chlorination divert.

During the audit site inspection undertaken on 9 March 2020, visible components of the new Pitt Town infrastructure included in the scope of this audit were observed and considered to be compliant with relevant standards. This included the off-spec pipe downstream of the chlorine contact tank and upstream of the recycled water storage, the divert valve, the new chlorinated water temperature analyser and the new treated water total chlorine/pH analyser. Photos of these assets are provided in Appendix C.

As evidence of the arrangements in place to ensure that the new LWC infrastructure has been constructed in accordance with the design and appropriate standards, Flow Systems provided the Pitt Town LWC – Stage 2 – Phase 4 - Management of Change Plan.[12] This plan identifies the key elements of the commissioning of each new item included in the works, including electrical checks, system checks and verification of equipment at the end of each major step. In addition, the CCP 3 Commissioning Check Sheet was provided to confirm that the infrastructure had been installed correctly and was operating as expected.

The construction was largely completed offline as the new pipework that has been installed did not impact on the rest of the plant. There was an outage for approximately one day to allow the new pipework to be cut in to the existing pipework between the chlorine contact plant and the treated water storage tanks. Flow Systems also provided the P&ID markups showing the changes to the existing configuration for the installation of the new assets[13] and the email correspondence between the Project Delivery Team and the Operations team outlining the works to be carried out during the shutdown to cut in the new pipework and the proposed timing of these works.[14]

In summary, the Infrastructure Operating Plan, together with the Pitt Town Scheme Management Plan and other supporting documentation appropriately describes the arrangements in relation to the construction of the infrastructure.

Critical Control Points:

The critical control points (CCPs) for the treatment plant are documented in the Pitt Town – Control Points table[15]. These have associated process parameters, as follows, for the chlorine disinfection process step related to the new infrastructure that is the focus of this audit:

[11] Flow Systems, Pitt Town LWC – Stage 2 – Phase 4 – Management of Change Plan,
[12] Pitt Town LWC – Stage 2 – Phase 4 - Management of Change Plan, Version 1, 19/07/2019
[13] Flow Systems Constructions, P&ID markups for the changes to the inlet works (drawing no. 9268-3000) and chlorine disinfection system (drawing no. 9268-3004)
[14] Flow Systems internal correspondence for Pitt Town Chlorination Off-Spec Cut-In, 03/08/2019
[15] Flow Systems, Pitt Town – Control Points (PT-WAT-NSW-PL-OPS-1291, Revision 2), 21/11/2019

Parameter	Unit	Target	Action limit (alarm)	Critical Limit (Dial Out Alarm and shutdown or offspec diversion)
Chlorine Contact Time	CT – mg.min/L	>100 mg.min/L	≤100 mg.min/L	≤ 16 mg.min/L (Triggers off spec diversion)
pH	pH units	<7.6	>7.6	>8.0 (Triggers off spec diversion)
Temperature	(°C)	n/a	n/a	≤10°C (Triggers off spec diversion)

The table provides the following justification for the targets, action limits and critical limits:

"A critical limit of 16 mg.min/L is derived from the Victoria Department of Health Guidelines for validating treatment processes for pathogen reduction (February 2013) based on Turbidity ≤ 2 NTU, pH ≤ 8.0, Temperature ≥ 10 degC for 4 log reduction credits for viruses. CCP 3 is controlled by the Chlorine CT calculated in SCADA using the retention time (minutes), free chlorine residual (mg/L) and the baffling factor (0.5)."

Commissioning:

Each new item installed was commissioned individually and witnessed by an independent third party engineering consultant. The commissioning tasks to be completed were included in the Management of Change Plan[16] and the test results were recorded on the CCP Commissioning Check Sheet.[17]

The CCP Commissioning Check Sheet sets out the infrastructure to be commissioned in the current stage of the construction, the methodology for commissioning these assets and systems and the sign-off for the validation of the sensors installed for the chlorination divert. This included the following tests:

- pH Level: *A sidestream sample line allows flow from the contactor (T8100) to flow through a sample cell wi1h chlorine (AE8016) and pH(AE8017) sensing devices for measurement. The reading is transmitted to a transmitter (AIT8016) and the transmitter sends the signal to the central PLC. The reading is compared to the alert and critical limits for action.*
- Temperature: *An inline temperature switch (TS8101) measures the temperature. If the reading is above the set value the switch closes completing the circuit with the central PLC. If the circuit is not closed then the critical limit is assumed to be breached (fail-safe).*
- Chlorine Contact Time Factor: *A sidestream sample line allows flow from the contactor (T8100) to flow through a sample cell with chlorine (AE6016) and pH (AE0017) sensing devices for measurement. The reading is transmitted to a transmitter (AIT6016) and the transmitter sends the signal to the central PLC. The reading is compared to the alert and critical limits for action.*

The commissioning results showed that the new infrastructure that has been installed, and is the focus of this audit, operated in accordance with its design and operational requirements.

Test and certification of new infrastructure:

Flow Systems provided test sheets and calibration certificates for the new infrastructure it has installed. These included:

- CCT Analytical Transmitter[18]
- Treated Water Total Chlorine Analyser[19]
- Treated Water Analytical Transmitter[20]
- Disinfection Sensor[21]
- CCT Outlet Temperature Instrument[22]
- Endress+Hauser, Liquiline (CM442) Calibration Certificate, 14/08/2019

The treated water analytical transmitter is an existing asset but as the pH sensor was not being used to divert off-spec water at CCP3, this has been added to the system and was tested as part of the commissioning of the new infrastructure. Liquiline is the manufacturer's name for the transmitter model that has been installed and tested.

[16] Flow Systems, Pitt Town LWC – Stage 2 – Phase 4 – Management of Change Plan, 19/07/2019
[17] Flow Systems, Commissioning Check Sheet – Pitt Town LWC – CCP3 (revised for validation of chlorine divert) – checklists cover control point tests for high pH, low temperature and low c.t factor, 16/12/2019
[18] Flow Systems, Analytical Instrument Test Sheet, AIT8016 CCT Analytical Transmitter, 28/11/2019
[19] Flow Systems, Analytical Instrument Test Sheet, AIT9062 Treated Water Total Chlorine Analyser, 28/11/2019
[20] Flow Systems, Analytical Instrument Test Sheet, AIT9060 Treated Water Analytical Transmitter, 28/11/2019
[21] Endress+Hauser, Disinfection Sensor (CCS120D) Calibration Certificate, 13/08/2019
[22] Flow Systems – Temperature Sensor Test Sheet - TS8101 CCT Outlet Temperature Switch, 28/11/2019

The instrument probes are set-up in the LWC's SCADA and this was confirmed at the site inspection.

SCADA:

We reviewed the SCADA screen for monitoring and operating the chlorine contact tank. We confirmed that the new pH, temperature and total chlorine analysers are able to monitor the relevant parameters but are currently disabled from being able to be used to control the plant.

We confirmed that appropriate action and critical alarms have been set up for the new analysers at CCP3 to allow off-spec water to be automatically diverted if any of the critical alarms are set off (refer to above table).

We confirmed that the control point parameters set-up in the Pitt Town SCADA reconcile with the CCP limits recorded in the other documentation for the scheme.

The system has been set-up so that the off-spec water diverts if the critical alarm has been activated for 60 seconds. The system has also been set-up with a watchdog timeout, which shuts the plant down after 30 minutes so that the off-spec water does not keep being diverted to the old balance tanks. The off-spec water diversion valve closes and normal production resumes to deliver the water from the chlorine contact tank to the treated water storage, when there has been 60 continuous seconds of in-spec water.

Simulations tested during site inspection:

During the site inspection, Pitt Town Water ran a number of simulations to allow us to confirm that the new analysers that have been installed function correctly when the critical alarm limits are reaches and divert the off-spec water to the old balance tank at the head of the works.

Simulations were run for the following events:

- pH of 8.2
- Chlorine Contact Time of 10 mg.min/L
- Temperature of 9°C

For each simulation that was run, we confirmed in SCADA that:

- the relevant alarms were triggered
- the valve on the pipe from the chlorine contract tank to the treated water storage was fully closed
- the off-spec water valve after the chlorine contract tank was fully opened to divert the water
- the operations staff present at the site inspection received text notification of the alarms to their mobile phones
- the alarms stopped when the simulation was reset
- the off-spec water valve was closed and the valve to the treated water storage was opened after the analysers had recorded in-spec water for 60 seconds

For the chlorine contact time simulation, we also observed the two valves at the chlorine contact tank physically opening and closing when the critical limit was recorded for 60 seconds of continuous flow and again when the treated water had been in-spec for 60 seconds of continuous flow.

We also assessed a simulation run on the total chlorine for the treated water. The Pitt Town LWC diverts water from the treated water storage back into the plant to use as process water and analyses the quality of the treated water via this pipe. We confirmed that if the treated water is shown to be off-spec, alarms are raised in the SCADA system and, as for the other alarms, texts are sent to operations staff mobile phones.

Operations and Maintenance:

The Infrastructure Operating Plan[23] outlines that the contents of the Operation and Maintenance Manual for the scheme. The Recycled Water Quality Plan[24] also addresses the operation of the infrastructure, including arrangements in respect of ongoing monitoring and sampling. The scheme-specific documentation is consistent with the information provided in the high-level generic documentation that the Licensee develops for each of the facilities it operates, including the Pitt Town Recycled Water Scheme.

The information included in the Pitt Town LWC Operation and Maintenance Manual[25] reflects and should be read in conjunction with the Pitt Town Water Functional Description Addendum 1: Chlorination and Recycled Water document[26] which also provides a description of the system components and the detailed arrangements for system control.

[23] Flow Systems, Infrastructure Operating Plan, Section 3.4.3
[24] Flow Systems, Recycled Water Quality Plan (RWQP) (FS-WAT-AUS-PL-OPS-1311), Revision 13, 10/07/2019
[25] Flow Systems, Pitt Town LWC, Operation and Maintenance Manual – Stage 2, Version 1, 30/05/2018
[26] Flow Systems, Pitt Town Water, Functional Description: Addendum 1: Chlorination and Recycled Water, 21/11/2019

The Pitt Town LWC Operation and Maintenance Manual[27] includes the relevant information that would be expected for this document and for the infrastructure installed.

However, we note that current version of the Pitt Town Water O&M Manual has not been updated to include the new infrastructure that has been installed. The only off-spec water diversion operations documented in the manual relate to the Membrane Operating System and the UV disinfection processes. Flow Systems uses a Project Delivery to Operations/Retail Handover Checklist[28] to assign actions, responsibilities, and timeframe for tasks to be completed to ensure that all the relevant documentation has been handed over from Project Delivery to Operations to ensure efficient operation of the new scheme infrastructure. Although the checklist template was provided, Flow Systems have not yet agreed the timeframe or drafted the checklist to cover the handover of the documentation for the new infrastructure that has been installed. We would expect the Operation and Maintenance Manual to be updated within three months after the new infrastructure that has been installed has been brought into operation. IPART has provided notification that it will seek an addendum to this report to confirm that this has been completed prior to granting commercial operation.

We confirmed that additional procedures have been added to the Control Points table[29] based on the new infrastructure that has been installed.

Maintenance Management:

Flow Systems uses the Real Asset Management (RAM) system for its asset register and maintenance management system for all of its infrastructure, including the Pitt Town LWC.

We confirmed that the new infrastructure that has been installed at the Pitt Town LCW has been added to RAM, Flow Systems' asset register and maintenance management system. We confirmed that asset details have been recorded for the new assets and annual calibration for the analysers has been scheduled to be carried out by the appropriate manufacturer. We also confirmed that the weekly checklist for the Pitt Town LWC includes a number of tasks related to checking and calibrating the analysers for operational purposes.

The scheduled tasks and checklists are delivered to the maintenance staff's mobile phones and the field data is also captured using the same device.

Safety Management:

Flow System's Business Management System is certified as compliant with both OSHAS 18001 and AS 4801. Their retention requires demonstrated implementation of safety management practices, as assessed during annual audits undertaken by an independent certifying authority.

The Construction Safety Management Plan (CSMP)[30] documents Flow Systems overall framework for safety processes and procedures. The Plan also includes detail of the processes and procedures. This includes a range of safety principles, processes and procedures in place to manage safety risk including:

- Management and Recording of Hazards and Risks
- Risk Assessment and Control
- Hierarchy of Control
- Risk Registers
- Safe Work Method Statements (SWMS) – there is a General Operations SWMS[31] which been provided by Flow Systems.
- Take 5
- HSE Workplace Inspection[32]

The General Operations SWMS provides a checklist for identifying high risk work, PPE required, permit to work requirements, formal training requirements, relevant legislation, codes of practice and other guidance material, plant/tools/equipment, details of the tasks, hazards and risks and control measures, and work group sign-on.

Flow Systems also have documentation place for workplace safety incidents e.g., the WHS Incident Report and Investigation Form[33]

SWMS were used during the installation of the new infrastructure for the electrical work carried out to install. No specific safety management documentation was required for the new infrastructure.

[27] Flow Systems, Pitt Town LWC, Operation and Maintenance Manual – Stage 2, Version 1, 30/05/2018
[28] Flow Systems, PD to Ops/Retail Handover Checklist (FS-WAT-AUS-FM-PRD-2032)
[29] Flow Systems, Pitt Town – Control Points (PT-WAT-NSW-PL-OPS-1291)
[30] Flow Systems, Construction Safety Management Plan (CSMP) – Pitt Town, Revision 3, 03/06/2019 (PT-WAT-NSW-PL-WHS-2799)
[31] Flow Systems, General Scheme operations – SWMS (FS-WAT-NSW-SWMS-OPS-2579)
[32] HSE Workspace Inspection Checklist
[33] Flow Systems, WHS Incident Report and Investigation Form

Based on our observations during the site visit, we consider that the Pitt Town LWC infrastructure is capable of being operated safely.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

Although there are no specific opportunities for improvement, Pitt Town Water will need to update the O&M Manual to reflect the new infrastructure that has been installed. No timeframe has yet been agreed for the handover from Project Delivery to Operations to be completed but we would expect the manual to be updated within three months after operation of the new infrastructure commences. IPART has provided notification that it will seek an addendum to this report to confirm that this has been completed prior to granting commercial operation.

Table A3: WIC Reg (General) Sched 1 cl.2(2)(b)

Sub-clause	Requirement	Compliance Grade
WIC Reg (General) Sched 1 cl.2(2)(b)	The infrastructure is capable of being operated in accordance with its infrastructure operating plan and its water quality or sewage management plan, as the case requires	**Compliant**

Risk	Target for Full Compliance
This presents a high operational risk. The ability of the infrastructure to operate in accordance with the relevant management plan(s) is essential to the effective delivery of agreed levels of service.	Demonstration that the infrastructure is capable of operating in accordance with the relevant management plan(s).

Evidence sighted

- Interviews with Flow Systems personnel on 9 March 2020
- Site inspection of infrastructure on 9 March 2020
- Flow Systems, Pitt Town Scheme Management Plan (Scheme MP), Revision 11, 10/07/2019
- Flow Systems, Infrastructure Operating Plan (IOP), Revision 12, 20/11/2018
- Flow Systems, Pitt Town LWC – Stage 2 – Phase 4 – Management of Change Plan, 19/07/2019
- Flow Systems, Recycled Water Quality Plan (RWQP) (FS-WAT-AUS-PL-OPS-1311), Revision 13, 10/07/2019
- Flow Systems, Pitt Town – Control Points (PT-WAT-NSW-PL-OPS-1291, Revision 2), 21 November 2019
- Flow Systems, Pitt Town Process Flow Diagram, Recycled Water and Sewerage Phase 2, Rev 1 (PT-WAT-NSW-DR-OPS-1409), 10/09/2019
- Flow Systems, Pitt Town Monitoring and Sampling Program (PT-WAT-NSW-PL-OPS-2849), Revision 1, 25/11/2019
- Flow Systems, Pitt Town LWC – Operation and Maintenance Manual, Version 1, 30/05/2018
- Flow Systems, Incident Management Plan (IMP), Revision 8, 19/12/2018
- Flow Systems Operational Monitoring Corrective Actions (FS-WAT-NSW-PR-OPS-2722), Revision 1.0, 18/07/2019
- Flow Systems, Water Quality Incident Management, Reporting and Investigation Procedure (FS-WAT-NSW-PR-INC-2561), Revision 1, 17/12/2018

Summary of reasons for grade

Based on the review of Flow Systems' documentation, site observations and discussions with key Licensee personnel, we consider that the Licensee has demonstrated that the Pitt Town scheme infrastructure is capable of being operated in accordance with its Infrastructure Operating Plan and Recycled Water Management Plan.

Critical control points for the new infrastructure that has been installed at the Pitt Town LWC, and which is the focus of this audit, are clearly documented in a summary table. An extensive Operations and Maintenance Manual is in place, although as noted in Table A2 for WIC Reg (General) Sched 1 cl.2(2)(b), the manual has not yet been updated to include the operation of the new infrastructure that has been installed. We would expect the manual to be updated with this information within three months after operation of the new infrastructure commences. IPART has provided notification that it will seek an addendum to this report to confirm that this has been completed prior to granting commercial operation. As a result, we consider that the Licensee has demonstrated compliance with the IOP requirements under WIC Reg (General) Sched 1 cl.2(2)(b)

Discussion and notes

The overall operation of the Pitt Town infrastructure is addressed in the Infrastructure Operating Plan[34] (with reference to the scheme Operation and Maintenance Manual) and the Recycled Water Quality Plan[35] in conjunction with the Scheme Management Plan.

Infrastructure Operating Plan:

The Infrastructure Operating Plan[36] identifies "Asset condition and risk assessment" as a key step in Flow Systems' overall approach to asset management. The Pitt Town Scheme Risk Register[37] identifies hazardous events associated with the various assets and processes of the overall infrastructure system, including the treatment plant, and outlines appropriate control strategies to manage the risks. We confirmed that the register has been updated to

[34] Infrastructure Operating Plan, section 2.5.
[35] Recycled Water Quality Plan, section 5.
[36] Flow Systems, Infrastructure Operating Plan, Section 7.1
[37] Flow Systems, Pitt Town Scheme Risk Register, Revision 7.1, 28/05/2019

include the risks associated with the Chlorine disinfection & Contact Tank, the specific hazards, the risk score and ranking and the mitigating measures to manage the risks. This includes:

- Automatic corrective actions e.g. off spec loop or plant shutdown
- Automatic shutdown if CT reaches critical level
- Regular external calibration of analysers
- Preventive maintenance/ RAM
- All key indicators (chlorine residual, tank level) of Chlorination for disinfection performance (CT) are monitored continuously via the site SCADA
- Operational and verification monitoring.

Operation and Maintenance Manual:

The Infrastructure Operating Plan[38] outlines that an Operation and Maintenance Manual will be developed for the scheme and this will provide the system operating rules to operate the infrastructure in the most effective manner during normal and breakdown conditions.

The Pitt Town LWC Operation and Maintenance Manual[39] includes the relevant information that would be expected for this document and for the infrastructure installed. This includes sections related to:

- Introduction and Purposes of Document
- Contact details for the Flow System constructors
- A general description of the installation, with individual sections for each process unit
- SCADA Screens and Controls
- Operating Procedures for start-up of the different process units
- Maintenance Schedules, including daily, weekly, monthly, quarterly and annual maintenance requirements
- Troubleshooting
- Emergency response
- Equipment Schedules
- Manufacturer's Literature – Equipment
- Manufacturer's Literature – Instrumentation
- Manufacturer's Literature – Valves
- Manufacturer's Literature – MEMCOR
- As-Built Documentation.

As noted previously, the current version of the Pitt Town Water O&M Manual has not been updated to include the new infrastructure that has been installed. The only off-spec water diversion operations documented in the manual relate to the Membrane Operating System and the UV disinfection processes. Flow Systems uses a Project Delivery to Operations/Retail Handover Checklist[40] to assign actions, responsibilities, and timeframe for tasks to be completed to ensure that all the relevant documentation has been handed over from Project Delivery to Operations to ensure efficient operation of the new scheme infrastructure. No timeframe has yet been agreed for the handover from Project Delivery to Operations to be completed but we would expect the manual to be updated in the three months after operation of the new infrastructure commences. IPART has provided notification that it will seek an addendum to this report to confirm that this has been completed prior to granting commercial operation.

We confirmed that manufacturer's literature for the new infrastructure that has been installed and is stored on the Sharepoint folder for Pitt Town scheme.

The information included in the Pitt Town LWC Operation and Maintenance Manual reflects and should be read in conjunction with the Pitt Town Water Functional Description Addendum 1: Chlorination and Recycled Water document[41] which also provides a description of the system components and the detailed arrangements for system control.

[38] Flow Systems, Infrastructure Operating Plan, Section 2.5
[39] Flow Systems, Pitt Town LWC, Operation and Maintenance Manual – Stage 2, Version 1, 30/05/2018
[40] Flow Systems, PD to Ops/Retail Handover Checklist (FS-WAT-AUS-FM-PRD-2032)
[41] Flow Systems, Pitt Town Water, Functional Description: Addendum 1: Chlorination and Recycled Water, 21/11/2019

Recycled Water Quality Plan and Monitoring & Sampling Plan:

In addition to the procedural information included in the Operation and Maintenance Manual, operational procedures related to aiming to ensure the quality of the water supplied are documented in the Recycled Water Quality Plan[42] and Monitoring and Sampling Plan.[43] This includes procedures related to ongoing monitoring requirements and operational corrections. The Monitoring and Sampling Programme[44] outlines the Pitt Town sample locations, monitored parameters, and targets. We confirmed that this has been updated to include the operation characteristics for pH, temperature and free chlorine for the outlet from the chlorine contact tank to allow the diversion of off-spec treated water.

Site inspection observations

Based on our observations during the site visit and discussions with key Flow Systems personnel, we consider that the new infrastructure included in the scope of this audit has been constructed and configured to operate in accordance with the arrangements documented in the Infrastructure Operating Plan, Recycled Water Quality Plan, and Scheme Management Plan and other Flow Systems management plans and documentation.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[42] Flow Systems, Recycled Water Quality Plan, Section 5
[43] Flow Systems, Monitoring and Sampling Plan, Version 12.1, 14/08/2019, Section 6
[44] Flow Systems, Monitoring and Sampling Programme, Revision 1.0, 25/11/2019

Table A4: WIC Reg (General) Sched 1 cl.3(a) and (b)

Sub-clause	Requirement	Compliance Grade
WIC Reg (General) Sched 1 cl.3(a) and (b)	The water or sewerage infrastructure is properly designed and constructed, operated in a safe and reliable manner and maintained in a proper condition, having regard to: ▪ the purposes for which it is licensed, and ▪ the Licence conditions.	**Compliant**

Risk	Target for Full Compliance
This represents high operational risk. Proper design and construction, safe and reliable operation and condition maintenance is essential to the effective delivery of agreed levels of service.	Evidence that the infrastructure is properly designed and constructed, and demonstration that it is operated in a safe and reliable manner and is properly maintained, having regard for the purposes for which it is licensed.

Evidence sighted

- Flow Systems, Monitoring and Sampling Plan, Version 12.1, 14/08/2019
- Flow, Operations Environmental Management Plan (OEMP) (Revision 8), 27/09/2019
- Flow, Asset Management Plan (AMP) (Revision 4), 1 November 2018
- Interviews with Flow Systems personnel on 9 March 2020
- Site inspection of infrastructure on 9 March 2020
- Network Operator's Licence No: 10_014 issued to Pitt Town Water Pty Ltd, 16 May 2017
- Flow Systems, Pitt Town Scheme Management Plan (Scheme MP), Revision 11, 10/07/2019
- Flow Systems, Infrastructure Operating Plan (IOP), Revision 12, 20/11/2018
- Flow Systems, Pitt Town LWC – Stage 2 – Phase 4 – Management of Change Plan, 19/07/2019
- Flow Systems, Recycled Water Quality Plan (RWQP) (FS-WAT-AUS-PL-OPS-1311), Revision 13, 10/07/2019
- Flow Systems, Pitt Town Monitoring and Sampling Program (PT-WAT-NSW-PL-OPS-2849), Revision 1, 25/11/2019
- Flow Systems, Pitt Town LWC – Operation and Maintenance Manual, Version 1, 30/05/2018
- Flow Systems, Incident Management Plan (IMP), Revision 8, 19/12/2018
- Flow Systems Operational Monitoring Corrective Actions (FS-WAT-NSW-PR-OPS-2722), Revision 1.0, 18/07/2019
- Flow Systems, Water Quality Incident Management, Reporting and Investigation Procedure (FS-WAT-NSW-PR-INC-2561), Revision 1, 17/12/2018

Summary of reasons for grade

Based on the review of Flow' Systems' documentation, site observations and discussions with key Licensee personnel, we consider that the Licensee has demonstrated that the infrastructure that has been included in the scope of this audit has been properly designed and constructed and is ready to operate in a reliable and safe manner and be maintained in a proper condition with regard to the current purposes for which it is licensed and the current licence conditions.

Discussion and notes

Overview:

A separate Licence Plan Audit,[45] conducted in conjunction with this New Infrastructure Audit, considered the arrangements related to the design, construction, operation and maintenance of the infrastructure in detail. That audit found that:

The Infrastructure Operating Plan, together with the Pitt Town Scheme Management Plan and other key supporting documentation, provide a high level overview of the arrangements that have been adopted in relation to the design, construction, operation, maintenance and renewal (life cycle management) of the infrastructure.

The purposes for which the infrastructure is licensed, the Licence conditions and the guidance available in publicly available standards or codes is outlined in the following sections.

[45] Viridis/Cardno, Licence Plan Audit - Pitt Town Recycled Water Scheme, March 2020

Purpose for which the infrastructure is licensed:

Under Pitt Town Water's Network Operator's Licence No. 10_014, the use of non-potable water infrastructure is authorised for:

- "*Irrigation, toilet flushing, car washing, wash down of hard surfaces, supply of cold water to washing machine*"

The use of sewerage services is authorised for:

- "*Treat, store, convey or reticulate sewage*"

Based on the review of the relevant management plans and other documentation, as well as the observations made during the site visit and the discussions with key Flow Systems personnel, the audit has confirmed that the infrastructure included in the audit scope is appropriately designed and constructed and capable to be operated in a safe and reliable manner and maintained in a proper condition having regard for the purposes for which it was intended.

Licence conditions:

Licence conditions that impact or may impact on the design, construction, operation and maintenance of the infrastructure include:

- Clause A1.1 which outline the Licensee's requirements to:
  - prepare and provide IPART with a Construction Environmental Management Plan, which outlines the proposed actions and mitigation measures to manage the environmental risks for undertaking construction of the water industry infrastructure; and
  - provide IPART with a report, prepared by an approved auditor, in such manner and form as IPART may direct as to the adequacy of the Construction Environmental Management Plan

  As Pitt Town Water provide these documents during the initial construction of the Pitt Town Water LWC and as there has not been a requirement to provide IPART with these documents for the infrastructure upgrades that have been completed, we have excluded this clause from this audit.
- Clause A1.2, which requires the Licensee to implement all actions and mitigation measures in accordance with the document entitled "Response to the DECCW submission to IPART regarding the Pitt Town Water Factory" prepared by Parsons Brinkerhoff Australia Pty Ltd (2010).

  We have excluded this requirement from this audit as we do not consider that it applies to these infrastructure installations.
- Clause B1, which requires the Licensee to have the technical, financial and organisational capacity to carry out the activities authorised by the Licence.

  We have excluded this clause from this audit as these capabilities have previously been assessed and documented by IPART[46] as part of Pitt Town Water's application for a Network Operator's Licence.
- Clause B8, which outlines the requirements in respect of water quality monitoring.

  Detailed arrangements with regard to the recycled water quality monitoring are detailed in the Flow Systems' Recycled Water Quality Plan,[47] Monitoring and Sampling Plan[48] and the Monitoring and Sampling Programme.[49] The programme outlines the Pitt Town sample locations, monitored parameters, and targets. We confirmed that this has been updated to include the operation characteristics for pH, temperature and free chlorine for the outlet from the chlorine contact tank to allow the diversion of off-spec treated water.

We consider that the arrangements, which will form part of the infrastructure's operating regime when commercial operation commences, are appropriately documented.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[46] IPART, Application for a Network Operator's Licence and a Retail Supplier's Licence from Pitt Town Water Factory Pty Ltd - IPART's report to the Minister, September 2010
[47] Flow Systems, Recycled Water Quality Plan, Sections 5 and 6
[48] Flow Systems, Monitoring and Sampling Plan, Version 12.1, 14/08/2019
[49] Flow Systems, Monitoring and Sampling Programme, Revision 1.0, 25/11/2019

Table A5: WIC Reg (General) Sched 1 cl.3(c)

Sub-clause	Requirement	Compliance Grade
WIC Reg (General) Sched 1 cl.3(c)	The water or sewerage infrastructure is properly designed and constructed, operated in a safe and reliable manner and maintained in a proper condition, having regard to any publicly available standards or codes relating to its design, construction, operation and maintenance.	**Compliant**

Risk	Target for Full Compliance
This represents high operational risk. Proper design and construction, safe and reliable operation and condition maintenance is essential to the effective (safe and reliable) delivery of agreed levels of service.	Evidence that the infrastructure is properly designed and constructed, and demonstration that it is operated in a safe and reliable manner and is properly maintained, having regard for publicly available standards or codes; and evidence of procedures for ensuring that practices are kept up to date with changes to such standards or codes.

Evidence sighted

- Interviews with Flow Systems personnel on 9 March 2020
- Site inspection of infrastructure on 9 March 2020
- Flow Systems, Pitt Town Scheme Management Plan (Scheme MP), Revision 11, 10/07/2019
- Flow Systems, Infrastructure Operating Plan (IOP), Revision 12, 20/11/2018
- Flow Systems, Pitt Town LWC – Stage 2 – Phase 4 – Management of Change Plan, 19/07/2019
- Flow Systems, Recycled Water Quality Plan (RWQP) (FS-WAT-AUS-PL-OPS-1311), Revision 13, 10/07/2019
- Flow Systems, Pitt Town Monitoring and Sampling Program (PT-WAT-NSW-PL-OPS-2849), Revision 1, 25/11/2019
- Flow Systems, Pitt Town LWC – Operation and Maintenance Manual, Version 1, 30/05/2018
- Flow Systems, Incident Management Plan (IMP), Revision 8, 19/12/2018
- Flow Systems Operational Monitoring Corrective Actions (FS-WAT-NSW-PR-OPS-2722), Revision 1.0, 18/07/2019
- Flow Systems, Water Quality Incident Management, Reporting and Investigation Procedure (FS-WAT-NSW-PR-INC-2561), Revision 1, 17/12/2018
- Flow Systems, Construction Safety Management Plan (CSMP) – Pitt Town, Revision 3, 03/06/2019 (PT-WAT-NSW-PL-WHS-2799)
- HSE Workspace Inspection Checklist
- Flow Systems, WHS Incident Report and Investigation Form

Summary of reasons for grade

Based on the review of Flow Systems documentation, site observations and discussions with key Licensee personnel, we consider that the Licensee has demonstrated that the infrastructure that has been included in the scope of this audit has been properly designed and constructed with regard to any publicly available standards or codes relating to its design, construction, operation and maintenance.

As a result, we consider that the Licensee has demonstrated compliance with the requirements under WIC Reg (General) Sched 1 cl.3(c).

Discussion and notes

Currency of Standards and Codes:

The Infrastructure Operating Plan[50] identifies the standards to which the infrastructure is to be designed and constructed.

Operational Controls:

The Infrastructure Operating Plan outlines that the contents of the Operation and Maintenance Manual for the scheme. The Pitt Town LWC Operation and Maintenance Manual includes the relevant information that would be expected for this document and for the infrastructure installed.

As noted previously, the current version of the Pitt Town Water O&M Manual has not been updated to include the new infrastructure that has been installed. The only off-spec water diversion operations documented in the manual relate

[50] Flow Systems, Infrastructure Operating Plan, Section 2.3

to the Membrane Operating System and the UV disinfection processes. Flow Systems uses a Project Delivery to Operations/Retail Handover Checklist[51] to assign actions, responsibilities, and timeframe for tasks to be completed to ensure that all the relevant documentation has been handed over from Project Delivery to Operations to ensure efficient operation of the new scheme infrastructure. No timeframe has yet been agreed for the handover from Project Delivery to Operations to be completed but we would expect the manual to be updated in the three months after operation of the new infrastructure commences. IPART has provided notification that it will seek an addendum to this report to confirm that this has been completed prior to granting commercial operation.

The information included in the Pitt Town LWC Operation and Maintenance Manual reflects and should be read in conjunction with the Pitt Town Water Functional Description Addendum 1: Chlorination and Recycled Water document[52] which also provides a description of the system components and the detailed arrangements for system control.

Safety Management:

Flow System's Business Management System is certified as compliant with both OSHAS 18001 and AS 4801. Their retention requires demonstrated implementation of safety management practices, as assessed during annual audits undertaken by an independent certifying authority.

The Construction Safety Management Plan (CSMP)[53] documents Flow Systems overall framework for safety processes and procedures. The Plan also includes detail of the processes and procedures. This includes a range of safety principles, processes and procedures in place to manage safety risk including:

- Management and Recording of Hazards and Risks
- Risk Assessment and Control
- Hierarchy of Control
- Risk Registers
- Safe Work Method Statements (SWMS) – there is a General Operations SWMS[54] which been provided by Flow Systems.
- Take 5
- HSE Workplace Inspection[55]

The General Operations SWMS provides a checklist for identifying high risk work, PPE required, permit to work requirements, formal training requirements, relevant legislation, codes of practice and other guidance material, plant/tools/equipment, details of the tasks, hazards and risks and control measures, and work group sign-on.

SWMS were used during the installation of the new infrastructure for the electrical work carried out to install. No specific safety management documentation was required for the new infrastructure.

Flow Systems also have documentation in place for workplace safety incidents e.g., the WHS Incident Report and Investigation Form[56]

Compliance with Standards and Codes:

During the site inspection, we confirmed that:

- The new pipework is of the appropriate type and standard and is appropriately coloured and labelled
- The valves and fittings for the new infrastructure that has been installed are of the appropriate type and standard

New assets have been appropriately tagged.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[51] Flow Systems, PD to Ops/Retail Handover Checklist (FS-WAT-AUS-FM-PRD-2032)
[52] Flow Systems, Pitt Town Water, Functional Description: Addendum 1: Chlorination and Recycled Water, 21/11/2019
[53] Flow Systems, Construction Safety Management Plan (CSMP) – Pitt Town, Revision 3, 03/06/2019 (PT-WAT-NSW-PL-WHS-2799)
[54] Flow Systems, General Scheme operations – SWMS (FS-WAT-NSW-SWMS-OPS-2579)
[55] HSE Workspace Inspection Checklist
[56] Flow Systems, WHS Incident Report and Investigation Form

Table A6: Network Operator Licence cl.S1.1 and S3.1

Sub-clause	Requirement	Compliance Grade
Network Operator Licence cl.S1.1 and S3.1	In respect of non-potable water supply (S1.1) and sewerage service (S3.1): (a) The Licensee and the authorised third parties have constructed, operated and/or maintained the water industry infrastructure. (b) The Licensee and the authorised third parties have constructed, operated and/or maintained the water industry infrastructure specified in the Licence. (c) The Licensee and the authorised third parties have constructed, operated and/or maintained the water industry infrastructure for the authorised purposes. (d) The water industry infrastructure operated and/or maintained by the Licensee or an authorised third party does not extend outside the area of operations.	**Compliant**

Risk	Target for Full Compliance
This presents moderate risk that the appropriate operational controls may not be in place.	Evidence that the Licensee and authorised third parties have operated and/or maintained the specified infrastructure for the authorised purposes only within the area of operations.

Evidence sighted

- Interviews with Flow Systems personnel on 9 March 2020
- Site inspection of infrastructure on 9 March 2020
- Flow Systems, Pitt Town Scheme Management Plan (Scheme MP), Revision 11, 10/07/2019
- Flow Systems, Infrastructure Operating Plan (IOP), Revision 12, 20/11/2018
- Flow Systems, Pitt Town LWC – Stage 2 – Phase 4 – Management of Change Plan, 19/07/2019
- Flow Systems, Recycled Water Quality Plan (RWQP) (FS-WAT-AUS-PL-OPS-1311), Revision 13, 10/07/2019
- Network Operator's Licence No: 10_014 issued to Pitt Town Water, 16 May 2017

Summary of reasons for grade

Based on the review of Flow Systems' documentation, site observations and discussions with key Licensee personnel, we consider that the new infrastructure that has been installed, and which is the subject of this audit, has been constructed and will be operated and/or maintained by the Licensee and/or the authorised third parties for the authorised purposes and does not extend outside the specified area of operations.

As a result, we consider that the Licensee is compliant with the obligations included in clauses S1.1 and S1.3 of its Network Operator Licence.

Discussion and notes

Overview:

The Network Operator's Licence (Licence No: 10_014) issued to Pitt Town Water on 16 May 2017, authorises activities associated with the supply of recycled (non-potable) water and the provision of sewerage services.

Authorised persons are required to have constructed/are constructing and will be operating and/or maintaining the specified infrastructure for the authorised purposes. In addition, the infrastructure must not extend outside the specified area of operations.

Authorised persons:

The Network Operator's Licence nominates "Flow Systems Pty Ltd (ACN 136 272 298)" and Permeate Partners Pty Ltd (ACN 130 112 257) as an "Authorised persons" for both non-potable water supply[57] and the provision of sewerage services.[58]

[57] Network Operator's Licence, Licence No. 10_014, Pitt Town Water Pty Ltd, Table 1.1
[58] Network Operator's Licence, Licence No. 10_014, Pitt Town Water Pty Ltd, Table 3.1

Based on observations made during the audit and discussions with key Licensee personnel, we confirmed that the new infrastructure that has been installed at the Pitt Town LWC, and which is the subject of this audit, has been installed under the direction and supervision of Flow Systems who operate and maintain the Pitt Town sewage and recycled water systems for Pitt Town Water.

The audit discussions and review of documentation also confirmed that the operation and maintenance of the infrastructure will be managed by Pitt Town Water through Flow Systems. Flow Systems retains overall responsibility for the construction activities.

Water industry infrastructure:

The Network Operator's Licence specifies the following as the water industry infrastructure that is applicable for the purposes of this audit:

- For the authorised non-potable water supply activities:[59]
  - *"Infrastructure for the production, treatment, filtration, storage, conveyance or reticulation of non-potable water"*
- For the authorised sewerage services:[60]
  - *"Infrastructure for the treatment, storage, conveyance or reticulation of sewage, including any outfall pipe or other work that stores or conveys water leaving the infrastructure"*

Based on our review of the documentation provided by Flow Systems, we confirmed that the new infrastructure included in the scope for this audit is consistent with the specified water industry infrastructure set out in the Network Operator's Licence. Our assessment was completed during the site visit to the Pitt Town LWC on 9 March 2020.

Authorised purposes:

The Network Operator's Licence specifies the following authorised purposes for which the specified water industry infrastructure include in the licence can be used:

- For the authorised non-potable (recycled) water supply activities:[61]
  "*Irrigation, toilet flushing, car washing, wash down of hard surfaces, supply of cold water to washing machine*"
- For the authorised sewerage services:[62]
  "*Treat, store, convey or reticulate sewage*"

The Pitt Town Scheme Management Plan[63] nominates the intended end uses of recycled water as "*Irrigation, toilet flushing, car washing, wash down of hard surfaces, supply of cold water to washing machine*".

Review of the documentation provided, observations made during the site inspection and discussions with Flow Systems personnel during the audit provided no indication that the new infrastructure will be used for non-authorised purposes.

Area of operations:

The Network Operator's Licence specifies the area of operations within which the water industry infrastructure may be operated by the Licensee.[64] We confirmed during the audit that the Licensee has not constructed and will not operate and/or maintain the new infrastructure that has been installed outside the nominated area of operations.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[59] Network Operator's Licence, Licence No. 10_014, Pitt Town Water Pty Ltd, Table 1.2
[60] Network Operator's Licence, Licence No. 10_014, Pitt Town Water Pty Ltd, Table 3.2
[61] Network Operator's Licence, Licence No. 10_014, Pitt Town Water Pty Ltd, Table 1.3
[62] Network Operator's Licence, Licence No. 10_014, Pitt Town Water Pty Ltd, Table 3.3
[63] Flow Systems, Pitt Town Scheme Management Plan (Scheme MP), Revision 11, 10/07/2019, Section 6.1.1.2
[64] Network Operator's Licence, Licence No. 110_014, Pitt Town Water Pty Ltd, Table 1.4 and 3.4

Table A8: Network Operator Licence cl.B4

Sub-clause	Requirement	Compliance Grade
Network Operator Licence cl.B4	The Licensee must carry out the activities authorised by this Licence in compliance with any requirements of NSW Health that: (a) IPART has agreed to; and (b) are notified from time to time to the Licensee by IPART in writing.	**Compliant**

Risk	Target for Full Compliance
This potentially presents high operational risk. Compliance with agreed requirements of NSW Health is essential to ensuring that the activities authorised by the Licence are carried out in a manner that ensures public health and safety.	Evidence that the Licensee is carrying out its authorized activities in compliance with any requirements of NSW Health with which IPART has notified the Licensee that it must comply.

Evidence sighted

- Interviews with Flow Systems personnel on 9 March 2020
- Site inspection of infrastructure on 9 March 2020
- Flow Systems, Pitt Town Scheme Management Plan (Scheme MP), Revision 11, 10/07/2019
- Flow Systems, Infrastructure Operating Plan (IOP), Revision 12, 20/11/2018
- Flow Systems, Pitt Town LWC – Stage 2 – Phase 4 – Management of Change Plan, 19/07/2019
- Network Operator's Licence No: 10_014 issued to Pitt Town Water Pty Ltd, 16 May 2017
- Email from IPART, Notification of NSW Health Requirements under Licence Clause B4, 7 December 2017

Summary of reasons for grade

Pitt Town Water has not received any instructions from NSW Health related to the new infrastructure that has been installed at the Pitt Town LWC. As a result, we consider that the Licensee has demonstrated full compliance with the IOP requirements under Network Operator Licence cl.B4.

Discussion and notes

Summary

Under the requirements of the Network Operator Licence,

"The Licensee must carry out the activities authorised by this Licence in compliance with any requirements of NSW Health that:

a) IPART has agreed to; and

b) are notified from time to time to the Licensee by IPART in writing."

The NSW Health requirements under Licence Clause B4 for Pitt Town Water that IPART has agreed to have been set out in a notification letter provided by IPART. Pitt Town Water is required to comply with the following requirements:

- Item 1(a) – Consultation during detailed risk assessments
- Item 1(b) – Consultation during technology assessments
- Item 1(c) – Consultation during development of management plans
- Item 1(d) – Consultation during development of incident notification protocol
- Item 2(a) – Provision of copy of New Infrastructure Audit Report
- Item 2(b) – Notification when commencing commercial operation
- Item 2(c) – Consultation during development/amendment of a procedure for notification of health-related complaints
- Item 2(d) – Inclusion of a procedure for notification of health-related complaints in the retail supply management plan

NSW Health has not provided any specific requirements for the new infrastructure that has been installed at the Pitt Town LWC and which is the focus of this audit. The requirements have been addressed at previous audits. With regard to Item 1(c), the changes to the infrastructure did not result in the development or addition of any areas of the management plans which required consultation with NSW Health.

A copy of the New Infrastructure Audit Report (this report) will be submitted to NSW Health upon finalisation. This is, therefore, not applicable to be assessed at this stage.

Recommendations

There are no recommendations in respect of these obligations.

Opportunities for improvement

No opportunities for improvement have been identified in respect of these obligations.

APPENDIX

B

PITT TOWN LWC CHLORINE DISINFECTION PROCESS AND INLET WORKS P&IDS

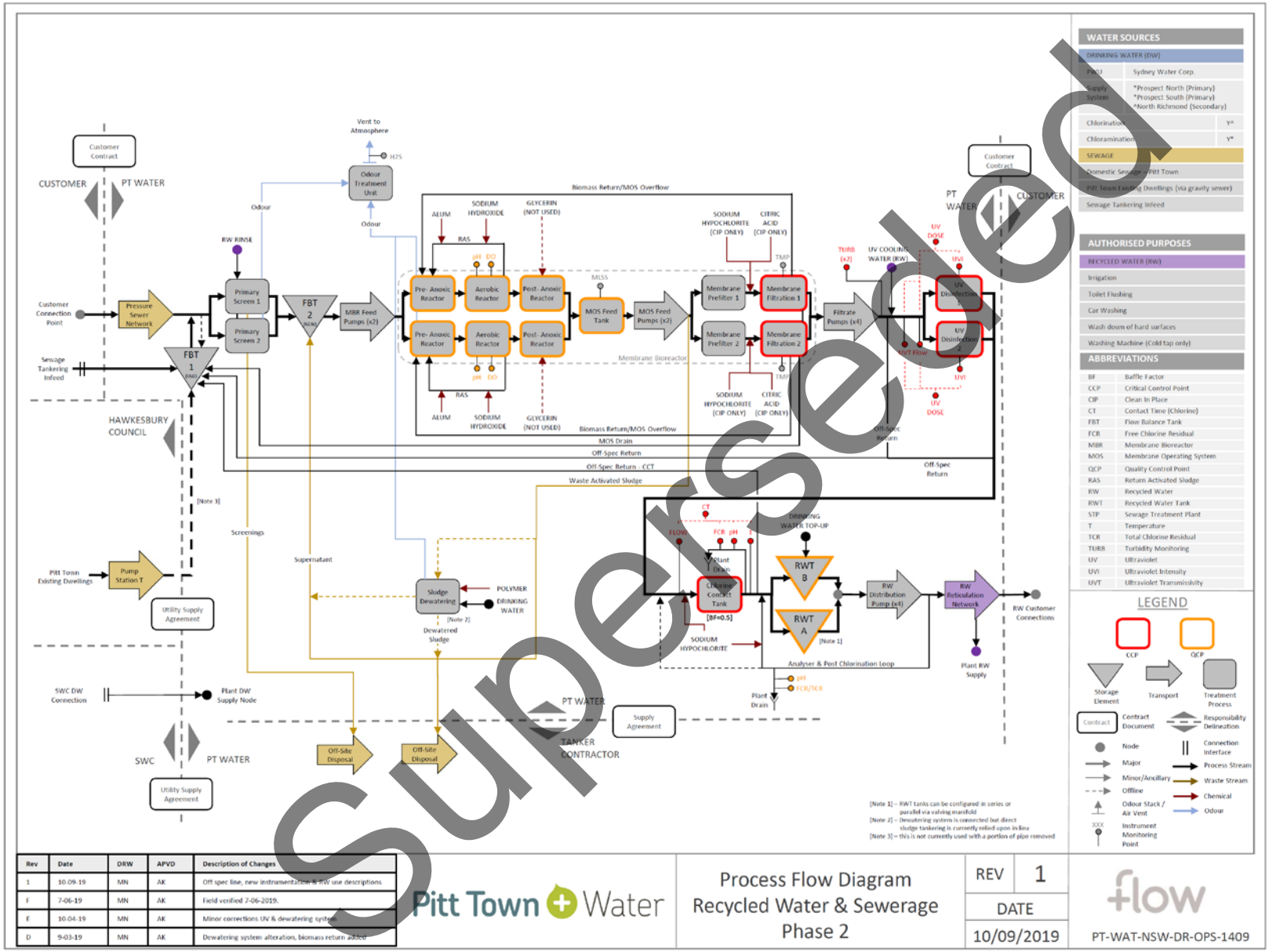

Figure 2-1 Pitt Town Water Process Flow Diagram – Recycled Water & Sewerage Phase 2 (PT-WAT-NSW-DR-OPS-1409), Revision 1, 10/09/2019

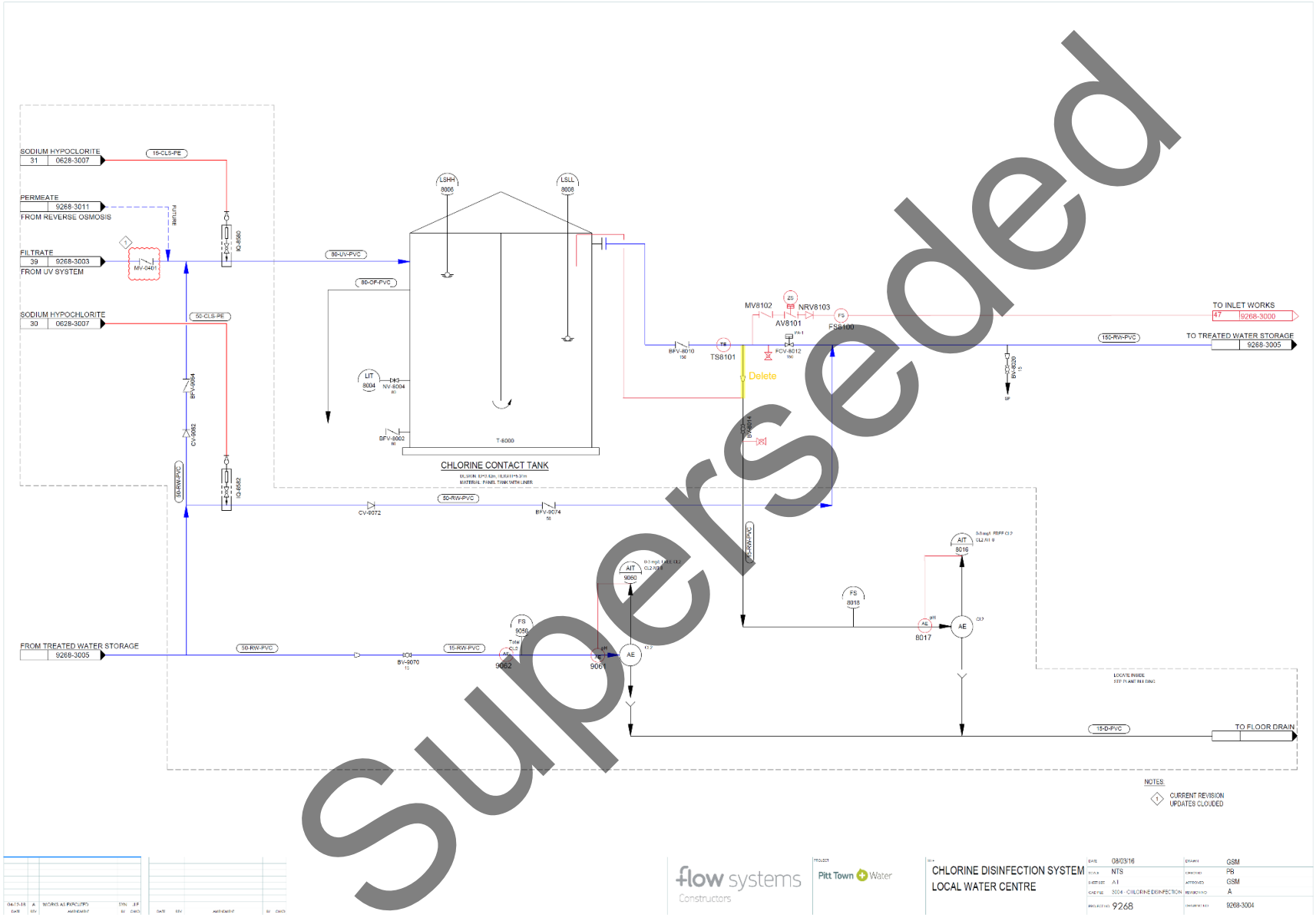

Figure 2-2 Pitt Town Water LWC chlorine disinfection system P&ID with mark-ups of new infrastructure to be installed and changes to existing assets

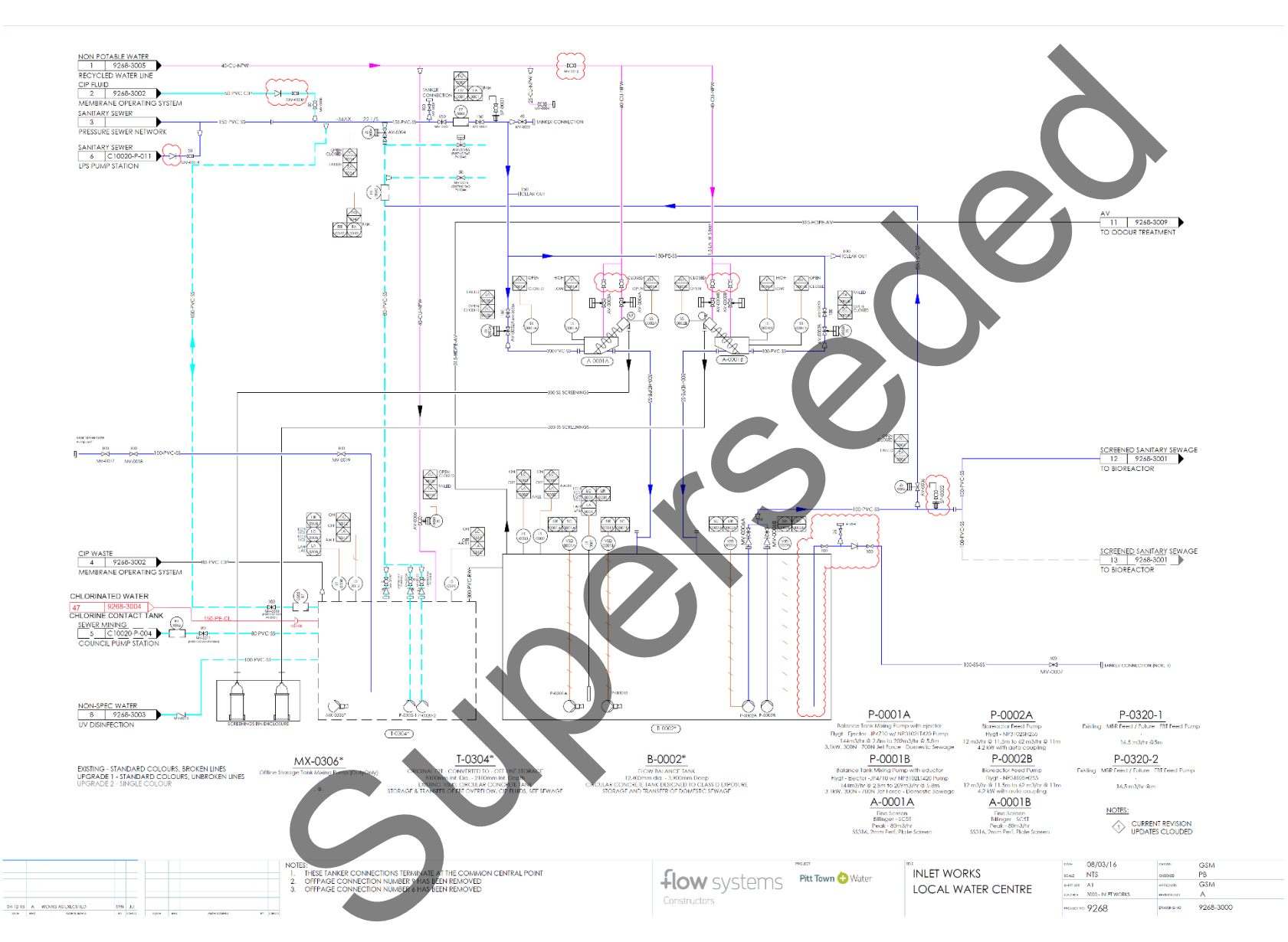

Figure 2-3 Pitt Town Water LWC inlet works P&ID with mark-ups of new infrastructures

APPENDIX C

PITT TOWN LWC SITE PHOTOS

Figure 2-4 Off-spec divert pipe valve

Figure 2-5 Off-spec divert pipe back to inlet works

Figure 2-6 Treated water chlorine and pH analyser

Figure 2-7 Chlorine contact tank chlorine and pH analyser

Figure 2-8 Temperature analyser