SA Water
OCUs Performance Assessments

Keywords: Odour assessment and measurement

Presenters: Paul Sproules[1], Heath Georgeff[2]

[1] Stantec Australia, NSW, Australia

[2] SA Water, SA, Australia

SA Water OCUs Performance Assessments

WWPS Sites:

WWPS184 - Reliance Rd Hallet Cove

WWPS282 - Capella Dr Hallet Cove

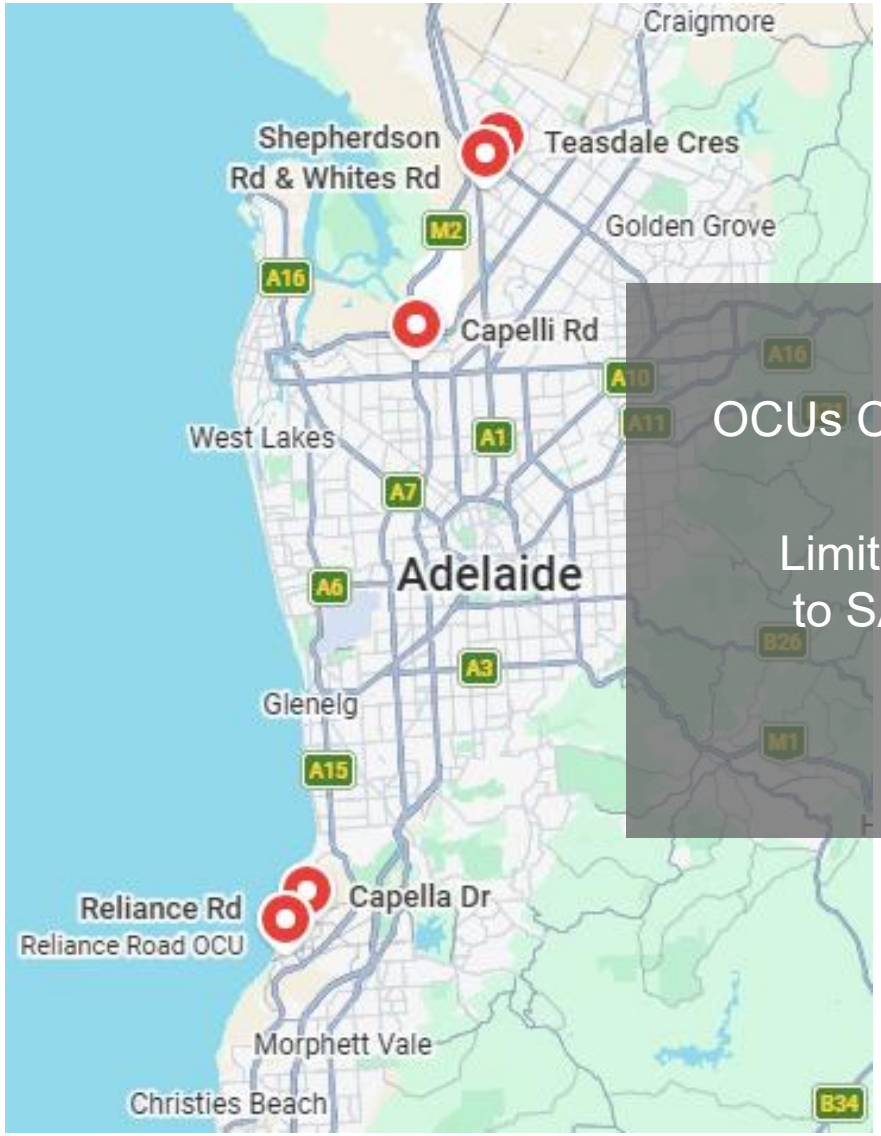
WWPS021 - Capelli Rd Wingfield

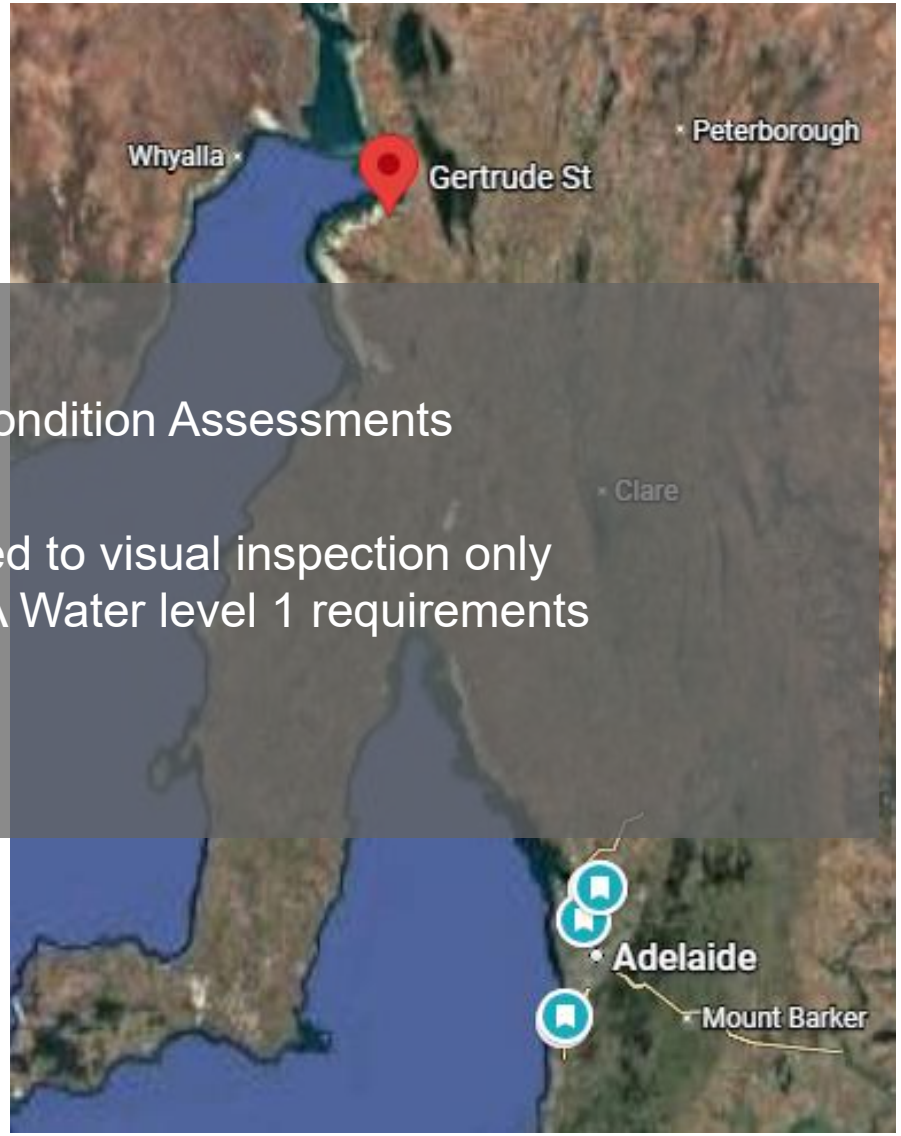
WWPS17 - Gertrude St Port Pirie

Trunk Sewer sites:

OCU1 - Teasdale Cr Parafield Gardens

OCU2 - Shepherdson Rd Parafield Gardens





OCUs Condition Assessments

Limited to visual inspection only
to SA Water level 1 requirements

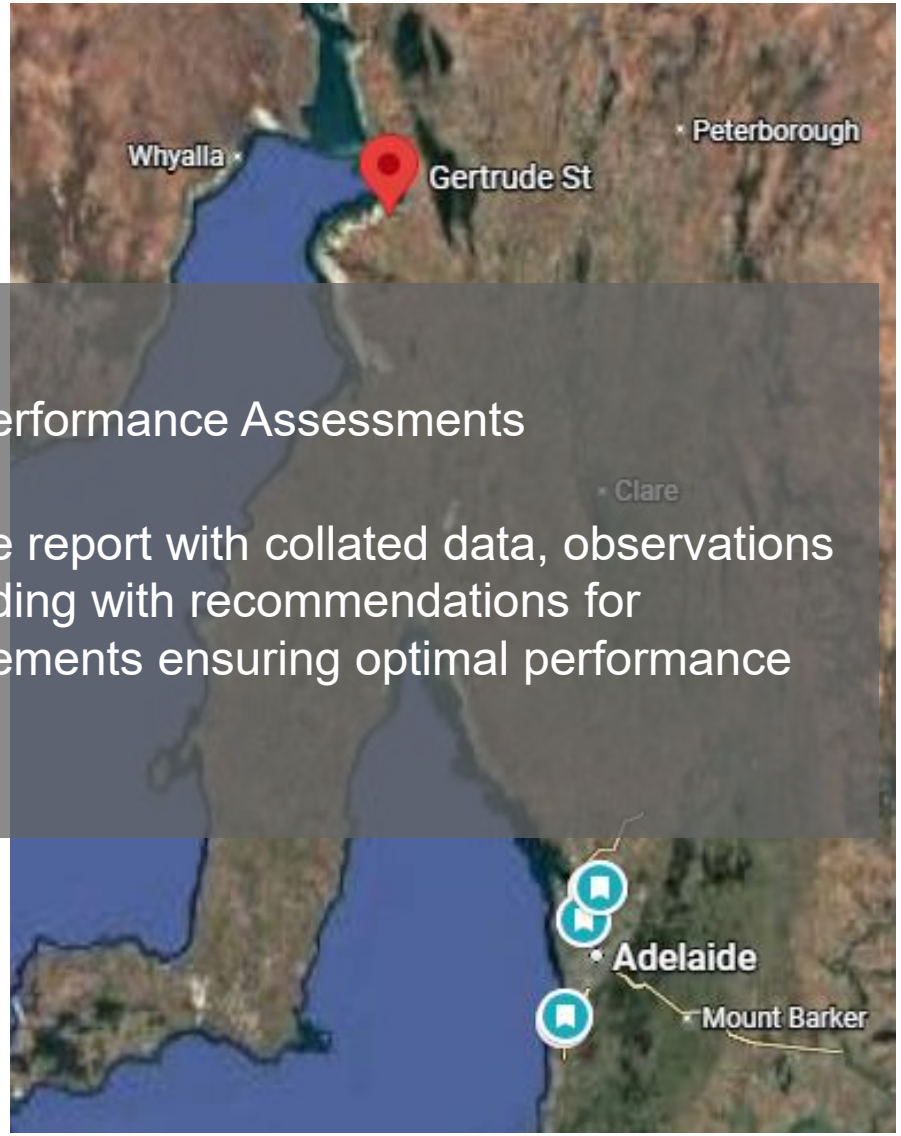
SA Water OCUs Performance Assessments

WWPS Sites:

- **WWPS184** - Reliance Rd Hallet Cove
- **WWPS282 -** Capella Dr Hallet Cove
- **WWPS021 -** Capelli Rd Wingfield
- **WWPS17 -** Gertrude St Port Pirie

Trunk Sewer sites:

- **OCU1 -** Teasdale Cr Parafield Gardens
- **OCU2 -** Shepherdson Rd Parafield Gardens



OCUs Performance Assessments

Prepare report with collated data, observations and finding with recommendations for improvements ensuring optimal performance

SA Water OCUs Performance Assessments

WWPS Sites:

- **WWPS184** - Reliance Rd Hallet Cove
- **WWPS282 -** Capella Dr Hallet Cove
- **WWPS021 -** Capelli Rd Wingfield
- **WWPS17 -** Gertrude St Port Pirie

Trunk Sewer sites:

- **OCU1 -** Teasdale Cr Parafield Gardens
- **OCU2 -** Shepherdson Rd Parafield Gardens

Two site visits were made:

17th April 2025

Condition assessments
(the five metropolitan sites)

20th to 22nd May 2025

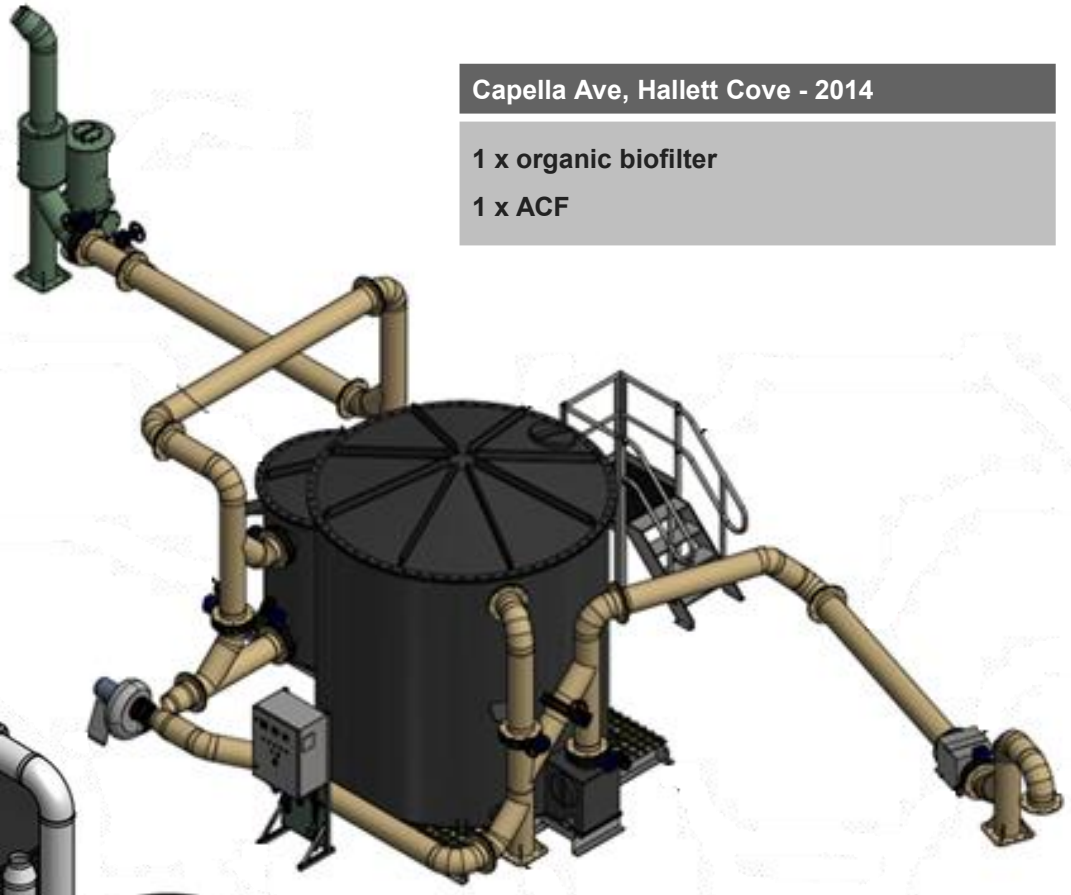
Performance assessments
(all six sites)

WWPS Sites

Reliance Rd, Hallett Cove - 2016

2 x organic biofilters

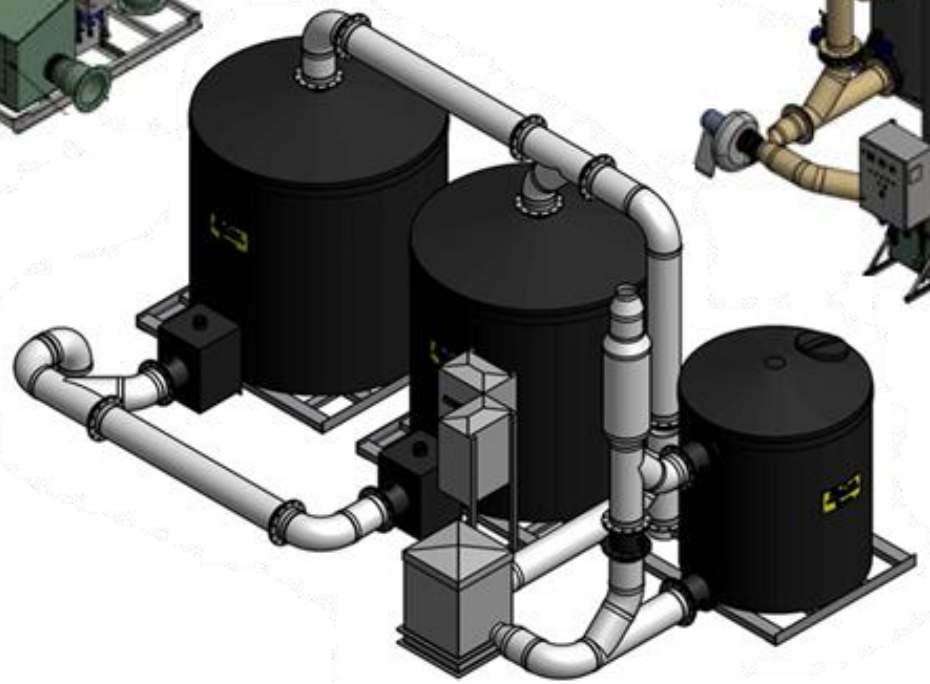
1 x activated carbon filter (ACF)



Capella Ave, Hallett Cove - 2014

1 x organic biofilter

1 x ACF

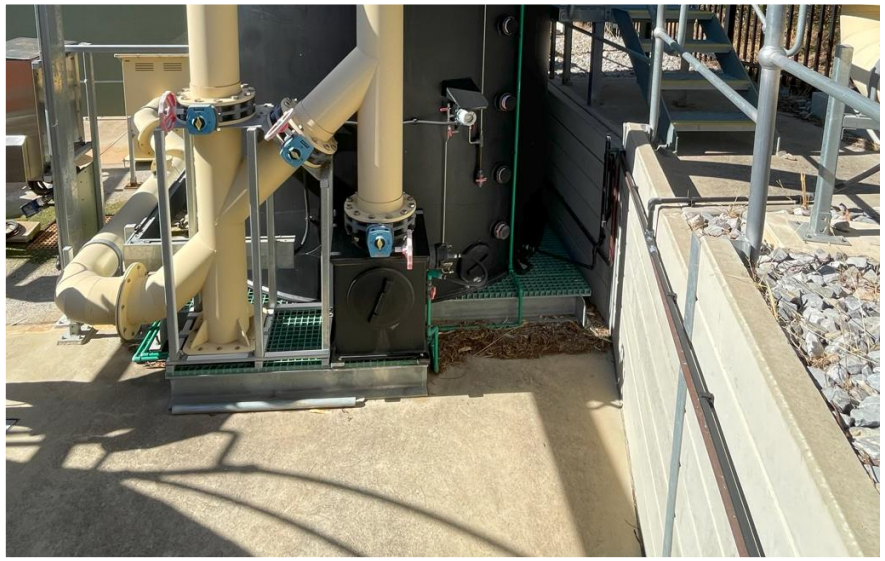


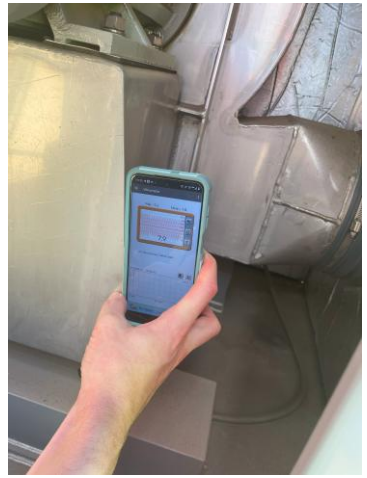
Capelli Rd, Wingfield - 2012

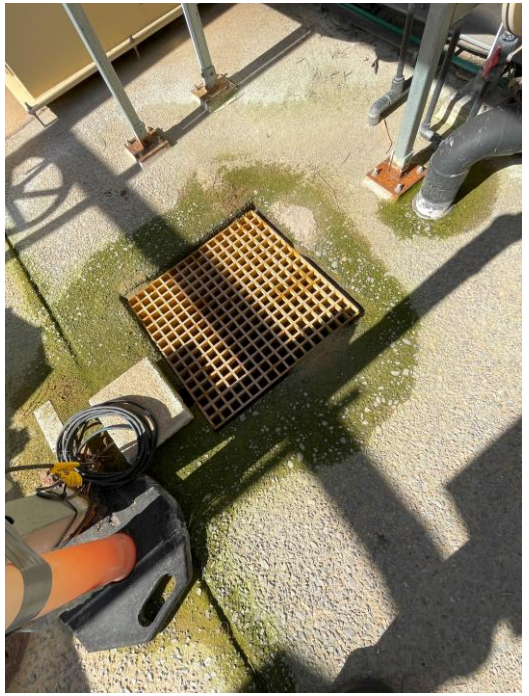
2 x organic biofilters

1 x ACF

Condition Assessments







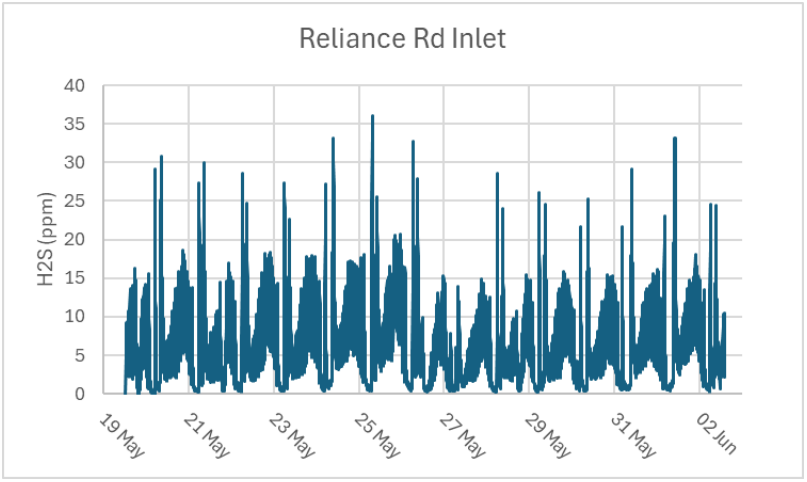
WWPS184 OCU, Reliance Road, Hallett Cove

Condition	Performance
GOOD	GOOD

Performance Assessment

KEY PARAMETER	MEASURED	TARGET
Airflow (m^3/hr)	774	2,398
pH	Not measured	N/A
dP* (Pa)	273	353
H_2S* (ppm)	0.48	<1
% efficiency	92	>90

- H_2S inlet: 6 ppm.
- Inlet volatile organic compounds (VOC): 1.5 ppm.
- H_2S after biofilters: 0.48 ppm (92% removal) via spot sample measurements.
- H_2S after carbon: 385 ppb



Recommended actions

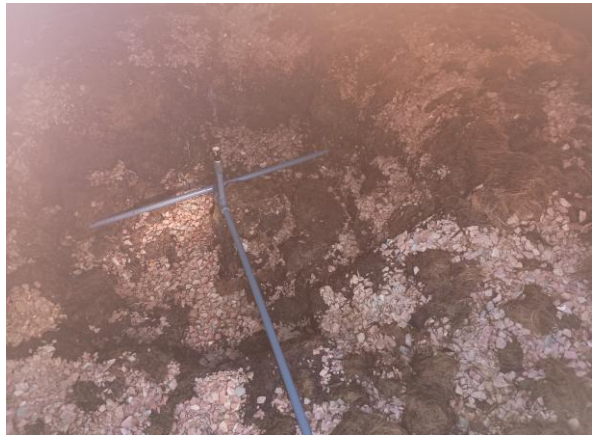
- Consideration of network ventilation and possible rectification of restricted airflow through collecting pump station manhole
- Renewal of blocked drains

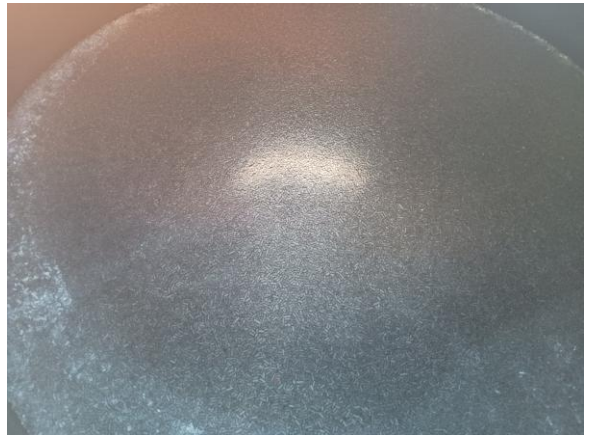
WWPS282 OCU, Capella Avenue, Hallett Cove

Condition	Performance
FAIR	GOOD

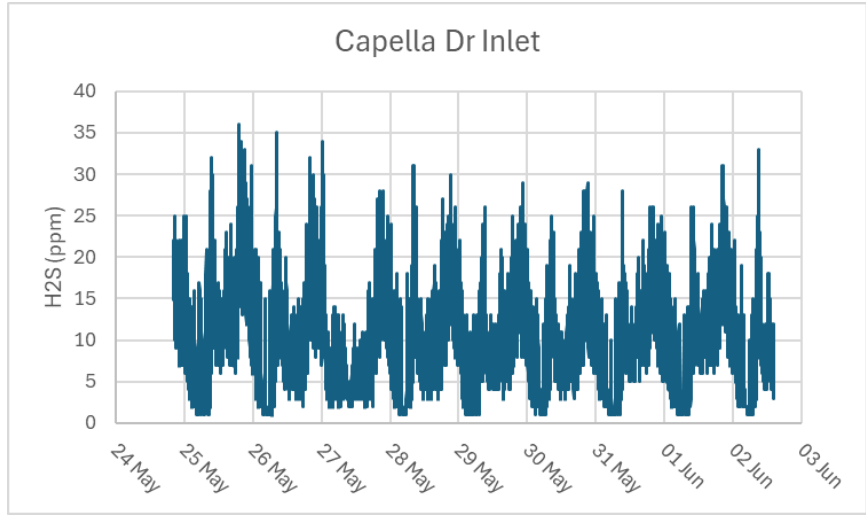
Performance Assessment

KEY PARAMETER	MEASURED	TARGET
Airflow (m^3/hr)	1080	1080
pH	-	-
dP across BF (Pa)	160	N/A
H_2S after BF (ppm)	0.3	<1
% efficiency	97	>90





- Inlet H_2S: 9.7 ppm
- Inlet VOCs: 1.5 ppm
- Outlet H_2S (post biofilter): 0.3 ppm (97% removal)
- Outlet H_2S (post carbon): 570 ppb



Recommended actions

- Investigate sump pump performance issue leading to flooding of sump.
- Fix blocked duct drain after the biofilter.
- Monitor carbon bed odour breakthrough and replace when required.

WWPS021 OCU, Capelli Road, Wingfield

Condition	Performance
FAIR	FAIR

Performance Assessment

KEY PARAMETER	MEASURED	TARGET
Airflow (m^3/hr)	1,501	2,160
pH	-	-
dP across BF1 (Pa)	600	<600
dP across BF2 (Pa)	720	<600
H_2S after BF (ppm)	3	<4.6
% efficiency	94	>90

Recommended actions

- Consideration of the restriction of foul air extraction from the sewer.
- Other items:
  - Replacement of the ductwork with FRP ductwork
  - Remedy of various leakage points
  - Renewal of the humidity sensors
  - Renewal of the H_2S sample pump
  - Renewal of the irrigation rotameters

WWPS17 OCU, Gertrude Road, Port Pirie

Condition	Performance
POOR	POOR

KEY PARAMETER	MEASURED	TARGET
Airflow (m^3/hr)	159	509 - 636
pH	-	-
dP across BF (Pa)	375	-
dP across ACF (Pa)	20	-
H_2S after BF (ppm)	1.6	<1.2
BF % efficiency	87	>90
H_2S after carbon (ppb)	400	0
ACF % efficiency	75	>99

OCU installed in 2016
1 x organic biofilter 1 x ACF

No complaints received from this site

Recommended actions

- Replacement of the biofilter media and checking of the irrigation rate and cycle.
- Replacement of the carbon media
- Repair of the hole in the site perimeter fence
- Replacement of the fan mounting
- Renewal of ductwork and expansion joints
- Rectification of the biofilter drain

Trunk Sewer sites: Parafield Gardens

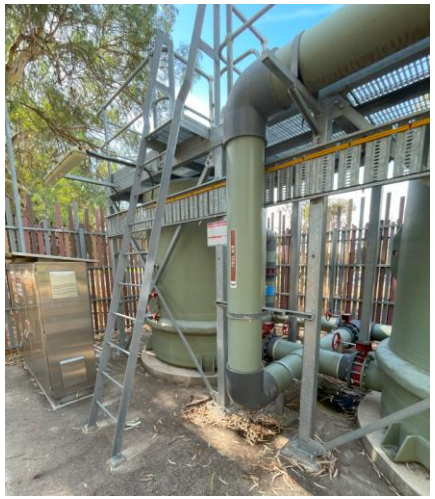
Teasdale Crescent and Shepherdson Road

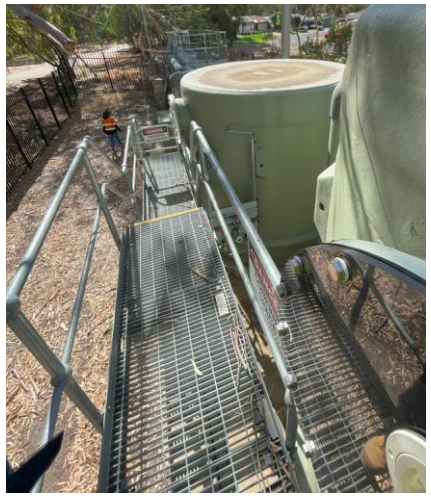
OCUs installed in 2017

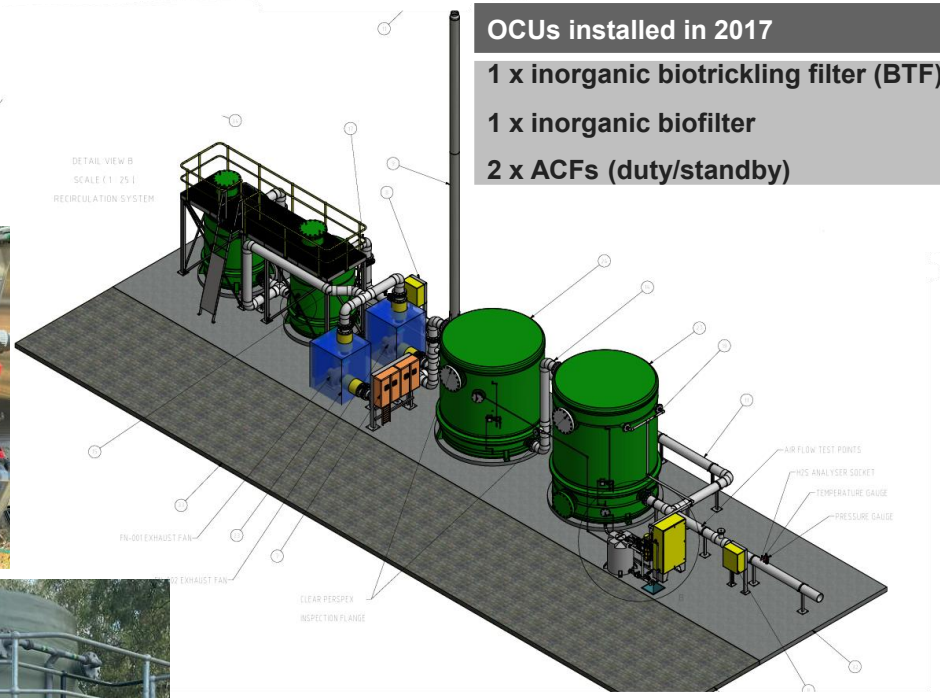
1 x inorganic biotrickling filter (BTF)

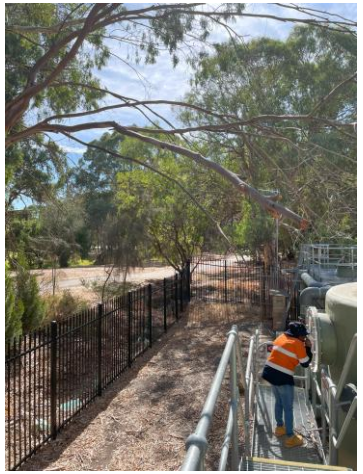
1 x inorganic biofilter

2 x ACFs (duty/standby)







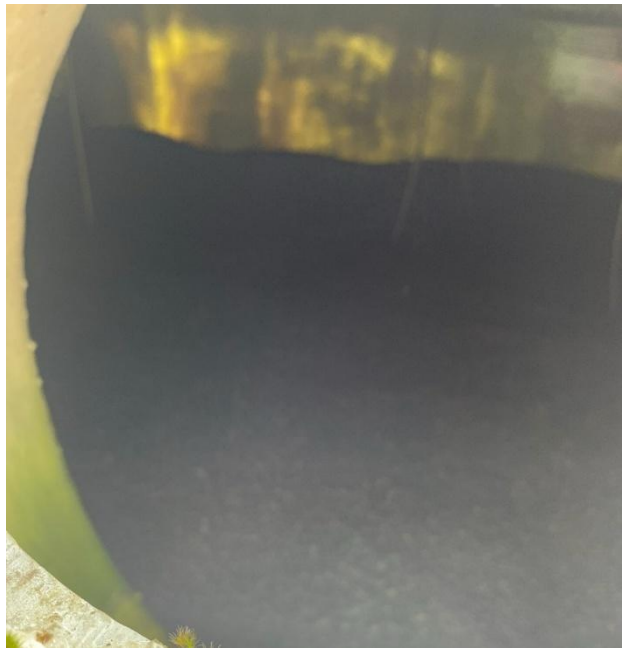


OCU1, Teasdale Crescent, Parafield Gardens

Condition	Performance
FAIR	FAIR

Performance Assessment

KEY PARAMETER	MEASURED	TARGET
Airflow (m^3/hr)	836	1,750 - 2,250
pH	2.68	1 - 3
dP across BTF (kPa)	1.05	<1.5
dP across BF (kPa)	0.6	<1.5
dP across ACF (kPa)	0.41	<1.5
H_2S after BTF (ppm)	1.8	<3
BTF % efficiency	>99	>99
H_2S after BF (ppm)	0.1	<0.2
BF % efficiency	95	>90



Recommended actions

- Renewal of:
  - leaking sampling ports
  - pressure indicators
  - dosing pump mounting and corroded cable tray
- Removal of an intrusive tree branch at top platform.
- Calibration of the Dräger Polytrons
- Consideration of sewer corrosion. High septicity is recommended to be addressed to prolong sewer life
- Although H_2S removal is good, further assessment of possible BTF media compaction will determine if DP continues to rise leading to potential biomass degradation putting performance pressures on the system

OCU2, Shepherdson Road, Parafield Gardens

Condition	Performance
FAIR	POOR

Performance Assessment

KEY PARAMETER	MEASURED	TARGET
Airflow (m^3/hr)	412	1,750-2,250
pH	3.26	1-3
dP across BTF (kPa)	2.58	<1.5
dP across BF (kPa)	0.08	<1.5
dP across ACF (kPa)	0.23	<1.5
H_2S after BTF (ppm)	30	<7.5
BTF % efficiency	96	>99
H_2S after BF (ppm)	0.6	<3
BF % efficiency	98	>90

Recommended actions

- High sewer septicity to be addressed to prolong sewer life
- Calibration of the Dräger Polytron units
- Renewal of:
  - leaking sampling ports, pressure indicators
  - bypass duct condensate accumulation
  - repair delaminating vessel rib at rear of biofilter
- Immediate attention to compacted BTF media preventing full airflow through BTF
- Signs indicate biomass degradation and increased activated carbon media usage

No complaints received from this site

Issues related to undraw of air from the sewer

Supporting Cast

Wider implications of findings

Where local residents were exposed to undertreated sewer gases

Sites exposed to higher OPEX

Sites with elevated corrosion rates

Planning improvements

Data and observations for planned interventions

Quantifiable evidence to improve internal systems

Overcoming maintenance challenges

Identify maintenance challenges

Resourcing of available staff

Identify operator training gaps

- additional training later this year
- different operating needs of the sites

Conclusions

Provided data and evidence of performance issues

Emphasised the need for better informed and trained operators

Increased awareness of issues for more effective plant operations

Any questions?

Heath Georgeff – SA Water | **Paul Sproules – Stantec**

heath.georgeff@sawater.com.au **paul.sproules@stantec.com**

Working together

Communities are fundamental. Whether around the corner or across the globe, they provide a foundation, a sense of place and of belonging. That's why at Stantec, we always design with community in mind.

We care about the communities we serve—because they're our communities too. We're designers, planners, engineers, scientists, and project managers, innovating together at the intersection of community, creativity, and client relationships. Balancing these priorities results in projects that advance the quality of life in communities across the globe. Stantec trades on the Toronto Stock Exchange (TSX) and the New York Stock Exchange (NYSE) under the symbol STN.

Australian offices:
Adelaide, Albany, Brisbane, Busselton, Gold Coast, Melbourne, Perth, Rockhampton, Sydney

New Zealand offices:
Alexandra, Auckland, Balclutha, Christchurch, Dunedin, Gisborne, Greymouth, Hamilton, Hastings, Napier, Nelson, Palmerston North, Queenstown, Tauranga, Wellington, Whangārei

Connect with us

Stantec.com