Managing an Emergency Situation at Rochester Water Treatment Plant

Greg Wood,
Regional Operations Manager NSW/VIC/TAS
Overview

- TRILITY overview
- CAMS contract overview
- Rochester Emergency
- Lessons Learned
TRILITY Overview
TRILITY is a water utility service provider to the municipal, industrial and resource sectors.

• Operating in Australia since 1993

• Proud to operate and maintain more than 34 treatment plants with a combined capacity of over 1.4 GL/d.

• Contracts throughout Australia:
  • 21 water treatment plants
  • 11 wastewater treatment and reuse plants/schemes
  • 2 desalination schemes

• 181 employees within the TRILITY Group Pty Ltd (as at end June 2014)

• Offices – Adelaide, Brisbane and Perth
We cover the entire value chain

Our broad range of capabilities differentiate us from Australian competitors
What we do well

Water, Wastewater, Reuse Water

Municipal, Industrial, Resource

Design, Finance, Operate
We have an Australia wide presence
CAMS Contract Overview
TRILITIY worked in collaboration with Coliban Water to manage operations and maintenance of Coliban Water’s Water and Waste Water Treatment Facilities across north central Victoria providing water and wastewater services to urban and regional customers across 49 towns.

Coliban Water has a significant portfolio of water and wastewater assets including:

- 19 water treatment plants
- 13 water reclamation plants
- 227 water and wastewater pumping stations
- Approximately 2,351 km of water mains
- Approximately 1,785 km of sewer mains
- Approximately 438 km of rural irrigation channels
Rochester Emergency
Rochester - Victoria

Campaspe River flows north into Murray River
Rochester - Victoria

Approximately 3000 people.

Mainly rural employment
Rochester Water Treatment Plant - 2011

9.0 MLD clarification/filtration plant

Excellently designed clarifier

Raw water from Campaspe River

2 x ground level CWS tanks

Treated water transfers into tower
Well designed clarifier.
- Campaspe River flooded Rochester Friday 14\textsuperscript{th} Jan 2011.
- The town was evacuated throughout that afternoon.
- Water treatment plant monitored and operated remotely.
- The water treatment plant became inoperable sometime between that evening and the following morning.
- At the floods highest point there was up to 300mm of flood water through the entire plant.
• When the plant stopped operating, the elevated storage drained until empty and pressure gradually dropped in the entire reticulation system.
• Flood water infiltrated the pipes and contaminated the reticulation system.
Crisis meeting in the morning.

Arrive at Rochester WTP at 1130 AM.

Water covering the drive way entrance to the depth of 1.0 Metre.

Most of the plant at least 300mm.
Rochester WTP – What was found

- All pumps, motors and drives were soaking wet.
- Wiring in effected cubicles and switch boards wet.
- Ground Clear Water Storages inundated with flood water.
- PLC cards and device net communications modules were soaked.
- Many invalid SCADA signals.
- A range of instrumentation was found to be not functioning.
• Plant Operators began cleaning up and coordinating contractors.

• CWS No 1 was considered to be too severely contaminated by flood water and was subsequently left off line for the short term.

• CWS No 2 was only infiltrated through some small engineering holes in the side of the wall.

• CWS No 2 turbidity of @ 5.0 NTU.

• Plan was to transfer this CWS No 2 water into the Elevated Tower so that the reticulation system could be pressurised and town water could be used by residents to hose out their homes.
Raw Water Inlet
The elevated tower supplies carrier water to each of the chemical dosing systems at the WTP.

Water needed in the elevated storage to be able to run initial plant trials because the plant cannot run without carrier water.

It was decided that the elevated storage tank needed to be isolated from town supply to ensure that no water supplied to town whilst trials were being undertaken.

Elevated tower common inlet/outlet pipe does not allow high lift pumps to supply elevated storage when outlet pipe is isolated.

High level storage was isolated from town reticulation by CAMS networks operators to ensure that no water was supplied to town until potable quality available.
Rochester Emergency January 2011

Elevated Storage Pipe Configuration
WTP was still unable to operate in auto mode so a plan was devised to enable the plant to run manually.

CWS No 2 needed to be completely pumped out and thoroughly cleaned prior to fresh potable water being introduced.

A large portable diesel pump was onsite and this was considered the most appropriate means to empty CWS No2.

The pump and trailer weighed approx 2.0 tonne and would not fit under clarifier pipe work to reach the required location to pump out CWS No2.

A crane was arranged to attend site to lift the pump over the offending pipe work and relocate as required.
- Crane relocated pump and CWS No2 was emptied.

- Water tankers were booked to attend site AM Tuesday 18th January.
• Once CWS No2 empty and cleaned, water tankers began filling.

• Plant rigged to operate in filter to waste mode so that start up trials could begin.

• Filtered water sent directly to backwash waste pit and transferred back to river using large diesel pump.

• Goal was to provide good quality water into elevated storage to enable plant dosing systems.

• Also allow reticulation flushing to occur when appropriate.
Campaspe River in Flood
Rochester Emergency January 2011

- Raw water turbidity @ 200 NTU and very high colour.
- Plant attended 24 hours per day until the process has settled and WTP functioning in auto mode.
- WTP was operating in manual, the site chlorine gas system was rigged to dose chlorine into the tanker water automatically as it was pumped into CWS No 2.
- Many dosing systems and switch gear still inoperable or wet.
- Waiting for dosing system availability and the best time to commence flushing.
• Raw water turbidity reduced to 120 NTU.

• Plant running in manual and to waste.

• Potable quality water manually transferred into elevated storage.

• Decision made to commence flushing.

• Jar testing continually occurring.
• Mid morning filter to waste ceased so filtered water supplied into CWS No 2.

• Plant switched to auto mode.

• Flushing of town completed late evening.

• Tanker drivers advised to cease deliveries and remain on standby.

• Plant continued to operate in automatic mode with good quality filtered water.
Plant Upgrade
• Upgrades have made the plant impressively robust.
• Flood wall and flood gates surround the facility.
Upgrade included flood wall
Plant Upgrade
New Upgrade Consisted of :-

• Ozone contact column capable of providing pre-ozonation and post ozonation, as well as ozone generation;

• Installation of coagulation control;

• Installation of membrane microfiltration;

• Conversion of existing sand filters into Granular Activated Carbon (GAC) filters;

• Sewer connection upgrade to discharge chemical clean waste from the membrane process and flood mitigation sewer pump station;

• Supernatant return works for the lagoon and backwash settling tank/stormwater discharge works;

• Flood protection barriers around the WTP site;

• New buildings and storage, vehicle access, drainage, chemical bunds, as well as site mechanical works including water, air, and reticulation.
Plant Upgrade – Commissioned 2013
Upgraded Rochester WTP
Lessons Learned
Lessons Learned

- Design in contingency.
- Bulk Water Management.
- Drills and Emergency Preparedness.
- Review of procedures.
- Awareness of all stakeholders.
- Need to retain human element to compliment automation.
- PPP arrangements successful.