Wastewater: Tackle the source, not the symptom.

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Wastewater sources

- Waste from winery operations
  - winemaking
  - cleaning
  - transfer and storage

- Environment
  - Stormwater in open tank farms
  - Runoff from roadways and building infrastructure
  - Unless diverted from the wastewater system
The symptoms

- Wastewater system costs
- System under/over load
- Odour
- Discharge fees
- Irrigation restrictions
- Carbon footprint
- Wasted product
Why understand sources?

There are significant opportunities to improve but;

- Without data on the generation of waste within wineries we are left with guesswork
- Need to study winery operations by process and from a wastewater perspective
- To enable wastewater to be treatable and re-use friendly!
Winery operations by process:

- Allows the cellar operations to be studied in terms of their waste production.

- Will identify where best practice can be applied to improve the waste stream.

- May expose processes that cause problems in wastewater management.
Understanding wastewater sources – links to best practices

- Site ‘audits’ of cellar production processes
- This helped us understand the issues at an industry level
- Observation and documentation of ‘best practice’ SOP`s in wine production
Stage 2 audit of cellar operations

- Study of 4 winery sites over 18 months
- Observation of each cellar operation in detail
- Collection of waste water samples for analysis
- To determine process impacts on the waste water stream
‘Best Practice’

- Through the audit process define current best practice SOP`s
- Document new ideas and innovation for future industry reference
- Research is ongoing
What is the purpose?

To reduce problem waste water components;
- high organic loads
- high salt levels
- excess solids
- lost product
Implement the 3 R`s

- Reduce
- Reuse
- Recycle
Reduce

- Inline product changeovers
- Water use by using high pressure hose nozzles or high pressure cleaners
- Water use by sweeping with brooms/squeegees before hosing
- Use of high water use cellar procedures
- Unnecessary water loss via leaking taps, lines and equipment.
Dry sweeping before hosing

- Dry sweeping will minimise the time of hose usage to clean the area.
- Solids can be removed before entering or blocking the drain.
- Reduce ‘recreational’ hosing and high water use in cellars.
High pressure cleaners

- The average cellar hose with a high pressure nozzle runs at 0.9L/s i.e. 54L/min
- High pressure cleaners run at 0.27L/sec i.e. 16L/min – 3x less!
- Reduction in water use to effectively clean cellar areas
Re-use

- Collect site rainwater for use in the winery
- Water used for cellar cleaning
- Water used for RDV and Centrifuge cooling
- Cleaning agents e.g. caustic, citric and cleanskin solutions.
- Large volume must transfer water in vintage?
Must push water reuse scheme
Crusher Recirculation

Winery Wastewater Management
Crusher Recirculation
Crusher Recirculation

- Automated control from crusher office
- Cleaning is easy and effective
- Comparatively small investment
- Large returns (not just in water saved)
- Can be issues on start of red crushing
- Monitoring and maintenance is required
Water / Caustic Reuse

- Initial rinse of tank using water from unit
- Recirculate caustic and collect
- Recirculate neutralising solution and collect
- Use clean water to rinse and collect
- Monitor solution strengths
- Use collected water for initial rinse of next tank to be cleaned
Water / Caustic Reuse
Recycle

- Recycled winery and sewage water for garden/lawn irrigation
- Recycled wastewater for vineyard/pasture or woodlot irrigation
- Stormwater diversion on tank farms
- Viable wastes collected for reprocessing
Waste Collected for Recycling

- Juice/water run off from marc bays
- Juicy water from crusher recirculation
- RDV cut-out water
- Investigating tartrate solids recovery after cold stabilisation
- Cleaning solution recovery post cellar use e.g. bulk spent caustic in larger wineries
Summary

- Reduce water use where possible at the source
- Reuse chemicals until spent
- No water is used only once (all water has a secondary purpose)
- All water is treated to a point for sustainable reuse
- Recycled water is used to reduce mains/supply requirements
Thankyou

- CSIRO Land and Water would like to thank....
- GWRDC
- Stage 2 Audit participating wineries