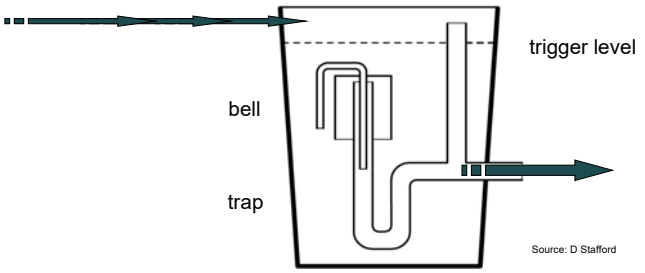
On-site Wastewater Management Training Course

Passive Dosing Systems

Siphons and Flouts, Low Pressure Effluent Distribution Systems

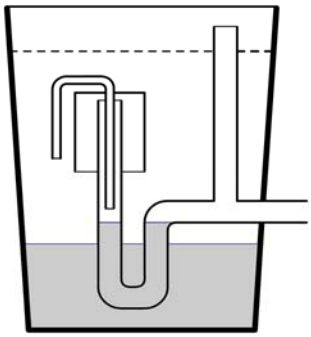
Dosing Siphon Anatomy



Siphons

- Transform low or variable flows into regular doses
- Suitable for pressurising manifolds and drainfields
- Have no moving parts
- Require no electricity
- Technology over 100 years old
- Require understanding to ensure appropriate use and operation

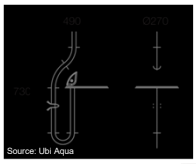
Siphon Cycle

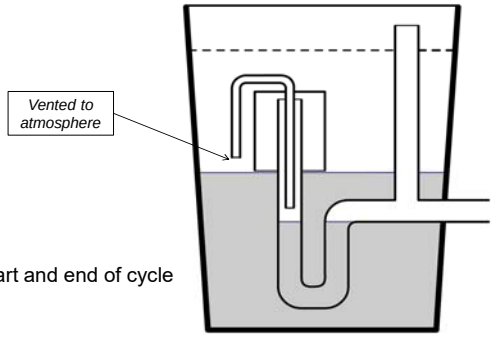


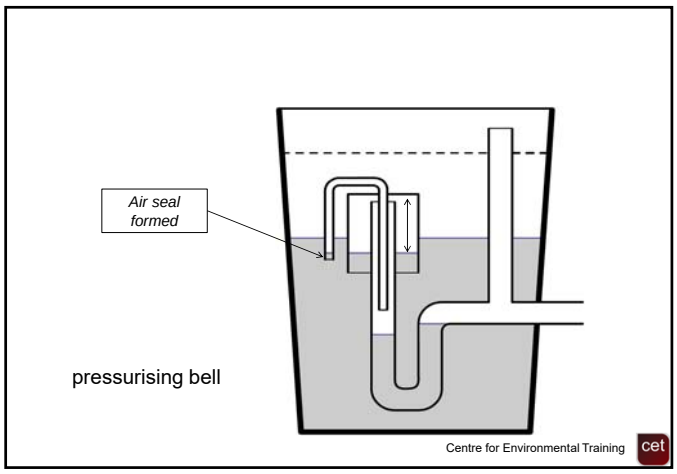
trap primed

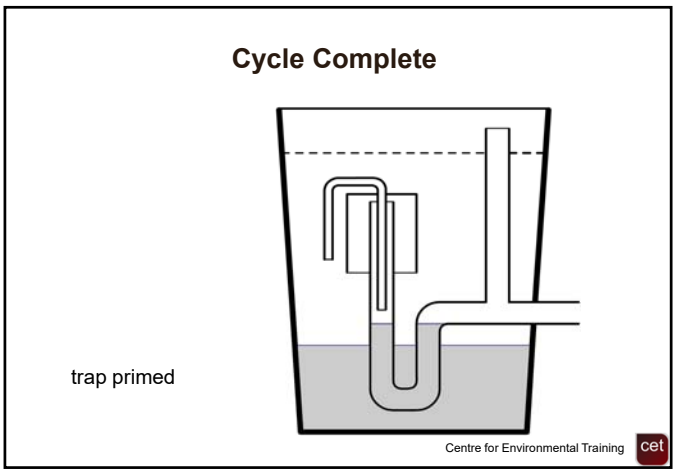
Various Siphons Available

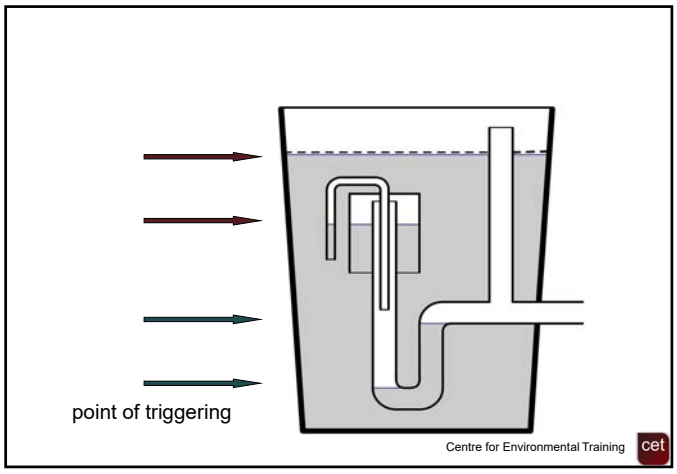
- Stafford siphon
- Flowking
- ecoteam Surgeflow
- Ubi Aqua by ecoteam
- Orenco

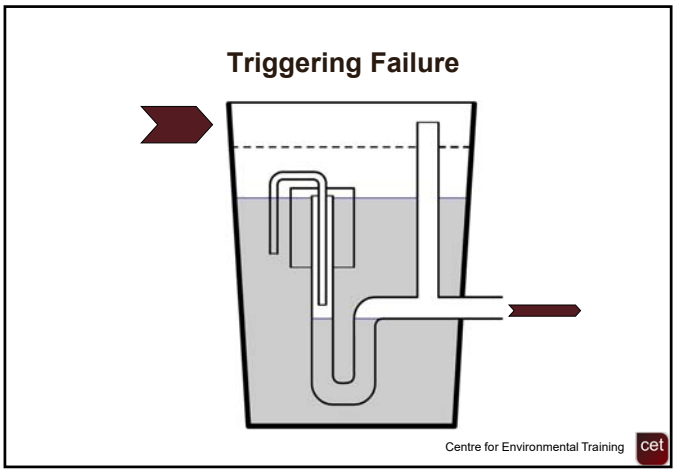


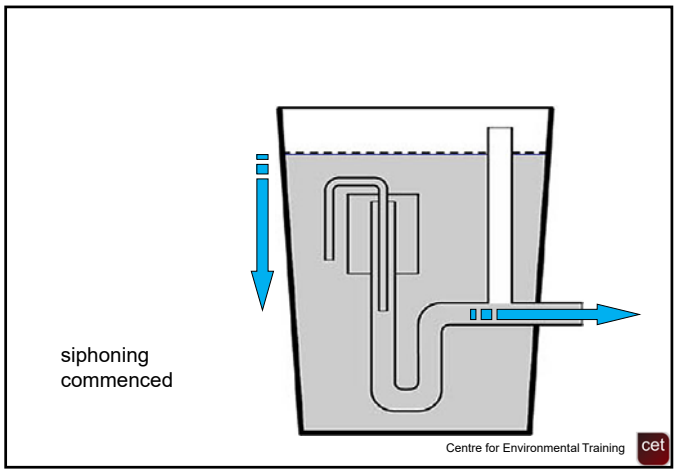


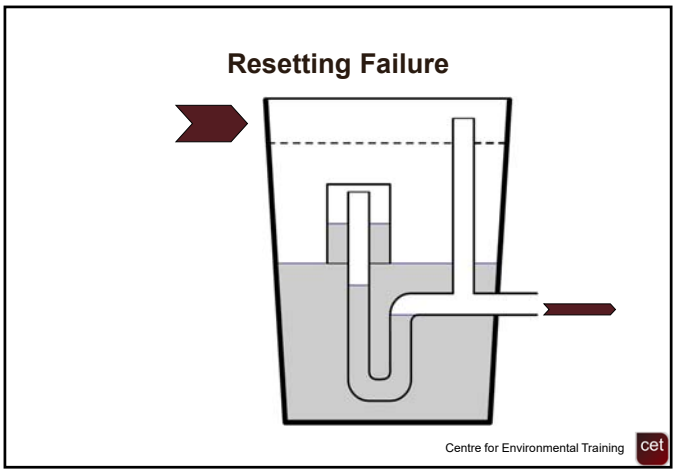

Air seal formed
pressurising bell
Centre for Environmental Training
cet


Cycle Complete
trap primed
Centre for Environmental Training
cet

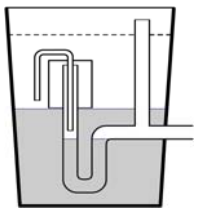

point of triggering
Centre for Environmental Training
cet


Triggering Failure
Centre for Environmental Training
cet


siphoning commenced
Centre for Environmental Training
cet

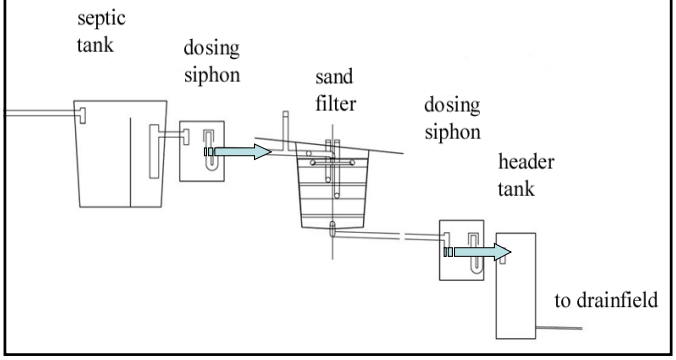

Resetting Failure
Centre for Environmental Training
cet

Siphon Optimisation

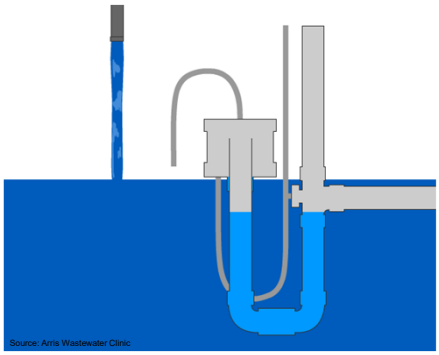


- An outlet filter must be fitted to the septic tank
- Bell:trap volume approximately 3:1
- Bell diameter:trap pipe diameter approximately 3:1
- Deep trap easier to trigger
- Shallow traps need to be driven with high inflow rates
- Balance tube required for reliable resetting
- Calibration of relationship of balance tube ends important

Use



Siphon Operation



Applications

- Domestic waste water treatment system, Martinsville, NSW
- One of two dosing siphons in the system

Stafford Siphon Developed

- Reliably triggers at inflow rates <0.2 L/m
- Reliably resets at inflow rates >30 L/m

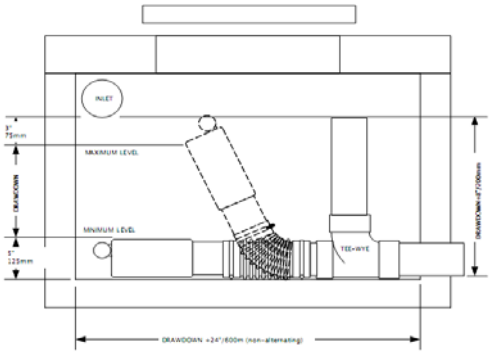
Applications

- Cheese making waste treatment, Nimbin, NSW
- Doses a drainfield manifold with limited fall

Applications

Greywater septic tank to dosing chamber, near Nimbin, NSW

Flout



Applications

Testing squirt height and uniformity, near Nimbin

Flout dosing a sand filter

Flout

- Single flout
- Double flout
- Low drawdown possible with larger dose volume
- http://www.flout.net/rissyplastics2/
- http://control.visionscape.com.au/page29091/Sales---Flout.aspx

Flout

Low Pressure Effluent Distribution (LPED) Systems

Definitions (AS/NZS1547:2012)

LPED Irrigation

- Shallow subsurface irrigation of effluent into topsoil through low pressure effluent distribution (LPED) lines

LPED line

- A pressure line perforated with drilled squirt holes and nestled in a distribution line

LPED Irrigation

- Minimum 1,000mm spacing between LPED trenches
- Trenches constructed along the contour on sloping ground (max 27% gradient)
- All LPED systems should incorporate capacity for flushing (as per Figure M3)
- LPED systems require appropriate hydraulic design

LPED Irrigation

- Suitable for both Primary (with outlet filter) and Secondary effluent
- On moderate to flat slopes up to 10-15%
- Distributed into shallow trenches 200mm wide by 200mm deep, excavated in good quality topsoil
- Minimum 250mm topsoil depth below application depth for Category 5 or 6 soils

DIRs for LPED

Soil Category	Soil texture	Structure	Drip and spray irrigation	LPED irrigation
			DIR mm/day	
1	Gravel and sand	--	5	Not advised
2	Sandy loam	All	5	4
3	Loam	All	4	3.5
4	Clay loam	All	3.5	3
5	Light clay	All	3	2.5
6	Medium to heavy clay	--	2	Not advised

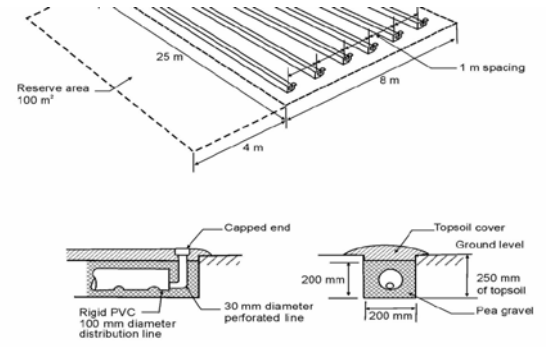
LPED Irrigation

- Require dosed flow by siphon, Flout or pump (not gravity fed)
- Ensures even distribution along whole LPED trench, avoids spot loading of slotted pipe
- Facilitates hydraulic and nutrient uptake by transpiration and seepage
- Use sequencing valve to alternate loading of lines (pump only)

LPED Irrigation

- Pressure line 25-40mm PVC with 3-6mm drilled holes at appropriate spacing for even distribution along whole length
- Clean water test to observe even squirt height before covering
- Distribution line Ag-pipe or slotted 100mm PVC

LPED Irrigation



References

- The Flout Dosing Device. A device for gravity dosing of effluent or stormwater. http://control.visionscape.com.au/page29091/Sales---Flout.aspx
- Arris Wastewater Clinic automatic dosing siphons https://www.arriswc.com.au/sample-page/automatic-dosing-siphons/