

On-site Wastewater Management Training Course

Passive Dosing Systems

Siphons and Flouts, Low Pressure Effluent Distribution Systems

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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

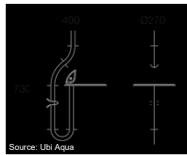
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Various Siphons Available

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



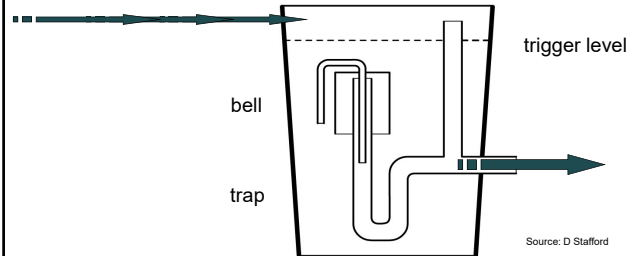
Source: Aris Wastewater Clinic



Source: Ubi Aqua

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Dosing Siphon Anatomy

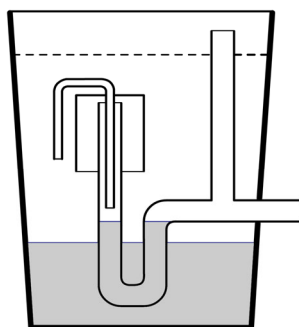


Source: D Stafford

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Siphon Cycle

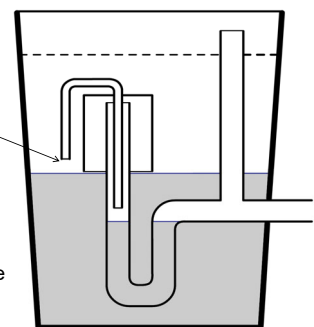
trap primed



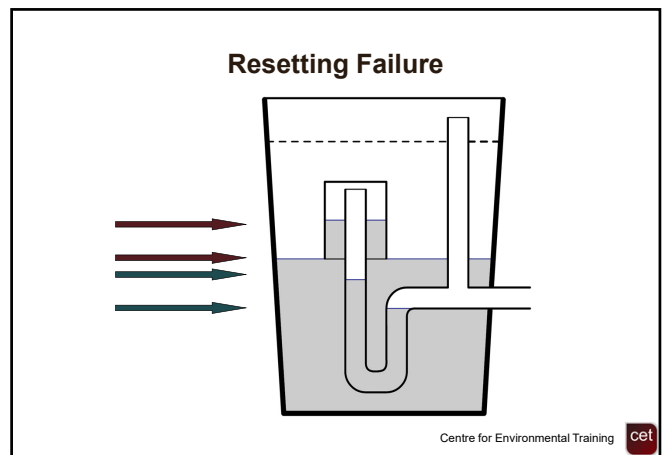
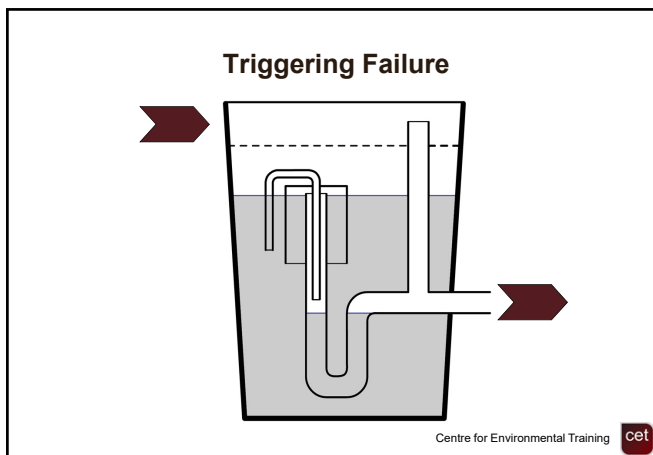
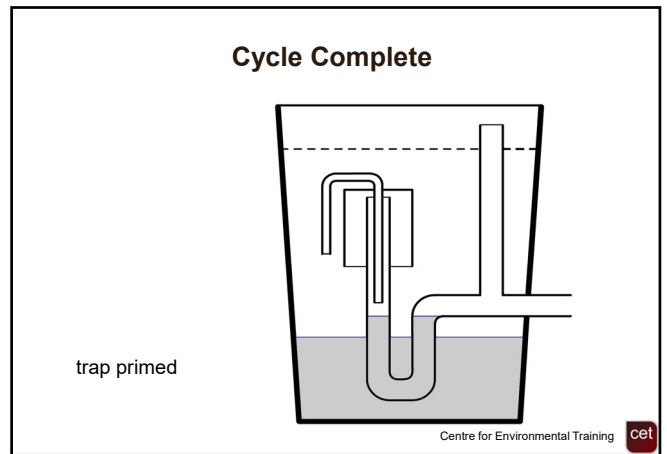
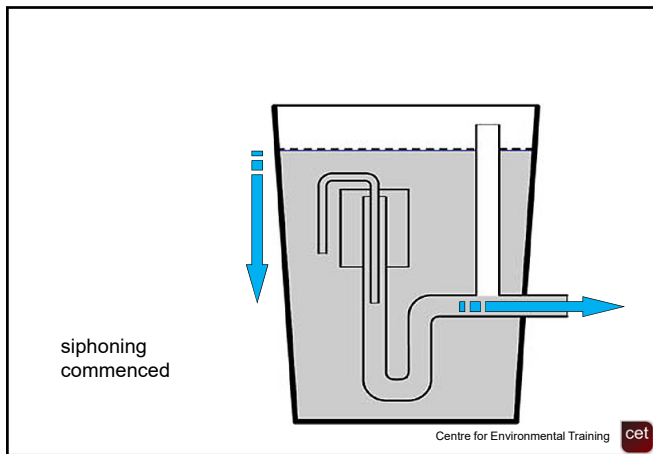
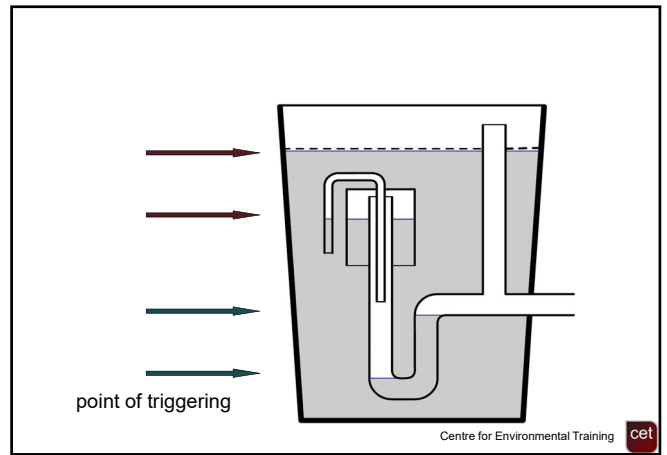
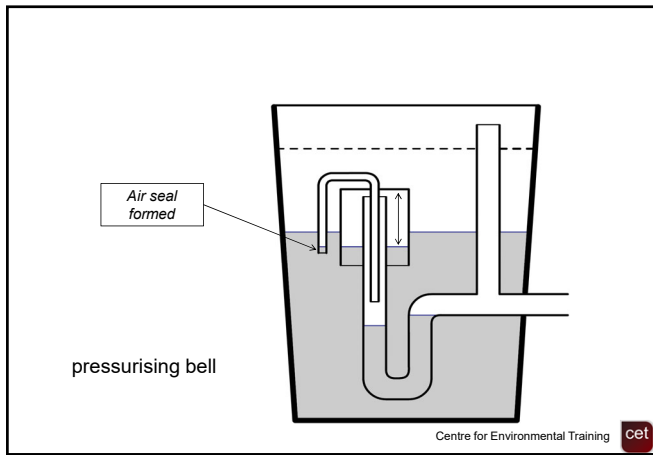
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start and end of cycle

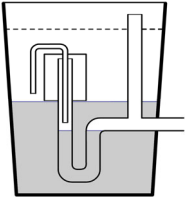
Vented to atmosphere



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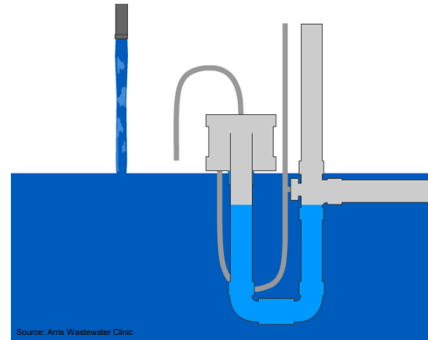
Siphon Optimisation



- 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

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Siphon Operation

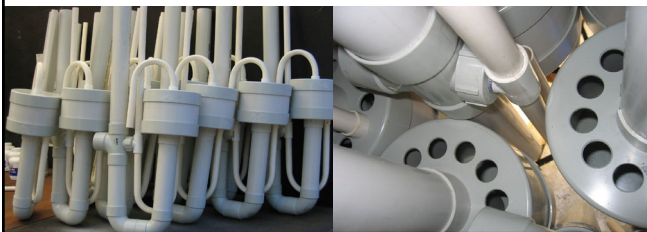


Source: Aris Wastewater Clinic

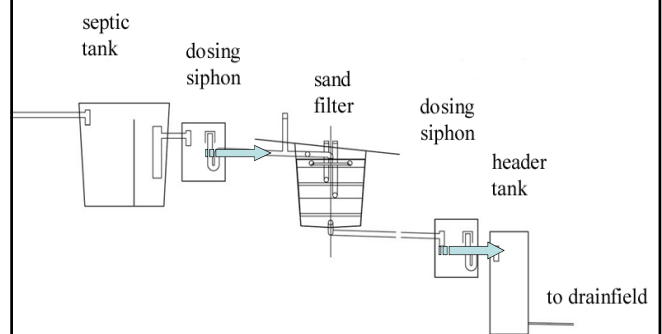
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Stafford Siphon Developed

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



Use



Applications



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

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Applications



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



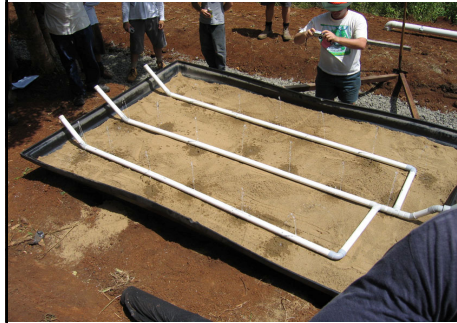
Applications



Greywater septic tank to dosing chamber, near Nimbin, NSW

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Applications

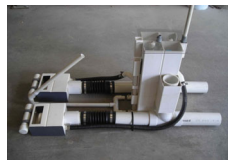


Testing squirt height and uniformity, near Nimbin

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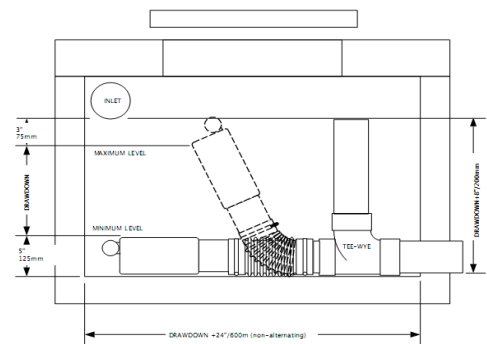
Flout

- Single flout
- Double flout
- Low drawdown possible with larger dose volume
- <https://rissyplastics.com/flout-systems/>
- <https://www.onsitesite.com/the-flout-dosing-device/>



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Flout



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Flout dosing a sand filter



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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

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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

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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)

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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

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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

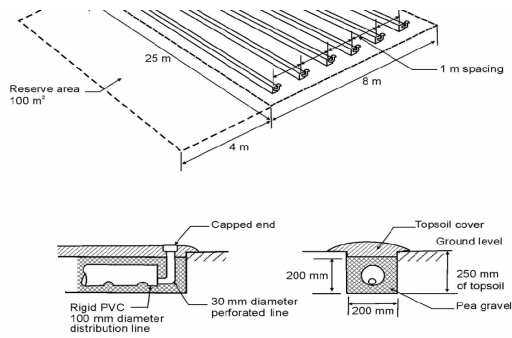
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LPED Irrigation

- 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

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LPED Irrigation



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References

- The Flout Dosing Device. A device for gravity dosing of effluent or stormwater.
<https://www.onsiteisite.com/the-flout-dosing-device/>
- Arris Wastewater Clinic automatic dosing siphons
<https://www.clinic.com.au/sample-page/automatic-dosing-siphons/>

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