

Environment and Heritage Committee Sustainable Cities 2025

Submission

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3. Establish an integrated sustainable water and stormwater management system addressing, capture, consumption, treatment and re-use opportunities.

Localised community (100 to 1000 homes) integrated water management schemes are best practice for the future because infrastructure and community and environmental requirements and activities can be beneficially centered on the sub-catchment. Quality of human life and nature is enhanced through the allocation of green / recreational space for recycling reclaimed water.

Integrating the 3 waters locally can more easily meet local financial, economic, cultural, social and environmental needs and goals and promote 'ownership' of and 'responsibility' for the waters, than centralized options.

The interrelationship and layout of the 3 waters should determine the 'blueprint' for the whole sustainable urban development design. Rainwater from roofs and stormwater from ground level can be captured in box gutters, hollow walls and fences and stored in above- and below-ground tanks. The volume of household wastewater generated can of course be reduced through water conserving household fixtures and appliances.

Best practice for economical small scale decentralized sewerage systems with reuse application is the **STEP / STEG** system (Septic Tank Effluent Pump & Septic Tank Effluent Gravity). The **key aspects** include:

1. totally watertight system (from the house to the treatment plant)
2. centralized professional management of onsite & decentralized sewerage systems utilizing remote monitoring
3. treated effluent and 'biosolids' are beneficially reused or recycled
4. household education and involvement.

The **key components** of the decentralized sewerage system (for clusters of 10's to 100's of homes) are:

1. household watertight interceptor tank (anaerobic or aerobic) with effluent filter
2. primary treated effluent from the interceptor tanks is reticulated through small diameter watertight polyethylene pipes to the community treatment plant
3. effluent pump in the interceptor tank where the house is below the main sewer line, otherwise gravity flow is utilized
4. the community sewage treatment plant is a fixed substrate (sand, textile, foam or plastic) trickling filter plus Ultra-Violet disinfection

5. treated effluent with a quality of <10 mg/L of BOD / TSS (Biochemical Oxygen Demand / Total Suspended Solids) is locally reused via sub-surface irrigation in gardens, parks, sporting fields, woodlots, agriculture and horticulture.

Green belts of parks, gardens, sporting fields, orchards and woodlots are designed to the size that will utilize the reclaimed water via sub-surface irrigation throughout the year. Because of the high effluent quality and sub-surface irrigation, wet weather storage is not required. The scale and shape of the green belt depends on the landform, geology, soils, slope, aspect, climate, vegetation cover, frequency of vegetation harvesting and social requirements.

Sewage from shops and industrial plants is to remain separate from domestic sewage, and treated in similar decentralized sewage treatment plants.

The decentralized nature of the STEP/STEG scheme provides a sewerage system that is modular, flexible and scalable, reducing the upfront costs and allowing the installation and payment to be staged. Discharge to waterways is eliminated, and treated effluent and 'biosolids' are recycled locally as valuable resources.

Standards

New standards are required for:

1. the plumbing for watertight small diameter polyethylene pipes & heat-welded joints
2. household and personal cleaning agents to contain no phosphorus and no sodium.

Mechanism of reform

Remove some of the subsidies from water and increase the price of reticulated potable water and educate the public why this is necessary. Inform the public of the real cost of water and wastewater.

Supporting Documentation

1. Appendix A – Centralised Management: the Key to Successful Onsite Sewerage Management
2. Appendix B – Innovations from Scandinavia: Increasing the Potential for Reuse
3. Appendix C – Elements of a Best Practice Decentralised Sewerage Service
- 4.- 7. Rodney District Council, New Zealand – Wastewater Community Information Sheets 1, 2, 3 and 4
8. US EPA Guidelines for Management of Onsite/Decentralised Wastewater Systems (CD)

ADDITIONAL INFORMATION HELD BY THE COMMITTEE

ATTACHMENT TO SUBMISSION NO. 38

**ATTACHMENTS, APPENDICES AND PHOTOGRAPHS PROVIDED WITH
SUBMISSIONS ARE HELD IN THE COMMITTEE OFFICE**