

SUBMISSION FOR AUCKLAND WATER REVIEW

Submitter: Cohousing NZ Ltd, PO Box 70001, Ranui
Contact: Peter Scott, Phone: 8324004, Email: ps@pl.net
Web: www.ecohousing.pl.net
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1. Summary of Submission

Cohousing NZ Ltd (CNZL) is of the opinion that the current review of regional water resources needs to go somewhat beyond the consulted issue of who will manage water capital assets. The following points will be made in this submission:

- Sustainability a key objective. The need to conserve and recycle. Doing more with less. The valid role of user pays charging methods.
- The need for the effective ability to choose decentralised options. The requisite regulatory and legal mandate. Role of pilot projects.

2. Submitter background

CNZL is a company developing an innovative housing project in Waitakere City. The project comprises 32 privately owned townhouses and is known as Earthsong Eco-Neighbourhood. The neighbourhood has the following features that contribute towards the project's goal of being a model of socially and environmentally sustainable urban development:

- Homes are designed to have very low heating and cooling energy demands due to passive solar design.
- Solar hot water heating standard in all units.
- All construction materials assessed for toxicity, breathability, natural durability and level of embodied energy.
- On-site rain water collection and storage for reuse to houses.
- Water efficient plumbing fixtures, and flow reduction valves throughout
- The installation of permeable paving to maximise stormwater absorption.
- Bio surface treatment of all surplus stormwater utilising vegetated swales, wetlands and a detention pond.
- Orchards and gardens and native bush areas on site, accommodated by clustering of units.
- A pedestrian friendly path network and the provision of community facilities to facilitate a stronger sense of community
- Resident participation in neighbourhood design

The project seeks to integrate its 'three waters' in a way that closes cycles, avoids pollution, and relieves pressure on overloaded infrastructure. Infrastructure Auckland has granted funds to implement the project's stormwater system, which is state of the art and will limit 1 in 5 year stormwater outflows to the site's predeveloped levels.

The notable omission from the above list is wastewater treatment. We have been advised that the present situation, whereby Watercare have sole rights to treat sewage in the inner drainage area, makes it impractical to achieve the project's aim to treat wastewater on-site. This is in spite of the fact that two separate feasibility studies have demonstrated the site's suitability for an on-site wastewater system, and also the cost effectiveness of this approach.

3. The Sustainability Imperative

CNZL in undertaking its own neighbourhood development has been mindful of the need to integrate human activities into the natural environment. The project's goals aligned with the now familiar language of the Resource Management Act 1991 (RMA91): "to sustain the potential of natural resources...to meet the reasonably foreseeable needs of future generations" and to "safeguard the life supporting capacity of air water soil and ecosystems".

A recent incident serves to illustrate the need to better consider a whole systems view for water management. The incident concerned the eradication of a large wasp nest in Massey. The nest was destroyed with a sufficiently large quantity of pesticide that the ecology of local watercourses was significantly disrupted, as indicated by the death of marine life. The sustainability argument would be that human safety and amenity are important, but that this must of necessity not be at the expense of other species or the ecology in general.

A brief examination of the existing regional water infrastructure also reveals the inadequacy of traditional human-centric linear thinking. Topsoil is mined and converted into food, which is transported at large energy cost to cities where it is consumed, transported, again at cost, to a central point, then flushed into the ocean using large quantities of highly treated potable water, along with a bundle of bio-toxins such as chlorine and aluminium sulphate used ostensibly to make the water safe. In all fairness environmental engineering is a newer science, and the current infrastructure and legislation reflect the prior 'modernist' state of water knowledge.

CNZL, inspired by holistic disciplines such as Permaculture, is seeking to work with the cyclical processes of nature and achieve intensive as opposed to extensive use of resources, at each point in the cycle. Accordingly, resources, which in the past have been seen as waste products, are recycled and used again as resources for other processes. For example instead of designing a stormwater system with the usual aim of using high embodied energy materials to pipe and pump water run-off as quickly and efficiently off the site, the project found ways to see the problem as resources without a use. Roof run-off flows into a network of storage tanks where it can be reused for most household uses. Tank overflows are diverted into swales where the water is absorbed into the ground, where it can be used by water loving plants to grow useful plants. Overflows from the swales will collect in a detention pond, which will be a source of irrigation water, and habitat for animal and plant life.

With regard to potable water it is widely accepted in the literature that the best sustainable source of potable water for urban areas is forested upland catchments. Given that such catchments within reasonable proximity of the city are a *finite* resource, and the cities population is *growing* suggests an urgent need to implement water demand management and conservation strategies. In a status quo water technology mindset we may associate 'water conservation' with being implored to use less or go without. Conversely Hawken et al (2000) argue the point that we need to increase the *utility* of each unit of resource that we use. This way we can use fewer resources to maintain the same or better standard of living. An example is that a well-designed toilet can be flushed with 3 or 6 litres of water just as well as an older design would use 15 litres.

Clearly, roof collected rainwater is abundant and available everywhere. Where there have been concerns about the quality of roof water, our research showed that while surprisingly little data exists, tests carried out in Sydney, a city four times more dense than Auckland, demonstrated that the urban rainwater quality actually exceeded the quality of the city water supply (Mobbs 1998). Storage and pumping do represent additional costs, however recent cost benefit analyses show that a correctly sized system compares favourably to the cost of mains supply.

In our case a correctly sized system is one that meets 80% of our water needs, the remaining 20% being the expensive component. Cognisant of the need to make the most of that 80% of water, CNZL will be metering tankwater use and will charge each user according to what they use. Reduced water consumption leads in turn to reduced wastewater production. As the user pays pricing is applied in a context of an integrated demand reducing design it is not seen as 'punitive', simply an incentive to do the right thing by the neighbourhood water supplies.

CNZL suggests that this thinking could also fruitfully be applied to both city water and city wastewater provision. Fundamentally, user pays billing is seen as critical to demand management. To avoid punishing existing high volume water users, for example large families of lesser economic means, it is believed that support should be available for households to increase their efficiency of water use. Such assistance can be seen as an investment in the integrity of the regional ecology, and the protection of it's water security, and might take the form of low interest loans on water accounts to buy water efficient appliances. Such investments are also quite likely to be cost effective ways to invest water funds. Before we start talking about spending big money on big capital projects, such soft approaches should be seriously weighed up. A recent NZ Herald reported the somewhat embarrassing calculations of an Auckland University economics professor who concluded that actually *giving* low flow toilets to every Auckland household would have been a cheaper option than the Waikato pipeline.

If user pays pricing signals will help foster a more intelligent free market, then according to the emerging resource economics theory, it is probable that an overall increase in water services pricing is needed to adequately reflect the true cost of pollution to receiving waters etc. Ideally increases in such charges can be offset by decreases in general rating based funding. This avoids trying to extract extra funding from users with finite finances

in an attempt to mitigate the environmental impacts of water services. Instead the pricing mechanisms simply inspire people to be more efficient, which in turn reduces impacts automatically. This is also referred to in the literature as fiscally neutral tax shifting.

It will be apparent from the above statements that the primary consulted issue of who will manage centralised water infrastructure and how is of lesser importance to CNZL. In a way any organisation taking the above criteria to heart could manage centralised water services. In this respect, in an ideal world, private companies might well manage such services. However we think it reasonably clear to any observant person that the present conduct of corporations in general, and privatised monopolies of strategic resources in particular demonstrates that there is an imbalance, or a tendency to have inadequate regard for global, community equity and environmental outcomes. Until such imbalances can be adequately addressed we think it prudent to retain ownership and management in local government. In this light we have serious concerns about the forthcoming World Trade Organisation's General Agreement On Services which as we understand it seeks to 'free up' control of all government non-profit services, making it illegal to restrict private management of such services.

4. The Validity of Decentralised Options

Innovative wastewater treatment technology appears to have arrived at a point where urban wastewater effluent can be treated locally, safely, and in cost effective and culturally appropriate manners. We therefore urge local government to prepare a regulatory, code of practice and legislative framework that accommodates and encourages this.

CNZL in its preliminary design stage commissioned wastewater consultants to prepare an initial system design and costing for a package aerobic treatment system, with reuse to toilet flushing and drip irrigation to productive land-uses. Combined with low-flow water efficient appliances it was confirmed that there is sufficient green open space area to accommodate the highly treated effluent. While additional design opportunities accrue to us developing a new site, it is reiterated that the development utilises standard suburban densities. Dedicated food growing and native bush areas have been created by denser clustering of homes. The academic literature has begun to stress the critical importance of growing food locally, as it is now recognised that the environmental impacts of highly packaged, processed and transported food in fact exceed that of private vehicle usage. Drip irrigation to orchard or fuel wood areas results in nutrients being recovered that would otherwise be lost to the system, requiring expensive replacement with further mined and polluting agricultural fertiliser inputs. Again this is a 'closing the loop' strategy.

Further to our own feasibility study, Waitakere City's EcoWater Solutions have also recently undertaken a major Cost Benefit Analysis exercise for on-site treatment for urban areas. The study used the Eco-Neighbourhood site as a case study, and concluded that on site wastewater treatment was viable and in fact the 50-year net present cost (NPC) was significantly less than with conventional offsite reticulation and treatment.

The cost for the off-site scenario was \$42,056 compared to the on-site scenario cost of \$7,498 (WCC 1999). It also should be noted that this study did not take into account the additional benefits arising from the on-site system, particularly avoiding impacts on traditional aquatic receiving environments, both environmental and cultural.

Notwithstanding the benefits to be gained, we have received legal advice that the effect of the Auckland Metropolitan Drainage Act 1960 (AMDA60) is to preclude on-site treatment within the inner drainage area. In late 1999, EcoWater Solutions sought on CNZL's behalf an exemption, which was declined by Watercare Services Ltd (copies of correspondence attached). The ARC has indicated that being bound by RMA91, they would assess any consent application for the best environmental outcome. However even though it may be that s363 of RMA91 subordinates the AMDA60, advice from the ARC in February 2000 suggests that while Watercare would not have the right to veto any ARC discharge consent, they would be consulted and would likely challenge the consent in the courts, and could leverage substantial legal resources to do so. Also, regardless, it was seen that we would still be liable for sanitary sewer levies.

CNZL argue that the intent of AMDA60, (probably that of mandating the Mangere Wastewater Treatment plant (MWWTP) as a result of the then poorer performing local septic and borough solutions), no longer has wide relevance, and the Act needs to be overhauled. Similarly outdated Health legislation is also cited as a barrier to innovative solutions.

Additionally from our experience with innovative stormwater solutions we know the vast difficulty involved in implementing innovative technologies without the benefit of supportive engineering codes of practice. As both applicants' and councils' engineers are highly reliant on such codes, it is clear that where a legal climate technically allows a certain solution, this is insufficient to facilitate general uptake. Indeed, it would be unreasonable to expect every developer to exercise the often-acknowledged level of perseverance demonstrated by CNZL.

CNZL is of the opinion that without significant regulatory changes the effective choice is removed to take responsibility for wastewater treatment locally. It is also noted that even with the current upgrade MWWTP will again be beyond design capacity within 5 years. Both the increasing cost and environmental objections inherent in discharging large volumes of effluent into harbours work against sole reliance on centralised approaches, and decentralised options are required.

In the interim knowing that we did not have the resources to change the law ourselves, we chose to proceed with the Earthsong development with a conventional wastewater reticulation. However it has been designed in such a way as to allow easy modification to an on-site solution at any time in the future.

Because part of Earthsong Eco-Neighbourhood's vision statement is to be a model of sustainable development, we have a willingness to serve a demonstration and/or pilot project role. The critical contribution of early adopters in the change process is widely

recognised (Rogers 1995), and pilot projects help 'cross the chasm' between theory and practice. Serving as a demonstration accessible to the public, we also believe it may be entirely appropriate for local government to assist the project in some technical or financial support role.

5. Conclusion

Earthsong Eco-Neighbourhood is projected to use, compared to average domestic consumption 20% of the water, 40% of the electricity, and produce 50% of normal wastewater volume. This will benefit users by reducing utility outgoings, benefit local councils by reducing demands on over-capacity infrastructure, and benefit the regional environment by placing fewer resource and pollution absorption demands upon it. Obviated is the need for network providers to make difficult system expansions with high marginal costs associated with design constraints. Tangata whenua and others of like mind can rest easy knowing wastewater is being diverted from water bodies. Everybody wins, and therefore CNZL urge regional and city councils to apply their resources to making on-site solutions possible, legal, known about, financially feasible and easier to implement. Thank you for this opportunity to make this submission. If hearing attendance or further information is required, we will be happy to help.

References

- Waitakere City Council (1999), *Cost Benefit Analysis of New Technologies Stormwater and Wastewater*, Worley/ Reilly Consultants for EcoWater Solutions Auckland
- Mobbs, M (1998), *Sustainable House*, University of Otago Press, Dunedin
- Hawken, P; Lovins, A; Lovins, H (1999), *Natural Capitalism*, Little, Brown and Co Boston, www.naturalcapitalism.org
- Rogers, E. M. (1995), *Diffusion of innovations*, Fourth edition. New York: The Free Press