Small Community Sewer Retrofits; Are There Any Lessons?

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ABSTRACT

The Ministry of Health's (MoH) Sanitary Works Subsidy Scheme (SWSS) provided the impetus to help small communities in predominantly rural areas meet the expense of changing from individual on-site discharges to reticulated systems with a common discharge. This retrofitting process requires a number of steps to be observed with projects worth several millions of dollars and significant impacts on communities who struggle to afford them.

In addition to the MoH requirements, there are a number of basic design and community relationship steps which need to be added to the mix, including:

- Option assessments for reticulation, treatment, discharge and funding;
- Establishment of population and flow models;
- Establishment of preferred discharge options;
- Undertaking conceptual, preliminary and detailed design;
- Identifying and procuring the right consents (RMA, Building Act, Historic Places Act);
- Cost estimation, cost revision, revision of the costs revision and cost management;
- Timing;
- Methods to compel residents to connect; and
- Development of community engagement plans.

This paper looks at a history of small community retrofits for five communities and considers the differing approaches used and provides a commentary as to what worked well, and not so well.

INTRODUCTION

In 2002 the Ministry of Health (MoH) introduced the Sanitary Works Subsidy Scheme (SWSS). This scheme was to provide financial assistance to communities with low socio-economic decile ratings to allow the installation of a reticulated sewer, community treatment and discharge system that resulted in improved environmental and public health impacts. In the ten years since the scheme was initiated, a range of communities around the country have had the ability to lodge applications and have funding awarded. The awarding of funding has been dependent on the ability of that community to procure the remaining funding to support the costs of full scheme upgrade. The SWSS funding level has ranged from 50 to 95% depending on the financial needs of the community.

The SWSS is being wound up, with no more applications being received; with a requirement that all currently allocated funding be utilised by June 2013. Despite the scheme coming to an end there are a number of processes and lessons that can help with future wastewater upgrade planning.

This paper shares lessons learnt by Lowe Environmental Impact staff though involvement with a number of communities, including Pio Pio, Waipataki Beach, Riversdale Beach, Himatangi Beach and Mahia Beach.

SWSS PROCESS

SWSS applications for funding were usually made by Territorial Local Authorities (TLA's) in three tiers: a Preliminary Application, a Provisional Application, and a Final Application.

A Preliminary Application required general information on the community involved, the health risk to be addressed by the proposed reticulated scheme, and the proposed reticulated scheme itself. Following acceptance of the Provisional Application, a socio-economic rating of the community was calculated, which determined the subsidy rate applicable. Based on this, and on a preliminary scheme cost estimate, an allocation of SWSS funding was earmarked for the project.

The Provisional Application then went into the detail of the proposed reticulated scheme, confirming that the proposal was feasible, with refined design, and with a revised budget. Approval of the Provisional Application triggered the requirement for resource consents for the scheme to be procured, and invited presentation of the Final Application.

The Final Application required final engineering design, confirmation of the availability of finance to pay for the remainder of the scheme, milestones for subsidy payment, a construction program, the nomination of an independent person to certify claims for subsidy payment, and copies of the required resource consents.

The SWSS is no longer accepting new proposals, and final subsidy payments are now dependent on the reticulated schemes being commissioned and operational by 30 June 2013.

WHY A RETROFIT

Experience tells us:

> Despite the opinion of some rate payers, councils typically spend money for good reasons. In the case of wastewater upgrades, this is usually as a result of environmental and/or public health concerns. The SWSS project was initiated to improve public health.
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> However, in many cases the rationale for upgrades is not made clear. Decisive reasons that justify the need for the upgrade are not fully articulated at an appropriate level, especially to the larger community who is ultimately paying for the upgrade.

Forward planning suggests:

> While there may be good technical reasons that justify a retrofit system, it is essential that the community is involved and information is conveyed to them at a technical level they can understand.

COMMUNITY BUY IN

Experience tells us:

> It is highly unlikely that retrofit programmes will be 100% funded from external sources (including rates) and a financial contribution from scheme users will be required. Where the community has to partially fund a scheme it is essential that they have the ability and opportunity to buy into the project.

Forward planning suggests:

Community buy-in requires the community to be involved in design, consenting, construction and commissioning components in order for them to understand where their financial contribution is being spent. A consultation plan should be developed at the out-set of a project, with a key aspect being the engagement of the community. This requires scheme justification as discussed earlier.

COMMUNITY DESCRIPTION

Experience tells us:

It is essential that the nature and characteristics of the community are understood. The starting point for this is understanding the occupancy within the community, both throughout the year but also during peak periods.

For example while there will be seasonal occupancy within a coastal community, there is a need to also describe the number of people that are likely to reside on an individual property at any one time. Community census information can be useful to establish what the population and occupancy characteristics may be, however this only provides a snapshot of what is happening on the day of that census.

Forward planning suggests:

In communities that have fluctuations in occupancy, it is appropriate to undertake a physical assessment during critical occupancy periods. Consideration should be given to door to door occupancy surveys during high occupancy periods. This may include repeat visits every day for two weeks over the Christmas and New Year period.

FLOW MODEL

Experience tells us:

The establishment of a flow model is a critical component to establish the volume of wastewater that needs to be managed and discharged on an hourly, daily and annual basis. It is also critical for it to be established to allow design of individual system components, including private property, reticulation, treatment plant and ultimately the discharge system.

It is very easy to take a conservative approach. However, when conservatism is added to conservatism the resulting design can be unrealistic. This can have a significant effect on system design and ultimately costs. For example the peak occupancy multiplied by the peak flow rate should not be used to determine the land application areas.

Forward planning suggests:

Real data should be used. Where possible and especially from larger dischargers (i.e. campgrounds), flow meters should be used to quantify the flows. In the absence of actual flows population and occupancy data should be collected that reflect the number of people using individual houses or other facilities. As suggested above, surveys may be appropriate, especially over the summer period in coastal communities. This data should identify two aspects influencing design, being the peak loading into the system, and a typical annual average.

LAND IDENTIFICATION FOR TREATMENT PLANT AND DISCHARGE

Experience tells us:

Individual community members can become concerned with the processes used to identify land for the treatment plant and discharges. Predetermination of outcomes and land preferences are typically a bone of contention within communities, with criticism often expressed that inappropriate land was used or the land being used for the wastewater system (including treatment plant) was chosen as a favour for the land owner. This is especially so when the council pay to purchase the land or provide a financial incentive to occupy the land.

Forward planning suggests:

A robust option assessment should be undertaken to identify land suitable for receiving treated wastewater. While this should consider property size, care should be taken not to include land ownership in the initial assessment. Once a technical evaluation of preferred land areas has been made, then individual land owners can be approached. Doing it the other way around generates suspicion of a biased process (with implications of financial back handers!).

LAND CONTRACT

Experience tells us:

Once a preferred land area is identified a process of establishing agreement between the land owner and the council is required. Consideration needs to also be given to any land in between and the need to establish easements.

Forward planning suggests:

When undertaking initial negotiations it is important to make sure the negotiations include multiple land options. Failure to do so may result in price gouging. A Heads of Agreement should be established at an early stage to establish critical design and management parameters, and manage confidentiality. Further, it is critical that access to the treatment and land application site is secured before any final commitment is given to the treatment and discharge sites.

COST JUSTIFICATION

Experience tells us:

The SWSS process has targeted low decile communities. Many of these communities have significant populations of people on low incomes. While many cannot afford the direct costs of the upgrades, the reality is at some stage an upgrade will be required and it will never be cheaper than it is now.

Forward planning suggests:

It needs to be explained to the community that retrofitting will be required at some stage in the future. They need to be given sufficient information to show there is a need and be given time to buy into the process. Once justification and time has been given, if they are still opposed the reality is that their relocation to other communities may be appropriate if they cannot afford it. This is unfortunate, but Councils have to consider the wider interests of public health and environmental protection. The unfortunate irony is that it is the people that most need the scheme are the ones who cannot afford it.

Adding to the irony is the fact that in the case of the SWSS funding it is provided for, and weighted in favour of, communities that cannot to pay themselves. If the low income people move on, then the community may not be eligible to receive the funding.

MANAGING OPPOSITION

Experience tells us:

In many community retrofit programmes there is considerable opposition within the community primarily because of the costs that are involved. However, a large component of the opposition is a result of the community not fully understanding the rationale and need for the upgrade. In cases where the need for the upgrade is discussed, both in terms of public health and also environmental effects, there is better acceptance of the need to spend money to ensure immediate and future protection of public health and the environment.

Forward planning suggests:

A clear and well set out programme justifying the reason for the upgrade is essential. This helps to demonstrate the system need, but also shows a diligent process is being followed.

It has to also be indicated that the local authority has an obligation under both the Local Government Act and the Health Act to consider the health and wellbeing of the whole community. This means that hard decisions have to be made that consider the community's current and future needs, including the ones that are vulnerable to the effects of poor water quality. Often this is a catch 22 situation as they effectively need to be saved from themselves.

COMPULSION TO CONNECT

Experience tells us:

The more people that connect, the smaller the individual contribution. Many councils struggle with the need to make properties connect. There is the dilemma of not wanting to force people that cannot afford the scheme, but not wanting to make it expensive for those that do. The reality is that over time people will connect, whether by their own accord or as a result of some form of compulsion. This means that the scheme should be designed and sized for the larger community, including future growth. This requires someone to pay for it.

Forward planning suggests:

The carrot is better than the stick. The SWSS has allowed a subsidy to be applied and with the pending deadline of funding drawdown an approach is to indicate the subsidy will not apply after a nominated date. This could result in an additional $5,000 to $10,000 should the property owner connect later.

A second option is to make reference to Regional Council requirements. Many councils are developing or have policy advocating reticulation in un-sewered areas. This means that at some stage in the future connection to a scheme will be required, and the reality is that it will be no cheaper than it is now.

A third option is for the District Council to utilise the Building Act (Building Code Section G13.3.3) requiring the connection to a sewer. While this can easily apply to new connections, old connections can only be insisted to connect when they undertake building modifications.

A forth option is a bylaw, being either specific or generic. Many District Councils are developing tradewaste and sewer bylaws. A bylaw, like the Building Act, could be

used to compel properties to connect. Regardless a bylaw should be considered to develop connection criteria, especially the specifications if a pressure sewer is needed.

A combination of all four options is now being used by many councils. This strongly indicates to the property owner that there is not just one reason for connecting once a sewer has been installed.

SCHEME TECHNOLOGY – RETICULATION AND TREATMENT

Experience tells us:

The community in many cases has a preconceived idea as to what is an appropriate reticulation and treatment system, being gravity or various forms of pressure sewers, or ponds or a package treatment plant. Unfortunately debate within communities all too often focuses on the technology options and not the need for a reticulation and treatment system. Consequently time and money is consumed debating methods and technology, and not the benefits of the scheme as a whole.

Forward planning suggests:

A clear preference for the benefits of a reticulation system needs to be conveyed to the community. There should be justification of a preferred option. If there is no clear preference (including after a whole of life assessment) then allowing the market to decide is an option that can demonstrate to the community they are getting the best deal. The community should be able to trust the council to make appropriate decisions on its behalf. An observation is that trust in a council is lost when no decision (or leadership) is made.

SCHEME TECHNOLOGY – DISCHARGE

Experience tells us:

The means of discharge from a treatment plant is ultimately going to be dependent on the receiving environment that is available. Surface water and land discharge environments are both equally acceptable. For example, in environments that have soil conditions that are not acceptable for year round application of wastewater it may be appropriate to consider surface water discharge. However, where the discharge is seasonal, the peakiness of summer discharges offers benefit from additional moisture being applied to land during the growing season.

Forward planning suggests:

Discharge options need to realistically consider the merits of the available receiving environments. This requires a sound understanding of the community's environment and preferences of local stakeholders, including the community and tangata whenua.

CONSENTING

Experience tells us:

Consenting involves far more than a single discharge consent from the regional council. Consents may be needed for stream crossings, water diversion, land clearance, dewatering, water supplies, land use, structures, designations, dam structures, air discharges and others.

There is often a chicken and egg situation in that consents cannot be determined or processed until design is complete, and the design cannot be finalised until consent conditions are known. In some cases an iterative design process is needed whereby conceptual design is followed by preliminary and detailed design. It may also be

appropriate that the consent process is staged with two or three rounds of consents that correspond with different iterations of the design process.

The consent process is often perceived to be difficult and a minefield. If managed appropriately the process can be streamlined. In three of our recent community upgrade projects (for communities ranging from 250 to 450 houses) LEI staff have had the opportunity for the consents to be processed on a **non-notified** basis. However, consideration may want to be given to full notification to ensure there is full public participation in a scheme that they may have to contribute to. This wish has to be balanced against limitations on costs and/or timing.

Forward planning suggests:

When planning the consenting process there is a need to thoroughly consider Regional Council and District Council consenting requirements. Building Act consideration should also not be overlooked. Where possible consents should be considered at one time and integrated to minimise the need for a continual and drawn out consenting process. However, if there is the potential for one consent to side-track the overall programme un-bundling the consents should be considered.

To assist with the key land application consent, if it can be demonstrated that the effects of the system are consistent with those of other activities, especially those that are permitted activities, there is the possibility that the resource consent can be processed on a non-notified basis. This helps to expedite the process and potentially eliminates the debate and conflict that occurs between assessing the effects of a consented activity versus the need for the reticulated sewerage scheme.

DEALING WITH MINISTRY OF HEALTH

Experience tells us:

The needs of individual communities vary around the country. While a consistent rule sheet has been prepared, experience has shown that it has been interpreted differently; in some cases by the Ministry of Health and in other cases by the local authority.

The level of information provided to the MoH varies with the three application stages, and is dependent on the system design and acceptance by the community. In a number of cases where there is less acceptance, or the design is unique, additional information has been required.

Forward planning suggests:

While no further applications are being received, the SWSS process has shown that what were thought to be consistent rules can be interpreted differently. Where a particular rule does not suit a community or part of the community, efforts should be made to pursue an interpretation that benefits that community. In many cases a degree of discretion can be applied by the funding allocators.

CONCLUSION

Small community wastewater retrofit projects are complex and multi-disciplined. The large number of communities that now have reticulation thanks to the SWSS have allowed the development of methodology that brings these disciplines together and can be used for future upgrade projects. However, the affordability of future upgrades may be dependent on additional funding if and when that occurs.

The experience from recent projects has highlighted the need to clearly define the objectives and need for sewering, and once identified, articulate them to the community in a way it can understand.

Upgrade projects come at a cost, and while there may be environmental, public health and social justification for the projects, there will be some people in the community who disagree with the technology or who simply cannot afford it. In such circumstances the council needs to show leadership and make decisions in the best interest of the community.