STATES OF JERSEY

WASTE WATER STRATEGY (P.39/2014): COMMENTS

Presented to the States on 12th May 2014
by the Environment Scrutiny Panel

STATES GREFFE

2014 Price code: B P.39 Com.

COMMENTS

The Environment Scrutiny Panel was informed by the Minister for Transport and Technical Services of his intention to lodge the Waste Water Strategy (P.39/2014) at a private briefing on 3rd February 2014. The Panel was told that the Minister planned to lodge a proposition in March, for debate in the States by the end of April; this was accompanied by a request for the Panel to carry out a review of the draft policy.

Given the lack of prior notice, a timescale of less than 3 months to debate and existing commitments the Panel found this challenging; however, as the draft policy involved substantial States investment, members felt that they had little choice but to launch an urgent review. The Panel was also advised that Transport and Technical Services Department were awaiting written comments from the Minister for Planning and Environment which were expected to indicate reservations about the strategy, including the type of technology proposed for the replacement Sewage Treatment Works.

The Panel was fortunate in being able to appoint international engineers and design consultants AECOM Limited as expert advisers, initially to carry out a desktop review of the draft strategy. Shortly after their appointment the debate on the strategy was delayed until 13th May 2014, and their brief was extended to include 2 visits to the Island, to view the Bellozanne site and meet officers of both Transport and Technical Services and the Department of the Environment, and attend public hearings with both Ministers on Tuesday 6th May.

AECOM have produced a technical report on the strategy (*Waste Water Strategy Peer Review*) which the Panel shared with both departments, to enable them to consider its findings and comment before the review hearings. The report and departmental responses can be accessed on the Scrutiny website, and copies will be circulated separately to all States Members. The Panel recommends the report to Members as a detailed, informative and objective appraisal of the strategy. Given the lack of time to complete a full Scrutiny report prior to the debate, the Panel has also produced these comments on key aspects of the draft strategy, based on its advisers' report and discussion with Ministers and their officers at the public hearings held on 6th May. For clarity these points are discussed under separate headings below.

1. Technology

The strategy proposes to adopt conventional Activated Sludge technology which is tried and tested in Jersey and the UK, and is the most widely used sewage treatment system. Jersey has over 60 years of experience of maintaining these systems. Their only disadvantage is the land area required. Historically Jersey developed Bellozanne Valley for these purposes and TTS has confirmed that adequate space is available on the existing site to contain the redesigned plant.

The Panel's consultants agree that the proposed system is entirely appropriate as a first choice; they have also identified a possible alternative process (Sequencing Batch Reactors or SBRs) which TTS agree they would be prepared to consider as a secondary option as part of the procurement process if a contractor proposed it.

However, the Minister for Planning Environment has stated that if a water based system is to be used, a principle to which he fundamentally objects, then Deep Shaft technology should be examined.

The Panel's consultants have advised that this system (which is very uncommon in the UK) is not suited to Jersey conditions; the Panel is completely satisfied by the evidence presented to it in this respect, which supports the conclusions of 2 separate reports previously commissioned by TTS. The Deep Shaft process is generally only employed in areas where there is a need to treat concentrated industrial and commercial wastes which do not exist in Jersey; the main advantage (space saving) is not in this case considered to be critical, whereas it would add substantially to the costs of the project. An estimate prepared by TTS consultants suggests that drilling 2 shafts (to allow for one in service and one being maintained) would cost approximately £89 million (compared with £75 million for the process proposed in the draft strategy); however TTS have pointed out that there would be a requirement for a third shaft as a standby to ensure that treatment standards can be maintained during any periods of maintenance. It is estimated by TTS that this would add a further £10 million to the overall cost, bringing this to the region of £100 million. (The Panel has asked its advisers to seek an independent assessment of deep shaft costs to verify these estimates; this was not available at the time of writing).

Further potential difficulties associated with Deep Shaft include risks for personnel involved in maintenance work, problems with monitoring and improving performance if difficulties are encountered, and that investment already made in primary treatment facilities would be wasted, as the process operates differently and could not use the same infrastructure. The Minister for Planning and Environment has claimed that Deep Shaft facilities could store rainwater, produce bioethanol fuels, eliminate odour problems and improve the standards of waste treatment. The Panel questioned TTS officers on these claims and were advised that they were unfounded. The odour issues will be addressed separately under the draft proposals.

However, the Panel was surprised to hear from the Minister for Planning and Environment that he believed the States should not be considering plans to replace the Sewage Treatment Works (STW), but should be considering alternatives such as dry composting or incinerating toilets. He advised the Panel that the Victorian engineering for a water-borne sewerage system should be challenged, saying that it was bizarre that we are incapable of doing anything more sensible.

The following extracts are taken from transcripts of the public hearing with the Minister on 6th May 2014, where he explained his views –

The Minister for Planning and Environment –

> *"At the moment since the Victorian engineering was introduced to the Island nobody has challenged the water borne transport sewerage system, and in environmental best practice terms I think that policy review or strategy review is due. In fact it is overdue. If you look at the whole issue of the sewerage production and treatment with an environmental hat on it does strike you as somewhat bizarre that we are incapable in today's technological age of doing anything more sensible in terms of providing different transportation systems or different treatment systems in order to deal with human faecal content. It strikes me as absolutely bizarre that when you look at the numbers of the system that the Island for a population of 100,000 is producing some 25 tonnes per day of faecal remains. It is wet. If you look at the dried remains it is about a third of that and we are using 1,000 times as much water in order to flush that content from positions on the Island to a central processing unit*

which does not clean up the waters that are used for the transport of the materials to a sufficiently high standard. Anybody in their right mind would be wanting to query these systems and see whether or not there are better systems to transport these materials either in a similar fashion from the households where it is being generated to a central processing unit, or better still to find a way whereby a distributed processing system would obviate the need for using these prodigious quantities of water and generating environmental problems at great expense…"

When challenged by the Panel on the alternatives the Minister replied –

The Minister for Planning and Environment –

"There is a whole host of dry toilets or composting toilets or indeed incinerating toilets and you just take your pick, but the key essence of that approach is to not try to hide the fact that people produce food waste and excrement, which has to be flushed out of sight underneath the ground in a way that kind of does not encourage people to be responsible for their actions, or indeed for taxpayers' money to be spent indiscriminately on systems that do not perform in an optimum fashion. So the key issue, in my mind, is that environmentally should Jersey in particular, and as part of the worldwide best practice, which is starting to consider this very question, be continuing to justify or to try and extend old-fashioned Victorian ideas in terms of dealing with human waste? …"

The Panel considers that the Minister's views on alternative waste disposal systems would be completely unacceptable to our modern society, particularly given the fact that we have an existing sewer network serving the majority of households. The systems cited by the Minister may suit less developed or more remote communities that do not have our infrastructure or the means to acquire it. However, as a densely populated Island, members consider that there could be significant impacts on the health and well-being of Jersey citizens if any widespread adoption of such systems were to be contemplated; while the Minister's argument that there is insufficient water to justify continuing with the present system does not seem to be substantiated in view of current climate change forecasts.

2. Regulatory standards

Effluent

In the Strategic Plan 2009-14 the States decided that an equivalent standard to EU regulation should be applied. Our consultants have reviewed the strategy for compliance with all 12 pieces of EU legislation, conventions and EU directives applying to waste water, particularly the Water Framework and Bathing Water Directives. The WFD particularly impacts on St. Aubin's Bay, whose status under the Directive is still not determined. In 1997, the bay was considered eutrophic, and therefore nitrate restrictions were applied to which the current STW does not comply; formal notifications of breaches of nitrate levels in effluent have been made to the Attorney General. More recent studies of the bay have not confirmed this status, and further monitoring work is taking place. The Environment Department has stated the results will be known by 2015. Depending on the confirmation of this status there may be a requirement for measures including the addition of secondary treatment processes to remove nitrates from the effluent.

The existing plant already meets other environmental limits of suspended solids and biological oxygen demand (BOD), except at times when excess flows occur due to high rainfall, at which times the effectiveness of UV treatment is reduced. The new STW will be designed to eliminate these problems and ensure that standards (other than for nitrates) are not exceeded.

To enable compliance with the Water Framework Directive will require the setting of trigger levels, set in advance, which can be monitored over time so that appropriate action can be taken in the event of a decline in standards.

Sewage Sludge

Despite following the UK (ADAS) sludge matrix, Jersey does not have legislation to cover the application of sewage sludge to fields. This matrix is not legally binding, but it was felt by TTS officers that it was working well under difficult circumstances. It was also noted that, in this regard, TTS was self-regulating; the Panel was not entirely content with this arrangement. Evidence showed that it was not always easy to find suitable land on which to spread sludge throughout the year. In some instances, over the last winter for example, sludge had been disposed of in the Energy from Waste plant at La Collette, and the Panel felt that this was an alternative that might be used more often. Regardless of where the sludge product ended up, the Panel felt that it was vital to produce a top quality product. The Panel also concluded that, if there was continued use of disposal to land, a 3rd party regulator should be put in place to oversee quality and environmental controls.

The new plant will pasteurise sludge, which will result in improved product quality.

3. Network and maintenance issues

The consultant's report highlighted that a large proportion of pumping stations in the sewer network are considered to be in poor condition. The Panel is concerned that the network serving the new plant should also perform to a high standard, since the pumps operate constantly and are essential to the system. The Minister for Transport and Technical Services informed the Panel that increased funding was now available to them and that the department intended to catch up with the backlog of maintenance. The Panel were also informed that the logistics of replacing pumping station equipment whilst keeping them in operation were difficult.

There is provision in the Strategy for the refurbishment of the existing outfall at a cost of over £4 million pounds. However, following long consideration there appeared to be little need to extend this outfall past the low water mark and into deep water offshore at this time. The conclusion was that such an extension should be a very last option, as evidence suggested that the effects would be largely aesthetic and not necessarily have any environmental benefits. The Panel considers that it would be preferable to improve the quality of effluent from the STW rather than pump it further out into the bay.

The department is placing great reliance on its programme of separation of foul and surface water, particularly in the town area, in order to reduce excess flows into the STW. This programme is dependent on future funding and the overall cost of this work is not known to the Panel.

4. Population and climate change

The system is designed to take into account climate change in order to deal with increasing rainfall on a similar basis to UK provisions, which allow for an estimated increase of 7% in annual rainfall figures. Individual storming events are accounted for by the provision of dedicated storm tanks at Bellozanne to contain excess flows until they can be treated; the Panel notes that it is not possible to confirm from information given whether the capacity of the tanks will be adequate to deal with future rainfall events.

Population increase is also catered for, based on the levels approved in the recent population debate (of an additional 325 population per annum) over the life of the policy. The system is designed to cope with these levels plus an additional 20% as a contingency; the figures include allowances for both resident population and visitors.

5. Funding

The Panel closely questioned the Minister for Transport and Technical Services on the £75 million cost of the new STW. This includes enabling works such as providing a new clinical waste facility at La Collette (£7 million), repairs to the outfall (£4 million), associated works and construction of the STW in 2 phases. It will be complete by 2020. Capital sums sufficient to complete this work are planned to be included in the 2016 Medium Term Financial Plan and subsequent annual capital budgets. This does not include the cost of secondary treatment for removal of nitrates; this would cost another £31 million, for which no allowance has been made in capital plans. The Panel considers that if this investment is required, it is essential that prior discussions take place with Jersey Water to determine the most cost-effective strategy for reducing nitrate levels in water generally. The Panel has major concerns that the limits for nitrates in drinking water are 5 times higher than the limits prescribed for the effluent from the STW.

The proposed new Activated Sludge plant is to be built as a phased development, and the Panel felt that this was a sensible approach. Despite assurances that monies for the project had been secured, if for any reason the funding became an issue in the future it would be possible to delay any sequenced phase without compromising the project. Construction work could stop and start at any point between phases. It is unlikely that such an approach could be used should a Sequencing Batch Reactor process, or Deep Shaft technology, be chosen. In both those cases the plant required would have to constructed in a single phase.

The strategy requires a further £135 million of capital expenditure on the sewer network over the next 20 years. Of this amount, £34 million is needed in the next 5 years. The total includes work on rising mains, sewers and pumping stations which is essential to the performance of the network. It includes connections to some 1,400 additional properties at a cost of approximately £42 million, which does seem rather high; the Panel considers that this should be compared with other possible methods of disposal.

At present there is no identified provision for this capital expenditure other than the annual maintenance allowance of 1% of assets. The Minister for Transport and Technical Services considers that this is sufficient to provide for priority works on pumping stations. The strategy refers to potential alternative funding sources including customer billing for sewage and drainage services, infrastructure charges to

developers, borrowing and taxation. No indication is given how this expenditure can be financed, only that further investigations will be carried out. The Panel has concerns about the lack of certainty over this funding.

6. Panel advisers' findings

In their report on the draft strategy the Panel's advisers identified the following risks –

- The classification of St. Aubin's Bay as a sensitive area would have a significant impact on the level of treatment and associated capital costs. The classification process should be undertaken as soon as possible.
- At this stage, only approximately 39% of the sewers have been inspected by CCTV. The Strategy has been developed on the assumption that the remaining sewers have the same mix of condition as those surveyed. If this assumption is not accurate, the capital and maintenance costs could be much higher than anticipated. The trend in condition of these assets is also not known at this stage and could significantly influence future investment needs.
- The Strategy states that a more detailed analysis of the sewerage network is required to prioritise future work and determine the associated costs. This analysis has the potential to uncover further problems, increasing the associated costs.
- A concept layout has been developed for a new conventional activated sludge system at the existing Bellozanne STW site. It has been demonstrated that the required land area appears to be available. However, should the design be sufficiently modified or increased in size, this solution may not be viable. A second technology may have to be considered, and the Strategy would therefore have to be modified.
- Climate change has not been fully considered in the Strategy. An allowance of 5% of the maintenance costs has been allocated to allow for upsizing of the sewers as they are maintained. However, the actual costs of climate change effects could be significantly greater. These risks include sewer flooding, inundation of treatment works and changes to discharge consents.
- As there is a variation planned to the current discharge consent, further discussions are required and agreement must be reached with the Department of Environment. This is critical to the design of the works, as the need to meet more stringent consents could significantly impact the Strategy, e.g. greater land areas required to construct the treatment plant.
- The length of the outfall into St. Aubin's Bay is referred to as 500 metres from the sea wall (section 2.3.2 of the Strategy). The diameter is not quoted and may need to be increased for higher final effluent flows, as well as for effects from increasing flows from the Bellozanne Valley stream.

7. Recommendations

The following are AECOM's recommendations for inclusion in the Strategy, endorsed by the Panel –

- The classification of St. Aubin's Bay should be completed as soon as possible to understand whether nitrification and denitrification are required to meet nitrogen and ammonia consents.
- Discussions regarding the proposed discharge consent for the new Bellozanne STW should be held to ensure that the treatment options proposed are reasonable.
- The sewer surveys should be completed as soon as possible. These would highlight whether the allowances made in the costs for sewer maintenance and upgrades are reasonable. Additional analysis should also be undertaken to assess likely future condition trends and their impact on investment needs.
- The network analysis should also be completed as soon as possible, to gain a better understanding of the issues.
- The Strategy should clarify whether modifications will be made to the overflows at the Weighbridge CSO (installation of a screen) and upstream of the Fauvic SPS.
- The H_2S issues at certain pumping stations around the island should be investigated, with the gas eliminated or minimised to lowest possible levels.
- Discussions regarding the proposed discharge consent for the new Bellozanne STW should be held to ensure that the treatment options proposed are reasonable.
- It should be established whether sustainable options such as SUDS and water minimisation should be considered within the Strategy, or whether these should be considered separately.
- The effects of climate change should be more fully considered. Understanding of these effects is now covered by legislation in the UK, and consistent with other aspects of the strategy, it would be appropriate to follow this approach.

The Panel would additionally recommend the following –

- Clarification of funding availability for the £135 million cost of improvements to the sewerage network.
- An end to self-regulation of sludge disposal by TTS, and introduction of suitable legislation to cover this activity.
- If investment in secondary treatment for removal of nitrates is required, prior discussions should take place with Jersey Water to determine the most cost-effective strategy for reducing nitrate levels in water generally.