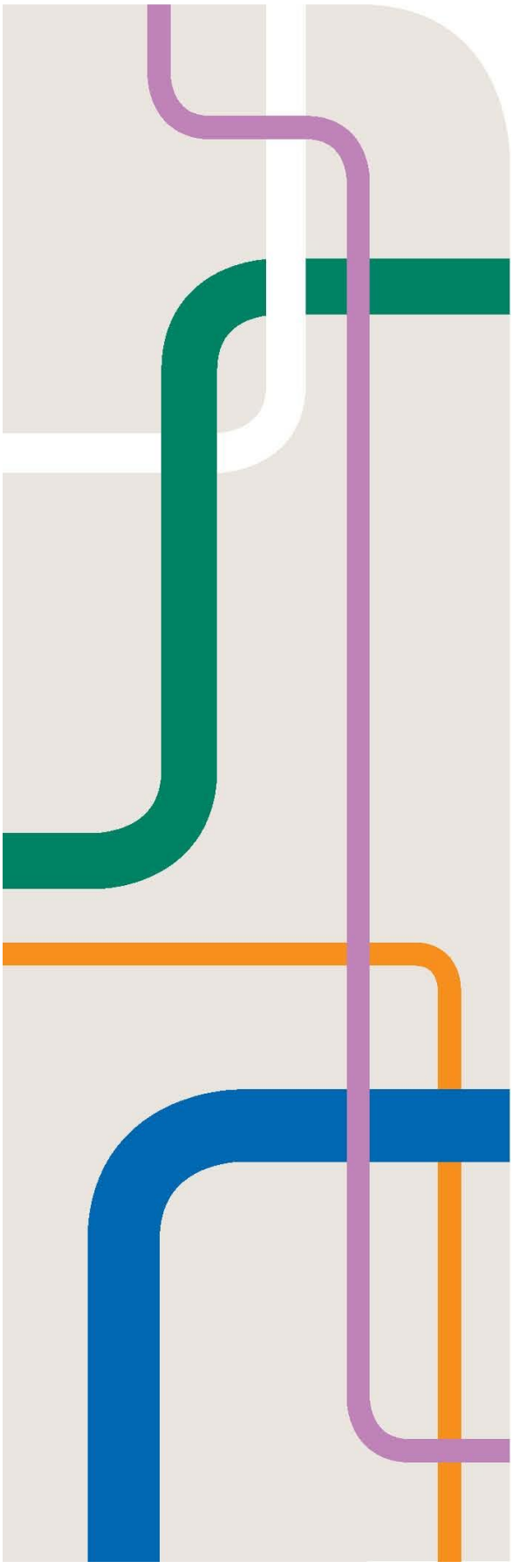
Government of South Australia

SA Water



90 Day Trade Waste Project

Activity 2 - Case Studies Snapshot

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Date: 27/08/2015

Status: FINAL

1 Overview

1.1 Purpose

The purpose of the case studies was to quantify site trade waste improvements, both from the customer's and SA Water's perspective. This involved selecting representative food and beverage trade waste sites and modelling trade waste discharge and financial data. The model was used to estimate the 'bigger picture' costs to industry and SA Water.

1.2 Important Points

Ideally, the case studies would have analysed costs associated with the trade waste discharge with zero pre-treatment and advanced pre-treatment. This would have represented the best 'improvement' scenario to accurately show the before and after costs incurred.

However, all case study sites used to shape this report had already installed some form of pre-treatment when data for this report was retrieved. Two inaccuracies arise from this: firstly, the case study site costs are higher than they would be with no pre-treatment. Secondly, SA Water treatment and network maintenance and upgrade costs are lower due to the decrease in contaminants already being screened out by the site.

The consequences of this drawback in the data available to analyse cost impacts is that the costs calculated in the present case studies are skewed by the degree of pre-treatment already in existence onsite. With zero pre-treatment onsite, higher grease, organic and suspended solids loads are placed on the network. Therefore, the real SA Water costs before improvements would be higher than the costs presented in these case studies.

Other assumptions, exclusions or definitions were:

1. Site coarse solids screening were excluded as this was seen as the bare necessity for every site from a basic plumbing design point of view.

2. SA Water costs were based on Bolivar wastewater treatment plant which receives around 85% of the state's trade waste discharges.

3. Specific data on the reduction of network maintenance following pretreatment upgrade did not exist, so estimates based on experience and whole of network data were made.

4. Wastewater quality degradation in the network was not accounted for, as this is a complex biological modelling process. This may affect total loads reaching the wastewater treatment plant, and underestimate impact on network infrastructure.

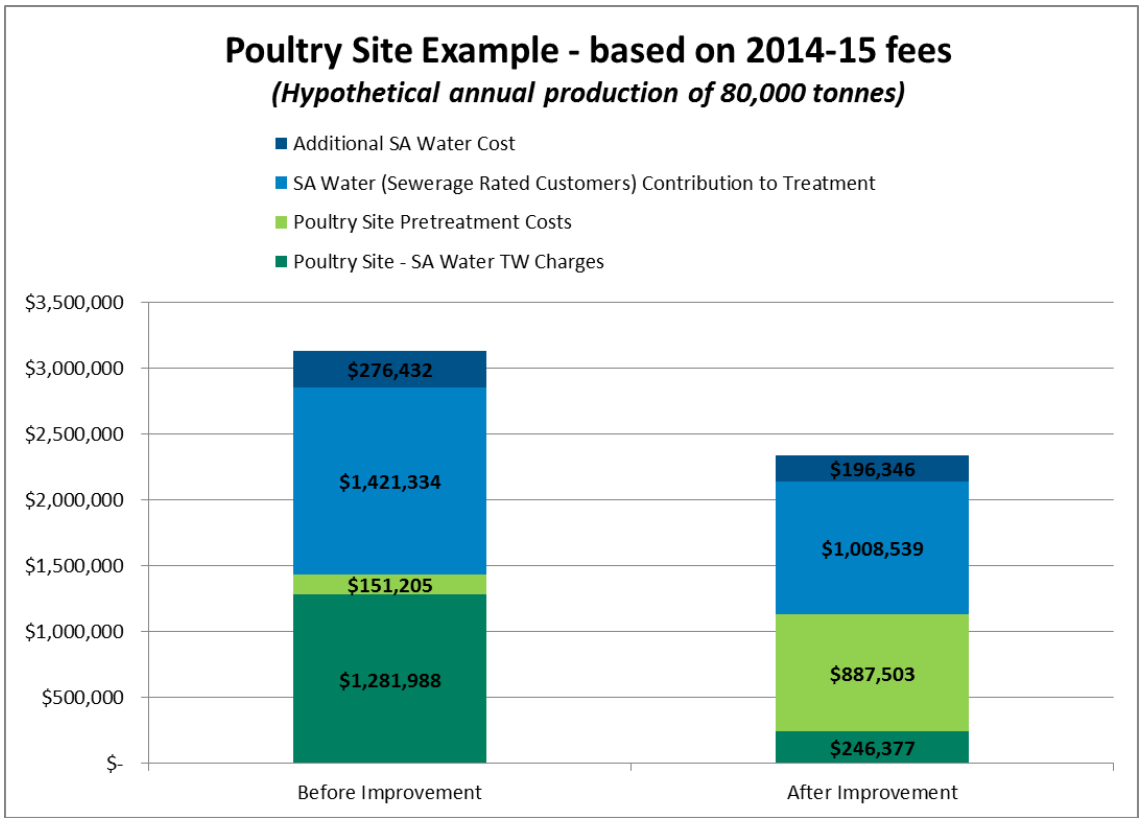
5. The production numbers used in the case study examples are similar to realistic production numbers reported by the industries.

6. *Additional SA Water Cost* referred to in each example includes SA Water costs which are wastewater network orientated such as wastewater network operation and maintenance, network blockages, accelerated network degradation and specific wastewater network pump station costs.

7. *Site – SA Water TW Charges* is how much the site is charged by SA Water, with the remainder of the full cost of accepting the site's trade waste discharge represented by *SA Water Contribution to Treatment*.

2 Poultry Case Study

The poultry site receives live chickens and slaughters onsite with limited processing of the carcass. Historically the site discharged trade waste to the network with basic coarse screening. After some time, they underwent a site improvement by installing a Dissolved Air Flotation (DAF) system to reduce suspended solids, biochemical oxygen demand and grease discharged to SA Water.

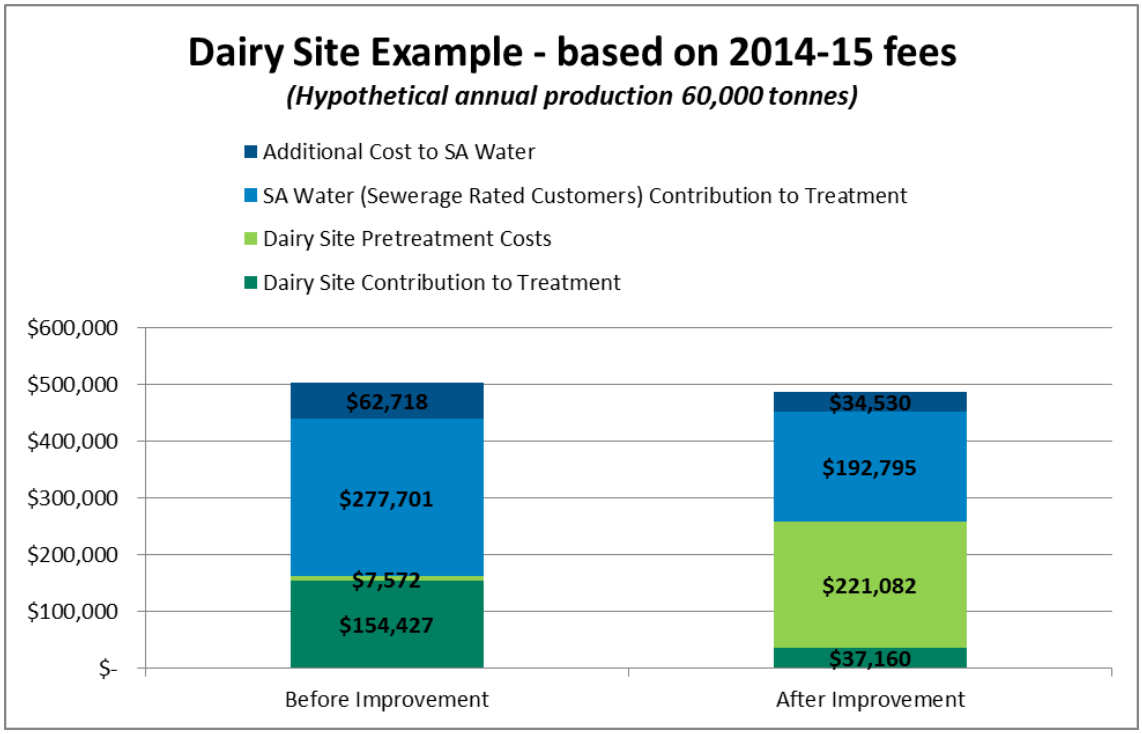


The poultry site example shows that with the installation of a DAF system, the overall annual cost associated with the site's trade waste discharge decreased. The key points are:

1. The installation of the DAF system had the following improvements:
    a. Biochemical oxygen demand reduction of 70%
    b. Suspended solids reduction of 85%
    c. Grease reduction of 91%
2. Overall saving over $700,000 per annum (25% reduction).
3. From the poultry site's perspective, despite spending over $700,000 per annum more on pretreatment, the relative savings in trade waste charges still result in a net benefit to the site (21% reduction).
4. Accordingly, the costs incurred by SA Water also reduced by almost $500,000, ultimately resulting in a saving for all sewerage rate paying customers of SA Water (29% reduction).
5. After the DAF system installation, SA Water still contributes 51% of the total value of accepting the poultry site's trade waste discharge.

3 Dairy Case Study

The dairy site receives dairy goods (milk, cream, etc) and packages them for distribution. At a point in the past, the dairy site underwent a trade waste pre-treatment upgrade to rectify non-compliant trade waste discharges. Some of which were associated with biochemical oxygen demand shock loads upsetting the receiving wastewater treatment plant and impacting on treatment costs and quality of treated effluent. A DAF system has improved the quality of their discharge to sewer, as well as reducing trade waste costs and reducing the load on the receiving wastewater treatment plant.



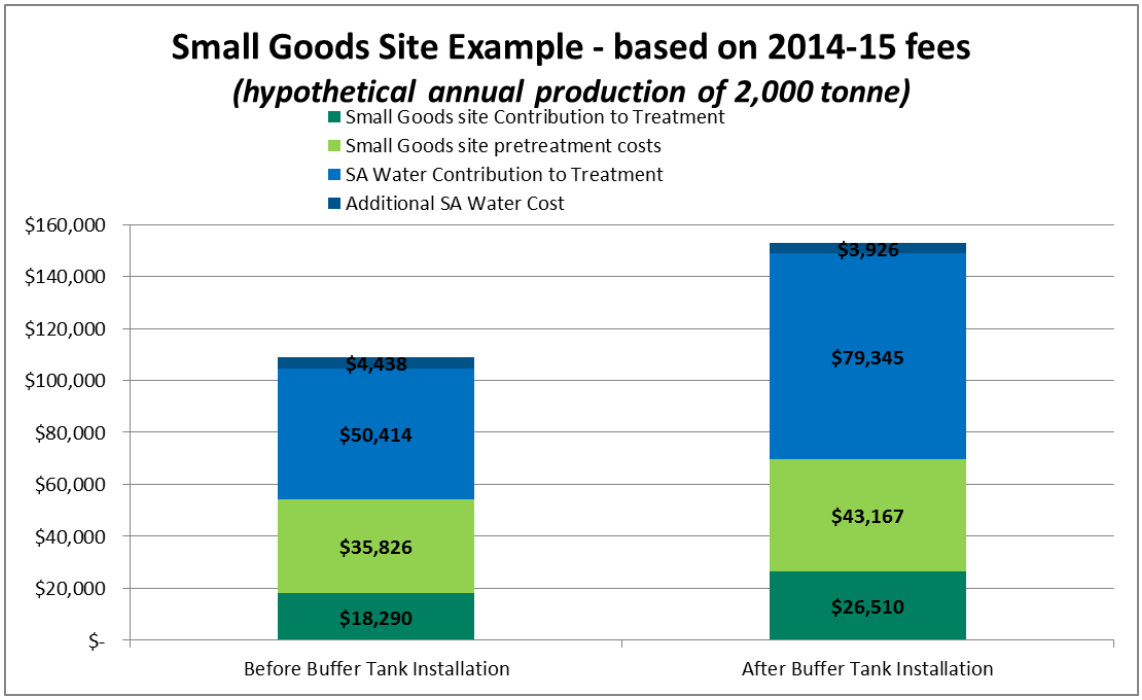
The dairy site example shows that with the installation of a DAF system, the overall annual cost associated with the site's trade waste discharge marginally decreased, but significantly reduced the cost to SA Water and sewer rate paying customers. The key points are:

1. The installation of the DAF system had the following improvements:
    a. Biochemical oxygen demand reduction of 83%
    b. Suspended solids reduction of 77%
    c. Grease reduction of 95%
2. Overall saving over $15,000 per annum (3 % reduction). Taking into account the assumptions made for the case studies, in this case a fair conclusion would be the overall cost before and after are on par, with the cost being shifted to the trade waste customer.
3. The DAF system increased pretreatment costs by over $200,000, offsetting the $100,000 saving in trade waste charges. This increase in site costs represents the site taking responsibility of their trade waste discharge.
4. Accordingly, the costs incurred by SA Water reduced by over $110,000, ultimately resulting in a saving for all sewerage rate paying customers of SA Water (33% reduction).
5. After the DAF system installation, SA Water still contributes 47% of the total value of accepting the dairy site's trade waste discharge.

4 Small Goods Case Study

This site produces small goods and meat products, including brined meats, smoked products and sausages. The site's trade waste was originally pumped through a grease arrestor, and then flowed by gravity to a sewer. After some time, a buffer tank was installed to moderate the trade waste flow through the arrestor.

It should be noted that the site still needs to improve management of the majority of parameters to be fully compliant, but is endeavouring to rectify issues with appropriate technology solutions, which are currently being investigated.

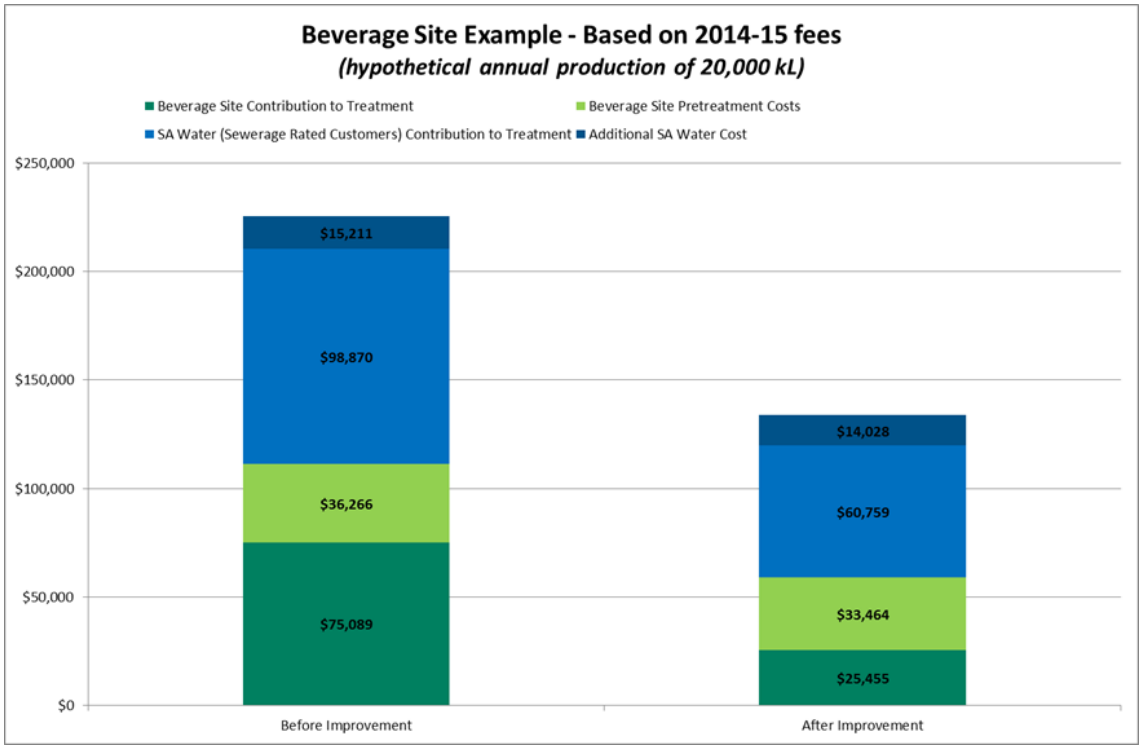


The small goods site example shows that once the buffer tank was installed, the overall cost associated with the site's trade waste discharge increased. The key points are:

1. Overall cost increase of over $40,000 per annum (40% increase).
2. The small goods site invested capital to install the buffer, which has additional pump out costs as well. Taking into account the continued non-compliant trade waste discharge, the annual site trade waste costs increased by $15,000 (28% increase).
3. Accordingly, the costs incurred by SA Water increased by over $28,000, ultimately resulting in additional cost for all sewerage rate paying customers of SA Water (51% increase).
4. After the buffer tank installation, SA Water still contributes 54% of the total value of accepting the small goods site trade waste discharge.
5. Despite the current discharge quality from the small goods site, the installation of the buffer tank will allow the site flexibility in the future to improve trade waste discharge quality adequately.

5 Beverage Case Study

The beverage site packages drinks for distribution; typically juices, syrups, carbonated drinks, water and cordial. This waste is inherently high in biochemical oxygen demand due to the sugar content (and pH as a result of biochemical oxygen demand degradation and cleaning products), but low in most other contaminants. Many years ago, the site underwent improvements installing buffer tanks and pH correction. In more recent times, there were non-compliant discharges involving biochemical oxygen demand and pH levels, which were rectified over time by improving site practices and improving chemical dosing.



The beverage site example shows that with effective trade waste management, the overall annual cost of associated with the site's trade waste discharge decreased and reduced the cost to SA Water and sewer rate paying customers. The key points are:

1. The improvement of trade waste management had the following improvements:
    a. Biochemical oxygen demand reduction of 60%
    b. Volume reduction of 23%
    c. Total dissolved solids reduction of 26%
2. Overall saving over $90,000 per annum (41% reduction).
3. There was no significant cost involved with pretreatment upgrade as the infrastructure was already in place; it was the management of high strength waste that resulted in savings. As a result, the savings for the beverage site were over $50,000 (52% reduction).
4. Accordingly, the costs incurred by SA Water reduced by almost $40,000, ultimately resulting in a saving for all sewerage rate paying customers of SA Water (34% reduction).
5. After the improvement, SA Water still contributes over 50% of the total value of accepting the beverage site's trade waste discharge.

6 Summary

1. Three out of four case studies showed dramatic improvement in discharge quality to the SA Water network.
2. Three out of four case studies resulted in net benefit to SA Water and the site.
3. All case studies showed a high percentage (greater than 47%) of the cost of the trade waste discharge still being contributed by SA Water, and ultimately SA Water sewerage rate paying customers.