



## Recycled Machinery washwater

Mains water costs at golf clubs can be a significant proportion of a club's expenditure on utilities so water use efficiency is a key target for many clubs. Water is used in the clubhouse in the kitchen, showers and toilets and on the course for irrigation and **course management machinery washdown**.

Every golf club is different, and every course requires a different maintenance programme and different machinery use across the year. Climate variations will determine frequency of mowing, nutrient application and amount of pest and disease management required and therefore amount of machinery washing and water used. Washdown water also has to comply with environmental legislation as trace chemicals and organic matter in washwater effluent has the potential to cause pollution and impact on water quality.

### Example water usage for machinery washdown

An average 18 hole club washes an estimated 5 pieces of machinery a day for approx. 6 days a week over a 6 month playing season (26 weeks) = 780 washes. Over the other 6 months of the year an average 2 pieces of machinery are washed per day = 312 washes.

This could equate to an approximate **1092** machinery washes per year.

If each wash lasts about 10 minutes and the wash hoses have a flow rate of 30 litres / minute, each wash uses approximately **300 litres** of water.

Over a year this could equate to 327,600 litres a year or **327.6m<sup>3</sup>**

### Example water costs for mains water supply to washdown

At present in Scotland costs of mains water and mains sewerage consist of standing charges related to water meter size and volumetric charges.

The volumetric charges are £0.8042/m<sup>3</sup> for mains water supply and £2.3982/m<sup>3</sup> for the first 23.75m<sup>3</sup> sewerage and £1.4421/m<sup>3</sup> thereafter (*Source: Scottish Water Business Stream 2013*)

For a washwater system that uses 327.6m<sup>3</sup> mains water would cost a Scottish golf club:

Supply: 0.8042 x 327.6 = £263.46

Sewerage: 2.3982 x 23.75 = £56.96 + 1.4421 x 303.85 = £438.18

**Estimate total costs for washdown = £758.60 per year in volumetric charges alone.**

**Standing charges would also be paid but they cover all the mains water use for the facility.**

## Closed Loop Recycled water washdown systems

Suppliers such as Hydroscape Ltd [www.hydroscape.co.uk](http://www.hydroscape.co.uk) and ESD Waste2Water [www.waste2water.com](http://www.waste2water.com) provide recycled water washdown systems to many clubs in the UK allowing machinery wash-off, vehicle refuelling, degreasing, chemical mixing and any other potentially polluting activities to all be undertaken on the wash pad. Washwater is recycled as the effluent is biologically treated by microbes and solids removed (and with the Hydroscape system also ozone treated for disinfection).



*Hydroscape Ltd*



*ESD Waste2water*

The recycling systems vary in size and specification depending on demand but an example of the operational costs / savings for the Hydroscape Ltd systems are as follows:

### Water savings:

Estimated water usage (as above) = 327.6m<sup>3</sup> / year

Estimated cost of mains water inc. sewerage charges (as above) = £758.60 / year

Hydroscape system recycles an estimated 80% of water used; (remainder lost through overspray and evaporation and also treats approx 3.6l/m<sup>2</sup> rainwater on washpad)

Therefore there is a potential saving of mains water costs of **£606.88 / year.**

### Operational costs:

Energy use: Continuous pumps for biological treatment =  $2 \times 3.75\text{kW} = 18\text{kW}$  per day

1 pump used for washwater flow through hoses = 1.2 kW and Ozone pump for additional disinfection treatment

Estimated average cost = £.075p/day = £273.75 / year

Monthly costs for microbes = £45/month = £540 / year

Maintenance costs – periodic draining down and cleaning of system - £minimal

Total operational costs = Energy, microbes and maintenance costs = £273.75 + £540 => **£813.75/year**

### Capital Costs:

System without concrete washpad = **£15k**

System including concrete washpad = **£20k-30k**

The Hydroscape system is on the Government's Water Technology List as an approved water saving device. It is possible to accelerate capital write down allowances and offset capital costs against corporation tax in the first year of acquisition. This is of particular interest to proprietary owned facilities to reduce corporation tax liability.

### Conclusion

For areas such as the south east of England, where water supplies are often low and further future hosepipe bans expected, recycled systems like these can insure uninterrupted machinery washing.

The other benefits of such a system however, such as pollution risk reduction as chemical mixing etc, which can also take place on the wash pad are all important factors to consider if upgrading your wash pad.

As the cost estimates show, recycled wash water systems, while saving substantial water costs, other operational costs such as energy, microbes and maintenance balance out or exceed the water savings. Capital costs may also be prohibitive to many clubs.

There are alternatives to a closed loop system that are approved by SEPA that will enable clubs in Scotland to meet The Water Environment (Controlled Activities) Scotland Regulations 2013 and SEPA's General Binding Rules GBRs 10 and 11.

Detailed guidance can be found the Environmental Legislation section of the Scottish Golf website.

Key legislation requirements:

- Removal of dirt, grass clippings and pollutants before washing by using a return maintenance track. Grass clippings contain high quantity of Nitrogen and Phosphorous which can cause pollution if released into the water environment.
- Appropriately planning frequency of washdown and use of brushes and air hoses where applicable can also reduce water use.
- Wash areas must be bunded and grass collecting interceptor chambers must be present.
- The guidance states there are a variety of legally acceptable ways to treat the wash water effluent, depending of the golf facility size, chemical activities and proximity to watercourses. These include discharge to swales, soakaways and reedbeds if washing is separate from chemical mixing, or to the more advanced carbon filter and recycled closed loop systems which also allow chemical mixing and refuelling activities to take place on the same washpad.

*Information in this article is intended to provide only a general outline of the subjects covered. It should neither be regarded as comprehensive nor sufficient for making decisions in place of professional advice for the specific needs of your club. Scottish Golf accepts no responsibility for any loss arising from any action taken or not taken by anyone using this guidance.*

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