THE PROBLEM OF SOLENT GREY WATER

With special reference to Bembridge Harbour and the issue of houseboats

Introduction

- This report has been produced for the Natural Environment Group of the Solent Forum, dated March 2021.
- It is intended to provide a brief insight into the issues of greywater discharge in the coastal environment of the Solent region, from marine to estuarine.
- For the purposes of this report, greywater is defined as all wastewater generated in households or office buildings except from toilets. Sources include sinks, showers, baths, washing machines and dishwashers.
- At a time when nutrient enrichment in the Solent is a matter of significant policy development, and when consultation on the Southern Coastal Plan proposes greater scrutiny of at-sea discharges and their impacts on water quality, the largely uncontrolled release of grey water from Solent vessels merits urgent attention. It joins agricultural run-off and storm release from water treatment works as the background ‘noise’ in the region’s marine contamination spectrum.

Blackwater Regulation at sea

- Sewage effluent (blackwater) from craft must not be discharged from onshore installations into controlled waters without the consent of the Environment Agency. Discharges to British Waterways canals will also require British Waterways consent.

- Sewage discharges from vessels to rivers, canals and lakes are regulated by the navigation authorities through bye-laws, and discharges from sanitation systems are not generally permitted. For tidal and coastal waters, reference should be made to local harbour authority by-laws. Under Schedule 21 of the Environmental Permitting Regulations a permit is **not** required if the discharge is of trade effluent or sewage effluent from a vessel.

- In some cases harbour byelaws state that sewage cannot be discharged if the vessel has a sewage holding tank and if reasonable facilities exist for pumping out into a suitable disposal system. Therefore, byelaws can sometimes be used to regulate sewage discharge.

- Regulations for the prevention of pollution by sewage at sea are contained in Annex IV of MARPOL but apply only to ships of 400 gross tonnage and above engaged in international voyages or certified to carry more than 15 persons. Small recreational and fishing craft for example are unregulated.

Legal Power, Duty or Regulatory Tool	Relevant Legislation	Lead Organisation
Requirement for ships above a certain size to have a garbage management plan and sewage treatment facilities	The Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008	MCA
Prohibition on disposal of plastic garbage from vessels at sea	The Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008	MCA
Requirement for Marine Licences for deposits at sea	Marine and Coastal Access Act 2009 (Section 71)	Marine Management Organisation

Name	Description	Responsible Organisation	Statutory or Non-Statutory?
Marine Guidance Note 385 (M+F)	Guidance on the Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008	MCA	Non-Statutory
Marine Guidance Note 280 (M)	Small Vessels in Commercial Use for Sport or Pleasure, Workboats and Pilot Boats – Alternative Construction Standards	MCA	Non-Statutory
Marine Guidance Note 363 (M+F)	The Control and Management of Ships' Ballast Water and Sediments	MCA	Non-Statutory

MCA AND MMO REGULATORY POWERS

Greywater Regulation at sea

- There are **no** UK or international rules applying to grey water discharge at sea.
- This combined with the regulatory exemptions for blackwater applied to small craft leaves high-volume leisure boating locations very vulnerable to uncontrolled and cumulative contamination.
- The Solent clearly falls into this category.
- Most of the Solent, and all of the Isle of Wight and its inshore waters is now designated as a UNESCO World Biosphere Reserve bringing into close alignment with the 17 United Nations Sustainable Development Goals (SDGs).
- The UK is a signatory to the international agreement promising the delivery of the SDGs by 2030.
- SDG 14 is ‘Life Below Water’.

Greywater Composition

- High volume, low strength wastewater with high potential for reuse.
- Contains high concentrations of easily biodegradable organic materials, nutrients such as nitrates and phosphates, pharmaceuticals, health and beauty products, aerosols, pigments, and toxic heavy metals such as Pb, Ni Cd, Cu, Hg and Cr.
- High temperatures may favour microbiological growth and may also cause precipitation of certain carbonates such as CaCO3 and other inorganic salts which become less soluble at high temperatures.
- Grey water contributes significantly to wastewater parameters such as biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS).
- There has been a gradual increase in the level of complexity in the composition of greywater.
- Daily greywater production is approximately 98 L per person per day and accounts for 70–75% of total household wastewater production (135 L per person per day).

Waste Source	Characteristics
Automatic clothes washer	bleach, foam, high pH, hot water, nitrate, oil and grease, oxygen demand, phosphate, salinity, soaps, sodium, suspended solids, turbidity
Automatic dish washer	bacteria, foam food particles, high pH, hot water, odor, oil and grease, organic matter, oxygen demand, salinity, soaps, suspended solids, turbidity
Sinks, including kitchen	bacteria, food particles, hot water, odor, oil and grease, organic matter, oxygen demand, soaps, suspended solids, turbidity
Bathtub and shower	bacteria, hair, hot water, odor, oil and grease, oxygen demand, soaps, suspended solids, turbidity

GREY WATER SOURCES AND CHARACTERISTICS

The Problem of Greywater

The World Wildlife Fund describes the problem:

"Chronic industrial pollution and climate change are transforming our oceans and helping drive a global biodiversity crisis. Among the many sources of ocean pollution, none are as prevalent — or as solvable — as "grey water" from ships. It's a mix of wastewater from cooking, cleaning and laundry as well as sinks, floor drains and showers. It's also a vector for pathogenic viruses and bacteria, among other hazardous substances like toxic cleaners, pesticides, heavy metals, nutrients and plastics."

There is a reasonable point of view that greywater is potentially more environmentally harmful than sewage. Black water is essentially organic while greywater can contain oils, fats, detergents, chemicals and greases as well as abundant micro and nano plastics.

In as busy a commercial, industrial and leisure sailing environment as the Solent, with its international obligations to protect internationally significant marine habitats and species assemblages there must be greater effort made to tackle the problem of greywater. This is especially so given the focus of regulators on nutrient enrichment from new development, even the worst of which has some system of management for wastewater. Discharge of greywater in the Solent remains essentially uncontrolled.

The scale of the problem can be captured by considering the potential impact of discharges from just one vessel, the Oasis of the Seas, a Royal Caribbean cruise ship visiting Southampton with the capacity for 6300 travellers. This is close to population of East Cowes.

The Case of Houseboats

There are several houseboat communities in the Solent and they form an interesting case study for greywater, often straddling the line between coastal and freshwater systems.

There are no greywater discharge regulations even where blackwater is covered by local byelaws (for example Thames):

Grey Water

Byelaw 49 applies only to Sewage (also known as black water), but the discharge from your sinks (also known as grey water) can also have a detrimental effect on the environment. We recommend that only phosphate-free detergents are used, and advise that you use environmentally-sensitive washing products where possible.

If possible, re-plumb waste water systems so that both grey and black water are diverted to the holding tank and then disposed of by one of the methods outline above.

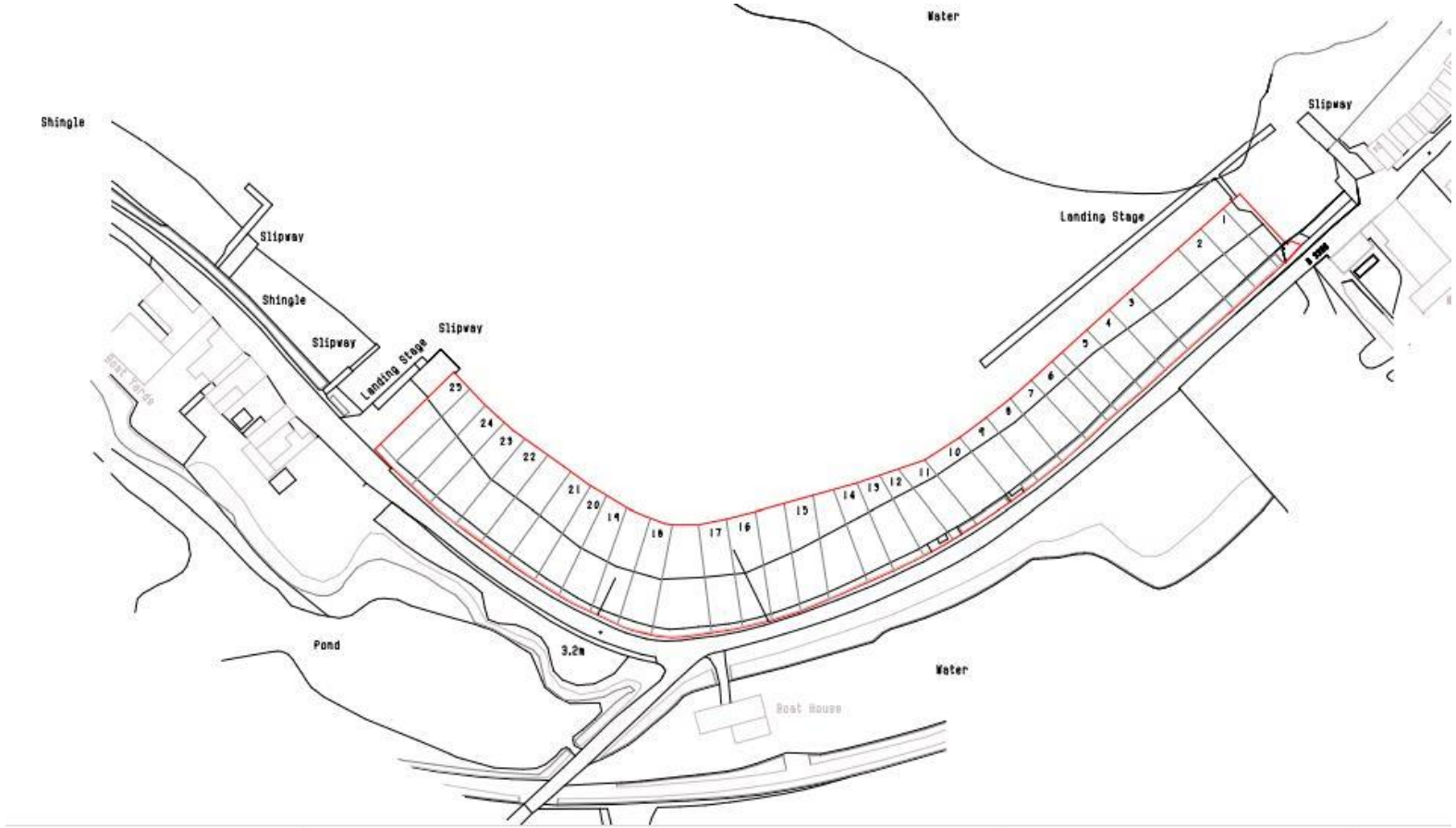
Planning requirements are confusing and inconsistent. Houseboats often fall outside of planning control unless moored for so long in the same place that they can be regarded as bringing about a material change of use of land.

In designated habitats (for example intertidal SSSIs), consent from Natural England may be required for some operational activities (‘potentially damaging operations’).

In summary, little is clear or prescribed and the delivery of sustainability goals is largely dependent on best practice case by case rather than a coherent supporting policy framework.

Bembridge Harbour

- The use of a part of the harbour for houseboats was regularised through the issue of a Lawful Development Certificate in 2018.
- This covers the area shown in red, comprising 25 plots.



Bembridge Harbour

- Where onboard sewage treatment equipment is required through new planning applications, for example for replacement vessels (such as plots 3 and 4 in 2019/20), an agreement exists whereby an equivalent installation will be made in an existing houseboat lacking such facilities. This is not formalised via s106 or legal agreement and is therefore voluntary.

- Onboard systems are capable of dealing with combined black and greywater but grey is largely scoped out as insignificant to harbour nutrient loading as a result of Environment Agency local monitoring data. Greywater is again therefore relegated to a voluntary control, both in planning and in harbour operations.

- There are no pump-out facilities in Bembridge Harbour (there are very few Solent marinas providing this service). Each houseboat is therefore responsible for its own wastewater collection and disposal. The assumption is that most visiting recreational boats are likely to be discharging untreated or partly treated black and grey water directly into the Solent.

- Bembridge Harbour, and the regulation of greywater discharge from its houseboats, is essentially a microcosm of the wider Solent shipping environment and exposes the same fundamental regulatory weaknesses and blindspots.

Recommended Actions for Bembridge Harbour

- Provide clear information on the impacts of both black and grey water discharge to every houseboat owner and operator. Make the same information freely and easily available to all visiting boats via the Harbour website and direct from the Harbour office. This information should also make a connection with the Harbour's own bye-laws, specifically no. 31 (though even here the wording clearly demonstrates the contingent nature of controls):

a) No person shall, without the consent of the Harbourmaster, pour, pump or wilfully or carelessly allow to escape into the harbour, any dangerous or offensive liquid or matter.

b) No sewage from a vessel equipped with sewage holding tanks shall be discharged into the harbour, if reasonable facilities exist for the pumping out of such sewage into a proper sewage disposal system.

- Provide links to The Green Blue via Harbour website and prominent sharing of information on product options for reduced impact including local suppliers.

- Provide links to examples of good practice such as Adur District Council.

- Provide links and access to a local document library on Solent Nutrient Neutrality, what it means and why it is important.

Recommended Actions for The Solent Forum

- Include greywater in the Solent Nutrient Neutrality discussion.
- Understand better the scale of likely greywater input from commercial and leisure craft into the Solent system and its marine protected areas.
- Work with the Solent local authorities, its ports and harbours and its regulators (Natural England, Environment Agency, Marine Management Organization, Marine and Coastguard Agency) to create a greywater code of conduct. This would be focussed on UN Sustainable Development Goal 14 with a 2030 deadline.
- Use the Isle of Wight Biosphere designation (which covers the whole Solent) and the new Solent Freeport, with its promise of an environmental and 'Greentech' specialism, to support the production of this code.
- Work with Solent local authorities, ports and harbours and regulators to review maritime development plans, LDOs and site allocations to improve supporting infrastructure for black and grey water controls. Use the Solent Freeport powers to support this review and the implementation of necessary upgrades.
- Support the work of The Green Blue to develop a detailed Solent facilities and advice portal.