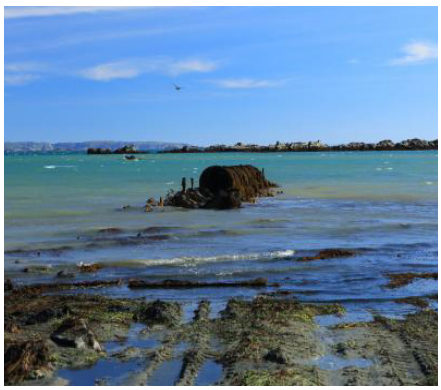
Guernsey Water

SURFACE WATER MANAGEMENT POLICY



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Blue infrastructure – infrastructure that keeps water at the surface, including streams and ponds. See also Green infrastructure

Climate Change – current trends in changes to rainfall and temperature, including more frequent heavy rainfall in both summer and winter. Extreme events such as heat waves, droughts and flooding are likely to become more frequent

CSO (Combined Sewer Overflow) – a discharge point on a pipe system that receives both foul and surface water, which spills to prevent flooding when the pipe or pumping station capacity is reached

Exceedance – occurs when the capacity of the drainage system is reached

Green infrastructure – use of features which include vegetation and soil media to manage and treat surface water flows close to the source. These include raingardens, swales, detention basins and wetlands. See also Blue infrastructure

Grey infrastructure – traditional drainage system including pipes and concrete tanks

Infiltration – water flowing into the ground. See also Runoff

Permeable surface – a surface allowing infiltration of rainwater to the sub-base for the purpose of storing the water, and, where the ground conditions allow, infiltration into the underlying soil

Pollution – biological or particle material that compromises the quality of surface- and ground water. Can be either diffuse, i.e. from widespread multiple sources, or a point source such as a CSO

Raingarden – planted area designed to receive stormwater runoff

Runoff – the water which flows over the ground surface following rainfall (or snow melt), which flows into surface water bodies or a drainage system. See also Infiltration

Storm Water Management – an organised approach to managing the quality and quantity of storm water, in order to achieve objectives including reduced flooding and pollution

Swale – a shallow vegetated channel designed to convey, store and sometimes infiltrate surface water runoff

Urban Creep – the increase in impermeable area (and associated runoff) relating to the extension of existing development (e.g. adding a conservatory or paved area for parking)

1. PURPOSE

The effective management of stormwater is vital to the success of the Island of Guernsey. We believe passionately that we have an opportunity to have a positive and sustainable impact, benefiting our population, enhancing the environment and providing security for commerce, business and property owners.

The purpose of this policy is to communicate the vision we have for managing stormwater, both now and in the future. This document will be complemented by a strategy, which will set out how this policy will be achieved.

This policy will be available to all stakeholders and interested parties.

Guernsey Water Vision:

Customers always value the quality of our drinking water and the safe return of our wastewater to the environment"

2. BACKGROUND – STORM WATER MANAGEMENT

Guernsey Water provides an essential service by managing the collection and return of surface water to the environment. In providing this service we face challenges that will only be exacerbated by more extreme rainfall patterns, population growth and development over previously greenfield land. Our development of a strategy to effectively manage surface water is an essential element of our long term success to provide affordable and effective services to our customers, in the face of a changing climate and a continuously evolving island.

High population density and large impermeable areas mean that the proportion of rainwater being passed forward through the sewerage system is much higher than a typical UK water industry area. To protect from flooding, some overflows discharge straight into the sea, which can impact the environment . Initiatives to improve the management of surface water have included extending the surface water network (for example at Le Truchot), new storm tanks at Belle Greve wastewater facility, and telemetry installed in wastewater pumping stations and overflows to monitor their operation and make them more efficient.

Guernsey Water have engaged in a hydraulic modelling partnership since 2013, and now have a well calibrated island-wide model of the foul and surface water networks. This model has identified flooding sites, and will be invaluable when evaluating the cost effectiveness of potential solutions.

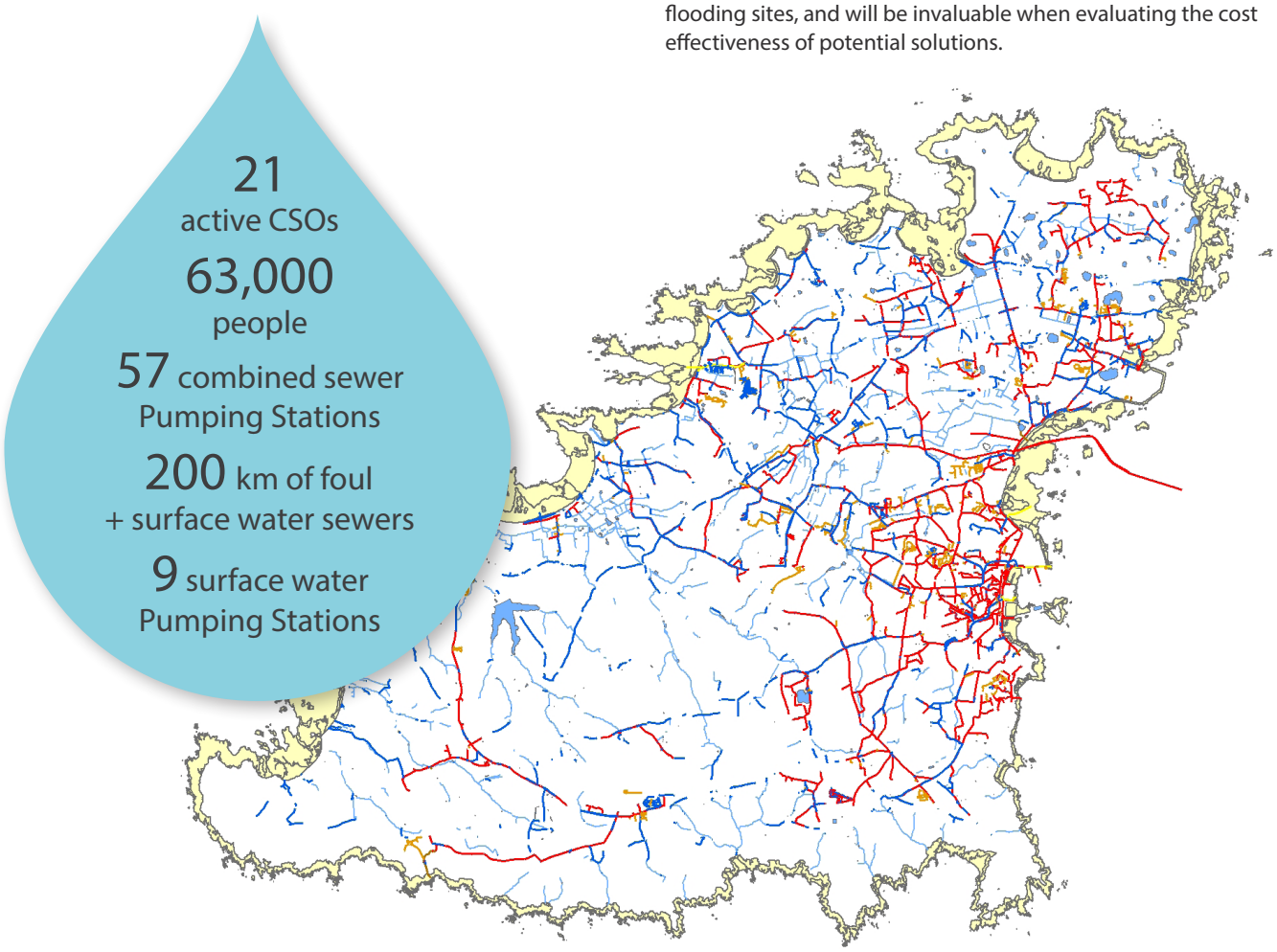


Figure 2-1 Drainage Map of Guernsey, showing foul and combined sewers (red and orange), watercourses (light blue) and surface water sewers (dark blue).

3. KEY DRIVERS

Guernsey has suffered from high-profile flooding in recent years, causing damage to homes and businesses. The topography of the island is such that the low-lying centre and north is particularly at risk. This area is also the most densely populated and includes St Peter Port. Some areas below sea level are particularly at risk.

Why is a sustainable approach to drainage needed?

Flooding and Pollution – our changing climate presents increasing uncertainty around rainfall frequency and intensity. There is a need to be more resilient to changes that are of unknown magnitude.

> "Decades of development have reduced our green spaces, so there is nowhere for the rain water to drain naturally. This means that when a lot of rain falls in a short space of time the drains quickly become overwhelmed and the only route is overland"
>
> Stephen Langlois,
> General Manager, Guernsey Water

Existing sewerage infrastructure is inflexible to coping with these changes. Urban Creep describes the extensions to existing properties and paving of driveways that increases the speed of runoff into the sewers. Large volumes of polluted stormwater runoff can discharge to watercourses or the sea through Combined Sewer Overflows (CSOs) and the short sea outfall at Belle Greve wastewater centre. The uncontrolled discharge of untreated sewage is undesirable, in particular where bathing sites or fisheries are affected. The traditional solution of stormwater storage tanks is high in cost and often unfeasible where space is limited. They can leave long term legacies of operation and maintenance, and require upsizing as runoff volumes increase.

Growth and Development Capacity – The population density of Guernsey is 2.5 times higher than that of England and 27% higher than Jersey. While a significant population increase is not anticipated, the distribution of the population is ever-changing, and new developments impact on the local sewer capacity. Removal of surface water from the sewage system creates headroom for development to occur. New developments could fulfil a useful role in helping us to implement sustainable drainage.

Energy, Carbon and Cost – once stormwater has entered the sewerage network it becomes a burden for Guernsey Water to pump, treat and dispose of. By contrast, in its natural state the rainwater would have made its way instead to groundwater, surface water bodies and the sea without any requirement for human intervention. Allowing this natural process to occur saves a huge amount of energy, carbon and cost, by simply keeping rain water out of the sewers.

4. APPROACH

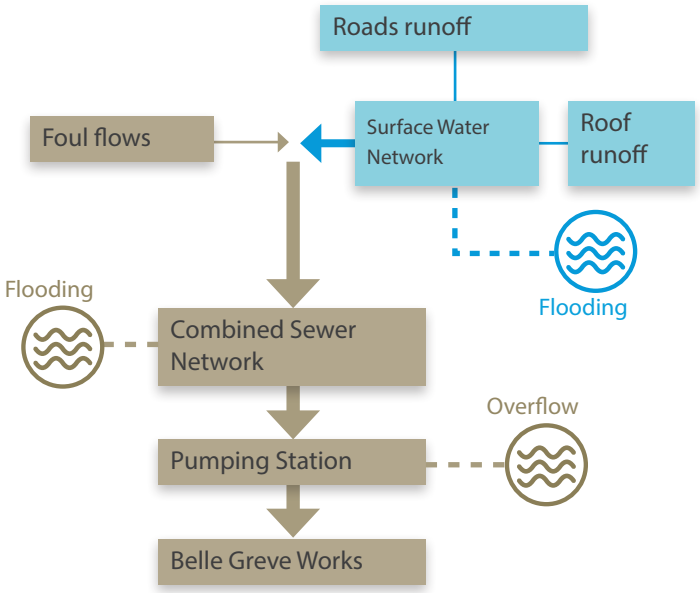


Figure 3-1 Separation of surface water can be the most effective way to create headroom and reduce operational costs in a combined sewer network

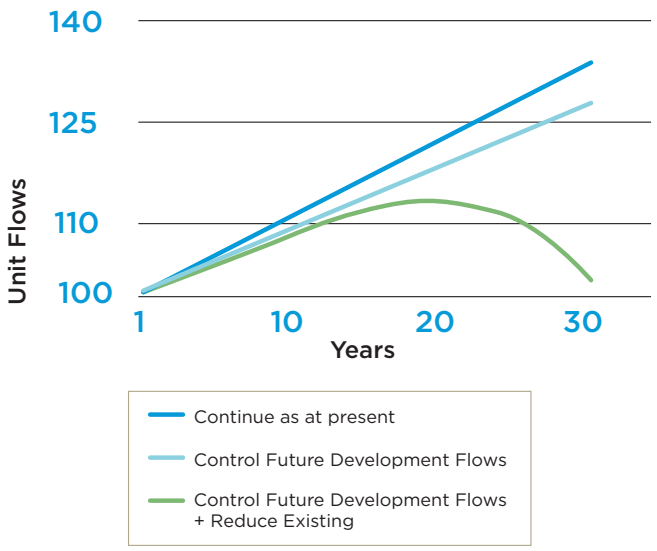


Figure 3-2 Indicative graph showing runoff volume trajectories in the long term. On the present trajectory, flows (and flooding) will continue to increase due to climate change, urban creep and growth. By removing impermeable area we can protect ourselves from future increases in rainfall and reverse the trend. This will require tackling existing infrastructure as well as new development.

In order to tackle these problems, a departure from the traditional approach to sewerage is required. A systems level approach which tackles a number of issues together will be the most effective. Our communities will be at the heart of all investment decisions: improving outcomes while reducing costs.

The process of reducing the impact of storm water on our systems is a long-term undertaking and will build up steadily and consistently over time, protecting homes and businesses from flooding and improving the impact on the environment.

There is an immediate need to protect properties that are vulnerable to flooding now. These are being identified and interim measures employed. This will generate the breathing space required for the long term, sustainable strategy to take effect.

Reference projects will be developed, both to grow our sustainable drainage skillset, and to demonstrate and communicate the approach to the stakeholders and residents. We will take an opportunistic approach to identifying areas to be developed.

Rural areas are vitally important when controlling rainwater. Managing water higher up in the catchment delivers a magnified benefit in reducing flooding downstream, and in addition lends itself to maximising environmental benefits, encouraging wildlife and supporting the ecosystem. By assessing upland habitat we will determine the potential for enhancement, looking at both quality and functionality for water storage and value creation through ecosystem services. Ecosystem services describe the benefits that people obtain from the natural environment in a more holistic way. This approach will be used to more adequately quantify the benefit we gain from natural features, benefits that include flood control, water quality and aesthetic and recreation. An appropriately sited wetland habitat for example would offer ecological and habitat opportunities as well as the potential for commercial visitor attraction.

Urban areas, in particular some areas of St Peter Port suffer from flooding, but the high density of housing and roads means the opportunities for installing green infrastructure are more constrained. Nonetheless, opportunities do exist and we will use new technology to seek them out. We recognise that green spaces in cities enhance health and wellbeing, absorb carbon emissions and improve air quality- they are the lungs that allow the city to breathe.

Difficulties in constructing infrastructure will be tackled through innovative approaches, for example installing special kerbings and installing storage with in pavements to minimise disruption to residents during installation.

We believe that Storm Water Management is a powerful vehicle for education and communicating sustainable values. It is paramount that communities and residents understand the value of what is being proposed, and are given the opportunity to contribute to successful outcomes. Using the Vauvert school as an example project helps to spread the message through our children. We will create communication strategies which show the positive impacts – reducing flood risk, improving water quality, habitat creating and enhancing biodiversity, education and community amenity.

The UK has suffered when implementing such strategies due to a myriad of legislative and administrative hurdles that split the statutory duties relating to rainfall runoff, creating red tape and inertia. Guernsey does not suffer from these barriers. A flexible approach to deal with the challenges of growth will flourish here in this less complex legislative environment, enabling outcomes to be a key priority. Implementation through Guernsey Water as a single entity, as well as the accessibility of government and other departments should smooth the process. Some UK companies have had success and we will learn from the best of these examples.

These types of approaches will require clear guidance on long-term operation and maintenance responsibilities. A coordinated approach will also be taken to the planning system.

Figure 4-1 Permeable paving installed on a recent development in St Peter Port, Guernsey

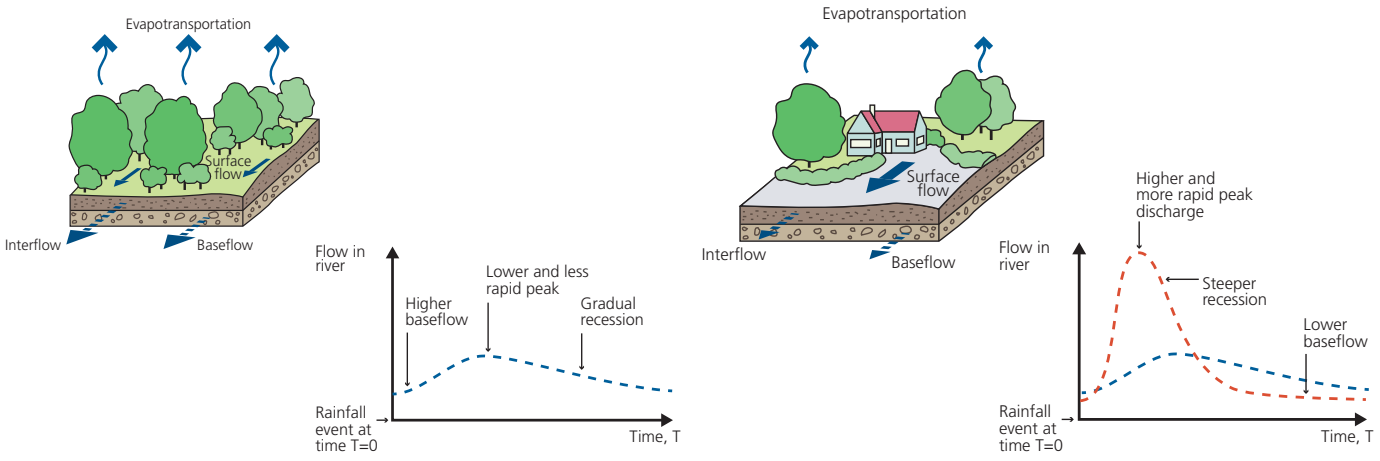


Figure 4-2 Graphic showing the impact of impermeable area on rainfall runoff. Careful management of the built environment can reverse the impact of impermeable surfaces and even seek to improve runoff characteristics beyond the natural state (source: susdrain.org)

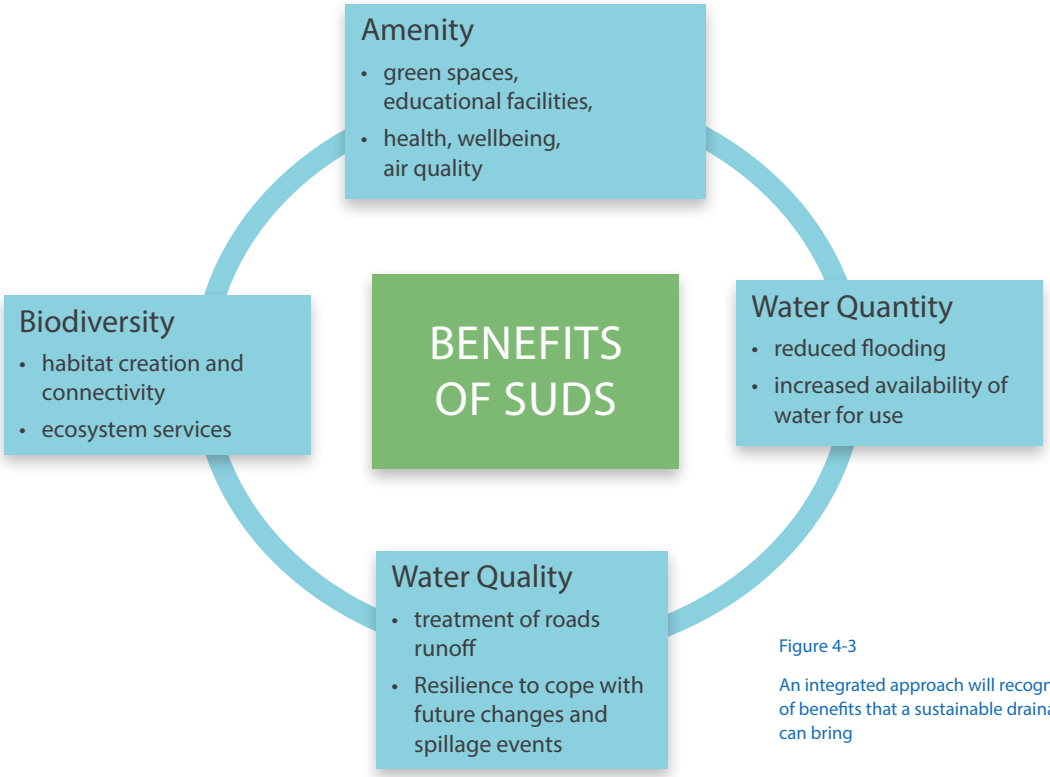


Figure 4-3

An integrated approach will recognise the multitude of benefits that a sustainable drainage systems (SuDS) can bring

5. FUTURE ACTION

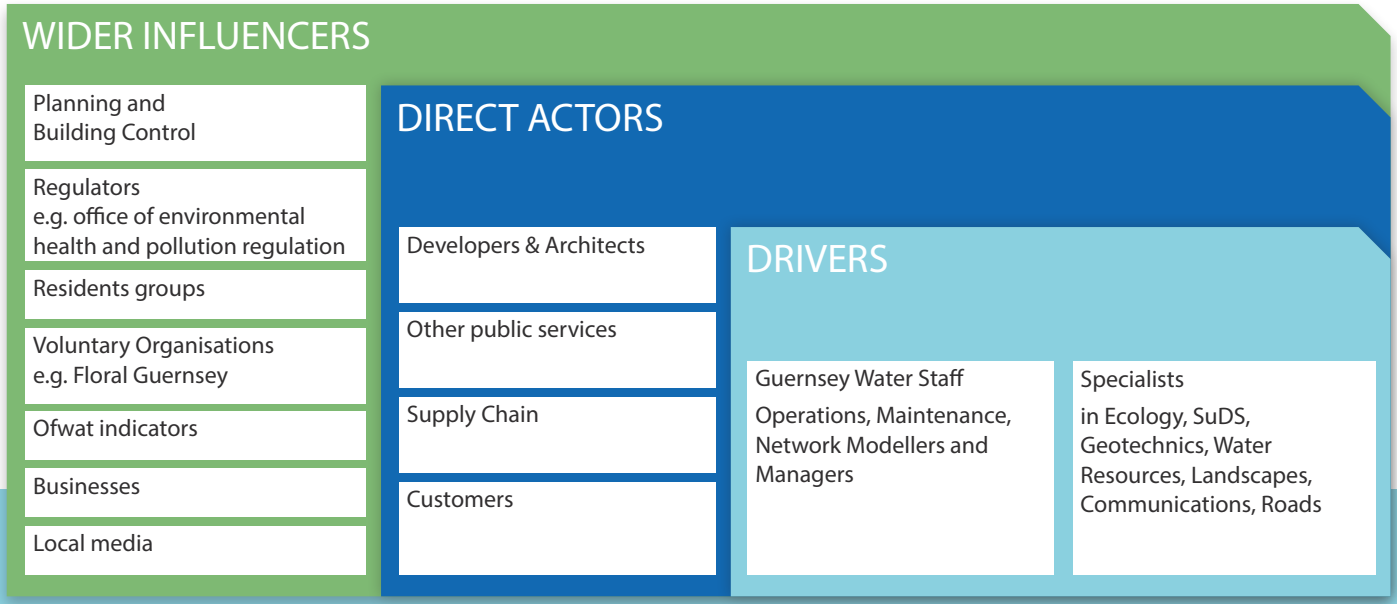
We will:

- Develop a Surface Water Management Strategy detailing our plans and priorities, and how we will achieve the desired outcomes
- Take a long-term view of how we manage storm water in a changing climate. Our long term plan will be complemented by detailed 5 year implementation plans. Shorter implementation plans give the opportunity for regular appraisal and developing the approach to maximise beneficial outcomes
- Develop the know-how and tools to integrate surface water management into decision making and quickly identify opportunities. It is essential that we establish and agree a way of assigning value to ecosystem services
- Build relationships with a variety of stakeholders and work in partnerships
- Aspire to use innovative demand management strategies and communication tools
- Identify scenarios for future development to help plan investment
- Work to influence Regulation and Planning to safeguard our sustainable approach
- Develop study sites to demonstrate the multi-faceted benefits that SuDS can bring

Figure 5-1 New swale in Llanelli constructed as part of Welsh Water's Rainscape initiative (Source: Atkins)

6. STAKEHOLDERS

The implementation of a successful sustainable drainage is a highly integrated process, which relies heavily on relevant stakeholders. These will be mapped and engaged. An initial outline of a range of stakeholders are presented below.



7. ROADMAP TO DELIVERY

The following model represents the transformation that will be undertaken, considering both the short term and long term horizons.

	Prepare (3–6 months)	Engage (12 months)	Demonstrate (6–24 months)	Embed (12–36 months)	Employ (2–25 years)	
Strategy	Develop policy in line with Vision	Develop strategy with input from stakeholders	GW reference projects	Guidance docs and decision tools rolled out	Vision and benefits understood and opportunities layer established	
Skills and Capability	Required skills start to be identified	Learn from experience of UK water companies and adapt to Guernsey	Engage GW staff and contractors, plan for maintenance	Develop the ability to measure and quantify the multi-faceted benefits of SWM including ecosystem services and amenity value	New skills and behaviours embedded within and without	Vision: Surface water managed effectively both top-down and bottom-up, in a way that recognises the multitude of benefits
Institutional Interface, Planning and Regulation	Consider potential interaction, complementary priorities, opportunities and existing relationships	Start to engage institutional stakeholders and other public services	Work with trailblazers	Establish tools and case studies demonstrating best practice and incorporating lessons learnt	Tools used to assist in decision making	
Communication	Map stakeholders and develop communications strategy	Set out vision, develop brand and identity	Use any setbacks and incidents to reinforce need for change	Visualise successes in a clear and understandable way	Established communication narrative to be maintained and refreshed	

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