

**SDS**

Water  
Infrastructure  
Systems

INNOVATORS IN  
WATER TECHNOLOGY

# INTEGRATED WATER MANAGEMENT SOLUTIONS



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# THE GREAT BRITISH RAIN PARADOX

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The UK has a reputation for being a wet, rainy country. However, the perception of a water-rich nation, immune from future water shortages, is very different to the reality that we are facing.

Climate change and population growth are placing the water sector under unprecedented and ever-increasing pressure. The impact on nature and the environment of over-abstraction of our water bodies and uncontrolled sewerage overflows are the subject of intense public and media scrutiny.

The adoption of innovative technologies and application of modern, integrated approaches to water management will play a key role in ensuring the water industry's long-term resilience and maintaining a sustainable supply of this most precious resource.



**FACT:** Demand for water in the UK has grown by 1% year on year every year since 1930.



**FACT:** The South East of England has less water available per person than the desert states of Syria and Sudan.

## ABOUT SDS

SDS all started with a single great idea – our GEOLight® geocellular stormwater attenuation and infiltration system – and, over the last 20 years, has grown to become the UK's leading supplier of sustainable drainage and surface water management systems.

In order to tackle the growing problem of water runoff pollution we have extended our product offering to include water treatment devices and materials and, most recently in response to the growing threat of water scarcity, we have introduced rainwater harvesting and grey water recycling systems.

SDS works in close collaboration with Water Companies in order to deliver solutions that will satisfy Ofwat's primary AMP requirements, in particular reductions in both the number of sewer flooding events and per capita water consumption. With 80% of the UK's population living in areas deemed to be water scarce this latter objective is especially significant.

SDS is committed to continually developing innovative new engineering solutions to meet forthcoming market requirements and the demands of our customers. This proactive and supportive approach has also led to considerable major business Awards success in recent years.





SDS takes a uniquely holistic approach to delivering SuDS and water management by providing design, engineering, manufacture, installation, operating and maintenance services.

## ENGINEERING

SDS creates engineering solutions that accommodate the increasing frequency and intensity of rainfall events; our continuous assessment of new data, alongside the mapping of potential future scenarios, is integral to the correct design and specification of water management systems that are bespoke to each individual site.



## DESIGN

Our in-house design team\* will consult with you from the early specification stages of a project to ensure a water management solution is provided to match your unique requirements; then, because we manufacture all the systems we specify, we can create the exact system your project requires. \* Backed by Professional Indemnity Insurance



## SUPPLY

Our manufacturing bases are quickly accessible from the UK motorway network, enabling product to be delivered quickly to all parts of the UK, whilst our flexible production processes allow us to turn around most urgent orders.



## MANUFACTURE

Our state-of-the-art manufacturing techniques underpin the SDS vision to innovate in design and delivery, ensuring we are able to keep tight control of your project costs whilst guaranteeing product quality and availability.



## INSTALLATION

Our team of expert installers\* ensures that the benefits of every SDS piece of equipment are optimised through correct preparation, installation and connection, guaranteeing peace of mind for both our partners and end customers.

\*All work is covered by our Contractors All Risk Insurance and a complete system warranty against any defects.



## ADOPTION & MAINTENANCE

The attention to detail paid during design and installation means SDS water management systems are simple and straightforward to maintain; however, for added protection, we offer complete scheduled maintenance and will even adopt our systems where required.



SDS SYMBiotIC™ smart sensing and reporting technologies enable water management assets to be monitored and controlled remotely, greatly increasing the efficiency of their operation and maintenance.

SYMBiotIC™ also addresses the current disconnect between drainage and water conservation, by linking stormwater storage facilities to opportunities for rainwater capture and reuse.

**SYMBiotIC™**



Weholite is spirally wound pipe or flat panel, manufactured from corrosion-resistant HDPE to provide a light weight, engineered water storage or conveyance solution. The material has a superior loading capacity and is chemically inert, providing a projected 120-year design life. Due to its excellent physical, hydraulic and mechanical properties, Weholite represents an ultra-reliable and cost-effective alternative to traditional steel, ductile iron and concrete and is utilised across every Water Company region in the UK.

In 2019 SDS acquired the exclusive licence to manufacture and sell Weholite, in modular and large diameter plastic pipe form, in the UK and Ireland. The production plant in Newport, South Wales, has

been manufacturing Weholite for more than 20 years and has the capacity to produce 10,000 tonnes of Weholite products each year.



Albion Water, the first competitive NAV company set up, in 1999, to bring growth and innovation to the water market, has been acquired by SDS in 2022. In conjunction with its market leading water infrastructure technologies, SDS is now in a unique position to take ownership of water management for a whole development and deliver a truly integrated approach.

# WEHOLITE SURFACE WATER MANAGEMENT

Weholite attenuation systems and pipeline products are used across the whole construction industry, including the Water Industry Capital Investment Programme (AMP), for water management infrastructure.

Systems are generally delivered to site as completed units. All products are pre-slung and lifted straight from the delivery lorry into place, eliminating the need for confined space entry on-site and shortening programme time.

## ATTENUATION SYSTEMS



Designed for both online and offline situations, Weholite systems are utilised by most of the major developers, where they provide safe water management to housing developments in the form of stormwater attenuation tanks, pumping stations, soakaways and flood relief culverts.

Weholite systems have been adopted by all of the UK Water Companies. The differing specifications and individual requirements of each Water Company are always taken into account during the design and approvals process to ensure system conformity.

Through adherence to the current edition of both Sewers for Adoption and the Civil Engineering Specification for the Water Industry (CESWI) as the guideline documents for this sector, projects can be approved under sections 104, 106 and 38 with both Water Companies and Local Authorities.



Weholite piping, supported by Weholite access manholes, provide surface water attenuation system for busy road junction.

## PIPE SYSTEMS



Weholite pipeline products are used in a variety of applications including inter-process pipework on sewerage treatment plants and for off-site build components. They are also used above- and below- ground as storage, contact and inter-process pipework for drinking water applications.

The uniqueness of the Weholite production process means that pipes can be run in any length from 300mm to 30m in one piece. It is one of the few polyethylene pipes in the world that can be produced in dimensions larger than two metres and can be supplied in ring stiffness classes from 2 to 8kN/m<sup>2</sup>.

Weholite pipes have a 120-year below- ground and a 60-year above- ground design life and are manufactured and certificated to meet the material and performance requirements of BS EN 13476: 2007 (Part 1-3) Plastic Piping Systems for Non-Pressure Underground Drainage and Sewerage. They have attained certification for DWI Regulation 31 Reference no DWI 56.4.513 "Approved for use in public water supplies" and are WRAS-approved.



**FACT:** Only 14% of England's rivers are in good ecological health and every one fails to meet chemical standards.



# RAF LOSSIEMOUTH

## CASE STUDY



New drainage works installed at RAF Lossiemouth will extend the life of the runway by up to 25 years and ensure the operational capabilities of the airbase are not compromised by heavy rainfall. Particular attention has been paid to the potential flood risk due to the location of the site on the Scottish coast.

Stormwater attenuation has been located below ground due to the restrictions on open bodies of water in close proximity to the airfield.

Along with conveyance piping and manholes, the Weholite tank measures 90m<sup>2</sup> and is constructed predominantly of 260 individual pipes of 14 metres in length and 50 pipes of approx. 7 metres in length. In total, over 4.4 kilometres of 1200mm diameter 4K pipe, along with 10 manholes, have been manufactured and installed by SDS.



The system complies with the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) which make SuDS a requirement for all new developments constructed after April 2007.

# M4 SMART MOTORWAY

## CASE STUDY



This project represents the UK's first installation of BBA-certified pre-fabricated Weholite chambers.

Weholite attenuation tanks are part of an environmentally safe surface water storage and drainage solution which ensures that any surface water runoff, which is contaminated by pollutant spills from the carriageways, is retained within the tank until collection and prevented from entering the natural surroundings.

The scheme, which runs from Junctions 3 to 12 on the M4, takes into account the groundwater Source Protection Zones ("SPZs"), which extend over the Scheme footprint, indicating the relatively high vulnerability of aquifers (particularly the Chalk) to potential contamination.

As part of the Development Consent Order (DCO) planning process, a full Environmental Impact Assessment was carried out in order to inform the design of the project. Since the scheme involves minimal additional impermeable areas, and discharges are essentially limited to prior rates, the adopted mitigation measures ensure that any impacts on the water environment, in terms of surface and groundwater quality, drainage and flood risk, will be negligible.



Of particular benefit to this project, the Weholite systems have been supplied in three-piece assemblies, with pre-fabricated chambers, enabling a much faster and safer installation than with conventional products.

# WEHOLITE WASTEWATER MANAGEMENT

A wide range of Weholite products is suitable for wastewater applications including CSO Chambers, Packaged Pumping Stations, Flow Regulator Chambers, V Notch Weir Chambers, Oversize Manholes, Flood Alleviation Tanks and Sewerage and Stormwater Networks.

HDPE sewer systems have an in-service life of at least 100 years, when materials, products and installation practices meet the appropriate requirements (as set out in 'BS EN 13476-2: 2007 Plastics piping systems for non-pressure underground drainage and sewerage. Structured-wall piping systems of unplasticised poly (vinyl-chloride) (PVC-U), polypropylene (PP) and polyethylene (PE)').

## SDS AQUA-XTRACT™ CSO SYSTEM



SDS Aqua-Xtract™ is a revolutionary prefabricated CSO system which provides a bespoke solution for preventing sewer litter from entering into, and polluting, watercourses and water bodies, whilst still providing the required hydraulic flood relief and guarding against sewer flooding in extreme rainfall events.

SDS Aqua-Xtract™'s removal of sewer litter pollution directly benefits Water Companies' efforts to improve the quality and aesthetics of the natural water environment and helps counter any negative publicity whilst also reducing the risk of prosecution for a pollution incident.

SDS Aqua-Xtract™ incorporates an innovative chamber design, manufactured from Weholite, which houses a sophisticated screen mechanism to remove solid waste from the sewer system during flood conditions. Weholite HDPE is unique in obviating the need for concrete inside or outside to provide structural integrity.



**FACT:** Over 2000 river bodies are affected by the water sector through pollution and over-abstraction.

## HEIGHAM TREATMENT WORKS (ANGLIAN WATER)

### CASE STUDY



Heigham Water Treatment Works (WTW) has been the main supply of water to Norwich for over 100 years and supplies an average of 42 million litres per day of water sourced from the River Wensum.

Historically, the Costessey Pits provided natural water storage from the River prior to treatment at Heigham WTW; sediment, that occurs naturally, was allowed to settle before the water was pumped to the treatment works prior to entering supply. However, with population growth in Norwich expected to reach 1 million by 2034, Costessey Pits would no longer be able to store enough water to support the needs of the region

without having a detrimental effect on the environment nor ensure compliance with the requirements of the 'Habitats Directive Review of Consents' and the Environment Agency's 'Restoring Sustainable Abstractions Programme'.

In order to protect minimum river flows downstream of the Costessey abstraction point and thus enhance the sensitive environment, it was necessary to move abstraction at times of low river flows closer to Heigham WTW, where water flows are higher. This posed a challenge as water from this part of the River Wensum contained higher levels of sediment that would require treatment without natural settling.

# HOOKSTONE ROAD CSO (YORKSHIRE WATER)

## CASE STUDY



Hookstone Road CSO in Harrogate, North Yorkshire, is a CSO chamber with upstream and downstream online storage provided by large diameter pipes. During storm events, restrictive pipe diameters and routing caused the pass forward flow to partially fill the storage pipes before excess flows were screened at the CSO chamber and discharged to the adjacent watercourse. This often led to blockages of the outlet sewer.

In order to comply with the existing Environment Agency Discharge Consent for the asset, the pass forward flow and storage volume provided at the point of spill of the CSO were key in developing an acceptable solution. The catchment was also particularly challenging due to the large number of other CSOs, which could not experience detriment as a result of the solution. Furthermore, the storage pipes are sited in a critical parking area for the Great Yorkshire Show.

The solution maximised the use of gravity return storage and avoided the use of small orifices which had resulted in problems with the system in the past. The final design included 184m<sup>3</sup> of additional sewer storage within large diameter Weholite pipes upstream of the CSO, 360 metres of

sewer upsized to 450mm diameter, and replacement of the existing restrictions downstream of the CSO. 730m<sup>3</sup> of online storage was provided by 4 legs of 1400mm diameter, 120m long Weholite pipes, delivered to site in units up to 10m long and internally welded together in situ.

For this project, making use of off-site fabricated products wherever possible was important in minimising the construction programme and maximising the quality of installation, thereby reducing the risk of re-work.

Weholite HDPE manhole chambers were also selected for a number of reasons including their light weight for handling and installation, integral baseplate to help counteract flotation, no concrete surround required, and inlet and outlet stubs provided at the required angle and gradient. Installation of each prefabricated manhole reduced the construction duration by 4 days compared to traditional in situ construction for a 6m deep chamber.

The updated solution reduced the total carbon impact by 66%.



The existing works would not have been able to treat this poorer quality raw water, so a solution was developed to install a new state-of-the-art filtration membrane.

This new filtration system is the largest submerged ultrafiltration plant in the UK; Weholite waste tanks and manholes were installed as critical components of the system. The £36m scheme was the largest capital investment project within Anglian Water's portfolio in AMP6, helping to ensure resilience of supply for decades to come, while protecting the local environment around the River Wensum, a designated Site of Special Scientific Interest and Special Area of Conservation.

The project also delivered a 62% reduction in operational carbon when compared to the original design by no longer requiring water to be pumped 7km from Costessey Pits. The scheme took just over two years to complete, entering service at the end of 2019, and ensuring the treatment of 57 million litres of water per day to supply nearly a quarter of a million residents and businesses in and around Norwich.





# WEHOLITE DRINKING WATER MANAGEMENT

Weholite pipes can be used above- and below- ground, in drinking water treatment plants and as inter-process pipework on treatment works. Weholite pipes and modular meet the high standards of water supplies in the UK as laid down in the EU

Drinking Water Directive (98/83/EC) and satisfy DWI Regulation 31 Reference number DWI 56.4.513 "Approved for use in public water supplies" as well as earning WRAS approval



3000mm dia Potable Water Balance Tank, Broadfields, Isle of Wight

Weholite has been used to provide off-site build solutions from packaged pumping chambers to chlorine contact tanks and many other similar products including balance tanks and RGF filter tanks.

As we carry our own professional indemnity, we are able to undertake design, produce drawings, manufacture and deliver these types of vessel to site generally as completed units.

All products are pre-slung and lifted straight from the lorry and into place, saving time in design, construction and in the plant required, thereby eliminating the need for confined space entry on site and shortening programme time.



## WEHOLITE PUMPING STATIONS

Weholite packaged pumping stations are manufactured to varying depths and fully assembled in our Newport factory with all the internal pipework and valves to comply with the criteria and specifications of Government legislation. The modular system simplifies the installation process, reducing overall cost whilst ensuring each assembly is functioning correctly.

In addition to enabling significant savings from a more streamlined installation process and reductions in the construction materials used, the off-site manufacturing process also eliminates the need for confined space entry to complete the works. Our clients are also able to save on time by improving site productivity whilst also reducing risks on site.

A factory-fitted HDPE benching arrangement provides the pumps with an ideal operating environment, reducing the potential for blockages and improving the long term reliability and design life of the pumping station. In most cases there is no need for a concrete surround due to the utilisation of Weholite Modular

structural bases, which help counter groundwater and flotation. This gives property developers and Water Companies true benefits when it comes to reducing the overall capital cost of construction and installation of the pumping station itself as well as contributing to significant improvements in the reliability of the system with the corresponding reductions in operational running costs.





# IRTON TREATMENT WORKS (YORKSHIRE WATER)

CASE  
STUDY



Irtton Water Treatment Works (WTW) abstracts water from an aquifer via numerous boreholes and supplies two local service reservoirs which feed Scarborough and the surrounding area. Due to a deterioration in raw water quality and increased risk of pesticides within the raw water, pesticide removal and pH correction equipment were required to achieve effective clarification and reduce cryptosporidium risk.

An interstage pumping station and ten steel pressure vessels for GAC have been installed for pesticide removal. New chlorine contact tanks, comprising six cylindrical above-ground Weholite tanks, each 3.5m in diameter and 16m in length and holding 154m<sup>3</sup> of potable water, address the access and maintenance issues expected of an aging asset.

Significant cost savings were made by using an innovative approach to the design of the tanks' inlet structures in order to ensure an enhanced plug flow. An inlet diffuser attached to the incoming pipework disperses the flow evenly through each contact tank; this exceeded the required plug flow factor without the requirement for any baffles or weir walls. The tanks were sized on a 5+1 basis, substantially reducing the overall required capacity compared with the traditional 1+1 (one in use one out for maintenance) basis, and hydrostatically tested to 1.5 bars pressure at the factory.

Equipped with supporting legs for above ground installation and two 1200mm hinged manway access shafts the tanks were connected in series to allow for any combination to be taken offline or out of service.

# CAMBRIDGE WRC PUMPING STATION (ANGLIAN WATER)

CASE  
STUDY



In order to increase the treatment capacity of Cambridge's sewage treatment works as part of AMP6, Anglian Water commissioned the largest Weholite modular tank ever built. Measuring 20 metres long by 4.5m wide and 5m high, the tank has a capacity of 340,000 litres of sewage and comprises complex design work including PN16 pipework connections and internal plastic benching.

Following delivery to site by articulated lorry the tank was installed, fusion jointed and tested for water tightness in a single morning, a task which would have taken approx. 13 weeks for its equivalent concrete structure.

# GEOLIGHT® SURFACE WATER MANAGEMENT

SDS GEOLight® is widely recognised as the UK's market leading water storage and attenuation / infiltration system and is used in all sectors of the Private and Public sector construction industry.

SDS works in partnership with the UK's leading contractors to supply both bespoke and off-the-shelf water storage solutions, in a broad range of capacities, to a diverse range of sectors, from industrial and transportation to residential and commercial.

SDS GEOLight® is constructed entirely from post-consumer recycled PVC waste, which would otherwise be destined for landfill, and has been specifically engineered to form underground water storage reservoirs in stormwater management schemes. The size of these reservoirs is determined by the quantity of water to be stored, while the layout of each scheme is designed to suit the individual characteristics and limitations of each site.



SDS GEOLight®'s highly permeable honeycomb structure has a high compressive strength and provides a void ratio of over 95%. Supplied in 400kN/m<sup>2</sup> strength as standard it is also available from 600 to 1000kN/m<sup>2</sup> and can be used under a range of surfaces including grass, porous and standard paving, tarmac and concrete.



**The water storage capability of SDS GEOLight® can be applied not only to minimise the impact of intense rainfall and prevent flooding but in many other ways including:-**

- Water recycling: Water can be pumped to a network of standpipes for irrigation;
- Water pollution control: When combined with filtration devices and separators, SDS GEOLight® systems can replenish groundwater without the risk of contamination from oil, chemicals, hydrocarbons or suspended solids;
- Embankment protection: SDS GEOLight® can be used to quickly form the base of embankments that only weigh a fraction of earth embankments (slope stabilisation).



**FACT:** Over 3 million properties in England alone are at risk of surface flooding, more than those at risk from rivers and the sea.



# SOUTH SEBASTOPOL, TORFAEN

## HOUSING DEVELOPMENT

CASE  
STUDY



Multiple GEOLight® surface water storage tanks, totalling in excess of 8,000m<sup>3</sup> capacity, have been installed in combination with Weholite HDPE manholes over the past five years at this 244-acre residential development in South Wales. Taking up to 12 years to construct it will eventually comprise 1,200 homes and associated facilities alongside extensive areas of green space and conservation land. In order to ensure that the site remains flood risk free the SDS-engineered drainage system operates in harmony with natural, vegetative SuDS, including new balancing ponds and swales, creating new habitats for nature conservation, whilst still retaining the existing streams and canal which traverse the site.



The catchment is relatively urbanised and receives approximately 1,150mm of rainfall per year. Due to its steep, impermeable upper reaches and moderate urban area it responds quickly to storm events and was therefore at risk of significant sewer flooding.

The SuDS system ensures that, despite the redevelopment of the former grass and woodland to impermeable areas, the hydrological status quo is retained. Consequently, the rate and volume of surface water runoff leaving the development is no greater, and its quality no poorer, than before the new development occurred.



# STORTFORD FIELDS, HERTFORDSHIRE

## MIXED USE DEVELOPMENT

CASE  
STUDY



The new Stortford Fields mixed-use development is located on the northern fringes of Bishop's Stortford, Hertfordshire, and will comprise, on completion in 2027, of over 2,000 new homes, along with nursery, primary and secondary schools, care home, retail and business park. It will also provide circa 58 hectares of green open space, trees and hedgerows as part of a drive to improve the overall diversity of the site, with play areas for children and allotments, footpaths, cycling routes and bridle ways.

SDS GEOLight® attenuation tanks were installed in May 2018 and sit beneath the schools' full-size football pitch and adjoining junior pitch, which have been designed to provide additional stormwater storage capacity when required. Representing the single largest surface water storage facility yet installed in the UK, the tanks have the capacity to store up to 8,000m<sup>3</sup>, or eight million litres, of water.

A pre-existing watercourse provides a natural feature by which the layout of the development is structured, in order to maximise drainage, recreation and biodiversity benefits within an enhanced, 2,250-metre-long green corridor. The site-wide sustainable drainage scheme, linked to the watercourse, will improve water levels and water quality in the watercourse and also provide a new riparian habitat which includes reed beds and increased plant diversity.



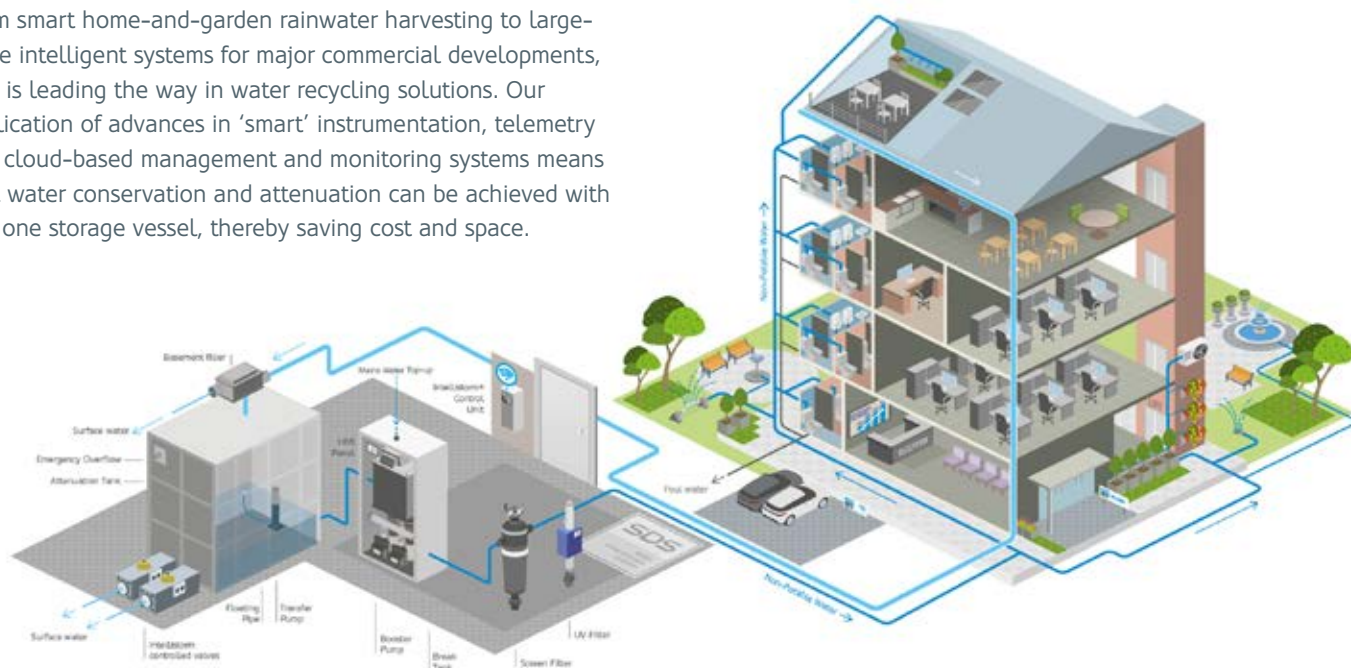


# DUAL-PURPOSE RAINWATER HARVESTING AND RECYCLING

The dual forces of climate change and population growth have led to massive pressure on our water infrastructure. Longer periods of drought, interspersed by more intense periods of heavy rain, are creating severe water shortages and causing flash flooding; indeed, some parts of the UK are at serious risk of not having enough water in less than 20 years' time. Widely introduced across the UK, water reuse could help to close the gap between predicted demand and supply, whilst also alleviating pressure on an overstretched sewer network.

From smart home-and-garden rainwater harvesting to large-scale intelligent systems for major commercial developments, SDS is leading the way in water recycling solutions. Our application of advances in 'smart' instrumentation, telemetry and cloud-based management and monitoring systems means that water conservation and attenuation can be achieved with just one storage vessel, thereby saving cost and space.

SDS Intellistorm® uses weather prediction data, downloaded via secure mobile phone signal, to control the levels of rainwater in a single tank for both attenuation and reuse. When a storm is predicted, the tank level can be lowered if required in sufficient time to allow the spare capacity to be used as a defence against surface water flooding, while retaining as much water as possible for reuse. As a result, the costs of building and operating a rainwater harvesting system are significantly lower.



A digital cloud-based system, such as SDS' SYMBiotIC™, can also provide a wealth of data on system performance in order to better plan maintenance and demonstrate water savings in real-time.

SDS "hybrid" systems combine natural features such as ponds with hard-engineered devices, enabling the same retention facilities to be used to save rainwater for reuse while providing a safe storage space to capture excess surface water and prevent flash flood events.

SDS is an active technology provider in a number of visionary projects to demonstrate the practicalities of rainwater reuse systems. These include Barratt Developments' pioneering carbon neutral 'Z-House' project in Salford, Manchester, and the first at-scale installations of rainwater harvesting on a new, 1,000-home, residential development as part of the Ofwat-funded Water Breakthrough Challenge.



**FACT :** Today the average person in the UK consumes around 140 litres of water per day, up from 85 litres just 50 years ago, and only 30% of this is for drinking purposes.

# COMBE MARTIN, DEVON (SOUTH WEST WATER)

## CASE STUDY



In Combe Martin, a small resort on the north Devon coast, SDS smart rainwater management systems have been deployed by South West Water as a pilot measure to help reduce the frequency with which CSOs discharge untreated stormwater into the bay and ultimately help reverse the resort's 'poor' bathing water quality status (as monitored by the Environment Agency under the Bathing Water Directive). Rainwater from the steep slopes in the area, which is mostly agricultural, often floods the watercourse feeding the bay, overcoming the sewerage network. Multiple improvements and repairs made to the serving CSOs over the past 25 years had so far failed to rectify the discharge of polluted water into the bay.

The installation in 34 residential properties of smart SDS SYMBiotiC™-enabled rainwater storage tanks is intended to ease headroom issues in the combined sewer network and has provided data enabling the assessment of the tanks' contribution to meeting the Water Company's primary objective.

With the assistance of South West Water's engineering consultants, Stantec, each house was equipped with a domestic version of the SDS Intellistorm® rainwater recycling and attenuation system. This comprised of a slim, space-saving 275 litre capacity rainwater storage tank, connected to the main downpipe from the roof and fitted with a small, solar-powered and computer-controlled box positioned at its side.



Results show the systems have realised total stormwater attenuation volumes 19 times greater than the volume of the tanks installed. This level of performance could not be realised in distributed, plot-scale systems without dynamic management. Data from this pilot shows that without smart intervention, many systems where the water is not used by homeowners would have filled once and then remained full.

Together, the tanks have a combined storage capacity of over 9,500 litres which, if not being reused, are automatically released only when there is no pressure on the network. Data received, via SDS SYMBiotiC™, over the first six months of the project indicate that a single 'smart' water tank stores as much water as 7 traditional water butts and is on course to attenuate more than 3,500 litres per year. Residents consequently save money on their water bills by recycling the collected rainwater for uses such as watering the garden and washing the car.

Similar domestic systems have been adopted by several Water Companies around the UK including existing residential developments in East Anglia, Powys and the Scilly Isles, in the latter case with the primary objective of reducing demand on limited mains supply availability.

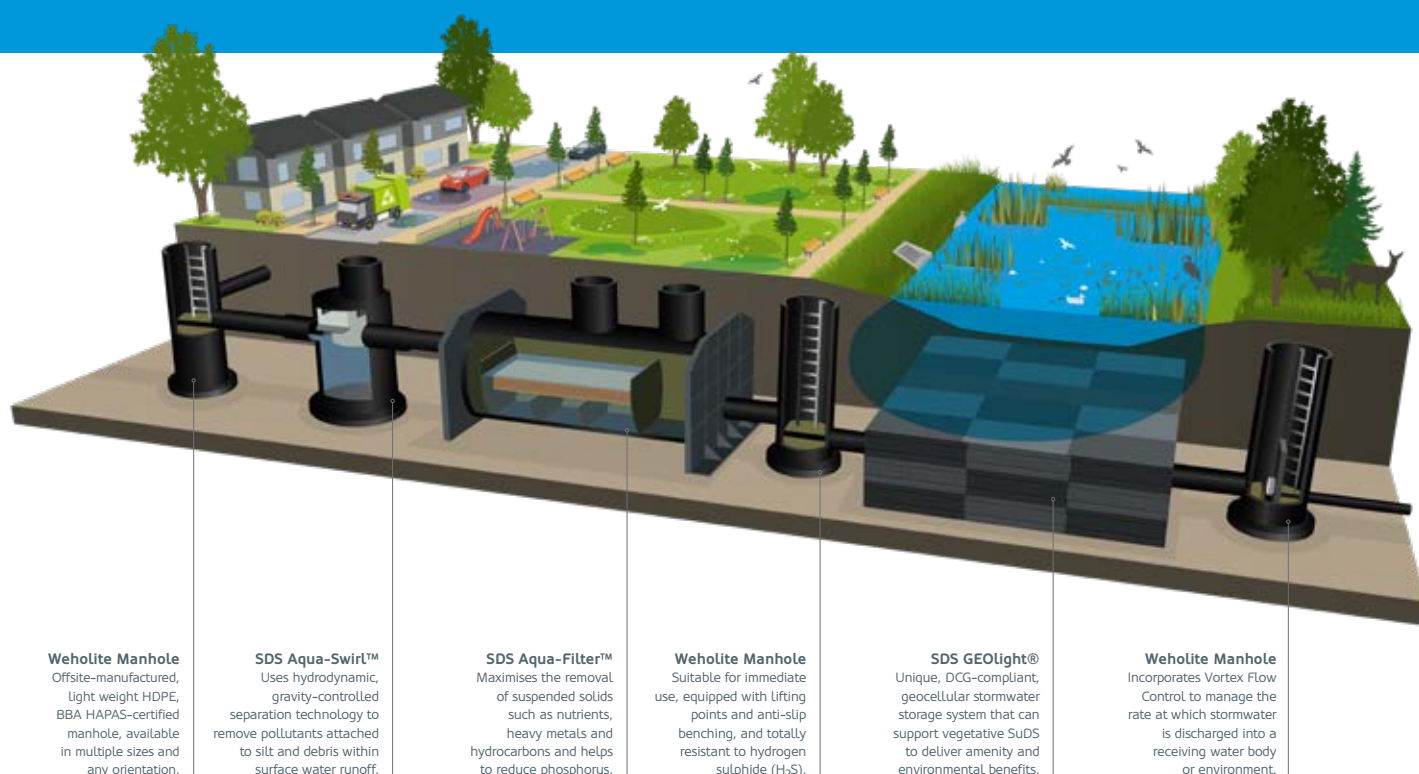


# HYBRID SUDS SYSTEMS

The State of Nature Report of 2019 identified 41% of the species studied in the UK were in decline and 15% under threat of extinction; more than 100 British species have become extinct in the last 100 years.

The Environment Act, which came into effect in 2022, encourages all stakeholders in new developments, in particular housebuilders, to consider the impact that this growing

urbanisation might have on the local ecosystem and the wildlife that it supports. The Act legislates the requirement to achieve Biodiversity Net Gain, an approach to development that mandates the need for a site to end up in a better position to support wildlife and habitats than it was before construction began; using a mitigation hierarchy and metric system, applicable developments must deliver a 10% net gain in biodiversity.



Alongside their ability to prevent flooding, provide community amenities and support mental wellbeing, SuDS have been identified as a means to help meet these requirements whilst also addressing the falling health of our watercourses, a consequence of unchecked pollution and wastewater discharges.



Engineered SuDS equipment, including the water treatment and storage devices designed and manufactured by SDS, can be combined with natural vegetative features, such as reed beds, to maximise the volume and variety of pollutants' removal whilst also reducing the rate of deterioration of these features and thereby extending their lifespan. Such "hybrid" SuDS schemes allow developers to meet their legal obligations without the loss of extended areas of land, that would otherwise generate revenue, and to support nature.

This symbiotic relationship between the engineered and the natural can be further enhanced with the application of SDS smart technology. Wet areas that are introduced for the benefit of existing flora and fauna or to attract new species to a development must retain a constant supply of water, else such initiatives will ultimately cause even more damage to the local ecosystem.



# THE QUARRY, ERITH, KENT

## RESIDENTIAL DEVELOPMENT

### CASE STUDY



The Quarry is a new residential development located on a former gravel mine and landfill site for inert materials, and more recently abandoned to let nature take its course. Spanning approximately 20 hectares, the site is designated a Grade One Site of Borough Importance for Nature Conservation (SINC). Its redevelopment was therefore required to take account of the local ecology and to incorporate sustainable drainage features, including wet ponds and swales, which were able to promote biodiversity.

A number of SDS GEOLight® attenuation tanks, with a combined storage capacity of 6,070m<sup>3</sup> of water, have been installed beneath new wet pond features that include three

low level lakes and an area of natural grassland and scrub, surrounded by small areas of woodland. These 'wildlife areas' provide a habitat for notable protected species including newts, lizards and slow worms.

The GEOLight® tanks were integral to the drainage solution, providing attenuation to meet the very low discharge rate on a steeply-sloping site with limited space and no opportunity to infiltrate. Using below-ground storage in conjunction with surface water drainage features has facilitated the environmental and wildlife benefits above-ground, while achieving sufficient surface water storage necessary to satisfy planning requirements at this sensitive location.



# BEREWOOD, HAMPSHIRE

## MIXED USE DEVELOPMENT

### CASE STUDY



The 500 acre "Newlands" residential development will accommodate over 2,500 homes once completed, supported by a range of amenities and around 100,000m<sup>2</sup> of employment land. SuDS have been considered a priority in order to provide pollution prevention services, while helping to develop a new wetland resource of substantial ecological and amenity value.

SDS worked closely with the consulting engineers to develop a "SuDS management train" approach, whereby a series of above- and below-ground drainage techniques are used to change the flow and quality characteristics of the runoff in stages. Surface water runoff from the site is first cleaned, through one of several SDS Aqua-Swirl separators of varying capacity before entering one of seven separate ponds and swales that have been landscaped into the development.

The SuDS scheme was also required to be capable of controlling water not only upon final completion of the development, but also during its periods of construction, when a substantially higher level of water-bound contaminants than normal might be expected. Selected for their ability to surpass Environment Agency required standards, thereby maximising pollution mitigation, the Aqua-Swirl™ separators provided the additional flexibility to engineer high-performance water quality protection upstream of the SuDS ponds.



**SDS**

Water  
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INNOVATORS IN  
WATER TECHNOLOGY



**SDS Limited**  
Clearwater House  
Castlemills  
Biddisham  
Somerset  
BS26 2RE

**T** +44 (0)1934 751303  
**E** [info@sdslimited.com](mailto:info@sdslimited.com)



**[sdslimited.com](http://sdslimited.com)**