SRN-DDR-049: Resilience - Coastal

Enhancement Cost Evidence Case

28th August 2024
Version 1.0

from Southern Water

Contents

1. Introduction

Our Coastal Resilience enhancement case (SRN53) has been challenged at Draft Determination. The intervention options described in SRN53 are a combination of interventions led by us and interventions led in partnership with the Environment Agency (EA). We have continued to work with the EA to progress the options development for Ventnor (Coastal Erosion and Slope Stabilisation) and the Pevensey to Eastbourne schemes. **This document provides our response to the challenges at Draft Determination and proposed changes since our October submission.**

1 – Our response to the challenge on the Southern Water delivered schemes - £13.86m

Ofwat has challenged the Southern Water delivered projects highlighting that insufficient evidence at this time to support our enhancement needs on the Portobello Waste Pumping Station (£9.75m) and the Ventnor Waste Pumping Station (WPS) and Sewer Stabilisation (£4.1m). We will continue to take appropriate interventions to ensure the sites remain safe and continue to deliver the outcomes that our customers want. These costs may be more appropriate as part of our Coastal Population Cost Adjustment Claim (SRN-DDR-015), although we still expect climate change to require additional enhancement in the future.

2 - Our response to other challenges - £3.42m

The EA delivered schemes - Ventnor Coastal Erosion and Slope Stabilisation and Pevensey Bay to Eastbourne passed on the “Needs” and “Customer Protection” criteria but there was a 40% challenge on the “Best option for Customers” and the “Cost efficiency” criteria. This document explains our response to the 40% challenge, the changes to our Coastal Resilience enhancement need since the submission in October 2023, and it presents evidence which enables Ofwat to make the full requested allowance for the two sites.

3 - Changes to our plan - £1.25m

In our October 2023 submission, we proposed the £12m Sandown WTW - Yaverland & Embankment Road (Bembridge) scheme as an AMP 9 programme. Since that submission, the Environment Agency has presented updated information to confirm that the Yaverland investment needs to be brought forward into AMP 8. This document describes why this scheme needs to be funded in AMP 8, but we are proposing a reduced 5% contribution to the total construction cost of £25m, this is on par with the levels of contribution to the Ventnor and Portobello schemes.

Pre-submission update – in seeking a letter of support from the Environment Agency (see: Appendix B) for this acceleration for this submission, they have highlighted that the time-sensitivity of this scheme which means the full £12m allowance would be required in AMP8. We are highlighting this late change here with the view that this is reviewed with both regulators prior to final determination.

Table 1: Coastal erosion resilience enhancement scheme and changes

Ref.	Scheme	Total AMP 8 Oct 2023	Ofwat challenge	Allowed at DD	Our response Aug 2024	Change	Total
1	Southern Water Delivered Coastal Erosion Schemes (Ventnor - The Grabben and Portobello Schemes)	£13.86m	100%	-	We will continue to monitor	-	-
2	EA Delivered Coastal Erosion Schemes (Ventnor and Eastbourne)	£3.42m	40%	£2.05m	Full allowance with additional evidence	-	£3.42m
3	EA Delivered Coastal Erosion Scheme brought into AMP 8 (Sandown WTW - Yaverland & Embankment Road (Bembridge))	-	-	-	Submit evidence for scheme brought to AMP 8	£1.25m	£1.25m
	Total						**£4.67m**

In the rest of this document, we have laid out our responses to 1 and 2 above – the Ventnor Coastal Erosion and Slope Stabilisation and Pevensey Bay to Eastbourne schemes and the evidence to support the EA delivered Sandown WTW - Yaverland & Embankment Road (Bembridge) scheme.

We will continue to work with the EA and other partners on these schemes to foster a long-term collaborative partnership. The Ventnor Emergency Works project won the 'Integration and Collaborative Working' category at the Constructing Excellence SECBE Awards in June 2024. The award was for the close partnership working between the Isle of Wight council, JBA, Mackley, Coastal Partners, the Environment Agency, Jacobs, Southern Water, Island Roads, and Ventnor Town Council. The judges were impressed with the number of organisations who immediately came together to address a critical issue and that the collaboration and commitment of our organisations was maintained through the entirety of the programme. This is great evidence that the partnership formed can be used to our advantage for effective delivery on the main scheme.

2. Summary enhancement case and the changes

We are working with the Environmental Agency (EA) on their Flood and Coastal Erosion Risk Management (FCERM) schemes and Local Authorities to understand the risks and collaborate in developing appropriate solutions to improve our coastal defences and protect our customers and the wider community. The EA provided a letter of support which we submitted in Oct 2023 and an updated letter which we have appended to this submission.

Table 2: Summary of our enhancement case

Summary of Enhancement Case	
Name of Enhancement Case	Coastal Erosion
Summary of Case	• To improve coastal defences • To reduce ground movement
Expected Benefits	• Reduce risk of pollution • Reduce risk of bathing water incidents • Reduce risk of a public safety incidents • Maintain, restore, and improve our beaches
Associated Price Control	Wastewater Network+
Enhancement TOTEX	£4.67m
Enhancement OPEX	N/A
Enhancement CAPEX	£4.67m
Is this enhancement proposed for a direct procurement for customer (DPC)?	No, this investment does not qualify for the DPC threshold.

Table 3: Links to data table lines

Links to data table lines		
Enhancement	Table	Line
Wastewater network+ - Sewage treatment and disposal	CWW3	CWW3 168

2.1 Drivers for the enhancement need.

Sea level continues to rise because of climate change and according to the Met Office, the global mean seal level has risen by around 20cm in the past century[1]. The IPCC predicts global mean sea level rise between 0.26m (RCP 2.6) and 1m (RCP 8.5) by 2100[2].

Rising sea levels increases the risk of coastal flooding and erosion causing significant damages to our customers and assets on or near the coast. Between 1993 and 2010, the annual rate of rise was about 3mm a year, considerably more than the rate for the preceding century[3].

Sea level rise leads to increased coastal flooding, erosion, storms, cliff collapses and landslips. This represents a significant and increasing challenge for our assets and the service we provide for our customers at the coastal areas in our region which can be affected by these incidents.

This is a new permanent state of risk that is beyond management control, and we have identified sites at risk and in need of investment now and in the future.

Whilst we have removed some of our original scope, we maintain that there is still a real need for our proposed enhancement works at Portobello Waste Pumping Station (£9.75m); and the Ventnor Waste Pumping Station (WPS) and Sewer Stabilisation (£4.1m). We will continue to monitor these risks and take appropriate measures and ensure we prepare the evidence necessary for investment in the future, this however may mean the costs are higher. At this stage, these costs may be better aligned to the Coastal Population Cost Adjustment Claim (SRN-DDR-015).

The primary and secondary drivers for the enhancement needs are not within management control as laid out below, the needs are driven by a combination of two factors, the increasing risk of climate change leading to sea level rise and the subsequent impact of that on ground movement, pollution, and bathing water quality.

[1] https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/climate/cop/sea_level_rise_final_v1.2.pdf
[2] Sea Level Change (Chapter 13) - WG1AR5_Chapter13_FINAL.pdf (https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter13_FINAL.pdf)
[3] https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/climate/cop/sea_level_rise_final_v1.2.pdf

Primary and Secondary drivers for the enhancement need

- **Primary driver** – increasing risk of climate change leading to sea level rise and coastal erosion and cliff collapses.
- **Secondary drivers** – coastal erosion exacerbating ground movement, (slope destabilisation, subsidence, and landslip) risks. Coastal flooding and erosion leading to pollution and impacts on bathing water quality in the community and environment.

These enhancements do not overlap with any other activity delivered through base because it is responding to a new risk that has materialised because of sea level rise leading to coastal erosion.

2.2 Changes since Oct 2023

The table below highlights all the schemes submitted in October 2023 and our response to the Draft Determination (DD) for each of the scheme.

Table 4: Enhancement case sites, costs and our response

Ref	Site Impacted	Costs	Period	Response
1	Portobello Waste Pumping Station (WPS)	£9.75m	AMP8	We will continue to monitor
2	Ventnor Wastewater Pumping Station (WPS) and 32km of sewer infrastructure*	£2.25m	AMP8	Additional evidence provided for full funding
		£4.1m	AMP8	We will continue to monitor
3	Pevensey Bay to Eastbourne	£1.17m	AMP8	Additional evidence provided for full funding
		£5.85m	APM 9-11	Not applicable
4	Sandown WTW - Yaverland & Embankment Road (Bembridge)	£12m	AMP 9	£1.25m brought forward to AMP 8
5	Farlington Flood & Coastal Erosion Risk Management Scheme	Under review	AMP9-11	Not applicable
6	Motney WTW	Under review	AMP9-11	Not applicable
7	Aylesford WTW	Under review	AMP9-11	Not applicable

3. Our response

3.1 The EA delivered Ventnor Coastal Erosion and Slope Stabilisation scheme – £2.25m

3.1.1 Need for enhancement

You have passed the Ventnor Coastal Erosion and Slope Stabilisation scheme on need for assessment.

Scope change, but no impact on contribution:
The EA has however advanced the programme and there is a better understanding of the needs, scale, and timing of the options. The scope for the need has since increased.

Existing coastal defences are at the end of their life. Asset grades in some locations are very poor with significant to severe defects. More recent surveys completed by the EA in 2022, which we have become aware of since our October 2023 submission, show that the speed of deterioration is greater than normal and that the extent of frontage where work is needed has increased from about 900m to 2,700m (delivering 1,800m more). This is a National Priority Project for the Environment Agency. Additional resource and a bespoke acceleration plan have been put in place to get to construction in 2026.

The Environment Agency said: “At the Strategic Outline Case (SOC), the asset condition survey concluded there were 4 defence sections out of 16 where the condition was assessed as grade 4 (poor) or 5 (very poor/failed). However, the most recent survey shows that 14 of the 16 defence sections are now assessed as condition grade 3 or 5. This is an additional 10 sections, compared to the 4 originally included in the scope.” As illustrated in Figure 1.

Sections at risk of failure within scheme delivery timeframe	A	C	E	G	H	I	J	K	L	M	N	O	P	R	S	X	Summary
At SOC -(based on Ventnor study 2020 , based on 2017 survey)					5			4	5				4				4 out of 16
Updated asset survey in 2022	3	3	3	3	4		3	4	5	3	3	3	4	3	3		14 out of 16

(Grades: 3 fair – defects that could reduce performance, 4 Poor – defects that would significantly reduce performance, 5 very poor/fail – severe defects resulting in complete performance failure)

Figure 1: Updated assessment of the protection needed at Ventnor

Despite this increased protection, our overall contribution remains the same, but it further demonstrates the value for money we can deliver by partnering with the EA to deliver this scheme at Ventnor. Our investment will help to:

1) **Improve the coastal defences** by replacing or enhancing all four sections of the coastal defence (that impact us), improving the capacity of the defences to cope with the increasing coastal erosion risks (the sections are Ventnor Park - Western Cliff Eastern section, Central Ventnor - Eastern Cliffs Western section, Wheelers Bay- Eastern section and Wheelers Bay- Eastern Cliffs Eastern Section).

2) **Stabilise the landslip** – working with the EA and other partners, we are considering two areas for investment to reduce the ground movement.
   a) **Enabling works** – The EA has already started urgent works to ensure that the risk of slope failure in the short term (through to 2028) is reduced, thereby protecting properties and infrastructure.
   b) **Dewatering** – this is a Research & Development trial to create a long-term solution. The aim of this solution is to alleviate the ground water pore pressure and enable the partners to understand if ground water levels can be managed effectively i.e., maintained at summer levels all year-round to demonstrate it as an effective method of reducing land movement within Ventnor Undercliff. If successful, the dewatering scheme will be scaled up and delivered as part of the longer-term strategic solution.

Change to construction timeline.
As we described in our SRN 53 submission, this is a scheme in development, and the EA has been able to move faster and construction is now planned to start a year earlier, in 2026 and finish in 2029. This does not change the total contribution to the EA, but it means that the risk to our asset is mitigated earlier, and it reduces the chance of any risk impact on our customers.

3.1.2 Best option for customers

In your deep dive assessment, you said:

"We have some concerns whether the investment is the best option for customers. The company does not provide sufficient details in their price review submission that alternative options have been considered or a robust option development process has been followed".

Our response on best option for customers:

Demonstrating that a robust option development process has been followed.
In our Best Option for customers section for SRN53, we provided evidence of three programme level options considered, the benefits and risks. We also said, "Whilst Option 3 has been adopted at a programme level, we are continuing to work with the EA to develop options for each element of the investment using the approach outlined in Figures 20.0 and 21.0 of the SRN53 October submission".

Table 5: Summary of the intervention options considered at Ventnor provided in our October submissionSRN53

Ref	Description	Decision
1	Do Minimum - Monitoring of asset condition - Patch repairs - Evacuate properties - Manage public H&S	Considered
2	Maintain - Maintain existing standard of protection of coastal defences through maintenance programme	Considered
3	**Improve the coastal defences** by replacing or enhancing all four sections of the coastal defences, improving the capacity of the defences to cope with the increasing coastal erosion risks (the sections are Ventnor Park - Western Cliff Eastern section, Central Ventnor - Eastern Cliffs Western section, Wheelers Bay- Eastern section and Wheelers Bay- Eastern Cliffs Eastern Section) **Stabilise the landslip** – working with the EA and other partners.	Adopted

What has happened since.

We have been working with the EA on its Flood and Coastal Erosion Risk Management (FCERM) programme, and we are taking advantage of the robust options development process for the FCERM process and the potential cost efficiency that can be delivered in a combined programme delivered through one governance process where we participate as a Partner and interested Stakeholder. All Environment Agency capital projects follow a robust Gateway control appraisal and decision-making process. Project business cases are scrutinised at each Gateway by Independent Assurance Service who make a recommendation to the financial approver and gateway review board. This process aims to control spending and ensure that project costs are outweighed by the benefits (and stopping projects passing gateways if they are no longer economically viable), whilst also ensuring HM Treasury guidance on best practice in project management is followed in developing and delivering schemes. This process is the same for all projects and further detail on **the EA's robust optioneering process is provided below in the Eastbourne section in Table 6**

Providing sufficient details that alternative options have been considered.

Leading up to Oct 2023, we considered programme level options. In May 2024, alternative and detailed options have been considered as part of the appraisal process to go from a long list to a short list for the Ventnor Coastal Protection and Slope Stabilisation scheme Outline Business Case (OBC). This is a critical part of the HM Treasury Green Book process to ensure the long list of options have been considered and tested against Critical Success Factors, described in Table 6.

Table 6: Critical Success Factors for Ventnor Coastal Protection and Slope Stabilisation scheme options from the Outline Business Case (OBC)

1	Strategic Fit: Implementation of the 'Hold the Line' policy as per the Isle of Wight Shoreline Management Plan 2010 (SMP2) to better protect properties, key infrastructure assets and services from coastal erosion.
2	Achievable: The designed scheme is technically feasible, buildable, and will be able to adhere to consents and licences as required.
3	Affordable: The initial scheme is affordable and future maintenance costs are accepted. Required partnership funding contributions are achievable.
4	Value for Money: Whole life benefits, including the economic, social, and environmental benefits, of the option exceed the costs.
5	Supplier Capacity and Capability: Suppliers chosen to design and construct the scheme will be able to provide the relevant resources and capable personnel to undertake the work required.

JBA Consulting have carried out a full options assessment and have proposed a to take forward for the next stages of the OBC. We have appended the **JBA Ventnor Briefing Note for the Outline Business Case short listing as part of this submission**. The briefing note summarises the options appraisal process from Long List to Short List that has been carried out as part of Ventnor Coastal Protection and Slope Stabilisation Scheme Outline Business Case (OBC).

3.1.3 Cost efficiency

In your deep dive assessment, you said:

"We have some concerns whether the investment is efficient. The company does not provide sufficient and convincing evidence that the proposed costs are efficient. The company have worked with the EA to understand the costs… The company provides limited and insufficient evidence of external assurance of cost related to this investment".

Our response on cost efficiency:

In the Cost efficiency section, we described our cost efficiency process and for each investment need, we described the options provided, the benefits and residual risk of each option and the decision. However, there were no specific cost benchmarks available due to the stage of the project. By delivering this jointly with the EA, we do not have to incur any overhead costs and pass it through to our customers, that immediately delivers £2.5m cost avoidance to our customers if we assume a typical level of indirect cost for this scheme given the technical complexity.

The EA has secured £3.9m of central Government funding. The funding will enable appraisal of options to enhance the coastal defences and undertake a significant amount ground investigation as described in 2a. The data gathered will confirm the most appropriate approach of achieving increased stability of the landslide complex at Ventnor. Currently the whole life cost of the scheme is approximately £46m.

Our contribution alongside other partners and beneficiaries locally to support this will be £2.25m this remains the same even though the scheme is now delivering 1,800m more in seawall protection. We estimate this represents good value for our customers.

To demonstrate that these costs are efficient and represent good value for customers, we share the cost on recent emergency works in the last couple of years.

In November 2022 at Ventnor Eastern Esplanade the seawall failed resulting in £4.8m emergency works project to stabilise the defences and secure a Southern Water sewerage pipe that was at risk of rupture into a Special Area of Conservation. This shows the cost of proactive enhancement is significantly less than reactive emergency works.

As a result of this incident and knowing other sections of the seawall are in poor condition the EA are accelerating the Ventnor scheme, hence they are looking to invest in the 14 seawall sections at risk.

Further detail about the emergency works and the cost.

The emergency stabilisation site works commenced on the 9th of November following a period of stormy weather between the 3rd and 9th November 2022 and the loss of complete pile sections. The initial works involved the protection of the Southern Water sewer by surrounding the pipe with 1tonne of dumpy bags to protect the pipe.

The reactive works have been broken down into three phases, shown in Table 7.

Table 7: Breakdown summary of costs for the Ventnor Emergency works

Phases	Description of works done	Cost	Date
1 – Immediate emergency works	Eastern Esplanade Emergency Works – Initial stabilisation of the collapsing asset, add weight to the toe of the landslide complex, reduce infill wash out from the seawall. Securing the Southern Water sewerage pipe. Southern Water carried out emergency works overnight within days of the asset failure.	£891,635	Nov '22 – May '23
2 – Short term solution	Eastern Esplanade Urgent works - Implementation of the short-term solution whilst the main Ventnor scheme is developed	£3,621,780	Jun '23 – Jun '24
3 – Additional Urgent works in adjacent seawall	Void infilling at Ventnor Holiday Villas (next to Eastern Esplanade). Urgent works where rotational movement in the seawall caused the defence to spall allowing infill washout and void formation.	£280,000*	May '24- Jun '24
	Total	**£4,793,415**	

**Latest lowest estimated cost. High estimate - £310,000.*

The reactive cost to repair a section of the seawall and carry out additional works is about £4.8m. This is compared against a total contribution of £2.25m to develop permanent long-term solutions to protect 14 sections of the seawall.

Additionally, the town of Ventnor is built on the largest urbanised landslide system in northwestern Europe. Under a Do-Nothing scenario, [redacted] The Do-Nothing Present Value damages over the duration of benefits is £132m.

	Cost for economic appraisal (PV)	Whole-life cash cost	Total Project cost (approval)
Costs up to OBC	n/a	n/a	n/a
Costs after OBC			
Staff costs	68,665	68,665	68,665
Consultants' fees	31,534	31,534	31,534
Contractors' fees	0	0	0

	Cost for economic appraisal (PV)	Whole-life cash cost	Total Project cost (approval)
Cost consultants' fees	0	0	0
Site investigation and survey	0	0	0
Construction	786,258	786,258	786,258
Site supervision	Inc. in staff cost	Inc. in staff cost	Inc. in staff cost
Environmental mitigation	0	0	0
Environmental enhancement	0	0	0
Compensation	5,178	5,178	5,178
Risk Contingency			
Optimism Bias	0	0	0
Risk - Monte Carlo 95%ile or similar	0	0	0
Risk - Monte Carlo 50%ile or similar	0	0	0
Inflation	0	0	0
Future costs (construction + maintenance)	(PV)	(Cash)	
	0	0	
Optimism Bias on future costs	0	0	N/a
Project total cost	891,635	891,635	891,635

Figure 2: Further breakdown of Phase 1 costs for immediate emergency works (£) as provided by the EA

Cost Heading	Project value
Cost up to OBC	n/a
Salary costs	105,499
Cost of Professional Advice – QS support	25,000

Cost Heading	Project value
Site investigation and survey	70,270
Construction	2,844,073
ECC Project Manager	27,703
Supervision	25,127
Compensation	19,593
Miscellaneous i.e., comms & engagement material	4,163
Risk and optimism bias	500,352
Total	3,621,780

Figure 3: Further breakdown of phase 2 costs - short term solution (£) as provided by the EA

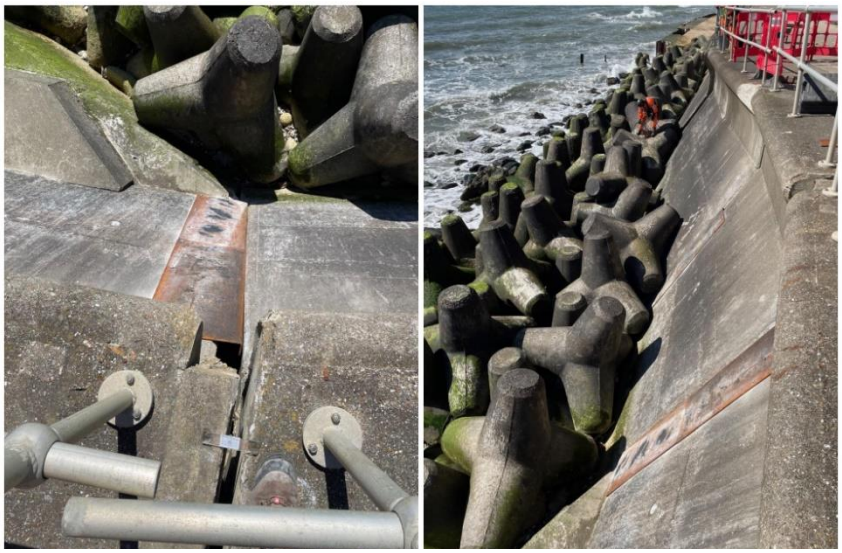


Figure 4: Phase 3, Image from May 2024, showing metal shuttering across the spawled seawall, foam infill, before aggregate infill from the surface

3.1.4 Summary of the additional information and evidence we have presented on Ventnor

Need for enhancement

- We have described the increased scope of the required investment in Ventnor proposed by the EA.
- We have told you that despite the increase in the scope, we are not proposing to contribute more funding to this scheme in AMP8.

Best option for customer

- We have provided more information and evidence on the work we have done and additional work we have become aware of since October 2023 that supports the case for the level of and timing of this proposed investment being appropriate.

Cost efficiency

- In our revised plan, the funding we are requesting is a direct contribution to the EA scheme.
- We have provided additional information on the anticipated costs of the whole scheme from the EA in response to your feedback.

3.2 Pevensey Bay to Eastbourne – £1.17m

3.2.1 Need for enhancement

You have passed the Pevensey Bay to Eastbourne scheme on need for enhancement.

This full investment contribution is needed now to meet the needs. We have continued to work with the EA, and we **highlight the background and key reasons why the full investment is needed now** to build on our submission – SRN53 in October:

- The Pevensey Bay to Eastbourne Coastal Management Scheme aims to protect over 18,000 properties4, as well as critical assets and infrastructure, in the face of climate change and sea level rise.

- The UKCP18 dataset with representative concentration pathway (RCP) 8.53 for capturing assumptions on future climate evolution, has been used. This forecasts 10cm sea level rise over the Phase 1 duration. Action is required now to respond to this increase in risk. Further, the severity of storm surge is also expected to increase.

- The existing coastal flood defences comprise primarily of shingle beaches and timber groynes, with associated sea walls and other hard structures in some locations. Surveying work has determined that asset residual life is low in some places and modelling shows likely failure without active intervention. As a result, the scheme needs to be delivered to the planned schedule or significant damages could occur. Without this scheme modelling shows that over 1,000 properties and infrastructure would be inundated in a 0.5% AEP event in 2027, rising to over 10,000 by 2040.

- Continuing the current beach management contracts is not an option. the current contractual arrangements, that deliver the status quo are ending in May 2025. New contractual arrangements for beach maintenance are required to meet the legal obligations set out in the Sovereign Harbour Beaches Sea Defence Deed 2001

- In addition, based on the EA's estimation of current management costs, if the current practice of beach management were to continue, the cost over the next 20 years will be £70m (£3.5m/year).

- A new coastal defence plan is needed to sustain the current standard of protection. The new plan needs to account for a 10cm forecast increase in sea level.

- Preferred option for 2027-2037 (Phase 1) has already been selected and is on scheduled to be assured in autumn 2024.

- Modelling predicts significant inundation and damages without the scheme.

[4]Pevensey Bay to Eastbourne Coastal Management scheme - Flood Modelling Report (JBA Consulting, January 2023)

The total volume of beach material at Pevensey Bay has decreased over the past two decades, from a high in excess of 2,100,000m3 in 2003, to a low of below 1,950,000m^3 in 2023 (Figure 5). This downward trend of total beach sediment volume is further supported by beach monitoring work conducted by the South East Regional Beach Monitoring Programme. Their 2022 Annual report states that “overall, there is a substantial net loss of 257,586m3 since 2003 despite the large-scale recycling programme and the regular import of sediment.” This volume is now approaching critical levels to effectively function as a flood defence.

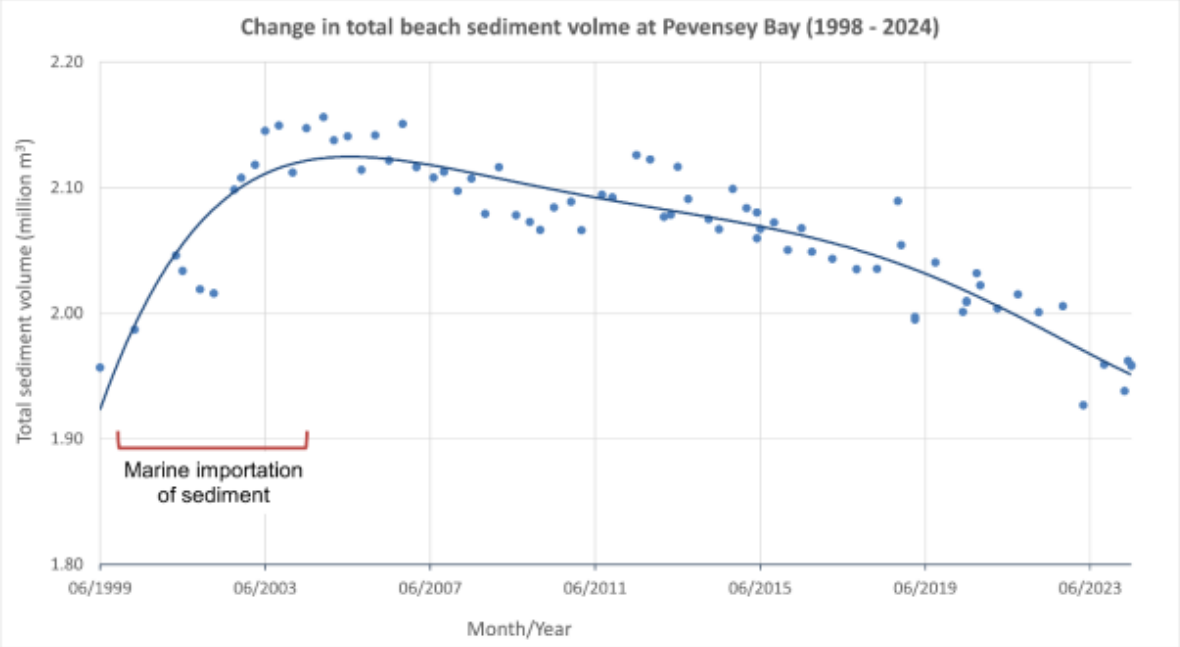


Figure 5: Volume of beach material within the Pevensey Bay sediment cell from 1999 to 2024. Volume data from Pevensey Coastal Defence Limited with fitted polynomial trendline.

3.2.2 Best option for customers

In your deep dive assessment, you said:

"We have some concerns whether the investment is the best option for customers. The company does not provide sufficient details in their price review submission that alternative options have been considered or a robust option development process has been followed".

"At Eastbourne no option to move the assets is presented".

Our response on best option for customers:

Demonstrating that the option to move the assets is not the best option for customers.
The option to rebuild the Eastbourne treatment works, is exponentially more than the £1.17m investment contribution being requested. This investment part of a 20-year investment plan which is based on a 100-year adaptable plan by the EA. Therefore, moving the assets is not the best option for customers. This solution provides a long-term cost-effective alternative that delivers the best outcomes for customers. Moving the assets may be an alternative to consider when the assets are at the end of life, but right now, this option enables us to continue to operate the sites, deliver performance for our customers and the environment whilst effectively and efficiently mitigating the biggest risk to the site.

Additionally, wave and inundation modelling has been undertaken to estimate extreme weather conditions along the Eastbourne and Pevensey frontages. Structural failure risk, erosion risk, overtopping risk and breach risk have been assessed for 2025, 2040, 2070 and 2125[5]. **The modelling shows that in 2025, in a "do nothing" scenario, there would be a risk of defence failure leading to inundation, with a greater number of breaches and degree of overtopping across the frontages by 2040.**

Demonstrating that a robust option development process has been followed.
All Environment Agency (EA) capital projects follow a Gateway control appraisal and decision-making process as outlined in Figure 6 below. Project business cases are scrutinised at each Gateway by EA's Independent Assurance Service who make a recommendation to the financial approver and gateway review board. This process aims to control spending and ensure that project costs are outweighed by the benefits (and stopping projects passing gateways if they are no longer economically viable), whilst also ensuring HM Treasury guidance on best practice in project management is followed in developing and delivering schemes. We have worked with the EA through this process, and we are confident that it aligns with our internal optioneering processes and delivers cost efficiency for our customers.

Gateway 1 – ensures that a clear case for change has been made and is able to identify at least one economically viable and achievable option to progress. Broad objectives are set.

Between Gateway 1 and 2 –Modelling and surveys take place, and more detail is worked through. Different options are explored and professional partners, stakeholders and the public are consulted on project outcomes. A longlist of options is reduced to a shortlist and to a preferred option though an appraisal

[5] "WaveReport 2023_PBy.pdf"

process looking at technical, economic, sustainable, and environmental aspects. An outline design is developed with whole life costs estimated. **This stage was concluded in July 2024.**

Gateway 2 – Outline design and costings are assessed to confirm the project remains technically and economically viable. To pass Gateway 2 projects are expected to have identified partnership funding sources and to be able to demonstrate this. **We will be at this point in October 2024.**

Between Gateway 2 and 3 final further detail is added to the design and costing with further engagement or consultation with professional partners, stakeholders, and the public. Planning permission and licences are sought where required; environmental assessments are carried out. Delivery contracts are scoped and tendered and contracts are developed. full business case is created, detailed design and costing are carried out.

Gateway 3 – passing Gateway 3 means that financial approval is given to proceed to construction and delivery. To pass Gateway 3 partnership funding required to make a scheme economically viable needs to be secured. **We will be at this point in December 2026. From this point, we move into Delivery and Construction phases in 2027.**

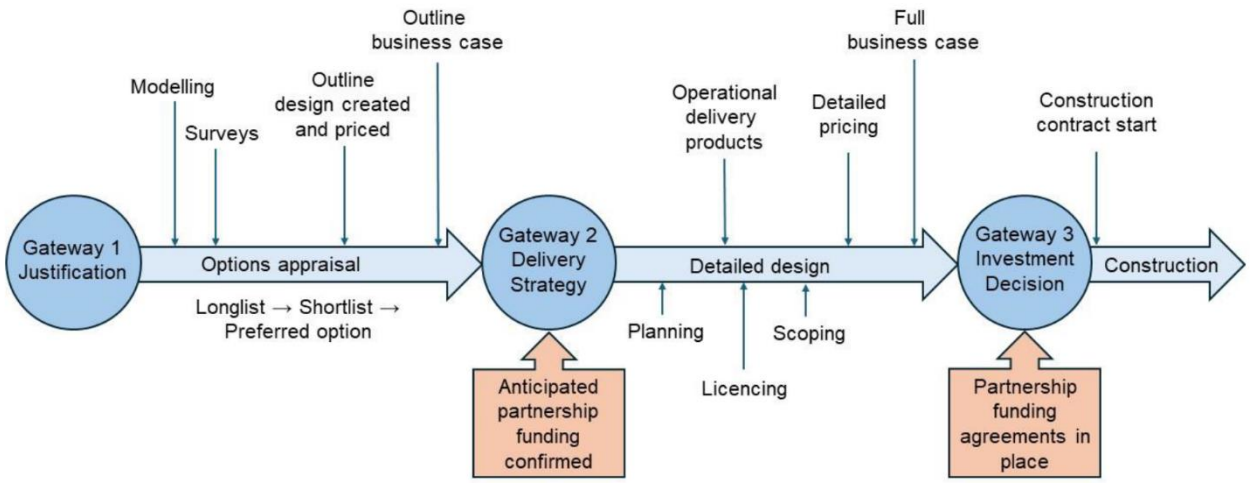


Figure 6: Schematic of Gateways 1-3 from project inception to construction for EA capital projects

3.2.3 Cost efficiency

In your deep dive assessment, you said:

"We have some concerns whether the investment is efficient. The company does not provide sufficient and convincing evidence that the proposed costs are efficient.
The company have worked with the EA to understand the costs and how they have allocated the funds - the EA have been advised by DEFRA commercial to seek a minimum of 15% private contributions for the scheme. The Engineering Technical Services Team (ETS) reviewed the contributions and both Eastbourne and Ventnor 1, 2a, and 2c were based on expert judgement.

The company provides limited and insufficient evidence of external assurance of cost related to this investment".

Our response on cost efficiency:

Coastal management programmes are typically delivered by the EA and benchmark data is not commonplace. However, by delivering this jointly with the EA, we do not have to incur any overhead costs and pass it through to our customers, that immediately delivers £1.29m cost avoidance to our customers if we assume a typical level of indirect cost for this scheme given the technical complexity. Also, the capability required to deliver these types of schemes typically sit within the EA.

We have compared the costs of ongoing management with the cost of the current management costs. In addition, as seen in the Ventnor Eastern emergency works, this could be much more if allowed to fail in the future.

Based on the estimation of current management costs, if the current practice of beach management were to continue, the cost over the next 20 years will be £70m (£3.5m/year). The EA estimates a contribution of £0.39m per annum over 20 years. This is based on Defra's requirement for the EA to aim for 20% partnership contributions. The contribution is allocated evenly across the main beneficiaries (Southern Water, National Highways and Network Rail). This represents £1.17m in AMP8 and a total contribution of £7.8m over the 20-year period. This represents good value for money for our customers. Without cooperating and partnering with the EA, the other potential options available are to individually build own defences or relocate the treatment works which as described previously is not the best option for customers.

However, we have been working with the EA to ensure and demonstrate the efficiency of the scheme. The design and costings have been reviewed and scrutinised through Gateway 1 of the EA's appraisal and decision-making process[6] by the EA's Large Project Review Group, the Independent Assurance Service, who ensure cost efficiency and that treasury guidelines have been correctly followed. We are taking steps to ensure cost efficiency, some of these steps include design improvements, putting Eastbourne and Pevensey schemes under one contract, the use of recycled materials, multiple framework options for the provision of

[6] See attached images from 'EA processes and scheme timeline' in Appendix A.

the service, innovation, and enhanced survey using latest technologies. We have built these into our costs, and we share details of some of these steps being taken to ensure cost efficiency:

Design improvements and use of technology

One of the key principles of the EA's engineering design is to create beaches at are designed in such a way as to reduce erosion, therefore requiring less active intervention. Using the latest modelling software and our extensive experience of delivering beach management in the local area, the EA's engineering team are designing a beach which more effectively dissipates wave energy during storm events. With reduced erosion, there is less need for heavy plant activity to reinstate the beach following storm events, in turn reducing costs and carbon emissions. The team are also working with industry to seek methodological improvements which primarily focus on plant running costs.

Streamlining contract management

Historically the Pevensey Bay and Eastbourne frontages have been managed separately. Working in close partnership between the EA, Eastbourne Borough Council, ourselves and other Partners, the EA will be seeking to deliver coastal flood risk management works through a single contract. Procurement of services for construction will be done through nationally and locally agreed frameworks, where rates have been competitively tendered with the open market and benchmarked at a framework level, to ensure cost effectiveness.

Together, this creates efficiencies with staff resource through both planning and delivery phases. It also allows for far more integrated delivery on site.

Use of recycled materials

Phase 1 of the scheme has a 10-year duration. We have assessed existing assets (groynes) and determined that they are able to be repaired or improved through use of locally recycled materials to enable the standard of protection to be delivered over this time period. This saves cost and reduces carbon emissions compared to building new groynes.

Innovation and use of enhanced surveying techniques

There are multiple opportunities for innovation within the scheme. The team are exploring innovative methodologies for delivering shingle by-passing activities around Sovereign Harbour. Currently this activity is undertaken using road lorries, which is expensive, high in carbon emissions and adds to traffic in the local area. The solutions that are being developed have the potential to significantly reduce costs and deliver this work in a more efficient manner. Additionally, the team has been in conversation with suppliers and partners about the potential alternative fuelling solutions for plant and equipment. We are also seeking to use plant telematic systems to drive efficiency in the delivery of the works.

We are also planning to use enhanced surveying techniques to get a detailed understanding about how the coastline responds to storm events. With this we can far more accurately and efficiently plan the recovery works to reinstate the beach design. This will minimise unnecessary movement of plant and materials, driving further cost efficiencies.

3.2.4 Summary of the additional information and evidence we have presented on Pevensey Bay to Eastbourne

Need for enhancement

- We have provided additional background information and key reasons why the full level of investment is needed now to build on our submission – SRN53 from October:

Best option for customer

- We have provided more information on the EA's optioneering process that was followed to develop the proposed solution.

Cost efficiency

- We have provided additional information on the how we are working with the EA to demonstrate the efficiency of the scheme costs through their appraisal and decision-making process.

3.3 Sandown WTW – Yaverland and Embankment Road – £1.25m

3.3.1 Need for enhancement.

In our SRN 53 Coastal resilience enhancement case submission, we identified Yaverland as an AMP 9 scheme. However recent discussions with the EA have revealed that we need to bring the AMP 9 investment contribution for Yaverland and Embankment Road scheme forward to AMP 8.

Additional modelling works carried out by the EA shows that in addition to protecting the Sandown WTW, if brought forward, we will be able to provide additional protection from coastal erosion to the proposed Water recycling centre at Sandown WTW and the water transfer pipelines as described in the WRMP and LTDS submissions at a reduced cost whilst improving protection of the assets for the next 50 years from a breach.

This assessment is based on current climate modelling assessments but overall, this enables us to progress investment plans for improvements to WTW and the new Water Recycling Centre with reassurance that those assets will be better protected.

In our October submission, investment contribution in AMP 9 was £12m, however based on EA's latest construction estimate of £25m, we are proposing to contribute 5% of this, bringing it on par with our level of contribution on Eastbourne and Ventnor, hence total contribution will be £1.25m.

Pre-submission update – in seeking a letter of support from the Environment Agency for this acceleration for this submission, they have highlighted that the time-sensitivity of this scheme which means the full £12m allowance would be required in AMP8. We are highlighting this late change here with the view that this is reviewed with both regulators prior to final determination.

This is explained in the letter of support from the Environment Agency in Appendix B

Current state
The coastal defences currently reduce the risk of tidal flooding to Sandown WTW which has 180,000 Population Equivalents. The coastal defences need to be refurbished and repaired as there is a real risk of a significant breach leading to rapid inundation of sea water into the Southern Water plant.

By 2030 the Yaverland seawall will have come to the end of its life. Within 14 years the Yaverland seawall will breach without refurbishment. causing inundation to the low-lying land of Sandown and Yaverland. More than 300 homes, 200 businesses as well as existing SWS assets will be impacted. We do not want a repeat of the Isle of Wight Council seawall failure at Ventnor Eastern Esplanade in November 2022 where about £4.8m was spent and £0.9m of that in emergency works to protect our sewerage pipes.

A breach will risk the largest WTW on IOW- Sandown WTW and other assets in the next 18 years. In the event of a breach, modelling shows a present-day flood risk to Yaverland WTW, Sandown WSW, Moreton Pumping Station. Flood depths increase with Sea Level Rise, up to 1.32m at Sandown WSW by 2042. See figure 9

The flood risk to existing Southern Water assets has been modelled (See figures 7, 8 and 9), and the modelling results demonstrate that Yaverland WTW, Sandown WSW, and Morton Pumping Station will be

adversely impacted without the Yaverland defences. We also know that the site for the proposed for the new Water Recycling Centre will be surrounded by flood waters with depths of 0.51 by 2042 without coastal protection. The preferred option is to carry out a full refurbish of the seawall and refurbish 50% of the groynes. See Appendix B for more details. Construction will start in 2026 and conclude in 2029.

The EA model results indicated that Sandown WTW remains dry in the present day (2022 epoch) but is inundated by 2042 when failure of the frontage is estimated to occur. In addition, the model results suggest that during the 2042 0.5% AEP event, Sandown WTW will be inundated with depths of approximately 0.1m. By 2082 flood depths are predicated to reach up to 0.5m at Sandown Water Treatment Works.

It is anticipated that by 2121 Sandown WTW could experience flood depths of over 2m. Whilst, the main flood risk to the water treatment works is from the Yaverland frontage, the defences at Embankment Road will also need to be repaired as flooding is also possible from this coastal frontage. Access to some of the Southern Water assets at Bembridge point may be made difficult if Embankment Road is submerged and Sandown Road is impassable at Yar Bridge. See Figure 7 below:

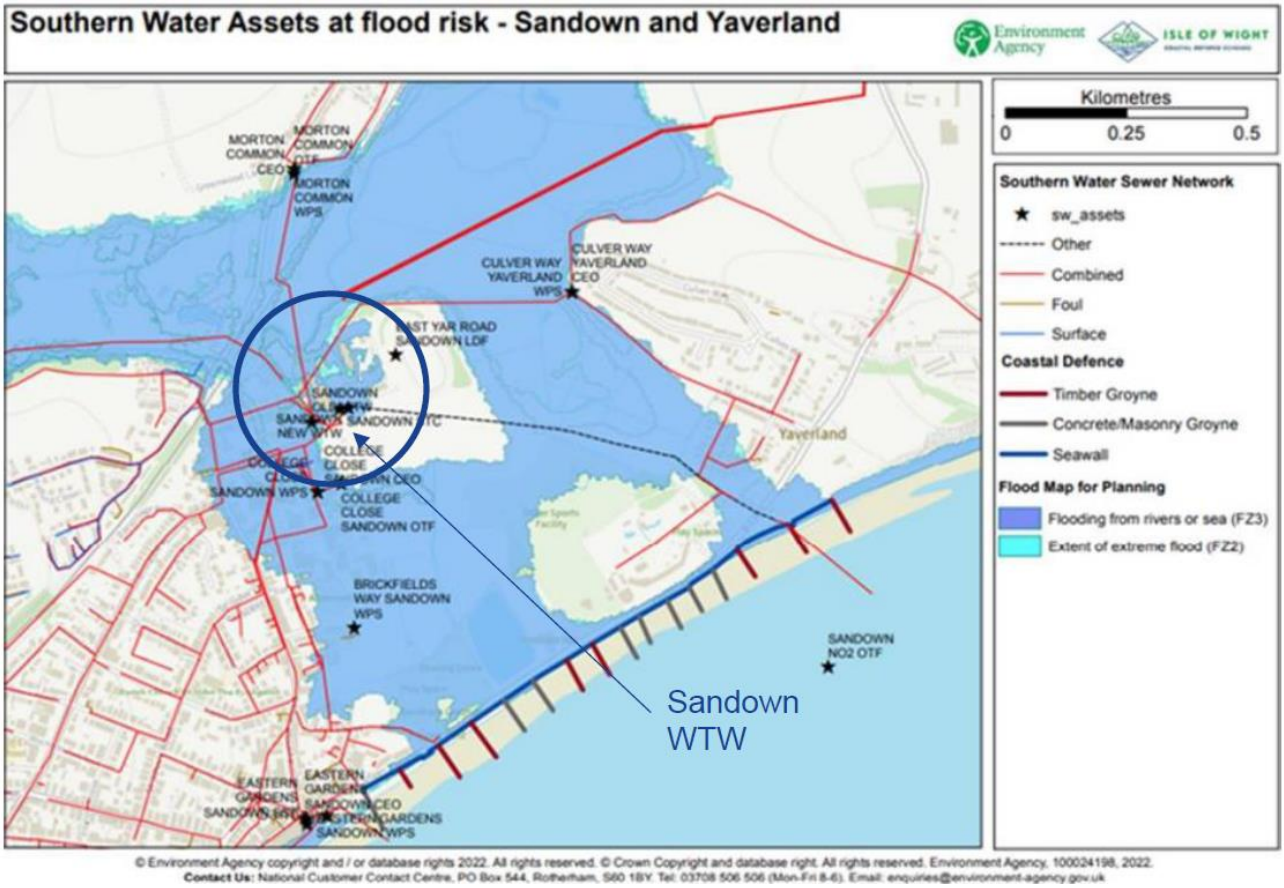


Figure 7: Our assets at risk - Sandown WTW

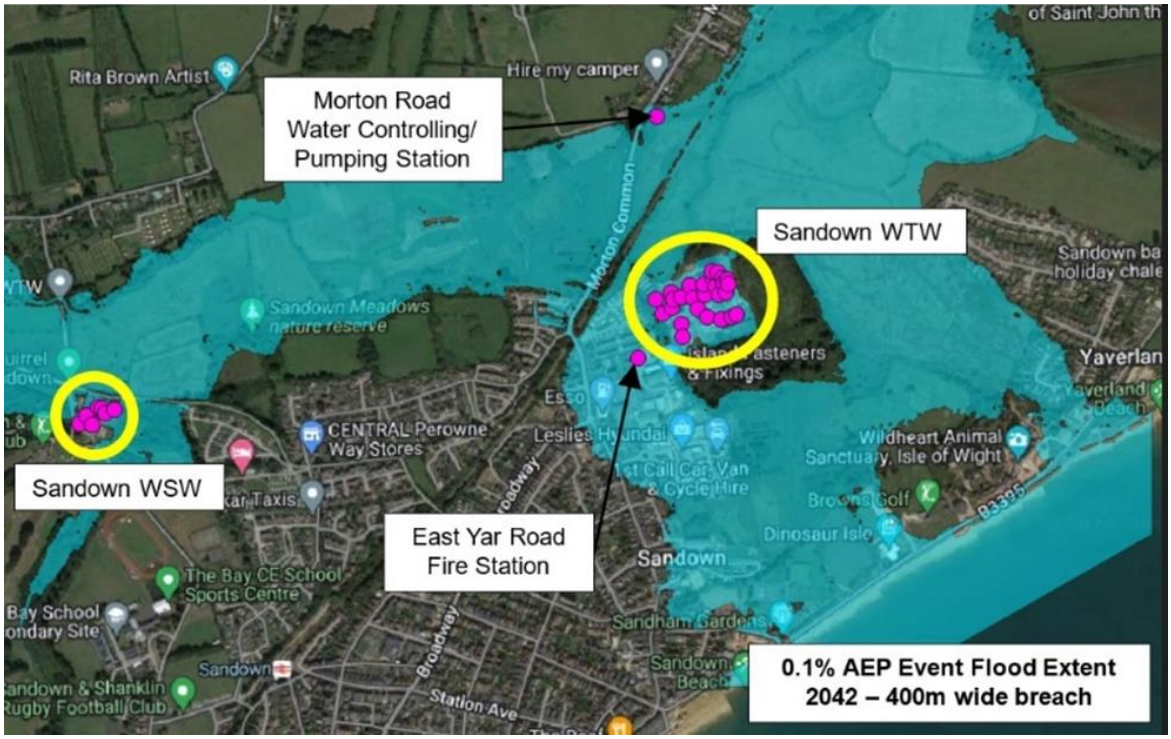


Figure 8: Our assets at risk – Sandown WSW, Sandown STW and Moreton WPS

Additional flood modelling

Given the poor asset condition and the risk of the seawall breaching within the next 20 years, JBA modelled a breach scenario both today (2022) and in 2042[7]. From the model we were able to ascertain the likely onset of flooding and depths of flood water for existing Southern Water assets in Sandown. Clearly supporting our case on the need to invest at this site promptly, during AMP8.

2021s1276 Yaverland OBC - Critical Infrastructure Flood Risk Review
19/06/2024
NB: The modelled flood depths provided are the average across the site and are not for specific buildings.

Defence condition	Failed - 100m wide breach								
Year	2022								
Tidal event	50% AEP	20% AEP	10% AEP	5% AEP	3.33% AEP	1.3% AEP	1% AEP	0.5% AEP	0.1% AEP
Site	Mean depth (m)	Mean depth (m)	Mean depth (m)	Mean depth (m)	Mean depth (m)	Mean depth (m)	Mean depth (m)	Mean depth (m)	Mean depth (m)
Sandown WTW		0.06	0.12	0.21	0.22	0.33	0.34	0.38	0.48
Sandown WSW	0.81	0.88	0.93	0.98	1.00	1.05	1.07	1.16	1.30
Morton Road PS	0.23	0.22	0.16	0.17	0.19	0.19	0.19	0.21	0.33

	Failed - 400m wide breach								
	2042								
	50% AEP	20% AEP	10% AEP	5% AEP	3.33% AEP	1.3% AEP	1% AEP	0.5% AEP	0.1% AEP
Site	Mean depth (m)	Mean depth (m)	Mean depth (m)	Mean depth (m)	Mean depth (m)	Mean depth (m)	Mean depth (m)	Mean depth (m)	Mean depth (m)
Sandown WTW	0.12	0.21	0.25	0.35	0.36	0.43	0.45	0.51	0.64
Sandown WSW	0.92	0.98	1.03	1.07	1.12	1.22	1.24	1.32	0.66
Morton Road PS	0.15	0.17	0.18	0.19	0.17	0.22	0.25	0.35	0.60

Figure 9: Coastal Infrastructure Flood Risk Review – Environment Agency

7 Yaverland Flood Modelling Report (JBA, 2024)

More information available on:

- The visual assessment condition – **Yaverland Visual Condition Assessment by JBA, 2022.**
- The flood modelling report – **Shanklin Seawall Refurbishment Scheme – Flood Modelling Report, JBA, 2023.**

All attached to this submission.

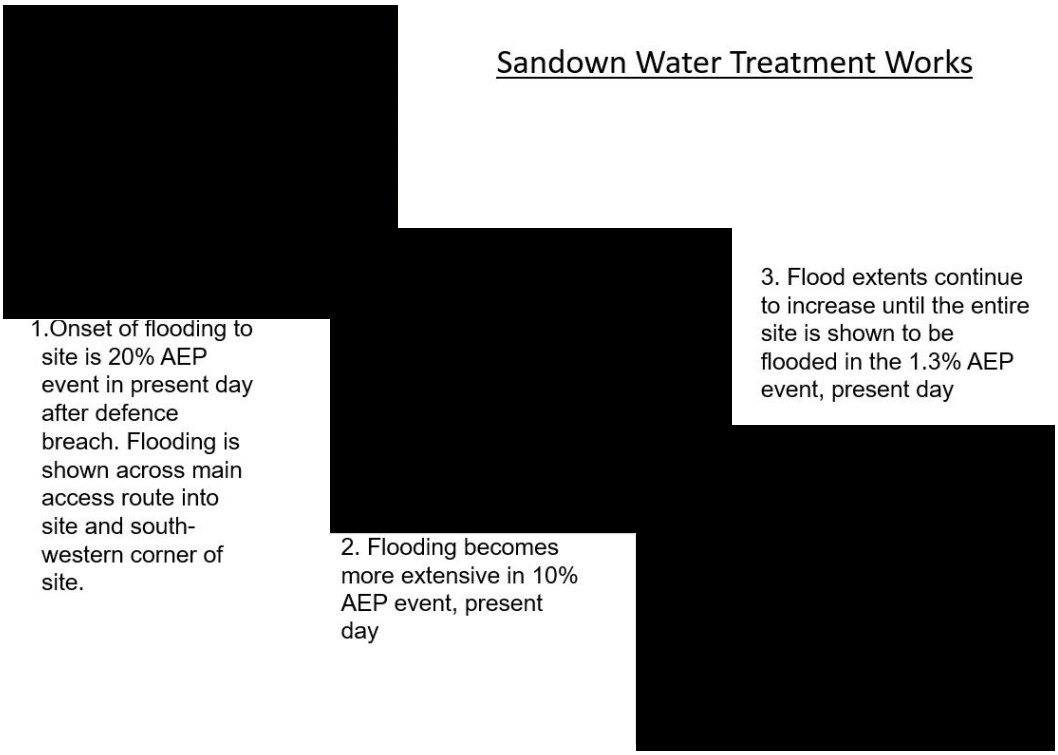


Figure 10: Highlighting the progressive risk that could impact Sandown WTW

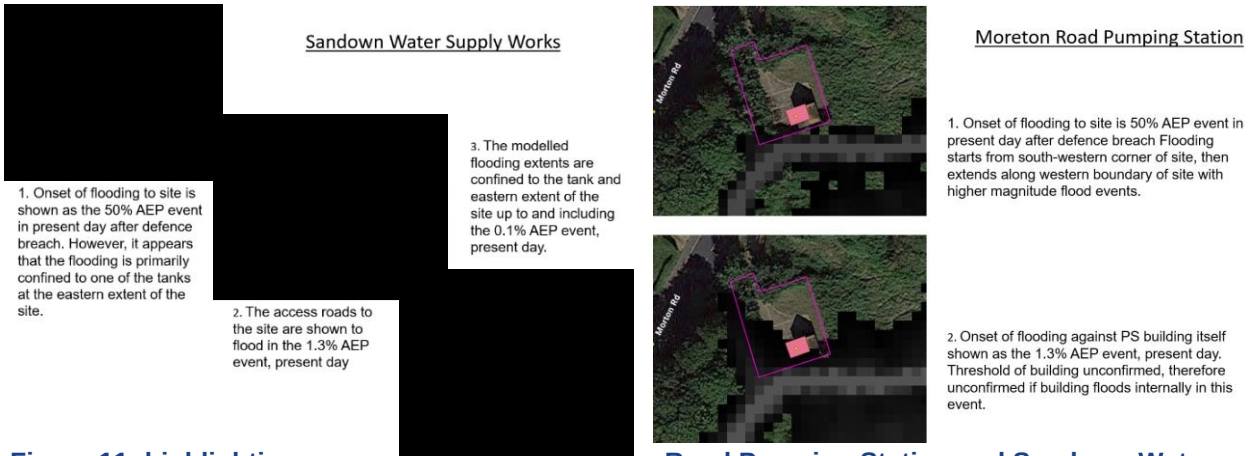


Figure 11: highlighting progres on Road Pumping Station and Sandown Water Supply Works

Ground investigations

Ground Penetrating Radar surveys (2022), Ground Investigations (2023) Coastal processes modelling and wave over topping modelling (2024) inform us that the overall residual life of the seawall is 15 years. Voiding was identified during the intrusive ground investigation works. Under a do-nothing scenario failure of the central section of the seawall near Dinosaur Isle has a 100% probability of breaching by year 14.

The groynes maintain beach levels, and doing so is intrinsic to protecting the toe of the seawall. The timber groynes are in fair (3/5) to poor (4/5) condition with a residual life of 4-9 years, whilst the concrete groynes are in fair condition (3/5). Defects include absence and damage to timber planks, cracking and splitting of king piles, section loss of tie piles, and cracking, spalling, and honeycombing to concrete piles[8].

Base overlap

This enhancement does not overlap with any other activity delivered through base because it is responding to a new risk that has materialised because of sea level rise leading to coastal erosion. In addition, we have assessed the Coastal Resilience programme against the criteria for low regret investment identified in the LTDS guidance and Appendix 9 of the Final Methodology. The guidance identified that low regret investments meet the needs across a wide range of plausible scenarios, meet short-term requirements; or keep future options open, including cost minimisation.

We consider that the investments proposed in this enhancement case is a low regret investment for the following reasons:

- Sea level is continuing to rise, and estimates indicate a 1.15m rise by 2100[9]. Our sites are already exposed to coastal erosion and if the coastal defences are not enhanced, many customers are at risk of losing our service and the evidence leaves us in no doubt that it will lead to a significant pollution and bathing water quality incident.
- For sites such as Sandown WTW we need to intervene now, this site will be needed in the future and there are no plans to relocate or abandon it, it is critical to future proofing our services and the coastal erosion impact is accelerating and could result in landslip. This asset will not be protected by assets owned by others at no cost.
- We are working in partnership with Local Authorities and the Environmental Agency (EA) as part of their FCERM Programme to ensure we consider the options at a system level and make appropriate contributions, ensuring that our sites are adequately protected. We will continue to work with the EA to identify a range of plausible futures for our coastal defences and slope stabilisation needs. See the External Legislative assumptions below.
- The solutions that are described in for Yaverland is required across a range of scenarios considered within our long-term delivery strategy, i.e.,
    - Adverse scenario: RCP 8.5 50th percentile probability level.
    - Benign scenario: RCP 2.6 50th percentile probability level
    - Time period: Through to 2050.

[8] Asset condition Report (JBA, 2022) for the EA.
[9] ukcp18-fact-sheet-sea-level-rise-and-storm-surge.pdf

External legislative assumptions

This applies to Yaverland and Embankment Road scheme as much as other EA delivered schemes. The assets being considered are not all Southern Water assets. However, the impact on the environment and customers will be severe if we do nothing. Customers and the environment will be impacted because of pollution. Southern Water is a risk management authority ("RMA") for the purposes of the Flood and Water Management Act 2010. As such, it is subject to a duty to cooperate with other RMAs, including the EA, in the exercise of their flood and coastal erosion risk management ("FCERM") functions. This duty applies with respect to Southern Water's FCERM functions – i.e., its functions to provide a public sewer system that effectually drains the area it serves, including the drainage of surface water. We have considered this investment through the lens of our obligations to protect key strategic assets from erosion and inundation due to rising sea levels because of climate change – this is our basis for partnership with the EA.

3.3.2 Best option for customers

All Environment Agency capital projects follow a Gateway control appraisal and decision-making process. A project timeline for Yaverland is outlined in Figure 12.

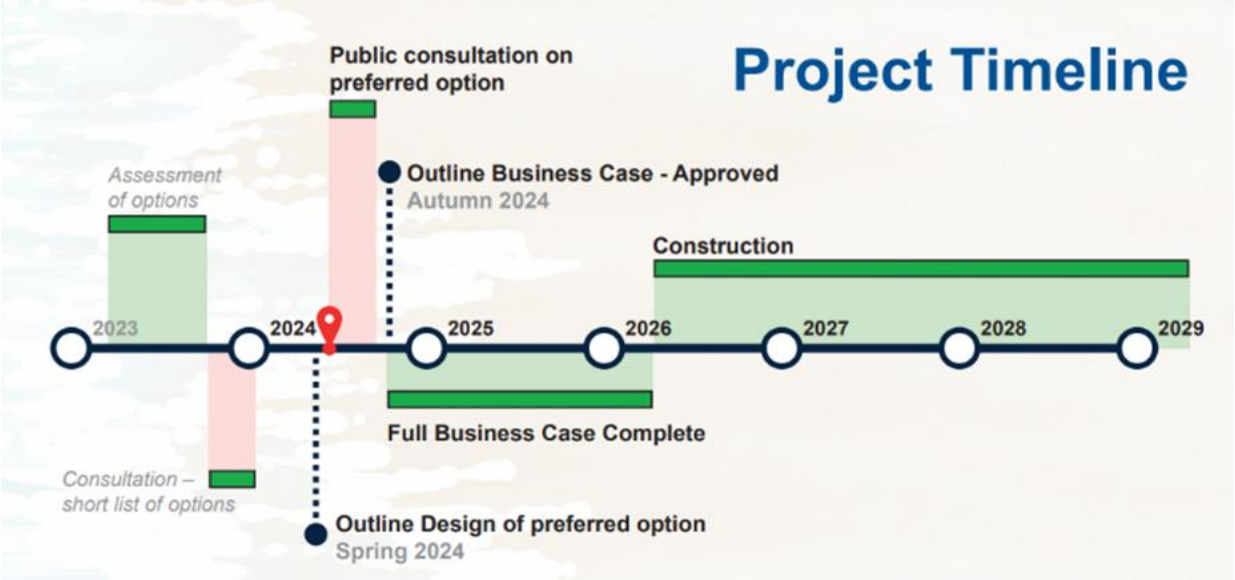


Figure 12: Yaverland and Embankment project timeline

Gateway 1 – ensures that a clear case for change has been made and is able to identify at least one economically viable and achievable option to progress. **Broad objectives are set. Yaverland and Embankment Road has gone beyond this point.**

Between Gateway 1 and 2 (Outline Design of preferred Option) –Modelling and surveys take place, and more detail is worked through. Different options are explored and professional partners, stakeholders and the public are consulted on project outcomes. A longlist of options is reduced to a shortlist and to a preferred option though an appraisal process looking at technical, economic, sustainable, and environmental aspects. An outline design is developed with whole life costs estimated. **This stage was concluded in July 2024 and public consultation is ongoing.**

The outline designs for the preferred option have been made available to Southern Water for review on 11th July 2024 which our Asset Management team have reviewed and are satisfied with the solution and the long-term benefits of protecting our sites. We see that the option selected is best for our customers.

The preferred option is to carry out a full refurbish of the seawall and refurbish 50% of the groynes. We see this solution as appropriate both technically and economically. **A do-nothing option was considered** but given our joint experience of the Ventnor emergency works, **it was not deemed feasible.**

Table 8: Options to protect our site in Yaverland

Ref	Description	Benefit / Residual risk	Decision
1	Do Nothing Allow coastal erosion and flooding	[redacted] in a "do-nothing" scenario. The cost of repair if allowed to fail is too significant. Ventnor emergency works cost £4.8m.	Considered
2	Refurbishment of original design	Full refurbish of the seawall and refurbishment of 50% of the sea groynes.	Preferred

3.3.3 Cost efficiency

Ensuring cost efficiency
The design and costings for Yaverland have been reviewed and scrutinised through Gateway 1 of the appraisal and decision-making process by the Environment Agency's Large Project Review Group, the Independent Assurance Service, who ensure cost efficiency and that treasury guidelines have been correctly followed.

We have identified multiple opportunities to achieve significant cost efficiency in delivery and used this to deliver savings on the construction costs. Opportunities considered include:

- Value engineering through design improvements and innovation
- Yaverland and Shanklin refurbishment projects under one construction contract
- Reuse of recycled materials
- Multiple framework options and greater us of island-based suppliers/contractors
- Reduced construction programme (linear programme with full beach closure)

Original costs
EA's contractor costed for preliminaries and construction of the preferred option using outline design drawings. The original submission was £30,256,988.

Benchmarking to deliver cost efficiency.
This was reviewed by the EA's Senior Estimator in the Portfolio Assurance Service Team (commercial), in Major Projects and Programme Delivery who reviewed the rates and benchmarked these against other similar projects. **All the efficiency saving resulted in revised totals of £25,197.630, saving £5,059,359 on the original offer.** Given the thorough review and inclusion of Isle of Wight based Specialist Subcontractors and material supplier, the project team have confidence that these costs are robust and realistic. We have been in discussions with the EA to understand the costs and how they have been developed.

The additional benchmarking exercise by EA's Cost Estimator uses their Project Cost Tool which is cost curve generated based on previous projects delivered. Within it are unit costs for seawall and groyne refurbishment. This provides further assurance in terms of having robust construction costs.

Table 9: Breakdown of direct construction costs per defence feature

Defence feature	Direct construction Cost (60% should be applied for indirect costs)
Seawall (m^2)	£1,492
Concrete groyne repairs (m^2)	£1,767
Wooden planks (m)	£63
Wooden Piles (m)	£5,364

A full breakdown of all costs can be seen in the summary spreadsheet of the EA cost review which is attached here in Figure 14 in Appendix B. The preliminaries are the most significant part of the construction cost. **These are estimated to be £16.9m whilst the actual construction is £8.4m. Total construction costs are £25.2m.**

The preferred option is both the economically preferred option (lowest cost solution) and the option that best meets the broader objectives for the Isle of Wight Council in terms of environment, sociological and local economics.

The EA are already progressing the current business case as part of an optimised delivery package, concurrently working across two other similar/interlinked projects. The team has in depth knowledge, familiarity and experience, aiding delivery across these projects.

Optimal programme for efficiency
The EA has been progressing the IOW coastal defence programme since 2020 with industry experts JBA, and in partnership with the Isle of Wight Council. The Yaverland projects is being delivered concurrently with two additional nearby schemes, Shanklin and Embankment Road. All three projects are developing outline designs for the preferred option.

Table 10: Overview of cost changes at Yaverland

Yaverland costs and efficiencies	Values	Total AMP 8 Costs
Original total	£30.26m	
Efficiency / saving total (detail in Appendix B)	£5.06m	
Revised total	£25.2m	
Southern Water Contribution – 5% of total		£1.25m

Cost avoidance through joint delivery
As described in the other two cases, coastal management programmes are typically delivered by the EA and benchmark data is not commonplace. However, by delivering this jointly with the EA, we do not have to incur any overhead costs and pass it through to our customers and, that immediately delivers £1.39m cost avoidance to our customers if we assume a typical level of indirect cost for this scheme given the technical complexity. Also, the capability required to deliver these types of schemes typically sit within the EA.

Table 11: Cost multiplier for Yaverland scheme

Scheme	Overall Cost Multiplier	Total AMP 8 Costs
EA Delivered Yaverland and Embankment	1.00	£1.25m

As shown in Table 11, there is no Southern water overhead as we will continue to work with the EA in monitoring the delivery of this scheme as we have done in the development phases.

Improving confidence in costs and in delivery.
We have demonstrated evidence of successful collaborative partnership via the Ventnor Esplanade sea defence upgrades win top construction excellence award (onthewight.com)

The Ventnor Emergency Works project won the 'Integration and Collaborative Working' category at the Constructing Excellence SECBE Awards in June 2024.

The award was for the close partnership working between the Isle of Wight council, JBA, Mackley, Coastal Partners, the Environment Agency, Jacobs, Southern Water, Island Roads and Ventnor Town Council. The judges were impressed with the number of organisations who immediately came together to address a critical issue and that the collaboration and commitment of our organisations was maintained through the entirety of the programme. **This is great evidence that the partnership already formed can be used to our advantage for effective delivery on the main Ventnor scheme.**
Customer support.

Overall, our customers discussed funding resilience, most agreed that we need to invest in resilience in AMP8. The bill impact is low, and they acknowledged the importance of collaborative working, suggesting that coastal defences should not be our sole responsibility and given our work with the EA and Local Authorities, we are aligned.

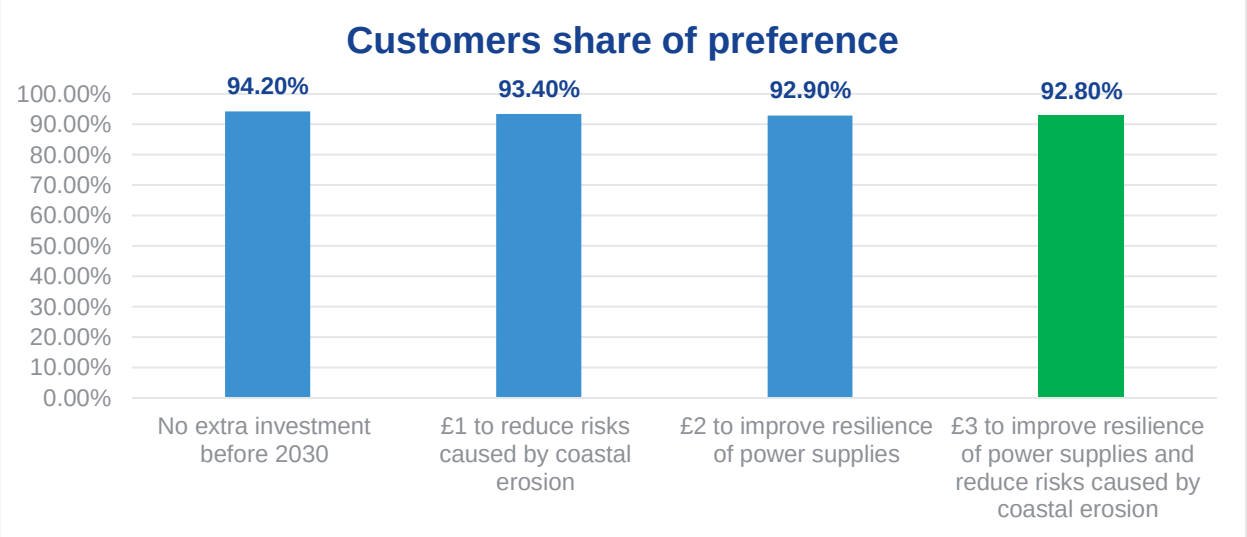


Figure 13: Graph showing our customer share of preference for resilience schemes and protecting against coastal erosion

Taken in the round, it is not surprising to see marginally higher share of preference for no extra investment in resilience before 2030. However, this feels like an area of ambition in which the more informed customers become, the more they believe that this investment should be undertaken – particularly since the predicted bill impact is relatively low.

Overall, our customers are supportive of our investment in coastal flooding and erosion, during our customer engagement, about 93% our customers were willing to contribute between £1-3 to reducing power and coastal erosion risks depending on the options presented to them. Our customers who use coastal areas very often are more likely than others to support investment in storm overflows, resilience, and river water

quality monitoring. 92.8% of our customers have recommended £3 to improve resilience of power supplies and reduce risks caused by coastal erosion. We have also seen 93.9% of our customers who struggle to pay their outgoings support this plan10

Delivering additional benefits for customers

Regeneration and Yaverland Seapool
Regeneration is a key objective of the Isle of Wight Council for this locality. In 2024 they published The Bay Area Place Plan which includes aspirations for public realm enhancement, infrastructure improvements and economic growth. To be take forward actions, the reassurance of coastal protection for the next 50 years is needed to attract investment. The coastal defence scheme is seen as a catalyst and the starter for the regeneration programme in the area. The EA has the support of the council to pilot community steering groups. Tasks and events are already aligned between the coastal defence scheme and the Bay Area Place Plan, with a community steering group being established. One of the community lead projects is Yaverland Seapool. The Seapool is dependent upon the seawall refurbishment scheme as it will be built into the defences.

3.3.4 Customer protection

About 60% (2.86m) of our customers in the region are served by assets within 100m of the coast. With sea level rising (33.9cm by 2065, Source: EA), and leading to increased storms and coastal erosion we are acting now to protect our customers from higher maintenance costs and repair in the near future.

With ongoing coastal erosion comes the increased risk of pollution and bathing water quality incidents – this is a major risk in all the areas and sites we want to invest in.

This investment does not pass the materiality threshold for a Price Control Deliverable. However, we have an ambitious and stretching target to reduce pollution incidents, this investment when considered in the round with our investments in Storm overflows will enable us deliver on our target by reducing the risk of undercliff failure and ground movements leading to pollution. These schemes will help improve the habitat and increase biodiversity and restore or maintain our beaches as safe environments for the community we serve.

[10] PR24 Environmental Ambition Prepared for Southern Water

3.3.5 Summary of the additional information and evidence we have presented on Yaverland and Embankment Road

Need for enhancement.

- We have been provided additional information and evidence to support the need to bring forward delivery of this scheme into AMP8 based on further engagement with the EA.

Best option for customer

- We have set out our **preferred option, to carry out a full refurbish of the seawall and refurbish 50% of the groynes**. We see this solution as appropriate both technically and economically and compared it to the **do-nothing option that has been was considered.**
- We have set out information on the optioneering stage this scheme has progressed to within the EA's process and when the next Gateways are scheduled.

Cost efficiency

- We have described how the costs have been built up by the EA and how the costs have been revised through the EA's optioneering and design process.

Customer protection

- As we did with the schemes submitted in our October submission, we have provided additional information on the customer protection considerations we have applied for this scheme.

4. Supporting Evidence

We have provided below the following supporting evidence in our appendices:

- Environment Agency business case, appraisal and approval process summary timeline
- Yaverland and Embankment project – additional information and evidence on costs

The schemes we propose are being led and delivered by the Environment Agency, in developing the additional information and evidence submitted in this response we have summarised the most relevant documentation and information provided by the EA.

We have not attached copies of the individual documents that underpins each of the schemes we are requesting funding for in AMP8 as they are not owned by us. If you require more information on these documents, we can discuss this on a case-by-case basis.

5. Business Plan Dependencies

This document is linked to the SRN53 Coastal Resilience enhancement case submission submitted in Oct 2023.

Chapters	
SRN53 Resilience - Coastal Enhancement Business Case	Chapter 3 – Best Option for Customers

Data Tables impacted by the representation:

Table/s Impacted	Data Lines Impacted

All documents and tables referenced above can be found on our website here: Business Plan 2025-30 - Southern Water

6. Appendix A – EA business case, appraisal and approval process summary and timeline

Environment Agency

Environment Agency business case, appraisal and approval process summary and timeline

Prepared for Southern Water to support the business case for partnership contributions for the Yaverland coastal defence scheme, the Ventnor coastal protection and slope stabilisation scheme, and the Pevensey Bay to Eastbourne coastal management scheme.

All Environment Agency capital projects follow a Gateway control appraisal and decision-making process as outlined in Figure 1. Project business cases are scrutinised at each Gateway by our Independent Assurance Service who make a recommendation to the financial approver and gateway review board. This process aims to control spending and ensure that project costs are outweighed by the benefits (and stopping projects passing gateways if they are no longer economically viable), whilst also ensuring HM Treasury guidance on best practice in project management is followed in developing and delivering schemes.

Gateway 1 – ensures that a clear case for change has been made and is able to identify at least one economically viable and achievable option to progress. Broad objectives are set.

Between Gateway 1 and 2 –Modelling and surveys take place, and more detail is worked through. Different options are explored and professional partners, stakeholders and the public are consulted on project outcomes. A longlist of options is reduced to a shortlist and to a preferred option though an appraisal process looking at technical, economic, sustainable and environmental aspects. An outline design is developed with whole life costs estimated.

Gateway 2 – Outline design and costings are assessed to confirm the project remains technically and economically viable. To pass Gateway 2 projects are expected to have identified partnership funding sources and to be able to demonstrate this.

Between Gateway 2 and 3 final further detail is added to the design and costing with further engagement or consultation with professional partners, stakeholders and the public. Planning permission and licences are sought where required, environmental assessments are carried out. Delivery contracts are scoped and tendered and contracts are developed. full business case is created, detailed design and costing are carried out.

Gateway 3 – passing Gateway 3 means that financial approval is given to proceed to construction and delivery. To pass Gateway 3 partnership funding required to make a scheme economically viable needs to be secured.

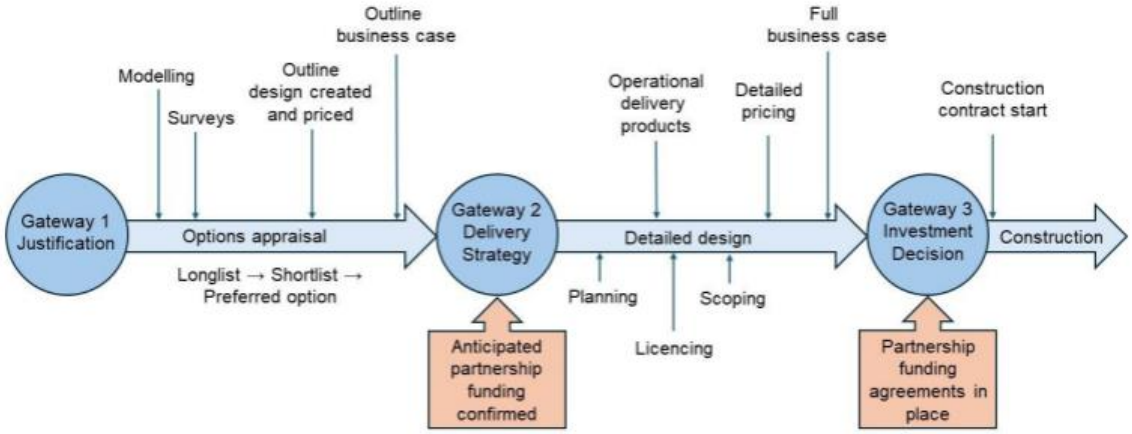


Figure 1: Schematic of Gateways 1-3 from project inception to construction for EA capital projects

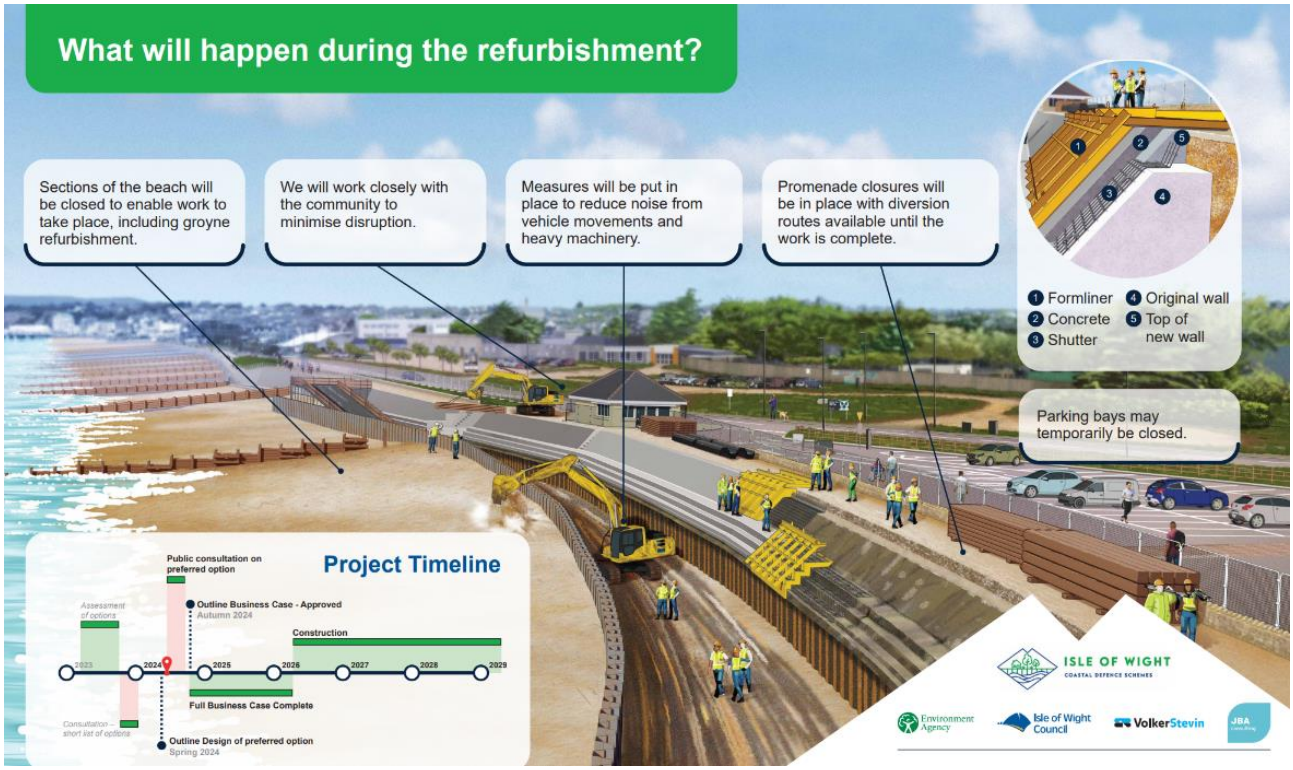
Figure 14: EA Capital project gateway process schematic

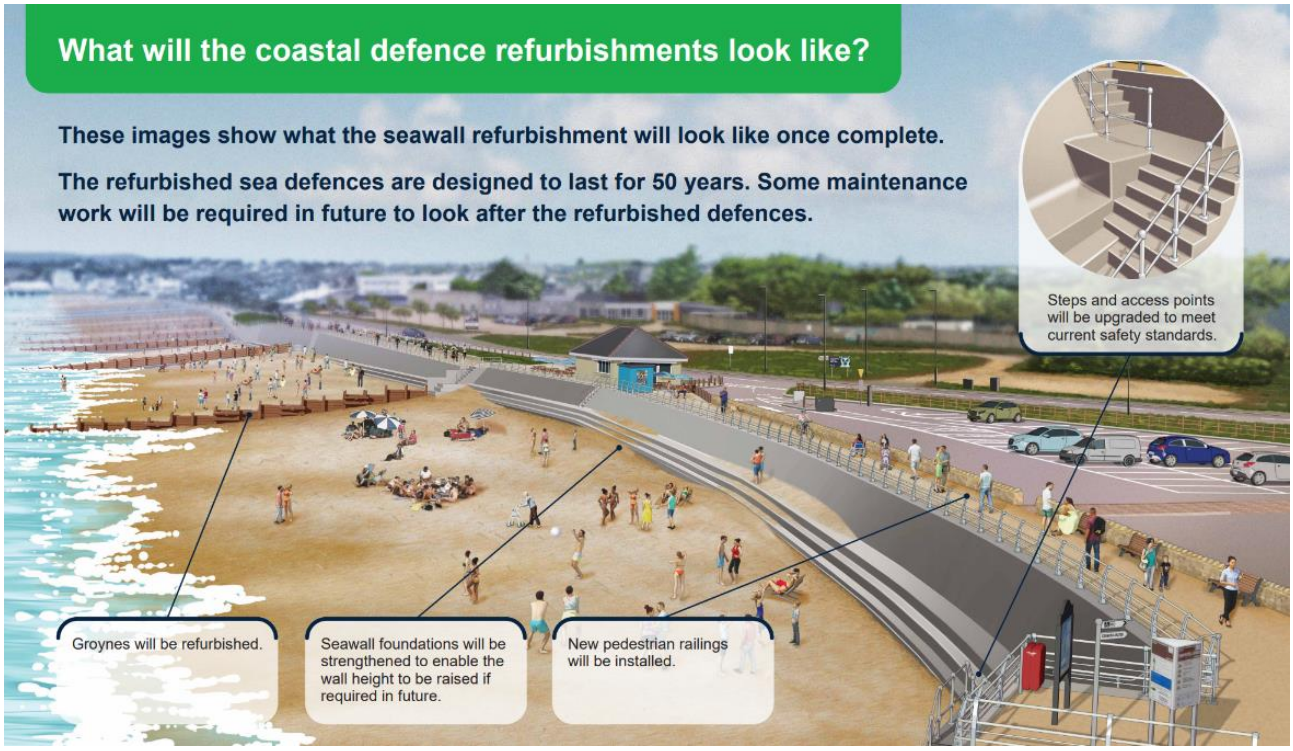
Scheme timelines and Southern Water requested contributions

Scheme	Gateway 1	Confirmation of intended AMP8 investment from SW	Gateway 2	Agree detail of AMP8 investment from SW	Gateway 3	Delivery/ construction begins	Delivery/ construction ends
Pevensey Bay to Eastbourne CMS	November 2021	July 2024	October 2024	2025	December 2026	Summer 2027	Summer 2037
Yaverland coastal defence scheme	July 2021	July 2024	November 2024	2025	March 2026	Spring 2026	Summer 2029
Ventnor Coastal Protection and Slope Stabilisation Scheme	October 2021	July 2024	April 2025	2025	September 2026	November 2026	October 2028

Figure 15: EA timelines for schemes with SWS contributions

7. Appendix B – Yaverland and Embankment project





Description	Values
Original Total for Yaverland Sea Wall Refurbishment - OBC	£30,256,988.17
Saving on FRC - Amendment to rates	£140,144.01
Saving on Staff - Amendment to travel and Subsistance	£483,560.00
Saving on OH - Amendment to Water provision	£54,750.00
Saving on Traffic Management - Amendment to allowances	£424,641.23
Saving on Risk Value 5%	£55,154.76
Saving on Fee 8.9%	£103,084.25
Reduction	£1,261,334.25
Revised Price (incl reduction in Risk & fee)	£28,995,653.92
Direct Cost Savings on revised price if Design Changed (excludes Fee)	
Saving if Stainless Steel Mesh and Rebar changed to standard mesh and rebar	£1,189,080.80
Saving on Risk Value	£59,454.04
Saving on Fee	£111,119.60
Total	**£1,359,654.44**
Saving if reduction in dowels from 6nr to 4nr	£767,569.00
Saving on Risk Value	£38,378.45
Saving on Fee	£71,729.32
Total	**£877,676.77**
Saving if removal of Reckli from shutter design	£900,243.32
Saving on Risk Value	£45,012.17
Saving on Fee	£84,127.74
Total	**£1,029,383.22**
Direct Cost Savings on Timber disposal The current allowance is to dispose all Timber as Hazardous waste. If tested and deemed not hazardous , this could be either donated or sold. The value here is simply the saving onf not disposing of the material but doesn't add in for transporting from site.	
Saving on Timber disposal	£153,679.50
Saving on Risk Value	£7,683.98
Saving on Fee	£14,361.35
Total	**£175,724.82**
Direct Cost saving if Handrail revised to Kee Klamp system in lieu of Broxap	
Key Klamp System per lin.m	£118.75
Broxap system per lin.m	£292.97
Rate reduction	£174.22
Total meterage	1214
Saving on Handrail	£211,503.08
Saving on Risk Value	£10,575.15
Saving on Fee	£19,764.96
Total	**£241,843.20**
Potential Total if all savings are realised	
Revised Price (incl reduction in Risk & fee)	£28,995,653.92
Saving if Stainless Steel Mesh and Rebar changed to standard mesh and rebar	£1,359,654.44
Saving if reduction in dowels from 6nr to 4nr	£877,676.77
Saving if removal of Reckli from shutter design	£1,029,383.22
Direct Cost Savings on Timber disposal	£175,724.82
Direct Cost saving if Handrail revised to Kee Klamp system in lieu of Broxap	£241,843.20
Revised total with all reductions (except Material fee reduction below)	**£25,311,371.46**
Material Fee reduction (see separate Tab for further consideration and potential saving)	£113,741.90
Revised Total Option A including Material fee reduction	**£25,197,629.56**

Figure 16: Yaverland cost breakdown and associated cost savings

Environment Agency

Southern Water Services Limited
Southern House,
Yeoman Road,
Worthing,
West Sussex,
BN133NX

Date: 27th August 2024

Dear Chris Braham, Head of Wastewater Asset Strategy and Planning

SRN53 Resilience: Coastal Enhancement Business Case

I write to you to summarise recent collaborative working with Southern Water Services Limited who are in support of three coastal defence projects currently being developed by the Environment Agency. These projects will better protect three of Southern Waters essential assets, and the wider sewer network in Eastbourne and the Isle of Wight, for the next 20-50 years from the combined risks of coastal erosion, tidal flooding and sea level rise, as well as 13,000 homes.

We are grateful to Southern Water for their financial support with the stipulated financial contributions in AMP8 within the revised SRN53 Resilience business case:

- Pevensey Bay to Eastbourne (phase 1) - £1.17m
- Ventnor, Isle of Wight - £2.25m
- Yaverland, Isle of Wight- £1.25m

To note, since version 1.0 SRN53, we have agreed that the revised business case ought to bring forward part of the AMP9 investment for the Yaverland Coastal Defence Scheme. The indicative £12m for AMP9 in SRN53 v1.0 has been reprofiled as:

- AMP8 = £1.25m
- AMP 9 = £10.75m

The reason for this amendment is recent evidence from ground investigations (2023) and modelling (2024), indicate a much earlier onset of risk from a breach in the Yaverland seawall if there is no capital investment in the short term. The Environment Agency are developing an Outline Business Case to deliver a seawall refurbishment project with construction commencing in AMP8. Without this contribution to work alongside our £9.5m and an additional time sensitive contribution of £5.8m, this project will not progress through to construction.

Without these three schemes there would be significant impacts on Southern Water assets in the short term, with associated financial and social costs. With the right investment now we can provide cost-effective resilience to coastal change.

Yours sincerely,

[redacted]

Nick Gray
Flood and Coastal Risk Manager
Hampshire, Isle of Wight and Sussex
Guildbourne House, Chatsworth Road, Worthing, BN11 1LD