

Little Orme to Clwyd Estuary (I Ia 2)



Recommendations:

Overview:

The long term plan is to manage flood and erosion risks to the road and railway that provide the main transport links to the region and properties. There are isolated areas where it may be possible to move the defences back from the current alignment, closer to these assets, although such realignment of the defences could interrupt the longshore movement of sediment, making neighbouring frontages more difficult to defend, and also remove the 'buffer zone' of empty land between the sea and these key assets. The very large area at risk of flooding behind the defences the east of Abergele including Towyn, Kinmel Bay and Pensarn suggests that a more substantial defence system with a second line of defences should be developed to minimise the risks involved with the failure of main defences. An alternative approach to a second line of defences set back behind the main defences could be to Advance The Line by constructing new defences in front of the existing, for example with tidal energy impoundment lagoons. Full environmental impact assessments would be required for proposals such as tidal lagoons that could change the whole character of the coast.

By reducing flood risk to the extensive flood risk zone the majority of the social objectives are met. However, doing so creates the potential for coastal squeeze against the hard defences and interrupts sediment supply to down drift beaches including both natural and human interests and therefore impacting other objectives elsewhere along the coastline. This negative impact can be potentially mitigated if considered in the design of future defences, the inclusion of beach recharge in the management plan and the creation of compensatory intertidal habitats elsewhere in the Shoreline Management Plan area.

Location (Policy Unit)		Policy and Approach (from 2010)			Justification		
		0-20 years	20-50 years	50-100 years	Social	Environmental	Economic
2.1	Little Orme to Rhos on Sea (Penrhyn Bay)	Hold the Line – By maintaining and improving / raising the existing defences, including investigating improving the beach control structures to widen the beach.	Hold the Line – By maintaining and improving / raising the defence system, including beach control.	Hold the Line – By maintaining and improving / raising the existing defences.	Manages risk to the communities of Penrhyn Bay & Rhos-on-Sea as well as the wider flood risk area.	No conservation designations present (although impacts on the vegetated shingle would need to be considered further).	Hold the line is economically viable and likely to be the most cost effective option in the long term. Where there are undeveloped areas behind the defences lower or smaller defences could be considered provided there is space to safely store overtopping water.
2.2	Rhos on Sea to Llanddulas (Colwyn Bay)	Hold the Line – By maintaining and improving / raising the existing defences. A strategy study needs to be undertaken to confirm the long term economic viability.	Hold the Line – By maintaining and improving / raising the existing defences, subject to confirmation through the strategy study.	Hold the Line – By maintaining and improving / raising the existing defences, subject to confirmation through the strategy study.	Manages risk to the railway and other infrastructure as well as other assets in the erosion risk zone Manages risk to the cycleway and coastal path.	No conservation designations present. Local opportunities for environmental improvements and the layout and size of the groynes should be considered in a more detailed local study.	The economic viability of the policy may depend on estimated costs for relocating the railway and road which would be at long term risk.
2.3	Llanddulas to Clwyd Estuary	Hold the Line – By maintaining and improving / raising / widening the existing defences and beach. Construction of a second set-back line of defences in addition to the main defence would be recommended in parallel with other non-structural measures to further reduce both probability and consequences of flooding to the large flood risk area.	Hold the Line – By maintaining and improving / raising / widening the existing defences and retaining a wider beach. Construction of a second set-back line of defences in addition to the main defence would be recommended in parallel with other non-structural measures to further reduce both probability and consequences of flooding to the large flood risk area.	Hold the Line – By maintaining and improving / raising / widening the existing defences. Construction of a second set-back line of defences in addition to the main defence would be recommended in parallel with other non-structural measures to further reduce both probability and consequences of flooding to the large flood risk area.	Provides a consistent approach to managing the coastal flood risk to communities in the extensive flood east of Abergele. Manages risk to the cycleway and coastal path, recreational and tourist assets.	No real environmental benefit to realign defences as very little space is available due to location of railway line and any habitat creation is unlikely to be sustainable over 100 years. Defences restrict shingle movement, which may have an adverse affect on the SSSI in the future. Therefore future policy implementation should take this into consideration.	Hold the line is economically viable and justified by the high value of the property at flood risk.

Key assumptions made during development

Beaches along the open coast may narrow and steepen with coastal squeeze due to predicted sea level rise. Hard defences are likely to become increasingly expensive to maintain and the risk of overtopping and flooding will increase. The expected sea level rise combined with higher / larger defences will result in the potential consequence of storms greater than the design standard becoming significantly more frequent in the long term epoch. Management of this "residual risk" through adaptation of land use, development control and flood warning will be essential if the hold the line scenario is adopted. Management of this section will be closely linked with the management of the Clwyd Estuary due to shared flood risk issues.

The main economic uncertainty in this section is associated with the benefits of reducing flood and erosion risk to infrastructure assets within the Colwyn Bay frontage. However, the recommended policies provide a consistent approach along the frontage and the uncertainties associated with the economic case for a long-term hold policy will be investigated at the risk management strategy stage.

The SMP policies will be subject to review if sea level rise predictions are changed.

Little Orme to Clwyd Estuary (I1a 2)



Predicted Implications of the Policies being Adopted in this Location:

Time period from 2010	Property and population	Land use, infrastructure and material assets	Amenity and recreational use	Historic environment	Landscape character and visual amenity	Earth heritage soils, and geology	Water	Biodiversity, flora and fauna
0-20 years	<ul style="list-style-type: none"> + Risk to property and population will continue to be managed. 	<ul style="list-style-type: none"> + No loss of infrastructure or material assets. ● Potential impacts on cable crossings from Rhyl Flats Wind Farm at Kinmel Bay – Impact Uncertain + Manages risk to agricultural land. 	<ul style="list-style-type: none"> + Manages risk to community facilities. + The beach will be maintained as a defence and amenity. 	<ul style="list-style-type: none"> ● No known impacts on the historic environment. 	<ul style="list-style-type: none"> ● No designated landscapes within this area. 	<ul style="list-style-type: none"> + The geological features will be maintained by allowing natural processes to continue. 	<ul style="list-style-type: none"> ● No known impacts on chemical and biological water quality. - Holding the line may contribute to coastal squeeze, potentially adversely impacting ecological potential by changes to water depth and beach water table. 	<ul style="list-style-type: none"> - Hard defences will continue to prevent natural processes, which may limit supply of shingle to some locations which is important for the maintenance of vegetated shingle (BAP habitat). + No expected impacts on potential Special Protection Area seaward of low water.
20-50 years	As above	As above	<ul style="list-style-type: none"> + Beach foreshore levels will narrow and steepen with coastal squeeze as sea levels rise. However, additional defences to retain sediment or beach recharge campaigns may help stabilise the beach and maintain beach amenity value. 	As above	As above	As above	As above	As above. Also, <ul style="list-style-type: none"> ● Potential for displacement of qualifying waterbirds within Liverpool Bay pSPA as a result of coastal squeeze losses of non-designated intertidal habitat or sandbanks at Llandudno. However, based on the extent of supporting sandbank habitat for waterbirds, their exposure to a small loss of habitat is considered to be low and represents only a tiny proportion of the overall pSPA.
50-100 years	As above.	As above	As above	As above	As above	As above	As above	As above

Impact colour key	+ Positive	● Neutral	- Negative
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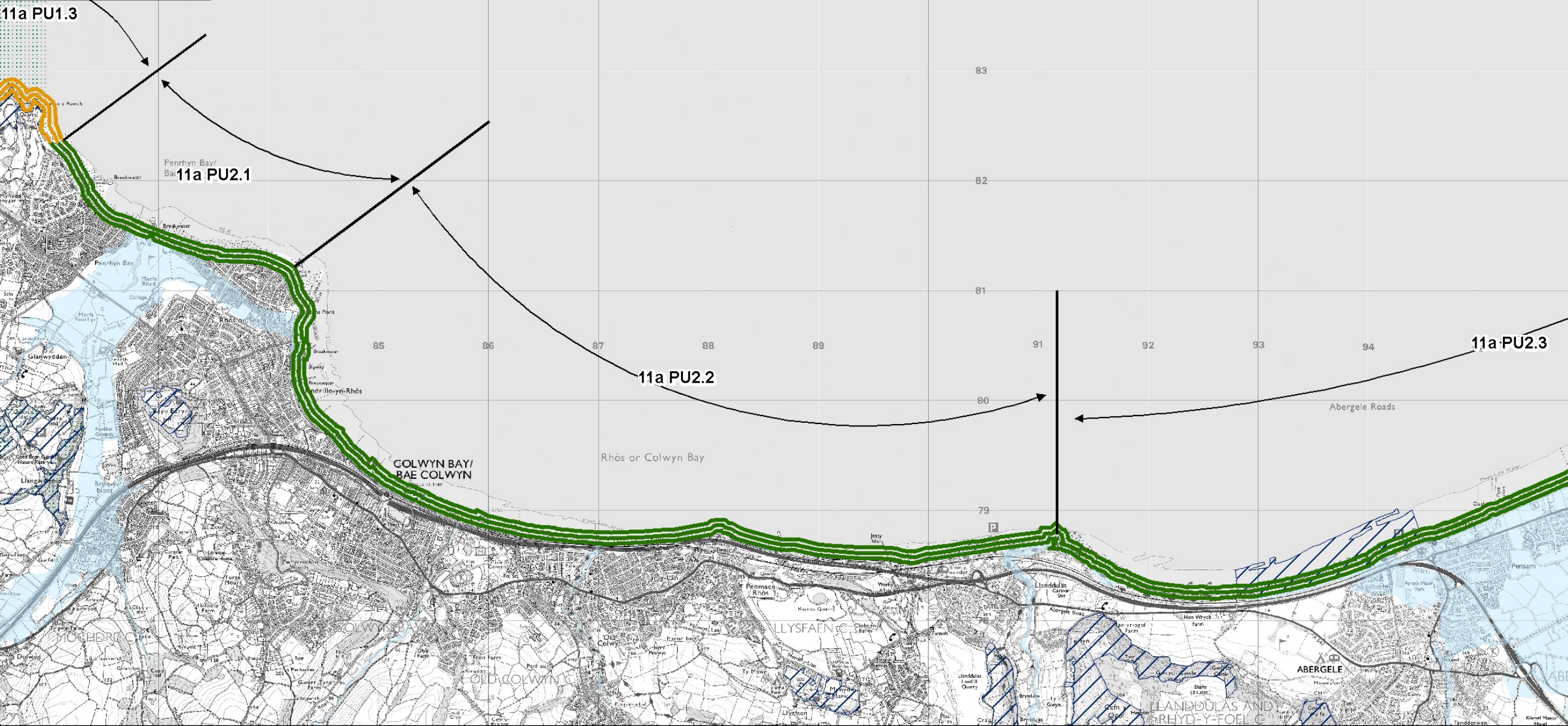


ACTION PLAN						
Action	Action Ref	Action Description (to be approved)	Potential source of funding (subject to approval)	Lead authority and key partners	To start by (subject to funding)	Outcome
1. Studies for policy area	1.1	Develop a strategic approach to beach management and beach recharge for the whole north Wales frontage from Little Orme through to the Dee estuary. Strategy development should include a sediment transport study to assess monitoring data, review potential sediment sources, use numerical modelling and environmental for assessment of options and appraisal of costs and benefits.	WAG / CCBC	EA, CCBC, DCC, CCW	2015	Consistent beach management strategy that addresses coastal process linkages and provides flood risk reduction for the whole coast.
	1.2	Examine ways to integrate defence schemes across the whole (I Ia 2) policy area, so as to improve the coastal landscapes.	WAG / CCBC	CCBC, CCW	2015	Landscape objectives defined for future scheme appraisals.
	1.3	Undertake a qualitative risk assessment to identify particularly vulnerable communities along the frontage.	WAG	EA	2011	Raise awareness of coastal risk.
2. Studies for Policy Units:	2.1	Assess possible landscape enhancements to the coastal defences in this unit in the future.	WAG / CCBC	CCBC, CCW	2015	Landscape objectives defined for future scheme appraisals.
PU2.1	2.2	In conjunction with item 1.1, assess options for modifying the beach control structures to manage potential losses to beaches and intertidal areas.	WAG / CCBC	CCBC	2015	PU specific requirements provided to beach management strategy.
PU2.2	2.3	Undertake more detailed economic appraisal for Colwyn Bay to confirm the approach and economic justification of the SMP policy to hold the line.	WAG / CCBC	CCBC	2011	PAR approval for scheme funding.
PU2.2 & PU2.3	2.4	In conjunction with item 1.1, assess beach recharge requirements necessary to maintain the condition of the Traeth Pensarn SSSI in the long term.	WAG / CCBC	CCBC, CCW	2015	PU specific objectives provided to beach management strategy.
PU2.3	2.5	Undertake studies, including completion of ongoing EAW Clwyd strategy study, and develop the approach to delivering the shoreline management policies to manage flood risks to the flood cell between Abergele and the Clwyd estuary, in order to have a co-ordinated strategy taking into account risks from the open coast, estuary and land drainage. This should include investigating opportunities for a second line of defences in the medium term for improved flood protection from breaches of the primary defence system. Short term MR opportunities and possible habitat creation as part of HTL policy should be considered for BAP targets. The strategy should allow for inclusion of investigation of non-structural ways to manage the tidal flood risk, e.g. awareness, resistance and resilience, emergency response, warnings, development of local flood risk management plan.	WAG / CCBC	EA, CCBC, CCW	2015	Strategy agreed by WAG, including programme of works and studies.
3. Strategy	3.1	Adopt a strategic approach developed through above studies to manage coastal risks across the whole flood cell, taking into account linkages between open coast and Clwyd estuary. Implement beach recharge strategies to maintain beach as a defence and an amenity feature.	WAG / CCBC	EA, CCBC	2015	Strategy adopted by RFDC and CCBC and works programmed and prioritised on MTP.
4. Scheme Work	4.1	To be defined by strategic approach developed in above actions.	WAG	CCBC, EA	ongoing	Actions identified on Long Term Plan.
5. Monitoring (Data Collection)	5.1	Undertake beach and defence asset monitoring in conjunction with Cell 11 Regional Monitoring Strategy to inform strategy and future SMP reviews	WAG / CCBC	CCBC	ongoing	Data available through CERMS provides improved evidence base for future decision making.
	5.2	Environmental monitoring of designated sites to provide baseline data for future Habitat Regulations Assessments	CCW	CCW	ongoing	
	5.3	Undertake detailed monitoring of shingle movements to inform beach management strategy.	WAG / CCBC	CCBC	ongoing	
6. Asset Management	6.1	Maintenance of defences and beach and dune management including management of public access	CCBC, LO	CCBC, EA	ongoing	Maintenance undertaken to required standards.
7. Communication	7.1	Undertake consultation with key stakeholders and general public during strategy development	WAG / CCBC	CCBC, EA	ongoing	Stakeholder agreement to strategy

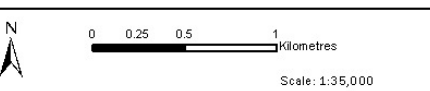
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	7.2	Monitoring and management of Action Plans to ensure SMP policies are put into practice	n/a	NWNWCG	ongoing	NWNWCG reports on progress.
8. Interface with Planning and Land Management	8.1	Advise local Planning Authority about SMP policies and flood and erosion risks so they can be accounted for in the next revisions of land use plans in order to help manage residual risks from flooding and erosion, in accordance with WAG's "New Approaches" policy.	n/a	CCBC	ongoing	Reduction of flood risk in line with WAG "New Approaches" policy.
	8.2	Advise local Planning Authority about SMP policies and flood and erosion risks so they can take due account in planning decisions and aim to reduce the need to manage flood risk in future.	n/a	EA , CCBC	ongoing	Reduction of flood risk in line with WAG "New Approaches" policy.
9. Emergency Response	9.1	Development, monitoring and review of emergency response plans to prepare for over design standard events.	n/a	CCBC, EA	ongoing	Coastal flood risks considered in emergency plans.
10. Adaptation/Resilience	10.1	Monitor proposals for tidal power embayments and barrages and build into next review of SMP	n/a	NWNWCG	2015	Integrated approach to tidal power and coastal risk management in SMP3.
	10.2	Build in incremental adaptation to beach and defence management for policy area to manage risks from rising sea level in medium and long term in parallel with reduction of risks through development control and planning guidance to build in resilience.	WAG / CCBC	CCBC , EA	ongoing	Long term risk reduction through implementation of WAG "New Approaches"
11. Flood Forecasting and Warning	11.1	Improve flood risk maps and inundation modelling and provide improve flood warning service	EA / WAG	EA	ongoing	Reduction of flood risk in line with WAG "New Approaches" policy.
12. Habitat Creation and Environmental Mitigation	12.1	The beach management strategy for the whole frontage, see item 1.1, needs to take into account environmental objectives in relation to management of vegetated shingle.	WAG / CCBC	EA , CCBC	ongoing	Specific requirements provided to beach management strategy.
<p>NB Activities from SMP will be carried forward into medium term plans and carried out on a priority basis, subject to funding and approval. n/a = activity is part of authorities general duties, not funded through flood and erosion risk management routes.</p> <p>CCBC = Conwy County Borough Council; CCW = Countryside Council for Wales; DCC = Denbighshire County Council; EA = Environment Agency; LO = Land Owners; NWNWCG = North West and North Wales Coastal Group; RHCP = Regional Habitat Creation Programme; WAG = Welsh Assembly Government.</p>						

North West England and North Wales Shoreline Management Plan 2

Sub-Cell 11a: Area: 2 Map: 1



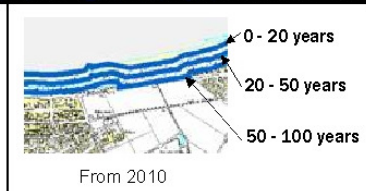
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- Legend**
- National Nature Conservation Designations
 - International Nature Conservation Designations
 - Scheduled Monuments

- Coastal flood risk area under extreme events, Environment Agency Flood Map, 2008
- Policy Unit Boundary
- Policy Unit Extent

- Shoreline Management Policies**
- Hold the Line (HTL)
 - Managed Realignment (MR)
 - No Active Intervention (NAI)



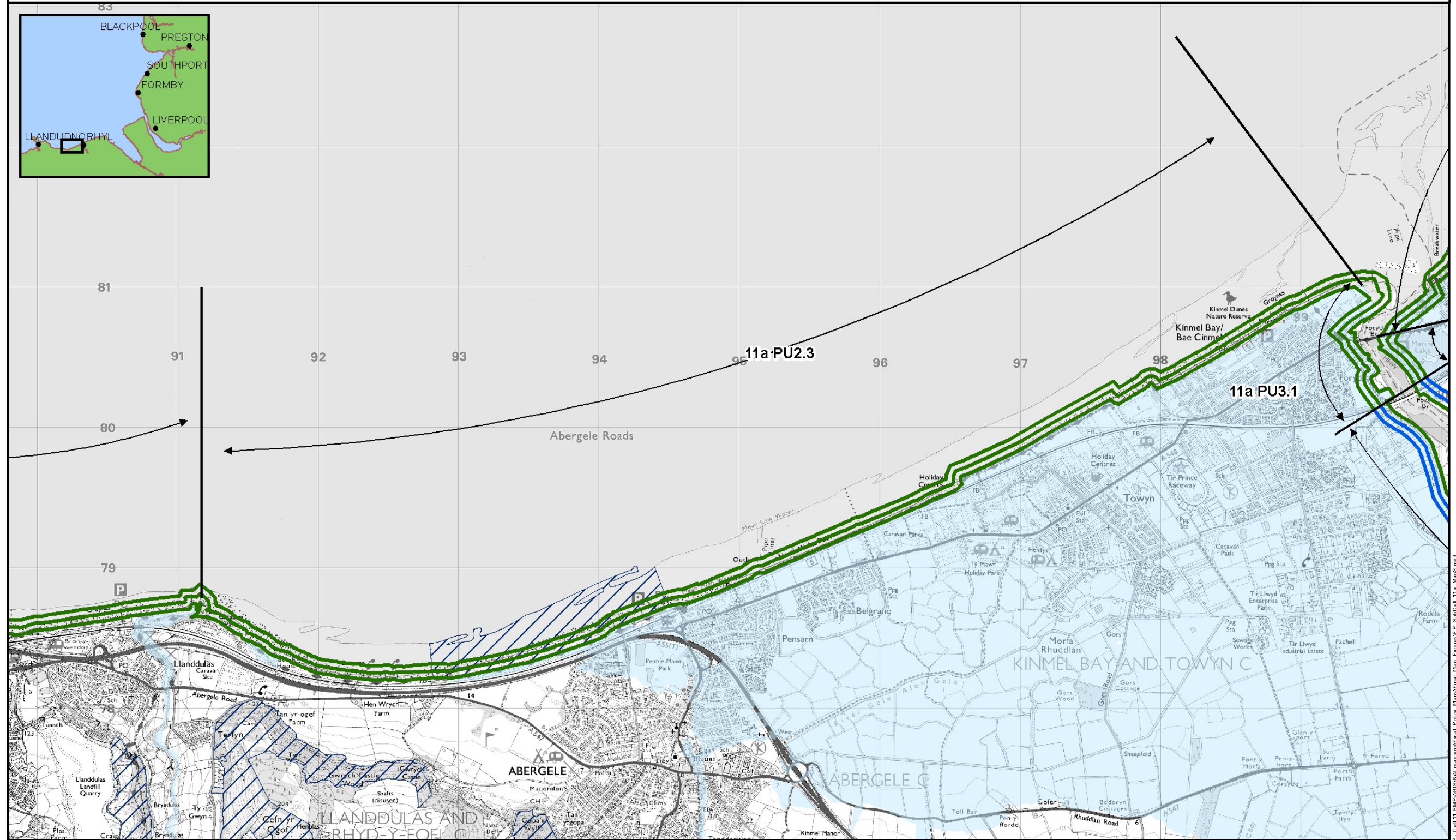
Note that the policy lines on the map show the preferred shoreline management policy for each period and do not represent either the shoreline or defence location



Boxes showing cumulative erosion estimates represent the expected minimum and maximum erosion distance from the shoreline position in 2010. They are only shown where there is a NAI policy and coastal erosion is the main risk

North West England and North Wales Shoreline Management Plan 2

Sub-Cell 11a: Area: 2 Map: 2



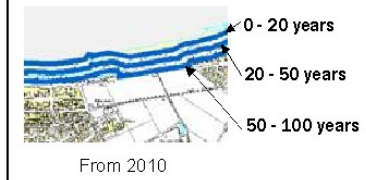
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