Detailed Scoping Document
May 2025

Project Overview

The RSPB and North Kent Marshes Internal Drainage Board are launching a focused study to establish the foundational data required for informed, adaptive water management on the Hoo Peninsula. This study will provide the critical evidence base needed to ensure that agriculture, flood risk management, and conservation efforts can respond effectively to increasing climate pressures.

Currently, the lack of integrated hydrological data leaves the North Kent Marshes vulnerable to water scarcity, inefficient drainage, infrastructure failures, and missed opportunities for water storage. By compiling and analysing existing data alongside targeted monitoring, this study will create a robust baseline to support future resilience planning and investment in water management solutions.

This study will:

- Support integrated decision-making across agriculture, flood risk, and conservation by assessing water availability needs.
- Establish a robust evidence base for future modelling and / or options appraisal, infrastructure resilience planning, and water management strategies.
- Review and consolidate existing datasets, including Water Level Management Plans (WLMPs), LiDAR, flow monitoring records, and abstraction data.
- Assess water inputs, retention, and losses to define key hydrological units and ensure a clear understanding of water balance dynamics.
- Monitor discharges from key outfalls to quantify flow patterns, validate water balance estimates, and support future options appraisal.
- Identify and address data gaps to ensure that any options appraisal and testing of options is built on a validated, high-quality dataset.
- Evaluate suitable evidence-based option appraisal approaches including modelling (hydrological/hydraulic/terrain) for future phases to support adaptive, data-driven decision-making.

This study is part of a broader vision for long-term water resource planning, it will deliver clear, actionable insights in its own right. The findings will provide immediate value to land managers, policymakers, and stakeholders, equipping them with the knowledge needed to enhance resilience to climate change, land use pressures, and evolving regulatory requirements.

To ensure that any further study is appropriately targeted, this Phase 1 study will incorporate early, focused stakeholder engagement. This will allow landowner and partner insights to shape the identification of opportunity areas for water retention or redistribution which support both environmental and agricultural outcomes.

Rationale

The lowland areas of the North Kent Marshes encompass a complex network of designated sites, agricultural land, and managed water systems that are highly dependent on sustainable water availability. The region supports arable farming and grazing marsh, the latter supporting nationally important breeding wader populations, making integrated water management critical to balancing ecological, agricultural, and flood risk priorities.

However, this balance is under increasing pressure due to:

- Severe water stress in Kent, where demand for water already exceeds supply in many catchments.
- Climate change impacts – UK Climate Projections 2018 (UKCP18) predict decreasing summer rainfall of up to 50%, intensifying pressure on water availability for both agriculture and wetland habitats. At the same time, winter rainfall may increase by up to 30%, creating new challenges for drainage and flood risk, but also potential opportunities for water retention and storage.
- Limited existing data on water balance dynamics. There is currently no comprehensive, up-to-date understanding of water inputs, retention, and losses across the marshes, making it difficult to develop effective long-term water management strategies.
- A need to future-proof infrastructure and land management. The ability to maintain productive agriculture, support biodiversity, and manage flood risk depends on evidence-based decision-making about water availability, seasonal variability, and adaptive storage solutions.

To respond to these challenges, this study will generate the foundational evidence needed to inform water resource management across the North Kent Marshes. It will support:

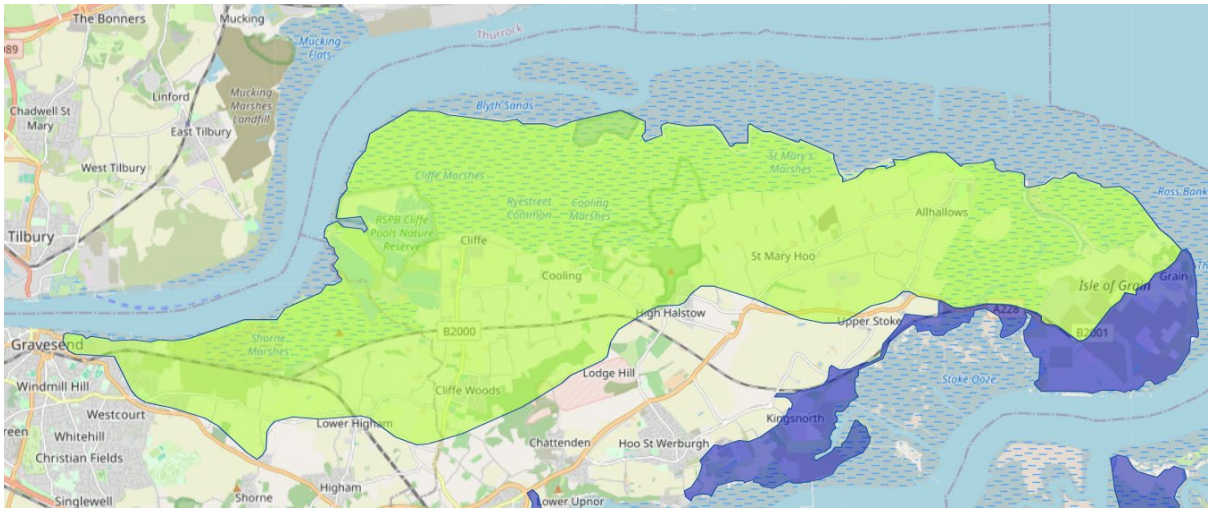
- Risk Management Authority and stakeholder decisions by providing the evidence needed to secure funding for infrastructure improvements and resilience projects.
- Regulatory decision-making by informing flood risk management strategies, water resource policies, and long-term adaptation planning.
- Local and regional water resource planning by ensuring that landowners, conservation groups, and policymakers have reliable hydrological data to guide future management strategies.

While this is a standalone work package, it is a critical first step in enabling long-term water resource planning. The data and findings will help:

- Consider further options appraisal approaches, including modelling (hydrological/hydraulic/terrain) as appropriate to simulate water balance dynamics, supporting scenario testing and future decision-making.
- Identify the most effective interventions for sustainable water management, including storage solutions, water level and water transfer adjustments and provide the evidence base to support consent for interventions on designated sites.
- Create a spatial water management plan that optimises water availability for both environmental and agricultural needs.

The focus is the Hoo Peninsula within the Medway catchment, covering Shorne, Cliffe, Ryestreet Common, Cooling, St Mary's Marsh, and Allhallows.

Figure 1 Area 1, Hoo Peninsula between Shorne marshes and Allhallows



ada.org.uk/idb-map/

Background

Water Level Management Plans (WLMPs) were originally introduced by MAFF to help operating authorities manage water levels on designated sites such as SSSIs, balancing conservation, agriculture, and land use needs.

Two WLMPs have been developed for the North Kent Marshes:

- **South Thames Estuary and Marshes SSSI WLMP (EA, 1998)** – Focused on balancing land use and water level needs, with objectives around stakeholder engagement, drainage management, and monitoring.
- **North Kent Marshes IDB WLMP (JBA, 2023)** – Offers an updated hydrological baseline, particularly around SSSI sites and wet grassland management, including mapping of drainage infrastructure and past stakeholder input.

These plans offer a useful foundation but are limited in scope. They focus largely on designated sites, without addressing wider catchment hydrology, abstraction pressures, or the needs of non-designated agricultural land. They also pre-date and underrepresent climate change adaptation strategies.

This baseline study aims to address those gaps by:

- Taking a catchment-scale approach that includes both designated and non-designated areas.
- Compiling and analysing existing and new hydrological data to support informed, climate-resilient decision-making.
- Identifying constraints and opportunities for collaborative water management across different land uses.
- Evaluating whether future hydrological/hydraulic/terrain modelling is appropriate and feasible.

Stakeholder Engagement

Stakeholder engagement will play a critical role in this phase, both in identifying key water management challenges and in shaping priorities for future phases. This study will include targeted engagement with key stakeholders, particularly farmers, landowners, and conservation organisations across the Hoo Peninsula. The aim is to identify early opportunity areas for water retention or redistribution and to guide the focus of future data collection, modelling, and funding bids.

To support this, the study will support one stakeholder event, bringing together representatives from the farming community, conservation groups, flood risk authorities, and regulators. This event will provide a platform to test emerging themes, validate desk-based findings, and ensure the project reflects a balance of agricultural and environmental interests from the outset.

For this phase the consultant will:

- Identify key stakeholder groups relevant to water management, including landowners, conservation bodies, flood risk authorities, and regulators.
- Assess existing stakeholder priorities using available data, policy documents, and past consultations (e.g., identifying broad areas where agricultural, flood risk, and conservation interests may align or diverge).
- Map areas of vulnerability where water availability may be at risk due to abstraction reductions.
- Identify priority areas for future engagement in subsequent phases.
- Determine key knowledge gaps that will require direct engagement in later phases.

The IDB and RSPB are maintaining ongoing engagement with farming clusters as part of their wider work, helping to ensure that all consultation aligns with local landowner concerns and is embedded in existing relationships.

Biodiversity

The North Kent Marshes support nationally and internationally designated habitats, including grazing marsh, salt marsh, mudflats, and shingle, which are characteristic of the estuarine landscape. Key designated sites include:

- South Thames Estuary and Marshes SSSI.
- Medway Estuary and Marshes SSSI.

These wetlands provide critical habitat for breeding waders and other biodiversity, emphasising the need for hydrological assessments that account for ecological water requirements and habitat sustainability.

To establish a robust ecological and hydrological baseline for future water management and biodiversity planning, this study will:

- Map the extent and condition of designated SSSI areas using available datasets, including Natural England condition assessments. Consultants are expected to use existing datasets (e.g. Magic Maps, Natural England SSSI condition layers) to identify and overlay designated sites when assessing opportunity areas. There is no requirement to digitise or remap designated boundaries.
- Identify hydrological dependencies of key habitats, defining how water level requirements support biodiversity and ecosystem resilience.
- Collate existing ecological and habitat trend data, ensuring a strong evidence base for biodiversity-integrated water management strategies.
- Identify opportunities where improved water management could benefit both land productivity and habitat resilience, including potential funding routes.
- Determine where ELMS-supported measures (e.g., water retention, habitat enhancement, or drainage improvements) could align with landowner priorities.
- Assess where BNG enhancements outside SSSI sites could provide hydrological and landscape-scale benefits while maintaining productive land use where applicable.

Coastal and infrastructure resilience

The North Kent Marshes are directly influenced by tidal interactions from the Thames and Medway Estuaries, with water level management heavily dependent on drainage outfalls and coastal defences. Understanding the future viability of outfalls and the implications of shoreline management policies is essential for long-term water level resilience planning.

Projections from UK Climate Projections 2018 (UKCP18) suggest that by 2060, sea levels in the London area may rise by 0.3m – 0.4m, with projections for 2100 ranging from 0.29m to 1.15m. These changes will:

- Affect the remaining lifespan of existing outfalls, increasing the risk of reduced drainage efficiency.
- Create additional constraints on tidal flood defences, influencing future adaptation strategies.
- Require alignment with the Thames Estuary 2100 Plan and Medway Estuary and Swale Strategy (MEASS) policy approaches.

While coastal management considerations will become more critical in later phases, this baseline study ensures that all necessary data is collected now, allowing for robust, informed decision-making in future study and spatial planning.

As part of this study, the consultant will:

- Assess outfall & flood defence longevity: Reference Thames Estuary 2100, MEASS policy, and the EA's North Kent Coast Model to estimate the remaining operational life of key outfalls and defences.
- Identify future constraints: Establish how expected sea level rise and overtopping risk will impact future water level management strategies.
- Engage with the Environment Agency: Determine the timing of future flood defence raising strategies and understand potential policy and investment implications for the marshes.

Water resources and regulation

The North Kent Marshes are classified as Seriously Water Stressed (Environment Agency, 2021), highlighting significant pressures on water availability. Water resource management in this area is guided by several key frameworks:

- North Kent & Swale and Medway Abstraction Licensing Strategies (EA, 2013): Defining water availability, abstraction constraints, and regulatory limits.
- Kent Spatial Risk Assessment for Water (KCC, 2021): Evaluating the impacts of climate change, land use change, and population growth on regional water systems.
- Water Resources Southeast (WRSE) Regional Plan: Providing a strategic framework for long-term water management, including future abstraction, supply-demand balance, and resilience planning.
- Southern Water & Southeast Water's Water Resource Management Plans (WRMPs) & Water Industry National Environment Programme (WINEP): Setting out current and future water supply priorities, infrastructure investments, and regulatory commitments that could impact water resource availability.
- Ongoing Abstraction Reform: The Environment Agency is implementing changes to abstraction licensing to improve water resource sustainability. These reforms may influence water availability, regulatory constraints, and adaptive management strategies in the North Kent Marshes.

These regulatory frameworks provide essential baseline data for assessing water inputs, abstraction pressures, and long-term water availability, helping to inform hydrological modelling and future resource management strategies.

The North Kent Marshes IDB is actively collaborating with WRSE to ensure that local water resource challenges are integrated into regional planning efforts.

This study will establish baseline hydrological data that may support future Local Resource Option (LRO) screening, helping to:

- Identify areas where water retention, redistribution, or alternative storage solutions could be viable.
- Position the North Kent Marshes for potential LRO assessments or funding opportunities.
- Ensure that local water management needs are considered in broader Southeast resilience planning.

Water quality and freshwater availability

Water quality is a critical factor in sustainable water resource management, influencing agriculture, conservation, and flood risk management. The study area falls within the Thames River Basin District (RBD) and is subject to the Water Environment (Water Framework Directive) (England & Wales) Regulations 2017, which establishes an integrated approach to protecting and managing water resources.

Key regulatory and catchment pressures:

- River Basin Management Plans (RBMPs) set legally binding objectives for ecological, chemical, and quantitative water status, applying to all public bodies.
- The area is designated as a Nitrate Vulnerable Zone (NVZ) for both surface and groundwater, largely due to agricultural runoff, which impacts water quality, catchment management, and future water retention strategies.
- Water abstraction, pollution mitigation, and climate resilience are key priorities under the RBMP, directly influencing water level management and long-term freshwater availability.

Water quality will directly affect future water resource planning and water level management strategies in the North Kent Marshes. Establishing a strong baseline will:

- Determine current water quality conditions, ensuring future resource planning is based on accurate, up-to-date data.
- Improve understanding of fresh and saline water interactions, particularly in relation to freshwater availability, salinity intrusion, and conductivity shifts.
- Provide a reference point for assessing long-term changes due to climate variability, abstraction pressures, and land-use changes.

To complement and strengthen this effort, the study will:

- Collate available datasets from EA, and other relevant sources to establish a comprehensive water quality baseline.
- Integrate salinity monitoring into discharge monitoring at key outfalls to capture seasonal variations & identify areas at risk of saline intrusion.
- Identify data gaps that may require additional monitoring in later phases.

Methodology and approach

This study will provide a structured, evidence-based assessment of water management across the North Kent Marshes. The consultant will combine desk-based analysis, targeted field surveys, hydrological and water quality monitoring, and early stakeholder engagement to create a robust baseline. This baseline will inform future spatial planning, modelling, and options appraisal. Activities will focus on identifying hydrological units, assessing infrastructure and flow dynamics, evaluating risks and opportunities, and capturing both environmental and agricultural perspectives to guide future investment and management strategies.

The level of detail provided in each workstream should be proportionate to Phase 1 objectives. Where assumptions or limitations are made, these should be clearly stated to support Phase 2 planning

Objective: Establish a detailed understanding of how water moves across the study area, including hydrological units, control assets, and flow patterns.

Hydrological units and water levels

- Identify known hydrological units and validate nominal water levels to metres above Ordnance Datum Newlyn (ODN).
- Cross-reference historic Water Level Management Plans (WLMPs) with LiDAR data & targeted field surveys to refine accuracy.
- Field surveys should only focus on validating gaps and assumptions rather than a full remapping.

Water control assets and outfalls

- Identify significant water control assets and key outfalls via desk study and ground-truthing.
- There is no requirement for a full condition survey but a focus on how assets influence water levels rather than detailed structural reporting.
- Assess the role of third-party assets in maintaining water levels, focusing on:
- At what level they hold water relative to ODN.
- How they influence drainage and retention dynamics.
- Potential constraints on water movement under different seasonal conditions.
- Determine the extent to which structures act as barriers to flow, retain water, or allow free discharge under different conditions.
- Engage with the EA and asset owners (where necessary) to clarify operational considerations that may impact water level management strategies in future phases.

Discharge monitoring

- Install monitoring equipment at key outfalls to assess seasonal flow variations over at least one hydrological year. The IDB intends to procure discharge monitoring equipment directly to support long-term data collection at key outfalls. However, the consultant will be expected to provide technical advice on suitable specifications, sensor types, and placement to ensure the data meets project needs. Consultants should also interpret flow data as it becomes available during Phase 1, summarising seasonal trends and identifying key implications for water balance and future options appraisal. Time should be allowed in the programme for both advisory and analytical roles.
- Monitoring should be undertaken at the outfalls listed below. Photos are included at Appendix 1 of this document. Note that the outfalls are under the ownership of the EA.

	NGR	W3W	Lat Long
Cliffe Inundation Sluice	TQ 75546 79150	occupiers.stunt.plays	51°29'03"N , 000°31'37"E
Curtis and Harvey	TQ 71435 78461	twigs.luxury.healers	51°28'45"N , 000°28'03"E
St Marys	TQ 78795 79267	bead.payback.fraction	51°29'03"N , 000°34'25"E
Allhallows	TQ 85565 78183	mirror.files.boxing	51°28'20"N , 000°40'14"E
Hoo	TQ 79240 71695	herbs.moves.cones	51°24'57"N , 000°34'34"E
Denton	TQ 67484 74353	paths.exile.acting	51°26'36"N , 000°24'31"E

- Ensure data aligns with any future modelling requirements where there is an identified need to test options.

Objective: Define the key hydrological inputs, outputs, and retention capacity to inform future adaptive water management strategies.

Assess water inputs and outputs

- Quantify abstraction, retention, and flow dynamics across the study area using available information.
- Conduct a high-level review of surface water, groundwater, and artificial inflows (e.g., drainage & pumped discharges).

Hydrological unit water balances

- Identify the optimum surface water conditions & water levels (to metres ODN) for agricultural & ecological needs.
- Establish soil-moisture deficit/evapotranspiration estimates using available climate and hydrological data.

Objective: Evaluate the long-term resilience of water management systems under climate change and sea level rise scenarios.

Tidal and sea level change risks

- Assess EA's North Kent Coast Model, Thames Estuary 2100, and MEASS to determine flood risk & drainage infrastructure viability.
- Survey invert levels of key outfalls (if not already recorded) to estimate their remaining useful lifespan in the context of estimated sea level rise.

Projected hydrological and habitat changes

- Establish how changing rainfall patterns (UKCP18 projections) will impact freshwater retention & seasonal drying.
- Identify most vulnerable areas, considering shifts in tidal range, designated site boundaries, & floodplain connectivity.

Objective: Assess competition for water resources & constraints on abstraction to guide future water management strategies.

Abstraction licensing and regulation

- Assess existing EA abstraction licenses, including volumes, sources & constraints.

- Determine whether any existing discharges or outfalls could be repurposed as alternative water sources.

Water Framework Directive & pollution considerations

- Analyse relevant Water Framework Directive (WFD) pressures & status assessments to understand water quality constraints.
- Identify potential Southern Water & Southeast Water abstraction changes affecting the hydrological balance.

Objective: Establish a clear understanding of water quality conditions, salinity trends, and pollution risks.

Baseline water quality assessment

- Collate available datasets from EA to create a comprehensive water quality baseline.
- Identify spatial trends & areas of concern (e.g., high nutrient loads, contamination risks).

Salinity and conductivity testing

- Integrate salinity monitoring into discharge monitoring at key outfalls to assess seasonal trends & saline intrusion risks.
- Identify gaps in existing water quality data that may require additional monitoring in later phases.

Objective: Identify land use pressures, flood risk changes, and long-term constraints affecting water management strategies.

Future land use pressures

- Assess potential land use changes linked to flood risk, Local Plan developments, and strategic water planning policies.
- Review EA Thames Estuary 2100, MEASS & Local Plans for insights into long-term land use expectations.

Stakeholder engagement and future considerations

- Define where potential collaborative water management opportunities exist, particularly between agriculture & conservation.
- Engage with key stakeholder groups including landowners, tenant farmers, conservation organisations, and abstraction licence holders to

identify areas where water is or could be held back. Capture views on long-term needs, pressures, and possible interventions. Align insights with technical findings to identify high-potential opportunity zones for future options appraisal and investment.

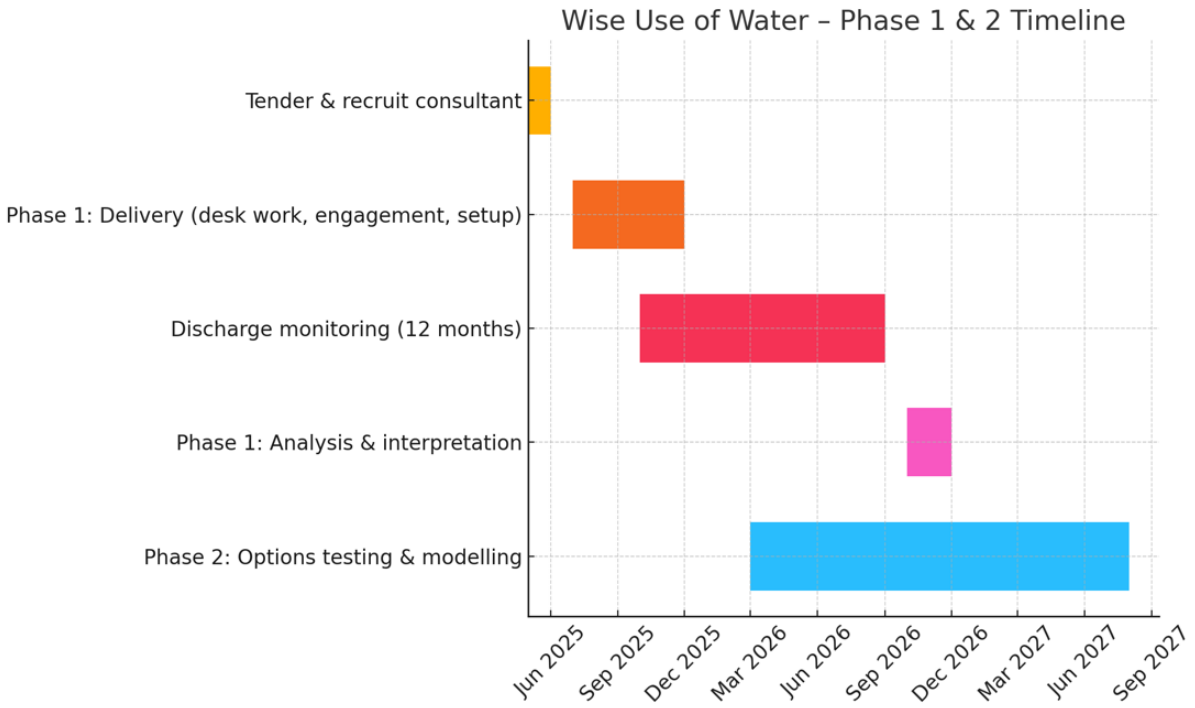
- Given the overlap with ongoing abstraction reform and the potential for Local Resource Options (LROs), engagement should explore both environmental and agricultural motivations for improved water management.

***Objective: Identify potential funding streams & incentive mechanisms** for **long-term water resource management**.*

Explore blended funding options

- Assess funding opportunities through Environmental Land Management Schemes (ELMS), Biodiversity Net Gain (BNG), and carbon offsetting programs.
- Map designated sites & agri-environment agreements to identify potential funding eligibility.

Timeframe for delivery



The Wise Use of Water study is being delivered in distinct phases to ensure robust evidence gathering, stakeholder alignment, and cost-effective investment. Phase 1 will focus on establishing a clear baseline of hydrological, ecological, and stakeholder information, including a full hydrological year of discharge monitoring. Analysis and interpretation of this monitoring data will conclude in late 2026.

Phase 2 will build on these findings, progressing to options testing and adaptive planning. The inclusion of hydrological, hydraulic, or terrain modelling in Phase 2 will depend on the outcomes of Phase 1 and whether such tools are necessary to support credible options appraisal or scenario testing. The consultant delivering Phase 1 will be expected to advise on the suitability and scope of modelling based on the evidence base developed during the project.

Project Management requirements

As part of their appointment, the consultant will be expected to define and maintain a clear framework for project delivery. This should include:

- A project documentation and reporting plan, including progress updates at agreed intervals, a final summary report, and a short post-delivery review to support lessons learned and continuity into later phases.

- A detailed budget breakdown that categorises anticipated costs (e.g. materials, consultation, monitoring equipment, and contingencies) to support transparency and enable effective financial oversight.

- Clear technical specifications for all methodologies proposed or used, including any software, modelling tools, or analytical techniques relevant to hydrological assessment and spatial analysis.

- A timeline outlining the programme of work, including key milestones, decision points, and dependencies across the project's phases.

Existing information and references

Title	Owner
Water Resources	
Medway Catchment Abstraction Management/Licensing Strategy	EA
North Kent and Swale Catchment Abstraction Management/Licensing Strategy	EA
Southern Water, Water Resources Management Plan	Southern Water
South East Water, Water Resources Management Plan	South East Water
Kent Spatial Risk Assessment for Water	Kent County Council
Water Resources South East Regional Plan	Water Resources South East
River Basin Management Plan	EA
Coastal Streams to Lower Thames Nitrate Vulnerable Zone	EA
Kent Groundwater Situation	EA
Water Stressed Areas	EA
Shoreline Management	
Thames Estuary 2100 (TE2100)	GOV.UK
Medway Estuary and Swale Strategy (MEASS)	EA
Land Use	
Guidance - Flood Risk Assessments: Climate Change Allowances	GOV.UK
Hoo Development Framework	Medway Council
Medway Local Plan 2023	Medway Council
Swale Local Plan: Bearing Fruits	Swale Borough Council
Flood Risk	
Flood Risk Management Plan	
Medway Strategic Flood Risk Assessment	Medway Council
Swale Strategic Flood Risk Assessment	Swale Borough Council
KCC Local Flood Risk Management Strategy	Kent County Council
Medway Local Flood Risk Management Strategy	Medway Council
Surface Water Management Plan for Hoo and Rainham	Medway Council
Surface Water Management Plan for Swale	Kent County Council
Water Level Management Plans	
North Kent Marshes Water Level Management Plan (WLMP) February 2023, Jeremy Benn Associates	NKIDB
South Thames Estuary and Marshes SSSI Water Level Management Plan FINAL September 1998	NKIDB
North Kent Marshes Breeding Wader Project data	NKIDB
WLMP Capel Fleet January 1996	LMIDB
WLMP Chetney and Ferry Marshes August 1997	LMIDB
WLMP Eastchurch Marshes and Windmill Creek June 1999	LMIDB
WLMP Elmley and Spitend Marshes May 1999	LMIDB
WLMP Gillingham and Rainham May 1998	LMIDB
WLMP Graveney Marshes February 1999	LMIDB
WLMP Ham Marshes January 1999	LMIDB
WLMP Hoo and Stoke March 1998	LMIDB
WLMP Iwade and Milton December 1998	LMIDB
WLMP Luddenham Marshes February 1999	LMIDB
WLMP Minster Marshes May 1999	LMIDB
WLMP Seasalter October 1998	LMIDB
WLMP Tonge and Murston January 1999	LMIDB
WLMP Upchurch and Lower Halstow March 1998	LMIDB

Environment	
Breeding Birds of Wet Meadow Survey	NKIDB / RSPB
RSPB Management Plans	RSPB
Making Space for Nature: Local Nature Recovery Strategy for Kent	Kent County Council
Biodiversity Action Plans (North Kent and Lower Medway IDB)	Lower Medway IDB

Budget

The total estimated budget for Phase 1 (Area 1) is **£94,500 – £143,500 excluding VAT.**

This includes:

- Discharge monitoring equipment and installation: £34,500 – £51,000
  (This may be procured directly by the IDB or via the appointed consultant).

- All other Phase 1 consultancy activities (e.g., stakeholder engagement, data analysis, reporting, interpretation of flow data, and support for options appraisal): £60,000 – £92,500.

Appendix 1

Cliffe Inundation Sluice

Landward inlet

Outfall (somewhere in there)!

Curtis and Harvey

Upstream inlet

Outfall

St Marys

Upstream inlet

Outfall

Allhallows

Landward inlet

Hoo

Upstream inlet

Outfall

Denton

Awaiting access for closer inspection.