Framework: Mapping & Modelling Framework
Supplier: Jeremy Benn Associates Ltd
Company Number: 03246693

Geographical Area: National
Project Name: Improving WR Modelling for the Till and Tweed
Project Number: [redacted]

Contract Type: Professional Service Contract
Option: Option C

Contract Number: [redacted]

Stage: All_Work_Types

Revision	Status		Originator		Reviewer		Date
0.1	superseeded		[redacted]		[redacted]		06/10/2022
0.2	superseeded		[redacted]		[redacted]		07/10/2022
0.3	superseeded		[redacted]		[redacted]		10/10/2022
0.4	live		[redacted]		[redacted]	[redacted]	11/10/2022, 28/10/2022

PROFESSIONAL SERVICE CONTRACT under the Mapping and Modelling Framework
CONTRACT DATA

Project Name Improving WR Modelling for the Till and Tweed

Project Number [redacted]

This contract is made on 22 December 2022
between the *Client* and the *Consultant*

- This Contract is made pursuant to the Framework Agreement (the "Agreement") dated 16th day of May 2019 between the *Client* and the *Consultant* in relation to the NGSA Mapping and Modelling Support Framework. The entire Agreement and the following schedules are incorporated into this Contract by reference

- Schedules 1 to 22 inclusive

- The following documents are incorporated into this contract by reference
  PSC Scope [redacted] - Till Modelling v0.3

Part One - Data provided by the *Client*

Statements given in all Contracts

1 General

The *conditions of contract* are the core clauses and the clauses for the following main Option, the Option for resolving and avoiding disputes and secondary Options of the NEC4 Professional Service Contract June 2017.

Main Option	Option C	Option for resolving and avoiding disputes	W2

Secondary Options

X2: Changes in the law

X9: Transfer of rights

X10: Information modelling

X11: Termination by the *Client*

X18: Limitation of Liability

Y(UK)2: The Housing Grants, Construction and Regeneration Act 1996

Y(UK)3: The Contracts (Rights of Third Parties) Act 1999

Z: *Additional conditions of contract*

The *service* is — This project will deliver a desk-based study with two purposes. The first will be focused on hydrometric data and conceptualisation in order to provide a description of hydrological and hydrogeological processes within the catchment and, identify opportunities and constraints to achieving and maintaining a robust hydrometric monitoring programme. The second will be focused on developing inputs for our CAMS process by producing accurate mapping profiles of the catchment and developing appropriate records of artificially influenced flows on cross-border river reaches.

The *Client* is — *Environment Agency*

Address for communications — *Tyneside House*
Skinnerburn Road
Newcastle Business Park
Newcastle Upon Tyne
NE47AR

Address for electronic communications — [redacted]

The *Service Manager* is — [redacted]

Address for communications — [redacted]

Address for electronic communications — [redacted]

The Scope is in
PSC Scope - [redacted] - Till Modelling v0.3

The *language of the contract* is English

The *law of the contract* is
the law of England and Wales, subject to the jurisdiction of the courts of England and Wales

The period for reply is 2 weeks

The *period for retention* is
6 years following Completion or earlier termination

The following matters will be included in the Early Warning Register
1

2

3

4

Early warning meetings are to be held at intervals no longer than 2 weeks

2 The *Consultant's* main responsibilities

The *key dates* and *conditions* to be met are *conditions* to be met	*key date*
'none set'	'none set'
'none set'	'none set'
'none set'	'none set'

The *Consultant* prepares forecasts of the total Defined Cost plus Fee and *expenses* at intervals no longer than 4 weeks

3 Time

The *starting date* is 16 December 2022

The *Client* provides access to the following persons, places and things access	*access* date

The *Consultant* submits revised programmes at intervals no longer than 4 weeks

The *completion date* for the whole of the *service* is 31 March 2023

The period after the Contract Date within which the *Consultant* is to submit a first programme for acceptance is 4 weeks

4 Quality management

The period after the Contract Date within which the *Consultant* is to submit a quality policy statement and quality plan is 4 weeks

The period between Completion of the whole of the *service* and the *defects date* is 26 weeks

5 Payment

The *currency of the contract* is the £ sterling

The *assessment interval* is Monthly

The *expenses* stated by the *Client* are as stated in Schedule 9

The *interest rate* is 2.00% per annum (not less than 2) above the Base rate of the Bank of England

The locations for which the *Consultant* provides a charge for the cost of support people and office overhead are All UK Offices

The *Consultant's share percentages* and the *share ranges* are

share range						*Consultant's share percentage*
less than			80	%		0 %
from	80	%	to		120 %	50 %
greater than			120	%		100 %

6 Compensation events

These are additional compensation events

1. 'not used'
2. 'not used'
3. 'not used'
4. 'not used'
5. 'not used'

8 Liabilities and insurance

These are additional *Client's* liabilities

1. 'not used'
2. 'not used'
3. 'not used'

The minimum amount of cover and the periods for which the *Consultant* maintains insurance are

EVENT	MINIMUM AMOUNT OF	PERIOD FOLLOWING COMPLETION OF THE WHOLE OF THE *SERVICE* OR TERMINATION
The *Consultant's* failure to use the skill and care normally used by professionals providing services similar to the *service*	£ 5 Million in respect of each claim, without limit to the number of claims	12 Years
Loss of or damage to property and liability for bodily injury to or death of a person (not an employee of the *Consultant)* from or in connection with the *Consultant* Providing the Service	£ 5 Million in respect of each claim, without limit to the number of claims	12 Months
Death of or bodily injury to the employees of the *Consultant* arising out of and in the course of their employment in connection with the contract	Which ever is the greater of £5m or the amount required by law in respect of each claim, without limit to the number of claims	For the period required by law
The *Consultant's* total liability to the *Client* for all matters arising under or in connection with the contract, other than the excluded matters limited to	£ 5 Million	

Resolving and avoiding disputes

The *tribunal* is	Litigation in the courts
The *Adjudicator* is	'to be confirmed'
Address for communications	'to be confirmed'
Address for electronic communications	*'to be confirmed'*
The *Adjudicator nominating body* is	The Institution of Civil Engineers

Z Clauses

Z1 Disputes

Delete existing clause W2.1

Z2 Prevention

The text of clause 18 Prevention is deleted.
Delete the text of clause 60.1(12) and replaced by:
The *service* is are affected by any of the following events
• War, civil war, rebellion, revolution, insurrection, military or usurped power;
• Strikes, riots and civil commotion not confined to the employees of the *Consultant* and sub consultants,
• Ionising radiation or radioactive contamination from nuclear fuel or nuclear waste resulting from the combustion of nuclear fuel,
• Radioactive, toxic, explosive or other hazardous properties of an explosive nuclear device,
• Natural disaster,
• Fire and explosion,
• Impact by aircraft or other aerial device or thing dropped from them.

Z3 Disallowed Costs

Add the following in second bullet of 11.2 (18) add:
(including compensation events with the sub contractor, i.e. payment for work that should not have been undertaken).
Add the following additional bullets after 'and the cost of ' :
• Mistakes or delays caused by the *Consultant's* failure to follow standards in Scopes/quality plans.
• Reorganisation of the *Consultant's* project team.
• Additional costs or delays incurred due to *Consultant's* failure to comply with published and known guidance or document formats.
• Exceeding the Scope without prior instruction that leads to abortive cost
• Re-working of documents due to inadequate QA prior to submission, i.e. grammatical, factual arithmetical or design errors.
• Production or preparation of self-promotional material.
• Excessive charges for project management time on a commission for secondments or full time appointments (greater than 5% of commission value)
• Any hours exceeding 8 per day unless with prior written agreement of the *Service Manager*
• Any hours for travel beyond the location of the nearest consultant office to the project unless previously agreed with the *Service Manager*
• Attendance of additional individuals to meetings/ workshops etc who have not been previously invited by the *Service Manager*
• Costs associated with the attendance at additional meetings after programmed completion, if delay is due to *Consultant* performance.
• Costs associated with rectifications that are due to *Consultant* error or omission.
• Costs associated with the identification of opportunities to improve our processes and procedures for project delivery through the *Consultant's* involvement
• Was incurred due to a breach of safety requirements, or due additional work to comply with safety requirements
• Was incurred as a result of the *Client* issuing a Yellow or Red Card to prepare a Performance Improvement Plan
• Was incurred as a resulting of rectifying a non-compliance with the Framework Agreement and/or any call off contracts following an audit

Z4 Share on termination

Delete existing clause 93.3 and 93.4 and replace with:
92.3 In the event of termination in respect of a contract relating to services there is no *Consultant's* share'

Z6 The Schedule of Cost Components

The Schedule of Cost Components are as detailed in the Framework Schedule 9.

Z24 Requirement for Invoice

Add the following sentence to the end of clause 51.1:
The Party to which payment is due submits an invoice to the other Party for the amount to be paid within one week of the *Service Manager*'s approval of a fee note.
Delete existing clause 51.2 and replace with:
51.2 Each certified payment is made within one week after the paying Party receives an invoice from the other Party and
If a certified payment is late, interest is paid on the late payment. Interest is assessed from the date by which the late payment should have been made until the date when the late payment is made, and is included in the first assessment after the late payment is made

Secondary Options

OPTION X2: Changes in the law

The *law of the project* is the law of England and Wales, subject to the jurisdiction of the courts of England and Wales

OPTION X10: Information modelling

The period after the Contract Date within which the *Consultant* is to submit a first Information Execution Plan for acceptance is 2 weeks

OPTION X18: Limitation of Liability

The *Consultant's* liability to the *Client* for indirect or consequential loss is limited to

£1,000,000

The *Consultant's* liability to the *Client* for Defects that are not found until after the *defects date* is limited to

£5,000,000

The *end of liability date is* 6 years after the Completion of the whole of the *service*

Y(UK2): The Housing Grants, Construction and Regeneration Act 1996

The period for payment is 14 days after the date on which payment becomes due

Y(UK3): The Contracts (Rights of Third Parties Act) 1999

term	*beneficiary*
any	none

Part Two - Data provided by the *Consultant*

Completion of the data in full, according to the Options chosen, is essential to create a complete contract.

1 General

The *Consultant* is

Name: Jeremy Benn Associates Ltd

Address for communications:
1 Broughton Park Old Lane North
Broughton
Skipton
North Yorkshire
BD23 3FD

Email address: [redacted]

The subcontract *fee percentage* is: Option C [redacted]

The *key persons* are

Name (1) [redacted]
Job [redacted]
Responsibilities [redacted]
Qualifications [redacted]
Experience [redacted]

The *key persons* are

Name (2) [redacted]
Job [redacted]
Responsibilities [redacted]
Qualifications [redacted]
Experience

The *key persons* are

Name (3) [redacted]
Job [redacted]
Responsibilities [redacted]
Qualifications [redacted]
Experience [redacted]

The *key persons* are

Name (4) [redacted]
Job [redacted]
Responsibilities [redacted]
Qualifications [redacted]
Experience [redacted]

The *key persons* are

Name (5) [redacted]
Job [redacted]
Responsibilities [redacted]
Qualifications [redacted]
Experience [redacted]

The *key persons* are

Name (6)
Job
Responsibilities

Qualifications
Experience

The *key persons* are

Name (7)
Job
Responsibilities
Qualifications
Experience

The following matters will be included in the Early Warning Register

3 Time

If a programme is to be identified in the Contract Data.

The programme identified in the Contract Data is

W22-2656-project plan.pdf

5 Payment

The *activity schedule* is
W22-2656_Activity schedule1.pdf

The tendered total of the Prices is
£27,552.84

Resolving and avoiding disputes

The *Senior Representatives* of the *Consultant* are

Name (1) [redacted]
Address for communications
[redacted]

Address for electronic communications
[redacted]

Name (2) [redacted]
Address for communications
[redacted]

Address for electronic communications
[redacted]

X10: Information Modelling

The information execution plan identified in the Contract Data is

Contract Execution

Client **execution**

Signed Underhand by [**PRINT NAME**] for and on behalf of the Environment Agency

[redacted]

Consultant **execution**

Signed Underhand by [**PRINT NAME**] for and on behalf of Jeremy Benn Associates Ltd

[redacted]

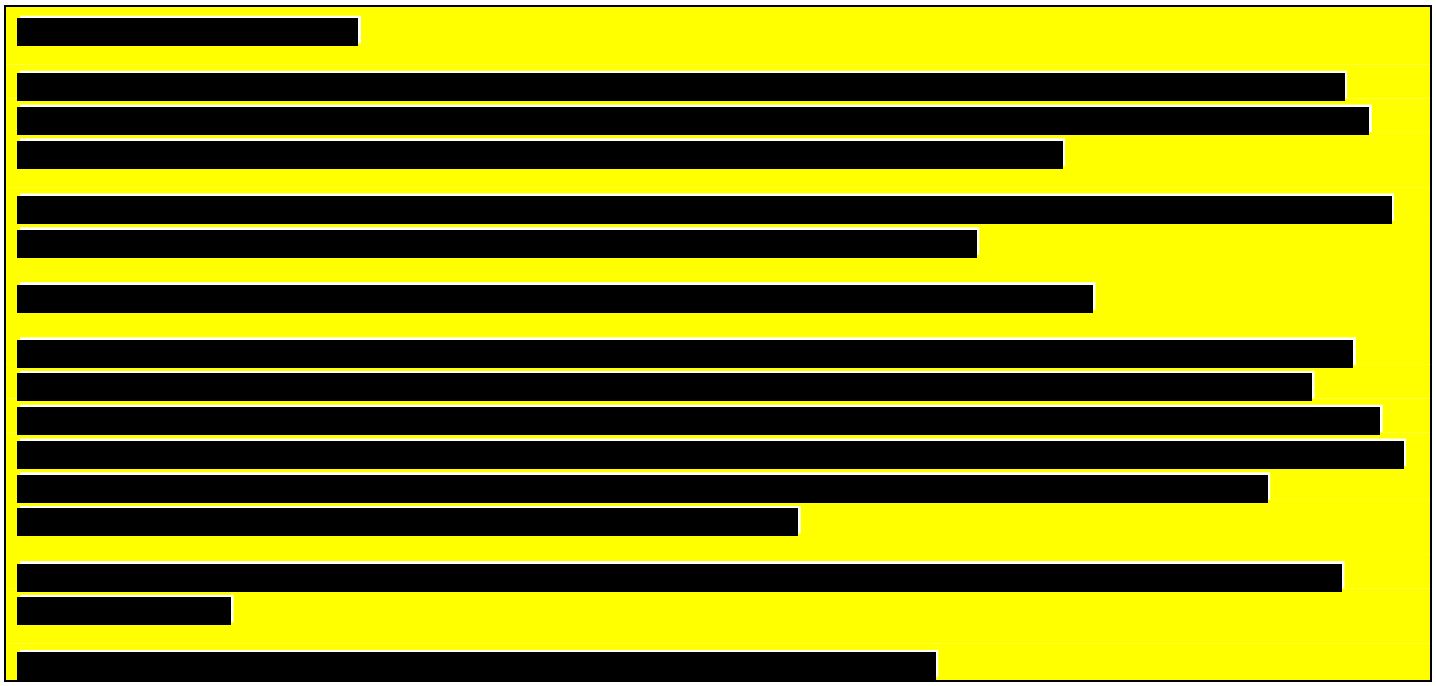
PSC scope template - blank

NEC4 professional services contract (PSC)

412_13_SD02

Document category: COMPULSORY

Use the template on the pages that follow to assist you when preparing the scope for an NEC4 professional services contract (PSC).



Environment Agency
NEC4 professional services contract (PSC)
Scope

Project / contract Information

Project name	Improving WR Modelling for the Till and Tweed
Project 1B1S reference	[redacted]
Contract reference	[redacted]
Date	20 October 2022
Version number	0.3
Author	[redacted]

Revision history

Revision date	Summary of changes	Version number
04/10/2022	First Draft	0.1
06/10/2022	Technical Review	0.2
19/10/2022	Final Technical Review	0.3

This Scope should be read in conjunction with the version of the Minimum Technical Requirements current at the Contract Date. In the event of conflict, this Scope shall prevail. The *services* are to be compliant with the following version of the Minimum Technical Requirements:

Document	Document Title	Version No	Issue date

Details of the *services*

Details of the *services* are:

1. Description of the work:

Objective

The objective of this project is to ensure that water resources (abstraction and impoundment) are effectively regulated within the English catchment of the River's Till and Tweed. This requires that robust assessments are developed through the Catchment Abstraction Management Strategy (CAM's) process. In order to improve the current assessments, an improved understanding of hydrometric processes occurring within the English catchment of the River Till and River Tweed is needed, along with updated CAMS modelling tools and inputs to better reflect recent changes to the geographical boundary of the assessment area.

The Environment Agency manages Water Resources in the Till and Tweed catchment through the CAMS process. The CAMS based assessments for the Till and Tweed catchment have been historically constrained in their accuracy, largely because of legislative exemptions for abstraction and impounding activity. This has meant the EA had an incomplete understanding of the artificial influences impacting the flow regime. Further, the available hydrometric data has been insufficient to fully explain observed hydrometric trends in the catchments.

Updates to the historic CAMS assessments were undertaken during Spring / Summer 2022 (following the removal of legislative exemptions and the regularisation of abstraction activity within the catchment). This has meant the assessments now better reflect artificial influences in most parts of the catchment. However, further work is still required to ensure the effect of influences in other parts of the catchment are fully incorporated and, to provide for a better understanding of flow dynamics and water balance in the catchment.

It is within the context of these further updates that this project has been commissioned. The outputs of this project will be used to support to further updates to the CAMS assessments which are planned to take place in 23/24 and 26/27.

This project therefore intends to deliver a study with three broad aims:

1) an improved understanding of hydrological processes within the catchment,
2) improving the CAMS process and assessments by developing new mapping tools and data inputs,
3) identifying a monitoring programme capable of ensuring that sufficient evidence will be available for future work.

Background

The English catchment of the River's Till and Tweed has a unique characteristic for water resources (WR) regulatory activity. Not only do the catchments straddle the English and Scottish border but, also, the catchments have historically been mostly exempt from regulation. As a result, the Environment Agency has historically been constrained in both the understanding of hydrological and hydrogeological processes in the catchment and, the understanding of influences arising from abstraction, impoundment, and discharge activity.

The New Authorisations project, undertaken to implement the Water Resources (Transitional Provisions) Regulations 2017, removed the historic regulatory exemptions for Water Resources. As a result, licenses for abstraction were issued for the first time in 2021 and the EA is now moving towards a more comprehensive WR regulatory regime for the catchment. This is being achieved

through: ongoing WR licensing and engagement activity, revisions to the Abstraction Licensing Strategy for the catchment, amendments to Resource Assessment Methodology (RAM) ledgers and, the development of more effective cross-border regulatory relationship. Outcomes in all those areas require the availability of a robust understanding of hydrometric process at the catchment and sub-catchment scale. This understanding would ordinarily be derived through the Catchment Abstraction Management System (CAMS) process. However, fully robust CAMS assessments are not currently available for the Till and Tweed catchment and, although some recent updates have provided a significant improvement in assessment, further changes are still necessary.

A key element of the recent update was an expansion of the geographic boundary of the CAMS assessments for the catchment. Historically the CAMS assessments for the catchment had been geographically limited to the English River Till. This excluded some parts of the upper Till catchment (i.e., the upper Bowmont Water / River Glen), as well as the entirety of the Tweed catchment (the English portion, as well as the Scottish portion). Updates to the CAMS assessment, undertaken during 2021 and 2022, increased the boundary area of the assessment to incorporate the full extent of the English catchment, as well expanding the assessment in order to reflect the flow influences occurring within Scotland. In this respect, the EA has been working with the Scottish Environment Protection Agency (SEPA) to identify cross-border influences on the flow regime. However, further work is required to ensure that these influences are considered against the observed flow regime for the catchment and, adjusted (naturalised) flow statistics are derived for each of the relevant sub-catchments. Additionally, the recent updates to the assessment have identified inconsistencies in the waterbody and catchment boundaries used in the CAMS process. These inconsistencies are linked to complexity of plotting assessment areas against administrative and hydrometric boundaries in a border region. Accurate mapping products and spatial tools are needed to ensure that future modelling and assessment activity are geographically correct.

A further element of the recent updates that requires further attention is, a validation of the Abstraction Sensitivity Bands (ASB) applied to the new AP's located on the River Till. ASB's are used to define the Ecological Flow Indicator (EFI) within the CAMS process and should be representative of the hydro-ecological typology of a watercourses. For expediency during the 2022 update activity, a decision was made to apply the most conservation ASB to the new AP's. However, this decision needs to be reviewed and the ASB assigned need validation by giving regard to the available habitat and monitoring data.

Despite the recent updates the CAMS assessments still do not fully reconcile with the conceptual understanding of hydrometric processes in the catchment, with a key issue being a greater volume of water present in the lower catchment than would be expected solely from upstream surface water inputs. In this respect, an update to the conceptual understanding of processes in the catchment is needed to ensure ongoing confidence in the CAMS outputs and to support future WR management decisions.

A further factor still constraining the CAMS process is the limited extent of hydrometric data currently available. Data availability in the Till catchment has been affected by the highly mobile nature of the catchment, which results in a very dynamic channel structure, and creates a technically difficult environment to monitor. The difficulty in planning for and maintaining monitoring sites, alongside a historical restriction on investment in the catchment, has resulted in the available data either being time limited and / or geographically constrained. Due to the dynamic nature of the catchment, addressing historic data gaps and improving the availability of hydrometric data in the catchment is therefore partially dependent upon developing a better understanding of the geomorphological processes in the catchment. A better understanding of channel stability would ensure that sustainable monitoring sites can be developed, and the quality of hydrometric monitoring can be maintained.

Further information on the CAMS assessments for the catchment can be found in the current Abstraction Licensing Strategy for the English Till and Tweed. This is available on gov.uk at Till and Tweed abstraction licensing strategy - GOV.UK (www.gov.uk)

Study Area

The study area for this project is inclusive of all areas of the English Till and Tweed catchment in North Northumberland. However, the study will also need to give some regard to influences occurring within the wider Tweed hydrometric catchment, which is predominantly located within the Border region of Scotland.

The study area is divisible into distinct sub-catchments based on hydrological connectivity with CAMS Assessment Points (AP)'s. Historically three AP's have been maintained for catchment, all located on the River Till. Following the 2022 update to the CAMS assessment for the catchment, the number of APs for the catchment was increased and, as a result, there are now 7 AP's available for the wider catchment; a fourth AP was created on the River Till and 3 new APs were created on the River Tweed.

One focus of the project is an improved understanding of how flows increase between the upper and lower River Till and, developing a water balance calculation for key reaches of the catchment. For these elements of the project, the principal focus of the study would be in the middle of the catchment, at areas surrounding Wooler and the Milfield Plain.

Project Objectives

Key aims of this study include:

- Produce water balance calculations for the River Till and identified sub catchments, identifying key knowledge gaps.
- Improve the understanding of groundwater and surface water connectivity within the River Till catchment.
- Improving the understanding of flow accretion within the catchment area and identified sub-catchments.
- Provide an assessment of impacts from sediment transportation for the River Till and its principal tributaries, giving regard to identifying reaches with stable channel morphology.
- Develop GIS shapefiles to support WR assessment (CAMS) activity in border areas not previously included within the CAMS methodology.
- Develop a naturalised flow profile for the River Tweed, incorporating influences currently under Scottish regulation.
- Review Abstraction Sensitivity Bands (ASBs) for the new Assessment Points created in 2022.
- Identify future evidence required to provide a robust level of catchment conceptualisation, including a reliable water balance for the River Till.
- Develop an optimal surface water and groundwater monitoring programme intended to maintain and improve the availability of hydrometric data for the catchment.

Project Timeline

The products of this project are required to support internal EA activity on CAMS which is planned to take place in phases, starting from Autumn 2022. The initial phase of this planned activity, expected to take place during autumn / winter 2022/2023, is targeted at the completion of Resource Assessment Methodology (RAM) ledger updates (originally commenced in Spring 2022) and the integration of the RAM ledger with the Water Resource Geographic Information System (WRGIS) model. Subsequent phases of this planned activity, expected to take place during spring / summer 2023, are targeted at reconciling CAMS based assessments with the wider conceptual understanding of the catchment.

The timeline for individual project outcomes is therefore aligned to the above indicative work plan. It is expected that the project will be completed no later than 31 March 2023, with all products completed no later than this date. Individual products related with the objectives of this project could be delivered to the following interim dates:

- Objective 1 - An improved understanding of hydrological processes within the catchment. Required no later than 31 March 2023.
- Objective 2 - Improving the CAMS process and assessments by developing new mapping tools and data inputs. Required by 31 December 2022.
- Objective 3 - Identifying a monitoring programme capable of ensuring that sufficient evidence will be available for future work. Required no later than 31 March 2023.

Senior Manager

The project will be managed on behalf of the Environment Agency by [redacted] The Environment Programme team develops and deliver a variety of environmental projects across the North East and has extensive experience managing projects for the Environment Agency.

Client

The principal *Client* for the outputs of this project will be Water Resources (WR) component of the Integrated Environment Planning (IEP) team for the North East Area. The WR staff in this team manage the CAMS process for the North East Area and work to maintain and update the RAM ledgers. The lead representative for IEP will be Kyle McGuigan (Environment Planning Specialist - Water Resources).
Secondary customers for the outputs of this project will be WR staff of the Groundwater, Hydrology and Contaminated Land (GHCL) Team within the North East Area. Staff in this team deliver the technical aspects of the CAMS process.

Outcome Specification

Products Required

To address the objectives and aims the *Consultant* shall provide the 4 distinct products:

1. The provision of an outcome report which summarises the project methodology, outcomes, constraints, and any recommendations for future activity.
2. The provision of an updated CAMS Conceptualisation Report for the catchment, which should provide a functional description of hydrological and hydrogeological processes in the catchment (Objective 1),
3. The provision of inputs to be used with the CAMS process, namely: mapping shapefiles for the catchment, a naturalised time series for flows at the three APs on the River Tweed, and, a technical report identifying appropriate Abstraction Sensitivity Bands for the three APs on the River Tweed (Objective 2),
4. The provision of outline monitoring programme sufficient to fulfil future monitoring needs and address any evidence gaps identified by the project (Objective 3),

Tasks

In developing the above products, the *Consultant* shall undertake and complete the following tasks:

For Product 1 (Outcome Report):

1. The *Consultant* should describe the activities undertaken and identify the products produced.
2. The *Consultant* should identify any constraints which may limit the suitability of the products provided.
3. The *Consultant* should schedule the data, reports and other material reviewed under the project.

4. The *Consultant* should provide an assessment of further activity that would be recommended to further improve the products provided.

For Product 2 (Updated CAMS Conceptualisation Report):

5. The *Consultant* shall provide a clear method statement on activities necessary to produce an updated CAMS Conceptualisation Report. This should include, but not be limited to:
    a. A review of the existing CAMS Conceptualisation Report (EA, 2010) and identify any previously identified knowledge gaps.
    b. A survey of EA technical officers intended to identify key concerns and known knowledge gaps.
    c. A review of relevant reports produced since the original CAMS Conceptualisation Report.
6. The *Consultant* shall collate, review, and summarise the available understanding of flow dynamics within the catchment from the recent technical reports and other sources.
7. The *Consultant* shall provide an update to the existing conceptualisation report for the catchment. Key elements of the updated report shall include:
    a. Integration of the expanded assessment area to fully incorporate the entirety of the English Till and Tweed catchment, plus a summary representation of the wider Tweed hydrometric catchment.
    b. The development of a water balance for the Till catchment, and each of the four sub-catchments associated with the 4 CAMS Assessment Points for the River Till.
    c. A numerical flow accretion profile for the River Till from its source on the southern slopes of The Cheviot (NT9085018584) to the confluence with the River Tweed (NT8700242986).
    d. A numerical flow accretion profile for the Wooler Water from its source on the southern slopes The Cheviot (NT9065919064) to the confluence with the River Till (NU0022530208)
    e. A numerical flow accretion profile for the River Glen from its source on the western slope of The Cheviot (NT8925419427) to the confluence with the River Till (NT9763832525).
    f. A numerical flow accretion profile for the English River Tweed from the border east of Kelso (NT7902537944) to the Tidal Limit at Norham (NT9339651038).

For Product 3 (Mapping Shapefiles):

8. The *Consultant* shall provide GIS shapefiles for each of the WFD reportable and unreportable Waterbodies, Operational Catchments and Management Catchments for the English Till and Tweed.
9. The *Consultant* shall provide GIS shapefiles for the Operational and Management Catchment of the hydrometric Tweed Catchment.
10. The *Consultant* shall provide GIS shapefiles for all the CAMS Assessment Points within the Till and Tweed CAMS assessments.
11. The *Consultant* shall provide GIS shapefiles for all the artificial influences identified within the CAMS ledger which are in Scotland. Each influence included in the Shapefile should have attributes consistent with the entry in the RAMS ledger, as advised by the Environment Agency.
12. The *Consultant* shall provide GIS shapefiles for all the impounding reservoirs and strategic water transfer (abstraction and discharges) elements located in the entire Tweed hydrometric catchment.
13. The *Consultant* shall develop the GIS shapefiles based on attribute tables consistent with those already developed existing WRGIS model, as provided by the Environment Agency.

For Product 3 (Naturalised Time Series for Tweed AP's)

14. The *Consultant* shall provide a time series of naturalised river flows for each of the x3 AP's on the River Tweed which meets the following criteria:
    a. cover a minimum period of 1990 – 2021,
    b. be representative of Daily Mean Flow,
    c. expressed as megalitres per day.

d. be reflective of observed influences, as provided by the Environment Agency.

For Product 3 (Technical Review of Abstraction Sensitivity Bands (ASB) for Tweed AP's)

15. The *Consultant* shall provide a technical report identifying the appropriate ASB for each of the x3 AP's on the River Tweed.
16. The *Consultant* shall identify appropriate ASB's by following the relevant Environment Agency guidance.
17. The *Consultant* shall, if Task 16 cannot be achieved, make a recommendation for an appropriate ASB based on expert judgement and identify additional data needed in order to confirm this recommendation.

For Product 4 (Proposed Monitoring Programme):

18. The *Consultant* shall provide a clear method statement on activities necessary to produce a monitoring programme. This should include, but not be limited to:
    a. The identification of key monitoring objectives, as advised by the Environment Agency.
    b. The identification of existing monitoring datasets, as advised by the Environment Agency.
    c. Propose monitoring methods consistent with the standards for environmental monitoring as used by the Environment Agency.
19. The *Consultant* shall seek to extend existing datasets where desirable.
20. The *Consultant* shall review the available understanding of morphological and sediment dynamics within the catchment from the recent technical reports and other sources.
21. The *Consultant* shall utilise the understanding of sediment dynamics to identify optimal locations for the measurement of channel cross-sections and river flow measurements.

The *services* specifically excludes the following:

- The *Consultant* will not be required to undertake any work directly on the RAM ledgers maintained by the Environment agency.
- The *Consultant* will not be required to collect or obtain any data independent of data provided directly from the Environment Agency.

2. Drawings, site information or reports already available

An indicative list of available data and reports is given in Appendix 2, but the Consultant shall review this list and identify further material through discussion with EA technical staff.

3. Specifications of standards to be used

All tools and files developed under this project should be compatible with the following Environment Agency's systems listed below and must be capable of functioning seamlessly with any future update of the applicable software products:

Software	Current Network Version
Windows Version	Windows 10
ArcGIS	ArcMap 10.4.1
Microsoft Office	Microsoft Office 365

4. Constraints on how the *Consultant* provides the *services*

1. The *Consultant* shall only carry out work directly associated to Provide the Service as set out in the outcome specification above.
2. The *Consultant* is to report monthly on works undertaken and time to be charged for that month as detailed in the Client's NEC4 Professional Services Contract.
3. The *Consultant* shall maintain close contact with the Project Manager in order to ensure that their actions reflect the Client's objectives.

4. The *Consultant* shall notify the *Service Manager* of any proposed changes from the Scope, and if there is any detrimental change to any of the following aspects of the Contract, time, cost, and quality. The *Consultant* shall:
    a. cease all work, howsoever arising, associated with the task
    b. await the Client's written instruction on how to proceed
5. Data held by the Client that is relevant to the project will be collected by the Service Manager and provided directly to the *Consultant*

5. Requirements of the programme

1. The *Consultant* shall provide a detailed programme in a format (pdf) agreed with the *Service Manager*. The programme must show critical path activities, gateway, risk buffers and activities requiring Client input, for example review periods.
2. A baseline programme shall be provided for the project start up meeting and this will be updated monthly, with actual and forecast progress against the baseline. The programme shall cover all the activities to be undertaken by the *Consultant* to deliver the study. Include all major project and modelling milestones. Milestones include, but are not limited to:
    a. Start-up meeting
    b. Data review / Technical Survey of EA staff
    c. Development of Product 3 (Mapping Shapefiles, Naturalised Time Series for Tweed APs, Technical Review of Abstraction Sensitivity Bands (ASB) for Tweed APs)
    d. Development of Product 2 ((Updated CAMS Conceptualisation Report)
    e. Development of Product 4 (Proposed Monitoring Programme)
    f. Reporting
    g. Project Close
3. It is acknowledged that the period for reply outlined in the contract is two weeks, however, provision of 2 weeks' notice of submission for review is required.

6. Services and other things provided by the *Client*

1. All the data supplied to the *Consultant* as part of this study remains the Intellectual Property of the *Client*.
2. The *Client* is responsible for the accuracy & sufficiency of existing data owned by the *Client*.
3. The data custodian for project deliverables from this commission will be the *Client's* area Integrated Environment Planning (IEP) team.
4. Licenses for Ordnance Survey mapping, environmental data, hydrometric data and permit information will be provided to the *Consultant* upon award of this commission.
5. All model and survey information will be provided to the *Consultant* according to Client data security policy. Once the commission is completed, the original data sent to the *Consultant* which is classed as commercially sensitive, is returned following the Client data security policy.
6. Timesheets as normally utilised by the *Consultant* shall be submitted with applications for payment unless otherwise agreed with the Service Manager. Electronic submissions would be acceptable.
7. Payment is subject to the procedure agreed in or under the framework.
8. The quality management system complies with the requirements of ISO9001 and ISO14001.

Appendix 1 BIM Protocol – Production and Delivery Table

All *Employer* issued information referenced within the Information Delivery Plan requires verifying by the *Consultant* unless it is referenced elsewhere within the *Scope.*

www.Pow.bim4.info

You need google chrome for this link to work. Once the table is completed it should be printed for issue in the tender document, so that the correct baseline position can be seen by suppliers.

Appendix 2: Drawings, site information or reports already available

Drawing / Info / Report / Data - Title	Purpose
Report - Abstraction Licensing Strategy – Till and Tweed (EA, 2022)	Background Information
Report - CAMS Conceptualisation Report (EA, 2013)	For update
Report – River Till Hydroecological Assessment (EA, 2020)	Background Information
Report – Groundwater Working with Natural Processes (JBA, 2020)	Background Information
Information – National Abstraction Licensing Database (NALD) Extract, Abstractions within English Till and Tweed	Background Information
Information – Water Information Management System (WIMS) Extract, Discharges within English Till and Tweed	Background Information
Information – ScottishWater, Information on Abstraction and Impoundment within the Tweed Catchment	For naturalised time series calculations
Information – ScottishWater, Information on Discharges within the Tweed Catchment	For naturalised time series calculations
Information – Hydrological Time Series; surface and groundwater monitoring for English Till and Tweed	For naturalised time series calculations
Information – GIS shapefiles and attribute tables, Indicative WFD waterbody and catchment boundaries for Till and Tweed management catchment	For production of GIS shapefiles
Information – GIS shapefiles and attribute tables, Indicative WFD waterbody and catchment boundaries for Northumberland management catchment	Background Information
Information – Location and characteristic of CAMS Assessment Points within Till and Tweed catchment	For update
Information – Ecological (Macroinvertebrate) Datasets for the English Till and Tweed	Background Information
Information – Ecological (Fish) Datasets for the English Till and Tweed	Background Information
Information – Habitat (RHS) Datasets for the English Till and Tweed	Background Information