Conditions of Contract

Services

Document version October 2019

Hertfordshire Chalk Groundwater Model Phase 2

[redacted]

1. DEFINITIONS

1.1. In the Contract, unless the context otherwise requires the following words and expressions shall have the following meanings assigned to them.

1.1.1. Agency
The Environment Agency, its successors and assigns.

1.1.2. Agency Property
All property issued or made available for use by the Agency to the Contractor in connection with the Contract.

1.1.3. The Appendix
The Appendix to these Conditions.

1.1.4. The Contract
These Conditions including the Appendix, any Special Conditions, Specification, Pricing Schedule, Contractor's tender, acceptance letter and any relevant documents agreeing modifications exchanged before the Contract is awarded, and any subsequent amendments or variations agreed in writing.

1.1.5. The Contractor
The person, firm company or body who undertakes to supply the Services to the Agency as defined in the Contract.

1.1.6. Contract Period
The time period stated in the Appendix or otherwise provided in the Contract, for the performance of the Services.

1.1.7. Contractor Personnel
means all directors, officers, employees, agents, consultants and contractors of the Contractor and/or of any sub-contractor engaged in the performance of its obligations under this Contract

1.1.8. Contract Price
The price exclusive of VAT set out in the Contract for which the Contractor has agreed to supply the services.

1.1.9. Contract Supervisor
Any duly authorised representative of the Agency notified in writing to the Contractor for all purposes connected with the Contract. Any Notice or other written instruction given by or made to the Contract Supervisor, shall be taken as given by or made to the Agency.

1.1.10. Contracting Authority
means any contracting authorities (other than the Environment Agency) as defined in regulation 2 of the Public Contract Regulations 2015 (SI 2015/102) (as amended).

1.1.11. Data Protection Legislation

means: (i) the General Data Protection Regulation (Regulation (EU) 2016/679) or GDPR, the Law Enforcement Directive (Directive (EU) 2016/680) ("LED") and any applicable national implementing Laws as amended from time to time (ii) the Data Protection Act 1998 ("DPA 1998") and/or the Data Protection Act 2018 ("DPA 2018") to the extent that it relates to processing of personal data and privacy; (iii) all applicable Law about the processing of personal data and privacy

1.1.12.Data Protection Schedule
The Schedule attached to this Contract describing how the Parties will comply with the Data Protection Legislation.

1.1.13.Intellectual Property Rights
All Intellectual Property Rights including without limitation, patents, patent applications, design rights, registered designs, utility models, trade and service marks and applications for same, copyright know-how, rights in semi-conductor chip topography, and in each case whether protectable at law or not, and if protectable, whether an application has been made for such protection or not, and all similar industrial, commercial, monopoly or other intellectual property rights whether present or future, vested or contingent wherever protected.

1.1.14.Law
means any law, subordinate legislation within the meaning of Section 21(1) of the Interpretation Act 1978, bye-law, enforceable right within the meaning of Section 2 of the European Communities Act 1972, regulation, order, regulatory policy, mandatory guidance or code of practice, judgment of a relevant court of law, or directives or requirements with which the Contractor is bound to comply

1.1.15.Notice
Any written instruction or notice given to the Contractor by the Contract Supervisor, delivered by:

i. fax, or hand delivery to the Contractor’s registered office or other address notified for the purposes of the Contract and deemed to have been served at the date and time of delivery;

First class post to the Contractor’s registered office. Such Notices are deemed to have been served 48 hours after posting.

1.1.16.Results
All things produced in performing the Services including maps, plans, photographs, drawings, tapes, statistical data, experimental results, field data, analysis of results, published and unpublished results and reports, inventions, computer programmes and user documentation.

1.1.17.The Resulting Rights
All Intellectual Property Rights in the Results that are originated, conceived, written or made by the Contractor, whether alone or with others in the performance of the Services or otherwise resulting from the Contract.

1.1.18.Permission

Express permission given in writing before the act being permitted.

1.1.19.Services
All Services detailed in the Specification including any additions or substitutions as may be requested by the Contract Supervisor.

1.1.20.Regulations
Means the Public Contract Regulations 2015 (SI 2015/102) as amended.

1.2. Except as set out above and in the Data Protection Schedule, the Contract shall be interpreted in accordance with the Interpretation Act 1988.

1.3. All headings in these Conditions are for ease of reference only, and shall not affect the construction of the Contract.

1.4. Any reference in these Conditions to a statutory provision will include all subsequent modifications.

1.5. All undefined words and expressions are to be given their normal English meaning within the context of this Contract. Any dispute as to the interpretation of such undefined words and expressions shall be settled by reference to the definition in the Shorter Oxford English Dictionary.

2. PRECEDENCE

To the extent that the following documents form the Contract, in the case of conflict of content, they shall have the following order of precedence:

- Conditions of Contract including Appendix, Data Protection Schedule and any Special Conditions;
- Specification;
- Pricing Schedule;
- Drawings, maps or other diagrams.

3. CONTRACT SUPERVISOR

The Contractor shall strictly comply with any instruction given by the Contract Supervisor concerning or about the Contract provided such instructions are reasonable and consistent with the nature, scope and value of the Contract. All such instructions shall be in writing. The Contractor is not obliged to comply with any verbal instruction from the Contract Supervisor that is not confirmed in writing within 7 working days.

4. THE SERVICES

4.1. The Contractor shall provide all staff, equipment, materials and any other requirements necessary for the performance of the Contract using reasonable skill, care and diligence, and to the reasonable satisfaction of the Contract Supervisor.

4.2. The Contractor shall only employ in the execution and superintendence of the Contract persons who are suitable and appropriately skilled and experienced. The Contract Supervisor shall be at liberty to object to and require the Contractor to remove any person employed in or about the Contract who is unsuitable, misconducts himself, is incompetent or negligent in the performance of his duties or persists in conduct which could endanger the health or safety of others. Such persons shall not be employed again on the Contract without the Permission of the Contract Supervisor.

5. ASSIGNMENT

5.1. The Contractor shall not assign, transfer or sub-contract the Contract, or any part of it, without the Permission of the Contract Supervisor.

5.2. Any assignment, transfer or sub-contract entered into, shall not relieve the Contractor of any of his obligations or duties under the Contract.

5.3. Nothing in this Contract confers or purports to confer on any third party any benefit or any right to enforce any term of the Contract.

6. CONTRACT PERIOD

The Contractor shall perform the Services within the time stated in the Appendix, subject to any changes arising from Condition 10 (Variations,) and/or Condition 11 (Extensions of time.).

7. PROPERTY

7.1. All property issued by the Agency to the Contractor in connection with the Contract shall remain the property of the Agency, and shall be used in the execution of the Contract, and for no other purpose whatsoever without the prior approval of the Contract Supervisor.

7.2. The Contractor shall keep all Agency Property in safe custody and good condition, set aside and clearly marked as the property of the Agency.

7.3. On expiry or earlier termination of the Contract the Contractor shall, if so required, either surrender such property to the Agency or otherwise dispose of it as instructed by the Contract Supervisor.

8. MATERIALS

8.1. The Contractor shall be responsible for establishing his own sources of supply for goods and materials and will be responsible for ensuring the reasonable and proper conduct by his suppliers and staff whilst on the Agency's premises.

8.2. The Contractor shall not place, or cause to be placed, any orders with suppliers or otherwise incur liabilities in the name of the Agency or any representative of the Agency.

9. SECURITY

9.1. The Contractor shall be responsible for the security of all goods and equipment belonging to the Agency and used by the Contractor in the provision of the Services, belonging to the Contractor, or Contractors staff, or sub-contractors whilst on Agency premises.

9.2. This Condition shall not prejudice the Agency's rights under Condition 15.

10. VARIATIONS

10.1. The Contract Supervisor may vary the Contract by adding to, deleting or otherwise modifying the Services to be supplied, by written order to the Contractor provided such variations are reasonable and consistent with the nature, scope and value of the Contract.

10.2. The value of any such variation, other than any variation arising out of Condition 10.3, shall be determined by reference to the rates contained in the Pricing Schedule. Where the Services so ordered are not covered in the Pricing Schedule, they shall be valued at a fair and reasonable rate agreed between the Contract Supervisor and the Contractor.

10.3. Where a variation is the result of some default or breach of the Contract by the Contractor or some other cause for which he is solely responsible, any additional cost attributable to the variation shall be borne by the Contractor.

10.4. The Contractor may also propose a variation to the Services but no such variation shall take effect unless agreed and confirmed in writing by the Contract Supervisor.

10.5. No variation shall have the effect of invalidating the Contract, or placing the Contract at large, if that variation is reasonably consistent with the nature, scope and value of the Contract. The Agency may vary the Contract to comply with a change in English Law. Such a change will be effected by the Contract Supervisor notifying the Contractor in writing.

10.6. The Agency may assign, novate or otherwise dispose of its rights and obligations under the Contract or any part thereof to:

10.6.1. any Contracting Authority; or

10.6.2. any other body established by the Crown or under statute in order substantially to perform any of the functions that had previously been performed by the Agency; or

10.6.3. any private sector body which substantially performs the functions of the Agency, provided that any such assignment, novation or other disposal shall not increase the burden of the Contractor's obligations under the Contract.

10.7. Any change in the legal status of the Agency such that it ceases to be a Contracting Authority shall not affect the validity of the Contract. In such circumstances the Contract shall bind and inure to the benefit of any successor body to the Agency.

11. EXTENSIONS OF TIME

11.1. Should the performance of the Contract be directly delayed by any cause beyond the reasonable control of the Contractor, and provided that the Contractor shall first have given the Contract Supervisor written notice within five working days after becoming aware that such delay was likely to occur, then the Contract Supervisor, if satisfied that this Condition applies:

11.1.1. in the case of any delay of which the Agency is not the cause, may grant the Contractor such extension of time, as in his opinion is reasonable, having regard without limitation, to any other delays or extensions of time that may have occurred or been granted under the Contract. The Contract Price shall not increase as a result of such an extension of time.

11.1.2. in the case of any delay of which the Agency is the cause, shall grant the Contractor a reasonable extension of time to take account of the delay.

11.2. No extension of time shall be granted where in the opinion of the Agency the Contractor has failed to use reasonable endeavours to avoid or reduce the cause and/or effects of the delay.

11.3. Any extension of time granted under this Condition shall not affect the Agency’s rights to terminate or determine the Contract under Conditions 13 and 14.

12. DEFAULT

12.1. The Contractor shall be in default if he:

12.1.1. fails to perform the Contract with due skill, care, diligence and timeliness;

12.1.2. refuses or neglects to comply with any reasonable written instruction given by the Contract Supervisor;

12.1.3. is in breach of the Contract.

12.2. Where in the opinion of the Contract Supervisor, the Contractor is in default, the Contract Supervisor may serve a Notice giving at least five working days in which to remedy the default.

12.3. If the Contractor fails to comply with such a Notice the Contract Supervisor may, without prejudice to any other rights or remedies under the Contract, take over for as such a period as is necessary the performance of the relevant part of the Contract and make other arrangements for its completion. Any extra costs arising from this action, will be paid by the Contractor or deducted from any monies owing to him.

13. TERMINATION

13.1. The Agency may immediately, without prejudice to any other rights and remedies under the Contract, terminate all or any part of the Contract by Notice in writing to the Contractor, Receiver, Liquidator or to any other person in whom the Contract may become vested, if the Contractor:

13.1.1. fails in the opinion of the Contract Supervisor to comply with (or take reasonable steps to comply with) a Notice under Condition 12.2.

13.1.2. becomes bankrupt or insolvent, or has a receiving order made against him, or makes and arrangement with his creditors or (being a corporation) commences to be wound up, not being a voluntary winding up for the purpose of reconstruction or amalgamation, or has a receiver, administrator, or administrative receiver appointed by a Court.
'Termination under the Regulations'
13.2. The Agency may terminate the Contract on written Notice to the Contractor if:

13.2.1. the contract has been subject to a substantial modification which requires a new procurement procedure pursuant to regulation 72(9) of the Regulations;

13.2.2. the Contractor was, at the time the Contract was awarded, in one of the situations specified in regulation 57(1) of the Regulations, including as a result of the application of regulation 57(2), and should therefore have been excluded from the procurement procedure which resulted in its award of the Contract; or

13.2.3. The Contract should not have been awarded to the Contractor in view of a serious infringement of the obligations under the Treaties and the Regulations

that has been declared by the Court of Justice of the European Union in a procedure under Article 258 of the TFEU.

14. DETERMINATION

14.1. Without prejudice to any other rights or remedies under the Contract, the Agency reserves the right to determine the Contract at any time by giving not less than one month's Notice, (or such other time period as may be appropriate).

14.2. The Agency shall pay the Contractor such amounts as may be necessary to cover his reasonable costs and outstanding and unavoidable commitments necessarily and solely incurred in properly performing the Contract prior to determination.

14.3. The Agency will not pay for any costs or commitments that the Contractor is able to mitigate and shall only pay those costs that the Agency has validated to its satisfaction. The Agency's total liability under this Condition shall not in any circumstances exceed the Contract Price that would have been payable for the Services if the Contract had not been determined.

15. INDEMNITY

15.1. Without prejudice to the Agency's remedies for breach of Contract, the Contractor shall fully indemnify the Agency and its staff against any legally enforceable and reasonably mitigated liability, loss, costs, expenses, claims or proceedings in respect of:

15.1.1. death or injury to any person;

15.1.2. loss or damage to any property excluding indirect and consequential loss;

15.1.3. infringement of third party Intellectual Property Rights

which might arise as a direct consequence of the actions or negligence of the Contractor, his staff or agents in the execution of the Contract.

15.2. This Condition shall not apply where the damage, injury or death is a direct result of the actions, or negligence of the Agency or its staff.

16. LIMIT OF CONTRACTOR'S LIABILITY

16.1. The limit of the Contractor's liability for each and every claim by the Agency, other than for death or personal injury, whether by way of indemnity or by reason of breach of contract, or statutory duty, or by reason of any tort shall be:

16.1.1. the sum stated in the Appendix;

16.1.2. if no sum is stated, the Contract Price or five million pounds whichever is the greater.

17. INSURANCE

17.1. The Contractor shall insure and maintain insurance against liabilities under Condition 15 (Indemnity) in the manner and to the values listed in the Appendix to these Conditions. If no sum is stated, the value insured shall be £5M (five million pounds.)

17.2. If specifically required by the Agency, nominated insurances shall be in the joint names of the Contractor and the Agency.

17.3. The Contractor shall, upon request, produce to the Contract Supervisor documentary evidence that the insurances required are fully paid up and valid for the duration of the Contract.

18. PREVENTION OF FRAUD AND CORRUPTION

18.1. The Contractor shall not offer, give, or agree to give anything, to any person an inducement or reward for doing, refraining from doing, or for having done or refrained from doing, any act in relation to the obtaining or execution of the Contract or for showing or refraining from showing favour or disfavour to any person in relation to the Contract.

18.2. The Contractor shall take all reasonable steps, in accordance with good industry practice, to prevent fraud by the Contractor's staff and the Contractor (including its shareholders, members and directors) in connection with the Contract and shall notify the Agency immediately if it has reason to suspect that any fraud has occurred or is occurring or is likely to occur.

18.3. If the Contractor or the Contractor's staff engages in conduct prohibited by this clause 18 or commits fraud in relation to the Contract or any other contract with the Crown (including the Agency) the Agency may:

18.3.1. terminate the Contract and recover from the Contractor the amount of any loss suffered by the Agency resulting from the termination, including the cost reasonably incurred by the Agency of making other arrangements for the supply of the Goods and any additional expenditure incurred by the Agency throughout the remainder of the Contract; or

18.3.2. recover in full from the Contractor any other loss sustained by the Agency in consequence of any breach of this clause.

18.4. The Contractor shall not, directly or indirectly through intermediaries commit any offence under the Bribery Act 2010 (as amended), in any of its dealings with the Agency.

19. MONITORING AND AUDIT

19.1. The Contract Supervisor may inspect and examine the Services being carried out on the Agency's premises, or elsewhere at any reasonable time. Where the Services are being performed on other than the Agency's premises, reasonable notice to inspect shall be given to the Contractor. The Contractor shall give all such facilities as the Contract Supervisor may reasonably require for such inspection and examination.

20. CONTRACT PRICE

20.1. The Contract Price will be paid by the Agency to the Contractor as amended by any Variations ordered under Condition 10 (Variations).

20.2. In addition to the Contract Price, the Agency will pay to the Contractor such Value Added Tax (if any) as may properly be chargeable at rates ruling at the time of invoice.

21. INVOICING AND PAYMENT

21.1. Invoices shall only be submitted for work already satisfactorily completed, and accompanied by such information as the Contract Supervisor may reasonably require to verify the Contractor's entitlement to payment. Such invoices will be paid in 30 days from receipt by the Agency.

21.2. If any sum is payable under the Contract by the Contractor to the Agency, whether by deduction from the Contract or otherwise, it will be deducted from the next available invoice.

21.3. If the Contractor enters into a sub-contract with a supplier for the purpose of performing its obligations under the Contract, it shall ensure that a provision is included in the sub-contract which requires payment to be made of all sums due from it to the sub-contractor within 30 days from the receipt of a valid invoice.

22. INTELLECTUAL PROPERTY RIGHTS

22.1. All Prior Rights used in connection with the Services shall remain the property of the party introducing them. Details of each party's Prior Rights are set out in the Prior Right Schedule to this contract.

22.2. All Results shall be the property of the Agency.

22.3. The Resulting Rights in any Results, and any interim results shall, from the time they arise, be the property of the Agency and the Agency shall be free, should it

so wish, to apply at its own expense for patent or other protection in respect of the Results or any interim results. The Agency's intention to apply for such patent or other protection shall be notified to the Contractor. Such applications for patents or other registered intellectual property rights shall be filed in the name of the Agency.

Unless otherwise agreed in writing between the Contractor and the Agency, the Contractor hereby:

22.3.1. assigns to the Agency all Resulting Rights

22.3.2. grants the Agency a non-exclusive, non-transferable (save for the purposes of sub-licensing, reorganisation or transfer to a successor body, for the purposes of all the successor body's normal business use), irrevocable , royalty free perpetual licence to the Agency in respect of all the Contractor's Prior Rights necessary in order for the Agency to use or exploit the Resulting Rights.

22.4. The Contractor undertakes to the Agency not to use, exploit or deal with any of the Agency's Prior Rights, other than in the performance of the Contract unless the Contractor has first obtained a written licence from the Agency, in specific terms to do so.

22.5. The Agency undertakes to the Contractor not to use or exploit the Contractor's Prior Rights, save as provided in Condition 22.3.2.

22.6. The Contractor warrants to the Agency that the performance of the Services, the Contractor's Prior Rights and the Results shall not in any way infringe any intellectual property rights of any third party.

22.7. If the Contractor is prevented from carrying out his obligations under the Contract due to any infringement or alleged infringement of any Intellectual Property Rights, the Agency may without prejudice to any other rights and remedies under the Contract, exercise the powers and remedies available to it under Conditions 13 and 14, Termination and Determination respectively.

22.8. The Contractor shall not be liable if such infringement arises from the use of any design, technique or method of working provided by or specified by the Agency.

22.9. The Contractor waives in favour of the Agency its rights to object to derogatory treatment of the Results of the Work and the Contractor also agrees that he will not assert or seek to enforce against the Agency and/or any other person, firm or company any of its moral rights as defined in the Copyright Designs and Patents Act 1988 (as amended) without the prior agreement of the Agency.

22.10. The Contractor shall not be liable for any consequential losses, damage or injuries arising from third party misuse of the Results, of which the Contractor is not aware.

23. WARRANTY

The Contractor warrants that the Services supplied by him will be discharged with reasonable skill, care and diligence.

24. STATUTORY REQUIREMENTS

The Contractor shall fully comply with all relevant statutory requirements in the performance of the Contract, including, but not limited to the giving of all necessary notices and the paying of all fees.

25. ENVIRONMENT, SUSTAINABILITY AND DIVERSITY

25.1. The Contractor in the performance of this Contract should adopt a sound proactive environmental approach, designed to minimise harm to the environment, to conserve energy, water, wood, paper and other resources, reduce waste and phase out the use of single-use plastic, ozone depleting substances and minimise the release of greenhouse gases, volatile organic compounds and other substances damaging to health and/or the environment, and be able to provide proof of so doing to the Agency on demand.

25.2. The Agency is committed to ensuring that workers employed within its supply chains are treated fairly, humanely and equitably. The Agency expects the Contractor to share this commitment and to understand any areas of risk associated with this and work to ensure they are meeting International Labour Standards. The Contractor ensures that it and its sub-contractors and its supply chain:

25.2.1. comply with the provisions of the Modern Slavery Act 2015;

25.2.2. pay staff fair wages (and pays its staff in the UK not less than the Foundation Living Wage Rate); and

25.2.3. Implement fair shift arrangements, providing sufficient gaps between shifts, adequate rest breaks and reasonable shift length, and other best practices for staff welfare and performance.

25.3. The Contractor should support the Agency to achieve its Public Sector Equality Duty by complying with the Agency's policies (as amended from time to time) on Equality, Diversity and Inclusion (EDI). This includes ensuring that the Contractor (and their sub-contractors) in the delivery of its obligations under this Contract:

25.3.1. eliminates discrimination, harassment, victimisation and any other conduct that is prohibited by or under the Equality Act 2010;

25.3.2. advances equality of opportunity between people who share a protected characteristic and those who do not; and

25.3.3. fosters good relations between people who share a protected characteristic and those who do not.

25. PUBLICITY

The Contractor shall not advertise or publicly announce that he is supplying Services or undertaking work for the Agency without the Permission of the Contract Supervisor.

26. LAW

This Contract shall be governed and construed in accordance with the Law, and subject to the jurisdiction of the courts of England.

27. WAIVER

27.1. No delay, neglect or forbearance by the Agency in enforcing any provision of the Contract shall be deemed to be a waiver, or in any other way prejudice the rights of the Agency under the Contract.

27.2. No waiver by the Agency shall be effective unless made in writing.

27.3. No waiver by the Agency of a breach of the Contract shall constitute a waiver of any subsequent breach.

28. ENFORCEABILITY AND SURVIVORSHIP

28.1. If any part of the Contract is found by a court of competent jurisdiction or other competent authority to be invalid or legally unenforceable, that part will be severed from the remainder of the Contract which will continue to be valid and enforceable to the fullest extent permitted by law.

28.2. The following clauses shall survive termination of the Contract, howsoever caused: 13, 14, 15, 22, 23, 24, 27, 29, 30, 31, 32 and 33.

29. DISPUTE RESOLUTION

29.1. All disputes under or in connection with this agreement shall be referred first to negotiators nominated at a suitable and appropriate working level by the Agency and the Contractor.

29.2. If the parties' negotiators are unable to resolve the dispute within a period of forty five days from its being referred to them, the dispute shall be referred at the instance of either party to the parties' respective senior managers or directors (supported as necessary by their advisers).

29.3. If the parties' respective senior managers or directors are unable to resolve the dispute within forty five days the dispute shall be referred to the Centre for Dispute Resolution who shall appoint a mediator and the parties shall then submit to the mediator's supervision of the resolution of the dispute.

29.4. Recourse to this dispute resolution procedure shall be binding on the parties as to submission to the mediation but not as to its outcome. Accordingly all negotiations connected with the dispute shall be conducted in strict confidence and without prejudice to the rights of the parties in any future legal proceedings. Except for any party's right to seek interlocutory relief in the courts, no party may commence other legal proceedings under the jurisdiction of the courts or any other form of arbitration until forty five days after the appointment of the mediator.

29.5. If, with the assistance of the mediator, the parties reach a settlement, such settlement shall be put in writing and, once signed by a duly authorised representative of each of the parties, shall remain binding on the parties.

29.6. The parties shall bear their own legal costs of this dispute resolution procedure, but the costs and expenses of mediation shall be borne by the parties equally.

29.7. Any of the time limits in Conditions 30 may be extended by mutual agreement. Such agreed extension shall not prejudice the right of either party to proceed to the next stage of resolution.

30. GENERAL

30.1. Neither party to the Contract will be liable to the other for any delay in performing or failing to perform its obligations (other than a payment obligation) under the Contract because of any cause outside its reasonable control. Such delay or failure will not constitute a breach of the Contract and the time for performance of the affected obligation will be extended by a reasonable period.

30.2. The Contract contains the whole agreement between the parties and supersedes all previous communications, representations and arrangements, written or oral. It is accepted that the Contract has not been entered into on the basis of any representations that are not expressly contained in the Contract.

31. FREEDOM OF INFORMATION ACT

31.1. The Agency is committed to open government and to meeting its responsibilities under the Freedom of Information Act 2000 (as amended) ('Act') and the Environmental Information Regulations 2004 (as amended) (Regulations').

31.2. The Contractor agrees that:

31.2.1. All information submitted to the Agency may need to be disclosed by the Agency in response to a request under the Act or the Regulations; and

31.2.2. The Agency may include information submitted (in whole or in part) in the publication scheme which it maintains under the Act or publish the Contract, including from time to time agreed changes to the Contract, to the public.

31.3. If the Contractor considers that any of the information included in its tender, or that it has submitted to the Agency or that is otherwise contained in the Contract, is commercially sensitive, it shall identify and explain (in broad terms) what harm may result from disclosure if a request is received, and the time period applicable to that sensitivity. The Contractor acknowledges that if it has indicated that information is commercially sensitive, such information may still be required to be disclosed by the Agency under the Act or the Regulations. The receipt of any material marked 'confidential' or equivalent by the Agency shall not be deemed to infer that the Agency agrees any duty of confidentiality by virtue of that marking.

32. DATA PROTECTION

32.1. In the event that the Contract requires data to be processed within the meaning of the Data Protection Legislation the Data Protection Schedule shall be completed by the Parties and provisions and definitions therein shall apply and bind the Parties as part of this Contract.

Appendix to Conditions Services

[redacted] [redacted]
Title: Hertfordshire Chalk Groundwater Model Phase 2

		Condition
1	Contract Supervisor	3

[redacted]

2 Contractor

Stantec UK Limited

[redacted]

3	Completion	6

Contract Start Date 19 August 2022

Contract End Date 05 June 2023

The Agency will enter into the Contract on the basis that it requires the Services for the Initial Contract Period. However, in entering into the Contract, both Parties acknowledge that circumstances may prevent the Agency from fulfilling the funding requirements of the Contract for the Initial Contract Period. In these circumstances, the Parties undertake to discuss the future scope of the Contract before the end of February 2023.

4	Delivery	11

Address:-
Insert delivery address if different to above

5	Insurance	17

[redacted]

16

SCHEDULE 1 – SPECIFICATION

Hertfordshire Chalk Groundwater Model Phase 2 Revised Conceptual

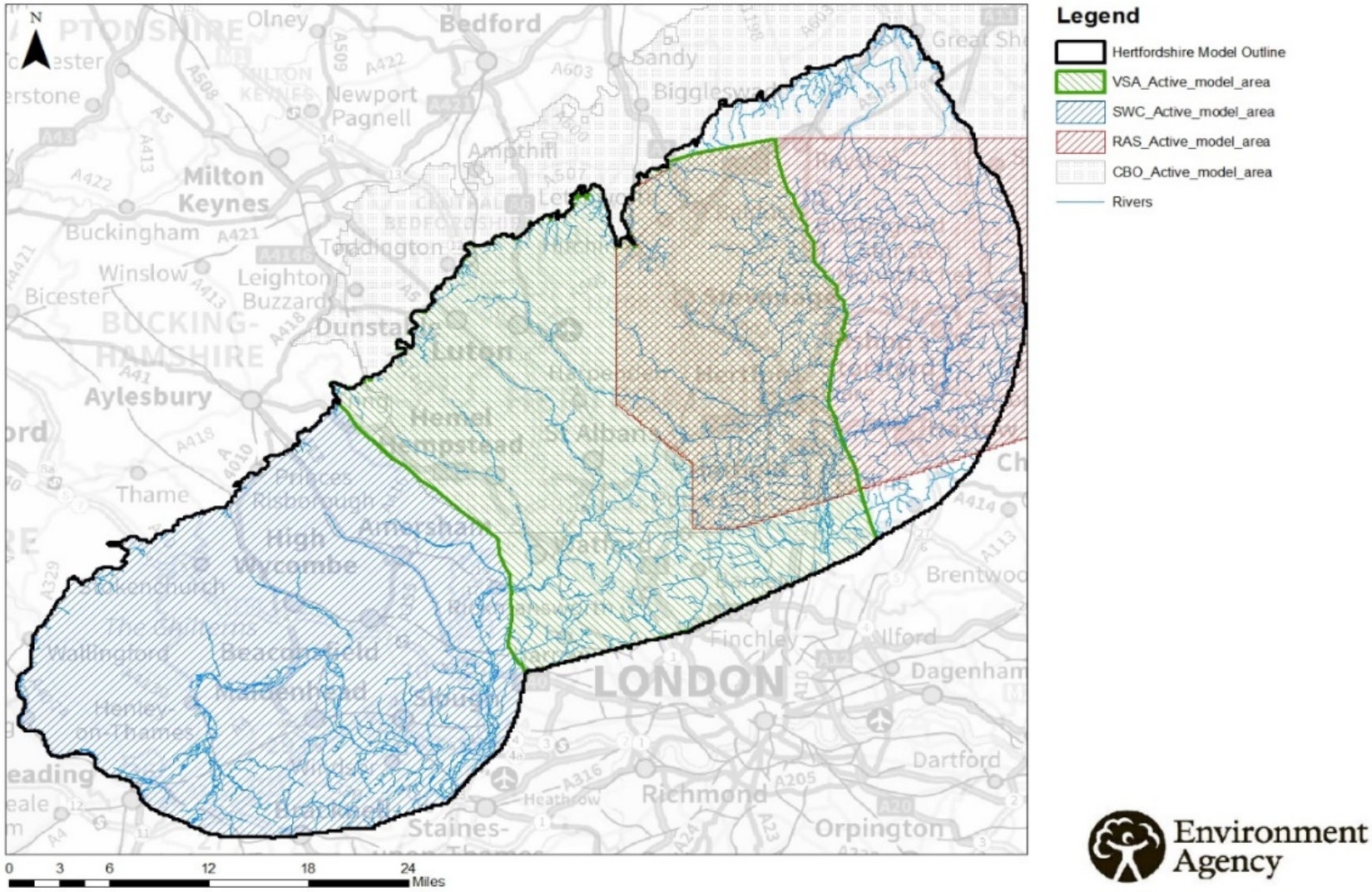
1.1. Background History & Objectives for Phase 2

1.1.1. Overview of Hertfordshire Chalk Groundwater Model

The Hertfordshire Chalk Groundwater Model (HCGM) represents 4060km^2 of the Chalk aquifer to the north-east of London, including the county of Hertfordshire, parts of Buckinghamshire, Bedfordshire, Oxfordshire, Essex, Cambridgeshire, and London. The model represents a number of Chalk streams that are situated in the Wye, Colne and Lee catchments. These catchments have been previously assessed to suffer from large scale over abstraction through the Catchment Abstraction Management Strategy (CAMS) methodology. This area has a high level of public interest and challenge to existing abstraction management (and management tools) particularly in relation to the protection of Chalk Streams. Other pressures include water quality issues such as Bromate contamination and large scale infrastructure projects such as High Speed Rail 2.

The Hertfordshire Chalk Groundwater Model (HCGM) was built by Mott MacDonald between 2017 and 2019. The focus of the HCGM build was to join three existing groundwater models; Vale of St Albans (VSA), Rib-Ash-Stort (RAS) and South West Chilterns (SWC), which covered the area into one single model. Additional input from the Cam, Bedford Ouse (CBO) groundwater model was used where the newly defined boundary of the HCGM extended into the CBO model area. The model is currently used for groundwater management for surface water catchments in the Agency's Hertfordshire and North London (HNL) and Thames areas. Surface water catchments for the Cambridgeshire and Bedfordshire (CAMBED) Area are assessed using the CBO model, which at the time of writing runs up to March 2020.

The objective of this model merger was to overcome the difficulties in assessing the impact of abstractions where such abstractions were located close to model boundaries. Other exploratory work considered in the model build included consideration of how to represent the chalk as a layered system. Overall, in areas where the foundation models overlap and model parameters needed to be merged, the VSA model was used for model parameters in preference to the RAS model, which in turn was given a priority over the CBO model.
Currently the model period is being extended from 2015 to 2020. This phase of works (Phase 1) will also migrate rainfall and potential evaporation datasets to new gridded datasets (Had-UK and EA-PET) as well as expanding existing calibration datasets from a review of Environment Agency and third-party data. Initial deliverables that will be relevant for this phase of works are anticipated to be delivered during the summer of 2022.
Both the model extent map and basic details of the model configuration are presented below.



Environment Agency

Figure 1 Conceptual Model Study Area

Summary of HCGM

Item	Notes
Period	Recharge Model: 1st January 1962 to 31st December 2015 MODFLOW model: 1st January 1968 to 31st December 2015 Currently the model period is being extended to December 2020.
Stress Periods	Number of Stress Periods: 1728. Each month covers 3 stress periods of approx. 10 days, with the last stress period adjusting the month length. Each stress period has one time step. The number of stress periods will increase with the current model update.
Recharge Model	4R Model
Model Code	MODFLOW96-VKD (MF96VKDportable.exe)
Grid	435 Rows x 500 Columns, 200 m x 200 m cell size
Layers	Layer 1 – Chalk above Chalk Rock Layer 2 – Chalk below Chalk Rock
Boundary Conditions	South East General Head Boundary to simulate flows into the London Basin area; Southerly Constant Head boundary within confined Chalk of the south west Chilterns area; Westerly General Head boundary representing River Thames as a boundary condition; and South Westerly River boundary mimicking groundwater flow from the Kennet area into the model area.
Aquifer Parameters	Extracted and retained from foundation models, with minor refinement to base hydraulic conductivity where required. Vertical Conductivity with Depth (VKD) is only active within the SWC and CBO component model areas. During the VSA model build, it was concluded that comparison of simulated and observed heads and flows during model refinement did not indicate that incorporating VKD would have improved the calibration. Pilot refinement runs for the RAS build utilising VKD did not indicate an improvement in model calibration at the time of the model build. As such, within the HCGM, the VSA and RAS sections of the models do not have a conductivity gradient nor elevation change in K, with base and max hydraulic conductivity set to be the same. Specific yield (Sy) parameters retained as per foundation models, and are the same for Layer 1 and 2, with some calibration refinement undertaken such as Sy increased to 0.1 in River Lee, Mimram, Beane, Rib, Ash and Stort. Confined storage based on foundation models for Layer 1. Layer 2 was set to 1xE-4 where confined by Layer 1. It had been attempted to implement the coincident storage layer approach used in the VSA model, which would simulate matrix storage processes within the Chalk. However, this was removed as its absence improved flows and groundwater levels in most catchments. The area around the southern boundary of the confined catchment of the River Colne was adversely affected by the removal and so to compensate the VSA matrix storage value of 2x1E-4 was used in this location.
Standard Runs	Historic (Herts116) Naturalised (Herts117) Recent Actual (Herts118) Fully Licenced (Herts119) These are currently in the process of being updated and are likely to be superseded at the time of the start of Phase 2.

Reporting associated with the model build of the HCGM or any of its foundation models is available on the following Sharefile page:
https://ea.sharefile.com/d-s9fa844ad72a34c56ab546538256370ff

Files will only be available for 30 days from the issue of this ITT.

1.1.2. Overview of Future Project Phasing

The Agency envisages that the long term project for upgrading the HCGM will comprise the following four phases of work:

Phase	Overview of Phase and anticipated tasks
Phase 1: Update of Current Historic model and scenarios (Year 1)	**Ongoing works** Phase 1 is currently being delivered. It will extend the current model period and enhance or change existing modelling datasets. This is an important foundation for the works scheduled in Phase 2 and Phase 3. Phase 1 tasks include: • Changing and updating Climate Datasets, refining the model where deemed necessary by the project working group • Compile and update groundwater level, gauging station and spot flow, incorporating new sites. • Borehole Records Compilation for abstractions and observation borehole sites • Reviewing and updating abstraction datasets and reviewing discharges to also update • Characterising and Updating Discharges • Review of impacts of Canal Systems • Updating MODFLOW-96 model files and running the historic model • Review model performance after historic run update and need for optional refinement • Run standard scenarios • Run and assess groundwater emergence scenarios • NGMS Configuration (MODFLOW-96) • Formulation of Phase 1 Report and Delivery of MODFLOW-96 Files It is anticipated that the processing of relevant datasets and update of the model period will be complete in the summer of 2022. There may be a period of overlap for Phase 2 task and later Phase 1 tasks such as review of model performance and possible refinement works.
Phase 2: Formulation of Revised Conceptual Model (Year 2)	This phase will refresh the existing foundation conceptual models and merge them into a single conceptual model that will then be updated (Phase 2). This will then support proposals for further development of the model in Phase 3. Phase 2 will involve the following tasks: • Merger of existing foundation models (SWC, VSA, LM) in to one single conceptual model • Collation of new relevant datasets • Updated Literature Review • Initial Assessment of Merged Model Conceptual Model Uncertainty • Topography review • Mains and sewage leakage and surcharging Analysis • Groundwater contouring and groundwater catchment delineation • Bypass recharge review • Review of influence of superficial deposits • Review of unsaturated zone processes • Review of recharge model parameters • Geological Model Development • Flowing and Artesian Features Analysis • Aquifer Properties Update • Karstic Features Update • Review of Evidence for Hydrogeological Layering • Review of Impacts of Abstraction Investigations and Changes • Update of conceptual model water balance • Review of model boundary conditions • Update of surface water/groundwater conceptual Model • Proposals for development of numerical model in MODFLOW 6 • Formulation of Phase 2 Report

Phase	Overview of Phase and anticipated tasks
Phase 3: Development and Refinement of the Historical Model in MODFLOW 6 (Year 3)	Depending on the conclusions of Phase 2, this phase will be the conversion of the modelling code to the current MODFLOW code, MODFLOW 6, and refines reflect updated conceptual understanding. Phase 3 will likely include the following tasks: • Construction of MODFLOW 6 Model • Model Refinement • Sensitivity Analysis • Re-run of Standard Scenarios • NGMS Configuration (MODFLOW 6) • Formulation of Phase 3 Report
Phase 4: Training and User Support (Year 4)	Once the MODFLOW 6 model has been completed in Phase 3, a period of training and model support will need to be provided. This will likely include the follow tasks: • Compilation of a User Manual • Provision of a Model Training Course • Provision of Model Support

This current contract is for the second phase of works (Phase 2) only and not for the previous Phase 1 or subsequent Phases 3 and 4. These subsequent phases are to be hosted over a number of financial years subject to Agency funding. The likely tasks have been presented above as they hold relevance to some of the tasks being carried out under Phase 2.

1.2. Aims and Objectives of the Project

1.2.1. Overview of Objectives

Two of the HCGM foundation models, the SWC and VSA, were supported by a conceptual model. The RAS does not have an independent conceptual model but was covered in part by the conceptual model developed for the Lee-Mimram Project in the early 2000's. This in itself is light on conceptualisation of bounding catchments of the Ash and Stort Rivers, as these were not targeted catchments at the time of the model build. Currently, the HCGM does not have a standalone conceptual model or report and therefore hangs off the founding conceptual models of the foundation models. The 2019 HCGM model report provides a light nine-page conceptual model summary, though does not provide the full depth of the individual conceptual models available in the earlier reports.

Over time, new datasets and understanding have become available as well as the presentation of new conceptual ideas behind how the Chalk catchments of the HCGM behave. As such there is a need to consolidate and update the original conceptual models of the foundation models into one single HCGM conceptual model. As such, this phase will refresh the existing foundation conceptual models and merge them into a single conceptual model that will then be updated (Phase 2). This will then support proposals for further development of the model in Phase 3.

The objectives of Phase 2 will be:

- To refresh the existing foundation conceptual models and merge them into a single conceptual model

- To gather and review necessary datasets and literature to support merged conceptual model update, reporting on initial model conceptual model uncertainty and data gaps

- To expand the conceptual model where new data and literature is available for several concepts such as influence of superficial deposits, karstic development, evidence of hydrogeological layering within the Chalk

- To report on the updated conceptual model and make recommendations for development and refinement of numerical model in MODFLOW 6 (Phase 3)

Further details expanding on the requirements of the individual tasks is presented in the work scope summary.

1.2.2. Data Available for Phase 2

The following datasets will be available either at the start of the project or as the project develops. This is not an exhaustive list, and other datasets may be identified as the project progresses. Where data is to be provided by a source external to the Agency and the Consultant, then this will be purchased by the Consultant. The Consultant shall make provisions within their tender proposal for the acquisition of data. In any event, the Consultant is reminded that any data obtained as part of this Task shall remain the exclusive property of the Agency.

Data Source	Comments and Constraints
HCGM Groundwater Model Files	The latest version of the groundwater model and utilities will be packaged up and provided by the South East Groundwater Modelling Unit. When the final model from Phase 1 has been delivered this will also be provided. Conceptual Models for the foundation models will be supplied. Foundation numerical modelling files for the foundation models can also be supplied.
Abstraction details and returns	Abstraction datasets from 1970 to 2020 have been compiled and processed for Phase 1 and will have been reviewed by the Water Companies. This will be provided when finalised at the end of Phase 1.
History of large abstraction changes	After the model period has been extended, a review of how the model captures hydrogeological changes in response to large abstraction changes and observed datasets should be undertaken, especially those that have been implemented between 2015 and 2020. Therefore, a log of major reductions or increases in abstractions within the model area will be provided.
Discharges	Daily effluent discharge totals for STW within the model area have been compiled and reviewed as part of Phase 1 and can be provided at the start of the project along with statistical analysis that has been undertaken for characterising the discharges within the HCGM.
Groundwater Levels	A large volume of groundwater level monitoring over the last ten years has been collected by the Environment Agency, the Water Companies under various AMP/RSA/WINEP investigations and other third parties such as High Speed 2. This has been compiled for Phase 1 and been reviewed for the purposes of selecting new calibration targets within the model area.
River Flows	Mean daily flows for the full period of the gauging station record has been extracted from WISKI and provided for Phase 1 for model calibration. This can be made available at the start of the study.
Spot flow data	Both Environment Agency and Water Company spot flow data will have been compiled for Phase 1 and will be made available at the start of the study.
River Levels	To aid conceptualisation of groundwater – surface water interactions and groundwater contouring, an export of all river level data surveyed to mAOD can be provide from the EA's WISKI archive.
Rainfall	HADUK gridded data will have been compiled for Phase 1 and will be available at the start of the project for the period for the 4R model (1965 to 2020). Daily

Data Source	Comments and Constraints
	rain gauge readings for rainfall stations present in the model area will be provided where available as a WISKI export.
Potential Evaporation	EA- Potential Evapotranspiration (PET) gridded data will have been compiled for Phase 1 and will cover the 4R model period of 1965 to 1970.
Springs and Sources	Thames area and HNL area datasets are available on springs and sources surveys. Typically, these are monthly field visits that record (qualitative) flow and non-flowing sections of the ephemeral stretches of local water courses and typically cover the last fifteen years of the model period.
Borehole Logs	One of the deliverables for Phase 1 is a model wide dataset of borehole logs for observation boreholes and abstraction sites to identify installation details, depth and geology. This dataset will be made available once delivered. The EA has compiled a number of datasets to support this work which can be made available: • Well Cards • Borehole Wells and Springs database export • Borehole logs for EA OBH where availed Within the EA Thames area, recent project work has been completed on compiling, interpreting and coding BGS borehole logs within large sections of the SWC model area to support long term geological mapping and modelling works within the Wye catchments. Information on borehole logs, adit locations and geophysics records for Water Company abstraction and observation boreholes may be available.
Pumping Test Reports and Aquifer Properties	In preparation of Phase 1, EA records were reviewed to compile pumping test reports to extract borehole logs where available. These have been centralised and will be made available at the start of the project. Water Companies may have additional reports to compliment this dataset. During this review, where aquifer properties were reported, these were tabulated in excel and will be made available. Copies of the aquifer properties manual database will also be made available.
Geophysics	There is ongoing work on compiling digital logs collected by the Agency since the 1970's and there should be a digital dataset available for Phase 2. Geophysical logs that are present in the model area will be provided at project start. This may be complimented by Geophysical logs collected by the Water Companies.
Geological Mapping and Modelling	For the conceptual model update and later MODFLOW6 build works, geological mapping datasets collected by the British Geological Survey will be available for the following catchments as a single composite product at the start of the project: • Ver • Gade • Chess • Mimram • Beane • Misbourne There may also be geological mapping available for the Upper Cam, as commissioned by the EA's Anglian region. Thames area are commissioning mapping works within the Wye catchment, but this will not be available until the end of 2024. A copy of the British Geological Karst Database will also be available for the project, which will map known karstic features in the model area.
Topographic Datasets	River channel survey data - A review of what is available through the EA's National Survey Archive indicates that some of the main rivers within the model, there are linear survey data of bed and river levels for rivers in the model area. The format of this data is variable, from image pdf files to .dwg and text file data. There is a new high resolution EA Digital Terrain Model (DTM) dataset which has recently been used for the Wessex Basin model and other projects. An export of this for the HCGM will be made available.

Data Source	Comments and Constraints
Groundwater Quality Data	Groundwater quality data collected from the Environment Agency's quality network could also be compiled for the project for conceptual model works where required.
Geographical Information Systems (GIS) Datasets	In order to aid the conceptual model update a number of datasets can be compiled, both from the Environment Agency's I drive, such as: • British Geological Survey mapping • Land use datasets (Land Cover Map [LCM] for various years) • Soils data (National Soil Resources Institute [NSRI]) • Population Datasets And datasets from local area drives: • Spring Locations • Artesian boreholes locations Other GIS datasets will be listed as the project develops.
Mains and Sewage Networks	From correspondence with Water Companies within the model area, some leakage rates over time for the model area have been compiled. Though there are GIS datasets within the Environment Agency on the network coverage and catchments that sewerage is directed to, there is limited information within the Environment Agency on the condition of that network, which will require correspondence with Sewerage Undertakers in the model area (Thames Water for the SWC, VSA and RAS sections of the model, Anglian Water for the CBO section of the model) regarding datasets on sewage surcharging and leakage that could be useful to explore this conceptual uncertainty.

1.3. Work scope summary

Task	Purpose	Overview	Outcomes
Task 1 Foundation Model Conceptual Model Merger	This task will need to bring together the foundation model conceptual reports in to one conceptual model that can be easily updated following task 2 onwards. This will enable model users to readily access and update the conceptual model where required as this study and future studies progress.	The foundation model conceptual reports (SWC, VSA, Lee-Mimram) will need to be reviewed and merged into a single HCGM conceptual model report. Electronic copies of these will be provided at the project start. It is not intended that this will be a direct merger of the reporting text, figures and appendices but more of a centralisation of core conceptual understanding and historic analysis that can then be built upon and updated where necessary. The reporting structure should be that enough of the foundation models are presented that there should be limited instances in the future where the foundation conceptual models need to be referred to directly to gather more insight on conceptual processes.	Structure of the model reporting should be designed at this stage to be easily updated for future model updates when new data may change conceptual understanding, and therefore should be treated as a live document. For example, the report may need to be updated after the construction and refinement of the MODFLOW 6 model in Phase 3 if new conceptual understanding is achieved. The first draft version of the report will be delivered at the end of Task 4. This will then be used as template for the final version to be delivered under Task 22.

Task	Purpose	Overview	Outcomes
Task 2 New Dataset Collation	The study area is defined in Figure 1 and the main study period will be from 1965 to 2020. Data collection and collation should concentrate on the study area and the time period 1965 to 2020 although it may be necessary to obtain some information for a larger area and cover a longer time period.	The collation of geological, hydrological and hydrogeological information available and relevant to the HCGM and study period will primarily be the responsibility of the Consultant, though Agency and Water Company staff will assist with the collation of in-house data where the task does not impinge on their other work commitments. Where data is available from the Agency, then this will be provided at no additional cost to the Consultant. In its proposal the Consultant is expected to demonstrate an awareness of the various issues that are likely to arise during this extensive data search. Any possible additional sources of data should also be mentioned (but not costed) in the proposal. Where appropriate the Consultant will enter or import the raw data into Excel compatible spreadsheets or access database to enable later presentation of the data or further analysis. These datasets should be passed over to the Agency at the end of the project. A workshop should be held at the start of this task with members of the project steering group to help identify datasets that may be available.	The Consultant will be expected to have acquired, inspected and quality assured the data covering the above stated study period. Ownership of datasets supplied (for example, data relating to infrastructure projects such as HS2 are not Agency datasets) will be clearly identified and reporting made of any processing undertaken and resultant data accuracy. Digital copies of processed datasets should be supplied as digital appendices to the conceptual model. This will ensure that data is not lost in future updates of the model and can be readily updated in the future if required.

Task	Purpose	Overview	Outcomes
Task 3 Updated Literature Review	Information about the study area is available in reports and other forms of literature associated with the study area. The literature review is to provide a comprehensive summary of the contents of all the relevant literature. Not only is the review important for the current project but it will also provide a valuable long-term resource for the Agency.	A list of known references is given in Appendix 1. This list is not meant to be all-inclusive, and the Consultant will be expected to examine other reports and papers as appropriate. Sources of reference material include papers in published Journals, Geological Memoirs, Water Company and Agency reports (and those of the previous organizations), University theses and reports, reports of contractors, maps (geological, hydrogeological, topographical, soils, mineral assessments, etc.), computer programs etc. The main tasks in a literature review include: a. Updating the existing list of all the available literature b. Preparing a brief summary of the contents of new items c. For references which have a particular relevance to the current study; the important information or insights should be presented in the main text of the Phase 2 report (Task 22). d. Critical yet constructive comments should be provided about the important contributions.	A brief summary of each key reference will be presented by the Consultant as an Appendix to the first draft (Task 4) and final Phase 2 report (Task 22).

Task	Purpose	Overview	Outcomes
Task 4 Initial ***Assessment of Merged Model Conceptual Model Uncertainty***	After the merger of conceptual model and collation of datasets, an understanding as to if old conceptual model uncertainty can be improved upon from new data and studies that were not available at the time of the original conceptual model development. This will steer which of Task 5 to Task 21 can be progressed during the study and which may need to be put on hold until further data is available.	The draft merged conceptual model with compiled datasets and literature review will be used as a foundation to explore key uncertainties and data gaps that present themselves with respect to Task 5 to Task 21. This should take the form of a draft merged conceptual model from Tasks 1 to 3 and overarching uncertainty technical note identify conceptual model topics that can be expanded on from the foundation conceptual models or where no new data is available and therefore need to be explored under a separate data after new data is collected.	A workshop should be held at this stage with the project review group to identify conceptual model topics that can be expanded on from the foundation conceptual models or no new data is available and therefore need to be parked until new data is collected. The draft merged conceptual model and uncertainty technical note will need to be issued at least two weeks before this workshop. The outcomes of the workshop will then steer the scope of what can be achieved within the conceptual model update and subsequent tasks.

Task	Purpose	Overview	Outcomes
Task 5 Topography Review	There are newer DTM datasets and topographic information that have become available since the development of the HCGM and its foundation models. Existing top of model surfaces within the HCGM use old OS panorama DTM data that now shows differences with newer datasets. It has also been found that a 100 m offset has been accidentally applied to the SWC top of model topographic surface that may need correcting in the future. Therefore a review of topographic dataset to inform both conceptual and numerical model is required.	There is a new high resolution EA DTM dataset which has recently been used for other Agency models such as the Wessex Basin model. The Consultant will review this data to determine if this provides more benefits than the current EA LiDAR dataset used to define the topography of the current model and could be utilised for the MODFLOW 6 build. Current stream file elevations have been based on LiDAR data, which is a change from the foundation models, which used a combination of OS DTM data and river channel survey data. Sample analysis for a collection of catchments where there is detailed river channel survey data will be undertaken by the Consultant to better understand the resolution of stream bed elevations and stream stage, and how this compares to the resolution of existing LiDAR and EA DTM datasets. If stream survey data demonstrates a better dataset for setting stream elevations, then this method should be applied to create a dataset of main rivers elevations within the Thames catchments.	Conclusions from this task will then enable decisions to be made as to the dataset of choice for updating and setting topographic levels for the geological model (Task 12), recharge model and groundwater model as well as stream bed and stage elevations over the model extent and aid further conceptual analysis. The merged conceptual model report will have a section on topographic datasets.

Task	Purpose	Overview	Outcomes
Task 6 Mains and Sewage Leakage or Surcharging Analysis	Within the current and foundation models, mains leakage is a constant rate within the recharge model, where it is in reality likely to have changed over time. In addition, leakage from the sewer network, which is likely in large urban areas within parts of the model domain, are unaccounted for within the recharge model. Works are needed to better understand these components within model water balance and if they should be characterised differently within the recharge model.	From new datasets currently being sought from the Water Companies, it should be possible to better update the current mains leakage distribution and if there is merit in making it variable over time. Recent amendments to the 4R code has been implemented for the London Basin Model (LBM). It may be possible to implement this the existing HCGM 4R model too. Sewers themselves can influence local recharge and runoff. Sewers often have open slots or cracks and flaws although the natural build-up of silt tends to stop leakage to the ground. However, as groundwater levels rise, the sewers can be surcharged allowing a rapid outflow of groundwater to rivers. This only happens where the water table is close to the surface but may mean that at times of high groundwater levels groundwater is released to streams via STW. The conceptual model will therefore need to utilise existing data sets (effluent returns, sewage catchment, exports and imports, topography and groundwater levels) to explore this further and if it should be embedded into the HCGM recharge model in some form.	The merged conceptual model report will have a section on mains and sewage leakage analysis and recommendations for characterisation within the HCGM recharge model.

Task	Purpose	Overview	Outcomes
Task 7 Groundwater Contouring and Groundwater Catchment Delineation	Insights into the long term and short term response of the aquifer to inflows and outflows of the aquifer system can be gained from an examination of the groundwater head hydrographs. Information can also be gained about the horizontal and vertical flow components. The purpose of this task is to examine all the groundwater head information to assist in the updating of the merged conceptual model and to provide a data base against which the adequacy of the groundwater model can be assessed. Many of the foundation conceptual models had uncertainty relating to the distribution of groundwater flow between catchments. The quantification of boundary flows had been highlighted as a particular issue within the St. Albans study area due to the fact that the area does not follow defined hydrological and hydrogeological boundaries. Another example is that it was uncertain what caused the groundwater divide of the Chess to move further south at high groundwater levels. There are more OBHs now available than at the time of the foundation conceptual models that could aid this analysis and provide more robust local catchment water balance estimates.	All groundwater head hydrographs shall be inspected and a full understanding of the hydrograph will be presented. Each description should indicate the quality of record as well as identify and explain influences and significant variations to the hydrograph, especially in terms of seasonal and climatic changes in rainfall, abstraction and aquifer properties (e.g. transmissivity, storage). The hydrograph shall be quality checked and any anomalies shall be corrected or removed following agreement with the Agency Project Manager. Each hydrograph shall be compared to adjacent hydrographs to identify any anomalies or inconsistencies. The description for each hydrograph shall also detail a summary of this grouped comparison. In assessing the significance of the hydrographs, a description should be presented of horizontal and vertical flow patterns and hydraulic gradients Whichever technique is selected for contouring, the Consultant shall take into account the effect of ground features on water levels (including ground surface, confining areas, rivers, springs etc.); data points should be presented on all contour diagrams. Groundwater level datasets and OBHs installations should be reviewed to determine if contoured datasets for differing Chalk formations could be developed and implemented accordingly.	Contours for various times throughout the refinement period shall be prepared. At a minimum all contours for the following periods shall be included and supplied as 1:50,000 maps and ArcGIS shapefiles:- • contours for the climatic wettest year; • contours for the climatic driest year; and • contours for an average year The Consultant shall provide an audit of any changes made to the data together with reasons for the changes. The audit shall document all Agency Project Manager approvals relating to the correction or removal of data These datasets coupled with topographic datasets should then be used to delineate: • use to determine depth to groundwater for variable conditions and therefore unsaturated zone thickness variation • difference between high and low groundwater levels • groundwater catchments and groundwater divides and how these change seasonally Maps and reporting of these contours will be included in the merged conceptual model report.

Task	Purpose	Overview	Outcomes
Task 8 Bypass Recharge Review	Bypass recharge is currently not represented in the HCGM, whereas it was included in the foundation models, though all conceptual models identified this as an area of uncertainty due to limited high resolution groundwater level analysis. Further investigation into the presence of bypass flow mechanisms across the study area and potential implementation via the recharge model is needed.	Logger data collected by the Environment Agency and Water Companies and other projects such as High Speed 2 will need to be reviewed to identify groundwater level response evidence for bypass recharge. Other relevant datasets include high frequency rain gauge records available within the model area and information on karstic features and geophysics gathered from the collection of new datasets (see Task 2).	The merged conceptual model will have a section exploring the evidence for Bypass recharge and recommendations as to if and how this should be represented in the MODFLOW 6 model.

Task	Purpose	Overview	Outcomes
Task 9 Influence of Superficial Deposits	Key uncertainties within the foundation conceptual models as well as uncertainties raised from recent model use. This task will explore if new data helps to resolve or lessen these uncertainties.	Further data collection and understanding regarding the role of superficial deposits with respect to recharge mechanisms and groundwater flow within the model area is required. Key superficial units to explore include: • Clay-with-Flints and their influence on recharge mechanisms • Till – Limited understanding in terms of where it might be connected to the underlying Chalk. Glacial paleochannels may also have a bearing on groundwater and surface water interactions • Gravel Aquifers - This has a bearing on estimates such as interflow and conceptually where they may be connected to the Chalk as well as storage contributions. This has a bearing on water quality study work on subject such as Bromate contamination as well as water resource impacts where gravels could be providing additional support to river baseflow during drying summers. Currently there is limited information on groundwater levels and thickness of superficial deposits. Updated geological mapping of the HCGM catchments undertaken by the BGS may in some parts of the model help address deposit thickness. A review of logger datasets may aid further understanding where Chalk sites are located near specific drift deposits to see evidence of run-off recharge.	The merged conceptual model will have a section exploring the influence of superficial deposits on recharge and groundwater flows. This review of superficial deposits will aid decision making as to if all or some of the superficial deposits should remain within the recharge model or be set as a new layer within the future MODFLOW model.

Task	Purpose	Overview	Outcomes
Task 10 Unsaturated Zone Processes	The HCGM applies a delayed recharge process to account for recharge delay through the unsaturated zone. There is currently limited available reporting on how the delayed recharge zones had been set up, or why the parameters have been set to what they are in the post processing, which needs to be better understood and supported by the conceptual model.	With new groundwater contouring and review of groundwater level data from Task 7, both in terms of dips and logger data, it may be possible to build a more detailed understanding of processes occurring within the unsaturated zone and how these are related to mechanisms such as drift cover, unsaturated zone thickness variability and geological formations encountered within the unsaturated zone. Further analysis should be undertaken to understand these processes better and provide a justified framework as to delayed recharge parameterisation.	The merged conceptual model will have a section exploring the processes occurring within the unsaturated zone of the Chalk and recommendations for changes in how it is represented in the HCGM.
Task 11 Recharge Model Parameters Review	An important part of the study is to better understand and quantify the runoff and recharge processes so that the total catchment response (both surface water and groundwater) is represented. At the time of model reporting of the foundation models, sensitivity analysis of some of the foundation recharge models demonstrated that some recharge model parameters may have been miss-set, in particular the SWC. Currently recharge modelling work on the Ver-Gade-Chess model has presented a number of new datasets relating to land use that could be utilised for the MODFLOW 6 model. A review of recharge parameters is therefore needed.	The parameters of the current 4R recharge model will be reviewed, with the exception of rainfall and PE datasets as these will have been replaced in Phase1, to determine if these should be updated or replaced with newer datasets, drawing from conclusions made on other projects such as the Ver-Gade-Chess model and any refinement work carried out on the HCGM during Phase 1. This will also need to consider if parameters associated with soils and land-use datasets need to be adjusted from their current characterisation.	The merged conceptual model will have a section exploring the current recharge model parameters and recommendations for changes in how it is represented in the HCGM. These will be implemented within the recharge model and explored further under the sensitivity analysis proposed in Phase 3.

Task 12 Geological Mapping and Model Development	The Consultant shall utilise the geological resources available for the project from task 2 (lithological logs, geological and topographical maps, memoirs and existing geological models commissioned by the EA) to develop an understanding of the geology through the development of a model wide geological model and to define the hydrogeological units. Modelling will need to capture the geological sequence of both superficial and bedrock geology exposed at surface down to the top of the Gault Clay Formation.	The conceptual model should review new geological data, mapping and modelling works to expand existing conceptual understanding of geology within the model area. The intention would then be to build a geological model that utilises new geological dataset (BGS mapping projects commissioned by the EA, HS2 ground investigations, information on OBH and abstractions, geophysical logs where available and relevant etc.). This review should then highlight any new structures that may have a bearing on the hydrogeology of the area. This model will aid analysis of later sections of the conceptual model such as location of flowing features and analysis of vertical hydraulic gradients. The borehole records or geological surfaces acquired by the Consultant during task 2 should be entered into a database or geological modelling package to enable visualisation of the Bedrock and Superficial deposits in aerial plan and cross-section. (This work is considered to be of high priority and will form the main basis for assigning the various layers in the later numerical model.) The Agency should be consulted as to the database or modelling software format required to ensure compatibility with any existing database. The resulting data set must be made available to the Agency at the end of the project. The geological model should be set up in such away it is easily updateable as new datasets and mapping work from organisations such as the BGS become available, or clear recommendations as to the format that new datasets need to be received to enable a	During this task the Consultant shall produce a geological model and ArcGIS raster and shapefiles of that model that provides the following: 1. Contours of the base of the relevant geological formations in the model area; 2. Contours of the top of the relevant geological formations in the model area; 3. Contours of the thickness of the of the relevant geological formations in the model area; 4. Contours of the thickness of separate drift deposits - where possible (e.g. boulder clay, fluvial sands/gravels); 5. Solid and drift geology maps for the study area; 6. A sufficient number of geological cross-sections to adequately understand the aquifer system. The Consultant shall produce 1:50,000 scale maps with Ordnance Survey background information as well as cross sections with a horizontal scale of I:50,000 to show the above geological modelling interpretations. All map overlay images will be maintained in .SHP or raster format for later use by the Agency in ArcGIS. Both the maps and cross-sections shall show the same current BGS classification for colouring, ornamentation and stratigraphy. The maps shall post the lithological log sites and the corresponding depth/height value used in the interpretation, while the cross-sections shall show all lithological logs with either full or annotated descriptions. The Consultant shall produce a 1:50,000 scaled map showing the location of all cross-sections, clearly indicating which lithological logs were used in each cross-section. The scale

Task	Purpose	Overview	Outcomes
		smooth update of the geological model. The Consultant will be required to explain how the issue of limited or conflicting evidence will be resolved.	of the maps will be reviewed to ensure that the information illustrated is visible and of a high quality.

Task	Purpose	Overview	Outcomes
Task 13 Flowing and Artesian Features Analysis	There are a number of known artesian features within the HGCM study area that were not explored within the original foundation models. Higher resolution geological formation mapping and modelling since the original conceptual model means that more work may be possible relating flowing features (springs, fissures at depth) to geological features to gain enhanced understanding of geological controls on flowing features.	Flowing features such as: • springs at surface • artesian boreholes • flowing fissures and fractures observed at depth within geophysical borehole logs will be mapped as to their location and topographic depth to mAOD within the model area. From geological modelling works of task 12, the formation or members that these features align will be logged, providing more conceptualisation as to which formations may have a higher density of flowing features than others or if particular features can be tied into specific Chalk marl members. Twenty years of Springs and Sources data across the model area will also be provided for this task. This dataset will be analysed in the context of new geological datasets and modelling in task 12 to explore how ephemeral reaches of Chalk streams vary in response to climate, geological structure and artificial influences. This will include the development of charts of how ephemeral reaches flow and dry out over the period of the observed surveys that can be compared in the long term to numerical model output. The EA will provide outputs from current work carried out in this respect to aid the review and implementation of this task.	During this Activity the Consultant shall produce maps and ArcGIS shapefiles showing location and depth of flowing features and a dataset on how ephemeral Chalk streams flow over time. The merged conceptual model will be updated to exploring these features and how they reflect geological and hydrogeological conceptual understanding. This will aid later decisions as to possible future layering and/or VKD parameter changes in the future numerical model for Phase 3.

Task	Purpose	Overview	Outcomes
Task 14 Aquifer Properties Update	All foundation models highlight the uncertainty regarding aquifer parameters based on the limited information available within the model areas at the time of development. In most instances, conceptual models rely on the BGS aquifer properties manuals (BGS, 1997) and a selection of pumping test results. New information from Water Company pumping tests, along with compilation of more historic pumping tests or recent NEP investigation testing within the Environment Agency's archives, may help expand this aquifer properties dataset. There are also new datasets looking at core hydraulic properties in varying Chalk formations which may aid conceptualisation.	Expanded aquifer proprieties data will need to be reviewed to update known distribution of aquifer properties within the model area. Where possible, this should consider both superficial and bedrock formations present within the model area. During this task, the datasets from Task 3 should be used to determine the formations, if known, that aquifer properties are associated with. A literature review of river bed sediment conductivity should be undertaken to determine if the uncertainty on the hydraulic parameter could be reduced. This will aid later decision making on current set up of stream cell conductance within the model and if it should revert to those originally used in the foundation models or overridden to new values. New data should be used to reflect on current model parametrisation. For example, within the RAS section of the model, a high specific yield of 0.1 was applied to the Chalk which may need to be reviewed.	During this Activity the Consultant shall produce maps and ArcGIS shapefiles showing location and values of aquifer properties. The merged conceptual model will be updated to reflect the geological and hydrogeological conceptual understanding. This will aid later discussions and decisions on the parameterisation of a future MODFLOW model that may have more layers than currently simulated and options for simulating aquifer storage (should a coincident storage approach be revisited) and application of VKD in the model.

Task	Purpose	Overview	Outcomes
Task 15 Karstic Features Update	A number of new pieces of literature and datasets are available that were not present in the original foundation model conceptual development. This includes new PhD thesis covering tracer studies in the model area, studies relating to bromate plume development and karstic datasets available from the British Geological Survey, some of which will have been reviewed in task 3. These information sources need to be reviewed, and the conceptual model updated with any new concepts or characterisation stemming from this work.	From the literature review in task 3 and other karst datasets, the Consultant shall review the effectiveness of the current HCGM representation of karst systems both conceptually and numerically, along with new lines of evidence of karstic connections, and if amendments are needed as to how this network is defined in future versions of the model. This should include a review, if possible of likely formations the karst network is likely to be present within from recent geological modelling work and if this is more of a control on where stream bed elevations should be set, and should it be retained. If there are better ways to represent karstic systems in a MODFLOW 6 model, then these should be explored. There has been much uncertainty in the past about the proportion of karstic spring flow discharges along the Lee valley. A means to plug this data gap is to carry out a selection of spring gauging over differing seasonal conditions. The Consultant should provide a separate cost for carrying out this gauging for one hydrological year in their tender submission.	The merged conceptual model will be updated to explore these features and how they reflect geological and hydrogeological conceptual understanding. This will aid later decisions as to possible future layering and VKD parameter changes in the future numerical model for Phase 3 as well as how current karstic features in the HCGM numerical model can should be represented in the future MODFLOW 6 model.

Task	Purpose	Overview	Outcomes
Task 16 Review of Evidence for Hydrogeological Layering	Within the current and foundation models, there is always some uncertainty with regards to modelling the effects of geological features such as hardgrounds and geological layering within the Chalk. These geological features can have a major effect on hydraulic properties and can also divert groundwater flow between sub-catchments depending on groundwater level fluctuations. Further review of data compiled for the study needs to be reviewed to expand on the current conceptual model with respect to evidence of hydrogeological layering.	Further understanding gained from preceding dataset collation and analysis (artesian boreholes, preferential flow horizons, marl or hard bands, geological modelling work) in combination with what limited data on vertical head gradients will need to be reviewed by the Consultant to explore the concept of the Chalk as a multi-layered aquifer system within the conceptual model. These datasets, literature and conclusions from other modelling studies (Test and Itchen, Ver-Gade-Chess) will need to be reviewed to understand the evidence for the Chalk behaving as a multi-layered aquifer system within the model area to better inform the conceptual model. Other formations such as the Lambeth Group and Upper Greensands Formation, as well as the role of superficial deposits, may also have a bearing on the concept of a multi-aquifer system, and where data is available this should also be reviewed. Relationships between the Chalk and the Upper Greensand are particularly important for modelling Chalk and Upper Greensand abstractions within the Northwest sections of the model area.	The merged conceptual model will be updated to explore these features and how they reflect geological and hydrogeological conceptual understanding. This will aid later decisions as to possible layering representation in the future numerical model for Phase 3

Task	Purpose	Overview	Outcomes
Task 17 Impacts of Abstraction Investigations and Changes	From the review of the MODFLOW-96 model performance in Phase 1, there should be an initial understanding of potential changes in confidence incurred by the inclusion of the most recent and targeted monitoring data related to large abstraction changes. These identified changes need to be further explored in the context of new dataset collated during Phase 2 and any conceptual insight they provide.	Building up from the enhanced conceptualisation and datasets of the proceeding sections, the response to licence reductions and any investigative reporting associated with the abstraction should be reviewed further to understand what additional conceptual understanding they may provide. This include the review of observed abstraction responses within groundwater levels and river flows and how they relate to hydrogeological units identified in the study area.	The merged conceptual model will be updated to explore abstraction changes and how they reflect geological and hydrogeological conceptual understanding. This will aid later decisions as to possible layering or aquifer property representation in the future numerical model for Phase 3.
Task 18 Water Balance	It is hoped that with a larger groundwater level monitoring dataset than was available during the time of the original foundation models, there will be more data to delineate groundwater catchments, groundwater divides and how these change seasonally. Hence existing catchment groundwater balances will need to be updated and new water balances compiled, as may be necessary (e.g. RAS model area). This should take into account the abstraction changes that may affect either the groundwater catchment or water balances over time.	The Consultant is expected to calculate preliminary water balances for the model area. The consultant should advise on the appropriate time periods for water balances based on the data available. The water balances will indicate the general availability of water resources in the area and how conditions have changed during the period 1965 to 2020. The Consultant should state in their proposal the assumptions that are likely to be made in the calculation of this preliminary water balance. The Agency attaches great importance to this step in the modelling procedure since it is the first indication of the viability of the conceptual model.	The Consultant shall produce a series of water balances for different catchments. A number of water balances should be prepared covering different time periods. Both total water balances and groundwater balances should be presented. It is unlikely that the numerical sum of the components will be zero, but the significance and reasons for any out of balance should be discussed. This output will be important for reviewing the groundwater catchments and water balances produced by updated numerical modelling in MODFLOW 6.

Task	Purpose	Overview	Outcomes
Task 19 Boundary Conditions	The conceptualisation behind the boundary condition cells within the current model will need to be reviewed, and where needed refreshed, in light of the Phase 2 conceptual model update.	All current model boundary conditions should be reviewed in the context of the conceptual model update and updated groundwater contouring (task 7) and water balance work (task 18), to review if how these are characterised still adequately represent the merged conceptual model. Particular focus should be given to how the flow in and out of the model is simulated for flow from the Kennet Valley Chalk and to the London Basin, and where there is evidence for hydrogeological layering, if these change with identified hydrogeological units.	The merged conceptual model will be updated to explore these boundary features. Recommendations will be made as to updates or alternative boundary conditions and means of quantifying these for the later MODFLOW 6 build in Phase 3.

Task	Purpose	Overview	Outcomes
Task 20 Update of Surface Water/Groundwater Conceptual Model	This conceptual model forms the foundation upon which the numerical model will be updated, therefore, the ideas it embodies need to be comprehensively tested prior to and during any numerical modelling. Prior to the commencement of the modelling in Phase 3, the Agency will require the Consultant to update where needed existing ideas concerning the dominant aquifer flow mechanisms and the degree of surface water-groundwater interaction into a conceptual model.	To illustrate the system's behaviour, the Consultant shall produce relevant hydrogeological cross-sections (between 6 and 10 is typical), water balances at appropriate time scales, relevant river and water level hydrographs and plans showing the hydraulic gradients and the major changes in hydrogeology. Once the conceptual model has been agreed a generalised three-dimensional colour picture of the area should be produced, annotated to highlight key features.	The Agency will require the Consultant to present any revision to the foundation conceptual model concerning the dominant aquifer flow mechanisms and the degree of surface water-groundwater interaction for discussion. The Consultant will: 1. define the extent of the study area and subdivide this into appropriate zones (vertically and horizontally) based on the hydrogeology 2. describe the hydrogeological conditions and flows at the boundaries of the study area 3. identify all inflows and outflows, estimate their size and illustrate their temporal variation 4. estimate the plausible range of all aquifer parameters in each hydrogeologically distinct zone 5. identify the limitations of the current conceptual understanding and the major sources of uncertainty This conceptual model should include a description of the mechanisms operating in the area, the nature of the inflows and outflows, the number and types of boundaries, and should include a variety of different diagrams of the area, annotated to highlight key features (geological, hydrogeological and hydraulic) and to indicate average or typical flow quantities and aquifer parameter values.

Task	Purpose	Overview	Outcomes
Task 21 Proposed Development of MODFLOW 6 Numerical Model	Once an updated conceptual model has been agreed, the flow mechanisms identified can be represented numerically and the output compared with observed data and other information. The aim of this task is to review the existing numerical model representation of the revised conceptual model and make recommendations for change when converting the model to MODFLOW 6 where necessary.	The Consultant shall consider how the model is set up based on the conceptual model and what features need to be successfully refreshed. This will also need to recommend: 1. if the current two-layer model should have more layers added and how this will need to be set up 2. if VKD should continue to be applied to sections of the model, be updated to cover the whole model or even removed 3. any adjustment or changes to current boundary conditions and how to set up 4. any adjustments as to how karstic systems are currently represented. 5. any changes to model parameters as a result of the above recommendations or identifying where further work will be needed to translate current model parameters (e.g. stream cell parameters) and refinement that may be necessary It is currently intended that the current rectangular grid is retained, as this aligns with neighbouring model approaches such as CBO and LBM which have and will retain their rectangular grids once translated to MODFLOW 6. If after conceptual model update, there are strong gains to be had by moving to a different grid structure such as unstructured grid, then this would be considered by the project working group. These recommendations will be discussed and agreed with the Project Review Group at the end of Phase 2.	The Consultant shall recommend and justify the following: 1. the extent, layers, orientation and nodal spacing of the model grid 2. the period of simulation and discretisation of time 3. the representation of boundary conditions and initial conditions 4. the aquifer types, geometry and properties 5. the spatial and temporal variation in recharge 6. the representation of abstraction 7. the representation of flow between model layers 8. the surface water-groundwater interactions where these differ from the current HCGM representation in MODFLOW96. The model layering shall be justified on the basis of the conceptual model by considering the flow system and the relationship between hydrogeological units.

Task 22 Formulation of Phase 2 Report	The Phase 2 report is intended primarily for internal use by the Agency. The earlier sections will provide a record for the Agency of data and information relevant to the study area. The presentation should be in a suitable form for updating. In addition, the Phase 2 report will provide detailed information about the conceptual model and the associated parameter values. The uncertainties should be stated and possible methods of resolving them during subsequent phases of the work should be explained.	The Phase 2 report with Appendices should provide a comprehensive record of the methodologies adopted and the findings of the Phase 2 study. It should be sufficiently complete for another consultant to carry out updates to it in subsequent Phases of the work.	An electronic draft Phase 2 report should be presented in Microsoft Word. The report will include the following items: 1. Presentation in graphical and tabular form (where appropriate) the raw data as collated in Task 2 e.g. digitised topographic, geological and piezometric maps, river-flow and groundwater hydrographs, tabulation of groundwater and surface water licence information; 2. Summary (in the form of an Appendix) of the key reference papers identified in Task 3, including a full reference of all relevant literature; 3. Interpretation and presentation (again preferably in graphical form) of data and information collated in the tasks above e.g. maps and cross-sections showing the thickness and nature of Superficial Deposits deduced from borehole log information, results of baseflow separation analysis and interpretation of previous Agency low-flow surveys; 4. Presentation of the effective rainfall and water balance estimates from the relevant tasks and the proposed conceptual model; 5. Indication of any extra data needs, especially river flow information, to enable the Agency to initiate a data collection programme; and 6. Formulation of the initial model design, including model dimensions, recharge and boundary conditions, general aquifer and riverbed characteristics, refinement and sensitivity analysis criteria.

Task	Purpose	Overview	Outcomes
			This draft report will be presented and discussed at a progress meeting between the Project Manager and Senior Modeller of the Consultant and the Project Steering Group. Prior to the meeting, the Consultant should allow up to four weeks for consideration by the Agency of the draft report and any modifications required for the final stage report. Any presentation materials used during the meeting should later be made available to the Agency. The final version of the report (including colour maps and cross-sections where appropriate) will be issued within one month of this meeting. The report should also be provided both in an Adobe PDF format and in Microsoft Word.

1.4. Deliverables

The following table presents the outputs that are expected to be delivered at various stages as the project is being completed. Anticipated dates of completion after Contract Start are also provided as a guide, though these can be adjusted in the proposed project programme requested in the Technical Questionnaire, which is contained in the Procurement Specific Requirements Document.

Deliverable	Responsible parties	Anticipated date of completion after Contract Start
Provision of known project data sets	Agency	1 month
Literature review and summaries	Consultant	3 – 4 months
Draft merged conceptual model report at end of Task 4		
Conceptual module uncertainty technical note		
Geological Model	Consultant	8 - 9 months
Draft Phase 2 report for progress meeting discussions	Consultant	10 months
Reviewed draft phase 2 report	Agency	11 months
Final Phase 2 report with digital appendices and GIS datasets	Consultant	12 months

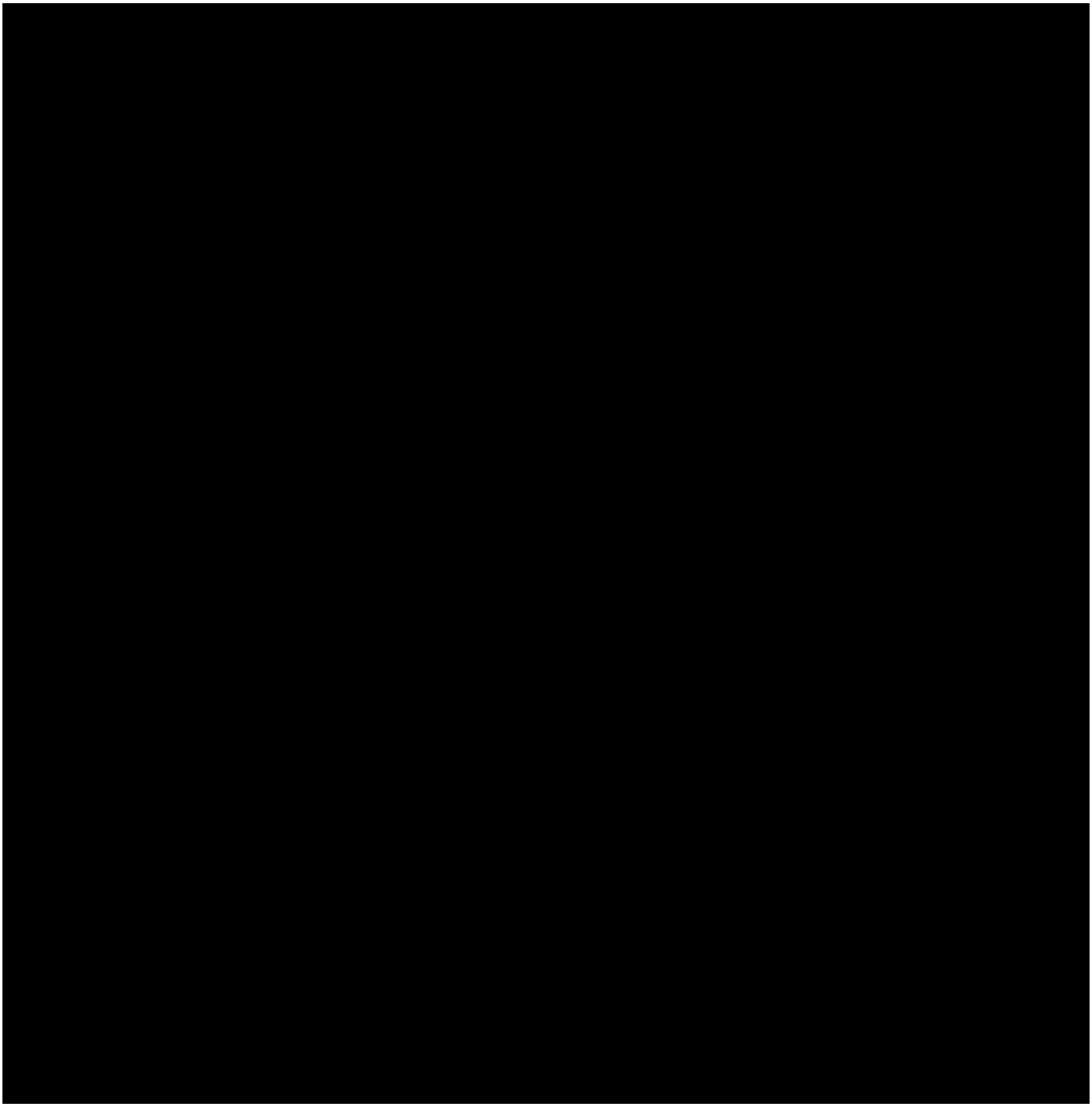
All tools and files developed under this project should be compatible with the following Environment Agency's systems listed below and must be capable of functioning seamlessly with any future update of the applicable software products:

Software	Current Network Version
Windows Version	Windows 10
ArcGIS	ArcMap 10.4.1
Groundwater Vistas	Version 8.11 Build 11
Microsoft Office	Microsoft Office 365
Python	Python 3.7.4 We are unable to update python libraries due to security restrictions on our Central Modelling Platform. Where newer versions are required, the python packages should be supplied with the model files.

1.5. Pricing and Payment Strategy

The pricing strategy for this project will be fixed price. The payment model is fixed price per milestone, which is linked to the deliverables outlined in 1.4 and costed in the pricing schedule. The dates of the payment milestones have been established in the tender process and by the programme of works submitted by the successful bidder.

The pricing schedule comprises fixed priced hourly inputs from named staff, to deliver each task. Payment will be made to the successful bidder after receipt and acceptance of the agreed deliverables by the Environment Agency Project Manager.



1.6. Project Management and Governance

Project Management Requirements:

- Provide monthly spend forecast detailing work completed, matched against budget.
- Monthly invoicing.
- Share updated risk register when changes are applied

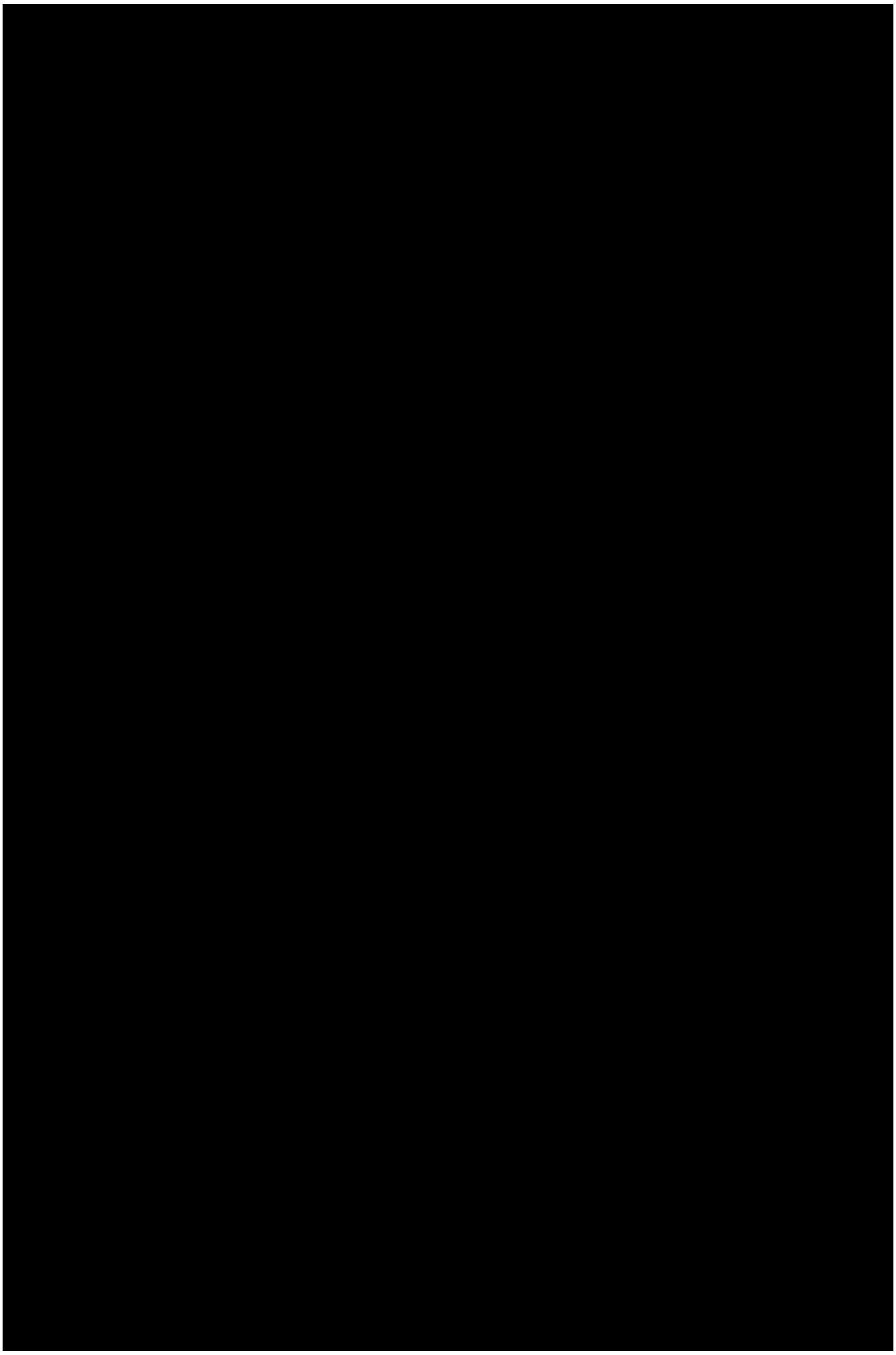
Governance/Meeting Requirements

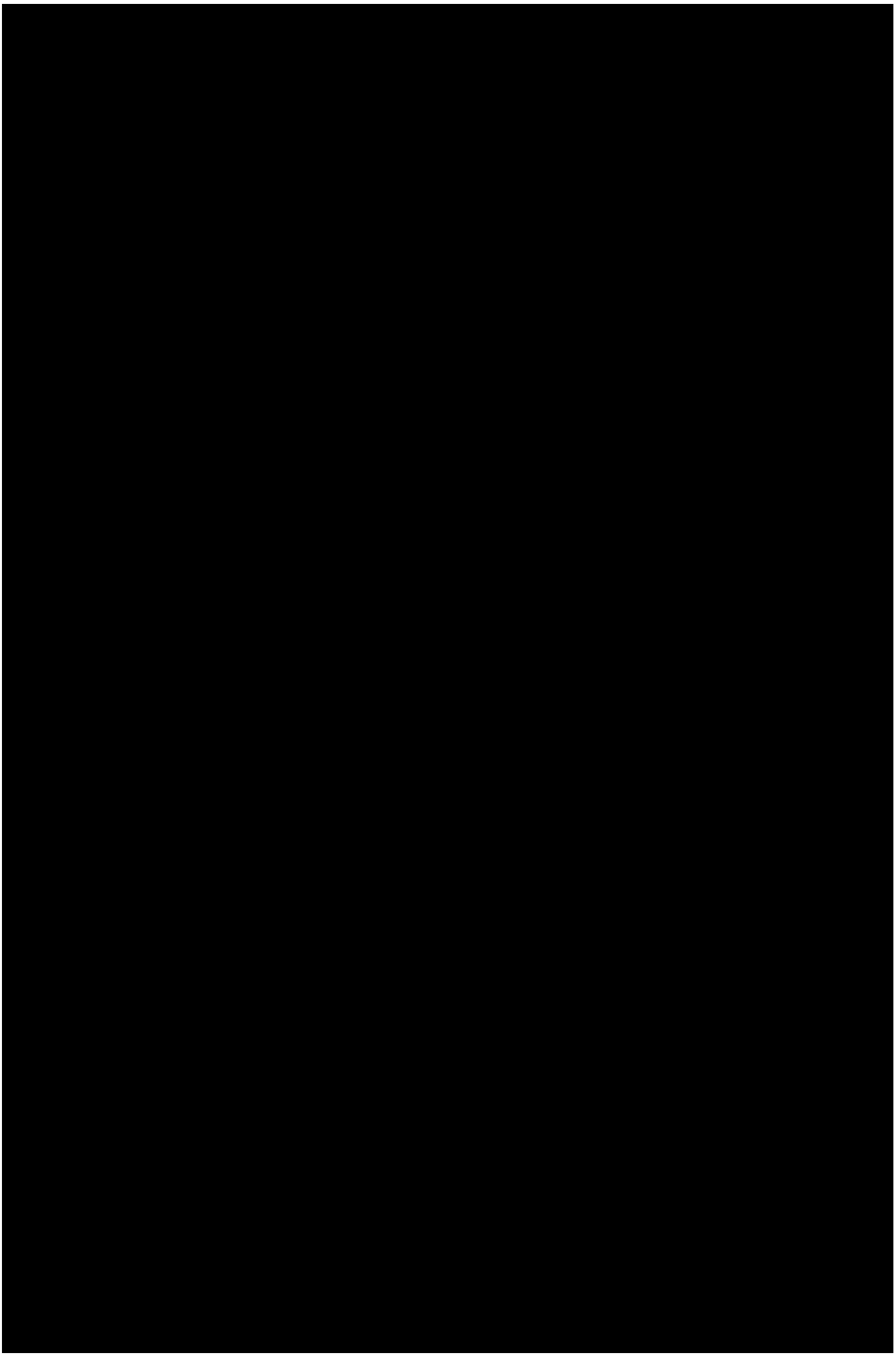
- Monthly progress update with steering group via video
- Secretarial services to be provided by supplier

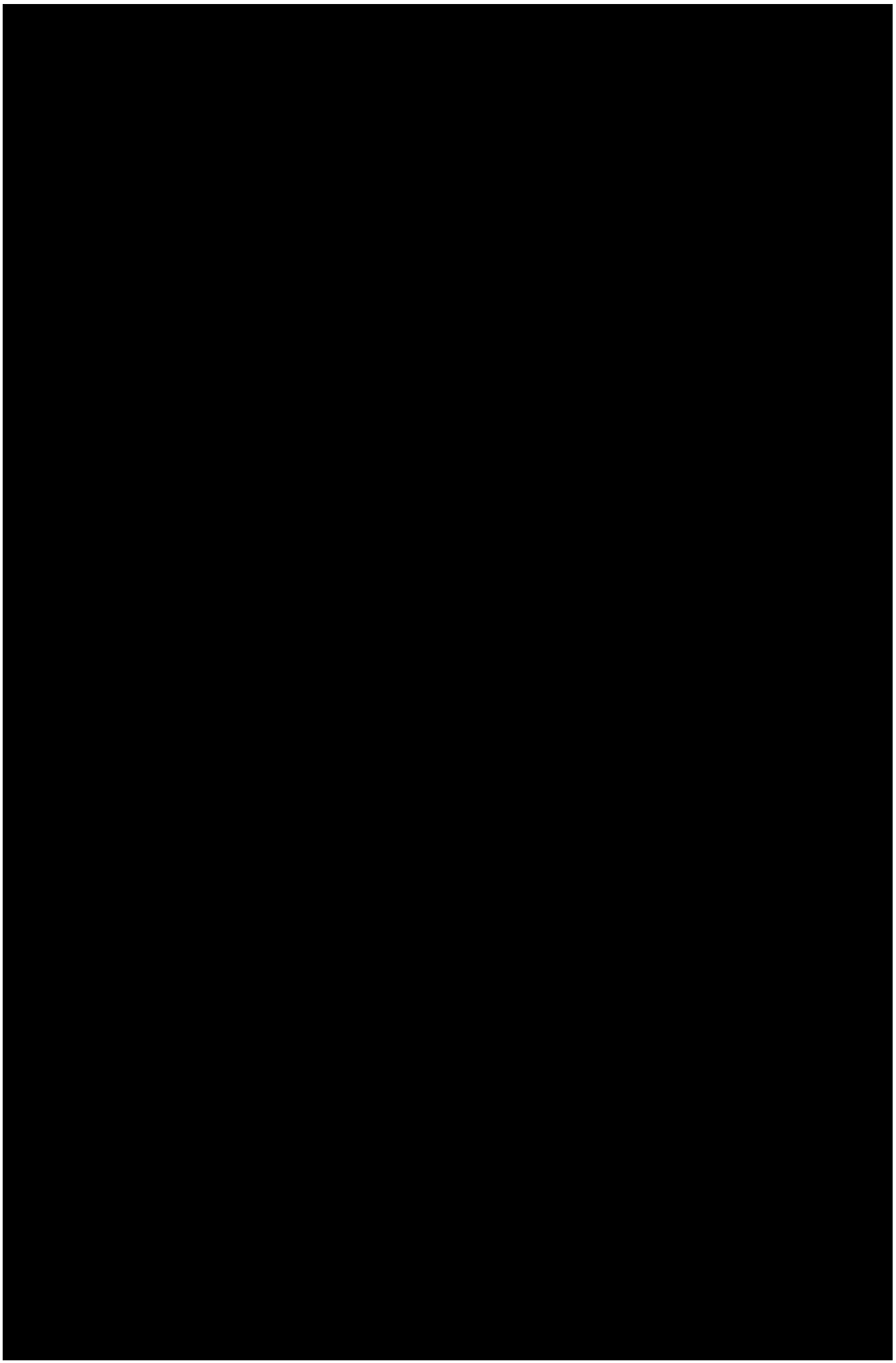
SCHEDULE 2 – RESOURCE AND PRICING

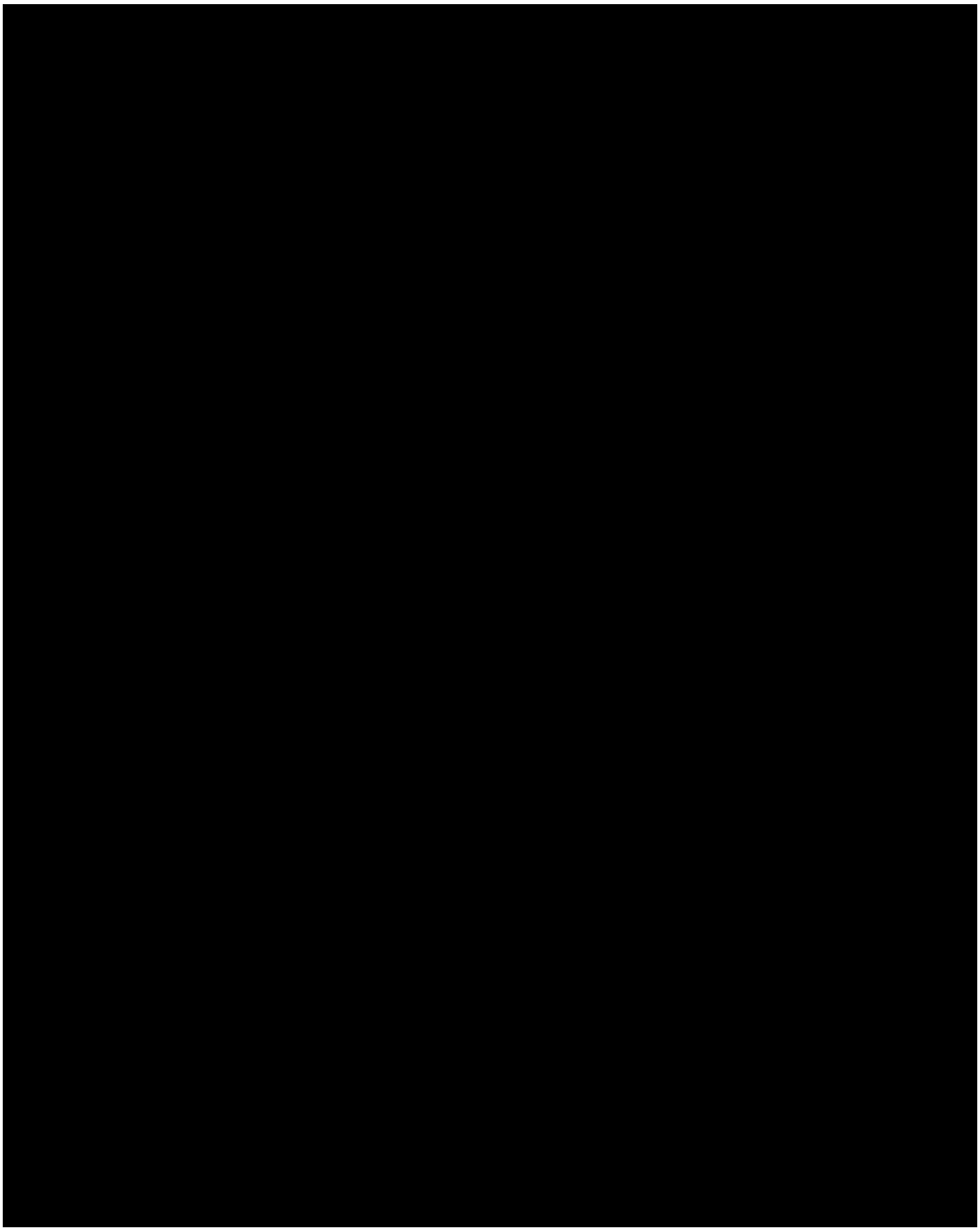
The Price due to the Contractor in consideration for the provision of the

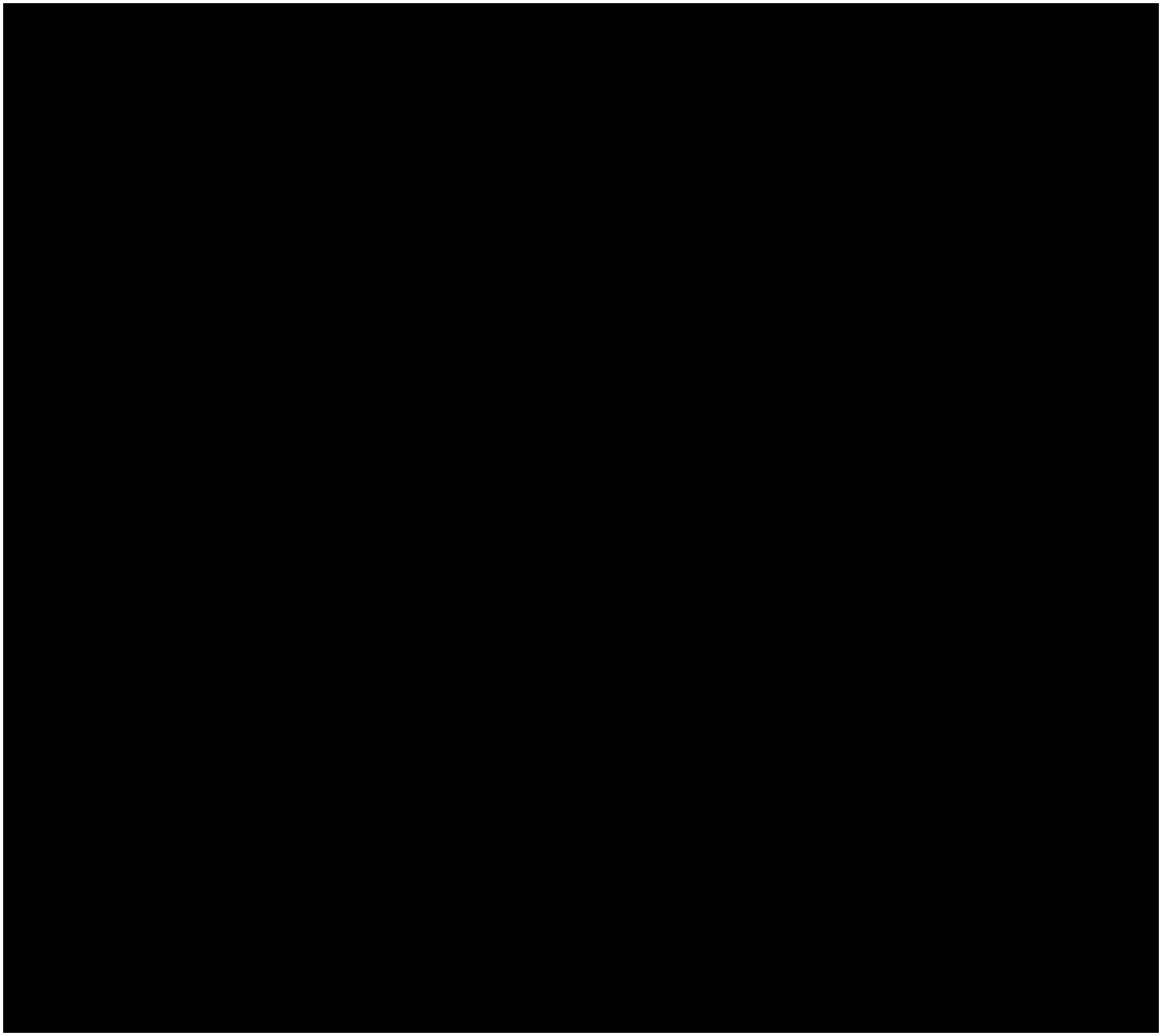
[redacted]











SCHEDULE 3 – CHANGE CONTROL NOTE

Department
for Environment
Food & Rural Affairs

CONTRACT CHANGE NOTE

Contract Change Note Number	
Contract Reference Number and Title	
Variation Title	
Number of Pages	

Whereas the [Contractor] and the Authority entered into a Contract for the provision of [contract title] dated [dd/mm/yyyy] (the "Original Contract") and now wish to amend the Original Contract.

It is agreed as follows:

1. With effect from [dd/mm/yyyy] the Original Contract shall be amended as set out in this Contract Change Note:

Change Requestor / Originator		
Summary of Change		
Reason for Change		
Revised Contract Price	Original Contract Value	£
	Previous Contract Changes	£
	Contract Change Note [x]	£
	New Contract Value	£
Revised Payment Schedule		
Revised Specification (see Annex A)		
Revised Contract Period		
Change in Contract Manager(s)		
Other Changes		

2. Save as herein amended all other terms and conditions of the Original Contract shall remain in full force and effect.

Execution of the Contract Change Note is carried out in accordance with EU Directive 99/93 (Community framework for electronic signatures) and the Electronic Communications Act 2000. The revised Contract is formed on the date on which both Parties communicate acceptance of its terms on the Authority's electronic contract management system ("Bravo").

SCHEDULE 4 – DATA PROTECTION

Schedule 4 – Data Protection

Definitions – the definitions in this Schedule and the Contract shall apply:

Annex 1: the Schedule of Processing, Personal Data and Data Subjects attached to this Data Protection Schedule.

Annex 2: Joint Controller Agreement (where required).

Party: a Party to this Contract.

Data Protection Impact Assessment: an assessment by the Controller of the impact of the envisaged processing on the protection of Personal Data.

Controller, Processor, Data Subject, Personal Data, Personal Data Breach, Data Protection Officer: takes the meaning given in the GDPR.

Data Loss Event: any event that results, or may result, in unauthorised access to Personal Data held by the Processor under this Contract, and/or actual or potential loss and/or destruction of Personal Data in breach of this Contract, including any Personal Data Breach.

Data Subject Request: a request made by, or on behalf of, a Data Subject in accordance with rights granted pursuant to the Data Protection Legislation to access their Personal Data.

Joint Controllers: where two or more Controllers jointly determine the purposes and means of processing. **Protective Measures**: appropriate technical and organisational measures which may include: the use of pseudonyms and encrypting Personal Data, ensuring confidentiality, integrity, availability and resilience of systems and services, ensuring that availability of and access to Personal Data can be restored in a timely manner after an incident, and regularly assessing and evaluating the effectiveness of the such measures adopted by it including those outlined in Annex 1 (Security).

Sub-processor: any third Party appointed to process Personal Data on behalf of the Processor related to this Contract.

1. DATA PROTECTION

1.1 The Parties acknowledge that for the purposes of the Data Protection Legislation, the Agency is the Controller and the Contractor is the Processor unless otherwise specified in Annex 1. The only processing that the Processor is authorised to do is listed in Annex 1 by the Controller and may not be determined by the Processor.

1.2 The Processor shall notify the Controller immediately if it considers that any of the Controller's instructions infringe the Data Protection Legislation.

1.3 The Processor shall provide all reasonable assistance to the Controller in the preparation of any Data Protection Impact Assessment prior to commencing any processing. Such assistance may, at the discretion of the Controller, include:

(a) a systematic description of the envisaged processing operations and the purpose of the processing;

(b) an assessment of the necessity and proportionality of the processing operations in relation to the Services;

(c) an assessment of the risks to the rights and freedoms of Data Subjects; and

(d) the measures envisaged to address the risks, including safeguards, security measures and mechanisms to ensure the protection of Personal Data.

1.4 The Processor shall, in relation to any Personal Data processed in connection with its obligations under this Contract:

(a) process that Personal Data only in accordance with Annex 1, unless the Processor is required to do otherwise by Law. If it is so required the Processor shall promptly notify the Controller before processing the Personal Data unless prohibited by Law;

(b) ensure that it has in place Protective Measures, which are appropriate to protect against a Data Loss Event, which the Controller may reasonably reject (but failure to reject shall not amount to approval by the Controller of the adequacy of the Protective Measures), having taken account of the:
(i) nature of the data to be protected;
(ii) harm that might result from a Data Loss Event;
(iii) state of technological development; and
(iv) cost of implementing any measures;

(c) ensure that :

(i) the Contractor Personnel do not process Personal Data except in accordance with this Contract (and in particular Annex 1);

(ii) it takes all reasonable steps to ensure the reliability and integrity of any Contractor Personnel who have access to the Personal Data and ensure that they:

(A) are aware of and comply with the Processor's duties under this clause;

(B) are subject to appropriate confidentiality undertakings with the Processor or any Sub-processor;

(C) are informed of the confidential nature of the Personal Data and do not publish, disclose or divulge any of the Personal Data to any third Party unless directed in writing to do so by the Controller or as otherwise permitted by this Contract; and

(D) have undergone adequate training in the use, care, protection and handling of Personal Data; and

(d) not transfer Personal Data outside of the EU unless the prior written consent of the Controller has been obtained and the following conditions are fulfilled:

(i) the Controller or the Processor has provided appropriate safeguards in relation to the transfer (whether in accordance with GDPR Article 46 or LED Article 37) as determined by the Controller;

(ii) the Data Subject has enforceable rights and effective legal remedies;

(iii) the Processor complies with its obligations under the Data Protection Legislation by providing an adequate level of protection to any Personal Data that is transferred (or, if it is not so bound, uses its best endeavours to assist the Controller in meeting its obligations); and

(iv) the Processor complies with any reasonable instructions notified to it in advance by the Controller with respect to the processing of the Personal Data;

(e) at the written direction of the Controller, delete or return Personal Data (and any copies of it) to the Controller on termination of the Contract unless the Processor is required by Law to retain the Personal Data.

1.5 Subject to clause 1.6, the Processor shall notify the Controller immediately if it:

(a) receives a Data Subject Request (or purported Data Subject Request);

(b) receives a request to rectify, block or erase any Personal Data;

(c) receives any other request, complaint or communication relating to either Party's obligations under the Data Protection Legislation;

(d) receives any communication from the Information Commissioner or any other regulatory authority in connection with Personal Data processed under this Contract;

(e) receives a request from any third Party for disclosure of Personal Data where compliance with such request is required or purported to be required by Law; or

(f) becomes aware of a Data Loss Event.

1.6 The Processor's obligation to notify under clause 1.5 shall include the provision of further information to the Controller in phases, as details become available.

1.7 Taking into account the nature of the processing, the Processor shall provide the Controller with full assistance in relation to either Party's obligations under Data Protection Legislation and any complaint, communication or request made under clause 1.5 (and insofar as possible within the timescales reasonably required by the Controller) including by promptly providing:

(a) the Controller with full details and copies of the complaint, communication or request;

(b) such assistance as is reasonably requested by the Controller to enable the Controller to comply with a Data Subject Request within the relevant timescales set out in the Data Protection Legislation;

(c) the Controller, at its request, with any Personal Data it holds in relation to a Data Subject;

(d) assistance as requested by the Controller following any Data Loss Event;

(e) assistance as requested by the Controller with respect to any request from the Information Commissioner's Office, or any consultation by the Controller with the Information Commissioner's Office.

1.8 The Processor shall maintain complete and accurate records and information to demonstrate its compliance with this clause. This requirement does not apply where the Processor employs fewer than 250 staff, unless:

(a) the Controller determines that the processing is not occasional;

(b) the Controller determines the processing includes special categories of data as referred to in Article 9(1) of the GDPR or Personal Data relating to criminal convictions and offences referred to in Article 10 of the GDPR; or

(c) the Controller determines that the processing is likely to result in a risk to the rights and freedoms of Data Subjects.

1.9 The Processor shall allow for audits of its Data Processing activity by the Controller or the Controller's designated auditor.

1.10 Each Party shall designate its own data protection officer if required by the Data Protection Legislation.

1.11 Before allowing any Sub-processor to process any Personal Data related to this Contract, the Processor must:

(a) notify the Controller in writing of the intended Sub-processor and processing;

(b) obtain the written consent of the Controller;

(c) enter into a written agreement with the Sub-processor which gives effect to the terms set out in this Schedule such that they apply to the Sub-processor; and

(d) provide the Controller with such information regarding the Sub-processor as the Controller may reasonably require.

1.12 The Processor shall remain fully liable for all acts or omissions of any of its Sub-processors.

1.13 The Controller may, at any time on not less than 30 Working Days' notice, revise this clause by replacing it with any applicable controller to processor standard clauses or similar terms forming part of an applicable certification scheme (which shall apply when incorporated by attachment to this Contract).

1.14 The Parties agree to take account of any guidance issued by the Information Commissioner's Office. The Controller may on not less than 30 Working Days' notice to the Processor amend this Contract to ensure that it complies with any guidance issued by the Information Commissioner's Office.

1.15 Where the Parties include two or more Joint Controllers as identified in Annex 1 in accordance with GDPR Article 26, those Parties shall enter into a Joint Controller Agreement based on the terms outlined in Annex 2 in replacement of Clauses 1.1-1.14 for the Personal Data under Joint Control.

Annex 2 - Schedule of Processing, Personal Data and Data Subjects Processing, Personal Data and Data Subjects

This Schedule shall be completed by the Controller, who may take account of the view of the Processor, however the final decision as to the content of this Schedule shall be with the Controller at its absolute discretion.

1. The contact details of the Controller's Data Protection Officer are:

2. The contact details of the Processor's Data Protection Officer are:

3. The Processor shall comply with any further written instructions with respect to processing by the Controller.
4. Any such further instructions shall be incorporated into this Annex 1.

Description	Details
Identity of the Controller and Processor	The Parties acknowledge that for the purposes of the Data Protection Legislation, the Agency is the Controller and the Contractor is the Processor in accordance with Clause 1.1.
Subject matter of the processing	*No Personal Data will be collected through the activities defined in this Contract.*
Duration of the processing	*No Personal Data will be collected through the activities defined in this Contract.*
Nature and purposes of the processing	*No Personal Data will be collected through the activities defined in this Contract.*
Type of Personal Data being Processed	*None*
Categories of Data Subject	*None*
Plan for return and destruction of the data once the processing is complete UNLESS requirement under union or member state law to preserve that type of data	*No Personal Data will be collected through the activities defined in this Contract.*

ANNEX A – BIDDERS PROPOSAL