

Project Design: Staffordshire Minerals Resource Assessment. Stage 1 Aggregates

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As a Registered Archaeological Organisation of the Institute of Field Archaeologists we deliver a quality service to our clients, users and partners. We have a commitment to providing clients with projects to a high standard and which are on time and within budget. Through information and education we provide the present and future communities of Worcestershire with a well managed archaeological heritage. To the Service's partners we will initiate ideas and seek their implementation in areas such as research.

Project Design

Staffordshire Minerals Resource Assessment. Stage 1 Aggregates

Part 1 Summary description

This Project Design is for the undertaking of Stage 1 of a Minerals Resource Assessment (MRA) for the county of Staffordshire which is largest county producer of land won sand and gravel in England, as well as a major producer of a range of other mineral resources.

The Stage 1 project will enhance the archaeological evidence base and provide an resource assessment for the aggregate (sand and gravel and hard rock) producing areas of the county. This will be accompanied by a specifically focussed archaeological research agenda.

The Assessment and Research Agenda produced will consider the impact of past, current and future aggregate extraction on historic environment assets in a quantifiable and systematic manner and will be used to underpin future decisions regarding strategic planning, management and preservation of heritage assets in the aggregate producing parts of the Staffordshire Mineral Consultation Areas. It will also provide a framework for future work in these areas, including identifying appropriate techniques for application in programmes of evaluation and mitigation and highlighting areas where data capture is required to enhance the evidence base. In particular the project output will facilitate the development of a core mineral strategy for the County (due for delivery by 2012-13) and support the provision of consistent approaches to mineral planning across the region.

A future stage of assessment to incorporate non-aggregate minerals (coal, clay, gypsum, etc) will be developed in an Updated Project Design for Stage 2 which will accompany the aggregates assessment produced at the end of the current project cycle.

Part 2 Project Design

1 Description of the project

1.1 Background and reasons for the project

This Project Design (PD) is for the undertaking of Stage 1 of a Minerals Resource Assessment (MRA) for the county of Staffordshire which is the largest county producer of land won sand and gravel in England, as well as a major producer of a range of other mineral resources.

The Project Design and prior Project Proposal have been submitted following a request by English Heritage seeking such mineral resource assessment projects which fall under NHPP Topic 2D: Impact of Resource Exploitation and specifically addresses Activity 2D4: Mineral Extraction Impacts.

The project will use an approach which has been widely employed within comparable mineral resource assessments undertaken over recent years and uses mapped solid and drift geology to define landforms within areas of potential mineral extraction. Mineral extraction, archaeological and other data can then be mapped against these landforms within a GIS environment to provide a reliable evidence-base from which a specifically targeted resource assessment and research agenda can be developed (e.g. Jackson and Dalwood 2007; Mullin 2008; Brightman and Waddington 2010). Such assessments have been produced for most adjacent counties and cover the remainder of the Trent Valley, so the Staffordshire resource assessment will complete the provision of frameworks designed to support delivery of consistent and evidence-based archaeological advice across this key aggregate producing region.

Stage 1 of the Staffordshire MRA will focus on landforms associated with exploitation of the county's aggregates resources (as defined by the Aggregates Levy), namely Sherwood Sandstone, Carboniferous Limestone and other building stone, silica sand and superficial sand and gravel (both river terrace and fluvio-glacial). Holocene landforms (alluvium, palaeochannels and peat) which often overlie exploitable minerals resources will also be considered since they typically have distinct archaeological associations and often require different evaluation and mitigation strategies. Figure 1 shows the extent of all mineral resources in the county including the aggregates which will be covered by this project. A second stage (Stage 2) is envisaged which will cover non-aggregate resources (cement shale, brick clay, coal and associated fire clay and gypsum) and will be defined in an Updated Project Design which will be produced at the conclusion of Stage 1.

The Project Design derives from an initial Project Proposal which was submitted (WHEAS and SCC, 12 December 2011) in response to a request by English Heritage for proposals for such Mineral Resource Assessment projects. The PD incorporates EH feedback (received 11 January 2012) on the Project Proposal.

The project falls under NHPP Topic 2D: Impact of Resource Exploitation and specifically addresses Activity 2D4: Mineral Extraction Impacts. Such MRA projects enable assessment of the impact of past, current and future mineral extraction on historic environment assets in a quantifiable and systematic manner. The Assessment and Research Agenda produced will be used to underpin future decisions regarding strategic planning, management and preservation of heritage assets in the aggregate producing

parts of the Staffordshire Mineral Consultation Areas (see Bee *et al* 2006 <http://www.staffordshire.gov.uk/Resources/Documents/s/sc/SCCMCAreviewreportwebpageversion.pdf>). It will also provide a framework for future work in these areas, including the identification of areas where further data capture is specifically required to enhance the evidence base. Through targeted HER enhancement and the identification of appropriate methodological and mitigation approaches it will support the delivery of consistent and question-led responses to minerals planning in line with regional and national frameworks. The project is seen as particularly opportune by Minerals Planners and the Minerals Industry as its timing coincides with the development of a core mineral strategy for the County which is due for delivery by 2012-13.

The project will be managed and led by the Worcestershire County Council Archive and Archaeology Service's field team with support, input and guidance from Staffordshire County Council's Historic Environment Team and Planning, Policy and Development Control Team.

1.2 Summary of mineral resources and minerals planning in Staffordshire

1.2.1 Minerals resources

Staffordshire County Council's Planning, Policy and Development Control Team are responsible for mineral planning in the county with the exception of the area covered by the City of Stoke on Trent and part of the north-east of the county within the Peak District National Park for which separate arrangements exist (Figure 2).

Minerals resources in the county reflect the complex geological and geomorphological history of the area spanning the last 340 million years. These events produced a wide range of rock types, mainly sedimentary, either exposed at the surface or found at relatively shallow depths beneath a cover of younger sedimentary rocks, including superficial (unconsolidated) deposits. These older sediments were laid down in a variety of environments and climatic conditions very different to those we encounter today. Following deposition, the sediments were altered and hardened and now form the major part of the mineral resources exploited in the county today.

These include the following non-aggregate minerals:

- Deep mined and open cast coal
- Clay and shale; and
- Anhydrite

And the following aggregates:

- Sand and gravel
- Silica sand
- Limestone, and
- Building and dimensional stone (Hollington Formation and Millstone Grit)

To provide an impression of scale, in 1996 when the Minerals Local plan was produced, there were over 100 permitted minerals sites, with production figures for 1995

comprising an estimated 13 million tonnes. For the aggregates, figures provided in Bees *et al* (2006, figure 1) indicate that in 2004 production figures comprised 5,761,000 tonnes of sand and gravel and 870,000 tonnes of limestone, with figures for silica sand and building stone not available.

1.2.2 Minerals planning in Staffordshire

The current 'key' document for the county is the adopted Minerals Local Plan 1994-2006 (<http://www.staffordshire.gov.uk/Resources/Documents/m/MineralsLocalPlanadoptedsavedpolicieswebversion1.pdf>). Under 'direction letters' dated 7 September 2007 from the Department for Communities and Local Government (DCLG) c/o of the Government Office for the West Midlands (GOWM) this was confirmed as 'saved' policy and thus has remained the adopted planning policy for minerals since 28 September 2007. As a consequence, the adopted Waste Local Plan and Minerals Local Plan, together with the Staffordshire Borough / District Local Plans, the Structure Plan and Stoke-on-Trent's Unitary Development Plan, which form a part of 'the development plan' for Staffordshire and Stoke-on-Trent, changed with effect from 28 September 2007. Essentially this means that the number of policies making up the development plan have been reduced and more reliance is now placed on national Planning Policy Statements to help determine planning applications until such time as replacement Development Plan Documents are adopted.

This 'saved' policy document is now being revised and will be replaced by a new Minerals and Waste Development Scheme which will include a Minerals Core Strategy (see <http://www.staffordshire.gov.uk/environment/planning/policy/corestrategy/MineralsandWasteDevelopmentSchemeDecember2011.pdf>). This is currently being developed and it is envisaged that this will considerably change the direction of minerals planning policy in Staffordshire. The resultant Minerals Core Strategy will set out the vision, objectives and spatial strategy for future mineral related development within Staffordshire. Notably, the Core Strategy will indicate the strategic sites for future mineral working over the next 15 to 20 years. Each site will have to be judged on whether it meets the aims of the national and regional policies, whether they are sustainable and environmentally acceptable, and whether they can be commenced within a 15 year time frame.

It is therefore against the background of the development of this new core strategy that this ARA is being undertaken with the intention that it can both inform and be integrated into that strategy.

1.3 Aims and objectives

The overarching aim of the project is to improve the understanding, management and presentation of the Historic Environment within the mineral extraction areas of Staffordshire.

Six further aims are defined for the Stage 1 project:

- A1. to provide an enhanced and appropriately focussed evidence-base to support decisions regarding strategic planning, management and preservation of heritage assets in the aggregates producing (safeguarded) areas of Staffordshire;

- A2. to use, and where necessary enhance, HER-derived information to assess and summarise the state of knowledge and significance of the heritage assets (both designated and undesignated) for each of the landforms associated with aggregate producing areas;
- A3. to assess and summarise the impact of past and current aggregate extraction upon the archaeological resource (including the archaeological dividend resulting from discoveries made during aggregate extraction), as well as quantify and assess the potential impact of future aggregate extraction; thereby supporting the development of appropriate management strategies for surviving archaeological assets in such a manner that the most significant can be safeguarded;
- A4. to establish an archaeological research agenda for each of the defined landforms associated with aggregate producing areas, thus supporting the delivery of consistent, evidence-based and question-led archaeological responses to minerals development. This will draw heavily on the West Midlands Regional Research Framework (Watt 2011), the research framework for the adjacent East Midlands region (Cooper 2006), the work of the Trent Valley Geoarchaeology Group (specifically Knight and Howard 2004) and the Archaeological Resource Assessments already completed for adjacent aggregate producing areas within the region (Brightman and Waddington 2010; Mullin 2008; Knight *et al* 2012). Recent key discoveries will also be taken into account;
- A5. to identify appropriate approaches to archaeological evaluation, excavation and mitigation for each landform based upon those described in *Mineral Extraction and Archaeology: A Practice Guide* (MHEF 2008); *Mineral Extraction and the Historic Environment* (EH 2008) and the ARAs already produced for other local authorities in the region; thereby helping to ensure that the most appropriate techniques are identified when designing pre-determination evaluation and post-determination mitigation strategies for heritage assets likely to be, or to be affected, by aggregates development;
- A6. to engage with industry and other stakeholders and increase their awareness of the archaeology of the aggregate producing areas, and the benefits that aggregates extraction has provided, and thereby promote informed understanding of the different stakeholder positions.

Objectives will include:

- O1. identification of the exploited aggregates resource and associated landforms within Staffordshire and production of mapping and accompanying written summary descriptions for each of the landforms, based upon mapped solid and drift geology and the already established mineral mapping for Staffordshire held by the SCC MPA (Task 2; Products 1 and 2);
- O2. identification, quantification, summary description and mapping of areas of past, present and potential future aggregates extraction using data held by the BGS and the Staffordshire Planning, Policy and Development Control Team (Task 2; Products 1 and 2);

- O3. targeted enhancement of the HER for defined landforms where data is either limited or requires upgrading (Tasks 3 and 4; Products 3 and 4);
- O4. production of a brief archaeological and historical overview of Staffordshire drawing on the West Midlands Regional Research Framework (Watt 2011) and other published sources (Task 5; Product 2);
- O5. mapping of the evidence-base and resource assessment for each of the landforms associated with aggregate production based upon data held within the project GIS and background research (Task 6; Product 2);
- O6. provision of an archaeological research agenda for each of the landforms associated with aggregate production to provide a framework for future investigations and identify areas where future data capture and/or enhancement is required for the evidence base (Task 7; Product 2);
- O7. provision of a management framework for the aggregate producing areas which discusses use of the landform mapping and assessments provided and summarises and signposts current policies, appropriate methodologies and guidance documents relevant to minerals planning for the industry and other stakeholders and which is designed to be consistent with those developed elsewhere in the region and especially within the remainder of the Trent catchment (Tasks 8 and 9; Product 2);
- O8. collation of project results into detailed project report for professional archaeological audience and production of a shorter and more accessible guidance booklet for wider dissemination and use by non-archaeological stakeholder groups (Tasks 10, 11 and 12; Products 2 and 5);
- O9. signposting of project outputs through OASIS and deposition of archive with HER and ADS to make results widely accessible for use by all stakeholders (Task 13; Product 6).

Project outputs (Products 1-6; see Appendix 1 for product descriptions) will comprise GIS layers and data, along with project reports which:

1. will inform and underpin structured dialogue and decision-making in relation to the future management of heritage assets and historic landscapes in Staffordshire where they might be or are to be affected by minerals extraction, thereby reducing risk to all stakeholders.
2. will provide an enhanced HER evidence-base and identify likely archaeological associations for the different landforms in the aggregate producing (safeguarded) areas of Staffordshire thus supporting the development of informed and question-led approaches to programmes of archaeological evaluation and mitigation;
3. will develop and signpost appropriate policies, strategies and methods for strategic minerals planning, pre-determination archaeological evaluation and post-determination mitigation that will support the delivery of more consistent approaches both within the county and with neighbouring local authorities (especially Derbyshire and Nottinghamshire);

4. will provide accessible sources of information which meet the needs of the archaeological community, the minerals industry and the wider public and which highlight both the impacts and positive gains which have been made and may result from mineral extraction;
5. will raise awareness and promote informed understanding of the different stakeholder positions.

1.4 Business case

As a result of the Aggregates Levy Sustainability Fund, understanding of the potential impact of mineral extraction on heritage assets is well documented and assessments of the archaeological resource in aggregate producing areas were a major component of the EH Aggregates Levy Sustainability Fund programme (2002-10).

The importance and potential of such projects is recognised within the National Heritage Protection Plan under NHPP Topic 2D: Impact of Resource Exploitation and specifically Activity 2D4: Mineral Extraction Impacts. Where completed these assessments provide a vital part of the evidence-base used for strategic planning purposes and are widely consulted by historic environment curators, land use planners and the minerals industry. Such assessments support the delivery of consistent and proportionate approaches to the provision of advice relating to the winning of sand and gravel and hard rock resources across county boundaries. Through assessment and definition of the potential archaeological assets present in aggregate producing areas they assist in the identification and application of the most appropriate techniques to gather the information necessary for the effective discharge of the various stakeholder roles within the planning system, they reduce risk for all parties involved.

In contrast to many adjacent counties in the West and East Midlands with significant aggregate apportionments, Staffordshire has yet to benefit from the completion of such an assessment. In the light of the recognition of the value of such projects in the NHPP, the extent of extraction and the ongoing development of a core mineral strategy for the County (Minerals Local Plan; due to be produced in 2012-13) the undertaking of an Aggregates Resource Assessment (ARA) at this point in time (Project Stage 1) is seen as particularly opportune by minerals planners and archaeological advisors for the county as well as by the English Heritage Inspector (Ian George). Minerals planning in the county will be considerably enhanced through the provision of an enhanced archaeological evidence base and targeted research framework, with project outputs intended to be used to support development of the new minerals strategy as well as in considering specific applications. Paul Wilcox (SCC Policy and Development Control Manager) will form part of the Project Team; his input ensuring that the ARA produced will be used during the development of the new strategy and that the GIS information and accompanying documentation are fit for purpose for use by SCC's minerals planning team and for the wider aggregates industry.

A further project stage (Stage 2) is envisaged to address the extensive non-aggregate minerals resources of the county and this will be further defined at the end of the current project cycle. These are coming under increasing pressure for development and often occupy areas of the county with limited archaeological records, thus present considerable difficulties to those managing the archaeological resource both strategically and in relation to specific applications.

The project (both Stages 1 and 2) will provide an opportunity to construct a strategic overview (assessment) of the extent and character of the mineral deposits in the county, the archaeological resource in these areas and the impact of past, present and potential future mineral extraction on these areas. The enhanced understanding will inform future decision-making on priorities for the preservation of both designated and undesignated heritage assets through the minerals planning process. Other project outputs will include a research agenda that will inform decision-making through summarising archaeological understanding of the mineral producing areas and through identifying priorities for research and appropriate investigative approaches for use at both pre-determination (evaluation) and post-determination (mitigation) stages.

Project methodology and outputs have been designed to closely follow those of the aggregate resource assessments already produced for Derbyshire and the Peak District (Brightman and Waddington 2010), Nottinghamshire (Knight *et al* 2012) and Warwickshire and Solihull (Alexander 2008), thus supporting the delivery of consistent advice and approaches throughout the region and especially for the nationally important aggregate production area of the Trent catchment.

The Project Team identified is ideally placed to deliver such a project. The Staffordshire County Council Historic Environment team has extensive county-based expertise on both the archaeological resource and minerals development and have direct access to the main sources of information required for the project (HER, Minerals Planning and ongoing project data). They will lead identified HER enhancement tasks and provide input to all other aspects of the project. WAAS' Field Section has over 20 years experience of delivering advice and fieldwork services both within the county and further afield. They will manage the project and lead production of the assessment of the archaeological resource, the impact of extraction upon that resource and the definition of research agendas for the extraction areas. WAAS have a long-standing track record in the design, implementation and successful delivery of aggregate and other strategic planning projects for English Heritage and other bodies, both in their own right and through partnering other organisations. Of particular relevance they have prior experience of undertaking an Aggregates Resource Assessment (for Worcestershire; Jackson and Dalwood 2007, http://archaeologydataservice.ac.uk/archives/view/worcsagg_eh_2007/), of making a major contribution to a similar assessment project in Herefordshire (http://archaeologydataservice.ac.uk/archives/view/lugg_eh_2007/overview.cfm) and of having completed a number of other strategic aggregates related projects through the ALSF which have been both county and cross-county based. Further, as a contractor, they have direct experience of identifying, designing and delivering appropriate mitigation strategies on behalf of minerals operators and archaeological consultants across the West Midlands, including at the major quarry at Whitemoor Haye, Staffordshire.

Staff from both the Staffordshire and Worcestershire teams made major contributions to the West Midlands Regional Research Framework (Watt 2011) and are involved in the Trent Valley Geoarchaeology Group, thus bringing a close working knowledge of the appropriate local and regional research frameworks.

Both organisations work on a comparable HER and GIS platform thus enabling data to be readily shared between organisations and ensuring compatibility of outputs and data management standards.

The WAAS project team is underpinned by management values based on three basic principles, making them the ideal partner for both English Heritage and Staffordshire County Council.

Value	Purpose	What it means
Customer Focus	Providing high quality services which meet the express needs of the community <i>following the customer charter</i>	Knowing that the customer is the most important person in your job and always putting their needs first. Always treating customers with respect and courtesy. Consulting and involving customers in development of services and seeking feedback on the quality and level of service delivery. Seeing complaints as opportunities to improve. Putting yourself in the customer's shoes. Always doing what you said you would do.
'Can do' culture	Encouraging solutions and creative ways of working not blocked by bureaucracy	Knowing that your job is about making things happen. Having a positive attitude to fixing problems including being innovative and seeking solutions outside of traditional approaches. Taking managed risks and supporting colleagues to take managed risks. Being excited about trying new things
Freedom within boundaries	Devolving decision making and ensuring services are responsive to needs	Being willing to take ownership of an issue and exploring new approaches to resolving it. Delegating responsibility and giving people as much freedom as possible in deciding how to do their job. Being able to constructively challenge boundaries where they cause blockages.

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1.5 Project scope

The project is designed to be undertaken in two stages of which only Stage 1 is defined through this proposal.

The Stage 1 project study area encompasses those parts of Staffordshire defined within the Minerals and Waste Development Scheme as potential minerals producing areas (the Mineral Consultation Areas; Figures 1 and 2) and incorporates only those areas producing aggregates (as defined by the Aggregates Levy; namely bedrock sand, building stone, limestone, silica sand and superficial sand and gravel).

The Stage 1 project will be entirely desk-based using existing HER data and other readily available sources. No new data collection is intended, however, targeted areas of HER enhancement will be undertaken following an initial rapid assessment of the quality

and quantity of readily available data for the aggregate production areas and associated landforms.

The scope of Stage 2 will be defined in a UPD produced at the completion of Stage 1. In outline, Stage 2 is proposed to encompass assessment of the non-aggregate, mineral production areas of Staffordshire. Methods will be based upon those utilised in Stage 1 but will be adapted as necessary to reflect the different requirements, focus and impacts of non-aggregate mineral extraction.

1.6 Interfaces

Project interfaces will be as follows:

- The Mineral Resource Assessment being commissioned (by EH) for the adjacent county of Shropshire (to be undertaken by Shropshire County Council)
- the completed Aggregates Resource Assessments of Derbyshire (Brightman and Waddington 2011) and Nottinghamshire (Knight *et al* 2012)
- ongoing commercial or research fieldwork within aggregate production areas of Staffordshire which is as yet unpublished but which provides important evidence for the development of the Resource Assessment Research Agenda;
- any aspects of the NMP which may be brought forwards or affect the proposed Study Area or influence the proposed Stage 2 project;
- NHPP projects which may be developed in relation to assessment of non-aggregate minerals and thus influence the design and content of the proposed Stage 2 project.

1.7 Communications

Communication with the Project Team (see below) will principally be undertaken by telephone and email and will be co-ordinated by the Senior Project Manager (Robin Jackson) who will be the principal point of contact for the project. All project documentation and correspondence will therefore be copied at minimum to the Senior Project Manager who will be responsible for maintaining copies of all project documentation for both management and archive purposes.

All communication with English Heritage on project progress, resourcing, variations and other issues which may affect the agreed delivery of the project will be maintained by, and channelled through, the Senior Project Manager. The primary contacts at English Heritage will be the Project Monitor, Helen Keeley and Jon Humble Senior National Minerals Advisor.

Key project documentation (Project Designs, Updated Project Designs, minutes of Team Meetings, Highlight Reports, Issues Log, etc) will be maintained and co-ordinated by the Senior Project Manager with the assistance of other project team members and will normally be circulated to all members of the Project Team.

Scheduled Project Team meetings will be undertaken at intervals during the course of the project (principally at SCC), following which minutes or key resulting documentation will be circulated to the Project Team. At least one Project Team Meeting (see below)

will be held at initiation and near completion of each phase of the project (4 in total). Other team meetings for appropriate sub-groups of the team may also be held periodically.

It is intended that the Project Officer from WCC who will complete the mapping and undertake the bulk of the assessment and research agenda will be based at the Worcestershire Archive and Archaeology Service offices with direct access to the SCC HER (provided by CITRIX), whilst SCC staff will complete the HER enhancement based at their own offices.

1.8 Project review

The following project Stage 1 phases are identified:

Project Design

Completion and submission of a detailed Project Design (by 31 January 2012)

Main (Stage 1) project

- Phase 1 Establish GIS and collate and rapidly assess baseline data quality using geological and drift mapping, modern and historic OS mapping, HER data and mapping, HLS data, and available aerial photographic and LiDAR coverage. Undertake mapping and description of aggregate resources and associated landforms. Undertake quantification and analysis of aggregate extraction/production data and trends leading to mapping and description of past, present and likely potential future aggregate extraction and the impact of past and ongoing quarrying (including the research dividend) on the archaeological resource (March to July 2012). Tasks 1, 2 and 3. Review Point 1. Highlight Report 1. Programme period c. 8 weeks. Programme allocated 20 weeks (Tolerance 12 weeks).
- Phase 2 Targeted data enhancement of HER. Research regional and county archaeological resource assessments and other relevant archaeological sources (including unpublished and ongoing fieldwork/research). Produce historical and archaeological overview of Staffordshire. Collate research agenda objectives identified in relevant regional and sub-regional resource assessments (August 2012 to January 2013). Tasks 1, 4 and 5. Review Point 2. Highlight Report 2. Programme period c. 11 weeks. Programme allocated 26 weeks (Tolerance 15 weeks).
- Phase 3 Quantification, mapping, analysis and assessment of HER data for identified landforms/extraction areas. Establish research agenda. Summarise mitigation approaches. Summarise policies and planning frameworks. (February 2013 to November 2013). Tasks 6, 7, 8 and 9. Review Point 3. Highlight Report 3. Programme period c. 20 weeks. Programme allocated 40 weeks (Tolerance 20 weeks).
- Phase 4 Collate and output main report. Produce summary guidance booklet. Submission of Stage 1 outputs to EH for editing/comment (Quality Assurance). Stage 1 Review and archive deposition. Production of Stage 2 UPD (December 2013 to April 2014). Tasks 10, 11, 12 and 13. Review Point 4. Highlight Report 4. Programme period c. 12 weeks. Programme allocated 20 weeks (Tolerance 8 weeks).

1.9 Health and safety

The current conditions and requirements of Worcestershire County Council's health and safety policies and procedures cover WAAS. Current versions are available through the County Council's intranet (SID).

- *Health and Safety, corporate health and safety policy.*
- *Corporate Services safety policy (Cultural Services).*

The County Council also produces supplementary guidance (for example).

- *Accidents, emergencies, fire and first aid.*
- *Action in unbearably hot workplaces.*
- *Display screen equipment*
- *General risk assessment.*
- *How to set up your workstation.*
- *Lone working.*
- *Moving and handling of objects.*
- *No smoking policy.*
- *Personal protective equipment.*
- *The handling, storage and use of hazardous substances.*
- *Violence and personal safety.*
- *Workplace (health safety and welfare).*

The current conditions and requirements of Staffordshire County Council's health and safety policies and procedures cover SCC staff. Current versions are available on line at <http://www.intra.staffordshire.gov.uk/healthsafety/policy/home.aspx>

2 Resources and programming

2.1 Project Team structure

2.1.1 Project Manager/executive

Robin Jackson (WAAS: Senior Project Manager).

Project planning and coordination, cost and resource monitoring, programming, and liaison with EH and other stakeholders.
Production and maintenance of risk logs, issue logs and highlight reports. Internal quality assurance.

Robin has been a Project Manager at WAAS since 1998 and has been responsible for the design and implementation of numerous research and development projects on behalf of English Heritage as well as other clients. He specialises in both the strategic management and commercial field investigation of large-scale rural sites, especially relating to aggregate extraction. He has

developed, and contributed to, many ALSF projects including managing the delivery of Worcestershire ARA. He is a member of the Trent Valley Geoarchaeological Group and has contributed widely to the West Midlands Regional Research Framework. In 2010 he was invited by MIRO to present a paper on good practice at stakeholder workshops disseminating the MHEF *Mineral Extraction and Archaeology: A Practice Guide*.

2.1.2 Project Experts

Project Leader	<p>Andrew Mann (WAAS: Project Officer). GIS set-up. Production of aggregate and landform mapping and descriptions. Archaeological research leading to production of archaeological and historical overview. Production of overview of past, present and potential future aggregate extraction. Production of archaeological resource assessments for landforms. Lead production of Research Agenda. Lead production of methods, mitigation, and management and policy sections. Contribute to summary guidance booklet. Collation and submission of archive, etc.</p> <p>Andy is a Project Officer at WAAS and brings considerable experience of both environmental archaeology and field archaeology to the project. Over the past 6 years he has led major programmes of evaluation and mitigation fieldwork in quarries across Worcestershire, Herefordshire and Staffordshire. He was the WHEAS lead for the ALSF Project <i>Evaluating and Enhancing the Geoarchaeological Resource of the Lower Severn Valley</i> which used a landform based mapping approach to the investigation of the geoarchaeological and archaeological resource of this major river catchment.</p>
SCC Lead	<p>Suzy Blake (SCC Historic Environment Record Officer). Co-ordinate SCC input. Ensure and advise on data standards and provide training in use of SCC HER. Lead targeted data enhancement of HER. Contribute to research agenda. Contribute to summary guidance report. Lead integration of results into SCC HER.</p> <p>Suzy has been Historic Environment Record Officer at SCC since 2003 and over the last eight years has been responsible for the management and development of Staffordshire's HER. She has undertaken a full HER Audit as well as numerous enhancement projects to improve the quality of the HER data in line with MIDAS and IFP2 standards. The development of the HER has also involved Suzy assisting in the design, implementation of and delivery of externally funded projects (for English Heritage and Natural England).</p>
HER enhancement	<p>Debbie Taylor (SCC Landscape Archaeologist). Undertake targeted data enhancement of HER. Integration of results into SCC HER.</p>

Debbie has worked in local government heritage teams for eight years. She joined SCC Historic Environment Team in 2006 as the landscape archaeologist principally to take the HLC project forward. She has been instrumental in delivering projects including five Historic Environment Assessments and the Extensive Urban Survey. Both projects considered both historic character and heritage assets utilising the HER; this has resulted in considerable HER enhancement. Prior to joining SCC Debbie worked as an Assistant HER Officer at Hampshire County Council and carried out the Black Country HLC project.

Project Support

Emma Hancox and Oliver Russell (Historic Environment Policy and Advisory Manager and Historic Environment Record Officer). HER advice Worcester Offices (since both HERs share the same platform Emma and Olly can provide on site guidance and support)

Stephen Dean (SCC Principal Archaeologist). Attend meetings. Input to planning policy, strategy and mitigation/methodology sections. Principal point of contact and information on ongoing work within quarries in the county.

Paul Wilcox (SCC: Policy and Development Control Manager). Lead provision of information and input on SCC Minerals Strategy Planning. Attend Project Team meetings. Contact with Minerals Operators. Advice and support in producing project outputs. Integration of ARA into SCC Minerals Local Plan.

Dr Andy Howard (University of Birmingham). Expert input to project (geoarchaeological frameworks, Quaternary environments and Trent Valley archaeology)

HER enhancement work will be supported if required by other members of the Staffordshire/Worcestershire Historic Environment Record teams (Historic Environment Record Assistants)

2.1.3 Project Assurance

The Project Assurance Officer will be Helen Keeley.

2.2 Stakeholders

English Heritage is sponsoring the project and Jon Humble, Senior National Minerals Advisor and Ian George the regional Inspector of Ancient Monuments are the primary contacts.

A number of archaeological consultants, practitioners and minerals operators working in Staffordshire will be approached and consulted during the course of the project to provide input and perspectives from other intended primary end-users of the project.

3 Methods statement

The project will be undertaken according to the format and procedures described in *Management of research projects in the historic environment: the MoRPHE project manager's guide* (English Heritage 2006).

The first stage of the project (Stage 1) as proposed and defined in this Project Proposal will cover the aggregate producing areas of Staffordshire.

A second stage (Stage 2) is envisaged following completion of Stage 1 and if approved would cover the non-aggregates minerals.

Methods for Stage 1 will be based upon those used for other ARAs and will use a landform based approach to identification, quantification and assessment of the archaeological resource within a GIS environment (see for instance Brightman and Waddington 2011, http://archaeologydataservice.ac.uk/archives/view/derbyaggs_eh_2011/index.cfm; and Knight *et al*).

The project's products and tasks and their relationships to aims and objectives are summarised in the Task list below with further details provided in Appendix 1: Products.

3.1 Project management (Task 1)

3.1.1 Management, meetings and quality control (All Stages: Task 1)

Management and Coordination (Task 1.1)

Project Management will follow established WAAS procedures using Microsoft Project to monitor resource allocation, track progress and provide progress reports to the English Heritage Project Officer.

The WAAS Senior Project Manager (Robin Jackson) will co-ordinate the project and maintain project documentation (including OASIS entry, Risk and Issue Logs, Highlight Reports, etc) with the assistance of the WCC PO (Andy Mann) as well as the SCC lead (Suzy Blake), who will co-ordinate SCC input to the project and liaise with the WAAS Senior Project Manager providing updates on progress with elements of the project for which they have responsibility.

An OASIS form will be started to register the project and thereby ensure that the wider archaeological community can be made aware of, and have access to, the project results.

One or more EH monitoring meetings will be arranged during the course of the project.

Team meetings (Task 1.2)

Project Team members will attend an initial Project Team meeting (Phase 1) which will enable all team members to be briefed and familiarised with the project.

A Project Team meeting will be held at the outset of (or during) each subsequent phases (x3) of the project. Team meetings will be held at SCC offices in Stafford.

Resources are also included to enable meetings between those members of the Project Team undertaking the bulk of the tasks and/or critical tasks during the course of the project so as to ensure approaches and resources remain appropriately targeted and outcomes meet project aims and objectives.

A half day is allowed for each meeting plus appropriate travel time.

3.2 Phase 1: Establish base mapping and quantify and assess existing baseline data (Tasks 2 and 3)

3.2.1 Mapping (Task 2)

Task 2.1: Familiarisation and set-up of Project GIS (Product 1)

The WAAS Project Officer (Andy Mann) will be inducted into use of the SCC HER and GIS including use of the remote access system (CITRIX).

Training/induction will be undertaken by Suzy Blake.

The Project GIS will be established based on data held by SCC. To include:

- Modern and historic OS mapping,
- BGS geological data (1:50,000 scale bedrock and superficial coverages);
- Historic Environment Record data,
- Historic Landscape Characterisation data,
- Aerial photographs,
- LiDAR coverage (high resolution images from the EA as held by SCC HER),
- Palaeochannel mapping (from Trent Valley Geoarchaeology),
- Scheduled Monuments, Conservation Areas, Registered Parks and Gardens and Historic Battlefields,
- The Portable Antiquities Scheme database,

Note Listed building data will not be included since they are very rarely affected by mineral extraction and on those rare occasions when they are affected are only affected on an individual basis.

Task 2.2: Define and map aggregate production sites (Product 1)

Former and active aggregate extraction sites will be mapped on a defined layer (polygons) within the GIS using data from the BGS and SCC MPA.

In particular the following Minerals Planning data held by SCC will be used:

- Historic Minerals Sites Since 1947
- Active Quarries and Mines
- Mineral Consultation Areas (after Bees *et al* 2006)
- Strategic Mineral Site Options
- Minerals Plan Saved Allocated Sites (which are in addition to the Strategic Mineral Site Options to be considered as part of the Minerals Core Strategy Document)
- Mineral Safeguard Areas (which are specific areas around Newcastle over and above the Mineral Consultation Areas which are for the safeguard of the Etruria Marl deposits).

The BritPits database will also be consulted for information on former mining and extraction areas.

Task 2.3: Define and map aggregate resources and landforms (Product 1)

Central to the project approach is the identification of landform elements and their associated sedimentary sequences which provide the exploited aggregate resources.

The available and potentially exploitable aggregate resources will therefore be mapped as a defined layer (polygons) within the GIS using the BGS solid and drift mapping and SCC Minerals Planning datasets (as listed for Task 2.2).

The associated landforms within these areas will then be mapped (as polygons) within the GIS as one or more defined layers. Landform elements are defined as discrete landform units that have homogeneous geomorphological and topographical characteristics that can be defined at a variety of spatial scales. Previous research has shown that there is a direct link between particular types of landforms and their archaeological and palaeoecological associations, thus making them an important tool in the assessment .

The following are anticipated:

1. Landforms associated with the county's aggregates resources (as defined by the Aggregates Levy), namely hard rock (Sherwood Sandstone and Carboniferous Limestone) and sand and gravel (both river terrace and fluvio-glacial);
2. Holocene landforms (alluvium, palaeochannels and peat) which often overlie exploitable minerals resources and typically have distinct archaeological associations and thus can require different evaluation and mitigation strategies

The landforms identified will define the study areas for the Stage 1 Project.

Task 2.4: Describe landforms associated with aggregate extraction (Product 2)

A descriptive summary of the character and extents of the landforms identified and associated with aggregate extraction will be produced based on desktop analysis of the mapping available and associated descriptions such as the memoirs published by the BGS accompanying solid and drift mapping.

Available LiDAR data may also be consulted to support identification of alluviated areas and palaeochannels.

Task 2.5: Quantify and describe aggregate production (Product 2)

Descriptions of the aggregates which are exploited within the county will be produced and past, present and potential future aggregate extraction trends will be assessed, quantified and summarised.

This will use data provided by the SCC MPA, the BGS survey undertaken on behalf of SCC (Bees *et al* 2006) and also sub-regional apportionment data available from the West Midlands Regional Aggregates Working Party (WMRAWP) to examine trends in, and levels of, production (see for instance - http://www.wmra.gov.uk/Planning_and_Regional_Spatial_Strategy/RSS_Revision/Agg.a_spx).

The impact of past and ongoing quarrying (including the research dividend) on the archaeological resource will be assessed, quantified and summarised.

3.2.2 Assess baseline data and prioritise areas for data enhancement (Task 3; Product 3)

The GIS will be used to map HER data and AP and LiDAR coverage against the defined landforms and this will be used as the basis of a rapid assessment of the quality and quantity of the baseline data available for the aggregate producing areas/landforms, using the density of data mapping as a basic index (quantity) and the professional judgement of the SCC HER staff (quality).

Areas where data enhancement is desirable will be identified and prioritised (where practical) against resources identified for this element of the project (see Task 4 below). In the absence of NMP coverage within Staffordshire, it is anticipated that digital scanning and geo-referencing of NMR AP transcriptions (as are already held by SCC) is liable to be identified as an important adjunct to HER data and those APs already integrated. Areas of data 'cleaning' and 'enhancement' are also liable to be identified where the record is poorly defined and/or poorly verified.

The areas identified for prioritising how project resources will be allocated in Phase 2: Task 4 will be a 'key' discussion area for Project Review Point 1 to be held at the conclusion of Phase 1 and prior to commencement of Phase 2.

3.3 Phase 2: Enhancement and research (Tasks 4 and 5)

The Staffordshire HER met the agreed national data standards at their last audit in 2008 and are due to revisit the HER Audit in the coming financial year (2012/13); however, due to lack of resources, HER data does not incorporate all available information and is therefore in need of enhancement and editing for the aggregate production areas and associated landforms. Such enhancement will provide clearer and more consistent datasets to support assessment of the archaeological resource and will enhance the evidence base for future decision making as a part of aggregate planning.

3.3.1 HER Enhancement (Task 4; Products 3 and 4)

Task 4.1: Data enhancement – integration of information from EH and LiDAR overlays
Data enhancement is anticipated to focus on integration of readily available overlays for selected areas, notably the NMP overlays of the National Forest Area.

The following will be undertaken:

- Geo-rectification of NMP (c. 25 quarter sheets) and RCHME overlay sheets (130 overlay sheets of which 40 cover cropmarks and 90 cover ridge and furrow) – exact numbers of these covering aggregate producing areas cannot currently be specified but the majority are understood to incorporate aggregate producing areas.
- Existing HER GIS data will be checked against overlays
- Existing HER records will be checked against related information on PastScape
- New sites and additional information identified from overlays will be added to HER (an estimated 2,500 records will be involved).

Enhancement will include ensuring that all sites in these areas are defined as polygons rather than points, thus providing proper definition of likely extents (as is the case for the SCC HER data in areas which do not require 'cleaning' and enhancement).

Geo-referenced EA LiDAR data is also available for 642 tiles (each covering a relatively small area) and a rapid assessment of each tile for archaeological potential within specific areas of 'high priority'/'high sensitivity' as identified by the SCC Planning Team will also be undertaken. This will focus on whether potentially important geomorphological landforms (palaeochannels, terraces, terrace 'islands' and terrace edges) or cultural features (watermeadows, field systems, etc) are present and thus inform understanding and assessment of the associated landforms; as well as potentially helping to identify Holocene landforms such as palaeochannels which as noted previously may have distinct archaeological associations and require different prospection and mitigation strategies to those applicable on adjacent landforms.

Task 4.2: Data enhancement – integration of other data

Water meadow survey data is also available and where this falls within ARA areas polygons and associated data will be added to the HER.

A rapid assessment (2 days) of data held within the National Record of the Historic Environment against that held within the Staffordshire HER will also be undertaken to identify and prioritise new data sets relevant to the project. All new, relevant data will be made available for use with the project and where feasible will be incorporated into the HER (max 5 days).

3.3.2 Background research, consultation and archaeological overviews (Task 5; Product 2)

Task 5.1: Research and consultation

Regional and county archaeological resource assessments and other relevant archaeological sources (including unpublished and ongoing fieldwork/research) will be consulted, including:

- West Midlands Regional Research Framework (Watts 2011),
- The Undiscovered Country. The Earlier Prehistory of the West Midlands (Garwood 2007),
- East Midlands Regional Research Framework (Cooper 2006),
- Trent Valley Landscapes (Knight and Howard 2004),
- Derbyshire and the Peak District ARA (Brightman and Waddington 2011),
- Nottinghamshire ARA (Knight *et al* 2012),
- Warwickshire ARA (Mullin 2008).

A review of grey literature involving archaeological interventions within ARA areas will be undertaken to enable integration of previously unrecorded sites into the HER.

Organisations holding 'undisseminated' information concerning archaeological remains within the study area will be also contacted for summary information on 'key discoveries'.

A number of archaeological consultants, practitioners and minerals operators working in Staffordshire will be approached and consulted to provide input and perspectives from other intended primary end-users of the project.

Gary Coates and Andy Richmond (Phoenix Consulting), Jim Brightman (Archaeological Research Services: Bakewell Office) and Tim Malim (SLR Consulting) have all been approached and are willing to act as consultees.

A number of quarry operators will also be approached via their relevant estate managers. Lafarge Aggregates (Ross Halley), Hanson Aggregates (Tim Darling), Aggregate Industries UK Ltd (Tim Claxton) and Tarmac Ltd (Nick Atkins) are suggested as appropriate industry representatives for this region.

This will ensure that the resultant research framework, agenda and policy overviews produced (see Phase 3) take into account local, regional and national overviews and research priorities, as well as incorporating up-to-date information and stakeholder opinions.

Task 5.2: Produce historical and archaeological overview

Upon completion of Task 5.1, an historical and archaeological overview of Staffordshire will be produced for inclusion in the project report so as to provide a general background and framework for the landform specific assessments and research agenda (see Phase 3: Tasks 6 and 7) .

Task 5.3: Identify regional research objectives relevant to aggregate producing areas

The research agenda objectives identified in relevant regional and sub-regional resource assessments will be collated and those relevant to the aggregate extraction areas and associated landforms will be identified.

3.4 Phase 3: Production of Resource Assessment, Research Agenda, methodological guidance and summary policy framework (Tasks 6, 7, 8 and 9)

3.4.1 Production of resource assessment (Task 6; Product 2)

Task 6.1: Mapping and quantification of project data against landforms

All data, following initial collation (Task 2) and enhancement (Task 4), will be collated and the distribution of archaeological remains of different types and periods will be mapped and quantified against the identified landforms within each aggregate extraction area. This will include production of asset densities by period per 1km² for each of the aggregate areas/landforms as well as for the whole county.

This will provide baseline data which can be used to demonstrate gaps in knowledge, areas of good knowledge, hot spots etc and be used in assessing the evidence-base for each (Task 6.2).

Task 6.2: Assessment and analysis of evidence base

The data identified for each aggregate resource/landform will be assessed and a period-based summary for each will be produced. This will be formulated through analysing and reporting the evidence-base collated throughout the project. It will also provide understanding of the trends of loss (impact) and enhancements to knowledge (benefits) resulting from aggregate extraction.

Broad assessments and statements of significance (national, regional, local) for areas will be made based upon the approaches employed for Historic Environment Character Area (HECA) / Historic Environment Character Zone (HECZ) assessments. The intention is that the focus will not be placed on individual heritage assets (which where significant are appropriately protected within the planning process) but on areas where the 'group value' of sites/landscape areas (or whole landforms) is high and thus significance is greater than that represented by the individual component sites.

3.4.2 Production of aggregates research agenda (Task 7; Product 2)

The information provided during Task 6.2, will be drawn upon to provide a specifically tailored research framework for each of the landforms associated with the defined aggregate production areas. The research framework will especially consider the potential of these areas to provide data which will inform key debates/themes identified in the West Midlands Regional Research Framework and other relevant documents (as identified through Task 5).

The framework will also identify areas/landforms where the evidence base requires enhancement both at a broad level as well as in relation to specific periods, asset categories or evidence types.

In establishing the research agenda, priorities will be established for the aggregate production areas and associated landforms using professional judgement but also taking into account those areas for research which identified in more than one of the research frameworks consulted during Task 5.

3.4.3 Assessment and identification of evaluation and mitigation approaches (Task 8; Product 2)

Text will be produced summarising (for a non-archaeological audience) the range of archaeological techniques available.

Assessment will be undertaken to identify the most appropriate archaeological evaluation and mitigation strategies for use with each landform type and to highlight issues which might compromise their effectiveness.

This will be based firmly upon national guidance as provided in the *Mineral Extraction and Archaeology: A Practice Guide* (MHEF 2008) and *Mineral Extraction and the Historic Environment* (EH 2008). It will also draw on consultation with archaeological consultants, practitioners and minerals operators working in Staffordshire who will be approached and consulted during the course of the project to provide input and perspectives from other intended primary end-users of the project.

3.4.4 Summarise minerals planning policies and frameworks (Task 9; product 2)

Text will be produced summarising the Minerals Planning Process as specifically applicable in Staffordshire via the new Mineral Core Strategy for the county and based upon national guidance as provided in *Mineral Extraction and Archaeology: A Practice Guide* (MHEF 2008), *Mineral Extraction and the Historic Environment* (EH 2008), PPS5, NPP1, etc.

3.5 Phase 4: Dissemination and archiving

3.5.1 Report production (Task 10; Product 2)

A detailed (archive) report will be produced. This will be aimed primarily at the archaeological community and will collate the results from the tasks described above providing a detailed narrative and accompanying illustrative material.

Four main report sections are intended as follows:

- *Introduction* (to include project background, aims and objectives, and methods)
- *Overviews* (to include aggregate production in the county and archaeological and historical overview of the county and region)
- *Resource Assessment* (providing summary mapping and description of the identified landforms and associated archaeology by landform type for both solid geology and superficial geology)
- *Management framework* (comprising summary results, description of regulatory framework and national guidance, guidance on how to use the project outputs, identification of appropriate methods/mitigation strategies and presentation of research agenda for archaeology in the aggregate producing areas).

3.5.2 Produce summary guidance booklet (Task 11; Product 5)

A short A4 guidance booklet will be produced summarising project results (the format to be based on that used for the Derbyshire and Nottinghamshire ARAs).

This will be specifically designed for use by other (non-archaeological) stakeholders and will make extensive use of tabular presentation of information and colour images to provide an accessible and easily consulted reference document which signposts policies, investigative approaches and key archaeological issues for each of the aggregate producing areas of Staffordshire within wider regional frameworks.

3.5.3 Editing (Task 12; Products 2 and 5)

Task 12.1: Internal editing

The main report and summary guidance booklet text sections and illustrations will be subject to internal editing by the Project Manager and members of the Expert Team (as appropriate). This is with the aim of maintaining quality control and ensuring that outputs reflect the understanding of the whole Project Team.

The Project Leader will incorporate the edited comments and collate the reports (Products 2 and 5) for submission to English Heritage for peer review.

A further stage of editing will follow receipt of English Heritage comments (Task 12.2).

Task 12.2: External editing

Following internal editing the project reports (Products 2 and 5) will be submitted to English Heritage for external editing/comment (Quality Assurance).

3.5.4 Task 13: Archive deposition and Stage 1 Project closure (Products 6 and 7)

Task 13.1: Submission/incorporation within SCC HER (Product 6)

It is considered that the most appropriate repository for the project archive is with the Staffordshire HER within which the project will be developed and which the project output and archive will enhance.

The HER data and mapping compiled for this project, and the abstracted landform element coverage will be therefore be provided to the SCC HER (and SCC Mineral Planning Authority) for uploading into their system so as to allow for the application of the enhanced data and guidance provided within development control and advice provision for the county.

The project digital data and hard copy outputs will also be available through the SCC HER to the public.

Task 13.2: Submission/incorporation within national information repositories (Product 6)

The project report, along with the guidance booklet derived from the report, will be made available for download from English Heritage's HELM website (www.helm.org.uk) and from the SCC website.

An OASIS form will be completed to register the project and thereby ensure that the wider archaeological community can be made aware of, and have access to, the project results.

A copy of the report and the project archive will also be deposited with the Archaeology Data Service.

Task 13.3: Updated project design for Stage 2 – non-aggregate minerals (Product 7)

Detailed proposals and methods will be presented in a UPD for Stage 2 to cover the landforms bearing non-aggregate minerals. Methods identified will be based upon those identified for Stage 1 but are anticipated to require some tailoring to be appropriate for the different circumstances which non-aggregate minerals present.

3.5.5 Standards and guidance

The project follows the format described in *Management of research projects in the historic environment: the MoRPHE project manager's guide* (English Heritage 2006).

3.5.6 Quality

Worcestershire Archive and Archaeology Service is part of Worcestershire County Council and is subject to the Council's policies, safeguards, practices and audit procedures.

They are registered as an archaeological organisation (RO) with the Institute for Archaeologists, and as such are bound to the IfA's *Code of Conduct* and bylaws.

WAAS forms part of Worcestershire County Council's Adult and Community Services division which has achieved Investors in People accreditation.

Staffordshire County Council's Historic Environment Team includes staff registered as Associate Members of the Institute for Archaeology and is in the process of applying RO status. The historic environment team sits within the 'Place' directorate at SCC, which

was described as 'performing well' in a 2009 Audit Commission organisational assessment.

3.5.7 Insurance

Worcestershire Archive and Archaeology Service is covered by public and employer's liability insurance (with a limit of £40 million), and professional indemnity insurance (with a limit of £5 million). Insurance is with Chartis Insurance UK Ltd (Policy Number 21005095, expires 29 September 2012).

3.6 Stages, products and tasks

Stages are outlined in Section 1.8 above with resources and tasks allocated as indicated in the tables below.

See also Appendix 1 for product details and Appendix 2 for a gannt showing the relationship between project tasks, resources and programming.

	Role	2011/12	2012/13	2013/14	2014/15	Totals
Robin Jackson	Project Manager (WAAS)	1.75	8	16.5	6.75	33
Andy Mann	Project Leader (WAAS)	11.25	57	58.5	7.25	134
Suzy Blake	SCC lead and HER enhancement	3	39	5.5	4.5	52
Debbie Taylor	HER enhancement	0.5	31.5	6.5	0.5	39
Stephen Dean	Expert team (SCC Planning – Archaeology)	0.5	1	3.5	1	6
Paul Wilcox	Expert team (SCC Planning - Minerals)	0.5	0.5	3.5	0.5	5
Andy Howard	Expert team (Trent Valley geoarchaeology)	0	2	2	0.5	4.5
SCC GIS	Project support (SCC)	0	5	0	0	5
Illustrator	Project support (WAAS)	0	0	5	0.5	5.5

Worcestershire County Council
Historic Environment and Archaeology Service

Task	Sub-task	Description	Project Phase	Personnel	Days 11/12	Days 12/13	Days 13/14	Days 14/15	Total days	Aims	Objective	Product
1		Management										
	1.1	Management and co-ordination	All	RJ AM SB	1 0.5 0.5	6 3 3	6 3 3	1 0.5 0.5	14 7 7	All	All	All
	1.2	Team meetings	All	RJ AM SB DT SD PW	0.75 0.75 0.5 0.5 0.5 0.5	2 2 2 1.5 1 0.5	1.5 1.5 1 1.5 2 1.5	0.75 0.75 0.5 0.5 0.5 0	5 5 4 4 4 2.5	All	All	All
2		Establish base mapping										
	2.1	Familiarisation/training SCC HER. Set up GIS project (.mxd file) with relevant GIS layers and sources	1	AM SB	5 2	0 0	0 0	0 0	5 2	All	O1 & O2	1
	2.2	Define and map aggregate production areas and sites	1	AM	3	0	0	0	3	A3	O1 & O2	1 and 2
	2.3	Define and map aggregate resources and landforms	1	AM	3	2	0	0	5	A2 & A3	O1 & O2	1 and 2
	2.4	Describe landforms	1	AM AH	0 0	3 1	0 0	0 0	3 1	A2	O1 & O2	2
	2.5	Quantify and describe aggregate production	1	AM AH	0 0	3 1	0 0	0 0	3 1	A3	O1 & O2	2
3		Assess baseline data and prioritise areas for data enhancement	1	SB	0	2	0	0	2	A1	O3	3
4		HER Enhancement										
	4.1	Enhancement – Geo-reference overlays. Clean and enhance data. Assess LiDAR	2	SCC GIS SB DT AM	0 0 0 0	5 25 25 3	0 0 0 0	0 0 0 0	5 25 25 3	A1 & A2	O3	3
	4.2	Enhancement – watermeadows (5 days) and assess and integrate NRHE data (2 days assessment plus 5 days enhancement)	2	DT SB	0 0	5 7	0 0	0 0	5 7	A1 & A2	O3	3
5		Research, consultation and overviews										
	5.1	Research and consultation	2	AM	0	15	0	0	15	A4	O4	2
	5.2	Produce historical and archaeological overview (region and county)	2	AM	0	5	0	0	5	A3 & A4	O4	2
	5.3	Identify relevant research objectives	2	AM	0	5	0	0	5	A4	O4	2

Worcestershire County Council
Historic Environment and Archaeology Service

Task	Sub-task	Description	Project Phase	Personnel	Days 11/12	Days 12/13	Days 13/14	Days 14/15	Total days	Aims	Objective	Product
6		Produce Resource assessment										
	6.1	Mapping and quantification of data vs landforms	3	AM	0	10	0	0	10	A2, A3 & A4	O5	2
	6.2	Assessment by landform	3	AM DT AH	0 0 0	5 0 0	35 5 0.5	0 0 0	40 5 0.5	A2, A3 & A4	O5	2
7		Produce Research Agenda	3	AM	0	0	5	0	5	A3 & A4	O6	2
8		Assess evaluation and mitigation approaches	3	AM	0	0	3	0	3	A5	O7	2
9		Summarise policies and frameworks	3	RJ PW	0 0	0 0	3 0.5	0 0	3 0.5	A5	O7	2
10		Collate and illustrate report	4	AM Illustrator	0 0	0 0	3 3	0 0	3 3	A6	O8	2
11		Produce summary guidance booklet	4	RJ AM Illustrator	0 0 0	0 0 0	3 5 2	0 0 0	3 5 2	A6	O8	5
12		Editing	4		0	0						
	12.1	Internal editing	4	RJ AM AH PW SD SB Illustrator	0 0 0 0 0 0 0	0 0 0 0 0 0 0	3 3 1.5 1.5 1.5 1.5 0	2 2 0.5 0.5 0.5 0.5 0.5	5 5 2 2 2 2 0.5	A6	O8	4 & 5
	12.2	External editing	4	EH staff	-	-	-	-		A6	O8	4 & 5
13		Archive deposition and project closure										
	13.1	Submission/incorporation to SCC HER	4	SB	0	0	0	2	2	All	O9	6
	13.2	Completion of OASIS and submission of report to HELM and ADS	4	AM	0	0	0	3	3	All	O9	6
	13.3	Production of UPD for Stage 2	4	RJ SB AM	0 0 0	0 0 0	0 0 0	3 1 1	3 1 1	All	O9	7

3.7 Copyright

WAAS and Staffordshire County Council will retain full copyright of the report and data under the *Copyrights, Designs and Patents Act 1988* with all rights reserved; excepting that they shall provide an exclusive licence to EH in all matters directly relating to the project as described in this proposal. This includes the right to use as they see fit the report and any data produced during the project. This licence will only become effective on payment of any agreed costs to Worcestershire County Council.

3.8 Risk Log

See Appendix 3.

3.- References

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Appendix 1: Product Descriptions

Product 01: GIS mapping and associated data
Purpose of the Product
Provide baseline cultural, geological and landscape mapping for aggregate production areas. Support generation of Products 2 and 3 by providing a tool for mapping data layers generated by the project, for examining data distributions and supporting assessments and for outputting mapping for illustration of reports Help meet Project Objectives O1, O2, O3, O4 and O5
Composition
Task 2.1: GIS basemapping - to include HER data, HLC data, OS mapping, aerial photographic and LiDAR coverage, historic mapping, drift and geology mapping, palaeochannel mapping, SAMs, etc Task 2.2: SCC Minerals Planning data (updated as appropriate for new extraction areas/sites) Task 2.3: Aggregate resource areas and landforms as mapped by the project Tasks 4.1 and 4.2: Newly generated HER mapping and data deriving from examination of geo-referenced NMP and RCHME overlays, HER data 'cleaning' (including where relevant newly generated polygons for sites existing only as points) and integration of water-meadow survey data Task 6.1: Mapped outputs and statistics of HER and other cultural data against identified landforms
Derived From
All mapping, overlays, data and archives involved are owned or held on licence by SCC and/or will be generated through the project from licensed data
Format and presentation
HER datasets and mapping. GIS - ARCGIS – files (.shp and attribute tables)
Allocated to
WCC staff and SCC HER staff (Task 2) and SCC staff (Task 4)
Quality criteria and method
SCC HER standards; National HER data standards (MIDAS).
Person / group responsible for quality assurance
SB (SCC HER Manager) and AM (WCC Project Lead)
Person / group responsible for approval
As above
Planned completion date / stage
Task 2 – July 2012 Task 4 – January 2013 Task 6 – March 2013

Product 02: Archive Report
Purpose of the Product
To provide a detailed report which will present the Stage 1 project outcomes for an archaeological audience
Project Objectives O1, O2, O4, O5, O6, O7 and O8
Composition
Tasks 2.4, 2.5, 5.2, 6, 7, 8, 9 and 10: Production of text sections as Microsoft Word documents with accompanying figures and data tables generated from the GIS
Task 10; Collation into a single PDF report for submission to Project team and then EH for circulation and comment
Task 12: Internal and EH editing of document
To incorporate:
<ol style="list-style-type: none"> 1. <i>Introduction</i> (to include project background, aims and objectives, and methods) 2. <i>Overviews</i> (to include aggregate production in the county and archaeological and historical overview of the county and region) 3. <i>Resource Assessment</i> (providing summary mapping and description of the identified landforms and associated archaeology by landform type for both solid geology and superficial geology) 4. <i>Management framework</i> (comprising summary results, description of regulatory framework and national guidance, guidance on how to use the project outputs, identification of appropriate methods/mitigation strategies and presentation of research agenda for archaeology in the aggregate producing areas).
Derived From
Phase 1, 2 and 3 outputs (Tasks 2-9)
Format and presentation
Word document presented as digital (PDF) report. To be produced as an internal report in WHEAS series to house style. Available following editing as an online PDF (through SCC, WAAS and ADS websites)
Allocated to
RJ, AM and Illustrator with support of Expert Team
Quality criteria and method
Presentation and content will follow appropriate MoRPHE guidance. Internal project review/edit. Subsequent EH circulation for comment, edit and approval
Person / group responsible for quality assurance
RJ with expert Team
Person / group responsible for approval
RJ, SB and EH monitor (following EH circulation)
Planned completion date / stage
Draft to Project Team for editing – January 2014 Draft to EH for circulation – February 2014 Final report – April 2014

Product 03: HER Data enhancement (GIS mapping and data)
Purpose of the Product
Provide a consistent dataset and enhanced evidence base for use in generating project outputs and in future HER and Planning work
Support generation of Products 2 and 5 by providing data to use in examining distributions, developing assessments and outputting mapping (for illustration of reports)
Project Objective 03
Composition
Task 4: Mapping of new heritage assets and enhancement of existing ones using Product 4 and other sources (water-meadow survey data). Assessment of LiDAR data held by SCC
Derived From
Product 4 – NMR and RCHME overlays Records held by HER, water meadow survey, EA LiDAR data images held on licence by SCC
Format and presentation
HER datasets and mapping GIS files (.shp and attribute tables)
Allocated to
SB and DT (SCC HER team) and AM (WAAS Project Leader)
Quality criteria and method
SCC HER standards; National HER data standards (MIDAS).
Person / group responsible for quality assurance
SB and AM
Person / group responsible for approval
RJ (PM) and SB
Planned completion date / stage
January 2013

Product 04: HER Data enhancement (geo-referenced NMR and RCHME overlays)
Purpose of the Product
Provide basemapping/information for use in enhancement of HER (Product 3)
Support generation of Products 2 and 5 by helping generation of data to use in examining distributions, developing assessments and outputting mapping (for illustration of reports)
Project Objective 03
Composition
Task 4: Geo-rectification of NMR and RCHME overlays for integration into HER and Project GIS
Derived From
NMR and RCHME overlays held by SCC
Format and presentation
GIS files (.shp and attribute tables)
Allocated to
SCC GIS support team
Quality criteria and method
SCC HER standards; National HER data standards (MIDAS).
Person / group responsible for quality assurance
SB
Person / group responsible for approval
SB
Planned completion date / stage
September 2012

Product 05: Summary Guidance Document
Purpose of the Product
To provide a Summary Guidance Document for which will present the Stage 1 project outcomes for a non specialist audience and as a quick reference for archaeological audiences
Project Objective O8
Composition
Task 11: Word document presented as digital (PDF) report with colour images and extensive use of tabular presentation for submission to Project team and then EH for circulation and comment
Task 12: Internal and EH editing of document
Derived From
Product 2
Format and presentation
Word document presented as digital (PDF) report. To be produced as a glossy booklet-style PDF and made available through SCC, WAAS and ADS websites
Allocated to
RJ, AM and Illustrator with support of Expert Team
Quality criteria and method
Presentation and content will be designed to be simple to use and understand using limited text supported by colour images and tables. Internal project review/edit. Subsequent EH circulation for comment, edit and approval
Person / group responsible for quality assurance
RJ and AM with Expert Team
Person / group responsible for approval
RJ, SB, PW and EH monitor (following EH circulation)
Planned completion date / stage
Draft to Project Team for editing – January 2014 Draft to EH for circulation – February 2014 Final report – April 2014

Product 06: Project Archive
Purpose of the Product
Collate archive and deposit with SCC HER. Key documents and signposting also deposited with ADS. To make available mapping, data and other outputs to all stakeholders through HER
Project Objective O9
Composition
GIS files (.shp and attribute tables). PDFs of Project Outputs (archive report, summary guidance document and accompanying data documentation)
Task 13
Derived From
P1-5
Format and presentation
GIS files (.shp and attribute tables) PDF documents
Allocated to
AM, SB and RJ
Quality criteria and method
SCC HER standards; National HER data standards (MIDAS) MoRPHE Technical Guide 1: Digital archiving and digital dissemination ADS Good Practice Guides
Person / group responsible for quality assurance
SB
Person / group responsible for approval
SB for SCC HER. Tim Evans for ADS. EH Monitor for OASIS
Planned completion date / stage
April 2014

Product 07: Updated Project Design
Purpose of the Product
Production of Stage 2 UPD for presentation to English Heritage for funding through the NHPP for production of a Resource Assessment for non-aggregate minerals within Staffordshire
Composition
Microsoft Word document
Task 13.3
Derived From
This Project Design
Format and presentation
WAAS UPD presented as a PDF document for submission to EH for circulation and comment
Allocated to
AM, SB and RJ
Quality criteria and method
Presentation and content will follow appropriate MoRPHE guidance. Subsequent EH circulation for comment, edit and approval
Person / group responsible for quality assurance
RJ and SB
Person / group responsible for approval
EH
Planned completion date / stage
April 2014

Appendix 2: Gantt

Task	Sub-task	Task name	Staff	Days	1 Mar-12	2 Apr-12	3 May-12	4 Jun-12	5 Jul-12	9 Aug-12	7 Sep-12	8 Oct-12	6 Nov-12	10 Dec-12	11 Jan-13	12 Feb-13	13 Mar-13	14 Apr-13	15 May-13	16 Jun-13	17 Jul-13	18 Aug-13	16 Sep-13	20 Oct-13	21 Nov-13	22 Dec-13	23 Jan-14	24 Feb-14	25 Mar-14	26 Apr-14		
1.0	1.0	Project Management																														
	1.1	Management and co-ordination	RJ AM SB	15 7 7	█					█						█						█				█					█	
	1.2	Team meetings	RJ AM SB DT SD PW	5 5 4 4 4 2.5	█					█						█						█				█					█	
2.0	2.1	Establish base mapping Training and GIS set-up	AM SB	5 2	█	█																										
	2.2	Map production areas and sites	AM	3	█	█																										
	2.3	Map aggregate resources and landforms	AM	5	█	█	█																									
	2.4	Describe landforms	AM AH	3 1	█	█	█	█																								
	2.5	Quantify and describe aggregate production	AM AH	3 1	█	█	█	█	█																							
3.0		Assess Baseline data	SB	2																												
4.0	4.1	HER Enhancement Geo-reference overlays. Clean and enhance data. Assess LIDAR	SCC GIS SB DT AM	5 25 25 3						█	█	█	█	█	█																	
	4.2	Integrate watermeadow data Assess HRHE data Integrate NRHE data	DT SB SB	5 2 5						█	█	█	█	█	█																	
5.0		Research, consultation and overviews																														
	5.1	Research and consultation	AM	15						█	█	█	█	█	█																	
	5.2	Historical and archaeological overview	AM	5						█	█	█	█	█	█																	
	5.3	Identify research objectives	AM	5						█	█	█	█	█	█																	
6.0		Produce resource assessment																														
	6.1	Mapping and quantifications	AM	10						█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	
	6.2	Assessment by landform	AM DT AH	40 5 0.5						█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	
7.0		Produce Research Agenda	AM	5																												
8.0		Assess evaluation and mitigation strategies	AM	3																												
9.0		Summarise policies and frameworks	RJ PW	3 0.5																												
10.0		Collate and illustrate report	AM Illust	3 3																												
11.0		Produce summary guidance booklet	RJ AM Illust	3 5 2																												
12.0		Editing																														
	12.1	Internal editing	RJ AM AH PW SD SB Illust	5 5 2 2 2 2 0.5																												
	12.2	EH editing	EH staff																													
13.0		Archive deposition and Stage 1 completion																														
	13.1	Submission/Incorporation to SCC HER	SB	2																												
	13.2	OASIS and ADS	AM	3																												
	13.3	UPD	RJ SB AM	3 1 1																												

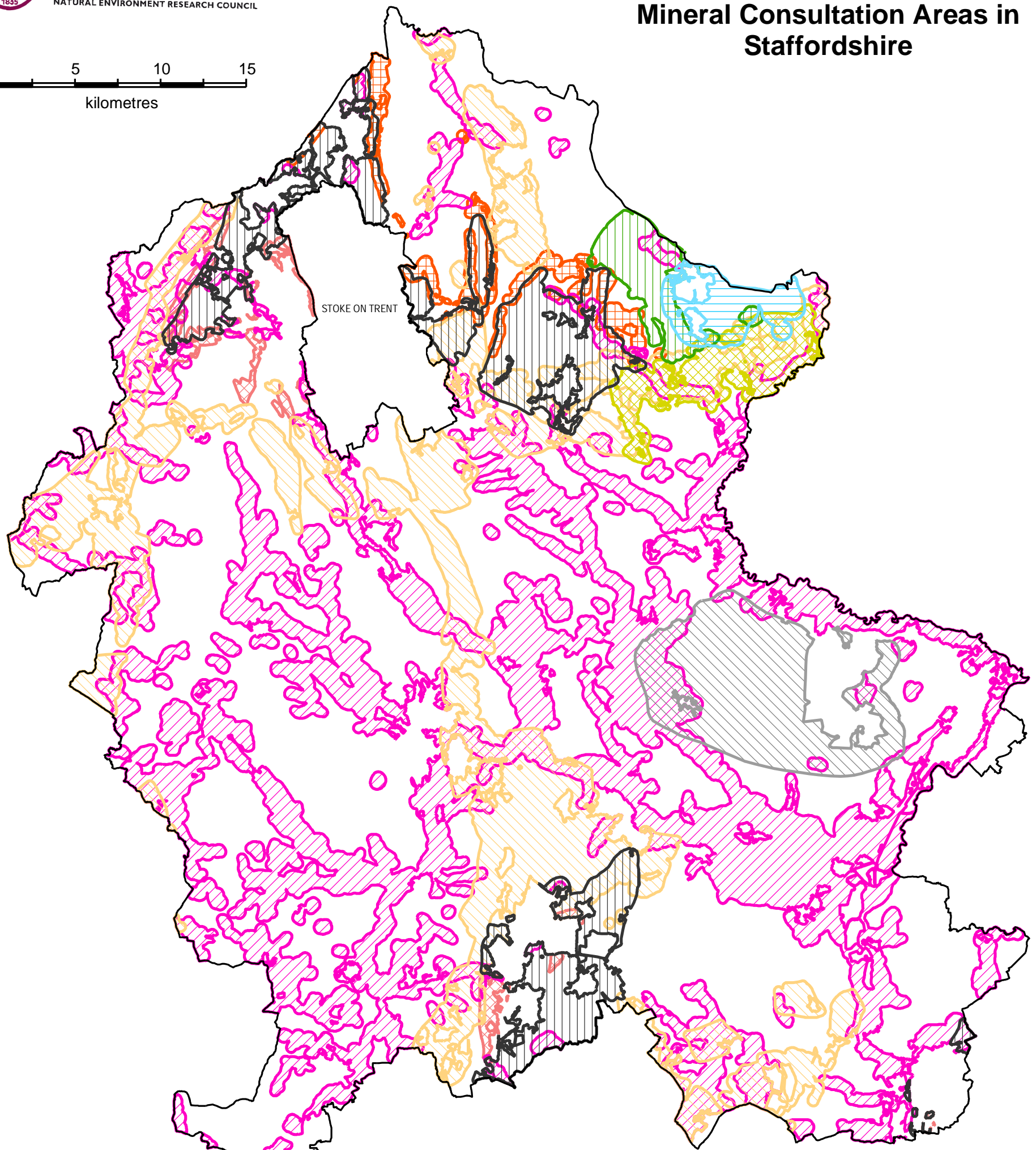
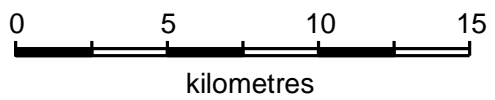
Appendix 3: Risk log

	Description	Probability	Impact	Countermeasures	Estimated time / cost	Owner	Date updated
1	<p>Project implementation delayed by EH decision period on acceptance of Project Design</p> <p>Applies to all Tasks and Phases</p>	Low to medium	Low	<p>Prior consultation and provision of EH brief and feedback on initial Proposal should expedite consideration of PD</p> <p>Project Manager to prioritise any amendments required within workload</p> <p>Tolerances built into Project Programme</p>	<p>Potential delay in start up of 2-4 weeks. Project tolerances allow for this.</p> <p>Costs/impacts beyond a 4 week delay are dependent on duration of delay</p>	RJ and EH staff	
2	<p>Project staffing. Staffing requirements can be met within current staffing levels but staff may leave or be made redundant over duration of project</p> <p>Applies to all Tasks and Phases</p>	Low to Medium	Low	<p>Long project programme with all tasks allocated additional time to actual duration</p> <p>WAAS have HER staff and Field Team staff with appropriate experience who could be brought into Project Team to secure completion of Tasks</p> <p>Current archaeological job market suggests that if recruitment is required a strong field of applicants is liable to come forwards</p>	<p>Potential delays in start and completion of Project Phases and completion²</p> <p>Unquantifiable beyond substantial tolerance allowed</p>	RJ (WCC) & SB (SCC)	
3	<p>Project Phase/Task/Product delivery delayed by workload conflicts arising from other project commitments</p> <p>Associated potential knock on effect on other elements of programme.</p> <p>Applies to all Tasks and Phases</p>	Low	Low	<p>Project programme has all tasks allocated longer duration than actual day allocation and all Phase divisions have been allocated appropriate tolerances</p> <p>Nature of outputs for Phase 3 tasks is not fully dependent on completion of Phase 2 enhancement allowing additional flexibility and early start to compensate for other delays</p>	<p>Potential delay in delivery of outputs (P2-6)</p> <p>Potential reduction in quality and range of Project Outcomes</p>	RJ (WCC) & SB (SCC)	
4	<p>Software and other computing problems</p> <p>Loss of data, processing problems, etc</p> <p>Tasks 2, 3, 4, and 6</p>	Low	Medium	<p>Tried and tested applications and use of experienced staff.</p> <p>Project Team familiar with software and internal training and expertise available at both SCC and WAAS.</p> <p>CITRIX external access software has proven reliable on other projects and a telephone support team is available</p> <p>Comprehensive system back-up procedures (daily) and data security/protection measures (firewall) in place at all locations where project outputs will be generated</p>	<p>Potential delays in Product/Phase delivery</p> <p>Potential reduction in quality and range of Project Outcomes</p>	RJ (WCC) & SB (SCC)	










	Description	Probability	Impact	Countermeasures	Estimated time / cost	Owner	Date updated
5	Core project tasks relating to enhancement of HER require longer than resources allocated allow (Task 4)	Low	Low	Resourcing based on experience of completion of similar tasks. Close monitoring of progress by SCC Project Lead (SB) SCC could potentially increase 'in-kind' contribution to project	Additional resourcing required to compensate for delays/loss. Cost for each additional week required for SCC HER staff plus 0.5 days PM time = £1,754.61	SB (SCC)	
6	Core project tasks relating to resource assessment for require longer than resources allocated allow (Task 6)	Low	Low	Resourcing based on discussions between project partners who have experience of completion of similar tasks. Close monitoring of progress by Project Manager	Additional resourcing required to compensate for delays/loss. Cost for each additional week required for WCC Project lead plus 0.5 days PM time = £1,311.99	RJ	
7	Final Project output and archiving delayed by EH feedback/circulation of Reports (Tasks 12 and 13; Products 2 and 5)	Low	Low	EH review is programmed for completion early in financial year 2014/15 providing degree of potential flexibility should this be required.	Delay in delivery	RJ & EH staff	



FIGURE 1
Mineral Consultation Areas in Staffordshire



MINERAL CONSULTATION AREAS

-  Bedrock sand
-  Brick clay
-  Building stone
-  Cement shale
-  Fireclay
-  Gypsum
-  Limestone
-  Silica sand
-  Superficial sand and gravel