

2018/19 CANDIDATE RECORD FORM, PRODUCTION LOG AND ASSESSMENT RECORD

INTERNATIONAL INDEPENDENT PROJECT QUALIFICATION (9690)

Please attach the form to your candidate's work and keep it at the centre or send it to the moderator as required. The declarations should be completed as indicated.

Centre number 59739	Centre name Central Valley Academy
Candidate number 26749	Candidate's full name Gemma White

Work submitted for assessment **must** be the candidate's own. If candidates copy work, allow candidates to copy from them, or cheat in any other way, they may be disqualified.

Candidate declaration

Have you received help/information from anyone **other than** your supervisor (include specialist consultant if relevant) to produce this work?

☒ No ☐ Yes (give details below or on a separate sheet if necessary).

Please list below any books, leaflets or other materials (eg DVDs, software packages, internet information) used to complete this work **not** acknowledged in the work itself. Presenting materials copied from other sources **without acknowledgement** is regarded as deliberate deception.

N/a

From time to time we use anonymous examples of candidates' work (in paper form and electronically) within our guidance materials to illustrate particular points. If your work appears in Oxford AQA Exams materials in this context and you object to this, please contact us and we will remove it on reasonable notice.

I have read and understood the above. I confirm I produced the attached work without assistance other than that which is acceptable under the scheme of assessment.

Candidate signature	Date 26 th January 2017
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Supervisor declaration

I confirm the candidate's work was conducted under the conditions laid out by the specification. I have authenticated the candidate's work and am satisfied (to the best of my knowledge) that the work produced is solely that of the candidate.

Supervisor signature	Date 26 th January 2017
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Candidate number	Candidate's full name
26749	Gemma White

Submission checklist

To be completed by the supervisor

International Independent Project working title	The Geology of Highley
International Independent Project final title	What is the Geology of Highley and how does it affect an areas development?

Please note that failure to complete or submit a compulsory element may result in a mark of zero being awarded.

Select/tick	Items that must be included	Notes
☒	1. A signed and completed <i>Candidate record form, production log and assessment record</i>	This document. All pages must be completed.
☒	2. Research based written report	Must be 5,000 words in length (+/- 10%).
☒	3. Evidence of a presentation within the <i>production log</i>	Presentation on the project process and findings/conclusions.

Candidate number

26749

Candidate's full name

Gemma White

The taught skills element

To be completed by the supervisor

Outline details of taught skills

Record here details of relevant skills taught in a class/group and details of relevant skills taught individually to this candidate as described in the specification eg your scheme of work. Continue on a separate sheet if necessary.

All students received a 30 hour taught skills course, delivered by the supervisor in a class-room setting. This course was divided into five sections, based on the guidance in the IPQ specification:

1. Project Planning/Management
2. Research Skills
3. Report Writing
4. Presentation and Oral Communication
5. Evaluation skills

For the part of the course on Research Skills, the school librarians ran several workshops on skills including: selecting relevant resources, evaluating sources, research ethics and the importance of referencing and bibliographies (in the context of avoiding plagiarism). The librarians also introduced students to the range of paper-based and online/electronic resources available in the school.

Regarding the part of the course on Presentation/Communication skills, students delivered practice presentations (on a separate subject of personal interest), to implement the skills learned.

The taught skills course was based on a number of resources, including the OxfordAQA Scheme of Work (<https://oxfordaqaexams.org.uk/subjects/projects/ipq>) and some online resources from:

- Southampton University: <https://www.southampton.ac.uk/learnwithustransition/epq-support/index.page>.
- Manchester University (Resources for Extended Project tutors and assessors): <http://www.manchester.ac.uk/connect/teachers/students/post-16/extended-project/resources/>
- Birmingham University (Research and Study Skills: Academic Writing): <https://www.birmingham.ac.uk/Documents/students/guide-to-academic-writing.pdf>
- No additional/specific skills were taught to the particular student in question.

Candidate number

26749

Candidate's full name

Gemma White

Record of grade

To be completed by the supervisor

Grades must be awarded in accordance with the instructions and criteria in the specification.

Has the student done the following:

Identified and selects an area of interest.	☒ Yes	☐ No
Set a working title.	☒ Yes	☐ No
Undertaken a risk assessment.	☒ Yes	☐ No
Produced a project plan.	☒ Yes	☐ No
Implemented the project plan and documents any changes to it.	☒ Yes	☐ No
Produced a report addressing the selected final title.	☒ Yes	☐ No
Used a referencing method.	☒ Yes	☐ No
Communicated findings in the report and the presentation.	☒ Yes	☐ No
Created a bibliography/reference list.	☒ Yes	☐ No
Evaluated the strengths and weaknesses of the project.	☒ Yes	☐ No

If you answered "No" to any of the above, the student must be awarded a Grade U. If all answers are "Yes" proceed to the Grading section below.

Grading

Which grade descriptor is the project most like? (circle one)

A

If you selected **A**, is the project an **A**,
or is it better (**A***)
or worse (**B**)?
(circle one)

A*	A	B
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D

If you selected **D**, is the project a **D**,
or is it better (**C**)
or worse (**E**)?
(circle one)

C	D	E
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If you selected **E** above, as a final check,
is the project worthy of a pass (**E**) as
opposed to a fail (**U**)?
(circle one)

E	U
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Candidate number

26749

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Gemma White

Record of grade (continued)

To be completed by the supervisor

Summary information to show how the grades have been awarded should be given in the spaces below in addition to comments in other pages of this document and any supporting information in the form of annotations on the candidate's work.

Assessment objectives	Supervisor's supporting statement
AO1: Selection of topic	Preliminary research on the original topic of the geology of Shropshire revealed 11 time periods that were represented. Narrowed to geology of Highley, largely including only one time period, to improve achievability. Aims and objectives are set but precision is lacking to begin with.
AO2: Planning, monitoring and developing	There is an outline plan in the Planning Review. Resources of the geological survey are identified and accessed. The student was aware of the danger of the topic becoming purely descriptive and changed the title to a question to attempt to avoid this. There is evidence of some thought regarding the structure of report. Monitoring in the Mid-Project Review is evident but lack detail in places. Decision-making for research and the report was described in the log. Few changes required after finalisation of the title.
AO3: Demonstration of research skills	There are only seven sources in the bibliography: one A-level text and six websites. There is an attempt at source scrutiny (e.g. Planning Review), at least in some cases. The topic is a specialism that is of interest largely to geologists or local historians. Research was certainly fit for purpose.
AO4: Analysis and application of research	The plan was implemented: the geology of the target area was described and its effect on development outlined. The main types of rock were identified and their formation through geological processes identified. The extraction of sandstone for building material and coal for industrial purposes was described. The development of the area was somewhat limited to building of homes and associated facilities for coal miners. Analysis was limited because the topic was largely factual, however good links made to historical and geological theories. Similarly, synthesis involved only the formation of the rocks, their subsequent characteristics and their potential for use. The structure adopted was logical, but the topic gave limited opportunities to deploy the higher skills. A rather superficial conclusion was reached. Materials were relevant to the topic. Presentation evidence (oral communication) is strong (Presentation Record Part B), although the presentation itself appears rather brief and the questions not very demanding, but were well answered. The report is well referenced.
AO5: Evaluation of product, process and self	There is honest reflection on own learning and process, identifying skills developed, strengths and weaknesses. The student clearly benefited from the experience, both through the skills developed and newfound self-confidence. More evaluation of the final report would have been good.

Candidate number

26749

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Record of grade (continued)

Supervisor's concluding comments

Clearly this was a project the student really enjoyed doing, being based on where she lives. The Reflection shows how much the student gained from completing the project and she set a clear aim that was realised it in the report. However, the project would have benefitted from a more strategic approach to planning, a wider selection of resources and a less descriptive approach to the report, which lead to limited analysis, synthesis and a relatively superficial conclusion.

Internal moderation comments if appropriate

Supervisor declaration

I confirm that no work assessed for the award of the grade above is also to be submitted, or has been submitted, for any other accredited qualification(s).

Supervisor signature

Date

22nd January 2017

Candidate number

26749

Candidate's full name

Gemma White

Record of initial ideas

To be completed by the candidate

This page records initial meeting(s) with your supervisor to agree your project ideas. Additional pages can be submitted if more than one idea has been explored.

My idea(s) for topic/title:

Initially my thoughts are to investigate the geology of Shropshire

Comment [A1]: AO1 – Appropriate area of interest identified and selected with some care – still rather broad at this point.

My preliminary research and development of my project ideas:

I plan to use the British Geological Survey website. I have also visited their head office in Nottingham. I also plan to visit the local area and look for texts published on Shropshire. I plan to visit libraries. I will also use local knowledge from residents and my family. I will use all this to begin my research into the types of rocks in Shropshire.

Comment [A2]: AO1 – Preliminary research evident, but at this point still largely what is intended, rather than what has been conducted.

I therefore plan to produce a report describing the existing geology of Shropshire and the processes of its formation.

My summary of the comments and advice from my supervisor (and specialist consultant if applicable):

My supervisor has asked whether Shropshire is too large an area. It does contain rocks and formations from most of the time periods, so I agree that I may need to limit the area.

Modifications I have made as a result of my discussion with my supervisor (and specialist consultant if applicable):

I have read an overview of Shropshire's geology and I have discovered that it contains rocks from most of the geological time periods. I have therefore reduced the area and I have chosen to limit the area to Highley, my home village in the South of Shropshire as there is plenty of geology that will be relevant to my study.

Comment [A3]: AO2 – Development of project is clear but could be more detailed – 'plenty of geology' is rather broad/vague.

My supervisor has asked me to plan my essay carefully and to produce a clear idea about the content covered. I have also arranged another visit to the British Geological Survey.

My proposed title, aims and objectives:

The Geology of Highley

Comment [A4]: AO1 – clear, but lacking in precision (at this stage).

Date 22nd January 2016

Candidate number

26749

Candidate's full name

Gemma White

Part A: Candidate proposal

To be completed by the candidate

Working title of my International Independent Project.

Present the topic to be researched in the form of a short statement/question/hypothesis with clear focus.

The Geology of Highley

My initial resources will be

British Geological Survey website

Local Knowledge

Memoirs of the Geological Survey of Great Britain, (one -inch Geological sheet 167, new series) By T.H. Whithead and R.W. Pocock

The courses of study or area(s) of personal interest to which the topic relates

I study Geology and find it to be an interesting subject, and as little has been written on Highley. It would be interesting to see what I would be able to find out.

Live in Highley

Known for coal but curious to know if other resources available.

Comment [A5]: AO1/2 – this is a rather broad statement. More specific detail is needed.

My project aims and objectives

5000 word essay on the surface and subsurface geology of Highley.

Comment [A6]: AO1/2 – 'some' further precision added here.

Provide details of the courses that you are currently studying

Qualification type	Awarding body and subject
eg A-level, IB, Modern Apprenticeship, BTEC	eg AQA Mathematics, OCR Computing, WJEC English
A-level	Geology
A-level	Geography
A-level	Chemistry

Qualification type	Awarding body and subject

Notice to candidate You must not take part in any unfair practice in the preparation of project work required for assessment and you must understand that to present material copied directly from any book or any other sources without acknowledgement will be regarded as deliberate deception. If you use or attempt to use any unfair practice you will be reported to Oxford AQA Exams and you may be disqualified from **all** subjects.

Candidate declaration

I certify that I have read and understood Oxford AQA Exams Regulations relating to unfair practice as set out in the notice to candidates above.

Candidate signature

Date 2nd February 2016

Candidate number	Candidate's full name
26749	Gemma White

Part B: Supervisor's comments on candidate proposal

To be completed by the supervisor

Please comment below on the validity and feasibility of the candidate proposal (Part A) as an International Independent Project.

	Supervisor's comments
Indicate the relation to, and development/extension outside of, the main course(s) of study or interest.	This project links to Gemma's study of Geology. However, it is extending her knowledge by examining local geology that is not covered in her course. It is her home village and is an area of personal interest.
Comment on the suitability of the proposed initial sources and research base.	Definitely suitable.
Confirm that the project is feasible in the proposed timescale and/or indicate any potential difficulties that may prevent the candidate from meeting the Assessment objectives.	The project is feasible in the timescale. Access to information may be tricky, however the geology staff are willing to help Gemma access relevant sources.
Comment on the suitability of the proposed title, aims and objectives.	The aims are clear but still lacking a little in precision and detail.

Comment [A7]: Note – with this sort of project, it is crucial that the supervisor confirms that the project will extended significantly beyond A-level study. In this case, the supervisor has done this to an extent, but more detail would be better, e.g. details regarding the specifications in question and that the focus of the project ('surface and subsurface geology') is not covered...

Supervisor signature	Date 10 th February 2016
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Candidate number

26749

Candidate's full name

Gemma White

Part C: Centre coordinator's approval of candidate proposal

Supervisor's name

Henrietta Dyer

To be completed by the centre coordinator

If you are acting as both the centre coordinator and the supervisor, please seek counter signature from a senior colleague.

Centre coordinator's comments on the feasibility and acceptability of the proposal (parts A and B) as an International Independent Project Qualification.

An acceptable project and feasible within the timescale.

☒ Approved

☐ Approved subject to the implementation of the centre coordinator's recommendations

☐ Resubmission required

Centre coordinator's name

Louis Oliver

Centre coordinator signature

Date 13th February 2016

Candidate number	Candidate's full name
26749	Gemma White

Planning review

To be completed by the candidate

This page records your outline plan once your proposal has been approved.

My next steps in planning, researching and deadlines that I will set myself. What I intend to do, by when, what resources I will use and how I will implement the recommendations of the centre coordinator (where appropriate).

Following my visit to the SGS I have been taught about borehole records and how to access them. I did not know that you could get these so easily. They will be really useful for finding out about the deep geology of Highley.

Finding sources is really tough, Highley is often left out of texts. They just get a brief mention. So the Geological survey is going to be very useful to my research.

Plan

Intro - About the area geologically and where Highley is situated in the UK

Part 1 - Main rock types, how they were formed and when, images of where they can be found in Highley if possible.

Part 2 - Boreholes in Highley, why they were done when and why

Part 3 - Resources/ rocks found in Highley and how they could have been used

Part 4 - Quarrying of the mudstone

Part 5 - Mining, where is was, links to other mines in the area.

Comment [A8]: AO2 – An outline plan of the report but lacking in a strategic approach

Research

I have used the SGS website, the British Geological Survey Website, so I know that the information published on there can be trusted, this is because this is a governmental based website. The whole point of the survey is to have accurate geological records so that companies can access it to assess geological sites for building purposes. I have also tried to find local articles to help give the specific information relating to Highley.

Comment [A9]: AO3 – Sources selected for a clear purpose and some evidence of source scrutiny.

Deadlines - I have planned to try and hit the following deadlines:

Research completed by September. If I start this in June and spend the summer holidays I should meet this deadline.

Report fully written by the Easter Hoiday

Presention and Producation log finished latest by April.

The reasons for my decisions.

I have organised my time to make sure that I do not leave things to the last minute, and that I can work on my project systematically.

My summary of the comments and advice from my supervisor (and specialist consultant if applicable).

My supervisor has been impressed with the initial research that I have completed so far. She has suggested to try and find some examples of the rocks in Highley being used or exposed. She suggested that if I do the field work I am planning I will need to write assessment for this.

Modifications I have made as a result of my discussion with my supervisor (and specialist consultant if applicable).

I have changed the title to make it more of a question. I changed this because it was a very generalised and I needed to give it a focus and more direction. After completing my initial plan, I realised my findings were leading me to be rather descriptive and that the essay had no focus. By changing it to a question it achieved this and therefore made my work more analytical.

Comment [A10]: AO1 – Aims and objectives being made clearer
AO2 – Project development – justified decisions

I have also had to change the order of some of the parts to the report, now that I have formulated a question. Originally, I put the borehole section before the mining section. I changed this so I could talk about mining first and then it flowed into the borehole section. I realised that many of the boreholes had been drilled to find out whether mining was viable or where old mine works had once been. So this made much more sense.

Comment [A11]: AO2 – Development – clear with some justification

The sections on resources and quarrying of rocks was moved to be included in the main rock group section, this was so that everything on rocks was in one place and it made the report flow better. Due to the word limit and the time to complete the IPQ, I may not have had time to complete the report with so many sections. The section on the boreholes was edited slightly as they were not always relevant to help answer the question, so I took them out.

I have written a risk assessment which I will put at the back of the report to show I have considered the risks of the field work I am planning to carry out around Highley

Please append any relevant planning documentation or tools that you have used.

Date 18th February 2016

Candidate number	Candidate's full name
26749	Gemma White

Mid-project review

To be completed by the candidate

This page records your outline plan when you have completed your research.

Is my project following my original plan? How has my plan developed?

The project is following the plan set, as the points covered are being followed. I have now agreed my final title for my project. I have also carried out a lot of research into uses of the areas geological resources, such as iron and clay from along the Ironbridge Gorge. Through this research I have learnt about the development of the mining industry and the development of Highley and the local area, so I intend to extend the project to include the geology of Highley, but also how the geology has influenced the development of the village. I have added links to the mining carried out in the area.

Comment [A12]: AO2 – Monitoring is evident here but could be more detailed/thorough.

Comment [A13]: AO2 – Development of the project.

My final title is now - What is the geology of Highley and how does geology affect an area's development? I have decided this title as it makes my aims and objectives much clearer. I am going to focus my project on evaluating how the geology affects development. I think this will also help me be clear about what I should be doing to develop my project and keep in mind my aims.

Comment [A14]: Student has clarified their aim and objectives with the finalised title.

My summary of the comments and advice from my supervisor (and specialist consultant if applicable).

My supervisor is happy with the changes I am making to the title and scope of my project. She is happy with the research that I have completed, but she has advised me to start my write up soon. I have a lot of coursework at the moment.

Modifications I have made as a result of my discussion with my supervisor at this stage (and specialist consultant if applicable).

I have now started my write up and have altered how much some topics are discussed in the report to so that the word limit is met as well as the deadline that I set, as some areas of the report will be too large.

My final title, aims and objectives.

What is the geology of Highley and how does geology affect an area's development?

Comment [A15]: Final title clarifies the project aim and objectives.

My planned next steps to achieve my project's aims and objectives.

Complete my research and produce my report.
Complete the written report as well as starting to plan the presentation part of the IPQ
Give a presentation to my supervisor and peers.

Please append any relevant planning documentation or tools that you have used.

Date 26th May 2016

Candidate number

26749

Candidate's full name

Gemma White

Project product review

Comment [A16]: Note – rather brief entries here.

To be completed by the candidate

This page records the near completion of your project product. Outline the successes, failures, additions and/or changes you made as you followed the plan in your mid-project review.

Did my project follow my revised plan from the mid-project review?

My project followed my revised plan. The British Geological Survey provided very good factual Info, but I could have benefited from more time and better access to their facilities as this was too costly.

I found it hard to find books. They were really scarce and focused mainly on the coal.

All areas spoken about were covered however the amount of detail they would covered in did change due to the word limit and time.

Comment [A17]: AO2 – Monitoring is evident but could be more detailed.

My summary of the comments and advice from my supervisor at this final stage (and specialist consultant if applicable).

Make sure that all of the images in the report are references correctly, as well as books.

Modifications I have made as a result of discussion with my supervisor (and specialist consultant if applicable) at this final stage.

Do I need to do anything else to complete my project?

Complete the presentation as well as present it to an audience.

Make final correction to the report.

Please append any relevant planning documentation or tools that you have used.

Date 14th September 2016

Candidate number

26749

Candidate's full name

Gemma White

Presentation record part A

To be completed by the candidate

This page records your presentation and its preparation.

Planned format of my 10 minute presentation (eg audience, use of visual aids, slides, use of notes, etc).

PowerPoint.

Cards with detailed notes for the presentation.

Planned content of my presentation.

- **Project process:**

Title page

Slide 2 --> Ideas --> One works the other doesn't (Show ideas and explain thoughts when planning project)

Slide 3 --> Data used --> Explain why each piece was good (Books, websites)

Slide 4 --> Explain each skill and how it was useful to the essay and what was learnt from it

Slide 5/6 --> New technologies --> How they were useful or not

Slide 7 --> Improvements --> Why, what could be done differently

Slide 8 --> Say the improvements and how they would improve the IPQ

More detail points will be made when the presentation is done.

- **Project findings and conclusions:**

I have found how important climate and conditions during the Carboniferous time period to the way the geology was formed. I have also learnt just how large the Highley Mining Company was. It showed me how important the company was for mining in South Shropshire, for example I did not know that the Severn Valley Railway was built to transfer coal from the mines to the carpet factories in Kidderminster.

Modifications I have made as a result of rehearsal and/or discussion with my supervisor (and specialist consultant if applicable):

Explain some points in more detail as some parts are explained better than others.

Date 22nd September 2016

Candidate number

26749

Candidate's full name

Gemma White

Presentation record part B

To be completed by the supervisor

Record and comment below on the delivery of the presentation.

	Supervisor's record/comments
The nature of the audience should be a minimum of two adults including supervisor (include numbers of staff, students and others present).	Staff and students and the Head of Sixth Form.
The nature of the presentation (include use of notes, use of display items, and use of presentation software).	Gemma utilised PowerPoint, but she also brought examples of the rocks that she had discussed in her presentation.
Comment on the content and delivery of the presentation (for example clarity of ideas, structure of presentation, pace, engagement with audience).	The presentation lasted 10 minutes. She addressed each of the assessment objectives in turn. The presentation was confident, well paced and the use of her geological samples was really good. She passed these around the audience and her oral explanations were excellent. Gemma's understanding of the Geology of Highley is superb. She could show us on maps where the coal seams were and she knew how this had led to the development of the mines across the whole area. She also explained how she had learnt about borehole records. She said this was something that she had never utilised before. She learnt how to interpret these on her visits to the Geological Society.

Comment [A18]: AO4 – Communication of findings is clear and reflects a sound grasp.

Please append any relevant planning documentation or tools that you have used.

Candidate number	Candidate's full name
26749	Gemma White

Presentation record part B

To be completed by the supervisor
Record and comment below on the delivery of the presentation.

Comment on the response of the candidate to questions that demonstrated understanding and grasp of the project and/or its production. Give examples of five questions asked and answers given.	1. Gemma was asked why mining ceased in Highley. She was clear in explaining how the workable seams were very deep. That the easily accessible coal had gone and therefore it became too expensive and dangerous to continue with mining and that it was cheaper to import from elsewhere.
	2. Gemma was asked why her topic on the geology of Shropshire was too wide. She said from the initial research she realised there were 11 periods covered in the County and she felt that she would end up being too generalised or not able to write within the word limit if she tried to do the whole County, so this is why she refined the title.
	3. What skills have you developed? The most important has been writing extended answers and referencing. She also explained that being dyslexic has meant that she has not wanted to tackle big pieces like this before, but it has wllowed her to realise that she can cope with the demands of extended writing.
	4.
	5.

Comment [A19]: These questions are well answered, but not particularly demanding. It is important that at least a couple of the questions attempt to stretch the student's subject knowledge.

Comment [A20]: Note - It is important that all five spaces are used here, i.e. at least five questions are asked at the end of the presentation.

Supervisor signature	Date 4 th October 2016
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Candidate number	Candidate's full name
26749	Gemma White

Summary and reflection

To be completed by the candidate

This page records your summary, reflection and evaluation when you have completed your report and given your presentation.

Some questions you may wish to answer in this section include, what have I learned from completing this project? What new knowledge or expertise have I enjoyed or found valuable? What are the strengths and weaknesses of my project (including planning and organisation)? What skills have I improved? What changes would I make if I undertook such work again? What advice would I give to others undertaking such a project?

From completing my IPQ I have learnt about Highley and the mining of the village, as well as the surrounding area. I now know how to plan and write a large essay along with how to reference work in an essay, this was something that I have never had to do before.

Comment [A21]: AO5 – Reflection on skills developed – relevant but rather brief/general.

I have developed new knowledge. I have found how important climate and conditions during the Carboniferous time period to the way the geology was formed. I have also learnt just how large the Highley Mining Company was. It showed me how important the company was for mining in South Shropshire, for example I did not know that the Severn Valley Railway was built to transfer coal from the mines to the carpet factories in Kidderminster.

The strengths of my IPQ: I was able to complete a 5000 essay, as well as learn how to reference my sources. This is something that I feel went really well. I also gave the best presentation that I have ever done before. I know that I will be doing this a lot at university, so this is something that I will really find valuable in the future. I have also realised that I am a good independent learner. My dyslexia makes me doubt my ability to comprehend what I am reading. This has given me confidence to realise that I can read and handle university level resources and that I can use them together well in my work.

Comment [A22]: AO5 – Reflection on own learning – honest and fairly detailed.

The weaknesses of my IPQ was my time management. I totally underestimated how long it would take to complete 5000 words. Which therefore led to some organisation issues as my original time plan could not be followed. I got in a mess with my coursework for other subjects because I was trying to do all my work at the same time. This was very stressful. I almost gave up. However, as I had put so much effort into the research I really did not want to abandon my project.

Comment [A23]: AO5 – Reasonable evaluation, but not particularly insightful...

Changes that I would make would be to add a practical part to the work by creating a field notebook and to go around Highley and find some more exposures of Mudstone, Sandstone and Siltstone and write detailed notes on the rocks I discovered, this would help to further improve my fieldwork skills. I had originally planned to this but realised I did not have the time.

Advice I would give to others who do an IPQ would be to plan your time and what you are doing in detail, allow enough time so if you don't meet your deadline you still have enough time to complete the work for the centre deadline.

GET HELP AND SUPPORT

Visit our website for information, guidance, support and resources at oxfordaqaexams.org.uk

You can contact the IPQ team directly;

E: IPQ@oxfordaqaexams.org.uk



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Intro

- Geological time scale → Reference to the geological time scale
- Location maps of H → Nation, Regional and local scale
- General information about the village → Where it is
- Short review of the area geology → Carboniferous, Mudstone, Sandstone, Siltstone and Coal, at the equator (northward drift of Britain)
- Geological map of H ; Shropshire and the UK

Paragraph 1 → The rocks

- Mudstone → Formation, description of the rock, Group it is from, uses, images
- Sandstone → Formation, description of the rock, comparison to B , uses, images
- Siltstone → Formation, description of rock, uses and images
- Coal → Formation, grades, Coal link to H ; condition of today for coal, where the conditions are today

Paragraph 2 → Mining

- Mines in H
- Local mines link to H
- How long it ran for
- How the mine developed
- Position of the mine in H

Paragraph 3 → Boreholes

- What they are
- Why they are used
- What their importance is
- Examples of new boreholes in H → where, when, explain what they show
- Older boreholes from the mine → show a link, find coal, other rocks which are unknown, do they show the position of H when the coal was formed.

Effect on development

- History of the village
- How geology has helped the village
- Farming helped the village → link to modern times
- Conclusion → 50/50

Note - this is a more detailed plan of the report - additional evidence the student has chosen to submit as part of their project.

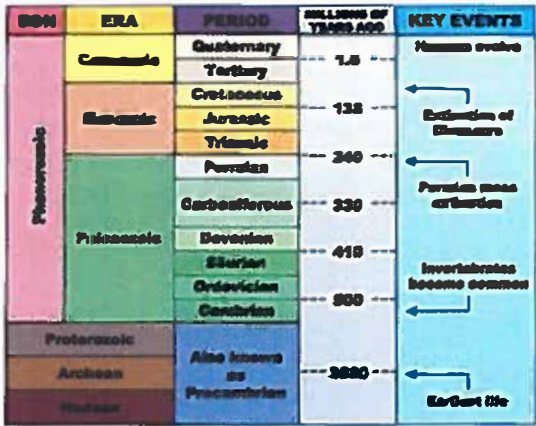
- The plan was implemented (AO4)
- The report is of appropriate length/focus (AO4)
- The key weaknesses were a rather superficial conclusion and, given the factual nature of the project, there was limited opportunity to develop higher-order skills, e.g. analysis and synthesis.

- EPQ

What is the geology of H and how does geology affect an area's development?

Introduction

In this report I will be investigating the geology of H , with the processes that created it as well as the geological history and how this affected the growth of the village through mining. The geology of H is Mudstone, Sandstone, and Siltstone with Upper Carboniferous coal measures. H is in the county of Shropshire, which is in the West Midlands of the UK. The geology of Shropshire is very important as part of the UK's overall geology as it has 11 of the 12 geological time periods represented, the only missing one being the Cretaceous period. The geological time period found in H is Carboniferous period with an age of 307 to 309 million years, and the environment is mainly rivers that lead to sand, fine silt and clays being deposited.



This is an image of a geological timescale, which shows the position of the Carboniferous time period in relation to geological time scale and key geological events.

Figure 1



Geological map of the UK.
Figure 2



Geological map of Shropshire
Figure 3



This image shows the position of H in relation to the UK.

Figure 4



A map of H on a more regional scale, showing near cities like Birmingham.

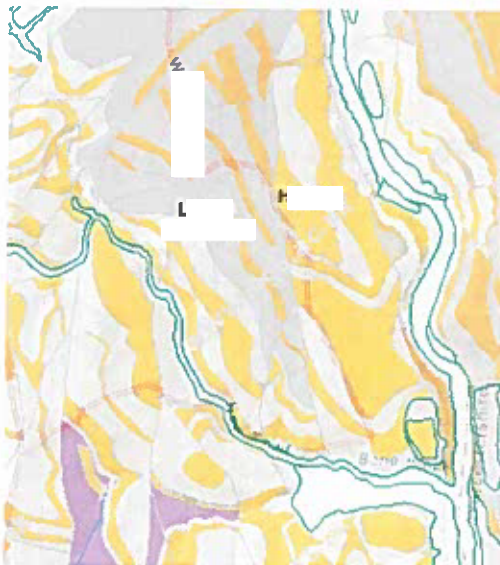
Figure 5



This is a map of H on a local scale, showing other local villages and towns.

Figure 6

This image shows the bedrock geology of H.



H FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE

H FORMATION - SANDSTONE

A MEMBER - MUDSTONE, SILTSTONE AND SANDSTONE

A MEMBER - SANDSTONE



Grid Ref: 1

Figure 7

What is the surface geology and how was it formed?

The Rocks

Mudstone

One of the main rock formations of H is Mudstone, there are two types of Mudstone which can be seen in H , both formed between 307 to 309 million years ago. One of the Mudstones is known as the Ha Formation, but in the past it has been known as the H Formation (HYG) [1]. The other type is known as the A Member which was formed at the same time as the Ha formation [2]. This shows that the Mudstones are from the Carboniferous time period when Britain was located around the equator with conditions similar to what are found today; this can be suggested by using the Principle of Uniformitarianism which says that the present is the key to the past and that processes that happen today must have happened millions of years ago as well. Mudstone suggests that the area would have been covered by rivers. The Mudstone that can be seen in H is fine grained, showing larger amounts of transportation due to the fine grains and the rounded clasts, further suggesting that the grains are likely to have been transported in a fluvial environment. The river would have deposited a lot of gravel and sand to form river terraces along with clays that make up the Mudstone in a flood event [3], these flood events would have happened when the river flooded onto the floodplains and deposited material that it could no longer carry due to the lack of energy that the river had, creating large Mudstone deposits that can be seen by the river that runs through H , similar conditions can be seen today at the Amazon Delta suggesting that this is how the Mudstone of H was formed as that is how it is formed today, this is using the Principle of uniformitarianism. The thickness of the Mudstone deposits suggest that the river would have flooded regularly, this could be due to large amounts of rainfall causing the ground to be saturated all the time, as the climate we see today is different to what Britain would have experienced 307-309 million years ago. Suggesting a different climate to what is found today at this latitude. However the river that would have formed this flood event is not the River Severn as it is thought to be as it once flowed northwards to join the Dee Estuary, it is believed that the age of the River Severn is around 15,000 years and was formed during the last ice age when two rivers joined [4]. The Mudstone found in H is likely to have come from a river that formed a delta and created bogs and peats as well, the age of these bogs and peats are unknown, however it would have been at some point in the Carboniferous, likely to be at the same time as the river as it would have ran into the delta and also formed the bogs and peats, which then later became coal due to the increase in confining pressure from other layers of sediment being deposited on top.



This image shows a mudstone deposit in H . With the bed thicknesses being around 5 meters high, with each bed showing a different time of deposition.

Figure 8

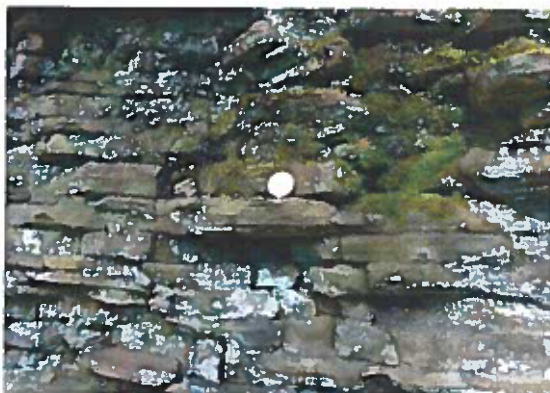
Sandstone

Another rock which is a part of the bedrock in H is Sandstone which is also Carboniferous in age. This is also a part of the Ha Formation with the Sandstone in H known as the H Sandstone or Thick Sandstone [5]. Another location in Shropshire where Sandstone can be found is in B , where the Sandstone here is Permo-Triassic in age making it younger than that found in H . Another difference in the two Sandstones is that the B Sandstone is red in colour due to iron in the rock and was formed in a Aeolian desert environment similar to the Sahara desert 25 degrees north of the equator, showing that Britain has moved north through time. The Sandstone of H was formed when Britain was still near the equator, therefore giving it very different conditions of formation and appearance compared to the Sandstone seen in E . The Sandstone of H would have been formed by a river with sand being deposited as the river flowed through the channel as well as any flood events that may have happened [6]. This gives the colour of the Sandstone a grey-green colour as compared to the brick red colour of E . The Sandstone of H is known as the best building stone in the Ha Formation, with it being used to make many churches and cottages. With it being quarried by the River Severn next to the county border. It has been used in many buildings around Shropshire, one of them being Worcester Cathedral, however the properties of the Sandstone means that it can be weathered easily so it must be replaced by a stronger Sandstone of the Carboniferous time period from the Forest Dean, other places where H Sandstone has been used is to build St. A 's Church in B ; S road-bridge as well as other bridges in the area [7]. Due to how easily the Sandstone can be weathered, by chemo-physical processes. Many of the structures that have used H Sandstone now need to be replaced with stronger Sandstone that looks like the original.



This image shows a piece of H Sandstone with a scale of a penny.

Figure 9



An image to the Sandstone being used in a wall, with a penny as the scale.

Figure 10

Siltstone

The third bedrock formation that can be found in H is Siltstone which would have also come from a river like the Mudstone and Sandstone. The three rocks show how the environment of the area has changed over time, from an area covered with rivers that would have frequently flooded, to now an area that has only the River Severn flowing through it today. The Siltstone is likely to have been deposited in a flood event when the river had little energy and could not carry the fine grained sediment any more, this shows that the geology of H is based on a series of floods in the Carboniferous time period.

Coal

In H the coal was called Brooch Coal with the seams being around two meters thick, with the shallower low grade coal being sulphur coal [8]. As the beds in the area dipped it meant that the seams went too deep to mine which led to the opening of the A mine. It is likely that most of the coal in the area was also of the same 'grade' and dipped in a similar direction and angle. Coal is formed from dead plant life which was not able to decay, millions of years ago it is thought that much of the plant life would have lived in swamps, so when died, fell into the water and were covered in sediment over time. As time went on the sediment on top of the plants would have built up, this caused an increase in heat and pressure which then therefore lithified the vegetation into coal, due to different amounts of heat and pressure being applied coal is put into grades with more heat and pressure causing a higher grade. The grades of coal are peat, which is still the plants that were unable to decay, this is similar to the peat bogs found in Ireland today which are still unable to decay and could potentially turn into coal if enough pressure was added to the bogs creating new coal fields in the future. The next grade is Lignite which has had some compression, Bituminous is the next grade, this being the most common type of coal around as well as the most used type, with the final grade of coal being Anthracite coal which has had the most compression and heat, which is sometimes classed as a metamorphic rock due to the amount of heat and pressure that has been applied. This therefore suggests that H was once a swamp with the Mudstones, Sandstones and Siltstones being deposited on the swamp bed, allowing for the large deposits that can be seen. This is similar to the mouth of the Amazon today, but the trees would have been lepidodendrons.

Mining

The geology of H has been very important in the development of mining in the area as Shropshire has had a long history of mining, which then led to the Industrial Revolution happening in the 18th century as people were able to cheaply extract useful minerals and other resources from the ground.



This image shows where the deep coal is in H and the surrounding area showing how it would have been a main area for people to come looking for coal.

Figure 11



This image shows the position of shallow coal in the area with the south of H having some shallow coal deposits which suggests that this is one of the reasons mining in H started as there was coal which was close to the surface and easy to get to, with the mining then going deeper down as shown in the previous image.

Figure 12

H is most well known as an area of coal mining, but also had a stone quarry with the stone being used on Worcester Cathedral. The coal is a part of the Wyre Forest Coalfield which covered large areas of South Shropshire. Within the coalfield there were 23 mines covering the area [9], H was related to 6 mines in the area, C Pit (SO), H Colliery (SO), H Pit (SO), K Colliery (SO), N Pit (SO) and S Colliery (SO), all of these mines mined coal. The part of S Mine was taken over by H Mining Company is now in the position of w the Severn Valley Country Park [10].

H Colliery is the most well-known mine in H as it based in H where the S Golf Course is today. The area was first mined in the mid-1870s by family called the V ; they opened a brick work and sank a shaft in the ground in 1874 to mine for Brooch and 4 foot seams. In 1877 the H Mining Company was created when the V family joined the S family. 2 9ft diameter shafts were sunk in 1878 and hit 4 ft thick 'Brooch' seams at 888 ft deep. In the 1900 the company had 240 men and boys employed by them, with 670 employees in 1937. Due to the growth in mine sidings were added to the south of the railway station and a standard gauge incline was built on the hillside next to the colliery, so that trucks could be filled up directly at the colliery from the railway line and then transported to the Severn Valley Railway to run the trains onto K ; so that the coal could be used to run the steam engines at the Carpet factories. The Clay and Shale found in the borehole records, was also used by builders and turned into brick for the local buildings being built as the village grew. With the mine becoming mechanised by the use of electricity underground and coal cutters the amount of coal being mined increased. However issues were soon formed as the direction of the coal lead the miners away from the shafts and toward the river. This meant that a mine was opened in A in 1935, and was connected to the H colliery mine in 1937. In 1940 H Colliery mine closed, but the shafts were kept open for ventilation while A mining was continued, the full output of the mine was 275,000 tons per annum in 1944 [11].

K Colliery was a part of the H Mining Company mines and by the early 1880s it was producing good quality coal which is likely to be the 'Brooch' coal found in H . The position of the mine next to the railway meant that the mine was a success as there was little distance to travel, which lowered the time needed to get there and back which meant more coal could be transported and also it lowered the cost of transport of the coal. A new

borehole was sunk in 1892, with the coal being found in December 1893, at a depth of 296 yards. More coal seams were looked for when seams which had basalt inside were discovered, this shows that the coal had been through metamorphism, due to the high heat and pressure. This made the mining hard as the rock was hard and cannot easily be cut through, however north of the shaft more coal was found and mining in the area continued. At the turn of the century the mine had employed 150 men and at the start of the First World War there were twice as many men working there. The mine was producing around 50,000 tons of coal per year, with the mine being closed in 1937.

Another mine which was linked to the H Mining Company was the B Colliery Company this was brought by H in 1915, B Company were the ones who originally had the railway line join the main line and go from H past the K mine and to the B mine, with this being completed in 1913, the railway was needed as there were no access roads to the mine so instead of building a road the railway was extended so that trains could go along all of the mines collecting the coal. The B mine was closed in 1921 by the H Mining Company and all of the machine and people who worked there moved to either H or K [12].

What is the deeper geology?

Boreholes

Drilling boreholes has been a very important part of the development of the village, as it allowed prospective mine owners to gain an idea of how much coal was in H as well as allow building companies to see if the land is safe to build on and can support the weight of the new development. Boreholes are when you drill into the ground to collect a sample of rock, showing the subsurface geology of an area and also showing you the properties of the rock and an idea into how it was formed. Due to the mining that has gone on in H in the past it therefore means that some of the ground underneath H is at possible risk of subsistence, this means that whenever there is new building development in H is done a survey must also be completed to show if they are as any shafts running under it, also to see how strong the rock is and if it can support the new weight being placed on it. In H there are many boreholes covering the village with some being part of new development and others like water wells. With the boreholes being done to check how stable the ground is.

British Geological Survey GEOLOGICAL INFORMATION SERVICE				Site		Trial Pit Number TP01	
Excavation Method Trial Pit		Disturbance	Ground Level (mOD) 130.00	Client		Job Number P2006	
		Location 873416 E 284674 N	Date 18/11/2003	Engineer		Sheet 1/1	
Depth (m)	Sample / Tools	Water Level (m)	Field Records	Local (mOD)	Depth (m) (Thickness)	Description	Legend
0.30	D01				0.30	MADE GROUND : Firm, lentic, brown sandy CLAY with occasional dark grey-black pebbles. (TOPSOIL)	
0.80	D02			118.80	0.80 0.50	Firm to stiff, red-brown sandy CLAY with many fine sand pebbles which are occasionally softened. (GLACIAL TILL)	
1.30	D03			119.00	1.00 0.20	Stiff, fissured, grey and red-brown mottled CLAY with occasional fine gravel. (GLACIAL TILL)	
2.00	D04			118.80	1.80 1.20	Firm to stiff, light grey and light brown CLAY with many spherulites. (PEBBLE BEDDED)	
				117.80	2.80	Complete at 3.00m	

This image shows an example of what a borehole record looks like.

Figure 13



An image to show the mass movement in the area.

This image here shows the mass movement in the area, with movement being shown along the river between H and A. As well as large amounts of movement south of H, this move suggests that it is possibly caused by old mine workings which have subsided or that the land which has move is possible waste material form the mine.

Figure 14



The image below is a map of the boreholes that are in H with the overlaying bedrock geology of the villages as well, along with the key below.

Figure 15

Borehole depth

- 0 - 10m
- 10 - 30m
- 30m+
- Unknown
- Confidential or Restricted

Some of the boreholes that are in H are more recent with the boreholes at the north of H on Ha, being drilled in 2003 as part of a new housing development that was developed. This image shows the position of where the boreholes were drilled.

Figure 16



This image showing the position of the boreholes that were done. Satellite images of what the area looked like before and after the new houses were built along with the position of the boreholes in relationship to the new houses.

These images show the before and after of the new houses being development, with the image on the right showing where the boreholes are in relationship to where the new houses have been built.



Figure 17



Figure 18

The boreholes that were taken show the geology of the area under where the houses were built with the deepest being around 3m and the shallowest at 1.5m. The reason for the boreholes is to be able to tell if the houses are being built on stable ground or not and if it is not stable, what foundations and support need to be put down to stop any subsistence.

This image is of borehole SO78SW30 which is the first borehole done in 2003 at H₂ using the excavation method of trial pit, this is done before construction to sample the soil geology of the area and to find the water table, with a shallow depth normally being dug.

British Geological Survey						Site	Trial Pit Number
Geological Survey							TP01
Excavation Method		Dimensions		Ground Level (mOD)		Client	Job Number
Trial Pit				120.00			P2008
		Location		Date		Engineer	Sheet
		373416 E 204074 N		18/11/2003			1/1
Depth (m)	Sample / Tests	Water Level (m)	Field Records	Level (mOD)	Depth (Thickness)	Description	Legend
0.30	D01				(0.30)	MADE GROUND : Firm, blebs, brown sandy CLAY with occasional dark grey-black pockets. (TOPSOIL)	
0.60	D02			118.50	0.30	Firm to stiff, red-brown sandy CLAY with many fine sand pockets which are occasionally softened. (GLACIAL TILL)	
1.20	D03			118.00	1.00	Stiff, fissured, grey and red-brown mottled CLAY with occasional fine gravel. (GLACIAL TILL)	
2.20	D04			116.30	1.20	Firm to stiff, light grey and light brown CLAY with many shorizons. (PEBBLE BEDS)	
				117.00	3.00	Complete at 3.00m	

Figure 19

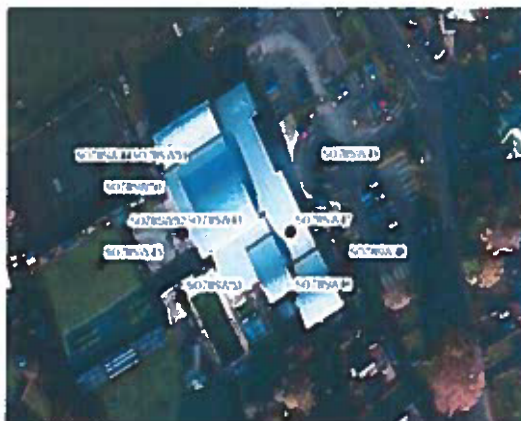
This survey shows that the first 0.30m is just topsoil which is made from sandy clay, as you move down you reach a glacial till which is formed when a glacier which is possibly from the

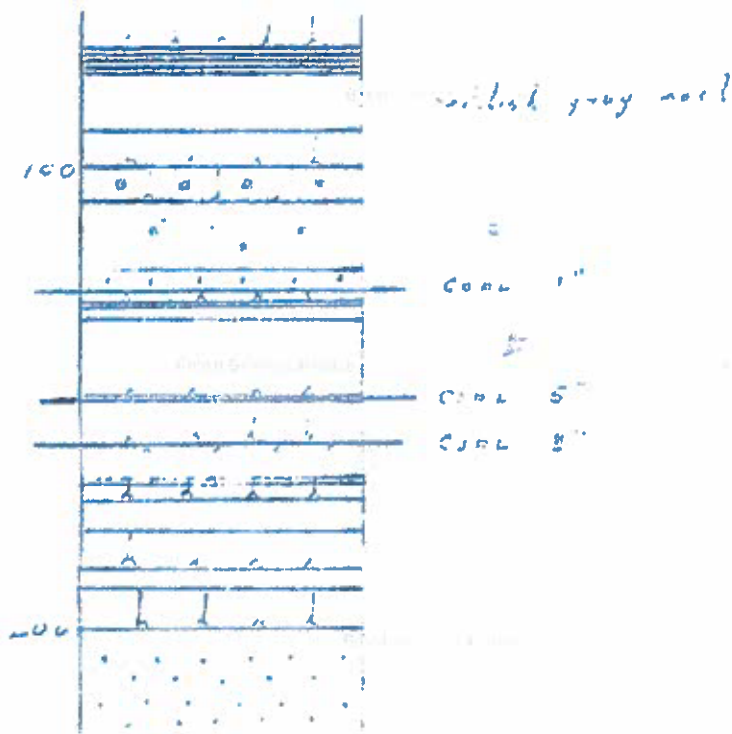
last ice age came and deposited material, the material deposited by the glacier is fine clays with some gravel. The K beds found at 1.50m onward also contain clays, the K beds is a previous name for the A Member which is the name for the Mudstone, Sandstone and Siltstone [13] that can be found in H , the cause for the clay can be suggested by the rivers that would have once been in H , with the glacier following the path of the river, as it would have been the easiest route, causing the deposition of the clay suggesting that it is at the limit of the ice sheet.

 British Geological Survey NATURAL SCIENCE AND HERITAGE COMMISSION					Site		Trial Pit Number TP06		
Excavation Method Trial Pit		Dimensions		Ground Level (aOD) 120.00		Client		Job Number P2055	
		Location 570000 E 254715 N		Date 18/11/2003		Engineer		Sheet 1/n	
Depth (m)	Sample / Tests	Water Level (m)	Field Records	Local (aOD)	Depth (Thickness)	Description			Legend
				119.70	0.30 0.30 0.30	MADE GROUND : Firm, friable, brown sandy CLAY with occasional dark grey-black pebbles. (TOPSOIL) Very stiff to hard, fissured, red-brown, slightly sandy CLAY. (GLACIAL TILL)			  
				119.10	0.20 0.30	Very stiff to hard, fissured, light grey and light brown mottled CLAY. (K BEDS)			
				118.80	1.50	Complete at 1.50m			

Figure 20

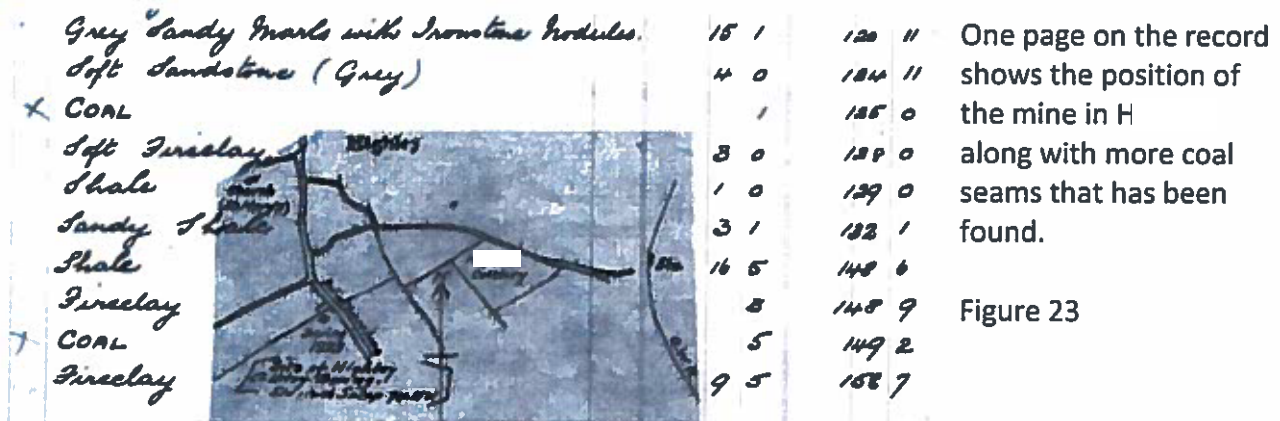
The shallowest borehole that can be found in the area has a depth of 1.50m and shows the same results as the other borehole with a thin section of topsoil, followed by the glacial till and K beds. The other boreholes in the area also show the same geology.





below shows that just over 100 meters down coal stems were found, meaning that the area was probably mined as coal was found close to the surface. The image here shows an old borehole which was done with the coal seam marked out.

Figure 22



One page on the record shows the position of the mine in H along with more coal seams that has been found.

Figure 23

This shows that the position of the main mine was where the S Golf Course is today as it would have been easy to get to the railway station to transport the coal with the amount found in H, possibly leading to the research for coal in the surrounding areas like K and A which then lead to the bridge being built. The map also shows where the borehole was carried out on S Lane.

Another section of the borehole record shows Shale with possible oil. At a depth of 967 ft 11 inches, followed by Coal again.

82.	Shale	4	7	967	2
83.	Fireclay	2	6	967	7
84.	Shale with oil (? surface)		4	967	11
85.	Coal		2	968	2
86.	Fireclay		2	968	2
87.	Gray sandstone (fine-grained, with slightly reddish tinge)	4	6	972	8

Figure 24 This image shows the borehole with possible oil.

A lot of the borehole records show signs of shales, marlstone and clays. These rock deposits suggest that H was once on the coast with the top of the village being a possible river delta going down onto the continental shelf of the ocean, where shales were formed under the pressure of sediment being constantly deposited on top of the layers, which can therefore account for the shale found with oil, this is due to oil being created by marine creatures dying and then falling to the sea floor where here they are buried and over millions of years with the pressure building up due to the increase in sediment being deposited oil is created. This also helps to explain how there was large amounts of coal found in H. However it is also likely that H was on low-lying wetlands which were covered in forests, with a flood event happening destroying the forest and causing it to be covered in sediment with a lack of oxygen, which could account for the range of sediment deposits found in H from coarse Sandstone to fine Siltstone. The age of the Shale is unknown, but is likely that it came before the forest was destroyed as the boreholes sections show the shale under the coal which suggests that it is older as the younger coal would have then been deposited on top this is known using the principle of deposition, however if the area was affected by large amounts of tectonic movement it could have caused the whole section of rock to be overturned. The sequence of the rocks found in H is part of a cyclothem which a complete sequence of rocks, it is likely that the cyclothem for the H is Shale/Siltstone, Sandstone, Mudstone and then coal seams with the sequence being repeated again, this therefore suggests that H was once a possible delta going on a continental shelf, with the change in sea level causing the forest to flood and allowing the coal to be formed as the trees would have died and quickly been buried [14].

The boreholes from the golf course can be found, with the records showing letters between H Mining Company and possibly a geologist, as well as records saying when the mining was finished and that the shafts were filled.

The first page of the record shows a borehole with little detail suggesting that the rocks in the area had not fully been studied and that geology was not a main profession as it suggests little knowledge of the subject area.

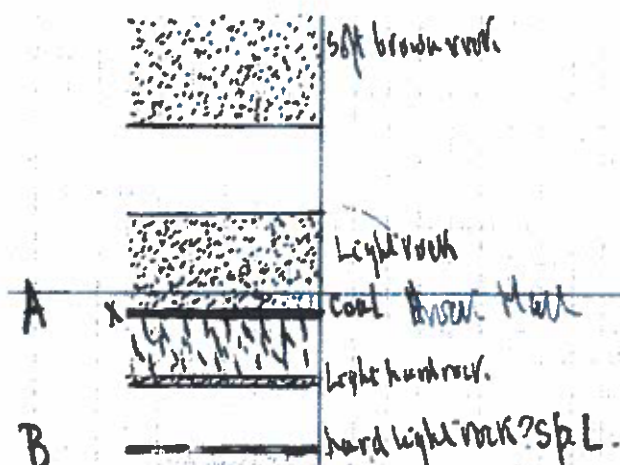
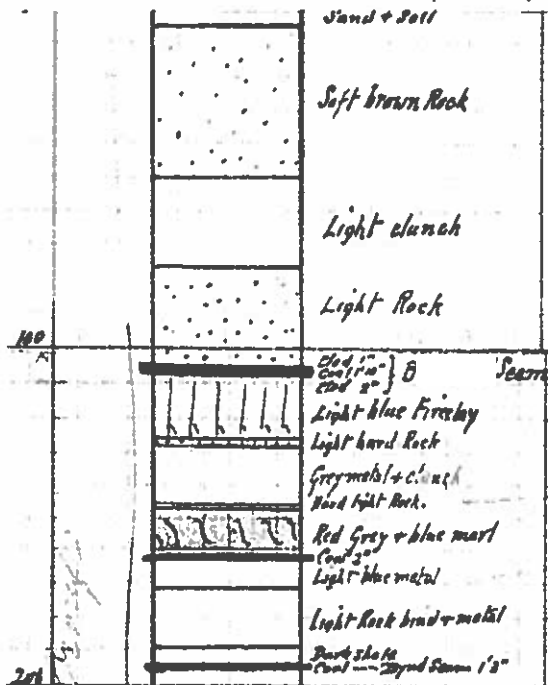


Figure 25

This image shows a borehole done in the village; however this borehole is possibly one of the first boreholes done, and making the record rare as it has not been lost over the years, whereas most of the other records have not survived.

The soft brown rock is likely to be part of the soil with coal being shown straight away at A



and another steam slightly further down at B, the borehole here has no depths written on it suggesting that they did not have a way to tell how deep it was or that it was not important as they mine no matter what the depth if it meant that they could mine coal. Other parts of the record show boreholes with more detail on them.

Figure 26

Later version of figure 15 showing more detail, suggesting more understanding of the geology and how to record boreholes more successfully.

This record has more detail on it with the soil being placed on the borehole and with it also still showing the soft brown rock and light rock. The coal seams A and B are still shown however they are in more detail with the depth being shown, the scale for the depth is not completely known, but I can suggest that it is likely to be in feet as other records are also, the rocks in between the coal seams is also shown and more far more detail as well.

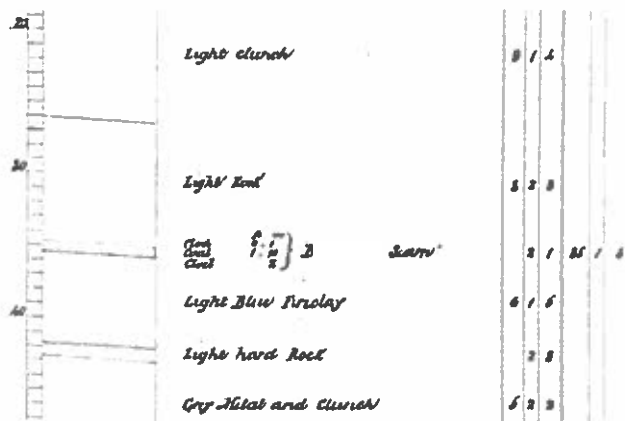


Figure 27

Shows the same section of borehole, but again more detail than figures 25/26

This image shows the rocks around coal seam A in more detail, and also showing that a grey metal was found.

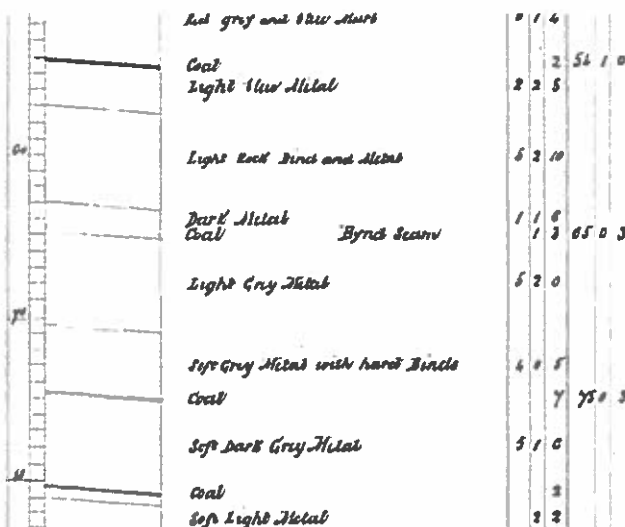


Figure 28

An image to show the continuation of figure 27

As the borehole continues down it shows that there was a large amount of metal found in the area the describe of the metals being. Grey metal, light blue metal and dark metal which

metals were found are unsure but it does show H could have been mined for more than coal if large amounts of other resources were found.

Dear Sir,
In reply to yours of the 31st May re H Section, we recently measured our No 1 Pit and ascertained the depth to be 235 yards. As regards the nomenclature of the seams, I am in some difficulty, as I have no personal knowledge of the thickness or position of any other seam than the one called the Brooch, which has at some day been called a "swint" coal. The Brooch I think will be the one referred to in the section as the Four foot at 235 yards. It is doubtful if any measurement of depth has ever been made previously and the discrepancy of 3 yards arises out of the difference between actual measurement and the total of the miners' measurements.

Yours faithfully,
Robert H. HENNING (1867).

20 78 SW
50 7462 8302
250 ft AOD

filled

H Staff
H Colliery Co.

Figure 29

Image showing a letter about the geology of H

In the records this letter is also shown which tells you about the type of coal and the uncertainty in the depth and thickness of the seams found.

167/
43
5078/46

Figure 30

Evidence of the mine being filled.

This is a record showing some of the shafts that were filled once all the coal had been removed from the area, with this being done by the H Mining Company.

Effect on development

Overall one of the main reasons for the growth of H and the surrounding areas was that there was a need for miners in the area, which caused the growth of H from a small countryside village, which appeared in the Domesday Book which contained a few houses and shops mainly surrounded by farmland to a large village. The area was first quarried for stone which was used on the Worcester Cathedral, and then by the Middle Ages having coal mined; these seams which were mined are likely to be the shallow coal deposited as the technology for deep coal mining was likely not known. With the main coal mining happening in the late 19th Century when H Mining Company was created, with need for more houses and the typical red-brick terraced houses are created,

While coal played a key role in the development of H, the growth of the village did also rely on local farmland being sold so that it could be developed on. For example H Primary School once based in the village was moved to its current position when the land was sold. The farm which was sold, around 1965, was called N Farm covered a

large area of the village, the houses at G Village which is at the top of the village were built for B mine with the land behind there being farmland, the main part of the village was further developed because of the mining and the land above it being part of the farm.

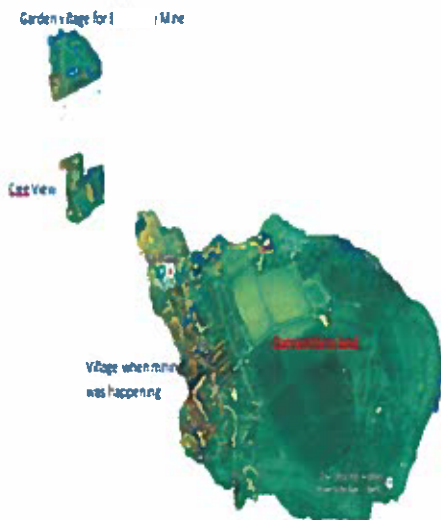


Figure 31

Shows the size of the village before N Farm was sold.



Figure 32

An image to show the current size of H .

This shows that the development of area depends on the natural resources around, this brings people to the area to begin with, but it also depends on the position of the settlement to how much it can expand, when relying on the ground being stable, whether there is space for development and what is around the area to support people moving there, for example if there is a source of water and food, which can also depend on the geology.

This report has therefore shown that the geology of H is Mudstone, Sandstone and Siltstone along with Upper Carboniferous coal measures, as well as the deeper geology containing Clays and Shales. This shows that it has supported the development of other areas for example the use of the Sandstone in Worcester Cathedral, but also the development of the village itself with the introduction of mining to the village and then other villages around. This has therefore answered the question that I set in finding out the geology of H and how does geology affect the development of an area, with the answer being yes as it is unlikely that H would have grown and could have disappeared with people possibly moving to B, showing how geology affects the development of an area.

References:

- [1] <http://www.bgs.ac.uk/lexicon/lexicon.cfm?pub=HA>
- [2] <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>
- [3] <http://www.bgs.ac.uk/lexicon/lexicon.cfm?pub=HA>
- [4] <http://www.org.uk/assets/Uploads/resourceriversevern.pdf>
- [5] Worcestershire_Building_Stone_Atlas.pdf
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- [8] http://www.wyreforestu3a.org.uk/files/Geology/Info_Sht_6_H_Colliery_Ap_13.pdf
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- [10] http://shropshirehistory.com/mining/mine_gazetteer.htm
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- [12] <http://shropshirehistory.com/mining/mines/t.htm>
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Image Reference

- Figure 1 - <http://www.vce.bioninja.com.au/aos-4-change-over-time/evolution/geological-time-scale.html>
- Figure 2 - http://www.thegeologytrusts.org/pub/our-earth-heritage/gb-lpr_123-16ctgeologymap/
- Figure 3 - <http://www.summitpost.org/geological-map-of-south-shropshire-hills-aonb/545420>
- Figure 4 - <http://www.bing.com/mapspreview>
- Figure 5 - <http://www.bing.com/mapspreview>
- Figure 6 - <http://www.bing.com/mapspreview>
- Figure 7 - <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>
- Figure 11 - <http://mapapps2.bgs.ac.uk/geoindex/home.html>
- Figure 12 - <http://mapapps2.bgs.ac.uk/geoindex/home.html>
- Figure 13 - http://scans.bgs.ac.uk/sobi_scans/boreholes/15902533/images/15592612.html
- Figure 14 - <http://mapapps2.bgs.ac.uk/geoindex/home.html>
- Figure 15 - <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>
- Figure 16 - <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>
- Figure 17 - <https://www.google.co.uk/maps/@52.4595116,-2.3935254,233m/data=!3m1!1e3>
- Figure 18 - <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>
- Figure 19 - http://scans.bgs.ac.uk/sobi_scans/boreholes/15902533/images/15592612.html
- Figure 20 - http://scans.bgs.ac.uk/sobi_scans/boreholes/15902538/images/15592617.html
- Figure 21 - <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>
- Figure 22 - http://scans.bgs.ac.uk/sobi_scans/boreholes/270381/images/10537502.html
- Figure 23 - http://scans.bgs.ac.uk/sobi_scans/boreholes/270381/images/10537502.html
- Figure 24 - http://scans.bgs.ac.uk/sobi_scans/boreholes/270381/images/10537516.html
- Figure 25 - http://scans.bgs.ac.uk/sobi_scans/boreholes/270380/images/10537487.html
- Figure 26 - http://scans.bgs.ac.uk/sobi_scans/boreholes/270380/images/10537488.html
- Figure 27 - http://scans.bgs.ac.uk/sobi_scans/boreholes/270380/images/10537489.html
- Figure 28 - http://scans.bgs.ac.uk/sobi_scans/boreholes/270380/images/10537490.html
- Figure 29 - http://scans.bgs.ac.uk/sobi_scans/boreholes/270380/images/10537494.html
- Figure 30 - http://scans.bgs.ac.uk/sobi_scans/boreholes/270380/images/14800969.html
- Figure 31 - <https://www.google.co.uk/maps/@52.4525413,-2.3857644,1939m/data=!3m1!1e3> (original image was taken from before editing)
- Figure 32 - <https://www.google.co.uk/maps/@52.4525413,-2.3857644,1939m/data=!3m1!1e3>

Date first accessed	Website/Book	Reliability
12th November	http://mapapps.bgs.ac.uk/geologyofbritain/home.html	Academic website, that is ran for the government
3rd February	http://www.bgs.ac.uk/lexicon/lexicon.cfm?pub=HA	System that is ran by the BGS
4th February	http://mapapps.bgs.ac.uk/geologyofbritain/home.html	System that is ran by the BGS
5th February	http://www.bgs.ac.uk/lexicon/lexicon.cfm?pub=HA	System that is ran by the BGS
6th February	http://www.....org.uk/assets/Uploads/resource/riversevern.pdf	I tourist attraction website link, could be trusted as it is used by lots of people, however the information for the page has a unknown source making it less reliable
6th February	Worcestershire_Building_Stone_Atlas.pdf	English Heritage page, which is know trust which is ran without England
9th February	http://www.wyreforestu3a.org.uk/files/Geology/Info_Sht_6_H_Colliery_Ap_13.pdf	Professional group in the wyre district
23rd March	http://www.bgs.ac.uk/lexicon/lexicon.cfm?pub=ALY	System that is ran by the BGS
23rd March	http://shropshirehistory.com/mining/mines/ft.....htm	Less reliable however is a largely used website, with information about all parts of Shropshire from different times
8th February	http://mapapps2.bgs.ac.uk/geoindex/home.html	System that is ran by the BGS
8th February	http://scans.bgs.ac.uk/sobi_scans/boreholes/270381/images/10537509.html	System that is ran by the BGS
29th April	https://www.google.co.uk/maps/@52.4525413,-2.3857644,1939m/data=!3m1!1e3	Large known company
30th July	Memoirs of the Geological Survey of Great Britain, D and B (one -inch Geological sheet 167, new series) By T.H.Whithead and R.W.Pocock	Published book by the Geological Survey, which is unlikely to have false information in it
3rd May	Understanding Geology By D.Webster Published by Oliver & Boyd 1995	School text book which is unlikely to have false information, making it reliable

Appendix

Risk assessment for Highley field work

Risk	Who could be affected?	Severity	Likelihood	Risk rating	Control measures
Getting lost whilst visiting the British Geological Society.	Me	Low	Low	Low	Plan my trip and make sure I have a map available if needed. Let my family know where I am going and expected timings of arrival and returning home.
Being harmed whilst collecting samples/finding examples of stones.	Me	Low	Low	Low	I will not get samples unless it is appropriate to do so (I will not dig up stones). I will use my phone to take pictures of the exposed stone.
Trespass.	Me	Low	Low	Low	I will check that I am allowed in the location I am investigating before I visit. I will ask permission to visit certain locations if I am not sure.