North York Moors National Park Authority

York Potash Application

Need Commentary

May 2015
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Report for
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Executive summary

Purpose of this report

The North York Moors National Park Authority are determining a planning application submitted by York Potash Ltd for a new polyhalite mine. The application will be considered against the policy contained within paragraph 116 of the National Planning Policy Framework which includes the following text:

“Planning permission should be refused for major developments in these designated areas except in exceptional circumstances and where it can be demonstrated they are in the public interest. Consideration of such applications should include an assessment of:

The need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy.”

This report has been produced for the purpose of providing a commentary to the North York Moors National Park Authority of the need for a new polyhalite mine. The commentary will be used by the Authority in its determination of a planning application for the mine.

York Potash Ltd propose to develop a mine which could deliver 13 million tonnes of polyhalite every year to global fertiliser markets. Polyhalite is only produced commercially by one operator in the world at the present time and volumes produced are estimated at a small percentage of these amounts. York Potash Ltd therefore expect to build a market by promoting polyhalite as a substitute product for other fertiliser products.

There are considered to be three issues relevant to the consideration of need in the application: supply and demand, agronomic and economic considerations.

As polyhalite is not currently produced in quantities to create a real market, there is currently no demand for polyhalite at a UK or global level. Potential markets are currently obtaining the nutrients they need for fertilisation from other products.

Polyhalite contains 4 principal components: potassium, sulphur, magnesium and calcium meaning that it is a multi-nutrient fertiliser with each of its component parts having a recognised and important role in fostering plant growth. It has a high sulphur content which would be beneficial in sulphur deficient environments around the world. It also has a low chloride content which would provide a benefit over Muriate of Potash for certain crops which are sensitive to high chloride concentrations. York Potash Ltd present crop trial results within the application to show the success of polyhalite as a fertiliser. The make-up of polyhalite is considered suitable to provide a multi-nutrient fertiliser and its characteristics would be useful in certain markets. However, the application provides no evidence which shows that polyhalite provides any unique properties. The agronomic benefits which do arise from polyhalite are simply due to the make-up of nutrients being appropriate for certain crops in certain situations – a feat which could be also achieved by using other, existing fertilisers/nutrients. This conclusion is borne out by the substitution marketing strategy proposed.

The applications key argument on need is around the economic benefits which are predicted: from contracts and employment during the construction phase, and then permanent employment, training, contracts and taxes/royalties during the operational phases. The application predicts that once fully operational in Phase 2, the project would support over 1,000 direct jobs – mainly over an area from Scarborough in to the south, Hartlepool in the north and Ryedale in the west. The application predicts the project would directly add £1 billion per year to the UK’s economy and would reduce the UK’s trade deficit by 4%. There project would however create some adverse effects on the economy and there are also a number of issues with some of the economic predictions made. Both of these issues mean that the total economic benefits realised may not be as great as estimated in the application. The two main issues being a lower price for polyhalite being needed to grow a 13 million tonne market as quickly as York Potash would like and negative effects on the local economy from the mine (particularly on tourism).
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1. Introduction

1.1 Background

1.1.1 York Potash Ltd (YPL) has submitted a planning application for a new polyhalite mine to the North York Moors National Park Authority (NYMNPA). The project would consist of a minehead in the National Park, a tunnel from the mine to Wilton which will be used to transport the mineral via conveyor (the Mineral Transport System or MTS), a materials handling facility (MHF) at Wilton and a port facility at Teesport (the Harbour Facility). The proposed development is considered to be a ‘major development’ and as such the policies of NYMNPA require it to be considered against the requirements of paragraph 116 of the National Planning Policy Framework (NPPF). This paragraph, often referred to as the ‘major development test’ (MDT), includes the following text:

“Planning permission should be refused for major developments in these designated areas except in exceptional circumstances and where it can be demonstrated they are in the public interest. Consideration of such applications should include an assessment of:

The need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy.”

1.1.2 This report provides a commentary on the need for the development, to assist the NYMNPA in its determination of the application. It has utilised information from the York Potash planning application, independent reviews of the application documentation by A.E. Johnson and Fertecon and representations made on the application by the Whitby Area Development Trust.

1.1.3 The commentary considers three specific areas: the need for the mineral, the agronomic need and the need for the economic benefits which are claimed.

1.2 Polyhalite

1.2.1 Polyhalite is a multi-nutrient mineral which YPL are proposing to extract for use in the fertiliser industry. YPL consider that the polyhalite they have identified is a high grade material which will require little in the way of processing to create a saleable product. The mineral identified contains 14% K_2O (potassium), 48% SO_3 (sulphur), 6% MgO (magnesium) and 17% CaO (calcium). Whilst polyhalite is primarily considered as a form of potash (a potassium based material), its multi-nutrient content means that it could be considered as an alternative to a number of other materials within the fertiliser industry.

1.2.2 The project proposes to build up production to a point where it is able to reach 6.5 million tonnes per annum (mtpa) of polyhalite during Phase 1, and then 13 mtpa during Phase 2. Phase 1 production would commence at the end of the construction period, i.e. from Month 59 onwards. Phase 2 is predicted to commence from Month 95 (i.e. just under 8 years from the start of construction) and would then run for the remainder of the mine’s proposed life (i.e. an estimated further 92 years).

1.2.3 The mine would only produce polyhalite and it is proposed that the majority of the mineral produced would be exported from Teesport to international markets. It is expected that UK distribution would be around the 100,000-150,000 tpa level, with the remainder being exported.

1.2.4 YPL’s consideration of the market potential for polyhalite is based on substitution opportunities, i.e. polyhalite taking market share currently occupied by other products. It is not based on an identified ‘gap’ in the market which could result from either a growing demand which can’t be met by existing suppliers, or from an identified opportunity for which no other product currently provides for.

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1 The Agronomic Case for Polyhalite, Executive Summary. ADAS, 8 April 2014
2 York Potash Mine MTS and MHF Environmental Statement, Part 1 Introductory Chapters, Royal Haskoning DHV. Paragraph 3.12.39
2. Need for the Mineral

2.1.1 Most minerals planning applications contain an assessment of the need for the mineral in terms of the supply and demand factors, seeking to show that demand for the mineral is not met by current supply and therefore that the additional production they propose is needed to meet this demand. Due to the substitution strategy used to identify the market for polyhalite, YPL make no specific case for the need in this sense. Its work seeks to show that polyhalite has the attributes to be used in a variety of products or as a straight application fertiliser in certain circumstances. Due to the benefits YPL claims for polyhalite over existing sources of nutrients, and the proposed pricing of the product, it considers that it will be able to create a market by substitution – replacing the market share currently occupied by existing suppliers.

2.1.2 From the information Amec Foster Wheeler has seen from the CRU Polyhalite Market Study, April 2014 (Appendix 5, Appendices to Major Development Test Planning Statement, September 2014) and the Fertecon review of this document (Review of CRU Polyhalite Market Study April 2014, Fertecon January 2015), there is no indication that there is a UK or global supply and demand need. In terms of the MDT, there is therefore no need for the polyhalite in terms of the supply of the mineral in itself.
3. Agronomic Need

3.1.1 YPL make a case that the agronomic qualities of polyhalite mean that it will be a successful fertiliser and identify five principal conclusions from the agronomy research it has undertaken:\(^2\):

1. Polyhalite comprises 4 principal components (potassium, sulphur, magnesium and calcium) – each component is a plant nutrient and “all are essential for plant growth”. In principle, therefore, polyhalite is a multi-nutrient fertiliser and each of its component parts have a recognised and important role in fostering plant growth;

2. Polyhalite has a low chloride content and has potential advantages over the more commonly used Muriate of Potash (MoP) fertilisers in use on crops which are sensitive to high chloride concentrations. This suggests that polyhalite is a useful general fertiliser, but also that it may be particularly useful for intensive agriculture and in relatively arid climates;

3. Experiments demonstrate that polyhalite significantly increased the growth of a wide range of crops compared with other widely used potash fertilisers;

4. Polyhalite is very well suited for inclusion in blended/complex fertiliser products because of its multi-nutrient qualities; and

5. The relatively high sulphur content of polyhalite is important in providing essential nutrients for sulphur-deficient environments, which are becoming increasingly widespread around the world.

3.1.2 Points 1, 2, and 4 above are accepted. These are considered to be relatively straightforward statements of fact about polyhalite; its nutrient make up; and what it could be used for. However, there is nothing in these statements that give polyhalite a unique quality over other fertilisers or nutrient sources which are already available.

3.1.3 The statement in Point 5 about polyhalite being important in providing sulphur is also accepted, although the need for additional sulphur products in the market is not as clear cut. Notwithstanding this, there is expected to be a growing market for sulphur in fertilisers, in part due to environmental legislation in many parts of the world restricting sulphur emissions in to the atmosphere – and thereby reducing the amount of free sulphur farmers receive from the atmosphere. However, the supply of sulphur to make fertilisers currently comes largely from the by-products of other processes, and the sulphur content of fertiliser is usually a secondary item behind other nutrients. As such it is difficult to identify the size of the existing sulphur market and how widespread deficient sulphur environments are.

3.1.4 With regard to Point 3, and the results of the experiments that have been undertaken on behalf of YPL, this is an area where conflicting opinions are available. YPL’s position (as set out in the ADAS Report\(^4\)) is that:

- polyhalite increased plant growth in a wide range of crop species;
- there were no negative growth effects;
- in 90% of species it produced equal or greater growth response compared to other potash fertilisers; and
- when compared with SoP, and when used alongside supplementary potash, in 8 out 9 species it provides valuable inputs of sulphur, magnesium and calcium.

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\(^2\) Major Development Test Planning Statement, Quod, September 2014.

3.1.5 The ADAS Report, and some of the data from YPL’s crop trials\(^5\), were reviewed on behalf of the NYMNPA by A.E. Johnston, Lawes Trust Senior Fellow. The conclusion of this review were that the crop trial data showed no evidence that polyhalite has any unique properties that would promote its use over other readily available fertilisers supplying the same nutrients in the same amounts. As such, the agronomic benefits which do arise from polyhalite are simply due to the make-up of nutrients being appropriate for certain crops in certain situations – a feat which could be also achieved by using other, existing fertilisers/nutrients. This conclusion is borne out by the substitution strategy proposed to market polyhalite, where polyhalite would take market share from existing fertiliser products, rather than creating a market from the introduction of a new, unique product or fill a supply and demand gap in the existing market.

3.1.6 The A.E Johnston review also notes that other opinions on the ADAS Report, such as those supplied by the Science Panel who reviewed the ADAS Report, also provide neutral opinions on the ADAS Report and the qualities of polyhalite. The Science Panel’s concluding paragraph simply states that they “…agree with the principal conclusion that polyhalite is an effective source of potassium, magnesium, calcium and sulphur for crop nutrition. We further agree that markets for these nutrients exist currently worldwide in agriculture and horticulture and that they are expected to grow as world food demand increases.” (Executive Summary of the ADAS Report). These conclusions are considered to be simple statements of fact, and provide no specific endorsement to polyhalite as a unique or special source of fertiliser nutrients.

\(^{5}\) This information is considered commercially confidential and was made available to the North York Moors National Park Authority on a strictly confidential basis for the subject of the A.E. Johnston review (Review of an ADAS Report ‘the Agronomic Case for Polyhalite’, dated 8 April 2014, A.E. Johnston, December 2014).
4. Economic Need

4.1 Introduction

4.1.1 The need for the development which is presented in the planning application focusses on the economic need: the economic benefits which will result at a local and national level from employment, taxes and royalties and exports. The extent of, and certainty of, these benefits occurring are therefore important in determining how the proposals meet the economic need for the development.

4.1.2 There are a number of important economic considerations which the planning application identifies. These include:

- A need for local employment which:
  - Reduces the reliance on the tourism sector for employment;
  - Provides permanent, skilled, full-time jobs, which are not seasonally dependant; and
  - Will benefit those people in deprived areas of Scarborough and Teesside.

- Local and Regional benefits from:
  - Business rate payments;
  - Royalty payments to landowners; and
  - Training and apprenticeship opportunities.

- National benefits from:
  - An increase in GDP;
  - A reduction in the trade deficit; and
  - Payment of national taxes and duties.

4.1.3 However, there are also some adverse effects on the economy form the proposals and therefore it is the net effects which will result which will be important in confirming how far the development would deliver against the economic needs identified.

4.2 Construction Period

Estimated effects

4.2.1 YPL estimate that it will invest £1.7 billion in the construction of the mine, with £1.4 billion of this being required during the initial construction period to facilitate the Phase 1 capacity of 6.5 mtpa. This initial construction period is predicted to last 58 months. Around 75% of the investment amount would be directly spent on the construction of the Mine and MTS, with the remaining spent on the construction of the MHF and Harbour Facility, and on power and utilities requirements. These figures have been estimated by YPL primarily on the basis of a Preliminary Feasibility Study for the mine and other studies (which are not published) for the MTS, MHF, Harbour facility and remaining elements.

4.2.2 The construction investment is expected to support 3,725 person-years of direct construction employment, averaging 770 workers per year over the 58 month programme, peaking at 1,670.

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6 York Potash Economic Impact Report, Appendix A1, Quod 2014.
The investment is predicted to support 6,760 person-years of indirect jobs and 1,240 person-years of induced jobs. Of the direct construction employment, YPL is targeting 35% of positions to be filled by people from the local labour market. The remainder are more likely to require specialist skills which are only found at a national or international level.

**Adverse effects and net benefits**

Alongside the consideration of the benefits, the application also identifies some adverse effects, which would have the result of reducing the net effect of the benefits identified. However, they would also cover some specific effects that the benefits would not directly replace.

Within the application, the Economic Impact Report (EIR) also identifies adverse effects on the tourism economy, through the loss of visitor days identified by Ipsos MORI, and a calculation that this would equate to a loss of £10.3 million and 150 jobs from the tourism economy every year through the construction phase. However, Amec Foster Wheeler’s review of the Ipsos MORI report considers that the translation of the Ipsos Mori findings into economic values is a weak point in the research with explanations of the information used or clarifications of the uncertainties involved being scarce. There is also no identification of the level of adverse indirect or induced effects from the loss of these figures from the tourism economy. The review also identifies that certain attractions or resorts may experience specific adverse effects, but that this is not explored by Ipsos MORI. Representations made by Whitby Area Development Trust on the application seek to explore the specific effects on Whitby as a tourist destination itself in more detail. Although outside of the National Park, Whitby is accessed through the National Park and is considered to provide a catalyst for a substantial proportion of the National Park’s tourism economy.

The WADT representations state that Whitby is a unique resort, with a large proportion of repeat visitors and there are no locations in the North York Moors National Park or nearby which would provide a similar, alternative destination. It therefore raises the question of whether repeat visitors, who make up a substantial proportion of visitors to Whitby and the National Park, would choose to visit other destinations in the National Park if the construction works detract from Whitby’s appeal. It also raises queries around the traffic impacts on the main route into Whitby from Teesside (the A171), which would be the primary HGV transport route for the construction traffic. WADT claims that existing traffic numbers already create congestion and delays for people travelling along this route towards and from Whitby during certain peak times of the day and year. The introduction of large numbers of slow moving HGVs onto this route could only exacerbate this problem and further detract potential visitors from the area. Given the importance of Whitby to the economy of the National Park as a whole, and the concerns which have been raised over the tourism and traffic assessments, it is considered that the effects on the tourism economy could be worse than predicted in the application. However, the traffic and transport review contained with Amec Foster Wheeler’s ES Review (Ref 35190CShr052i3, dated May 2015) has identified that the congestion issue in Whitby (specifically at the Mayfield Road junction) has not been resolved, despite the assertions by RHDHV that it would be by proposed changes to the junction layout and traffic light cycle times).

If the adverse effects on the tourism economy are taken at face value, the proposed direct job creation would average at 770 jobs from the construction phase (which would be spread over the

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7 Indirect jobs are those from supply chain companies which will benefit from the project’s spend. Induced jobs are those which will be supported by the spend of the construction workforce of their wages. Person-years is a method of identifying job creation from temporary activities e.g. a full time job lasting for 5 years creates 5 person-years. It ensures that undue weight is not placed upon total job numbers created, when some of these jobs may only last for limited periods within the construction phase.

8 York Potash Economic Impact Report, Appendix A2 Skills Strategy section 2.4 (York Potash, September 2014)

9 North York Moors Visitor Survey, Ipsos MORI, 18 July 2014

10 York Potash: Review of Ipsos MORI North York Moors Visitor Survey (35190CLon030ii1), Amec Environment & Infrastructure UK Limited, October 2014

11 The Whitby Area Development Trust reference that 59% of all day visitors to the National Park have the Whitby enclave as their main destination – from the Whitby STEAM Trend report 2011-2013, Global Tourism Solutions (UK) Ltd, 2014.
National Park, Scarborough Borough Council, Redcar & Cleveland Borough Council, Middlesbrough Council and parts of Ryedale, Hambleton and the East Riding of Yorkshire), against 150 jobs lost from the tourism economy in the National Park. Whilst this would be a net benefit of 620 direct jobs, the construction jobs would be temporary until the beginning of operations.

4.2.7 Similarly, the tourism job losses would also in theory be temporary until the end of construction, but no one knows how the tourism industry would respond to a near 5 year period of adverse effects and whether the economy and related job numbers would grow again at the end of the period. If the adverse effects on tourism were localised around the Doves Nest Farm, A171 and Whitby areas, the loss of £10.3 million from the tourism economy a year for a near 5 year period may also see specific individual businesses go out of business in this time. So whilst there would be an overall net benefit in terms of jobs, and the construction phase would provide employment which reduces the reliance of the economy on the tourism sector during this time, the proposals would also damage the tourism sector, which is and will remain, the most important sector of the economy in the National Park and immediate surrounding area.

Commentary

4.2.8 From the information that is available, the construction spend appears to be reasonable, when considering this type of development in a generic sense. The resulting effects (both positive and negative) also appear to be in the order of magnitude that could be expected. However, given that there are no primary polyhalite mines in the world, there are no examples to benchmark these proposed costs against.

4.2.9 Whilst the overall amounts could be considered to be reasonable, the calculations which have been used to determine the construction spend by YPL are difficult to validate to a greater degree of certainty for a number of reasons. Much of the cost for the mine (the largest individual element of the construction spend) has been calculated at a ‘Preliminary Feasibility’ stage only and is subject to a margin of error of +/- 25%. Whilst these are accepted margins of error for a preliminary study of this nature, they obviously cast a relatively high degree of uncertainty over the figures produced. A detailed feasibility study would expect to go into further detail and would usually work to a 10% margin of error giving greater confidence in the figures. The calculations for the other elements of the project have been calculated using ‘additional estimates’, but no details have been published of what these estimates are or to what margin of error they are subject to.

4.2.10 In addition, the details behind the calculations and assumptions made have not always been provided. In some cases this may be because they are considered to be commercially confidential, which is an accepted situation. However, given the scale of this project; the numerous elements of work that need to be costed; and the uncertainty surrounding the costs, there is no way of confirming the validity of the costs specific to this particular design and location. One example of a difficulty this brings is with the job losses from the tourism economy from the construction works. The EIR report identifies that a £10.3 m loss to the tourism economy would equate to 150 jobs but, if the EIR methodology is followed, a figure of 105 jobs is calculated, which is a third lower.

4.2.11 If the costs were to be incorrect, there are two possible outcomes. The first is that costs are actually lower than estimated (due to construction being completed more quickly, or the estimates being overpriced). Whilst, this would be good news for YPL in terms of a smaller construction bill, it would lead to the resulting direct, indirect and induced benefits also all being lower. Alternatively, if construction was delayed, or spend was underestimated, in theory the greater spend that would result would lead to greater direct, indirect and induced benefits. However, an increased spend would also require greater funding. Delays to the construction phase would also extend the period of time that adverse effects on the tourism economy would occur.

4.2.12 The EIR also presents some information on scenarios where construction costs change by +/- 25% and it identifies that all of the resulting effects increase or decrease by around 25% as well.
4.3 Operational Period

Estimated effects

4.3.1 Once the mine becomes operational, the production capacity is scheduled to ramp up to 6.5 mtpa in Phase 1, before increasing to 13 mtpa in Phase 2. The economic benefits estimated in YPL’s application are based on production reaching these levels, and pricing being based at $150 per tonne\(^{12}\).

4.3.2 The $150 amount is determined from the CRU Polyhalite Market Study, where a ‘demand window’ identifies the potential size of the market available at different pricing scenarios. The report identifies two market scenarios, one where the market responds to YPL by making world potash prices more competitive, and one where the market accepts YPL and makes no response. The CRU demand window identifies that;

- to reach 6.5 mtpa, prices would need to be around $118 per tonne (or less) at the highest level of market response, or around $185 per tonne (or less) where there is no market response; and
- to reach 13 mtpa, prices would need to be around $110 per tonnes (or less) at the highest level of market response, or around $170 per tonne (or less) where there is no market response.

4.3.3 $150 per tonne is therefore identified as a likely ‘central estimate’ within this range\(^{13}\). At $150 per tonne and 13 mtpa production, Quod calculates that the resulting GVA\(^{14}\) would be £1 billion per annum, with £214 million spent in the supply chain. A £1 billion GVA would also result in tax payments by YPL of £234 million per annum.

4.3.4 Operationally, the proposals are also estimated to support 700 direct jobs during Phase 1 and 1,040 jobs during Phase 2. For the direct jobs associated with the mine (435 for Phase 1, 725 for Phase 2), these direct jobs are expected to almost all be taken by people who will live in the Travel to Work Area (TTWA), i.e. either from the existing population or people who move specifically for a job with YPL. This covers a ‘local area’, including all of the North York Moors National Park, Redcar & Cleveland, Middlesbrough and Scarborough Council areas, and parts of the Stockton-on-Tees, Hartlepool and Ryedale council areas. Given that a number of these areas overlap with each other, it is difficult to determine exactly how many jobs are likely in each area, but roughly the National Park could see around 6% of the jobs, Redcar & Cleveland 45% and Scarborough 10%, with the remaining being spread throughout the rest of the TTWA. For other elements of the development, such as the MHF and Harbour Facility on Teesside, the operational labour force is estimated to come mainly from Teesside, but also from as far afield as Newcastle.

4.3.5 Indirectly, the proposal would also support 880 jobs in the supply chain during Phase 2 and there would be 220 induced jobs supported.

4.3.6 The fact that such a large proportion of the polyhalite produced will be exported will also have an impact on the UK’s trade deficit. Quod calculates that in Phase 2, 12.8 mtpa will be exported, bringing in £1.2 billion to the UK economy each year and reducing the trade deficit by 4%.

Adverse effects and net benefits

Boulby Mine

4.3.7 The proposal has the potential to have an effect on Cleveland Potash’s operations at Boulby. This could come from either taking CPL’s market share or from employees taking jobs with YPL and leaving CPL understaffed. The market situation is slightly complicated by the fact that traditionally Prices are quoted as Free on Board (FOB) Teesside in US$. FOB Teesside means the price of getting materials from the source (the mine) to the distribution point (at Teesport). Transportation costs from Teesport to the final destination are not included as they are determined by the specific contract between the supplier and the buyer.


14 GVA, gross value added. A measure of the value of goods or services produced by a specific area, sector or business.
Boulby has not mined much polyhalite to date, with its usual product being MOP, which is processed from the extraction of sylvinite ore.

4.3.8 If this situation continues, CPL and YPL would be marketing different products, and whilst both products would be potash based, any effects on market share should be negligible, due to the size of the global markets. However, CPL does mine relatively small quantities of polyhalite, and has plans to increase its production capacity for this mineral and so the two companies would (to some extent) be competing for the same market and therefore this issue could become more important.

4.3.9 In this scenario, it is likely that the two companies would be the only two mines in the world producing polyhalite in significant quantities for a period of time. The presence of two different organisations in the emerging polyhalite market could provide competition and drive the market positively. Within the wider potash market, certain specialist markets for polyhalite could emerge and it is here where there could be more likelihood of one operator winning market share from the other. However, given that CPL is only producing relatively small quantities in an immature market at present, it is difficult to judge which company would be affecting the other’s market in the 2020s, and therefore it is likely that this issue will come down to simple competition between two different organisations. Notwithstanding this, CPL would also have the advantage of being able (to some degree) to switch between MOP and polyhalite production depending on market conditions.

4.3.10 A potentially more serious issue could come from the loss of staff from Boulby Mine to YPL’s operations. CPL has raised concerns that specialist mining staff are much less widely available than when it started operations in the early 1970s, when many other deep mines were operating in both the coalfields of the UK and Yorkshire. The run down and soon to be complete closure the deep coal mining industry in the UK means that this pool of suitably qualified and experienced UK based-staff is very small and if YPL were to attract any of Boulby’s specialist employees there is nowhere obvious for Boulby to go to replace them. Specifically, CPL identify that there are certain roles in a deep mine operation that require specialist training and skills and, although the number of these jobs in a mine are relatively small, the operation of that mine cannot take place without them for health and safety reasons. In addition, more general underground workers need different skills and training than surface quarry workers (YPL identify prospective employees coming from a relatively large number of people currently working in the mining or quarrying from within a 60 minute commute of the site). Although some staff may be available from the expected closure of the 3 remaining deep coal mines in the UK over the next two years (Hatfield and Kellingley in Yorkshire, and Thoresby in Nottinghamshire), the relatively recent closures of the Daw Mill (Warwickshire) and Maltby (South Yorkshire) collieries have provided only limited manpower resources for CPL. However, if CPL lost staff and replacements were not available, it estimates that it would take around 18 months to train staff with no underground experience into valuable underground workers and this would therefore have serious implications for its operations over this period.

4.3.11 The EIR Report also identifies that the operational phase would have an adverse effect on tourism which would result in a loss of £5.2 million per annum. Using the methodology outlined by Quod in its EIR report, it has been calculated that this would equate to the loss of 50 tourism related jobs, and there would also be adverse effects from the loss of indirect and induced effects.

Polyhalite pricing

4.3.12 Fertecon’s review of the CRU work agrees with the general conclusions of the demand window, and that the price for YPL’s polyhalite would likely settle somewhere between $110 and $170 per tonne depending on how it is marketed. However, Fertecon is of the opinion that if YPL press to build a 13 mtpa market, especially in the timeframe indicated, there would be more of a market response than identified by CRU. Fertecon therefore are of the opinion that this market response will drop the likely price window to between $110 and $150 per tonne for a 13 mtpa supply

4.3.13 Fertecon also considers that further factors will be relevant to the demand window which will have an impact on the likely price. These include:

- The challenges of building a market for a new product. Consumers are likely to want to see agronomic test data, from both the supplier and/or their own trials, before purchasing new
polyhalite based products. This suggests building a market would take time, or YPL will need to compete on price to win volumes;

- The fact that not all buyers will want all of the nutrients available from polyhalite (and by consequence will not be willing to pay for them);

- The lower level of individual nutrients within polyhalite compared to many existing alternatives, and the higher logistics costs which would result per tonne of nutrient supplied; and

- The need to maximise market potential to move high volumes of polyhalite. At $150 per tonne YPL would need to take 86% of the potential market to move 13 mtpa and it is unlikely a single new company could reach that level of market penetration. At $110 the market share required to move 13mtpa drops to 40%.

4.3.14 There will also be other factors that would influence the price range, which include the number of competitors being limited for the foreseeable future and that most users will require investments in storage or handling equipment. This leads Fertecon to an opinion that polyhalite will need to be priced highly competitively against alternative products and that the price is therefore actually likely to be between $110 and $130 per tonne.

4.3.15 Fertecon highlight that all of the market sizes identified by CRU are theoretical and potential maximums, and therefore any risk in the calculations is to the downside (i.e. smaller markets or prices). When the factors around some of the actual workings of the industry are considered, some of these risks are stimulated, leading to the lower prices indicated.

4.3.16 Quod’s EIR provides a section on ‘sensitivity tests’, where different pricing scenarios are considered in order to show what the effects on economic benefits would be. These include a price of $110 per tonne (as this is at the lower end of CRU’s demand window), and also at $100 per tonne.

4.3.17 At $110 per tonne during Phase 2, Quod calculates that GVA would drop (from $150 levels) by 32% to £680 million per annum, and at $100 per tonne by 40% to £599 million. Similarly, the taxes due would drop as the value of the exports are lower. At $110, taxes would drop 34% to £155 million a year, and at $100 by 42% to £136 million.

4.3.18 Using Quod’s figures (para 6.27 of the EIR), the effect on the UK’s trade deficit would be a reduction of the deficit by around 2.6% each year at $110 per tonne, or by around 2.4% at $100.

4.3.19 The tables below show the comparison between the economic benefits resulting from a $150 or $110 per tonne sales price, at Phase 1 (6.5mtpa) and Phase 2 (13mtpa).

Table 4.1  Phase 1 Economic benefits comparison

<table>
<thead>
<tr>
<th></th>
<th>At 6.5mtpa $150 per tonne</th>
<th>$110 per tonne</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVA</td>
<td>£500 million</td>
<td>£335 million</td>
<td>-33%</td>
</tr>
<tr>
<td>Supply chain spend</td>
<td>£112 million</td>
<td>£112 million*</td>
<td>No change</td>
</tr>
<tr>
<td>Taxes</td>
<td>£117 million</td>
<td>£74 million</td>
<td>-37%</td>
</tr>
<tr>
<td>Trade deficit reduction</td>
<td>2.2%</td>
<td>1.6%</td>
<td>-27%</td>
</tr>
<tr>
<td>Direct Employment</td>
<td>700</td>
<td>700*</td>
<td>No change</td>
</tr>
<tr>
<td>Induced Employment</td>
<td>470</td>
<td>470*</td>
<td>No change</td>
</tr>
<tr>
<td>Induced Employment</td>
<td>130</td>
<td>130*</td>
<td>No change</td>
</tr>
<tr>
<td>Tourism Jobs lost</td>
<td>50</td>
<td>50</td>
<td>No change</td>
</tr>
</tbody>
</table>
Table 4.2  Phase 2 Economic benefits comparison

<table>
<thead>
<tr>
<th></th>
<th>At 13mtpa</th>
<th>$150 per tonne</th>
<th>$110 per tonne</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVA</td>
<td>£1 billion</td>
<td>£680 million</td>
<td>-32%</td>
<td></td>
</tr>
<tr>
<td>Supply chain spend</td>
<td>£214 million</td>
<td>£214 million*</td>
<td>No change</td>
<td></td>
</tr>
<tr>
<td>Taxes</td>
<td>£234 million</td>
<td>£155 million</td>
<td>-36%</td>
<td></td>
</tr>
<tr>
<td>Trade deficit reduction</td>
<td>4%</td>
<td>2.6%</td>
<td>-35%</td>
<td></td>
</tr>
<tr>
<td>Direct Employment</td>
<td>1,040</td>
<td>1,040*</td>
<td>No change</td>
<td></td>
</tr>
<tr>
<td>Indirect Employment</td>
<td>880</td>
<td>880*</td>
<td>No change</td>
<td></td>
</tr>
<tr>
<td>Induced Employment</td>
<td>220</td>
<td>220*</td>
<td>No change</td>
<td></td>
</tr>
<tr>
<td>Tourism Jobs lost</td>
<td>50</td>
<td>50</td>
<td>No change</td>
<td></td>
</tr>
</tbody>
</table>

*Note: These numbers are dependant primarily on the production capacity and therefore changes to the sales price don’t change the numbers.

4.3.20 To provide some context to these figures, at $110 per tonne the turnover of £447m\(^{15}\) at Phase 1 would be the equivalent of the 17\(^{th}\) largest company on the North East of England\(^{16}\). At $110, Phase 2 turnover (£894m) would put the development at 8\(^{th}\) in this list – the largest company being Nissan with a turnover of £4,963 million.

4.3.21 YPL would be a public company and the ‘size’ of such companies is usually recorded in terms of their market capitalisation (number of shares multiplied by the value of the shares). The FTSE indices are a measure of the UK public companies listed on the London Stock Exchange, with the FTSE 100 containing the 100 companies with the highest market capitalisations and the FTSE 250 the next 250 biggest. At the present time, YPL (as Sirius Minerals) is listed on the FTSE AIM 100 Index, which is a sub-market of the main FTSE indices for small/medium companies to float shares to help raise equity to support their growth. Due to the number and value of shares being highly variable, it is impossible to predict where YPL would stand in the list of public companies if the project was successful. Sirius has a market capitalisation of £416.6m (2,164 million shares at a value of 19.25p\(^{17}\)). To reach FTSE 100 Index value, the Sirius Minerals shares would need to rise in value to around £1.83) and to reach FTSE 250 value, they would need to rise to around 24.7p\(^{18}\).

4.3.22 Although public companies are not listed by the size of their sales, The Sunday Times publishes a list of the biggest British private companies every year\(^{19}\) which are measured by this factor. To give a comparison to these companies, at $110 per tonne the sales (turnover) of £447 million at Phase 1 would not see YPL reach the Top 100. The company in 100\(^{th}\) place being Firth Rixon, an aerospace manufacturer with £636m sales. At $110, Phase 2 turnover (£894m) would put YPL at 62\(^{nd}\) in this list. The top company is Alliance Boots (pharmaceutical retailer) with sales of £23,367m.

\(^{15}\) Calculated by Quod as GVA plus supply chain spend.


\(^{17}\) Information from [www.lse.co.uk](http://www.lse.co.uk), 20 May 2015.

\(^{18}\) The lowest market cap value on the FTSE 100 is Sports Direct International at £3,970.81m and the lowest on the FTSE 250 is Blackrock World Mining Trust at £534.52m. Information from [http://shares.telegraph.co.uk/indices/](http://shares.telegraph.co.uk/indices/) 20 April 2015.

\(^{19}\) The Sunday Times Top Track 100, Fast Track on behalf of The Sunday Times, 29 June 2014
Economic effects

Local economy and employment

4.3.23 The economy of the North York Moors National Park itself is relatively buoyant, and its prospects over the short to medium term are probably better than for the rest of the UK as a whole. Amec Foster Wheeler’s report on the economy of the National Park (35190 CBri065R) shows that the Park has low unemployment, has a high proportion of the population with qualifications holding degree level qualifications, a significantly high proportion of homes which are owned outright and a low proportion of socially rented properties and, although there is low full time employment, there is high self-employment. The tourism sector is the most important for employment, with the sector supporting around 4,000 FTE jobs within the National Park and around 7,800 FTE jobs in the wider area. Employment rates are predicted to slowly grow over the coming years with direct employment opportunities expected from the construction of the Dogger Bank Offshore Wind Farm, Whitby Business Park and the expansion of DEFRA’s facilities in Ryedale.

4.3.24 However, the National Park does have average house prices which are above the regional average and a situation where there is a 7,000 person commuter deficit out of the Park each day. This seems to present a picture of managerial level staff who live in the National Park but commute to highly paid jobs in the surrounding area, with salaries within the National Park being low on average.

4.3.25 The National Park’s strength from the tourism sector of the economy is closely connected to the economy of Whitby which is also strongly reliant on the tourism sector. Whitby is located in a pocket of land excluded from the National Park, but the Park surrounds Whitby on all landward sides. As such all tourists visiting Whitby must pass through the National Park to reach the town. In addition, the tourist attractions contained within Whitby will be attractive to those people visiting the National Park, and vice versa. Many seaside resorts in the UK are struggling to compete with foreign holidays, but it is recognised that those with unique selling points will be best placed to succeed in the future. Whitby appears to be in a position where tourism employment has probably grown over recent years, its combination of cultural and heritage attractions, good cuisine and original retailers mean it is in a good position to continue growth. There also other opportunities for economic growth on Whitby through the construction of the Dogger Bank Offshore Wind Farm and the extension of the Whitby Business Park. However, the opportunities from Dogger Bank are likely to focus on activities around the port facilities in the town, which may conflict with the importance of the river side areas for tourism as well. The difficulties which may face Whitby are therefore how to balance different elements of the economy which may conflict.

4.3.26 The area around the National Park shows some markedly different characteristics. Examining the constituent authorities, some areas of Scarborough and within Teesside are amongst the most deprived within the UK, whilst other areas within Scarborough, Teesside, Ryedale and Hambleton are amongst the least deprived in the country. Redcar and Cleveland has higher unemployment than the national average, with Scarborough being slightly under the average and Ryedale and Hambleton being much lower. Employment growth has been slower across all of the four constituent authorities (from 2001-2011) than at the national or Yorkshire and Humber regional level.

Regional economy

4.3.27 The York, North Yorkshire and East Riding LEP area shows that for the 10 years between 2002 and 2012, the area’s GVA, working age population and total population all increased at a slower rate than the UK as a whole, although the number of jobs and household disposal income did increase at a greater rate than the UK as a whole. Over the next decade the area is estimated to experience growth of GVA, the working age population, productivity and overall population at slower rates than the UK as a whole.

4.3.28 However, the LEP does also identify that the area, as with the more local economy, has wide contrasts. Certain parts of the LEP area are very successful, but the North Yorkshire coastal area is identified as having long standing challenges with low wages and skills, and relatively high
unemployment, benefit claimant levels and deprivation. These issues also spread into areas of the East Riding to the south and into Tees Valley LEP area to the north.

4.3.29 The Yorkshire and Humber region’s economy is based on a relatively high proportion of manufacturing, with productivity, employment and household income all among the lowest of the English regions. The region is responsible for 7% of the UK’s GVA, with a regional GVA of £89.7 billion in 2010, although almost half of this came from West Yorkshire.20

4.3.30 In North Yorkshire, the percentage of employees in fulltime employment is much higher than for the NYMNPA area and in line with the English average, and the unemployment rate is lower. Employment growth is much higher than for the National Park on its own (9% change 2001-2011, compared to 1.1%), but still falls below the English growth rate of 12.1%. As with the National Park, North Yorkshire shows higher levels of housing owned outright, and lower social renting.

National economy

4.3.31 The national economic context has changed dramatically in the last five years. Whilst uncertainty remains, the short and mid-term prospects for the UK economy appear to be generally good. In the UK in 2009 some 4.9% of output was lost and the UK’s subsequent economic performance has been mixed, although it is now improving. Growth in 2010 was less than 1% and has continued to grow at various slow rates up to 2013. However, the assessment for 2014 and 2015 is much more positive, with GDP expected to continue to improve. This will largely be driven by business and private investment. The UK’s GDP21 stands at around £1,657 billion and there was a trade deficit (value of imports against value of exports) of £27 billion for 2013, which had increased to £34.8 billion22 in 2014.

4.3.32 The decreases in public expenditure which started in in 2011 are expected to continue to result, nationally, in a drop in public sector employment numbers. Nationally, employment is rising slowly, but is expected to increase at a faster rate through 2015, and unemployment has fallen and is expected to fall further, alongside increases in average incomes. So whilst the national economic situation is improving, challenges do remain over the short term.

Commentary

4.3.33 The creation of any development which provides for both a large construction investment and long-term permanent employment is always going to have to have positive effects for any area of the UK, and this will be particularly true where the local area has economic challenges such as high unemployment, low wages and deprivation. In the local area, the National Park itself has a relatively buoyant economy, but there are issues with low wages and a reliance on the tourism sector. The key areas locally where there are more severe economic issues are within parts of the Scarborough and Teesside areas.

4.3.34 The proposal would have the effect of providing employment outside of the tourism sector, which are permanent, skilled and full time jobs. The employment offer is predicted to benefit those people living in the deprived areas of Teesside and Scarborough, as there will be opportunities for unskilled workers, as well as training opportunities for people to upskill to take skilled positions.

4.3.35 The maps produced by YPL in the ES to show where they expect workers to come from (from within the TTWA) show that for both construction and operational phases, the majority of local workers would come from the Teesside area. The maps also show that workers from outside of the local area, who will come to stay in the local area for parts of the construction phase, are also likely to locate in the Scarborough or Teesside areas, rather than the National Park. For some elements of the proposal (the MTS and MHF facilities) the figures indicate some staff could commute from as far away as Newcastle. It is also important to note that during the construction

phase, only 35% of the jobs on offer are expected to be taken by local people. The remainder would be specialised positions which would go to businesses based around the UK or abroad. So whilst the development is expected to bring jobs into the local area, it is important to note that the direct employment will not just be focused on the National Park and local area, and the resultant benefits will also be spread across a much wider geography.

4.3.36 The employment benefits identified also need to be considered against the adverse economic effects which are predicted. Whilst the proposals would help to diversify the local economy so that there would not be such a reliance on tourism, the tourism sector would remain as the largest employer in the local area. In addition, the proposals would lead to some weakening of the tourism economy, during both the construction period and operational phases of the development. Given the proposed development programme, the construction period of the mine is likely to overlap with the construction of the Dogger Bank Wind Farm (scheduled to commence 2019) by approximately 1 year and therefore there is a question of balance between the economic and employment benefits being brought from both schemes, and how they may adversely affect tourism.

4.3.37 In Fertecon’s review of the CRU market study, it identifies that all of the assumptions made in the CRU study are based on theoretical maximums. Therefore if there are any inaccuracies in the market size which is identified (13 mtpa) this will result in a smaller market being available, not a larger one. If this 13mtpa capacity was not reached, then employment numbers, as well as profits, would also be lower, as fewer staff would be needed to work the deposits and mineral produced. Notwithstanding this, Fertecon does acknowledge that the market does have the potential to accept a 13 mtpa supply of polyhalite from YPL, albeit it is of the opinion that YPL would need to sell polyhalite at a lower price than estimated, in order to reach this level of sales. If this scenario did occur, then the estimated employment numbers would remain the same as the same amount of work is required to extract the polyhalite. The increase in GDP and reduction in the trade deficit would however be lower due to the lower profits realised.

4.3.38 There is potential for the proposals to impact on the existing potash mine at Boulby, although this is more likely to be from Boulby losing staff to YPL’s operations than from the proposals taking market share from Boulby. The movement of certain staff from Boulby to YPL already indicates this threat is real, but it would be very difficult to confirm whether this staff movement will actually occur or not.

4.3.39 The EIR identifies that local taxes and duties will be paid to an estimated amount of £27 million in 2021 (6.5mtpa) rising to £48 million in 2024. In addition there would be £5 million of additional business rates across the local authorities where the project components are located. Although not stated in the application, it is expected that business rates would arise from the presence of staff at the YPL offices in Scarborough, together with the minehead (i.e. to Scarborough Borough Council), and the MHF and Harbour facilities to Redcar and Cleveland Borough Council.

4.3.40 At a national level, the economic benefits identified by YPL would increase UK GDP by around 0.06% and reduce the trade deficit by around 4%. Taking the figures from the Fertecon review, this would lead to an increase of GDP by 0.04% and the trade deficit by about 2.6%. In economic terms the development would undoubtable be a large scale development, with the potential to deliver substantial benefits over many years. However, it is difficult to confirm how accurate the economic predictions are and therefore how exceptional they are on a national scale.