



# Proposal Document

## Temporary borehole drilling site

### Langdale Rigg End

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**YORKPOTASH**  
A Sirius Minerals Project



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## Executive Summary

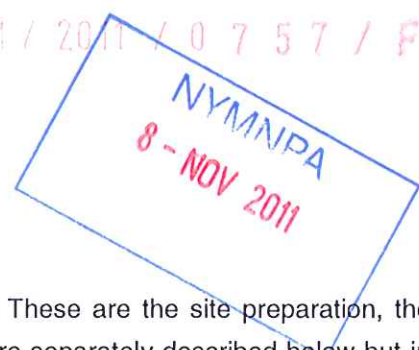
1. York Potash Limited is seeking to establish the extent, quality and quantity of potash deposits. This is being carried out by the analysis of existing data from previous exploration activities and the provision of data for analysis by new exploration activities. These activities consist of the drilling of boreholes and the carrying out of vibration (non-percussive) seismic survey. It is estimated that up to 10 new boreholes will be required.
2. This application is for planning permission for the drilling of an exploration borehole. The information derived from this temporary operation will aid the understanding of the nature and extent of the deposit and will contribute to the decision of position for the minehead.
3. The operation is approximately 8 weeks from beginning of soil stripping to completion of restoration ie soil replacement. Sites have been selected through the need to close geological information gaps and the intention to minimise the surface environmental impacts. It has also been driven by the need to obtain access to the surface.
4. The Langdale Rigg End site has been considered in terms of the potential impacts on ecology, the surface and sub-surface heritage environment, the noise environment, hydrogeology and landscape and visual impacts. The findings of these investigations show that there are temporary impacts that will be very short-lived and the archaeological study has not revealed any potential for harming important remains.
5. The proposals have also been considered, in the light of the study results, against the policy framework which constitutes the Development Plan for the North York Moors National Park and, where there are gaps in this regime reference has been made to the framework of national guidance against which development control decisions should be taken. The conclusion of the Policy review is that the proposals are in conformity with the extant framework and the national guidance.



## 1. Site and Surroundings

- 1.1 The application site is approximately 90m long and 60m deep, relatively flat, and lies to the west of, and adjacent to, a logging haul road which curves round from the north to the east. It is shown edged red on plan LRE1 (Rev A) dated 19<sup>th</sup> August 2011 – “Proposed Borehole Location, Langdale Rigg End”. The site is reasonably flat and elevated by approximately 1m above the level of the haul road. The site is part of the Langdale Forest conifer plantation and the trees on it have been felled and removed off-site. Brash and tree stumps remain over a thin layer of peaty soil.
- 1.2 To the north, east and west the retained woodland forms the horizon and a barrier to views in these directions. To the south there is an open area of felling beyond which the ground falls away to the line of the Mapperley Beck. There are open views towards Maw Rigg. The surrounding trees are around 12-15m high.
- 1.3 There are no significant watercourses in the vicinity of the site and access to it would be achieved along the logging haul roads that connect to the A169 highway at the access road into RAF Fylingdales. This access is bound, hard-surfaced to a point beyond the security checkpoint which is, itself, situated 110m from the public highway.



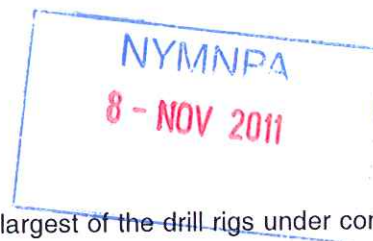


## 2. Proposals

- 2.1 There are three main phases to the proposed operation. These are the site preparation, the drilling operation and the site restoration. These phases are separately described below but in total are intended to last no more than eight weeks, of which the drilling will take approximately six weeks. The exact period of time will depend on the drill rig that is used and the progress being made, particularly with the retrieval of core samples.

### Phase 1 - Site Preparation

- 2.2 Prior to entry onto the site the consultant ecologist would re-visit the site to ensure that there has been no change to the ecological interest and that the area to be stripped, and the surrounding area to a distance of 50m, does not contain nesting birds or reptiles. When the ecologist has indicated that no additional ecological impacts will occur, the access point from the logging haul road will be formed. This will involve the temporary culverting of the ditch between the haul road and the site.
- 2.3 Consultation with the highways authority, for the carrying out of these operations has indicated that signage will not be required at the A169 due to the long straight views in both directions but temporary signs, indicating that lorries are turning, may be introduced.
- 2.4 The drilling area will then be prepared by the removal of the tree stumps and the separate stripping and storage of topsoil and subsoil, if a distinction can be made, followed by the levelling of the site. During the soil stripping the consultant archaeologist will carry out a watching brief to identify any archaeological interest that has not been anticipated through the desk-based assessment. In the event that an archaeological find is located the stripping operation will be moved to another part of the site whilst the find is examined and recorded in accordance with a written scheme of investigation that has been agreed with the Mineral Planning Authority. Any finds will be logged and placed in a local museum.
- 2.5 The soils would be handled, moved and stored in accordance with the 'MAFF Good Handling Guide for Soils' and will be placed around the perimeter of the compound area at no greater than 3m in height. The location of soil bunds would be dictated by the intention to minimise noise and visual impacts. On this site the emphasis would be towards the southeast.
- 2.6 The levelled site will then have terram and a geogrid membrane placed on the levelled area prior to the importation of approximately 1500 tonnes of single-size aggregate which will be spread to a depth of approximately 400mm. The importation would be carried out by 20 tonne loads resulting in approximately 75 vehicle movements in each direction over a two or three day period.
- 2.7 The aggregate will form a level working surface which will spread the load of the drilling rig and keep it in a stable position. The perimeter will then be fenced in accordance with a specification to be agreed with the Mineral Planning Authority.



### Phase 2 - Drilling operation

- 2.8 The area of the compound would accommodate the largest of the drill rigs under consideration for the site and car parking for six vehicles. However, whilst this larger rig has been used for the assessment of the potential impacts of the development it is the intention of the applicant to use the smallest rig that can be leased in order to minimise the landtake, visual impact and period of drilling. Therefore, a two stage drilling process is proposed with a 'top hole' rig spending 22-25 days on site, sinking the borehole to a depth of approximately 700m before departing the site and then completion of the hole by a larger drilling rig. The top hole rig is anticipated to be an M.I.45 truck-mounted rig that is driven onto and off the site.
- 2.9 The plant and equipment would be imported to the site over a period of three days. This is expected to consist of up to 40 lorryloads of equipment, including, one after the other, the two drilling rigs. When the first rig has vacated the site the second drill rig would be positioned, with the aid of a crane, and levelled. It will then deepen the borehole into the potash seams. The hole at the surface would be approximately 250mm wide and, as the borehole deepens the hole would gradually become narrower until the base of the hole which would be approximately 120mm wide.
- 2.10 As the hole approaches the interface between non-aquifer and aquifer a steel casing is introduced and cemented into place to prevent the migration of drilling fluids into the adjacent strata. The borehole is anticipated to meet three seams of potash mineral and as each is reached the drill bit will be changed in order to retrieve core samples. These cores will be recovered to the surface, referenced and temporarily stored prior to being split for permanent storage and analysis. The terminal hole depth will be determined by the depth of the poymalite but is anticipated to be approximately 1700m from the surface.
- 2.11 The drilling operation would take place on a 24-hour basis and is anticipated to last less than five weeks. The drilling rig would be a maximum height of 33 metres and would have to be lit for health and safety purposes. The majority of the lighting is at low level. All lighting is cowled in order to direct the light down and into the compound with the exception of the red aircraft warning light at the very top of the rig. The rig specification is detailed in Appendix 1.
- 2.12 During drilling the borehole is lubricated and flushed out by the introduction of drilling 'muds' at pressure. The mud returns to the surface where it is filtered and reused through the borehole. At the completion of drilling the mud in the borehole is replaced with a concrete which pushes the mud out of the hole for collection at the surface.
- 2.13 All drilling muds and other liquids used for the drilling process will be stored in compliance with all current UK legislation.

### Phase 3 - Restoration

- 2.14 When each drilling phase is complete the drilling rig will be moved to the next site along with all of its accompanying plant and equipment. When the hole is completed it is filled with a concrete/bentonite concrete mix which will prevent the migration of water or other liquids from

one horizon to another. The clean aggregate will be lifted and transported to the next drilling site that is being prepared in preference to being stored, to prevent double-handling. Any contaminated aggregate will be disposed of at a facility that is licensed to receive it. The terram and geogrid will also be lifted and removed off-site for re-use. Following the removal of the terram and geogrid the metal casing will be exposed to a depth of approximately 2m below ground level and cut.

- 2.15 The borehole itself would then be capped in accordance with a method which has been agreed with the Mines and Quarries Inspectorate, the Environment Agency and the MPA. Following the capping the operator will reinstate the water supplies that have been indicated by the landowner.
- 2.16 The soils would then be respread in sequence to achieve the previous contours and ripped to a depth of 200mm. Appropriate drains would then be incorporated, where necessary, and the site returned to the landowner so that it can be incorporated back into their planting programme.

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**Hours of working**

Operation	Mon- Friday	Saturdays	Sundays, Bank Holidays, Public Holidays	Comments
Soil stripping	0700 - 1800	0700 - 1800	Nil	
HGV movements associated with site preparation and restoration	0700 - 1800	0700 - 1300	Nil	
Drilling operations	24 hour	24 hour	24 hour	
Restoration	0700 - 1800	0700 - 1300	Nil	

**Traffic Management**

- 2.17 There will be a requirement for delivery of plant to the site for the site preparation phase as well as for the importation of stone and the plant and equipment that supports the drill rig. These vehicles will gain access to the site from the A169 via the entrance road to RAF Fylingdales and follow the haul route used by the Forestry Commission logging vehicles. These periods will

also occur during the rig removal and restoration operations although the number of vehicles will be reduced. There will also be approximately four water tanker deliveries per week which will gain access to the forest via Langdale End and West Side Brow.

- 2.18 Consultation with the Highways Authority has indicated that they will not require any additional traffic management measures to be put in place.

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### 3. Heritage

- 3.1 The site was visited by an archaeologist from Cotswold Archaeology who carried out an walkover survey and requested additional data from relevant historic records which are included in the Desk-based Assessment that is contained in Appendix 2 to this document.
- 3.2 The assessment shows that there are 9 Scheduled Ancient Monuments (SAMs) identified within the study area and there have been eight known archaeological finds. The SAMs are all barrows apart from one cairnfield and they are sufficiently distant from the site to not be affected by the proposed operations. They may indicate that the area formed part of an upland ritual landscape.
- 3.3 The assessment concludes that "no known heritage assets would be physically affected by the proposed works" and that "it is considered to be highly unlikely that remains of such significance survive that warrant preservation in situ". However, the applicant is proposing to have a qualified archaeologist present during the soil strip so that any archaeological features located during this operation would be excavated and recorded in line with their level of importance.



#### 4. Noise

- 4.1 The application site was visited by an appropriately qualified acoustician on 15<sup>th</sup> September. The locations of noise sensitive properties were established and computer modelling undertaken in accordance with a method that has previously been agreed with the Environmental Health Department of Scarborough Borough Council.
- 4.2 The nearest noise sensitive receptor to this site is High Langdale End which is approximately 610m from the site.
- 4.3 The modelling, taking into account the local topography, indicates that the most stringent night-time noise levels, as recommended by Minerals Policy Statement 2, would be met, as a maximum level, by a minimum of 6 decibels at any of the identified sensitive locations.
- 4.4 The full noise assessment is included at Appendix 3 to this document and concludes that "noise need not be a determining factor in granting planning approval for 24 hour drilling works at this site".
- 4.5 No further noise mitigation is proposed.



## 5. Landscape and visual

- 5.1 Following agreement of assessment viewpoints with the North York Moors National Park Authority the site was visited by a Chartered Landscape Architect and data collected for the assessment of landscape and visual impacts. The full assessment is included at Appendix 4 to this document and details the methodology that has been followed in reaching the reports' conclusions.
- 5.2 The landscape effects are considered to be temporary and of low.
- 5.3 Whilst the visual impact of the drilling rig would be "moderate and overall adverse" this would also be a temporary impact. The main receptors would be in close proximity to the Moors to Sea cycle route, which also attracts walkers, and from viewpoint 3 – brow of Langdale Rigg End. The visual impact would continue whilst these receptors are within line of sight which would be a matter of minutes.
- 5.4 The report concludes that "the short term and temporary nature of the development means that all adverse impacts will be removed and leave no visual or landscape impression following the removal of the site equipment". No further mitigation is proposed.



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## 6. Hydrology

- 6.1 A Hydrological Risk Assessment has been carried out using similar methods to that which has been previously submitted for the earlier borehole applications. The final document has been included at Appendix 5 to this document.
- 6.2 The Risk Assessment has considered the impacts of the drilling on surface waters, near-surface groundwaters, potable drinking resources and aquifers. Various mitigation measures are proposed including the use of specific drilling muds and the installation of a steel casing that is cemented in place to prevent ingress and egress of liquids to and from the borehole. With the implementation of the mitigation measures the report concludes that the risk associated with the proposed operations is "low".
- 6.3 The applicant will implement the proposed mitigation measures.

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## 7. Ecology

- 7.1 The application site has been subject to an extended Phase 1 habitat survey by a qualified ecologist and the resulting Ecological Impact Assessment Report is included at Appendix 6 to this document. The report presents the baseline situation and the nature conservation value of the area with the potential to be affected by the proposals ie wider than the application area.
- 7.2 The site has been used for single species conifer plantation and the impact assessment considers that the timing of the survey was appropriate for the flora and habitats of the site. The trees have been felled and the self-set trees on the site are only a few years old.
- 7.3 No statutorily protected plant species were noted at the time of the survey and no protected species were considered to be present within the application site or the immediate surroundings. Proposed mitigation measures include a site walkover by a qualified ecologist prior to the soil stripping and a destructive search for reptiles and amphibians with any located animals removed to suitable nearby locations.
- 7.4 It is anticipated that the site operations will avoid the main bird breeding season.
- 7.5 The Impact Assessment concludes that the "proposed development would not have a significant residual ecological impact, including at Parish level".



## 8. Conclusions

- 8.1 The applicant will implement the mitigation procedures outlined in the Appendices to this document. In doing so the proposal becomes Policy compliant.
- 8.2 The exploration phase is temporary and there will be no long-term impacts of the development.
- 8.3 The proposal is, therefore, commended to the Authority.

