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Date: 18 November 2025
Our ref: 50303/25/JG/ZS/40152330v3

Dear Rob

The Town & Country Planning (Environmental Impact Assessment) Regulations 2017 – Request for a Formal Scoping Opinion

The Woodsmith Project: S73 amendments to NYM/2017/0505/MEIA

On behalf of Anglo American Woodsmith Ltd, we request North York Moors National Park Authority's (NYMNPA) formal opinion on the scope of an Environmental Impact Assessment ('EIA') to be submitted in conjunction with an application to be made under Section 73 of the Town and Country Planning Act 1990 to amend planning permission NYM/2017/0505/MEIA. The request is made under Regulation 15 of the Town & Country Planning (Environmental Impact Assessment) Regulations 2017 ('the Regulations'); and is accompanied by the enclosed Environmental Scoping Report prepared by Haskoning (dated 17 November 2025).

A Section 73 application is a new application for planning permission under the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the '2017 Regulations'). As part of any Section 73 application, it is necessary to consider if further information needs to be added to the previously completed Environmental Statements submitted in relation to planning applications NYM/2014/0676/MEIA and NYM/2017/0505/MEIA¹ through the submission of further Supplementary Environmental Information to assist in consideration of the proposed amendments to the development.

Due to the nature of the amendments, it has been agreed with NYMNPA that a further Supplementary Environmental Statement ('SES') should be submitted with the Section 73 application. This is required in order to describe the potential for any additional or different environmental effects that have not

¹ including the York Potash Environmental Statement (September 2014) ('ES September 2014') and the Supplementary Environmental Information (February 2015) ('SEI February 2015') submitted under application reference NYM/2014/0676/MEIA and, the Supplementary Environmental Statement ('SES July 2017') submitted under planning application reference NYM/2017/0505/MEIA.

been previously identified as part of the original EIA process. This request seeks confirmation on the scope of the SES.

To assist NYMNPA in forming its scoping opinion, the enclosed Scoping Report provides the following information:

- Site location and description and background to the Project;
- Description of the proposed amendments;
- Possible significant environmental effects and the manner in which these are proposed to be addressed; and
- The proposed form of the Supplementary Environmental Statement ('SES').

In considering the content of the SES, we note that the focus of Schedule 4 of the EIA Regulations is the significant effects. Other lesser effects need not be assessed as part of the EIA process. On that basis, and following review of those matters specified within the enclosed report, it is considered that the scope of the SES should include assessment of:

- 1 Water Resources, Flood Risk, Drainage and Water Framework Directive
- 2 Geology and Hydrogeology
- 3 Landscape and Visual Impact
- 4 Noise and Vibration
- 5 Air Quality
- 6 Traffic and Transport
- 7 Climate Change
- 8 Socio-economic
- 9 Cumulative Assessment

It is also considered that assessment of the following matters can be scoped out of the SES:

- 1 Soils, Land Quality and Waste
- 2 Terrestrial Ecology
- 3 Archaeology and Heritage
- 4 Recreation and Access
- 5 Health Impact Assessment and Accident Risk

For those matters scoped in, the environmental assessment for each matter will be considered during the construction, operational and decommissioning periods of the development. Direct, indirect, secondary and cumulative effects will also be addressed as relevant.

For your information and to confirm, the applicant will also prepare information to assist in screening the development with reference to the requirements of the Conservation of Habitats and Species Regulations 2017.

We seek the Council's formal EIA Scoping Opinion. We trust that the above and the enclosed document provide you with sufficient information to adopt a scoping opinion and we look forward to receiving your opinion as soon as possible within the five weeks allowed by the EIA Regulations.

Yours sincerely

A small, faint horizontal line representing a signature.

James Cox
Planning Director
BA (Hons) MA MRTPI



Anglo American Woodsmith Project – Woodsmith Mine and Mineral Transport System

Environmental Scoping Report

Client: Anglo American

Reference: 1000-RHD-PA-RP-00003

Status: Final/1

Date: 17 November 2025

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Glossary of Terms

Term	Notes/ Description
Anglo American	Anglo American - a leading global mining company headquartered in the UK and listed on the FTSE 100 - is leading the development of the Woodsmith Project
Extent of Works	Outline of each site on approved plans
Development Area	The geographic area where development will take place within the Extent of Works. The construction footprint.
Ladycross Plantation	Intermediate shaft site located along the underground Mineral Transport System route, used to support the construction of the tunnel and for emergency egress during operations.
Lockwood Beck	Intermediate shaft site located along the underground Mineral Transport System route, used to support the construction of the tunnel. During operation, the site will be used for water management, tunnel access/ egress and ventilation.
Materials Handling Facility	Material Handling Facility at Teesside for processing Run of Mine ore.
Mineral Transport System	The Mineral Transport System Level and tunnel, including all associated infrastructure.
Mineral Transport System Portal	The point at which the Mineral Transport System reaches the surface at Wilton, Teesside.
North York Moors National Park	Location of Woodsmith Mine and Ladycross Plantation.
North York Moors National Park Authority	The Local Planning Authority and Minerals Planning Authority for the North York Moors National Park.
Planning application	The forms and documents submitted to the Local Planning Authority, requesting permission for a development.
Planning Permission	The approval provided by the Local Planning Authority/Minerals Planning Authority.
Polyhalite	A naturally occurring evaporite mineral.
Redcar and Cleveland Borough Council	The Local Planning Authority and Minerals Planning Authority for Redcar and Cleveland.
Study Area	The geographic area relating to a particular assessment.
The Currently Approved Development	Used in reference to the scheme approved in 2015.
The Currently Approved Development Area	The geographic area where development will take place.
Woodsmith Mine	The surface access point of the underground polyhalite mine being developed in the northeast of England.
Woodsmith Project	The currently Approved Development incorporating Woodsmith Mine, Ladycross Plantation, Lockwood Beck, Tocketts Lythe and the MTS Tunnel Portal.

Acronyms

AADF	Annual average daily flow
ALC	Agricultural Land Classification
AQMA	Air Quality Management Area
ARCADY	Assessment of Roundabout Capacity and Delay
ATC	Automatic Traffic Count
BNL	Basic Noise Level
BPM	Best Practicable Means
BS	British Standard
CCR	Climate Change Resilience
CEMP	Construction Environmental Management Plan
CIA	Cumulative Impact Assessment
CLVIA	Cumulative Landscape and Visual Impact Assessment
CO _{2e}	Carbon dioxide equivalent
CRTN	Calculation of Road Traffic Noise
CTMP	Construction Traffic Management Plan
DMRB	Design Manual for Roads and Bridges
EATM	Environmental Assessment of Traffic and Movement
EIA	Environmental Impact Assessment
EPUK	Environment Protection UK
ES	Environmental Statement
ESR	Environmental Scoping Report
EU	European Union
FRA	Flood Risk Assessment
GCN	Great Crested Newt
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GVA	Gross Value Added
GWP	Global Warming Potential
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
IEMA	Institute of Environmental Management and Assessment ¹
INCA	Industry Nature Conservation Association
LAQM	Local Air Quality Management
LDF	Local Development Framework
LGV	Light Vehicle
LNG	Liquid Natural Gas
LV	Light Vehicle

¹ In 2025, IEMA changed its name to the Institute of Sustainability and Environmental Professionals

LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
MHF	Materials Handling Facility
MTS	Mineral Transport System
MW	Megawatt
NHLE	National Heritage List for England
NO2	Nitrogen dioxide
NPPF	National Planning Policy Framework
NRMM	Non-road Mobile Machinery
NTS	Non-technical Summary
NVMP	Noise and Vibration Management Plan
NYC	North Yorkshire Council
NYMNP	North York Moors National Park
NYMNPA	North York Moors National Park Authority
OS	Ordnance Survey
OTP	Operations Travel Plan
PCA	Paul Chester and Associates
PICADY	Priority Intersection Capacity and Delay
PM2.5	Fine airborne Particulate Matter, average less than 2.5 micrometres in aerodynamic diameter
PM10	Fine airborne Particulate Matter, average less than 10 micrometres in aerodynamic diameter
PPG	Planning Practice Guidance
RCBC	Redcar and Cleveland Borough Council
RVAA	Residential Visual Amenity Assessment
SAC	Special Area of Conservation
SES	Supplementary Environmental Statement
SPA	Special Protection Area
SPD	Supplementary Planning Documents
SSSI	Site of Special Scientific Interest
TA	Transport Assessment
TBM	Tunnel Boring Machine
TMLG	Traffic Management Liaison Group
TTSA	Traffic and Transport Study Area
UK	United Kingdom
WER	Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
WHO	World Health Organisation
ZTV	Zone of Theoretical Visibility

1 Introduction

1.1 Background to the Woodsmith Project

1. The Woodsmith Project (The Project) was acquired by Anglo American in 2020 and is targeting the world's largest and highest grade polyhalite deposit. Polyhalite is a naturally occurring mineral containing four of the six macro nutrients (potassium, sulphur, magnesium, and calcium) that are essential for plant growth.
2. The Project involves the construction of an underground mine (to enable the extraction of polyhalite) located in the North York Moors National Park (NYMNP) five kilometres south of Whitby in North Yorkshire. The mine is serviced by an underground Mineral Transport System (MTS) that will convey the mined ore to the project's Materials Handling Facility (MHF) at the Wilton International site at Teesside, and an overland conveyor to Port Handling Facilities (PHF) and harbour/ ship loading facilities on the River Tees.
3. This Application focuses on the Mine and MTS elements of the Project.
4. The polyhalite deposit will be accessed via two ~1600m deep shafts, the Service and Production Shafts. The mining operations will be supported by a ventilation and cooling system, and other ancillary infrastructure. The Mine will be screened from external offsite views by a landscaped bund, and associated planting. Construction at Woodsmith Mine commenced in 2017.
5. The MTS tunnel will be approximately 36.7km long, formed of pre-cast concrete lining with an internal diameter of 4.9m. The primary functions of the tunnel are to carry the permanent mineral conveyor from Woodsmith Mine to the MHF, to accommodate a maintenance railway system and to bring cabled services (power and fibre) from Teesside to Woodsmith Mine. The tunnel will intersect with the Production Shaft at the Woodsmith site MTS level at approximately 360m below ground level (bgl). In full operation polyhalite will not be brought to surface at the Mine site.
6. The Project currently has Planning Permission (NYM/2017/0505/MEIA and R/2014/0627/FFM) to create the facilities to launch five TBMs and to operate the MTS. These are located as set out below.
 - The site of the MTS Portal, Wilton.
 - The intermediate sites at:
 - o Ladycross Plantation, near Egton;
 - o Lockwood Beck, near Moorsholm;
 - o Tocketts Lythe, near Guisborough.
 - The MTS shaft at Woodsmith Mine.
7. Construction of the MTS portal commenced in 2018, with tunnelling starting in 2020.

1.2 Planning history

1.2.1 Permission NYM/2014/0676/MEIA

8. In 2014 a planning application (reference NYM/2014/0676/MEIA) was submitted to the North York Moors National Park Authority (NYMNPA) for permission to develop a polyhalite mine and underground MTS. This was supported by an Environmental Statement (ES) produced by Royal HaskoningDHV, hereafter referred to as 'the 2014 ES' (Royal HaskoningDHV, 2014). The development description was as follows:

"The winning and working of polyhalite by underground methods including the construction of a minehead at Dove's Nest Farm involving access, maintenance and ventilation shafts, the

landforming of associated spoil, the construction of buildings, access roads, car parking and helicopter landing site, attenuation ponds, landscaping, restoration and aftercare and associated works. In addition, the construction of an underground tunnel between Doves Nest Farm and land at Wilton that links to the mine below ground, comprising 1 no. shaft at Doves Nest Farm, 3 no. intermediate access shaft sites, each with associated landforming of associated spoil, the construction of buildings, access roads and car parking, landscaping, restoration and aftercare, and the construction of a tunnel portal at Wilton comprising buildings, landforming of spoil and associated works at Dove's Nest Farm & Haxby Plantation, Sneatonthorpe (proposed minehead); underneath 252 sq. km of the NYMNPA (winning & working of minerals); a corridor extending underground from the edge of the NP boundary to Wilton International Complex (mineral transport system); Lady Cross Plantation near Egton, Lockwood Beck Farm near Moorsholm, Tocketts Lythe, near Guisborough (intermediate shaft sites); site within the eastern limits of the Wilton International Complex, Teesside (tunnel portal)."

9. Permission was granted on 19 October 2015, subject to 95 planning conditions and the signing of a Section 106 Agreement.

1.2.2 Permission R/2014/0627/FFM

10. In tandem with the above, Redcar and Cleveland Borough Council (RCBC) granted Planning Permission on 19 August 2015 (reference R/2014/0627/FFM) for the areas of the Woodsmith Project within its remit (including the Lockwood Beck and Tocketts Lythe intermediate shaft sites and the tunnel portal at Wilton International).
11. The permission was granted subject to 35 planning conditions, with a similar description of development as for Planning Permission NYM/2014/0676/MEIA (excluding the 252 sq. km of the mineral workings). It is this permission that has been implemented at Lockwood Beck and the MTS portal site at Wilton International. No work has commenced at Tocketts Lythe.

1.2.3 Permission NYM/2017/0505/MEIA

12. On 6 February 2018, the NYMNPA granted Planning Permission for an amendment Planning Permission NYM/2014/0676/MEIA, comprising various amendments at Woodsmith Mine. The description of the amendments was as follows:

"Variation of Condition 5 of Planning Permission NYM/2014/0676/MEIA to allow minor material amendments relating to that part of the development at the Woodsmith Mine site (formerly known as Doves Nest Farm and Haxby Plantation), including; re-design of foreshafts and shaft construction methodology, changes to building layout and shaft access arrangements, revisions to construction and operational shaft platform levels, revisions to location and layout of surface water attenuation ponds, revisions to groundwater management arrangements and amendments to internal access arrangements"
13. The amendments to the Approved Development were approved, and implemented, in 2018 subject to 98 planning conditions and a deed of variation to the originally approved Section 106 Agreement. This became the operative permission as the original permission (reference NYM/2014/0676/MEIA) would no longer be fully delivered. Various non-material amendments have since been made to the permission under S96a of the Town & Country Planning Act 1990.

1.3 Proposed amendments to the currently Approved Development

14. As the Project has progressed, Anglo American has identified, through detailed engineering, changes to the design that are necessary for the safe and efficient operation of the Project. While the fundamental principles and description of development associated with the Project are unaffected, the design changes themselves will require planning approval, via amendment under Section 73 of the Town and Country Planning Act 1990.
15. The proposed design changes to the Mine and MTS sites result in no greater footprint of impact than currently approved. The development at the Mine has been consolidated to the area already impacted by the construction phase.
16. The amendments proposed at Woodsmith Mine, Ladycross Plantation and Lockwood Beck are summarised in **Table 1-1**, **Table 1-2** and **Table 1-3**. No development will occur at Tocketts Lythe.

1.4 This Application

17. This Environmental Scoping Report (ESR) has the objective of informing and seeking agreement from the NYMNP and RCBC on the technical scope, assumptions, and methodology for the Environmental Impact Assessment (EIA) process to be undertaken as part of the Section 73 application for the amendments to the currently Approved Development, including the removal of Tocketts Lythe. The request for a Scoping Opinion from NYMNP and RCBC will be made under Regulation 15 of the Town and County Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations).
18. This ESR explains the background, principal elements of, and rationale for the currently Approved Development, in the context of it being an already permitted and part-implemented scheme. It then sets out the proposed scope of the EIA for those topics where the proposed amendments have the potential to give rise to significant effects on the environment. It also describes the topics that are proposed to be scoped out of the EIA, on the basis that the proposed amendments do not have the potential to give rise to significant effects on those topics. The ESR will inform the Supplementary Environmental Statement (SES), produced in support of the amendments to the currently Approved Development.

1.5 EIA Study Area

19. The currently Approved Development incorporates Woodsmith Mine, Ladycross Plantation, Lockwood Beck and Tocketts Lythe, as well as the MTS and Portal, which allows the material to be transferred and processed for export.
20. Woodsmith Mine, Ladycross Plantation, and Lockwood Beck, which have ongoing active construction activities, are located in a predominantly rural setting approximately 5km south, 8.5km west southwest, and 22km west northwest of Whitby respectively. Woodsmith Mine and Ladycross Plantation are located within the boundary of the NYMNP, while Lockwood Beck is located within the planning jurisdiction of RCBC, immediately north of the NYMNP boundary.
21. The proposed study area for the EIA is the area over which the potentially significant direct and indirect effects of the currently Approved Development may occur during construction, operation, and eventual decommissioning. The area over which the effects of the currently Approved Development may manifest will vary, dependent on the EIA parameter being assessed. The spatial extent of effects by parameter will be detailed in the relevant chapter of the SES.

22. A plan illustrating the boundaries of the currently Approved Development is provided in **Figure 1-1**.

Table 1-1 Woodsmith Mine amendments

Amendment	Description
Relocation of, and amendment to approved Ventilation Shaft, including deepening of structure to Production Level and change from intake to exhaust.	Required to meet Anglo American standards for ventilation and cooling and to provide safe and efficient working conditions, at full production. Construction methodology to include initial sink via Vertical Shaft sinking Machine (VSM), followed by the main sink utilising a headhouse with either shaft boring roadheader (SBR) as has been used to sink the Service and Production Shafts or “drill and blast” methodology, using a gallows, as has been used to sink the MTS shaft.
Relocation of, and amendment to ventilation fan house design.	To locate the building over the Ventilation Shaft and to house the fans used as part of the ventilation system.
Addition of cooling equipment, including bulk air coolers, refrigeration plant, and heat exchange units associated with the MTS Shaft.	To provide the volumes of air for ventilation and cooling necessary for the safe and efficient operation of Woodsmith Mine. The cooling equipment will be connected to the MTS Shaft, which will become the air intake shaft for Woodsmith Mine.
Extension of Service Shaft headhouse building.	To create a covered and screened “logistics hub” for the unloading of equipment that will be transferred underground via the Service Shaft.
Relocation of, and amendment to design of main electrical substation.	To improve constructability and to locate the substation in an area that allows for efficient power reticulation around Woodsmith Mine.
Relocation of, and amendment to design of welfare and car park.	To remove the currently approved welfare development from Haxby Plantation and move it onto the shaft platform, close to the shaft buildings. This improves operational efficiency and reduces the overall lateral extent of the development.
Relocation of, and amendment to design of security/gatehouse facility.	To move the gatehouse further into site, away from the site entrance and to create a safe and efficient area for handling arrivals and departures to/from site.
Relocation of helipad.	To locate the helipad close to the relocated welfare.
Addition of water storage tanks for firefighting and wastewater.	Retention and reconfiguration of existing construction phase tanks for process water handling and for firefighting contingency.
Retention of existing surface water treatment building.	To retain ability to treat surface water during the operational phase of Woodsmith Mine.
Retention of approved secure storage units.	To meet ongoing storage requirements.
Retention of current temporary winder buildings.	To meet requirements for surface stores and workshops. The temporary winders would be removed and the building repurposed.
Amendment of final landform and associated site restoration plans.	To reflect the amendments to the final site layout, to meet the screening requirements from external views and to provide habitat/biodiversity enhancement.

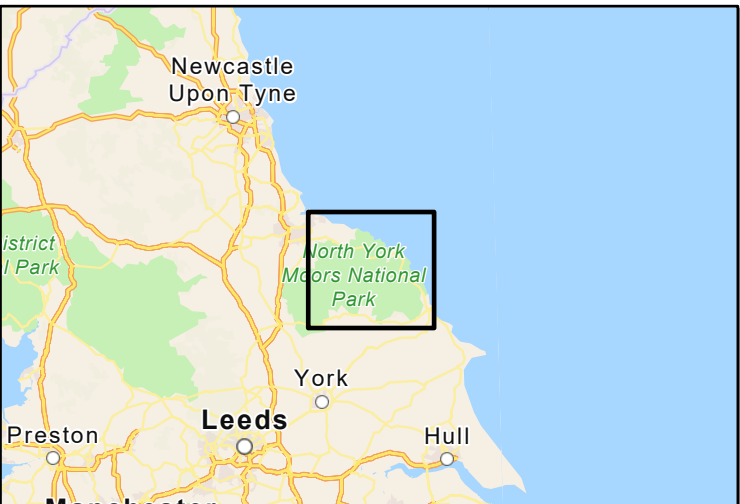
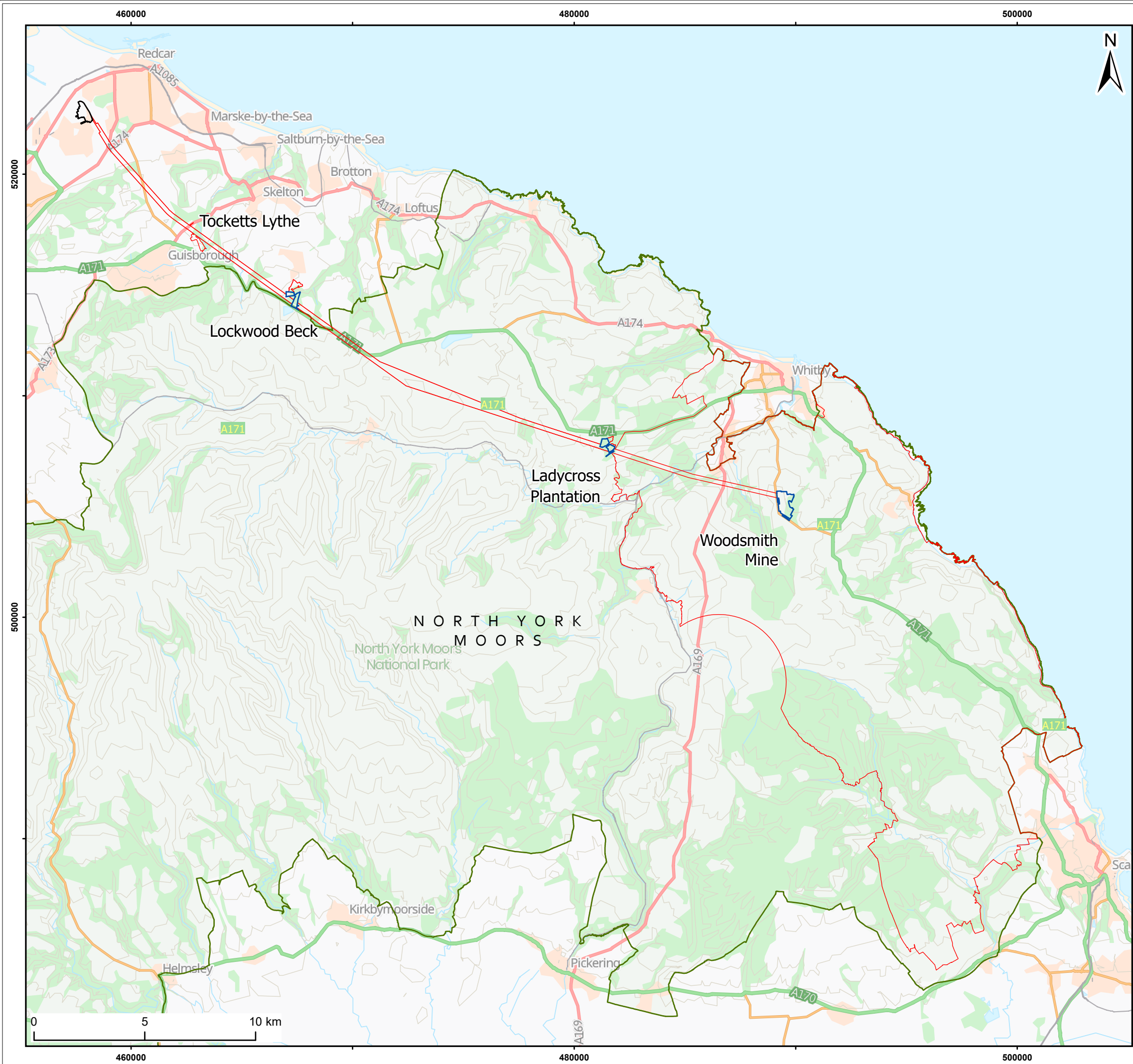
Amendment	Description
Amendment of surface water drainage scheme.	To meet long-term site drainage and water management requirements reflective of the design amendments.
Retention of Northern Power Grid (NPG) electrical kiosks.	Retention of NPG's existing electrical kiosk to allow the continued supply of 11kV power to Woodsmith Mine.
Reduction in overall development footprint.	An outcome of the design amendments is a reduction in the overall lateral extent of development at Woodsmith Mine, consolidating and concentrating development primarily on the shaft platforms.
Extended duration of construction.	The time between the re-acceleration of the Woodsmith Project and commencement of operations.

Table 1-2 Ladycross Plantation amendments

Amendment	Description
Relocation of approved shaft and associated headhouse.	This application seeks to 'regularise' and retain the construction phase access shaft at Ladycross Plantation. No TBM launch shaft would be constructed, removing a requirement for the 45m temporary headhouse.
Amendment of site access junction.	Retention of the existing construction phase access for the operational phase.
Retention of NPG electrical kiosks.	Retention of existing electrical kiosks to maintain provision of 11kV power to Ladycross Plantation.
Amendment to and reduction of final landform and associated site restoration plans, including the removal of extractive material waste management facilities/landfill).	Amendments to the final position of structures on the retained platform, removal of currently approved operational phase access road, amendment to permanent surface water pond and removal of waste management facility and associated drainage features, resulting in an overall significantly reduced development footprint.

Table 1-3 Lockwood Beck amendments

Amendment	Description
Relocation of approved shaft and associated headhouse.	This application seeks to 'regularise' and retain the construction phase access shaft at Lockwood Beck. No TBM launch shaft would be constructed, removing the requirement for a 45m temporary headhouse.
Addition of firewater and wastewater tanks.	Provision of tanks for the management of wastewater and for the provision of firefighting contingency.
Retention of NPG electrical kiosk and substation.	Retention of existing electrical kiosks to maintain provision of 400V power to Lockwood Beck.
Amendment to and reduction of final landform and associated site restoration plans, including the removal of extractive material waste management facilities/landfill).	Amendments to the final position of structures on the retained platform, amendment to the final landforming and restoration proposals, removal of waste management facility and associated drainage features, resulting in an overall significantly reduced development footprint.



- Legend:
- Extent of Works
 - MHF and MTS portal (out of scope)
 - Mine & MTS Planning Boundary
 - National Parks

Source: © Haskoning UK Ltd, 2025
Base map: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Contains OS data © Crown Copyright and database right 2023
Contains data from OS Zoomstack

Project: Anglo American Woodsmith Project - Woodsmith Mine and Mineral Transport System

Title: Boundary of the Approved Development

Figure: 1-1	Drawing No: PB1110-HAS-XX-ZZ-D-Z-0002				
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	06/10/2025	DL	CL	A3	1:170,000
02	28/10/2025	DL	CL	A3	1:170,000
03	17/11/2025	DL	CL	A3	1:170,000

Co-ordinate system: OSGB 1936 British National Grid

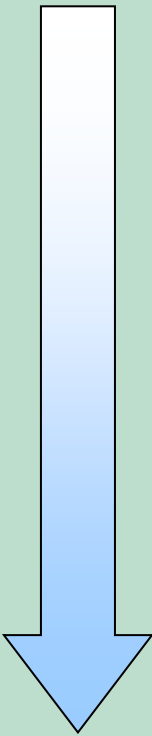


2 Approach to the Environmental Impact Assessment

2.1 The EIA

23. The EIA will conform to the requirements of the Town and Country Planning (EIA) Regulations 2017. It will identify and assess the potential significant environmental impacts during the construction, operational and decommissioning phases of the amendments to the currently Approved Development.
24. The information presented within this ESR identifies the proposed approach for the assessment of potential significant environmental impacts associated with the amendments to the currently Approved Development. The general steps in the process that will be followed as the EIA is taken forward are shown in **Table 2-1**.

Table 2-1 The EIA process

Stage	Task	Aim/ objective	Work/ output (examples)
Scoping	Scoping studies	Scoping to identify the potentially significant direct and indirect impacts of the amendments to the currently Approved Development.	- Appropriate level of information on proposals and approach. - ESR. - Preliminary consultation with key consultees. - Targets for specialist studies.
EIA 	Consultation	Consult with statutory and non-statutory organisations and individuals with an interest in the area and the amendments to the currently Approved Development.	Local knowledge and information.
	Primary data collection	To characterise the existing environment.	Background data including existing literature and specialist studies.
	Specialist studies	To further investigate those environmental parameters, which may be subject to potentially significant effects.	Specialist reports.
	Impact assessment	- To evaluate: - the existing environment, in terms of sensitivity - and predict the impact on the existing environment - To assess the significance of the predicted effects.	Series of potentially significant adverse and beneficial effects.
	Mitigation measures	To identify appropriate and practicable mitigation measures and enhancement measures.	The provision of solutions to minimise adverse effects as far as possible.

Stage	Task	Aim/ objective	Work/ output (examples)
			Feedback into the design process, as applicable.
	Supplementary Environmental Statement	Production of the SES in accordance with EIA guidance.	SES.

25. Further work that is considered necessary to fulfil the data requirements for EIA in this case is described in the Chapters. In cases where significant impacts are identified, appropriate mitigation measures will be developed, and details provided in the SES. The residual impact will then be assessed. The SES will report on the outcomes of the process, and technical appendices will provide additional information on relevant topic areas. The SES will also be accompanied by a separate Non-technical Summary (NTS).

2.2 Format of the SES

26. The SES is a formal report that documents the findings of the EIA process. It is expected that the format and structure of the SES will incorporate the following.
- Introduction to the amendments to the currently Approved Development, together with a description of the EIA process, scoping, consultation and impact assessment.
 - Description of the amendments to the currently Approved Development, including the alternative options considered and the reasons for selecting the preferred approach.
 - Detailed description of the existing environment.
 - Description of the assessment of potential impacts and mitigation measures identified during the EIA process for each of the environmental impacts under consideration. This part of the SES will cover the construction, operational and decommissioning phases of the amendments to the currently Approved Development, including both beneficial and adverse impacts.
 - Description of anticipated cumulative effects arising from the amendments to the currently Approved Development with other relevant plans or projects.
 - Description of the implications of the amendments to the currently Approved Development on sites designated for nature conservation interests, in light of their conservation objectives.
 - Description of effects of the amendments to the currently Approved Development in combination with other plans or projects within any European site.
 - Consideration of implications under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (typically referred to as the 'Water Environment Regulations' (WER)).
 - Summary of findings, including a table showing the predicted impacts and the residual impacts remaining following mitigation.
 - A list of references detailing information and publications cited in the ES.
 - Appendices containing relevant survey information and reports that may be produced during the undertaking of the EIA.
 - Confirmation that the SES has been compiled by competent experts as required by the EIA Regulations.
 - An NTS.

2.3 Consultation

27. Consultation is an important part of the EIA process which will ensure any issues of concern with regard to the potential impacts of the amendments to the currently Approved Development are identified at an early stage and, as such, can be investigated thoroughly and the results presented in the SES.

3 Policy Framework

28. Given the cross-boundary nature of the application, the statutory development plans for the application comprise the North York Moors Local Plan (July 2020); the Redcar and Cleveland Local Plan (May 2018); the North Yorkshire Minerals & Waste Joint Plan (March 2022); and the Tees Valley Joint Minerals and Waste Development Plan Document (September 2011).
29. The National Planning Policy Framework (February 2025), Planning Practice Guidance (PPG) and National Design Guidance (January 2021), as well as local Supplementary Planning Documents (SPDs) are also relevant material considerations.

3.1 Statutory development plan

30. Development plan policies of relevance to the currently Approved Development are as set out below.

3.1.1 North York Moors Local Plan 2020

- Strategic Policy A (Achieving National Park Purposes and Sustainable Development).
- Strategic Policy C (Quality and Design of Development).
- Strategic Policy D (Major Development).
- Strategic Policy E (The Natural Environment).
- Strategic Policy F (Climate Change Mitigation and Adaptation).
- Strategic Policy G (Landscape).
- Strategic Policy H (Habitats, Wildlife, Biodiversity and Geodiversity).
- Policy ENV1 (Trees, Woodlands, Traditional Orchards and Hedgerows).
- Policy ENV2 (Tranquility).
- Policy ENV3 (Remote Areas).
- Policy ENV4 (Dark Night Skies).
- Policy ENV5 (Flood Risk).
- Policy ENV6 (Land Instability).
- Policy ENV7 (Environmental Protection).
- Policy ENV8 (Renewable Energy).
- Policy ENV10 (Archaeological Heritage).
- Policy CO1 (Developer Contributions & Infrastructure).
- Policy CO2 (Highways).
- Policy CO4 (Public Rights of Way and Linear Routes).

3.1.2 Redcar and Cleveland Local Plan 2018

- Policy LS4 (South Tees Spatial Strategy).
- Policy ED6 (Promoting Economic Growth).
- Policy SD1 (Sustainable Development).
- Policy SD2 (Locational Policy).
- Policy SD3 (Development Limits).
- Policy SD4 (General Development Principles).
- Policy SD6 (Renewable & Low Carbon Energy).
- Policy SD5 (Developer Contributions).
- Policy SD7 (Flood and Water Management).
- Policy N1 (Landscape).
- Policy N2 (Green Infrastructure).

- Policy N4 (Biodiversity and Geological Conservation).
- Policy HE1 (Conservation Areas).
- Policy HE2 (Heritage Assets).
- Policy TA1 (Transport and New Development).
- Policy TA2 (Improving Accessibility Within and Beyond the Borough).

3.1.3 North Yorkshire Minerals and Waste Joint Plan 2022

- Policy M22 (Potash, Polyhalite and Salt Supply).
- Policy I02 (Minerals and Waste Transport Infrastructure).
- Policy D01 (Presumption in Favour of Sustainable Minerals and Waste Development).
- Policy D02 (Local Amenity and Cumulative Impacts).
- Policy D03 (Transport of Minerals and Waste and Associated Traffic Impacts).
- Policy D04 (Development affecting the North York Moors National Park and the AONBs).
- Policy D06 (Landscape).
- Policy D07 (Biodiversity and Geodiversity).
- Policy D11 (Sustainable Design, Construction and Operation of Development).
- Policy D14 (Air Quality).
- Policy D15 (Planning Obligations).

3.1.4 Tees Valley Joint Minerals and Waste Development Plan 2011

- Policy MWC1 (Minerals Strategy).
- Policy MWC10 (Sustainable Transport).

3.2 Other material considerations

3.2.1 The National Planning Policy Framework (February 2025)

31. The National Planning Policy Framework (NPPF, 2025) sets out the Government's planning policies for England and how they should be applied.
32. Chapters of relevance to the currently Approved Development include:
 - Chapter 6: Building a strong competitive economy.
 - Chapter 8: Promoting healthy and safe communities.
 - Chapter 9: Promoting sustainable transport.
 - Chapter 12: Achieving well-designed places.
 - Chapter 14: Meeting the challenge of climate change, flooding and coastal change.
 - Chapter 15: Conserving and enhancing the natural environment.
 - Chapter 16: Conserving and enhancing the historic environment.
 - Chapter 17: Facilitating the sustainable use of minerals.

3.2.2 Local guidance

33. The following SPDs are of relevance to the currently Approved Development:
 - NYMNPA Dark Skies SPD (December, 2023).
 - NYMNPA Renewable Energy SPD (April, 2010).
 - NYMNPA Design Guide SPD (June, 2008).
 - RCBC Developer Contributions SPD (December, 2014).
 - RCBC Landscape Character SPD (March, 2010).
 - South Tees Area SPD (May, 2018).

4 Water Resources, Flood Risk, Drainage and Water Environment Regulations

4.1 Introduction

- 34. This Chapter outlines the scope and methodology for the assessment of the potential impacts on Water Resources, Flood Risk, Drainage and WER receptors arising from the construction, operation and decommissioning of the amendments to the currently Approved Development.
- 35. The SES will focus on the amendments to the currently Approved Development, considering the existing and largely complete surface development.
- 36. No development will take place at Tocketts Lythe, as such the impacts on Water Resources, Flood Risk, Drainage and WER receptors assessed as part of the currently Approved Development will not arise. While originally assessed as being of negligible significance, the removal of these impacts is beneficial to the wider environment.
- 37. The MTS Portal is constructed. Final details for the operation of the mine, including surface water management measures at the MTS Portal will be incorporated into the final design layout of the MHF and, as such, are not considered further in this assessment.
- 38. This chapter does not assess the MTS Portal or the previously assessed Tocketts Lythe MTS site.

4.2 Overview of existing environment and receptors

4.2.1 Topography and surface water

4.2.1.1 Woodsmith Mine

- 39. The topography of Woodsmith Mine falls to the east and northeast from higher elevations along the western and southern boundaries. Woodsmith is drained by two tributaries of Sneaton Thorpe Beck, flowing from the northeast and southeast boundaries. The land is relatively flat across the plateau to the west of the site, before falling towards the base of a river valley, where Little Beck flows in a northerly direction.
- 40. Several ponds and wetlands associated with ongoing work as part of the currently Approved Development are present, or in construction at Woodsmith Mine. These link internally before discharging to the two Sneaton Thorpe Beck tributaries. Two springs are present within Woodsmith Mine and several springs are present within 1km of the site.
- 41. No surface water abstractions were identified within 1km of Woodsmith Mine (Landmark, 2024a).

4.2.1.2 Ladycross Plantation

- 42. Ladycross Plantation is drained to the south and west by tributaries of Cat Scar Beck and Cold Keld Beck respectively. Both becks drain directly to the River Esk.
- 43. A surface water attenuation pond associated with ongoing work as part of the currently Approved Development is located in the southern portion of Ladycross Plantation and discharges to Cat Scar Beck.
- 44. No surface water abstractions were identified within 1km of Ladycross Plantation (Landmark, 2024b).

4.2.1.3 Lockwood Beck

45. Lockwood Beck generally falls from south and east to north and west. The site is drained by Lockwood Beck, which flows in a narrow, wooded valley to the west of the site and drains into Dale Beck.
46. Lockwood Beck Reservoir is located approximately 30km south of Lockwood Beck.
47. A surface water attenuation pond associated with ongoing work as part of the currently Approved Development is located in the central eastern portion of the site and discharges to Dale Beck.
48. One public surface water abstraction is noted at the Lockwood Beck Reservoir and one public water supply abstraction from a spring is located 795m to the south-east of Lockwood Beck (Landmark, 2024c).

4.2.2 Drainage and flood risk

49. Under current conditions, surface water across Woodsmith Mine, Ladycross Plantation and Lockwood Beck is positively drained, i.e. there is an engineered (piped) drainage system in place. Surface water is routed to on-site attenuation ponds, before discharging to Sneaton Thorpe Beck, Cat Scar Beck and Lockwood Beck respectively.
50. Surface water drainage has been designed to ensure downstream flood risk is not increased. Construction phase surface water discharge is designed to be limited to Qbar (mean annual flood) for rainfall events up to and including the 1 in 20 year rainfall event. Operational phase surface water discharge is designed to be limited to Qbar for rainfall events up to and including the 1 in 100 year (plus 30% climate change) rainfall event.
51. All foul water is collected and tankered away for offsite disposal.
52. The Environment Agency Flood Map for Planning (Environment Agency, 2025a) indicates that:
 - Woodsmith Mine is located within Flood Zone 1. Land within Flood Zone 1 has a low probability (less than 0.1% chance in any year) of fluvial flooding.
 - Ladycross Plantation is located within Flood Zone 1.
 - Lockwood Beck is also predominantly located within Flood Zone 1 (Environment Agency, 2025a), however a small area in the north of Lockwood Beck is located within Flood Zone 2 and 3 (greater than 1% probability of flooding), associated with potential flooding at Dale Beck.

4.2.3 Geology and hydrogeology

4.2.3.1 Woodsmith Mine

53. Superficial Glacial Till is partially present across Woodsmith Mine and is classified as a Secondary Undifferentiated Aquifer (BGS, 2025a; BGS, 2025b). Bedrock comprises interbedded sandstones and mudstones of the Ravenscar Group and is classified as a Secondary A Aquifer (BGS, 2025a; BGS, 2025b).
54. Intermittent spring discharges noted at Woodsmith Mine and in the surrounding area originate from the Ravenscar Group.
55. There are no groundwater Source Protection Zones (SPZs) within, or in the vicinity of Woodsmith Mine (Environment Agency, 2025c). Anglo American currently holds an Abstraction Licence (Licence number: NE/027/0029/007) to abstract water from sites within Woodsmith Mine. Private groundwater abstraction sites are located 600m and 780m from Woodsmith Mine (Landmark, 2024a).

4.2.3.2 Ladycross Plantation

56. Superficial Glacial Till is present across Ladycross Plantation and is classified as a Secondary A Aquifer (BGS, 2025a; BGS, 2025b). Bedrock comprises interbedded sandstones and mudstones of the Ravenscar Group and is classified as a Secondary A Aquifer (BGS, 2025a; BGS, 2025b).
57. There are no SPZs within, or in the vicinity of Ladycross Plantation (Environment Agency, 2025c). There are no groundwater abstractions within the site, although two abstractions are located between 663m and 707m from Ladycross Plantation (Landmark, 2024b).

4.2.3.3 Lockwood Beck

58. Superficial Glacial Till is present across Lockwood Beck and is classified as a Secondary Undifferentiated Aquifer (BGS, 2025a; BGS, 2025b). Bedrock comprises interbedded sandstones and mudstones of the Ravenscar Group and is classified as a Secondary A Aquifer (BGS, 2025a; BGS, 2025b).
59. There are no SPZs within, or in the vicinity of Lockwood Beck (Environment Agency, 2025c).
60. There are no active Abstraction Licences for groundwater abstraction from the underlying geology. A Licence registered to Anglo American for groundwater abstraction within Lockwood Beck (Licence number: NE/025/0006/004) has now expired. No other groundwater abstractions are present within 1km of the site (Landmark, 2024c).
61. An abstraction licence associated with the MTS tunnel (licence number: NE/025/0001/024) is registered to Anglo American at the Lockwood Beck site. This licence allows the dewatering of the tunnel from water ingress associated with the Redcar Mudstone, water is drained to the Lockwood Beck site (as the Lockwood Beck shaft is the lowest point along the length of the tunnel), this water is collected and pumped along the tunnel to the Wilton site for discharge at Dabholm Gut. The abstraction is currently operating under a LEV, while a variation to the duration of the existing permit is determined by the EA.
62. An Environmental Permit (Permit number: NE/EPRMB3299RZ/001) has been granted to Anglo American, authorising the discharge of treated trade effluent consisting of displaced groundwater from excavations, surface water drainage and shaft flush waters to Lockwood Beck.

4.2.4 Water Environment Regulations receptors

63. The WER applies to rivers, lakes, estuaries, coastal waters and groundwater, including water bodies that are man-made. A WER compliance assessment is required for all identified water bodies.

4.2.4.1 Woodsmith Mine

64. The following WER receptors (Environment Agency, 2025d) are identified at Woodsmith Mine:
 - Rigg Mill Beck/ Long Mill Beck Catchment (tributary of Esk) Water Body (GB104027068140): A river currently with a Moderate Ecological Status.
 - Little Beck/ May Beck Catchment (tributary of Esk) Water Body (GB104027068100): A river catchment currently with Good Ecological Status.
 - Esk from Sleddale Beck to Ruswarp Water Body (GB104027068150): A river catchment currently with Good Ecological Status.
 - ESK (E) Water Body (GB510402703400): A Transitional Water Body currently with Moderate Ecological Status.
 - Esk and Yorkshire Coast Ravenscar Groundwater Body (GB40402G702300): A groundwater body.

4.2.4.2 Ladycross Plantation

65. The following WER receptors (Environment Agency, 2025d) are identified at Ladycross Plantation:
- Esk from Sleddale Beck to Ruswarp Water Body (GB104027068150): A river catchment currently with Good Ecological Status.
 - ESK (E) Water Body (GB510402703400): A Transitional Water Body currently with Moderate Ecological Status.
 - Esk and Yorkshire Coast Ravenscar Groundwater Body (GB40402G702300): A groundwater body.

4.2.4.3 Lockwood Beck

66. The following WER receptors (Environment Agency, 2025d) are identified at Lockwood Beck:
- Kilton Beck from Source to Middle Gill Beck Water Body (GB103025071920): A river currently with Good Ecological Status.
 - Kilton Beck from Middle Gill Beck to North Sea Water Body (GB103025071950): A heavily modified river currently with Moderate Ecological Potential.
 - Lockwood Beck Reservoir (GB30329099): A heavily modified reservoir currently with Moderate Ecological Potential.
 - Tees Mercia Mudstone and Redcar Mudstone Groundwater Body (GB40302G701300): A groundwater body.

4.3 Potential environmental impacts

67. Potential impacts during construction comprise:
- Increased sediment supply, which could affect the hydromorphology, physico-chemistry and biology of surface water bodies.
 - Direct modification of surface water bodies, which could impact upon their hydromorphology and biology.
 - Increased surface flows from site drainage, which could affect the volume and distribution of flows and impact upon the hydromorphology and biology of surface waters and quantity of groundwater.
 - Accidental release of fuels, oils and lubricants, which could affect the chemical, physico-chemical and biological status of surface water bodies and connected groundwaters.
 - Decreased spring flows as a result of depressed groundwater levels associated with increases in impermeable surfaces.
68. Potential impacts during operation comprise:
- Increased surface flows from site drainage, which could affect the volume and distribution of flows and impact upon the hydromorphology and biology of surface waters and quantity of groundwater.
 - Changes to water quality resulting from changes to land use and the potential for accidental release of fuels, oils and lubricants, which could affect the chemical, physico-chemical and biological status of surface water bodies and quality of connected groundwaters.
 - Decreased spring flows as a result of depressed groundwater levels associated with increases in impermeable surfaces.
69. Potential impacts during decommissioning are anticipated to be similar to impacts during the construction phase.
70. The following proposed amendments to the currently Approved Development could potentially affect the water environment:

- Removal of large areas of land from agricultural use, which would reduce the supply of sediment and nutrients and could affect the biodiversity, ecosystem, soil quality and water quality.
- Removal of the previously approved waste facilities at Lockwood Beck, Ladycross Plantation and Tocketts Lythe (due to the removal of Tocketts Lythe site from the Proposed Development). These amendments represent a reduction in the required civil engineering earthworks and a proportionate reduction in the risks of sediment supply and contamination.
- The proposed amendments to the currently Approved Development are considered unlikely to result in any significant adverse effects on water resources, flood risk, drainage and WER compliance.

4.3.1 Nutrient Neutrality

71. None of the three sites is located within a Nutrient Neutrality catchment. The closest to the site is the Teesmouth and Cleveland Coast SPA/Ramsar nutrient neutrality catchment approximately 6km to the east of Lockwood Beck.
72. Woodsmith Mine and Ladycross Plantation are located within the Esk operational catchment, which forms part of the Esk and Coast surface water management catchment. Lockwood Beck is located within the Saltburn Coast operational catchment, which forms part of the Tees surface water management catchment but is not connected to the River Tees itself (Environment Agency, 2025e).
73. As part of the Approved Development there will be no new connections to the sewage network and no direct discharge of treated domestic wastewater to surface or ground. All domestic wastewater will be tankered to water company treatment works for disposal as trade effluent.
74. All of the land within the Approved Development boundaries of Woodsmith Mine, Ladycross Plantation and Lockwood Beck that was previously farmed for grazing and cereals, has been taken out of agricultural use for a number of years, with no application of fertilisers or other agro-chemicals during this time. As such, the overall nutrient balance for the sites will have reduced significantly and will remain so throughout the full operation of the Mine.
75. In addition, Anglo American, in liaison with Natural England and the Environment Agency has adopted a precautionary approach for offsetting the potential impact of the discharge of abstracted groundwater associated with shaft sinking and groundwater ingress. This water is discharged, under an Environmental Permit (EPR/NB3498VD), via an outfall at Dabholm Gut, Teeside. As part of this approach Anglo American is currently leasing an area of farmland within the Tees catchment sufficiently sized to mitigate the worst-case scenario of total nitrogen loading from sinking two shafts concurrently.
76. The groundwater currently being discharged during construction of the shafts is considered to represent the greatest potential for nitrogen loading. Discharge water during the operational phase will be limited in volume and is anticipated to have a lower potential for nitrogen loading.
77. The removal of land from agricultural use, the diversion of domestic wastewater to water treatment facilities, and the leasing of farmland to offset potential nitrogen loading during mine construction and operation, as appropriate, collectively demonstrate a sustained net reduction in total nitrogen inputs versus the previous land use. On the basis of this evidence, nutrient neutrality is scoped out of further assessment.

4.4 Approach to EIA

4.4.1 General

- 78. The EIA will describe the existing water environment and flood risk and assess the potential impacts to sensitive receptors resulting in changes to existing conditions that could arise during the construction, operation and decommissioning phases. Any mitigation measures will be detailed and a discussion of the residual impacts provided where potentially significant effects are identified. The assessment will consider the potential effects on surface water, groundwater and flood risk receptors.
- 79. The EIA will consider the reduction in development area from the Approved Development at Ladycross Plantation and at Lockwood Beck, the reduction of lateral extent of development at Woodsmith Mine and the removal of development at Tocketts Lythe when assessing environmental impacts.

4.4.2 Flood Risk Assessment

- 80. Updated Flood Risk Assessments (FRAs) will be produced for the amended layouts of Woodsmith Mine, Ladycross Plantation and Lockwood Beck.
- 81. The FRAs will provide supporting information for the EIA and be included as part of the assessment. They will detail the existing levels of flood risk associated with the amendments to the currently Approved Development and surroundings and, where necessary, specify design measures to reduce impacts and manage risk.

4.4.3 Drainage strategy

- 82. Drainage strategies will be produced for Woodsmith Mine, Ladycross Plantation and Lockwood Beck.
- 83. The drainage strategies will set out how drainage will be effectively and safely managed, e.g. limiting surface water flows due to rainfall, and focus on addressing the requirements of Lead Local Flood Authorities. They will also detail the proposed attenuation of on-site surface water drainage to limit off-site impacts as a result of the amendments to the currently Approved Development.

4.4.4 Water Environment Regulations compliance assessment

- 84. WER compliance assessments will be produced for Woodsmith Mine, Ladycross Plantation and Lockwood Beck. A summary of the impacts scoped into and out of the assessment is presented in **Table 4-1**.
- 85. WER compliance assessments will provide supporting information for the EIA and be included as part of the assessment. The potential for the amendments to the currently Approved Development to impact upon WER receptors will be considered for all water bodies that are hydrologically connected to the proposed activities.
- 86. A WER compliance assessment will be undertaken to determine whether the Proposed Development is compliant with the requirements of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. The compliance assessment will consist of an initial screening of water bodies and a scoping assessment, in accordance with the Environment Agency's internal guidance (Environment Agency, 2016).

87. The WER compliance assessment is necessary to determine whether the Approved Development could:
- Cause deterioration in the status of any bodies of surface or groundwater.
 - Prevent status objectives being achieved in the future.
88. If impacts are predicted following that scoping assessment, it will be necessary to undertake a detailed compliance assessment. This would comprise:
- An assessment of whether the predicted impacts are considered to have a significant non-temporary effect on the status of one or more WER quality element.
 - Investigating and designing potential measures to avoid the potential impact or achieve improvement.
 - An assessment to determine whether the cost of any proposed measures is disproportionate, if required.

Table 4-1 Summary of potential impacts to be scoped in (✓) or scoped out (x) of the Water Resources, Flood Risk, Drainage and WER compliance assessment

Predicted Effect	Phase	Site		
		Woodsmith Mine	Ladycross Plantation	Lockwood Beck
Water environment receptors	Construction	✓	✓	✓
	Operation	✓	✓	✓
	Decommissioning	✓	✓	✓
Water Framework Directive receptors	Construction	✓	✓	✓
	Operation	✓	✓	✓
	Decommissioning	✓	✓	✓
Nutrient neutrality receptors	Construction	x	x	x
	Operation	x	x	x
	Decommissioning	x	x	x

4.5 Potential mitigation measures for key impacts

89. A number of mitigation measures are embedded within the design across the partially constructed currently Approved Development. These have been informed by previous EIA assessments. The conditions in place as part of the Approved Development include, but are not limited to, monitoring and managing surface water, submitting updated plans following changes or as part of a new phase of construction activity. There is no intent to change the current Conditions or move away from water management principals currently in place, which have been implemented successfully across the sites since the commencement of construction.
90. The FRA and Drainage Strategy will quantify flood risk associated with Woodsmith Mine, Ladycross Plantation and Lockwood Beck and inform the detailed design to ensure appropriate mitigation measures are in place. The mitigation measures will ensure flood risk is acceptable and discharge from the sites via site drainage is appropriately managed.
91. As part of the Drainage Strategy, construction phase surface water discharge will be designed to be limited to Q_{bar} for rainfall events up to and including the 1 in 20-year rainfall event. Operational phase surface water discharge will be designed to be limited to Q_{bar} for rainfall events up to and including the 1 in 100-year rainfall (plus 30% climate change) event, in line with the agreed existing approach.

92. The WER assessment will quantify risks to WER receptors and inform what mitigation measures, if any, are required to ensure risks are acceptable.
93. Mitigation measures will be implemented through appropriate design and construction methodologies. Relevant guidance published by the Environment Agency and the Construction Industry Research and Information Association will inform the design of mitigation measures alongside consultation with key stakeholders. Likely mitigation measures include:
- Adherence to a Construction Environmental Management Plan (CEMP).
 - Flood prevention measures and appropriate drainage design.
 - Monitoring of water levels and water quality during construction to verify the effectiveness of any engineered mitigation that may be implemented as a result of the risk assessments.

5 Geology and Hydrogeology

5.1 Introduction

94. This Chapter outlines the scope and methodology for the assessment of potential significant effects arising from the construction, operation and decommissioning of the amendments to the currently Approved Development on Geology and Hydrogeology.
95. The Chapter has been prepared on the basis that the currently Approved Development is already under construction and embedded mitigation measures have been demonstrated to be effective. These will remain in place as currently installed, with any modifications assessed in relation to the amendments to the currently Approved Development.
96. The SES will focus on the amendments to the currently Approved Development, considering the existing and largely complete surface development, including the construction of Ventilation Shaft at the Woodsmith Mine
97. No development will take place at Tocketts Lythe, as such the impacts on geology and hydrogeology assessed as part of the currently Approved Development will not arise. While originally assessed as being of negligible significance, the removal of these impacts is beneficial to the wider environment.
98. The MTS Portal is constructed, with final details for the operation of the mine, including surface water management measures at the MTS Portal will be incorporated into the final design layout of the MHF and, as such are not considered further in this assessment.
99. This chapter does not assess the MTS Portal or the previously assessed Tocketts Lythe MTS site.

5.2 Overview of existing environment and receptors

5.2.1 Woodsmith Mine

5.2.1.1 Geology

100. The geological sequence at Woodsmith Mine and regional aquifer designations are presented in **Table 5-1**.

Table 5-1 Woodsmith Mine geology and aquifer designations (BGS, 2025a; BGS, 2025b)

Stratigraphic unit	Description	Regional aquifer designation
Superficial Glacial Till	Gravelly sandy clay with discontinuous sand lenses	Secondary Undifferentiated
Long Nab Member (Ravenscar Group)	Mudstone, siltstone and sandstone	Secondary A
Moor Grit Member (Ravenscar Group)	Sandstone, siltstone and mudstone	Secondary A
Scarborough Formation (Ravenscar Group)	Shale and sandstone	Secondary A
Cloughton Formation (Ravenscar Group)	Sandstone, mudstone and thin coals	Secondary A
Eller Beck Formation (Ravenscar Group)	Ironstone and sandstone	Secondary A
Saltwick Formation (Ravenscar Group)	Sandstone, mudstone and thin coals	Secondary A
Dogger Formation	Sandstone and ironstone	Secondary A

Stratigraphic unit	Description	Regional aquifer designation
Whitby Mudstone Formation (Lias Group)	Mudstone	Unproductive strata
Cleveland Ironstone Formation (Lias Group)	Mudstone and siltstone interbedded with ironstone	Secondary A
Staithes Sandstone Formation (Lias Group)	Mudstone with laminations of siltstone and sandstone	Secondary A
Redcar Mudstone Formation (Lias Group)	Siltstone and mudstone with thin limestone and sandstone beds	Secondary B
Penarth Group	Mudstone and sandstone	Secondary B
Mercia Mudstone Group	Mudstone and halite	Secondary B
Sherwood Sandstone Group	Sandstones and siltstones	Principal
Eskdale Group	Mudstone, interbedded sandstone, evaporites and siltstone	Secondary B
Staintondale Group	Evaporites and marls	Secondary B
Teesside Group (including Brotherton Formation)	Evaporites over dolomitic limestone (Brotherton Formation)	Secondary B (evaporites) and Principal (Brotherton Formation)
Aislaby Group	Evaporites and mudstone over dolomitic limestone (Kirkham Abbey Formation)	Secondary B (evaporites and mudstones) and Principal (Kirkham Abbey Formation)

101. As part of the ongoing construction associated with the Approved Development the Production Shaft has been progressed into the Mercia Mudstone Group, the Service Shaft within the Sherwood Sandstone and the MTS shaft is at its full depth (within the Redcar Mudstone Formation of the Lias Group). The Service and Production Shafts will penetrate the full sequence presented in **Table 5-1**.
102. The Ventilation Shaft, as part of the new development will penetrate the full sequence presented in **Table 5-1**. The construction of the Ventilation Shaft would be subject to the existing Planning Conditions, follow the same controls, monitoring, management procedures and similar methodology as already being implemented for the construction of the Production and Service Shafts.

5.2.1.2 Hydrogeology

103. Superficial Glacial Till is partially present underneath Woodsmith Mine and is classified as a Secondary Undifferentiated Aquifer (BGS, 2025a; BGS, 2025b). Bedrock comprises interbedded sandstones and mudstones of the Ravenscar Group and is classified as a Secondary A Aquifer (BGS, 2025a; BGS, 2025b).
104. Intermittent spring discharges noted at Woodsmith Mine and in the surrounding area originate from the Ravenscar Group.
105. There are no groundwater SPZs within, or in the vicinity of Woodsmith Mine (Environment Agency, 2025c). Anglo American currently holds an Abstraction Licence (Licence number: NE/027/0029/007) to abstract groundwater from sites within the Woodsmith Mine boundary. Private groundwater abstraction sites are located 600m and 780m from Woodsmith Mine (Landmark, 2024a).

106. Based on the results of the deep drilling at Woodsmith Mine, the Sherwood Sandstone Group is the primary aquifer beneath the Ravenscar Group that will be intercepted by mining activities. Despite their regional classification as Secondary A Aquifers, the Cleveland Ironstone Formation and Staithes Sandstone are considered non-aquifers at Woodsmith Mine due to their predominantly argillaceous and low permeability nature.
107. The Sherwood Sandstone Group hosts regionally important sandstone aquifers and in some areas is classified as a Principal Aquifer. Due to high salinity (approximately 50,000mg/l) at Woodsmith Mine, groundwater in the Sherwood Sandstone Group is not considered to have any significant resource value.
108. The top of the Sherwood Sandstone Group is approximately 800m below ground level (bgl), with a thickness of approximately 240m. The Sherwood Sandstone Aquifer is confined, with piezometric heads approximately 400m bgl. Fracture flow dominates within the aquifer; however, intergranular flow is also important.
109. The Redcar Mudstone Formation is a Secondary B Aquifer comprising siltstone and mudstone with thin limestone and sandstone beds, and groundwater ingress through this formation is expected to be limited.
110. The Brotherton Formation comprises argillaceous dolomite and is a regionally important aquifer, however, low permeabilities have been observed at Woodsmith Mine and groundwater ingress rates are expected to be low. Due to expected high salinity at Woodsmith Mine, groundwater within the Brotherton Formation is not considered to have any significant resource value.

5.2.2 Ladycross Plantation

5.2.2.1 Geology

111. Ladycross Plantation is underlain by superficial deposits of Glaciofluvial Deposits (sand and gravel) and Glacial Till. The underlying bedrock is the Long Nab Member (BGS, 2025a; BGS, 2025b). Topsoil and sub-soil stockpiles are present on the site, to the north of the shaft headhouse and site office. Made Ground, associated with construction of the working platform and haulage roads, etc. is also present.

5.2.2.2 Hydrogeology

112. The superficial deposits and bedrock are classified as Secondary A Aquifers (BGS, 2025a; BGS, 2025b). The groundwater vulnerability map (Environment Agency, 2025e) indicates groundwater vulnerability of medium-low to medium-high.
113. No SPZs are located within 1km of Ladycross Plantation (Landmark, 2024b).
114. A lined surface water attenuation pond, associated with ongoing work as part of the currently Approved Development, is located in the southern portion of Ladycross Plantation and discharges to Cat Scar Beck.
115. As part of the Approved Development a shaft has been sunk and lined to its full depth without impact and the fully lined MTS tunnel has been progressed through and beyond the Ladycross Plantation site and shaft location.
116. Amendments to the Approved Development include the removal of the surface waste facility, which will remove the associated risk of groundwater contamination from leachate and changes to infiltration rates at the site.

5.2.3 Lockwood Beck

5.2.3.1 Geology

117. Lockwood Beck is underlain by superficial deposits of Glaciofluvial Deposits (sand and gravel) and Glacial Till. The underlying bedrock comprises the Scalby Formation (sandstone, siltstone and mudstone), Scarborough Formation, Cloughton Formation and Saltwick Formation (BGS, 2025a; BGS, 2025b).
118. Reworked natural ground embankments and Made Ground, associated with construction of the working platform, haulage roads, shaft and tunnel, etc. are also present at Lockwood Beck.

5.2.3.2 Hydrogeology

119. The superficial Glacial Till deposits and bedrock are classified as Secondary A Aquifers, with the Glacial Till classified as a Secondary Undifferentiated Aquifer (BGS, 2025a; BGS, 2025b). The groundwater vulnerability map (Environment Agency, 2025e) indicates groundwater vulnerability of medium-low to medium-high.
120. No SPZs are located within 1km of Lockwood Beck (Landmark, 2024c).
121. Lockwood Beck Reservoir is located approximately 30m south of Lockwood Beck.
122. A surface water attenuation pond associated with ongoing work as part of the currently Approved Development is located in the central eastern portion of the site and discharges to Dale Beck.
123. One public surface water abstraction is noted at the Lockwood Beck Reservoir, with one public water supply abstraction from a spring located 795m to the south-east of Lockwood Beck (Landmark, 2024c).
124. An abstraction licence associated with the MTS tunnel (licence number: NE/025/0001/024) is registered to Anglo American at the Lockwood Beck site. This licence allows the dewatering of the tunnel from water associated with the Redcar Mudstone, water is drained to the Lockwood Beck site (as the Lockwood Beck shaft is the lowest point along the length of the tunnel), this water is collected and pumped along the tunnel to the Wilton site for discharge, The abstraction is currently operating under a LEV, while a variation to the duration of the existing permit is determined by the EA.
125. Amendments to the Approved Development include the removal of the surface waste facility, which will remove the associated risk of groundwater contamination from leachate and changes to infiltration rates at the site.

5.3 Potential environmental Impacts

5.3.1.1 Woodsmith Mine

126. Ventilation Shaft sinking and grouting has the potential to impact sensitive hydrogeological receptors, particularly in the Ravenscar Group aquifers, both physically and chemically. Physical impacts may include changes to flow pathways and chemical impacts may include discharges of contaminative substances in grouts.
127. Placement of shaft arisings to form the required landscape screening bunds may present a potential contamination source to underlying aquifers and reduce natural infiltration across the site.
128. The additional works associated with the construction of the Ventilation Shaft and basement development would be subject to the existing Planning Conditions, follow the same controls, monitoring, management procedures and similar methodology as already being implemented for

the construction of the Production and Service Shafts. Updated plans will be produced to reflect the ongoing construction and will be submitted for consultation and approval.

5.3.1.2 Ladycross Plantation

- 129. Construction works have the potential to disturb pre-existing sources of contamination which could migrate via pre-existing pathways or via newly created pathways following the construction phase and be discharged into groundwater.
- 130. It should, however, be noted that during construction undertaken to date, including the ongoing tunnelling which has progressed beyond Ladycross Plantation, there has been no evidence that such impacts have occurred at Ladycross Plantation.
- 131. Amendments to the Approved Development include the removal of the surface waste facility, which will remove the associated risk of groundwater contamination from leachate and changes to infiltration rates at the site. The land set aside for the surface waste facility has been removed from agricultural use and will now form part of Anglo American's biodiversity enhancement plans.
- 132. It is considered unlikely that the amendments to the currently Approved Development will result in cumulative impacts to groundwater. Therefore, it is proposed to scope out potential impacts to groundwater at Ladycross Plantation from the Geology and Hydrogeology assessment.

5.3.1.3 Lockwood Beck

- 133. Construction works have the potential to disturb pre-existing sources of contamination which could migrate via pre-existing pathways or via newly created pathways following the construction phase and be discharged into groundwater.
- 134. It should, however, be noted that during the construction undertaken to date, across the currently Approved Development, that there has been no evidence that such impacts have occurred at Lockwood Beck.
- 135. Amendments to the Approved Development include the removal of the surface waste facility, which will remove the associated risk of groundwater contamination from leachate and changes to infiltration rates at the site. Anglo American has sold some of the land set aside for the surface waste facility, with this land now being back in agricultural use. The remaining land has been removed from agricultural use and will form part of Anglo American's biodiversity enhancement plans.
- 136. It is considered unlikely that the amendments to the currently Approved Development will result in cumulative impacts to groundwater. Therefore, it is proposed to scope out potential impacts to groundwater from the Geology and Hydrogeology assessment.

5.4 Approach to EIA

- 137. The EIA chapter will focus on geology and hydrogeology at Woodsmith Mine. The amendments at Ladycross Plantation and Lockwood Beck are minor and not considered to cause any significant hydrogeological impacts.
- 138. As part of the impact assessment, available groundwater and surface water data from ongoing long-term monitoring will be reviewed in conjunction with previous qualitative and quantitative risk assessments.
- 139. Following the review, the likelihood and magnitude of effects resulting from the amendments to the currently Approved Development during the construction, operational and decommissioning phases on hydrogeologically sensitive receptors will be evaluated and considered as part of the EIA chapter.

140. The outcomes of the impact assessment will inform identification and evaluation of any further groundwater mitigation measures that may be required. A summary of the impacts to be scoped into and out of the assessment is presented in **Table 5-2**.

Table 5-2 Summary of potential impacts to be scoped in (✓) or scoped out (x) of the Geology and Hydrogeology Assessment

Predicted Effect	Phase	Site		
		Woodsmith Mine	Ladycross Plantation	Lockwood Beck
Human health receptors (indirectly)	Construction	✓	✓	✓
	Operation	✓	✓	✓
	Decommissioning	✓	✓	✓
Surface water receptors	Construction	✓	✓	✓
	Operation	✓	✓	✓
	Decommissioning	✓	✓	✓
Environmental receptors	Construction	✓	✓	✓
	Operation	✓	✓	✓
	Decommissioning	✓	✓	✓
Shallow geological receptors	Construction	✓	x	x
	Operation	✓	x	x
	Decommissioning	✓	x	x
Shallow hydrogeological receptors	Construction	✓	x	x
	Operation	✓	x	x
	Decommissioning	✓	x	x
Deep geological receptors	Construction	✓	x	x
	Operation	✓	x	x
	Decommissioning	✓	x	x
Deep hydrogeological receptors	Construction	✓	x	x
	Operation	✓	x	x
	Decommissioning	✓	x	x

5.5 Potential mitigation measures for key impacts

141. Existing design principles, embedded mitigation measures and water monitoring developed during earlier phases of the currently Approved Development will continue.
142. Construction of the Ventilation Shaft will follow a similar approach to the Service and Production Shafts with impermeable liners/ cutoff walls limiting interaction between the surrounding groundwater environment and the shaft across Ravenscar Group. Appropriate grout will be selected to minimise leaching potential and isolate the shaft.
143. Groundwater within deep water-bearing geological units is anticipated to be isolated from shallow freshwater aquifers by several hundreds of metres of low permeability material. In addition, dewatering and the use of grouting, chemical seals and watertight shaft liners will control and restrict groundwater ingress. Due to the small horizontal extent of the shaft and the low sensitivity of deep aquifers, impacts are expected to be negligible.
144. In the event that any additional Abstraction Licenses are required to abstract groundwater as part of the construction, operational or decommissioning phases, a new and/ or variation application

will be submitted. It is recognised that an additional abstraction licence will be required for the Ventilation Shaft.

145. Landscape screening bunds will be constructed with appropriate engineered drainage systems, in order to manage groundwater ingress into the bunds, and basal discharge from the bunds. The engineering methodology for the development of the bunds to date has been accepted by the Environment Agency, this will continue to be followed as the construction progresses.

6 Soils, Land Quality and Waste

6.1 Introduction

146. This Chapter outlines the scope and methodology for the assessment of the impacts on Soils, Land Quality and Waste receptors arising from the construction, operation and decommissioning of the amendments to the currently Approved Development.
147. **Chapter 4 Water Resources, Flood Risk, Drainage and Water Environment Regulations** considers potential land quality impacts to water in the context of WER compliance requirements. **Chapter 5 Geology and Hydrogeology** considers the potential land quality impacts to groundwater.

6.2 Overview of existing environment and receptors

6.2.1 Soils

148. **Table 6-1, Table 6-2 and Table 6-3** summarise the existing soil environment for Woodsmith Mine, Ladycross Plantation and Lockwood Beck, respectively.
149. Tocketts Lythe, within the administration area of RCBC, is being removed from the currently Approved Development. This will result in a beneficial impact of no effect on soils and land quality, or to waste.

Table 6-1 Soils existing environment for Woodsmith Mine

Parameter	Description
Current land use and Agricultural Land Classification	Woodsmith Mine has been developed and is therefore no longer used for agricultural purposes.
Environmental Stewardship Agreements and Countryside Stewardship Agreements	Woodsmith Mine is not located within areas covered by Environmental Stewardship Agreements or Countryside Stewardship Agreements.
Soil type	Very acid loamy upland soils with a wet peaty surface dominate with an area of slowly permeable seasonally wet acid loamy and clayey soils present in the eastern extents of the study area (Cranfield University, 2025).
Additional information regarding soil type	More detailed information regarding the soil type baseline can be found in Sirius Minerals (2019) NYMNP 76 Soil Management Plan – North Yorkshire Polyhalite Project, July 2019.

Table 6-2 Soils existing environment for Ladycross Plantation

Parameter	Description
Current land use and Agricultural Land Classification	Ladycross Plantation has been developed and is therefore no longer used for agricultural purposes.
Environmental Stewardship Agreements and Countryside Stewardship Agreements	Ladycross Plantation is not located within areas covered by Environmental Stewardship Agreements or Countryside Stewardship Agreements.

Parameter	Description
Soil type	Slowly permeable seasonally wet basic loams and clays dominate with an area of freely draining very acidic sandy and loamy soils present along the northern boundary of the study area (Cranfield University, 2025).

Table 6-3 Soils existing environment for Lockwood Beck

Parameter	Description
Current land use and Agricultural Land Classification	Lockwood Beck has been developed and is therefore no longer used for agricultural purposes.
Environmental Stewardship Agreements and Countryside Stewardship Agreements	Lockwood Beck is not located within areas covered by Environmental Stewardship Agreements or Countryside Stewardship Agreements.
Soil type	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils dominate with an area of slowly permeable wet very acid upland soils with a peaty surface along the southern boundary of the study area (Cranfield University, 2025).

6.2.2 Land quality

6.2.2.1 Woodsmith Mine

150. There are no recorded historical landfills or permitted waste sites located within Woodsmith Mine or within 250m of the study area. No historical pits have been identified within Woodsmith Mine, however, an old gravel pit (between 1890s and 1970s) is recorded adjacent to the west of the study area (Envirocheck Report, 2024a).
151. Historical mapping indicates the presence of a pond to the east of the study area from the 1970s to the present day (Envirocheck Report, 2024a).
152. Two unnamed surface tributaries of Sneaton Thorpe Beck are located within Woodsmith Mine. Seaton Thorpe Beck itself is located within 250m, to the east of Woodsmith Mine. For further details, see **Chapter 4 Water Resources, Flood Risk, Drainage and Water Environment Regulations**.
153. There are no ecological or geological designated sites located within the boundary of Woodsmith Mine, however, the North York Moors Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC) and Special Protection Area (SPA) and Little Beck Wood Local Wildlife Site (LWS) are located within 250m of the currently Approved Development. For further details see **Chapter 7 Terrestrial Ecology**.
154. As part of the development of the wider Woodsmith Mine, several phases of ground investigation have been undertaken. The factual and interpretative geo-environmental reports associated with the ground investigations have identified the following which relate to potential contaminants:
 - Low levels of naturally occurring hydrocarbon gas, hydrocarbons (C1 – C6) and hydrocarbon odours were encountered within bedrock geology of the Whitby Mudstone Formation, Cleveland Ironstone Formation, Redcar Mudstone Formation and Mercia Mudstone Group, all at depths in excess of 120m bgl.

- There is the potential for hydrocarbon gases to be present within the Staithes Sandstone Formation.
- Hydrogen sulphide odours were recorded within the Teesside Group and Aislaby Group at depths in excess of 1.4km bgl.

6.2.2.2 Ladycross Plantation

155. There are no recorded historical landfills or permitted waste sites located within Ladycross Plantation or within 250m of the study area. No historical pits have been identified within Ladycross Plantation or within 100m of the study area (Envirocheck Report, 2024b). In addition, no potential sources of contamination have been identified within 250m of Ladycross Plantation.
156. No natural surface water features are located within the boundary of Ladycross Plantation. A pond is located to the north of the study area and tributaries of Cat Scar Beck and Cold Keld Beck drain Ladycross Plantation to the south and west respectively. Both becks drain into the River Esk. For further details, see **Chapter 4 Water Resources, Flood Risk, Drainage and Water Environment Regulations**.
157. As part of the Approved Development there are man-made surface water features which have been established, including an attenuation pond and ditches.
158. There are no ecological or geological designated sites located within Ladycross Plantation or within 250m of the study area (Envirocheck Report, 2024b).

6.2.2.3 Lockwood Beck

159. There are no recorded historical landfills or permitted waste sites located within Lockwood Beck or within 250m of the study area. No historical pits have been identified within Lockwood Beck or within 250m of the study area (Envirocheck Report, 2024c).
160. Historical mapping indicates the presence of filter beds to the south of the study area from the 1890s (Envirocheck Report, 2024c) and these are assumed to be associated with Lockwood Beck Reservoir due to their location. These filter beds remain to the present day; however, they are not considered to represent a potential source of contamination.
161. No natural surface water features are located within the boundary of Lockwood Beck; however, the study area drains into Lockwood Beck to the west and north before connecting to Dale Beck which crosses the Extent of Works. In addition, Lockwood Beck Reservoir and surface water drains are located within 250m of Lockwood Beck (Envirocheck Report, 2024c). For further details, see **Chapter 4 Water Resources, Flood Risk, Drainage and Water Environment Regulations**.
162. As part of the currently Approved Development there are man-made surface water features that have been established including an attenuation pond and ditches.
163. There are no ecological or geological designated sites located within Lockwood Beck, however the Kilton Beck complex LWS and North York Moors SSSI, SAC and SPA are located within 250m of the currently Approved Development. For further details, see **Chapter 7 Terrestrial Ecology**.

6.2.3 Waste

164. The waste assessment study area, for wastes generated at Woodsmith Mine, Ladycross Plantation and Lockwood Beck, is the currently Approved Extent of Works. The boundary area for the treatment and disposal of wastes not reused within the currently Approved Development is the former waste planning region of northeast England, which includes the sub-region covered by the Tees Valley Unitary Authorities and North York Moors National Park.

165. The following desktop sources have been used to inform the existing and future waste environment of the study area for the purpose of this ESR:
- Environment Agency Waste Data Interrogator 2023 (Environment Agency, 2025f).
 - Environment Agency Remaining Landfill Capacity (Environment Agency, 2025g).
166. The Environment Agency regional landfill capacity data has been used to inform the current environment for the management of inert, non-hazardous and hazardous wastes produced at the currently Approved Development (Environment Agency 2025f, 2025g).
167. The Environment Agency provides landfill capacity data in volume (cubic metres) and this has been converted to mass (tonnes) using the following conversion factors developed by the Environment Agency for the High Speed Rail Environmental Statement (High Speed Rail, 2015), and has since been used as appropriate conversion factors for other infrastructure projects, including the Hinkley Point C Connection EIA Scoping Report (National Grid, 2025):
- 1.5 tonnes per cubic metre for hazardous waste landfill.
 - 0.83 tonnes per cubic metre for non-hazardous waste landfill.
 - 1.5 tonnes per cubic metre for inert waste landfill.
168. The most recent landfill capacity, i.e. tonnes available at year end 2023, in the northeast region is presented in **Table 6-4** (Environment Agency 2025f, 2025g).

Table 6-4 2023 Northeast England landfill capacity (tonnes)

Inert Landfill	Non-Hazardous Landfill	Hazardous Landfill
9,882,000	7,380,000	5,688,000

169. It is expected that landfill capacity within the northeast region will continue to be available, if required, during the construction phase of the currently Approved Development. To demonstrate that there is ongoing landfill capacity, the capacity data published by the Environment Agency (Environment Agency, 2025g) for 2019 to 2023 has been used to estimate the projected landfill capacity for the northeast for three additional years, i.e. up to 2028.
170. The estimated future landfill capacity was calculated using the average percentage change in permitted landfill capacity for the years 2019 to 2023 reported by the Environment Agency (Environment Agency, 2025g). The average percentage change has then been applied to the 2023 permitted landfill capacity and projected forward to 2028 (**Table 6-5**). This method assumes that the average percentage change in permitted capacity for each class of landfill remains constant.

Table 6-5 Projected northeast England landfill capacity

Landfill Type	2024	2025	2026	2027	2028
Inert Landfill	9,051,000	8,290,000	7,593,000	6,955,000	6,370,000
Non-Hazardous Landfill	6,847,000	6,356,000	5,900,000	5,477,000	5,084,000
Hazardous Landfill	4,952,000	4,312,000	3,755,000	3,270,000	2,847,000

6.3 Potential environmental impacts

6.3.1 Construction

6.3.1.1 Impacts to human health

171. Construction works have the potential to mobilise pre-existing ground contamination from either anthropogenic or natural sources (where present). In addition to mobilising pre-existing contamination, construction works have the potential to alter migration pathways or create preferential pathways that did not previously exist between a source and receptor. This could result in impacts to human health through dermal contact, inhalation and ingestion of contaminants.
172. The amendments to the Approved Development which could potentially pose an issue in this respect at Woodsmith Mine include changes to the final landform and associated restoration requirements to meet screening requirements and habitat/ biodiversity enhancements. Mitigation is presently in place to manage this to limit the potential risk posed by the introduction of this as a source of contamination and is discussed in the approved Construction Environmental Management Plan for Phase 18 of the ongoing works (Worley, August 2023).
173. It is considered unlikely that the proposed amendments to Woodsmith Mine, Ladycross Plantation and Lockwood Beck would result in impacts to human health. In addition, potential sources of contamination have not been identified within the study areas for Woodsmith Mine (due to the presence of current mitigation), Ladycross Plantation or Lockwood Beck. Therefore, due to the nature of the revised design and the absence of potential sources of contamination, it is proposed to scope out potential impacts to human health from the soils, land quality and waste assessment.

6.3.1.2 Impacts to surface water features and ecological habitats

174. Construction works have the potential to disturb pre-existing sources of contamination, which could migrate via pre-existing pathways or via newly created pathways following the construction phase and be discharged into surface waters. Migration of contamination and discharge into surface water features may also impact on ecological habitats supported by these features.
175. The amendments to the Approved Development which could potentially pose an issue in this respect at Woodsmith Mine include changes to the final landform and associated restoration requirements to meet screening requirements and habitat/ biodiversity enhancements. Mitigation is currently in place to manage this to limit the potential risk posed by the introduction of this as a source of contamination and is discussed in the Construction Environmental Management Plan Phase 18 (Worley, August 2023). The site in addition has an Environment Agency permit in relation to discharges to water and groundwater (NE/EPRMB3399VR/001) to manage associated risks.
176. During the construction undertaken to date across the currently Approved Development, there has been no evidence that such impacts have occurred, and it is considered unlikely that the amendments to Woodsmith Mine (due to the present mitigation in place), Ladycross Plantation or Lockwood Beck would result in impacts to surface water features or on the ecological habitats which are supported by these features. Therefore, it is proposed to scope out potential impacts to surface water features and the ecological habitats they support from the soils, land quality and waste assessment.

6.3.1.3 Impacts to the built environment

177. Activities undertaken during the construction phase have the potential to impact on the existing built environment, albeit this is limited in nature due to the rural nature of the surrounding landscape. The modification, or creation of new preferential pathways has the potential to allow

contamination to migrate that may lead to the degradation of utilities and concrete from aggressive attack.

178. The amendments to the Approved Development which could potentially pose an issue in this respect at Woodsmith Mine include changes to the final landform and associated restoration requirements to meet screening requirements and habitat/ biodiversity enhancements. Mitigation is in place to manage this to limit the potential risk posed by the introduction of this as a source of contamination and is discussed in the Construction Environmental Management Plan Phase 18 (Worley, August 2023).
179. It is considered unlikely that the amendments to Woodsmith Mine, Ladycross Plantation and Lockwood Beck would result in impacts to the built environment. Therefore, it is proposed to scope out potential impacts to the built environment from the soils, land quality and waste assessment.

6.3.1.4 Impacts to agricultural land

180. Construction activities undertaken have the potential to both mobilise pre-existing sources of contamination and introduce new sources. Construction activities also have the potential to modify or create new preferential pathways which may result in the indirect contamination of the agricultural land surrounding the currently Approved Development having an adverse impact on current Agricultural Land Classification (ALC) grades.
181. The construction works also have the potential to indirectly impact on the areas surrounding the currently Approved Development, for example, through increased run-off because of increased areas of hardstanding. This in turn could impact on the risks associated with surface water flooding to agricultural land itself and the surrounding environment.
182. The amendments to the Approved Development which could potentially pose an issue in this respect at Woodsmith Mine include changes to the final landform and associated restoration requirements to meet screening requirements and habitat/ biodiversity enhancements. Mitigation is in place to manage this to limit the potential risk posed by the introduction of this as a source of contamination and is discussed in the Construction Environmental Management Plan Phase 18 (Worley, August 2023). The site in addition has an Environment Agency permit in relation to discharges to water and groundwater (NE/EPRMB3399VR/001) to manage associated risks. The final landform will additionally include an engineered drainage system as mitigation to reduce the potential impact of runoff.
183. It is considered unlikely that the amendments to Woodsmith Mine (due to the present mitigation in place), Ladycross Plantation and Lockwood Beck would result in impacts on agricultural land. Therefore, it is proposed to scope out potential impacts to agricultural land from the soils, land quality and waste assessment.

6.3.1.5 Soil degradation and erosion

184. There is the potential for adverse impacts to soil structure, productivity of soils impacted by the construction phase using heavy machinery and disturbance associated with ground works. Changes to soil can affect biological activity and water retention leading to loss or change in productivity.
185. However, during construction undertaken to date across the currently Approved Development there has been no evidence that such impacts have occurred. Existing controls to protect soil integrity will continue to be applied throughout construction, and, as such, it is considered unlikely that the amendments to Woodsmith Mine, Ladycross Plantation or Lockwood Beck would result in impacts in relation to soil degradation or erosion. Therefore, it is proposed to scope out potential

impacts associated with soil degradation or erosion from the soils, land quality and waste assessment.

6.3.2 Operation

6.3.2.1 Impacts to human health

186. During the operational phase, there is the potential for site personnel working within the underground mine and maintenance workers to be exposed to gases and/ or vapours. There is also the potential for maintenance workers to come into direct contact with contaminated soils and groundwater should excavations be required, noting however that no potential sources of contamination have been identified.
187. However, direct impacts to human health during the operational phase are considered unlikely. It is assumed that routine operation and maintenance activities, which would reduce any potential likely significant effects, will be conducted. In addition, the amendments to the currently Approved Development will be operated in line with relevant operational management plans. Should excavations (either planned or unplanned) be required, task specific risk assessments and method statements would be developed to mitigate potential impacts.
188. Therefore, it is proposed to scope out potential impacts to human health specifically in relation to soils and land quality at Woodsmith Mine, Ladycross Plantation and Lockwood Beck during operation of the amendments to the currently Approved Development from the soils, land quality and waste assessment.

6.3.2.2 Impacts to surface water features and ecological habitats

189. Although it is considered unlikely, operation and maintenance activities have the potential to introduce new sources of contamination through the leakage or spillage of fuels, oils or other chemicals from machinery, vehicles or operation equipment, which may impact surface water quality.
190. However, direct impacts to surface water features and ecological habitats during the operational phase are considered unlikely. It is assumed that routine operation and maintenance activities, which would reduce any potential likely significant effects, will be conducted. In addition, the amendments to the currently Approved Development will be operated in line with relevant operational management plans. Should excavations (either planned or unplanned) be required task specific risk assessments and method statements would be developed to mitigate potential impacts.
191. Therefore, it is proposed to scope out potential impacts to surface water features and ecological habitats during the operation of the currently Approved Development at Woodsmith Mine, Ladycross Plantation and Lockwood Beck from the soils, land quality and waste assessment.

6.3.2.3 Impacts to the built environment

192. Materials, for example concrete, used in the infrastructure both above and below ground have the potential to undergo degradation such as chemical attack from aggressive ground conditions due to the presence of acids or sulphates, which has the potential to compromise the integrity of structures. Utilities could also be impacted by the presence of contaminated soil which may result in corrosion and permeation of pipelines should utilities be installed during the construction phase.
193. However, infrastructure and utilities associated with the currently Approved Development have been designed to reflect the identified ground conditions and thereby limit the potential for impacts to occur because of, for example, aggressive ground conditions.

194. Therefore, it is proposed to scope out potential impacts to the built environment during the operation of the amendments to the currently Approved Development at Woodsmith Mine, Ladycross Plantation and Lockwood Beck from the soils, land quality and waste assessment.

6.3.2.4 Impacts from waste

195. As well as the direct impacts in terms of quantity of wastes produced during construction and operation of Woodsmith Mine, Ladycross Plantation and Lockwood Beck, there is the potential to cause disturbance and nuisance to landowners and occupiers from the movement and temporary storage of wastes.
196. Potential waste impacts associated with air quality and transportation are covered in **Chapter 10 Air Quality** and **Chapter 12 Traffic and Transport**.
197. Landfill sites are a finite resource and changes in available landfill capacity during construction and operation have the potential to give rise to significant effects (IEMA, 2020).
198. At this stage, the exact quantities and types of waste likely to be generated during the construction and operation stages at Woodsmith Mine, Ladycross Plantation and Lockwood Beck are unconfirmed, but it is not expected that the list of wastes produced will be extensive and is likely to primarily consist of:
- Concrete.
 - Soils and stones.
 - Mixed metals.
 - Packaging waste.
 - Wood waste.
199. The proposed amendments are not expected to produce significant quantities of hazardous wastes, as these will be operated in line with relevant operational management plans. Should any additional processes give rise to unexpected wastes, task specific risk assessments and method statements will be developed to mitigate potential impacts and ensure correct handling and disposal of the waste in accordance with the waste hierarchy.
200. Good site practices will also ensure that waste generation is minimised as far as practicable; any wastes produced will be temporarily stored on Woodsmith Mine, Ladycross Plantation and Lockwood Beck and collected for recycling, treatment or disposal by approved waste contractors. Waste storage areas will continue to be appropriately managed as per the current construction activities.
201. Most wastes produced are expected to be suitable for recycling; if non-recyclable wastes are generated in larger volumes than expected, these volumes are anticipated to be within the capacity of the regional landfills (Section 6.2.3).
202. Due to the effective waste management practices implemented for the current construction activities and prioritisation of the waste hierarchy, the impact of waste from the amendments to the currently Approved Development is considered unlikely to result in direct, indirect or cumulative effects at Woodsmith Mine, Ladycross Plantation and Lockwood Beck, or on the regional waste management infrastructure. It is proposed that waste is scoped out from further assessment.

6.4 Approach to EIA

6.4.1.1 Soils and Land Quality

203. It is not anticipated that any significant adverse effects will arise as a result of the amendments to the currently Approved Development at Woodsmith Mine, Ladycross Plantation or Lockwood

Beck, and as a result it is proposed to scope all such effects out of further consideration in the EIA.

6.4.1.2 Waste

204. It is not anticipated that any significant adverse effects will arise regarding waste as a result of the amendments to the currently Approved Development at Woodsmith Mine, Ladycross Plantation or Lockwood Beck
205. As a result, it is proposed to scope all such effects out of further consideration in the EIA (**Table 6-6**). Any wastewater generated will be considered in **Chapter 4 Water Resources, Flood Risk, Drainage and Water Environment Regulations**.

Table 6-6 Summary of potential impacts proposed to be scoped in (✓) or scoped out (x) of the Soils, Land Quality and Waste Assessment

Predicted Effect	Phase	Site		
		Woodsmith Mine	Ladycross Plantation	Lockwood Beck
Human health receptors	Construction	x	x	x
	Operation	x	x	x
	Decommissioning	x	x	x
Surface water features and ecological receptors	Construction	x	x	x
	Operation	x	x	x
	Decommissioning	x	x	x
Built environment receptors	Construction	x	x	x
	Operation	x	x	x
	Decommissioning	x	x	x
Agricultural land as a receptor	Construction	x	x	x
	Operation	x	x	x
	Decommissioning	x	x	x
Soil degradation and erosion	Construction	x	x	x
	Operation	x	x	x
	Decommissioning	x	x	x
Waste	Construction	x	x	x
	Operation	x	x	x
	Decommissioning	x	x	x

6.5 Potential mitigation measures for key impacts

206. A number of mitigation measures are already in place across the currently Approved Development, which have been informed by previous EIA submissions. The measures applicable to the assessment of potential impacts on soils, land quality and waste include, for example, a CEMP and Soil Management Plans.
207. The Planning Permissions also have a suite of planning conditions which are being adhered to and these form a key securing mechanism for implementation of the mitigation measures.

7 Terrestrial Ecology

7.1 Introduction

208. This Chapter outlines the scope and methodology for the assessment of the impacts on Terrestrial Ecology receptors arising from the construction, operation and decommissioning of the amendments to the currently Approved Development.
209. Construction activities have been underway at Woodsmith Mine and Lockwood Beck since 2017 and at Ladycross Plantation since 2021, following baseline ecological surveys in 2014. Since the commencement of construction, the ecological conditions within Woodsmith Mine, Ladycross Plantation and Lockwood Beck have inherently changed. Changes include removal of agricultural use and associated pressures from the land (i.e. cessation of planting crops, grazing livestock and application of agro-chemicals), creation of new infrastructure and material storage, areas of new habitat and natural recovery/regeneration of existing habitats.
210. Tocketts Lythe, within the administration area of RCBC, is being removed from the currently Approved Development and no construction activity has taken place there, to date. This is a positive outcome for ecology as the adverse ecological effects that would have arisen from the construction and operation of the shaft and waste facilities at Tocketts Lythe will no longer take place.
211. This Chapter seeks to demonstrate how the ecological conditions within Woodsmith Mine, Ladycross Plantation and Lockwood Beck have changed in accordance with the approved Planning Permissions and where some changes have diverged from the approved Planning Permissions.
212. Since the commencement of construction, Woodsmith Mine, Ladycross Plantation and Lockwood Beck have undergone regular ecological monitoring, primarily to provide data to inform future management decisions and the development of Anglo American's biodiversity strategy for the Woodsmith Project. A range of habitat and protected species surveys have been completed by Paul Chester and Associates (PCA) and The Industry Nature Conservation Association (INCA) (please see **Appendix A – Woodsmith Project – A summary of ecological monitoring, surveys and observations at Woodsmith Mine, Ladycross Plantation and Lockwood Beck 2017-2025**, (PCA and INCA, 2025)). While not originally intended to feed into EIA, the results of these surveys provide replicated data, collected over a number of years which can be used to robustly detect and describe ecological change arising because of, or in spite of the ongoing construction activities at each site.

7.1.1 Legislation and policy

213. Wildlife and habitats within the UK are subject to a range of legislative and policy driven protection and conservation measures. Legislation of relevance to this Chapter is listed below:
- The Habitats Directive (92/43/EEC).
 - The Birds Directive (2009/147/EC).
 - The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.
 - The Wildlife and Countryside Act (1981) as amended.
 - The Environment Act (2021).
 - The Natural Environment and Rural Communities (NERC) Act (2006).
 - The Protection of Badgers Act 1992.
 - The Salmon and Freshwater Fisheries Act 1975 (SAFFA).
 - The Eel (England and Wales) Regulations 2009.

- The Management of Hedgerows (England) Regulations 2024.
- The Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024.
- The North York Moors National Park Authority Local Plan (July 2020).

7.2 Overview of existing environment and receptors

7.2.1 Designated sites

214. A desk study of international and national statutory and non-statutory designated sites was undertaken in 2014 by PCA (PCA and INCA, 2025). Designated sites identified within 10km, 5km and 2km of Woodsmith Mine, Ladycross Plantation and Lockwood Beck are summarised in **Table 7-1**, **Table 7-2** and **Table 7-3** respectively.
215. The results of this desk study were checked against the current statutory designations in September 2025 (Defra, 2025). This confirmed that there have been no changes to the statutory designations recorded since the 2014 desk study.

Table 7-1 Statutory and non-statutory designated sites within the study area of Woodsmith Mine

Site Name and Designation	Qualifying Features	Distance and Direction from the amendments to the currently Approved Extent of Works
The North York Moors SAC, SPA and SSSI	SAC features = supporting Northern Atlantic Wet Heaths with <i>Erica tetralix</i>, European Dry Heath and Blanket Bog Annex I habitat types. SPA features = ornithological interest, specifically important breeding populations of golden plover <i>Pluvialis apricaria</i> and merlin <i>Falco Columbarius</i>. SSSI features = supporting habitats and species important within a moorland ecosystem.	Adjacent to the western and southern site boundaries.
Little Beck Wood SSSI	An area of ancient woodland.	c. 0.8km west
Biller Howe Dale SSSI	An area of woodland (historic conditions)	c. 3.5km southeast
Little Beck Wood LWS	An area of ancient woodland.	c. 0.6km west

Table 7-2 Statutory and non-statutory designated sites within the study area of Lockwood Beck

Site Name and Designation	Qualifying Features	Distance and Direction from the amendments to the currently Approved Extent of Works
The North York Moors SAC, SPA and SSSI	SAC features = supporting Northern Atlantic Wet Heaths with <i>Erica tetralix</i>, European Dry Heath and Blanket Bog Annex I habitat types. SPA features = ornithological interest, specifically important breeding populations of golden plover and merlin. SSSI features = supporting habitats and species important within a moorland ecosystem.	c. 0.2km south
Kilton Beck complex LWS	Complex of woodlands which comprise examples of ancient, ancient replanted and broadleaf woodland.	Adjacent to the northern site boundary.

Table 7-3 Statutory and non-statutory designated sites within the study area of Ladycross Plantation

Site Name and Designation	Qualifying Features	Distance and Direction from the amendments to the currently Approved Extent of Works
Arnecliff and Park Hole Woods SAC	SAC features = Supports an area of Old Sessile Oak woods with <i>Ilex</i> and <i>Blechnum</i> Annex I habitat. In addition to internationally important population of Killarney fern <i>Trichomanes speciosum</i> .	3.4km southwest
The North York Moors SAC & SPA	SAC features = supporting Northern Atlantic Wet Heaths with <i>Erica tetralix</i>, European Dry Heath and Blanket Bog Annex I habitat types. SPA features = ornithological interest, specifically important breeding populations of golden plover and merlin.	4.6km southwest

7.2.2 Habitats

216. The following paragraphs summarise the main habitats present within the Woodsmith Mine, Ladycross Plantation and Lockwood Beck in 2025. These habitats were assessed by PCA using the UKHab habitat classification methodology (UKHab, 2023). The habitats were previously categorised in 2014 using the Phase 1 Habitat Survey methodology (Royal HaskoningDHV, 2014).
217. To visually demonstrate the changes in habitat types and ecological interest, aerial photos of each Site are provided in **Appendix A**. These show images of the Sites before the commencement of construction and in present day (2025).

7.2.2.1 Woodsmith Mine

218. Prior to the commencement of construction, Woodsmith Mine was dominated by pasture habitats with substantial areas of broadleaved and mixed woodland plantation. Other habitats present included:
- Hardstanding and buildings.
 - Pasture grassland.
 - Semi-improved grassland.
 - Marsh/ rush pasture.
 - Broadleaved semi-natural woodlands.
 - Scrub.
 - Ditches.
 - Ponds.
219. By 2025, Woodsmith Mine had reached an advanced stage of construction, with significant ecological changes evident across the Development Area and wider site.
220. The construction works mainly affected the area of pasture and arable habitat which were present at the 2014 baseline.
221. The majority of the other habitats which were present in the baseline, including broadleaved semi-natural woodlands, have been retained and enhanced alongside the Woodsmith Mine. In addition, a number of new habitats have been created or allowed to develop naturally, following the cessation of their former agricultural or forestry use. These include:
- Lowland meadow.
 - Other neutral grassland.
 - Wetlands.
 - Ponds.
 - Dense scrub.
 - Developed land; sealed surface.
 - Artificial unvegetated, unsealed surfaces.
 - Hedgerows.
 - Other habitats (swales/ ditches).
222. Notably, the meadow surrounding the surface water management ponds and wetland, established using a combination of commercial seed mix and green hay from a local donor site, now supports over 70 plant species, including uncommon grasses and forbs such as meadow barley *Hordeum secalinum*, quaking-grass *Briza media*, and common spotted-orchid *Dactylorhiza fuchsii*.
223. Moreover, supplementary planting within the Belt Plantation has improved woodland structure and diversity, with natural regeneration of oak now observed. The woodland has become increasingly

valuable for breeding and wintering birds, including spotted flycatcher *Muscicapa striata*, a nationally declining species. Additionally, the creation of wet heath habitat within Haxby Plantation has supported breeding adder *Vipera berus* and the first record of slow worm *Anguis fragilis* on-site in 2024. Hedgerow enhancement and the removal of rhododendron *Rhododendron ponticum* (an invasive species listed under Schedule 9 of the Wildlife and Countryside Act (1981)) have further contributed to habitat quality.

224. As part of the amendments to the currently Approved Development, the Woodsmith Mine Development Area is changing. The relocation of the welfare facility, offices and car parking from Haxby Plantation onto the existing development platform, behind the future screening bunds results in an overall reduction of lateral Development Area across the Site. Moreover, the majority of the Extent of Works remains undeveloped and has been subject to habitat enhancement compared to the 2014 baseline conditions.

7.2.2.2 Ladycross Plantation

225. In 2014, Ladycross Plantation was dominated by arable habitats and improved grassland. Other habitats present included:
- Pasture.
 - Buildings.
 - Plantation woodland.
 - Broadleaved woodland.
 - Species-poor marsh.
 - Field boundaries.
 - Ditches.
 - Rush pasture.
 - Heather.
226. As part of the amendments to the currently Approved Development, the quantum of habitat loss for development purposes will reduce, compared to the proposals consented in 2014. This is primarily driven by the removal of the requirement for the permanent placement of tunnel arisings into a waste management facility in a field of improved grassland (approximately 2 ha) to the north-east of the site.
227. Construction activities commenced at Ladycross Plantation in 2021. The main habitats affected by construction were limited to previous areas of arable and a small area of broadleaved woodland. When works commenced, areas of the site immediately outside the Development Area but within the Extent of Works were taken out of agricultural use and allowed to regenerate naturally or have been seeded to create more ecologically valuable habitats.
228. The majority of other habitats which were present in the baseline, including most of the broadleaved woodland, marsh and heather have been retained alongside the Ladycross Plantation itself.
229. In 2025, the habitats within the Development Area were dominated by developed land, sealed surfaces and artificial unvegetated, unsealed surfaces, with smaller areas of establishing neutral grassland. Land within the Extent of Works, and outside of the Development Area, include an area of rush pasture grassland. This has allowed a natural transition into a grassland-heath mosaic, supporting species such as heather *Calluna vulgaris*, purple moor-grass *Molinia caerulea*, and marsh thistle *Cirsium palustre*. In addition, trial thinning of dense downy birch woodland within the west of the Site has improved structural diversity and ground flora, with potential for wider application in future management.

230. A particularly notable botanical record for the Development Area is what is believed to be marsh stitchwort *Stellaria palustris*, found within grassland in the north of the Site (**Appendix A**). This species, now rare and declining nationally, has not been recorded in the North York Moors National Park since 2000.
231. By way of summary, amendments to the Approved Development will reduce the Development Area and facilitate continued habitat enhancements which are occurring within the wider Extent of Works.

7.2.2.3 Lockwood Beck

232. Prior to the commencement of construction, Lockwood Beck was dominated by arable habitats and improved grassland. Other habitats present included:
- Species-rich rush pasture.
 - Woodland.
 - Field boundaries.
 - Ditches.
 - Scrub.
 - Watercourse.
233. As part the amendments to the currently Approved Development, the removal of the requirement for the permanent storage of tunnel arisings in a waste management facility reduces the Extent of Works by approximately 15 ha (land dominated by arable habitats and improved grassland), which has been returned to agricultural use. In addition, an area of approximately 6.5 ha, retained within the Extent of Works, which had been consented for use as a waste facility, is no longer required and will instead be subject to management as part of Anglo American's wider biodiversity enhancement activities.
234. Construction commenced at Lockwood Beck in 2017. To date, the main habitats affected by construction were limited to areas of habitat classified as arable and improved grassland in 2014, now comprising developed land; sealed surface and artificial unvegetated, unsealed surfaces.
235. Outside the construction footprint but within the Extent of Works, the cessation of agricultural use has allowed for the natural regeneration of habitats including neutral grassland, dense scrub, and marshy grassland mosaics.
236. Of particular success has been an area of species rich grassland establishment in the north-west of the Extent of Works. This area is becoming increasingly well-structured, supporting over 30 characteristic species, including Lady's bedstraw *Galium verum*, ragged-robin *Silene flos-cuculi*, and yellow-rattle *Rhinanthus minor*. Trial clearance of a small area of dominant scrub has created a diverse habitat supporting rare flora such as fragrant agrimony *Agrimonia procera* and notable fauna including bullfinch *Pyrrhula pyrrhula* and song thrush *Turdus philomelos*. Hedgerow management at the site has shifted from annual flailing to longer rotations, improving structure and fruiting, which benefits nesting and wintering birds.
237. Areas of woodland which were present in the 2014 baseline, have been retained alongside Lockwood Beck. Importantly, amendments to the Development have removed the requirement for a haul road across Dale Beck and through an area of on-site ancient woodland. While previously demonstrated to be achievable without significant adverse impacts, the removal of these works and the related extensive earthworks associated with permanent waste facility development is significant and beneficial.

238. As a result of the proposed amendments to the currently Approved Development, the quantum of habitat loss will substantially reduce compared to the proposals granted Planning Permission in 2015.

7.2.3 Protected and notable species

239. Since the 2012/2014 baseline surveys, Anglo American has undertaken voluntary protected and notable species surveys at Woodsmith Mine, Ladycross Plantation and Lockwood Beck, with the objective of providing data to inform mitigation, management and biodiversity enhancement planning decisions. The species listed in **Table 7-4** have been recorded between 2018 and 2025, and between 2012 and 2014 (Royal HaskoningDHV, 2014) at each respective Site.
240. Breeding and wintering birds are present at all sites, with notable increases in diversity and abundance since baseline surveys. At Woodsmith Mine, breeding bird species increased from 38 in 2012 to 52 in 2025, with new records including goshawk *Accipiter gentilis*, barn owl *Tyto alba*, and reed bunting *Emberiza schoeniclus*. Wintering bird surveys have recorded larger flocks of meadow pipit *Anthus pratensis*, goldfinch *Spinus tristis*, and yellowhammer *Emberiza citrinella*, reflecting improved habitat quality.
241. Bat activity has been recorded at all Sites, with common pipistrelle being the most frequent species. Woodsmith Mine supports a wider range of bat species, including Daubenton's *Myotis daubentonii* and noctule *Nyctalus noctula*.
242. Reptiles such as adder *Vipera berus* and common lizard *Zootoca vivipara* are present at Woodsmith Mine and Ladycross Plantation, with slow worm *Anguis fragilis* recorded for the first time at Woodsmith Mine in 2024. Common toad *Bufo bufo*, common frog *Rana temporaria* and palmate newt *Lissotriton helveticus* species are present at Woodsmith Mine, particularly in newly created ponds, while Ladycross Plantation and Lockwood Beck lack viable breeding habitat. Great crested newts *Triturus cristatus* have not been recorded in any surveys or in eDNA analysis and are considered absent from all three Sites.
243. Invertebrate surveys at Woodsmith Mine and Ladycross Plantation have revealed high species richness, including nationally significant moths and dragonflies. Over 440 invertebrate species were recorded within the Woodsmith Mine meadow and wetland habitats, with many unlikely to have been present under previous agricultural use. Lockwood Beck's ancient woodlands support notable moths such as Blomer's rivulet *Venusia blomeri* and square-spotted clay *Xestia stigmatica*.
244. Other mammals include brown hare *Lepus europaeus*, now common at all Sites outside of the Development Area, but within the Development Boundaries. Harvest mouse *Micromys minutus* have established populations at Woodsmith Mine within the grassland habitats. Otter signs have been recorded at Sneaton Thorpe Beck within Woodsmith Mine and Dale Beck at the Lockwood Beck Site, though not within or directly adjacent to the Development Areas.
245. This long-term monitoring has demonstrated positive trends in key indicator species groups, with improvements in population, diversity, and distribution at Woodsmith Mine, Ladycross Plantation, and Lockwood Beck since the commencement of development activities. These outcomes are linked to the cessation of active agricultural use at each Site, which has reduced disturbance and agro-chemical input, alongside the commitment of substantial areas within the Development Boundaries to habitat restoration and creation. Together, these factors have enhanced habitat quality and suitability for wildlife.

Table 7-4 Summary of protected or notable species which have been recorded within the Approved Extent of Works of Woodsmith Mine, Ladycross Plantation and Lockwood Beck since 2012.

Species	Recorded within the currently Approved Extent of Works		
	Woodsmith Mine	Ladycross Plantation	Lockwood Beck
Breeding birds	Yes	Yes	Yes
Wintering birds	Yes	Yes	Yes
Badgers	Yes	No – present within nearby habitats	No
Bats	Yes	Yes	Yes
Otters	Yes – Sneaton Thorpe Beck	Yes – recorded within Dale Beck	No
Water voles	No	No	No
Great crested newt	No	No	No
Amphibians	Yes	No	No
Reptiles	Yes	Yes	No
Invertebrates	Yes	Yes	No
Other Species	Yes – S41 Species of Principal Importance brown hare and harvest mouse.	Yes – S41 Species of Principal Importance brown hare and hedgehog <i>Erinaceus europaeus</i> .	Yes – S41 Species of Principal Importance brown hare.

7.3 Potential environmental impacts

7.3.1 Designated sites

246. The 2014 Application reported that the proximity of Woodsmith Mine, Ladycross Plantation and Lockwood Beck to designated nature conservation sites means that there is potential for effects to occur on the qualifying features of the designations. This may include disturbance or habitat degradation, e.g. from noise, dust, air pollution and lighting, and activities which may alter the hydrological conditions of water-dependent habitats.
247. The proposed amendments to the currently Approved Development will reduce the overall scale of the Development Area compared to the extant Planning Permissions. As a result, the potential for likely significant adverse effects on designated sites at Ladycross Plantation and Lockwood Beck is reduced. Consequently, potential ecological impacts on these designated sites will be scoped out of further ecological assessment within the EIA.
248. Similarly, the potential for likely significant adverse effects on designated sites adjacent to Woodsmith Mine is expected to reduce as a result of the proposed amendments. The 2014 Application identified potential impact pathways to the adjacent North York Moors SAC, SPA, and SSSI, particularly in relation to groundwater-dependent habitats and bird assemblages associated with Ugglebarnby Moor. However, monitoring of flora within Ugglebarnby Moor between 2017 and 2025 has confirmed that the habitats previously considered, on a highly precautionary basis, to be groundwater-dependent are in fact surface water-fed and have remained unaffected by the works completed to date (PCA and INCA, 2025).
249. In addition, breeding bird surveys (2022 to 2024) and wintering bird surveys (2023 to 2025) have demonstrated that qualifying bird assemblages are absent from this part of the designation, thereby removing the potential for likely significant adverse effects (PCA and INCA, 2025).

Furthermore, within the Woodsmith Mine Site, overall bird diversity has increased compared to 2014 baseline levels, with rising populations of scarce species such as willow tit *Poecile montanus* and nightjar *Caprimulgus europaeus* (BTO, 2025). Surveys on Ugglebarnby Moor between 2013 – 2024 demonstrated that the breeding nightjar population increased from zero pairs preconstruction, to up to nine pairs in 2024, seven years into the construction phase, further supporting the conclusion that significant adverse effects on designated bird features are unlikely. Accordingly, potential impacts on these qualifying features of the North York Moors SAC, SPA, and SSSI are scoped out of further ecological assessment within the EIA.

- 250. However, for Woodsmith Mine, the proposed amendments introduce new potential sources of air quality impact, which could affect the adjacent North York Moors SAC and SSSI, as detailed within **Chapter 10 Air Quality**. Therefore, potential designated site impacts from changes in air quality at Woodsmith Mine are scoped in for assessment within the EIA. These effects will be assessed in full within an Air Quality EIA chapter.
- 251. All other matters relating to designated sites are scoped out of further ecological assessment within the EIA.

7.3.2 Habitats

- 252. Permanent and temporary losses of habitat within Woodsmith Mine, Ladycross Plantation and Lockwood Beck were anticipated as part of the 2014 ES (Royal HaskoningDHV, 2014). However, habitat surveys undertaken between 2018 and 2025 demonstrate that a range of new habitats have since been established. These include species-rich meadows, wetlands, scrub mosaics, and enhanced hedgerows. The proposed amendments to the Approved Development result in a reduced overall extent of habitat loss, with substantial portions of the Extent of Works remaining undeveloped and/or ecologically improved at Woodsmith Mine, Ladycross Plantation and Lockwood Beck.
- 253. **Appendix A** provides before-and-after imagery illustrating the ecological improvements that have occurred since the cessation of agricultural activity and the commencement of construction. These changes have facilitated natural habitat recovery and the creation of new habitats across significant areas of the Sites.
- 254. The amendments to the Approved Development reduce the overall quantum of habitat loss, thereby lowering the potential for adverse ecological effects. Given these positive changes, it is proposed that habitats be scoped out from further impact assessment at the EIA stage. Further justification for this approach is outlined below.

7.3.2.1 Woodsmith Mine

- 255. The revised Development Proposals for Woodsmith Mine include the removal of certain previously approved infrastructure elements, resulting in a reduced lateral development footprint. Much of the Extent of Works remains undeveloped and has undergone ecological enhancement when compared to the 2014 baseline. These changes contribute to a net ecological benefit at the Site.

7.3.2.2 Ladycross Plantation

- 256. Under the currently Approved Development proposals, the grassland within the northern part of the Extent of Works was approved for permanent storage of tunnel arisings, which would have necessitated the removal of most existing grassland. Although long-term landscaping and biodiversity enhancements were planned under the 2014 proposals, the initial impact would have been adverse. Instead, under the revised Development Proposals, agricultural pressures have been removed since 2020, when it was last grazed, with no application of agrochemicals since 2018. The land has not been cut and baled for the last three years. This has allowed a period of

natural recovery, during which time habitat complexity and diversity is improving, along with related benefits of reduced runoff of agrochemicals to surface water. The northern field has been set aside throughout this period and is being actively monitored to inform future biodiversity enhancement measures under the Ladycross Plantation Landscape and Ecological Management Plan, required under an extant Planning Condition. Habitats in this area are expected to continue maturing in complexity and ecological value, with natural heath expansion and tree regeneration already underway.

7.3.2.3 Lockwood Beck

- 257. As part the amendments to the currently Approved Development, the Lockwood Beck Extent of Works will be reduced by approximately 15 ha, an area previously approved to be developed as a waste management facility which primarily comprises arable land and improved grassland. Additionally, an area of approximately 6.5 ha, previously similarly approved for development as a waste facility, is now developing as species rich grassland and grassland/scrub mosaic.
- 258. In addition, as a result of these changes, there is no longer the requirement to construct a haul road across Dale Beck and through an area of ancient woodland at Lockwood Beck. As a result, potential impacts on the watercourse, the ancient woodland, and associated species will no longer occur. This represents a highly positive outcome for the ecological integrity of the Site.
- 259. These changes represent a significant ecological gain and further reduce the potential for adverse habitat impacts.

7.3.3 Protected and notable species

- 260. A range of protected and notable species were recorded within Woodsmith Mine, Ladycross Plantation and Lockwood Beck as part of the ecological surveys which informed the Approved Development in 2014.
- 261. The monitoring surveys which have been carried out since 2018 demonstrate that these species groups have been successfully retained within the Development Boundaries of the Sites and are increasing in population, diversity and resilience, at least in part as a result of the habitat restoration and creation works being carried out and the successful implementation of construction controls intended to minimise disturbance. This has been demonstrated alongside the commencement and ongoing works within the Development Areas of the Sites.
- 262. The amendments to the currently Approved Development have reduced the scale of the currently Approved Development, thus impacts and risks to protected and notable species will also reduce.
- 263. Given the reduction of potential ecological impacts, compared against the extant Planning Permissions, monitoring data and observations which demonstrate positive ecological trends and commitment to continued implementation of the demonstrably effective ecological management plans, controlled by the extant Planning Conditions, the amendments to the currently Approved Development are anticipated to have no adverse effects on protected or notable species. Therefore, it is proposed that protected or notable species are scoped out from further impact assessment at the EIA stage.

7.3.4 Potential cumulative impacts

- 264. Potential ecological impacts of the amendments to the currently Approved Development are reduced when compared against the currently Approved Development. As above, with ongoing commitment to and implementation of the demonstrably effective ecological management plans,

the continued imposition of the extant Planning Conditions, impacts against all ecological features are proposed to be scoped out of the formal EIA process.

265. Therefore, there are no residual impacts anticipated which could contribute towards cumulative impacts within or beyond Woodsmith Mine, Ladycross Plantation or Lockwood Beck.

7.3.5 Summary of scoping proposals

266. **Table 7-5** summarises the potential terrestrial ecology impacts which are proposed to be scoped into the EIA.

Table 7-5 Summary of potential impacts proposed to be scoped in (✓) and out (x) for the terrestrial ecology assessment

Potential Impacts	Phase	Site		
		Woodsmith Mine	Ladycross Plantation	Lockwood Beck
Impacts to designated sites	Construction	x	x	x
	Operation	x	x	x
	Decommissioning	x	x	x
Permanent and temporary loss of habitats	Construction	x	x	x
	Operation	x	x	x
	Decommissioning	x	x	x
Impacts on protected species or on their resting or breeding sites	Construction	x	x	x
	Operation	x	x	x
	Decommissioning	x	x	x
Cumulative impacts	Construction	x	x	x
	Operation	x	x	x
	Decommissioning	x	x	x

7.4 Approach to EIA

267. Ecological monitoring across Woodsmith Mine, Ladycross Plantation, and Lockwood Beck demonstrates that biodiversity trends have been positive since the Approved Developments were consented in 2014. Habitat creation, restoration, and management measures implemented under previous approvals have successfully mitigated earlier impacts and, within the broader Development Boundaries, measurably enhanced ecological value of habitats and for wildlife. These outcomes indicate that the baseline conditions for ecology are stable and improving.
268. The Amended Development proposals further reduce potential ecological impacts. Key refinements include minimising habitat loss and retaining features, such as areas of ancient woodland at Lockwood Beck, that provide essential resources for wildlife, such as foraging and shelter opportunities.
269. In light of these factors, the Proposed Approach to EIA is to scope ecology out of the assessment. The combination of demonstrated ecological improvements and design amendments that avoid or reduce habitat disturbance ensures that potential adverse residual impacts are negligible. Consequently, further detailed ecological assessment is not considered necessary for the Amended Development.

Table 7-6 Ecological monitoring surveys completed on a voluntary basis to inform ongoing management and mitigation (✓) since the submission of the 2014 ES

Year	Survey Type	Site		
		Woodsmith Mine	Ladycross Plantation	Lockwood Beck
2018	Bats	✓	-	-
2019	Bats	✓	-	-
2020	Bats	✓	-	-
2021	Bats	✓	✓	-
2022	Bats	✓	✓	-
2023	Bats	✓	✓	-
2024	Bats	✓	✓	-
2025	Bats	✓	✓	-
2022	Birds - breeding	✓	✓	✓
2023	Birds - breeding	✓	✓	✓
2024	Birds - breeding	✓	✓	✓
2025	Birds - breeding	✓	✓	✓
2022	Birds - wintering	✓	-	✓
2023	Birds - wintering	✓	-	✓
2024	Birds - wintering	✓	✓	✓
2025	Birds - wintering	✓	✓	✓
2023	Harvest mouse	✓	-	-
2022	Terrestrial Invertebrates	✓	-	-
2023	Terrestrial Invertebrates	✓	-	-
2021	Moths	✓	-	-
2022	Moths	✓	✓	✓
2023	Moths	✓	✓	✓
2023	Reptiles	-	✓	✓

7.5 Potential mitigation measures for key impacts

270. At all Sites, the existing and effective package of mitigation and monitoring will continue to be applied. This includes the submission of updated plans (e.g. CEMP and Protected Species Management Plans) for each Phase of construction, as is done currently. As this approach has been robust and successful over the last eight years, there is high confidence that it will continue to result in positive outcomes for ecology across all three Sites.

8 Landscape and Visual Impact

8.1 Introduction

271. This Chapter outlines the scope and methodology for the assessment of the impacts on Landscape and Visual Impact receptors arising from the construction, operation and decommissioning of the amendments to the currently Approved Development. The assessment will be undertaken by a Director of DRaW (UK) Limited, a Registered Practice of the Landscape Institute.
272. LVIA's for Woodsmith Mine, Ladycross Plantation, Lockwood Beck and Tocketts Lythe were included in the 2014 ES for the currently Approved Development. In 2015, an updated LVIA formed part of a Supplementary Environmental Information report to accompany amendments at Woodsmith Mine. In 2017, a Supplementary Environmental Statement was submitted in support of a Section 73 Application relating to amendments to development at Woodsmith Mine.
273. A comprehensive Cumulative LVIA was also undertaken that included development sites across the North York Moors National Park, assessed in combination with proposed construction related features (winding towers) at Woodsmith Mine, Ladycross Plantation and Lockwood Beck.
274. The 2014 LVIA's adopted a 'total receptor' methodology identifying all landscape and visual receptors within an overall study area of 6km from the site boundaries and located within the Zones of Theoretical Visibility (ZTVs). It was agreed with the NYMNPA that the 2017 Section 73 application for Woodsmith Mine should focus on additional or different environmental effects that had not previously been identified as part of the original EIA process.
275. The proposed scope of the LVIA's is to follow a similar format to the 2017 Section 73 application, adopting a focused approach to landscape and visual effects for Woodsmith Mine, Ladycross Plantation and Lockwood Beck.

8.2 Approach to EIA

276. The LVIA methodology will adopt the following best practice guidance:
- Landscape Institute and Institute of Environmental Assessment and Management (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3), 2013.
 - Landscape Institute Technical Guidance Note (2024), Notes and Clarifications on Aspects of Guidelines for Landscape and Visual Impact Assessment Third edition (GLVIA3) LITGN-2024-01, August 2024.
 - Landscape Institute Technical Guidance Note (2021) Assessing Landscape Value Outside National Designations LITGN 02/21.
 - Landscape Institute Technical Guidance Note (2019) Residential Visual Amenity Assessment (RVAA) LITGN 2/19.
 - Landscape Institute Technical Guidance Note (2019) Visual Representation of Development Proposals LITGN 06/19, September 2019.
277. To allow effective interpretation and comparison of effects, the proposed LVIA methodology (including receptor sensitivity, magnitude of effect and the significance of effect) will follow, as closely as possible, the 2014 LVIA methodology. Variation in methodology will only occur where current or revised best practice guidance or legislation requires changes. Given that the key guidance literature (Guidelines for Landscape and Visual Impact Assessment, 3rd Edition) used in the original LVIA assessment remains current, there will be no significant change to proposed LVIA methodology. The assessment of changes in landscape and visual effects incurred by the

amendments to the currently Approved Development, using the currently Approved Development as a baseline, will include the following:

- Identify physical landscape effects that will arise from the amendments to the currently Approved Development.
- Identify changes that will be likely to be noticeable in terms of effects on landscape character and visual receptors and which might give rise to a change in the magnitude and significance of previously reported impacts.
- Consider the nature of each individual change, in terms of scale and contrast compared to the currently Approved Development.
- Identify whether the amendments to the currently Approved Development will affect new receptors not previously identified in previous LVIA reporting and assess potential effects to those receptors.

8.2.1 Representative viewpoint assessment and photography

278. In adopting a focused approach to LVIA, the proposed methodology for the assessment of visual effects is the use of 'representative viewpoints'. A selected series of viewpoints will be photographed to enable the description and assessment of predicted effects experienced by various types of visual receptor, including users of public rights of way, residential properties, transport routes, heritage and recreational sites. Selected viewpoints may include specific locations that are popular vantage points or tourist destinations.
279. The selection of representative viewpoints will partly be based upon photomontage locations used in the currently Approved Development LVIA; those locations being representative of a range of receptors that were considered most susceptible to changes in the view, either at construction stage, operational stage or both.
280. Proposed representative viewpoint locations are listed in the following sections for each site. Certain viewpoints will be representative of multiple receptor types and as such will avoid repetition of effects that occurred in the original 'total receptor' studies.
281. Additional viewpoint locations may be included that are identified during site field work or are requested by the determining authorities.

8.2.2 Photomontage visualisations

282. Computer generated photomontages will be used to illustrate the effects of the amendments to the currently Approved Development at a 'worst case' construction stage and Year 1/ Year 15 operational stages. The locations of photomontages will be selected from the representative viewpoints. Proposed photomontage locations are listed in the following sections for Woodsmith Mine, Ladycross Plantation and Lockwood Beck.

8.2.3 Extent of the study area

283. The proposed extent of the study area for Woodsmith Mine, Ladycross Plantation and Lockwood Beck will be as the currently Approved Development assessment, i.e. 6km from the site boundary.

8.2.4 Assumed baseline

8.2.4.1 Construction stage

284. The proposed baseline for the assessment of construction stage effects is from the point where commencement of proposed construction activity deviates in nature, extent and timing from the current, approved construction activity. The premise for the assessment of construction stage

effects will be a 'worst case' phase of works where the greatest number of tall plant, cranes, earthworks etc. are present/ visible at a given point in time.

285. Other factors, including revised construction methodology, changes in timing and duration of works, i.e. formation of earth bunds, phased planting etc., will be considered in the assessment of landscape and visual effects.

8.2.4.2 Operational stage

286. The proposed baseline for the assessment of operational stage effects is the currently Approved Development for Woodsmith Mine, Ladycross Plantation and Lockwood Beck. Amendments to the currently Approved Development operational stage effects will be assessed against the currently Approved Development.
287. Other factors, including the revised layout of restoration proposals and the potential effects of the phasing and establishment of restoration planting proposals will be considered in the assessment of landscape and visual effects.

8.2.5 Supporting drawings and information

288. The LVIAs will be supported by drawings and information as per the 2014/ 2015 ES. Receptor numbering/ references will be retained as the original ES with new receptors clearly identified. The LVIAs will include the following figures:
- Landscape Constraints and Designations Plan.
 - Landscape Character Areas Plan.
 - Topographical Analysis Plan.
 - Visual Analysis Plan showing the ZTVs, visual barriers and viewpoint locations.
 - Viewpoint Photographs, produced in accordance with the Landscape Institute 'Technical Guidance Note 06/19'.
289. All baseline information relating to landscape and visual receptors will be reviewed and updated as required. Viewpoint photography will be re-taken from the original photograph locations. Only selected viewpoints will be updated as appropriate to the findings of initial site assessment. Where new photograph locations are used these will be clearly identified.
290. Selected photomontage locations used in the currently Approved Development assessment will be re-photographed and photomontages updated to illustrate proposed construction and operational stage features.
291. A descriptive narrative will be provided, reviewing potential changes to landscape character, visual, perceptual, night-time, special qualities and cumulative LVIA effects and impacts arising from the amendments to the currently Approved Development. Changes in impact category or duration of impact between the proposed and currently Approved Development will be highlighted.

8.3 Potential environmental impacts

8.3.1 Woodsmith Mine

8.3.1.1 Landscape

292. Physical landscape effects will primarily be derived from the proposed:
- Relocation of the permanent Welfare to within the main shaft platform, reducing tree felling in Haxby Plantation.
 - Alteration of the approved eastern bunds.

293. The proposed focus of landscape character assessment will be those notably affected by the amendments to the currently Approved Development. The proposed assessment will focus on the following landscape character areas:
- Coast and Coastal Hinterland (4b) Whitby – Cloughton.
 - Moorland (1b) Central and Eastern Moors.
294. Landscape character effects will primarily be derived from the amendments to the currently Approved Development construction works, including the use of tall plant, cranes and lighting. Predicted landscape effects will be comparable, and no worse than currently Approved Development effects, with beneficial effects derived from the increased retention of existing woodland areas in comparison to the currently Approved Development.
295. Operational stage effects are predicted to be comparable to those identified for the currently Approved Development, with no significant adverse effects to landscape character and slight beneficial effects due to greater retention of woodland and long-term establishment of restoration planting.

8.3.1.2 Visual

296. The proposed location of representative viewpoints and photomontages used in the LVIA are provided in **Table 8-1**.

Table 8-1 Proposed representative viewpoints and photomontage locations

Representative Viewpoint Location (Using 2014 ES referencing)	Photomontage View & Commentary
Sneaton Thorpe	None proposed
Stainsacre	None proposed
Catwick House Farm (ref 48)	None proposed
Middle Rigg (ref 51)	None proposed
Parkdown residential property (ref 1)	None proposed
Blue Bank car park off the A169 road (View 3)	(Photomontage VP02) Construction stage view only. Operational stage views will remain as the currently Approved Development.
A171 The Stables (View 37)	None proposed
Grounds of Whitby Abbey (View 24)	(Photomontage VP04) Construction stage view only. Changes to operational stage views will not be discernible.
Ugglebarnby Moor/ Bridleway 312029 (View 12)	None proposed
B1416 nr. entrance to Knaggy House Farm (View 05)	(Photomontage VP06) Construction and operational stage views.
Sneaton Low Moor/ Coast to Coast Walk (View 08)	None proposed
Raikes Lane/ Moor to Sea Cycle Network (View 13)	(Photomontage VP08) Construction and operational stage views.
A171 Robin Hood's Bay Road (View 20)	(Photomontage VP11) Construction and operational stage views.
Low Hawsker and High Hawsker (View 31)	None proposed
Fylingdales Moor (View 51)	None proposed

Representative Viewpoint Location (Using 2014 ES referencing)	Photomontage View & Commentary
Coast to Coast Walk at B1416 to Stainsacre Lane	None proposed

297. Visual effects will primarily be derived from proposed construction stage works, including the use of tall plant, cranes and lighting and an additional tower constructed. Predicted effects will be comparable, and no worse than currently Approved Development effects.
298. Operational stage effects will consider the proposed relocation or addition of above ground structures/ facilities to that currently Approved Development. Overall, effects are predicted to be comparable to those identified for the currently Approved Development, with no significant adverse visual effects.

8.3.2 Ladycross Plantation

8.3.2.1 Landscape

299. Physical landscape effects will primarily be derived from alterations to the currently Approved Development:
- No extractive material is to be deposited at Ladycross Plantation, substantially reducing the extent of earthworks, vegetation removal and required landscape restoration.
 - Introduction of an emergency backup facility.
 - Relocation of the shaft and associated headhouse.
 - Amendment of the site access junction.
 - Revised restoration planting scheme.
300. The proposed focus of landscape character assessment will be those notably affected by the currently Approved Development. Proposed assessment will focus on landscape character areas:
- Central Valley (8b) Lower Esk Valley (NYMNP).
 - Coast and Coastal Hinterland (4a) Boulby – Whitby.
301. No significant change to effects upon landscape character is predicted during the construction stage of the shaft headhouse building and operational surface areas. Potential adverse landscape character effects will be derived from the use of tall plant, cranes and lighting with effects comparable to the currently Approved Development.
302. The amendments to the currently Approved Development will not require disposal of extractive material on site, or the construction of a haul road, significantly reducing construction related activity with beneficial effects upon landscape character in comparison to the currently Approved Development. The reduction in removal of vegetation will derive further beneficial effects.
303. There will be no change to landscape character effects identified for the currently Approved Development during operational stages of the amendments to the currently Approved Development.

8.3.2.2 Visual

304. Predicted construction stage visual effects incurred by the currently Approved Development included a limited number of residential receptors with most effects experienced by users of public rights of way and open access land. Predicted adverse visual effects were primarily derived from the proposed use of a tall winding tower with only limited views affected by the disposal and grading of extractive material.

305. The amendments to the currently Approved Development are predicted to incur significantly reduced visual effects, both during construction and operational stages of Ladycross Plantation.
306. The amended site access junction may incur an additional visual impact in a narrow, transitory view from the lane to the south of the site, towards the re-orientated shaft headhouse. The LVIA will include assessment of this potential effect.
307. Overall, both landscape and visual effects are predicted to be improved in comparison with the currently Approved Development. No significant operational stage effects are predicted.
308. The proposed location of representative viewpoints used in the LVIA are provided in **Table 8-2**.

Table 8-2 Proposed representative viewpoints and photomontage locations

Representative Viewpoint Location (Using 2014 ES referencing)	Photomontage View & Commentary
Egton	None proposed
Grosmont	None proposed
Watergate Farm (ref 4)	None proposed
Abbotsford and Flushing Meadow (ref 12)	None proposed
Moorfields (ref 13)	Commentary only
Footpath 310049 (Egton). Crosses site	Commentary only
Footpath 310050 (Egton).	Commentary only
Footpath 310046 (Egton)	Commentary only
Footpath 310066 (Egton)	None proposed
Bridleway 322008 (Hutton Mulgrave)	None proposed
Bridleway 310055 (Egton)	None proposed
Lady Cross Plantation Caravan & Lodge Park	Commentary only
Users of Access Land to the east of site at Egton Low Moor	Commentary only
A171 road to northeast & northwest of the site	Commentary only
Lane between Egton to A171 passing immediately to the south and east of site	Photomontage of the operational stage view along the access road.

8.3.3 Lockwood Beck

8.3.3.1 Landscape

309. Physical landscape effects will primarily be derived from amendments to the currently Approved Development:
- Relocation of the MTS shaft and associated headhouse.
 - Increase in extent of the approved operational surface layout.
 - Introduction of additional infrastructure within the operational surface layout.
 - No extractive material is to be deposited at Lockwood Beck, substantially reducing the extent of earthworks, vegetation removal and required landscape restoration.
 - Revised restoration scheme, including planting and earth modelling.
310. The proposed focus of landscape character assessment will be those notably affected by the currently Approved Development. Proposed assessment will focus on landscape character areas:

- P2 - Moorland Fringe Farmland (South Lingdale).
- P3 - Moorland Fringe Farmland (Moorsholm).
- P10 - Incised Wooded Valley (Kilton Beck/ Handale Beck).
- Moorland, (1c) Northern Moors (NYMNP).
- Coast and Coastal Hinterland (4a) Boulby – Whitby (NYMNP).

311. Adverse landscape character effects will be derived from the amendments to the currently Approved Development construction stage works within the operational surface layout, including the use of tall plant, cranes and lighting. Predicted effects will be comparable to currently Approved Development effects.
312. The avoidance of the disposal of extractive material and the associated reduction in construction related activity will be significantly beneficial to landscape character in comparison to the currently Approved Development. The avoidance of removing areas of established trees, scrub and hedgerow and dry-stone walls will derive further beneficial effects.
313. The greater extent of built form and infrastructure within the relocated operational surface area is predicted to incur slightly greater adverse landscape character effects during early operational stages, i.e. before proposed restoration planting has established. In the longer term, proposed planting, in combination with earth modelling, will provide an effective screen to operational features within Lockwood Beck, reducing the effects of the amendments to the currently Approved Development on local landscape character.

8.3.3.2 Visual

314. The proposed location of representative viewpoints and photomontages used in the LVIA are provided in **Table 8-3**.

Table 8-3 Proposed representative viewpoints and photomontage locations

Representative Viewpoint Location (Using 2014 ES referencing)	Photomontage View & Commentary
Lockwood Beck Farm (1)/ users of Lockwood Beck Reservoir	None proposed
Row of Houses on Stanghow Road – St Mary's Bungalow to Crossways (8)	(Photomontage VP30) Operational stage views only.
Landscape View (5)	None proposed
Stanghow Road at Junction to A171	(Photomontage VP25) Operational stage view only.
Bridleway 104604 (Quaker's Causeway) & visitors to cairn fields/ round barrows, and Listed boundary stones on Stanghow Moor	(Photomontage VP37) Operational stage views only.
Footpath 126/65/1, Jenny Frisk Rd and Open Access Land	None proposed
Swindale Lane (View 15)	None proposed

315. The construction stage of the currently Approved Development introduced a significant number of adverse visual effects, particularly high sensitivity visual receptors to the north and east of Lockwood Beck where close range views would be obtained to construction of temporary stockpiles and earth mounding, using extracted materials. The avoidance of extensive earth modelling and alteration of topography will significantly reduce or avoid, adverse visual effects to certain receptors.

- 316. The relocation of the MTS shaft to the south and west (away from the existing conifer plantation), the increased operational surface and quantum of built development within Lockwood Beck will incur increased adverse visual effects during construction stages, particularly receptors to the south, alongside or using the A171 road and within the NYMNP.
- 317. Higher adverse visual effects are also predicted during early operational stages, i.e. before proposed restoration planting has established. In the longer term, proposed planting, in combination with earth modelling, will provide an effective screen to operational features, reducing the visual effects of the amendments to the currently Approved Development to those comparable with the currently Approved Development.

8.3.4 Tocketts Lythe

- 318. No development will now take place at Tocketts Lythe. The removal of construction and operational features/ activity will result in significant beneficial effects to landscape and visual receptors identified in the original reporting of the Approved Development. Similarly, cumulative landscape and visual effects will be significantly reduced in adversity, primarily those effects resulting from the Approved Development, 45m high winding tower.

8.3.5 Summary of landscape and visual receptors to be scoped in/ scoped out

- 319. **Table 8-4** summarises the proposed scope of landscape and visual assessment for Woodsmith Mine, Ladycross Plantation and Lockwood Beck. Construction stage effects were (generally) the primary source of adverse effects identified for the currently Approved Development and that pattern is predicted for the amendments to the currently Approved Development.
- 320. Operational stage effects of the amendments to the currently Approved Development at Woodsmith Mine and Ladycross Plantation will be comparable or reduced from the currently Approved Development effects. Lockwood Beck is predicted to incur higher levels of adverse effect during early operational phases although in the long-term, will be comparable to the currently Approved Development.
- 321. No significant variation in decommissioning effects is predicted for the amendments to the currently Approved Development. The EIA will provide a summary statement of decommissioning effects for Woodsmith Mine, Ladycross Plantation and Lockwood Beck.
- 322. No significant variation in nighttime lighting/ landscape character effects is predicted for the amendments to the currently Approved Development. The EIA will provide a summary statement of effects for Woodsmith Mine, Ladycross Plantation and Lockwood Beck.
- 323. The currently Approved Development assessment included a comprehensive Cumulative LVIA (CLVIA). The assessment identified significant adverse effects, typically related to combined construction stage activity, particularly related to the use of tall winding towers.
- 324. The proposed permanent use of construction stage shafts at Ladycross Plantation and Lockwood Beck and avoidance of the need for the MTS winding towers will significantly reduce proposed construction stage CLVIA effects compared to the currently Approved Development. In addition, disposal and regrading of extracted materials is no longer required at Ladycross Plantation and Lockwood Beck, and development of Tocketts Lythe is entirely removed from the amendments to the currently Approved Development.
- 325. Overall, predicted adverse cumulative effects of the amendments to the currently Approved Development will be significantly reduced in comparison to the currently Approved Development. The EIA will provide a summary statement of predicted cumulative effects.

Table 8-4 Summary of potential impacts proposed to be scoped in (✓) or scoped out (x) of the LVIA

Predicted Effect	Phase	Site		
		Woodsmith Mine	Ladycross Plantation	Lockwood Beck
Landscape (physical features)	Construction	✓	✓	✓
	Operation	✓	✓	✓
	Decommissioning	x	x	x
Landscape (character)	Construction	✓	✓	✓
	Operation	✓	✓	✓
	Decommissioning	x	x	x
Visual receptors	Construction	✓	✓	✓
	Operation	✓	✓	✓
	Decommissioning	x	x	x
NYMNP Special Qualities	Construction	✓	✓	✓
	Operation	✓	x	✓
	Decommissioning	x	x	x

8.4 Potential mitigation measures for key impacts

326. Landscape restoration measures for the amendments to the currently Approved Development will be adapted to mitigate predicted landscape and visual effects of Woodsmith Mine, Ladycross Plantation and Lockwood Beck, with the aim of further enhancing landscape character. Proposed measures (primarily earth modelling and planting) will be effective in significantly reducing or negating predicted landscape and visual effects. Certain long-term effects will be beneficial.

9 Noise and Vibration

9.1 Introduction

327. This Chapter outlines the scope and methodology for the assessment of the impacts on Noise and Vibration receptors arising from the construction, operation and decommissioning of the amendments to the currently Approved Development. The potential noise and vibration impacts on ecological species and habitats, which may be present, will be assessed in the chapters of the SES relevant to the identified receptor (**Chapter 7 Terrestrial Ecology**).
328. Across the area of the amendments to the currently Approved Development, best practicable means (BPM) have been implemented to minimise noise and vibration emissions throughout the ongoing construction processes. These measures have included:
- Regular meetings to discuss the minimisation of noise emanating from the Woodsmith Project and the potential for noise reduction for any upcoming activities.
 - Locating temporary plant so that it is screened from receptors by on-site structures, such as site cabins.
 - Where practicable, not undertaking noisy activities concurrently near residential receptors.
 - Using modern, quiet equipment and ensuring such equipment is properly maintained and operated by trained staff.
 - Applying enclosures to noisy equipment where possible.
 - Undertaking daily, pre-start inspections of plant and machinery.
 - Informing local residents about the construction works including the timing and duration of any noisy elements.
 - Providing local residents with 24-hour contact details for a site representative in the event that disturbance due to noise is perceived.
329. **Chapter 1 Introduction** describes the three locations that are being considered as part of this ESR. Woodsmith Mine and Ladycross Plantation are in the administration area of NYMNPA, and Lockwood Beck is in the administration area of RCBC.
330. Tocketts Lythe, within the administration area of RCBC, is being removed from the currently Approved Development. This will result in a beneficial impact of removing the noise emissions that would have been associated with site preparation work, creation of a drill and blast shaft, and the production of waste facilities.

9.1.1 Legislation, policy and guidance

331. The principal guidelines for the assessment of environmental impacts of noise and vibration associated with mineral developments are the 'Guidance on the planning for mineral extraction in plan making and the application process' (Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government, October 2014). The guidance provides criteria for the assessment of noise from mineral operations under normal operations and noisy short-term activities.
332. Other applicable legislation, policy and guidance includes:
- Environmental Protection Act 1990.
 - The Control of Pollution Act 1974.
 - National Planning Policy Framework (2025).
 - Noise Policy Statement for England (2010).
 - National Planning Practice Guidance on Noise (2019).
 - Calculation of Road Traffic Noise (CRTN) (1988).

- World Health Organisation (WHO) (1999) Guidelines for community noise.
- Design Manual for Roads and Bridges (DMRB), LA 111 Noise and Vibration, Revision 2 (2020).
- British Standard 5228:2009 +A1:2014 Code of practice for noise and vibration control on construction and open sites Part 1 Noise and Part 2 Vibration.
- British Standard 4142:2014 + A1:2019 'Methods for rating and assessing commercial and industrial sound'.
- Guidelines for Environmental Noise Impact Assessment (2014).

9.2 Overview of the existing environment and receptors

9.2.1 Woodsmith Mine and Ladycross Plantation

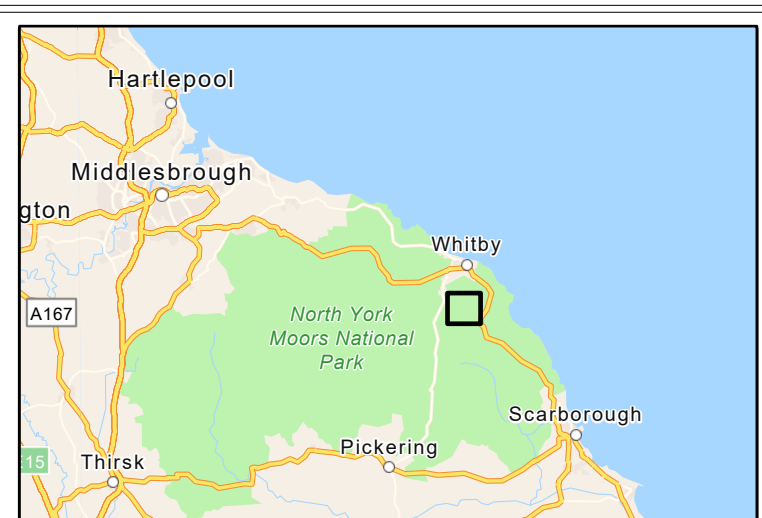
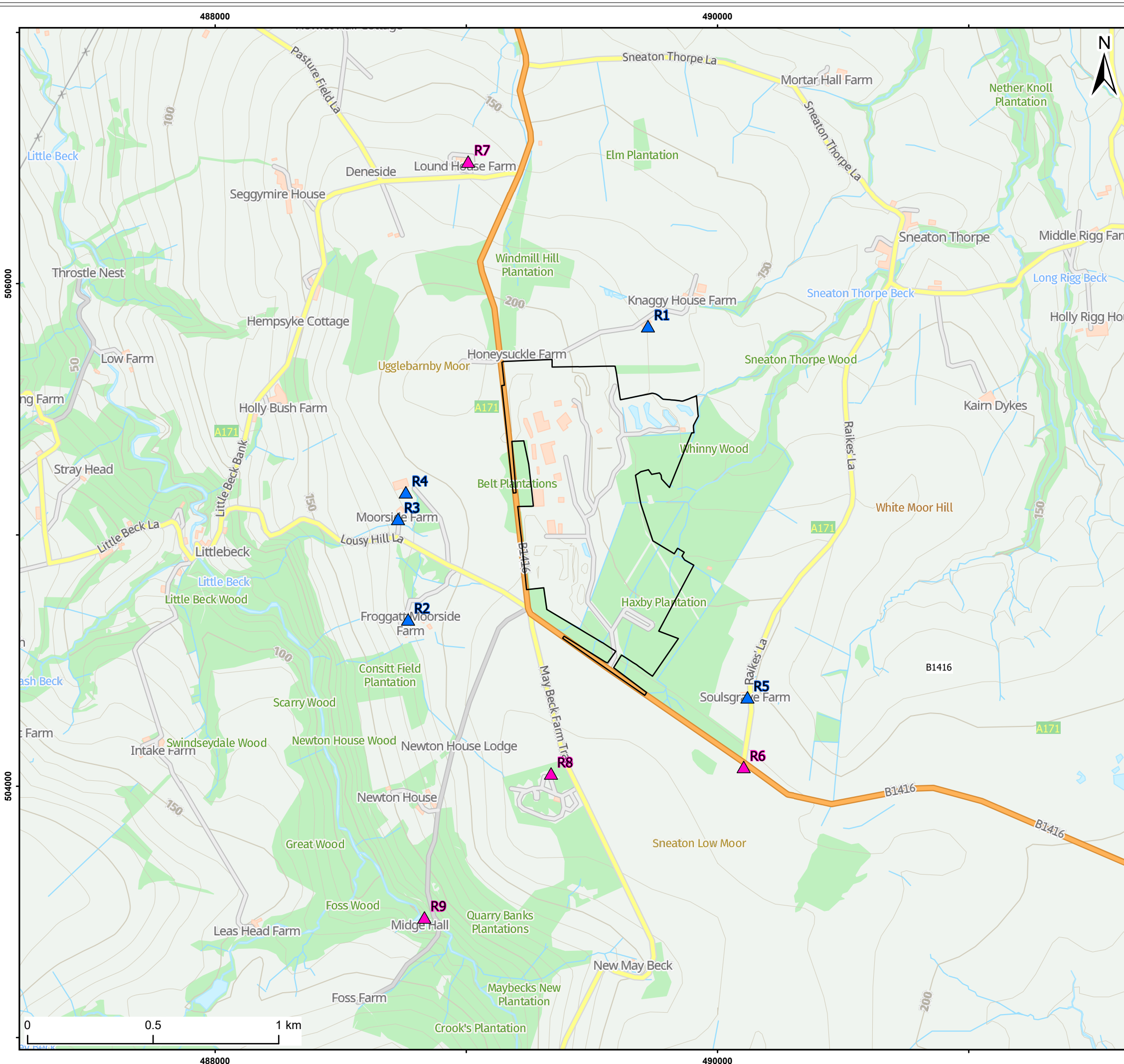
333. The surrounding area for Woodsmith Mine and Ladycross Plantation is rural with no significant industrial or commercial activities nearby. Woodsmith Mine is adjacent to the B1416 public highway with isolated residential properties, cottages, farms, and a caravan park within the surrounding area. Ladycross Plantation is located within 150m of the A171 public highway, adjacent to a caravan park, with isolated residential properties in the vicinity.
334. There are no significant sources of baseline ground-borne vibration in the local environment, and baseline vibration levels are expected to be negligible.
335. Baseline noise measurements were recorded in 2013 and reported in the 2014 ES. Continuous noise monitoring has been undertaken at sensitive receptors near Woodsmith Mine since 2017 and Ladycross Plantation since 2021. Data presented in the 2014 ES, and results from ongoing noise monitoring, will be used to represent the present-day baseline, where it can be shown that the current site operations have not contributed to the measured levels. Ordnance Survey (OS) mapping has been reviewed, and no additional noise sensitive receptors have been identified in the vicinity of Woodsmith Mine or Ladycross Plantation since those included in the 2014 ES. The key receptors that will be included in the assessment are residential dwellings and recreational locations close to Woodsmith Mine and Ladycross Plantation, as shown in **Table 9-1** and illustrated in **Figure 9-1** (Woodsmith Mine) and **Figure 9-2** (Ladycross Plantation).

Table 9-1 Receptor locations surrounding Woodsmith Mine and Ladycross Plantation

Receptor ID	Receptor Name	Receptor Classification	Sensitivity	Distance from Extent of Works (m)	Coordinates
Woodsmith Mine					
R1	Parkdown Bungalow	Residential	High	209	X: 489723 Y: 505834
R2	Thornhill Farm			486	X: 488768 Y: 504667
R3	Moorside Farm			469	X: 488728 Y: 505067
R4	Moor House Farm			424	X: 488759 Y: 505173
R5	Soulsgrove Farm			357	X: 490119 Y: 504357

Receptor ID	Receptor Name	Receptor Classification	Sensitivity	Distance from Extent of Works (m)	Coordinates
R6	Wainwright Coast to Coast Path*	Recreational	Medium	484	X: 490104 Y: 504080
R7	Lound House Caravan Park			811	X: 489007 Y: 506489
R8	Sneaton Foss Caravan Park			466	X: 489337 Y: 504054
R9	Falling Foss Tearooms*			1224	X: 488833 Y: 503481
Ladycross Plantation					
R10	Ladycross Caravan Park Owners Property	Residential	High	367	X: 481982 Y: 508031
R11	Davison Farm			179	X: 481262 Y: 507218
R12	Watergate Farm			289	X: 481902 Y: 507217
R22	Barn Cottages			260	X: 481502 Y: 507003
R13	Open access land OS Grid 816084*	Recreational	Medium	344	X:481600 Y:508400
R14	Open access land OS Grid 819077*			58	X:481900 Y:507700

* Not sensitive to night-time noise



Legend:

Extent of Works

Receptor Classification

Recreational

Residential

Source: © Haskoning UK Ltd, 2025
Base map: Contains OS data © Crown Copyright and database right 2025
Contains data from OS Zoomstack, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Project: Anglo American Woodsmith Project - Woodsmith Mine and Mineral Transport System

Title: Noise Sensitive Receptors – Woodsmith Mine

Figure:	9-1	Drawing No:	PB1110-HAS-XX-ZZ-D-Z-0003			
Revision:	Date:	Drawn:	Checked:	Size:	Scale:	
01	06/10/2025	DL	CL	A3	1:15,000	
02	28/10/2025	DL	CL	A3	1:15,000	
03	17/11/2025	DL	CL	A3	1:15,000	

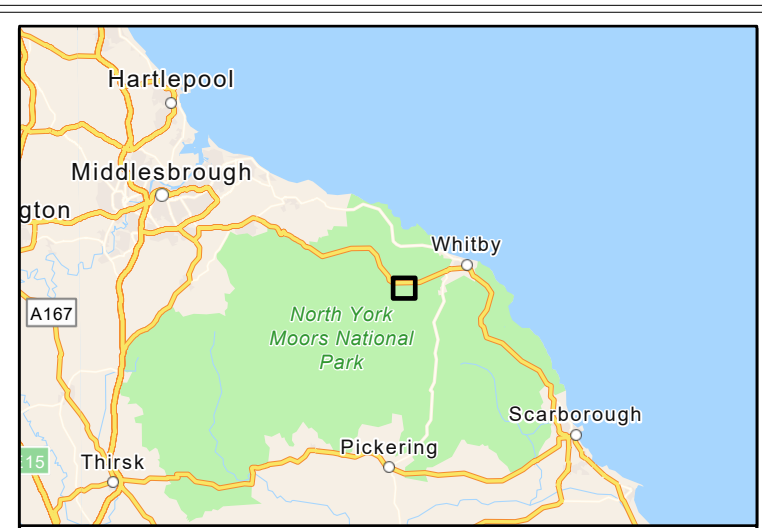
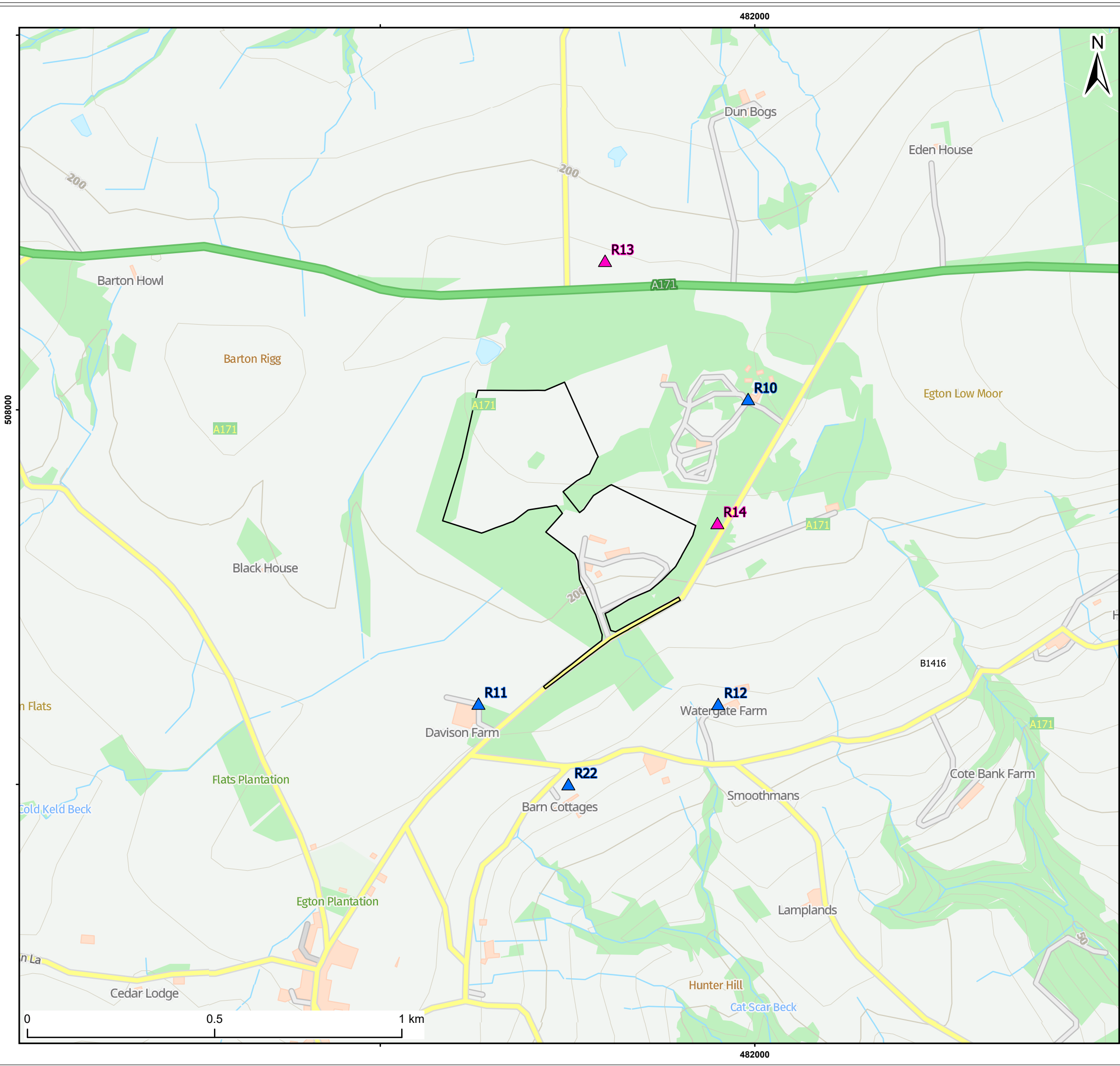
Co-ordinate system: OSGB 1936 British National Grid



Haskoning
Enhancing Society Together



Anglo American



Legend:

Extent of Works

Receptor Classification

Recreational

Residential

Source: © Haskoning UK Ltd, 2025
 Base map: Contains OS data © Crown Copyright and database right 2025
 Contains data from OS Zoomstack, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Project: Anglo American Woodsmith Project - Woodsmith Mine and Mineral Transport System

Title: Noise Sensitive Receptors – Ladycross Plantation

Figure:	9-2	Drawing No:	PB1110-HAS-XX-ZZ-D-Z-0004			
Revision:	Date:	Drawn:	Checked:	Size:	Scale:	
01	06/10/2025	DL	CL	A3	1:10,000	
02	28/10/2025	DL	CL	A3	1:10,000	
03	17/11/2025	DL	CL	A3	1:10,000	

Co-ordinate system: OSGB 1936 British National Grid

9.2.1.1 Existing controls

336. The Planning Permission for the currently Approved Development has several conditions relating to noise and vibration; these are NYMNPA-18 to NYMNPA-33. Condition NYMNPA-18 requires preparation and submission of a Noise and Vibration Management Plan (NVMP) for the control, mitigation, and monitoring of noise and vibration for both construction and operational phases at Woodsmith Mine and Ladycross Plantation. Conditions 20 to 25 impose the following noise level limits:
337. Construction phase:
- Daytime (07:00 to 19:00) mine construction noise, excluding blasting operations, shall not exceed 55dB LAeq,1h at all identified receptors.
 - Daytime noise from short-term, construction activities solely relating to the demolition of existing buildings and erection of new structures excluding earth mound and bunds shall not exceed 65dB LAeq,1hr at all identified receptors.
 - An upper daytime limit of 70dB LAeq,1hr for the purposes of temporary noisy operations to provide noise-reducing earth bunds and/ or barriers may be permitted for up to 56 days in any calendar year at all identified receptors.
 - Evening and night-time (19:00 to 07:00) mine construction noise, excluding blasting operations, shall not exceed 42dB LAeq,1h at residential receptors, Lound House Camp/ Caravan site and Sneaton Foss Caravan site.
 - Air overpressure from blasting shall not exceed 115dB (linear peak) at residential receptors.
338. Operational phase:
- Daytime operational noise shall not exceed 42dB LAr at residential receptors.
 - Night-time operational noise shall not exceed 28dB LAr at residential receptors.
 - Fixed plant and equipment noise shall not exceed 25dB LAr at residential receptors.
339. Conditions NYMNPA-26 to NYMNPA-28 identify the following limits on vibration emissions:
- Vibration from construction work on site and during operation (but excluding blasting) shall not exceed 0.3mm/s (PPV) at any residential property at any time.
 - Day time (07.00 to 19.00) ground vibration as a result of blasting shall not exceed a peak particle velocity of 6mm/s in 95% of all blasts measured over any period of six months, and no individual blast shall exceed a peak particle velocity of 10mm/s as measured at vibration sensitive buildings and infrastructure.
 - Evening (19.00 to 22.00) ground vibration as a result of blasting shall not exceed a peak particle velocity of 4.5mm/s in 95% of all blasts measured over any period of six months, and no individual blast shall exceed a peak particle velocity of 6mm/s as measured at vibration sensitive buildings and infrastructure.
 - Night-time (22:00 to 07.00) ground vibration from construction/ blasting shall not exceed a peak particle velocity of 2mm/s in 95% of blasts at residential properties and no individual blast shall exceed a peak particle velocity of 3mm/s as measured at vibration sensitive buildings and infrastructure.
340. Condition NYMNPA-29 requires that vibration from blasting associated with shaft sinking or chamber construction is monitored and that the results are reported to NYMNPA for approval. Conditions NYMNPA-30 to NYMNPA-32 include further requirements relating to the impact of blasting vibration on Ministry of Defence assets. Condition NYMNPA-33 requires that local residents and landowners are notified prior to any blasts, in accordance with a scheme approved by the NYMNPA.

341. Following commencement of construction, NVMPs have been prepared and submitted to the NYMNPA for each phase of works at Woodsmith Mine, Ladycross Plantation and Lockwood Beck (18 Phases at Woodsmith Mine and nine at Ladycross Plantation) in compliance with Condition NYMNPA-18, with the exception of Phase 19, which had a reduced scope, and therefore, a NVMP was not required to be submitted. Each NVMP has been based on 3-D modelling of the noise from the proposed activities for the relevant construction phase. The predicted noise levels at sensitive receptors have been compared with the consented noise level limits, and mitigation measures have been identified, where required, so that the limits are not exceeded.
342. Noise monitoring has also been undertaken at eight on-site locations (six at Woodsmith Mine and two at Ladycross Plantation) and at six off-site receptors (four near Woodsmith Mine and two near Ladycross Plantation). The results of the monitoring have been analysed and reported monthly to demonstrate compliance with the consented limits. The monitoring has identified many exceedances of the consented limits; however, analysis of the data has revealed that only 0.5% of the total exceedances at Woodsmith Mine and 0.3% at Ladycross Plantation were due to noise sources associated with the relevant site, or where a site-based source could not be conclusively ruled out resulting in very few exceedances of the limits set in the Planning Conditions and even fewer complaints made regarding noise from either Woodsmith Mine or Ladycross Plantation. The monitoring protocol is one minute rolling hourly average, which means that noise does not need to be persistent to result in an exceedance. Therefore, the very few exceedances recorded are primarily short durations, rather than extended periods.
343. Where exceedances were identified as being site-related, the specific cause was identified and suitable mitigation implemented as soon as practicable, e.g. where the cause was clanging of metal, training was provided to site operatives on soft-handling methods. These interventions were documented in the relevant monitoring report and have been shown to eliminate the observed exceedance. This demonstrates that the existing controls on the construction noise from Woodsmith Mine, Ladycross Plantation and Lockwood Beck are providing sufficient protection of amenity at the nearby sensitive receptors, as per the stated justification for the conditions included in the Planning Permission. There is no evidence to suggest that the amendments to the currently Approved Development would pose a higher risk of adverse noise impact.
344. The results from the blasting vibration and air overpressure monitoring, which are forwarded to the NYMNP quarterly during blasting operations as per condition NYMNPA-29, have identified that no exceedances of either the vibration or overpressure limits have been recorded at any receptor attributed to the blasting activities. On this basis, in September 2022, a request by Anglo American for a trial period of ten consecutive blasts on an unrestricted basis was approved by the NYMNPA, who requested to be notified in advance of the first trial blast after 22:00, and that monitoring results were issued for review. Monitoring results have been consistent with the conclusion that no exceedances have been identified, leading to an agreement with the NYMNPA in September 2023 that Anglo American is no longer required to issue prior blast notifications.
345. Additionally, a change in shaft sinking methodology at Ladycross Plantation has ensured that blasting has not been and will not be conducted.

9.2.2 Lockwood Beck

346. Lockwood Beck is located at the junction of the A171, Swindale Lane and Smeathorns Road.
347. Baseline noise measurements were recorded in 2013 and reported in the 2014 ES. Lockwood Beck is currently within the construction phase; therefore, no additional noise surveys will be conducted as measurements would be contaminated with noise from current site operations. Continuous noise monitoring was undertaken at sensitive receptors in the vicinity. Data presented

in the 2014 ES and results from ongoing noise monitoring will be used to represent the present-day baseline, where it can be shown that the current site operations have not contributed to the measured levels.

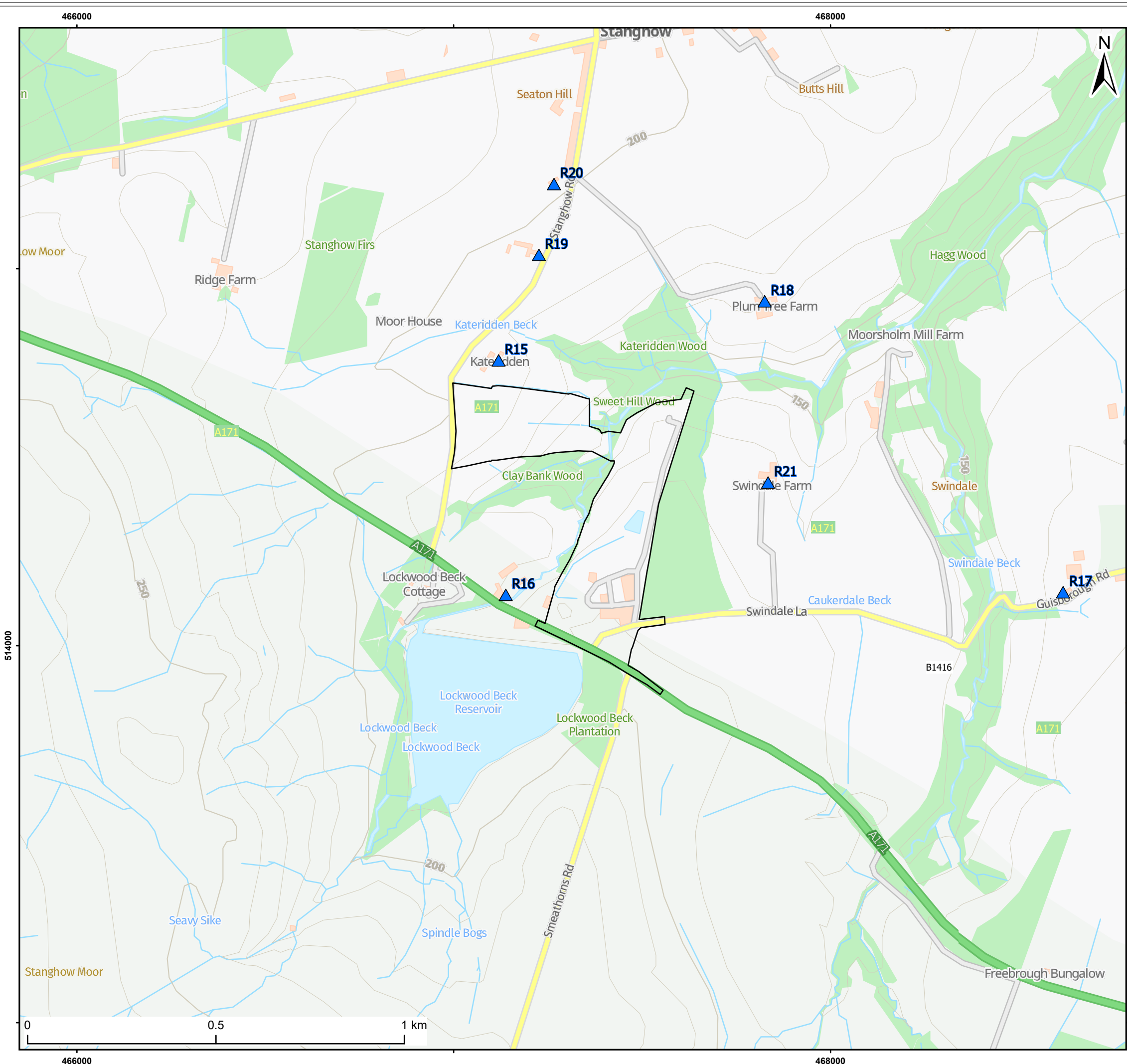
348. The key receptors considered are sensitive residential receptors close to Lockwood Beck, as shown in **Table 9-2** and illustrated in **Figure 9-3**.

Table 9-2 Receptor locations surrounding Lockwood Beck

Receptor ID	Receptor Name	Receptor Classification	Sensitivity	Distance from Extent of Works (m)	Coordinates
R15	Kateridden	Residential	High	69	X: 467119 Y: 514759
R16	Lockwood Beck Farm			110	X: 467138 Y: 514137
R17	Moorsholm Farm			1060	X: 468617 Y: 514144
R18	Plum Tree Farm			305	X: 467825 Y: 514916
R19	Property North of Kateridden			359	X: 467226 Y: 515039
R20	Property on Stanghow Road			550	X: 467266 Y: 515227
R21	Swindale Farm			259	X: 467834 Y: 514435

9.2.2.1 Existing controls

349. The existing RCBC Planning Permission has two conditions relating to noise and vibration; these are Conditions 10 and 11. Condition 10 requires Anglo American to adhere to the construction guidance given in British Standard (BS) 5228, and Condition 11 requires that operational noise levels shall not exceed the background sound level at defined residential properties.
350. Whilst the planning conditions do not require construction phase noise monitoring or compliance with noise level limits, Anglo American has undertaken continuous noise monitoring at one location, representative of the closest receptor, from 2019 to 2023, in parallel with on-site monitoring undertaken by the tunnelling contractor.
351. The detailed design of the Lockwood Beck construction activities is undertaken on a phase-by-phase basis, and the construction processes for each phase are reviewed to determine whether relatively high noise emissions are deemed likely. Where this is the case, assessments of noise from construction works at Lockwood Beck have also been undertaken, based on 3-D modelling of the noise from the proposed activities for the various construction phases.
352. The predicted noise levels at sensitive receptors have been compared with the Category A Threshold Values from the ABC Method specified in BS 5228-1 (65dB L_{Aeq} during the day and 45dB L_{Aeq} at night). Where required, additional mitigation measures were identified to ensure that these threshold values were not exceeded, irrespective of the fact that the Planning Permission does not impose these limits.



Legend:

Extent of Works

Receptor Classification

Residential

Source: © Haskoning UK Ltd, 2025
Base map: Contains OS data © Crown Copyright and database right 2025
Contains data from OS Zoomstack, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Project:

Anglo American Woodsmith Project -
Woodsmith Mine and Mineral Transport System

Title:

Noise Sensitive Receptors – Lockwood Beck

Figure: 9-3

Drawing No: PB1110-HAS-XX-ZZ-D-Z-0005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	06/10/2025	DL	CL	A3	1:10,000
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03	17/11/2025	DL	CL	A3	1:10,000

Co-ordinate system:

OSGB 1936 British National Grid

Haskoning
Enhancing Society Together

AngloAmerican

9.3 Approach to EIA

9.3.1 Woodsmith Mine and Ladycross Plantation

9.3.1.1 Construction

353. The proposed amendments to the currently Approved Scheme, as described in **Chapter 1 Introduction**, introduce additional built development, over a longer duration of construction. Construction methodologies, plant and controls will remain the same and will progress subject to the extant Planning Conditions and established noise levels.
354. As has been the case throughout construction to date, updated NVMPs will be submitted to the NYMNPA for approval, subject to any relevant consultation. The NVMPs will continue to assess the noise levels associated with defined Phases of construction and set out any measures necessary to ensure that the Phase can progress within the appropriate limits. The detailed design of the construction activities is undertaken on a phase-by-phase basis and the information required to undertake the calculations reported in the NVMPs is only available as the detailed design is completed. On that basis, no construction noise modelling will be undertaken as part of the EIA for the construction phase. The EIA will provide details of the historic monitoring results and a qualitative assessment of potential construction noise and vibration effects.
355. Construction phase traffic noise impacts will be calculated as a likely change in Basic Noise Level (BNL) using the methodology detailed in CRTN and based on baseline and with the amendments to the currently Approved Development construction traffic data, where available. The calculated changes in BNL due to the amendments to the currently Approved Development construction traffic will be assessed against the criteria within the DMRB.

9.3.1.2 Operation

356. Operational noise affecting existing residential receptors will be predicted using the guidance contained in BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. Operational phase noise level predictions will be undertaken for Woodsmith Mine and Ladycross Plantation using 3-D noise modelling software. The predicted noise levels will be compared with the measured background sound levels identified in the 2014 survey, supplemented with data from ongoing noise monitoring, where it can be shown that site operations were not contributing to the measured sound levels. This assessment will consider whether the consented operational noise level limits should be updated to more appropriate values, noting that the consented night-time noise level limits are far below the measured sound levels at the receptors, and it is therefore unlikely to be able to use real-time measurements to demonstrate compliance.
357. The operational phase will not include any surface-based activities with the potential to generate vibration that would be perceptible at the identified receptors. The below-ground activities with the potential to emit vibration will be located at least 360m bgl, and at this depth any emitted vibration would not be perceptible at a receptor. Operational vibration affecting existing residential receptors has therefore been scoped out of the assessment.
358. An assessment of potential operational phase road traffic noise impacts will be undertaken using the same methodology as for the construction phase road traffic noise.

9.3.1.3 Decommissioning

359. Noise and vibration impacts associated with decommissioning activities would be similar, but likely over a shorter period of time, to those identified due to the construction phase. Appropriate controls

and management approaches, similar to those of the construction phase, would be expected to be in place. NVMPs will be produced for the decommissioning phase, as appropriate.

9.3.2 Lockwood Beck

9.3.2.1 Construction

360. As for Woodsmith Mine and Ladycross Plantation, while the proposed amendments introduce additional permanent structures, the approach to their construction will not differ materially from the construction activities at Lockwood Beck to date, which have been demonstrated to be deliverable without adverse noise impacts. As such, the EIA will provide a qualitative assessment of potential construction noise and vibration effects. Quantitative assessment of construction noise and vibration impacts and determination of detailed mitigation requirements to avoid unacceptable adverse impacts will continue to be undertaken using the current phase-by-phase process and is therefore excluded from the EIA scope.
361. Construction phase traffic noise impacts will be calculated as a likely change in BNL using the methodology detailed in CRTN and based on baseline and with the amendments to the currently Approved Development construction traffic data, where available. The calculated changes in BNL due to the amendments to the currently Approved Development construction traffic will be assessed against the criteria within the DMRB.

9.3.2.2 Operation

362. Operational noise affecting existing residential receptors will be predicted using the guidance contained in BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. Operational phase noise level predictions will be undertaken for Lockwood Beck using 3-D noise modelling software. The predicted noise levels will be compared with the measured background sound levels identified in the 2014 survey, supplemented with data from the ongoing noise monitoring, where it can be shown that site operations were not contributing to the measured sound levels.
363. The operational phase will not include any surface-based activities with the potential to generate vibration which would be perceptible at the identified receptors. The below-ground activities with the potential to emit vibration will be located at least 360m bgl, and at this depth, any emitted vibration would not be perceptible at a receptor. Operational vibration affecting existing residential receptors has therefore been scoped out of the assessment.
364. An assessment of potential operational phase road traffic noise impacts will be undertaken using the same methodology as for the construction phase road traffic noise.
365. As a result, it is proposed to scope all such effects into the EIA (**Table 9-3**).

Table 9-3 Summary of potential impacts proposed to be scoped in (✓) or scoped out (x) of the Noise and Vibration Assessment

Predicted Effect	Phase	Site		
		Woodsmith Mine	Ladycross Plantation	Lockwood Beck
Construction noise	Construction	✓	✓	✓
Construction traffic noise		✓	✓	✓
Mining Operations	Operation	✓	✓	✓
Decommissioning noise	Decommissioning	✓	✓	✓
Decommissioning traffic noise		✓	✓	✓

9.3.2.3 Decommissioning

366. Noise and vibration impacts associated with decommissioning activities would be similar, but likely over a shorter period of time, to those identified due to the construction phase. Appropriate controls and management approaches, similar to those of the construction phase, would be expected to be in place. NVMPs will be produced for the decommissioning phase, as appropriate.

9.4 Potential mitigation measures for key impacts

9.4.1 Woodsmith Mine and Ladycross Plantation

367. The EIA will determine the requirement for the implementation of mitigation measures to reduce the significance of the impact to noise sensitive receptors.
368. Potential mitigation measures to reduce impacts from construction related activities would include adherence to the principles of BPM, as defined in BS 5228.
369. The assessment of noise and vibration in the 2014 ES included a package of mitigation measures (developed and agreed with statutory stakeholders). These measures have been applied to date, as appropriate, along with other measures identified through the assessments in the NVMPs submitted to discharge Planning Conditions. This will be the case throughout the remainder of the construction phase. With this continued commitment to the effective management of noise, it can be reasonably concluded that there will continue to be no significant adverse impacts on noise sensitive receptors.

9.4.2 Lockwood Beck

370. As for Woodsmith Mine and Ladycross Plantation, a detailed assessment of the predicted noise and vibration levels will be developed for each Phase of construction. This will also identify the need for and approach to provision of additional mitigation to those measures currently being effectively applied at the site.

10 Air Quality

10.1 Introduction

372. This Chapter outlines the scope and methodology for the assessment of air quality impacts on receptors arising from the construction, operation and decommissioning of the amendments to the currently Approved Development.
373. **Chapter 1 Introduction** describes the three locations that are being considered as part of this ESR, with two, Woodsmith Mine and Ladycross Plantation, located within the administrative area of NYMNPA, and one, Lockwood Beck, located within the administrative area of RCBC.
374. Tocketts Lythe, within the administrative area of RCBC, is being removed from the currently Approved Development. This will result in the removal of construction and operational activities and associated emissions for this part of the development. Therefore, this change represents a positive impact of the amendments to the currently Approved Development.
375. Across the Project Development Area, effective measures have been implemented to minimise air emissions (including dust) throughout the ongoing construction process. These include:
- The control of emissions associated with generators used during construction;
 - Mitigation measures to control and minimise the generation of dust and fine particulate matter; and
 - Monitoring of dust deposition.

10.2 Overview of existing environment and receptors

10.2.1 Woodsmith Mine and Ladycross Plantation

376. The surrounding area for Woodsmith Mine and Ladycross Plantation is rural with no significant industrial or commercial activities nearby. Neither site is located within or in proximity to any statutory Air Quality Management Areas (AQMAS) designated by North Yorkshire Council (NYC) (which includes the NYMNPA area).
377. Predicted annual mean background nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}) concentrations at the two currently Approved Development sites, obtained from Defra background mapping² across 1km x 1km grids, are well within, i.e. less than 75% of, and therefore meet, their respective ambient Air Quality Objectives. These are summarised in **Table 10-1** below, along with the background concentrations presented in the 2014 ES to provide context.
378. The background concentrations (**Table 10-1**) exhibit a decreasing trend from the original baseline and throughout the construction phases. The exception to this is the background NO₂ concentration at Woodsmith Mine between 2020 and 2025. This is likely due to emissions from Woodsmith Mine itself being incorporated into the more recent iterations of the Defra background map predictions (which is based on emissions estimates from the National Atmospheric Emissions Inventory), in this instance the 2021-based background maps, whereas it would not have been present as an emission source in the data presented in the 2014 ES, which used the 2011-based background maps.
379. The data presented in **Table 10-1** indicates that air quality is generally improving in the area around the ongoing construction activities at Woodsmith Mine and Ladycross Plantation.

² Defra (2024). Background Mapping data for local authorities – 2021. Available at: <https://uk-air.defra.gov.uk/data/lagm-background-maps?year=2021> [Accessed: September 2025].

Table 10-1 Background air quality mapping data (Woodsmith Mine and Ladycross Plantation)

Site	1 km x 1 km grid centre reference		Background concentration (µg.m ⁻³)			
	X	Y	Year	NO ₂	PM ₁₀	PM _{2.5}
Woodsmith Mine	489500	505500	2011 ³	5.5	12.5	8.2
			2020 ³	4.1	11.6	7.5
			2025 ²	4.3	8.0	4.0
Ladycross Plantation	481500	507500	2011 ³	5.6	12.4	8.3
			2020 ³	4.1	11.5	7.5
			2025 ²	3.0	7.7	4.0
Air Quality Objective (Annual Mean)				40	40	20 (10*)
* 2040 target value as set out in Environmental Targets (fine particulate matter) (England) Regulations 2023						

380. Ambient dust monitoring is undertaken at both Woodsmith Mine and Ladycross Plantation. Quarterly monitoring reports are submitted to NYMNPA for information, and to demonstrate environmental compliance in relation to ambient dust. Samples are collected using dust deposition gauges at four locations at both Woodsmith Mine (BML1, BML3, BML5 and BML6) and Ladycross Plantation (LCDS1, LCDS2, LCDS3 and LCDS4), each located near to the boundary of Woodsmith Mine and Ladycross Plantation.
381. **Figure 10-1** sets out monthly dust deposition data for the most recent 12-month period (September 2024 to August 2025), averaged across the four monitoring locations at Woodsmith Mine (navy bars) and the four monitoring locations at Ladycross Plantation (green bars), and shows that the measured values are consistently well below, i.e. less than 75% of, the recommended 'action level⁴' of 200 mg/m²/day (blue line).

³ From original ES, Defra 2011 background mapping (Available at: <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2011> [Accessed: September 2025]).

⁴ Institute of Air Quality Management (IAQM). Guidance on Monitoring in the Vicinity of Demolition and Construction (2018, v1.1)

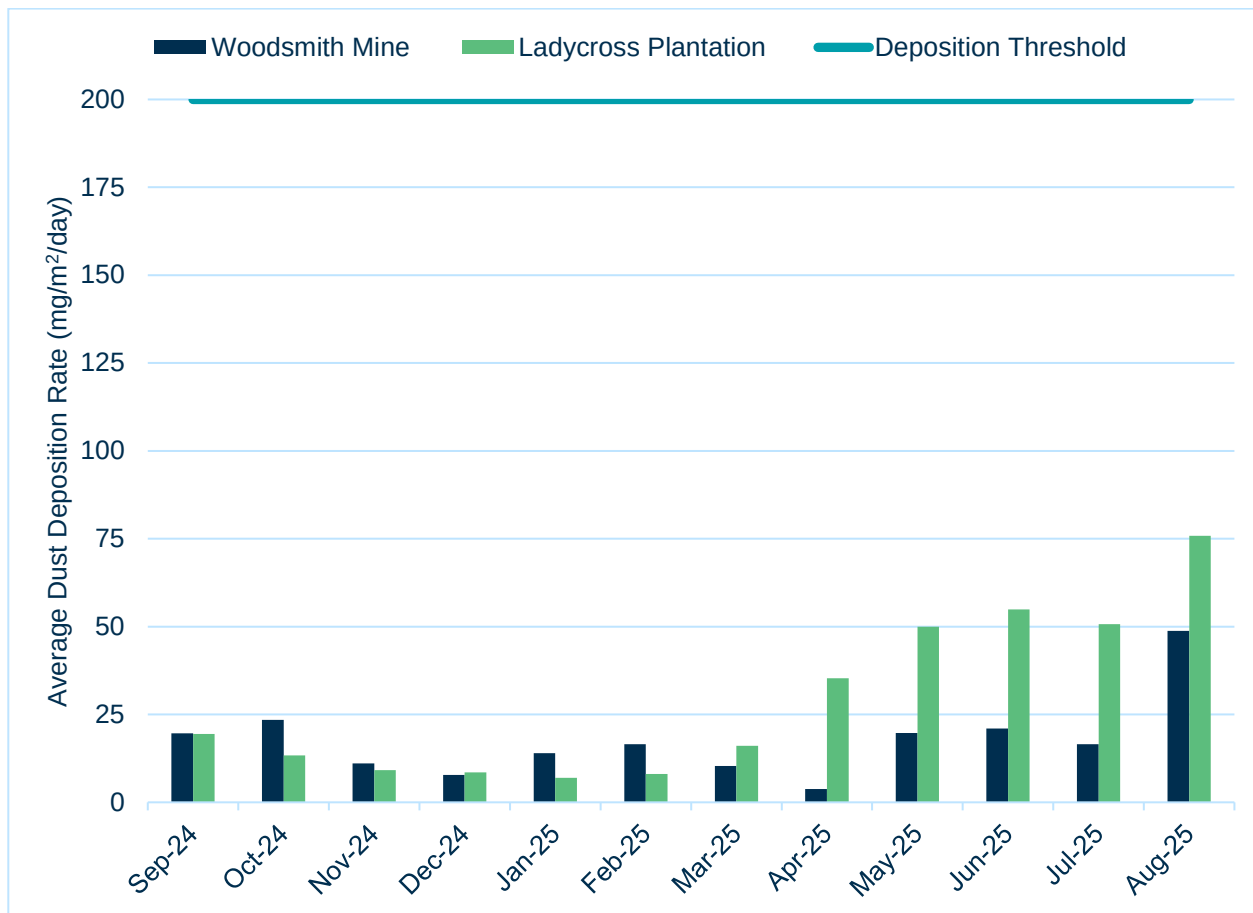


Figure 10-1 Average Dust Deposition Measurements at Woodsmith Mine and Ladycross Plantation (August 2024 to September 2025)

382. No other field surveys are proposed to inform the characterisation of the existing environment because publicly available desk-based data sources, e.g. monitoring data from local authority air quality annual status reports and Defra background mapping, will be used where required.
383. Predicted annual mean NO_x and ammonia (NH₃) concentrations and nitrogen/ acid deposition rates at the North York Moors SAC, SPA and SSSI near Woodsmith Mine (**Table 10-2**) are compared with those used in the 2014 assessment, where applicable. These have continued to decrease from the 2014 assessment and throughout construction at Woodsmith Mine.

Table 10-2 Background pollutant concentrations and deposition rates at North York Moors (near Woodsmith Mine)

Site	Background concentrations/ deposition				
	Year	NO _x ($\mu\text{g.m}^{-3}$)	NH ₃ ($\mu\text{g.m}^{-3}$)	Nitrogen Deposition ($\text{kgN.ha}^{-1}\text{.yr}^{-1}$)	Acid Deposition ($\text{keq.ha}^{-1}\text{.yr}^{-1}$)
Woodsmith Mine	2015 ⁵	10.2	N/A ⁶	19.9	1.4
	2025 (NO _x) ² 2020-22 (NH ₃ / Deposition) ⁷	3.8-5.3	0.9	12.8-13.1	1.0
Critical Levels / Loads		30	1 or 3 ⁸	5-15	0.792-4.962

10.2.1.1 Sensitive receptor locations – human receptor locations

384. The closest human receptors to Woodsmith Mine are four residential properties, which have been included in the various phases of discharge of Planning Conditions during the ongoing construction activities, namely Soulsgrave Farm, Moorside Farm, Parkdown Bungalow, and potential permanent or semi-permanent residents at Sneaton Foss Caravan Park.
385. The closest human receptors to Ladycross Plantation are residential properties where construction phase impacts have been assessed on an ongoing basis, namely Ladycross Plantation Caravan Park, Davison Farm and Watergate Farm. Sensitive residential receptors are also located along roads with the potential to be affected by project-generated traffic.
386. The potential air quality impacts at these receptors will be assessed as part of the EIA.

10.2.1.2 Sensitive receptor locations – designated ecological sites

387. The North York Moors SAC, SPA and SSSI lie adjacent to the west, south and east of Woodsmith Mine. Further distant, approximately 1km, to the west lies the Littlebeck Wood SSSI.
388. There are no ecological designations within the relevant screening distances of Ladycross Plantation.
389. The potential air quality impacts at these receptors will be considered, as appropriate, as part of the planning application.

10.2.2 Lockwood Beck

390. Lockwood Beck lies within the RCBC administrative area. No statutory AQMAs have been declared by RCBC. Therefore, it is not within, or in proximity to any statutory AQMAs.
391. Predicted annual mean background NO₂ and particulate matter concentrations at the currently Approved Development, obtained from Defra background mapping² across 1km x 1km grids, are well within, and therefore meet, their respective ambient Air Quality Objectives. These are summarised in **Table 10-3** below, along with the background concentrations presented in the 2014 ES to provide context. The background concentrations presented in **Table 10-3** exhibit a decreasing trend from the original baseline and throughout the construction phases to date and therefore indicate air quality improvements in the area local to Lockwood Beck.

⁵ From original ES, Defra 2011 background mapping (Available at: <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2011> [Accessed: September 2025]) and/ or UK Centre for Ecology and Hydrology (CEH) Air Pollution Information System (APIS).

⁶ Ammonia was not assessed in the original ES.

⁷ UK CEH (2025). APIS App. APIS app | Air Pollution Information System [Accessed: September 2025]

⁸ The Critical Level for ammonia is 1 $\mu\text{g.m}^{-3}$ where bryophytes or lichens are likely to be present, or 3 $\mu\text{g.m}^{-3}$ otherwise.

Table 10-3 Background air quality mapping data (Lockwood Beck)

Site	1 km x 1 km grid centre reference			Background concentration (µg.m ⁻³)			
		X	Y	Year	NO ₂	PM ₁₀	PM _{2.5}
Lockwood	467500		514500	2011 ³	7.3	13.1	8.6
Beck				2020 ³	5.3	12.2	7.8
				2025 ²	4.0	8.6	4.3
Air Quality Objective (Annual Mean)					40	40	20 (10*)
* 2040 target value as set out in Environmental Targets (fine particulate matter) (England) Regulations 2023							

392. No field surveys are proposed to inform the characterisation of the existing environment because publicly available desk-based data sources, e.g. monitoring data from local authority air quality annual status reports and Defra background mapping, will be used where required.
393. Predicted annual mean NO_x concentrations and nitrogen/ acid deposition rates at the North York Moors SAC, SPA and SSSI near Lockwood Beck are displayed in **Table 10-4** and are compared with those used in the original assessment. These have continued to decrease from the original assessment and throughout the construction phase at Lockwood Beck and indicate general air quality improvements in the area.

Table 10-4 Background pollutant concentrations and deposition rates at North York Moors (near Lockwood Beck)

Site	Background concentrations/ deposition				
	Year	NO _x ($\mu\text{g.m}^{-3}$)	NH ₃ ($\mu\text{g.m}^{-3}$)	Nitrogen Deposition ($\text{kgN.ha}^{-1}\text{.yr}^{-1}$)	Acid Deposition ($\text{keq.ha}^{-1}\text{.yr}^{-1}$)
Lockwood Beck	2015 ⁵	14.9	N/A ⁶	22.9	1.6
	2025 (NO _x) ²				
	2020-22 (Deposition) ⁷	4.9	0.9	13.8-14.1	1.1
Critical Levels / Loads		30	1 or 3 ⁸	5-15	0.792-4.962

10.2.2.1 Sensitive receptor locations – human receptor locations

394. The individual residential properties in proximity to Lockwood Beck, are Kateridden, Lockwood Beck Farm, Moorsholm Farm, Plum Tree Farm, Swindale Farm and other properties north of Kateridden and on Stanghow Road. Sensitive residential receptors are also located along roads with the potential to be affected by project-generated traffic.
395. The potential air quality impacts at these receptors will be assessed as part of the EIA.

10.2.2.2 Sensitive receptor locations – designated ecological sites

396. The wider North York Moors SAC, SPA and SSSI lies around Lockwood Beck Reservoir to the west and south of Lockwood Beck Extent of Works, and approximately 100m from the extent of works at its closest point.

10.3 Potential environmental impacts

10.3.1 Woodsmith Mine and Ladycross Plantation Overview

397. The 2014 ES for the Woodsmith Mine and MTS shafts included the assessment of potential impacts associated with the following elements which would result in emissions to air:
- Construction phase dust and fine particulate matter generated from construction, earthworks and trackout activities.
 - Construction phase plant and Non-Road Mobile Machinery (NRMM) exhaust emissions.
 - Construction phase energy plant fuel combustion.
 - Construction phase blasting operations.
 - Construction and operational phase road traffic exhaust emissions.
 - Operational phase mine ventilation.
398. Planning Conditions imposed via the extant Planning Permission, relevant to air quality, cover the following activities:
- The control of emissions associated with generators used during the construction phase.
 - Quantification of emissions associated with construction vehicles and plant.
 - Mitigation measures to minimise the generation of dust and fine particulate matter, and monitoring of dust deposition.
399. A key difference between the current Approved Development and the actual implementation of the construction phase to date, is that the proposed energy plant, a 20 MW diesel-fired generator array with two 40m high discharge stacks located within Woodsmith Mine, are no longer required. The power demand has instead been met to date via a combination of an 11 kV grid connection, battery storage for peak demand periods, and a 15 MW liquified natural gas (LNG) fired engine facility. There is a proposition to expand the LNG fired engine facility, which will be designed, assessed, agreed and consented on the basis that it will not result in an unacceptable environmental impact. This investment in the power supply for the main site has significantly reduced the air emissions inventory of the project, compared to that approved under the original Planning Permission.
400. The EIA for the amendments will consider those aspects which have the potential to give rise to air emissions and material air quality impacts at sensitive receptors within the study areas. In the operational phase, these will primarily comprise the ventilation shaft operation and associated air-cooling plant, and any significant changes in road traffic activities, in the context of associated vehicle exhaust emissions.

10.3.1.1 Woodsmith Mine Potential Environmental Impacts

401. For Woodsmith Mine, the proposed amendments lead to a reduction in the lateral extent of development but do introduce additional structures and potential sources of air quality impact, including increased HGV movements (during both construction and operation), as well as extending the overall duration of construction. As such, air quality impacts at Woodsmith Mine are scoped into the assessment.

10.3.1.2 Ladycross Plantation Potential Environmental Impacts

402. At Ladycross Plantation, improvements that have been implemented compared to the original Planning Permission include the removal of construction phase blasting and significantly reduced earthworks. Both amendments to the currently Approved Development will reduce emissions to air compared to those that would arise under the original Planning Permission.

403. As detailed in **Chapter 12 Traffic and Transport**, Ladycross Plantation will experience peak HGV and light goods vehicle (LGV) movements at or below the extant permissions and averages will be significantly lower. On the basis that:
- There will be no exceedance of the AADT vehicle movements permitted as part of the extant permissions.
 - There has been no material increase in background traffic flows.
 - Background concentrations across the study area have decreased.
404. It is proposed to scope out construction road traffic effects on local air quality for Ladycross Plantation.
405. Operational phase traffic effects on air quality and associated impacts at Ladycross Plantation are scoped out on the basis that there are no increases in vehicle movements that would give rise to significant air quality impacts.
406. The proposed amendments for Ladycross Plantation have reduced the overall scale of development compared with the design that was assessed in the 2014 ES. Therefore, Air Quality is scoped out of the assessment for Ladycross Plantation on the basis that the amendments represent a reduction in the potential for adverse air quality impacts.

10.3.2 Lockwood Beck

407. The 2014 ES for the MTS shafts included the assessment of potential impacts associated with the following elements which would result in emissions to air:
- Construction phase dust and fine particulate matter generated from construction, earthworks and trackout activities;
 - Construction phase plant and NRMM exhausts;
 - Construction phase energy plant fuel combustion;
 - Construction phase blasting operations;
 - Construction and operational phase road traffic exhaust emissions; and,
 - Operational phase mine ventilation.
408. Planning Conditions imposed via the extant Planning Permission (R/2014/0627/FFM) relevant to air quality, cover the following activities:
- Mitigation measures to minimise the generation of dust and fine particulate matter.
409. At Lockwood Beck, improvements that have been implemented compared to the currently Approved Development include the removal of construction phase blasting and significantly reduced earthworks. These amendments will reduce emissions to air compared to that which was consented at Lockwood Beck.
410. The proposed amendments for Lockwood Beck reduce the overall scale of development compared with the design that was assessed in the 2014 ES. This is due to the removal of the need for a TBM launch shaft and the extensive waste facilities that would have been necessary to permanently dispose of the extractive material.
411. As detailed in **Chapter 12 Traffic and Transport**, Lockwood Beck will experience peak HGV and light goods vehicle (LGV) movements at or below the extant permissions and averages will be significantly lower. On this basis, construction phase traffic effects on air quality are proposed to be scoped out.

412. Operational phase traffic effects on air quality and associated impacts at Lockwood Beck are scoped out on the basis that there are no increases in vehicle movements that would give rise to significant air quality impacts.
413. Therefore, Air Quality is scoped out of the assessment for Lockwood Beck on the basis that the amendments represent a reduction in the potential for adverse air quality impacts.

10.4 Approach to EIA

10.4.1 Guidance

414. The air quality assessment will be undertaken with reference to relevant technical guidance, including:
- Defra's Local Air Quality Management Technical Guidance (LAQM TG (22))⁹;
 - Institute of Air Quality Management (IAQM) and Environment Protection UK's (EPUK) 'Land-Use Planning & Development Control: Planning for Air Quality'¹⁰;
 - IAQM 'Guidance on the assessment of dust from demolition and construction'¹¹; and
 - IAQM's 'A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation sites'¹².

10.4.2 Woodsmith Mine

10.4.2.1 Construction

415. While aspects of Woodsmith Mine are changing from those previously approved, future construction activities will not differ in nature or extent from those assessed in the 2014 ES. Therefore, appropriate management and dust control measures are already being implemented at Woodsmith Mine (as well as at Ladycross Plantation and Lockwood Beck). While the IAQM guidance¹¹ has been revised since the original application, it is considered that the assessment undertaken for the 2014 ES is still robust. The 'risk of impacts' and the 'site specific mitigation' will be no greater or more onerous than that determined previously and remain appropriate.
416. As discussed above, compliance with and discharge of the approved planning conditions will continue to implement the relevant controls. As shown by the ongoing dust monitoring data presented in **Figure 10-1**, dust deposition rates are consistently well below the recommended action level. This demonstrates that dust is being adequately controlled on site and that if these controls are continued, dust will continue to be adequately controlled. Therefore, the residual effect will be not significant. It is proposed to scope out construction phase dust and fine particulate matter effects.
417. At Woodsmith Mine, as detailed in **Chapter 12 Traffic and Transport**, no increase in the forecast numbers of construction employees is proposed. However, there is the potential that the maximum permitted number of peak heavy goods vehicle (HGV) movements will increase. In addition, there is a requirement for a short-term (5-6 months) increase in HGV movements to facilitate the export of polyhalite by road.
418. It is understood that the AADT flows for the peak year of construction may be higher than those assessed in the 2014 ES. Furthermore, it is likely that construction traffic flows will trigger the need

⁹ Defra (2025). *Local Air Quality Management Technical Guidance (TG22)*. May 2025

¹⁰ Institute of Air Quality Management (IAQM), Environment Protection UK (EPUK) (2017). *Land-Use Planning & Development Control: Planning for Air Quality*. January 2017 version 1.2

¹¹ Institute of Air Quality Management (IAQM) (2024). *Guidance on the assessment of dust from demolition and construction*. January 2024 version 2.2

¹² Institute of Air Quality Management (IAQM) (2020). *A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation sites*. May 2020 version 1.1

for assessment using the screening criteria as prescribed by guidance ^{10 12} (this will be confirmed once the full traffic dataset is available and compared with the screening criteria). Therefore, it is proposed to scope in construction road traffic effects on local air quality for Woodsmith Mine.

419. As detailed in **Chapter 1 Introduction**, the key difference between the currently Approved Development and the amendments to the currently Approved Development is that the proposed energy plant, a 20 MW diesel-fired generator array with 40 m high discharge stacks located within the Woodsmith Mine, is no longer required. During the initial phases of construction at Woodsmith Mine, (up until 2018), power was provided by diesel generators located across Woodsmith Mine. However, a mains power network connection was installed, which is supported by gas-fired engines and battery storage. This has removed the requirement for most diesel generators and thereby significantly reduced emissions to air. The four LNG-fired engine facility operates in accordance with the Environmental Permit (ref. EPR/XP3836QL) for Woodsmith Mine, which was issued in 2018. There is a proposition to expand the LNG fired engine facility and therefore associated emissions from this, or any alternative combustion sources consented to fulfil the same purpose, will need to be considered alongside any construction road traffic emissions.
420. In regard to the other onsite construction activities occurring across Woodsmith Mine, the EIA will review any controlled emissions that vary significantly from those previously assessed, where relevant, and determine whether emissions may give rise to significant offsite effects.

10.4.2.2 Operation

421. Operation of the amended ventilation shaft and associated cooling infrastructure will be reviewed to assess the significance of any associated air emissions. Where necessary, and where potential effects cannot be screened out by distance separation, offsite impacts will be assessed using the ADMS dispersion model and relevant Defra and/ or Environment Agency guidance.
422. The assessment of air quality impacts arising as a result of operational traffic movements at Woodsmith Mine are scoped into the EIA. As necessary, the assessment will be carried out using the screening criteria as prescribed by guidance ^{10 12}.

10.4.3 Summary of impacts scoped in and scoped out

423. The amendments to the currently Approved Development will require deviation from the construction activities which were originally presented. For Ladycross Plantation and Lockwood Beck, these deviations are anticipated to lead to a reduction in the scale of development. The deviations are within the partially built-out currently Approved Development and will utilise the same general approaches in respect to controls on generators, plant, vehicles and associated emissions. Compliance with and discharge of the approved planning conditions will continue to be ensured via a phased approach as the details of each construction phase become defined. It is therefore proposed that the assessment of Air Quality impacts is scoped out of the SES.
424. For Woodsmith Mine, construction activities will continue, and the SES will consider the onsite plant and equipment requirements, capacities and locations. The SES will assess whether associated emissions may give rise to any significant offsite effects. The implication for changes in construction traffic movements on the approved network routes is being developed. Where any related changes in traffic cannot be screened out as not significant, using the criteria detailed in industry guidance documents, a detailed assessment of the impact on relevant roadside human and/ or ecological receptors, as appropriate, will be undertaken.
425. **Table 10-5** summarises the potential Air Quality impacts to be scoped in and scoped out of the SES.

Table 10-5 Summary of potential impacts to be scoped in (✓) or scoped out (x) of the Air Quality Assessment

Predicted Effect	Phase	Site		
		Woodsmith Mine	Ladycross Plantation	Lockwood Beck
Dust and fine particulate matter generated from construction activities	Construction	x	x	x
Plant and NRMM exhaust	Construction	✓	x	x
Energy plant fuel combustion	Construction	✓	x	x
Blasting operations	Construction	✓	x	x
Road traffic exhaust emissions	Construction	✓	x	x
	Operation	✓	x	x
Mine ventilation	Operation	✓	x	x

10.5 Potential mitigation measures for key impacts

426. The EIA will determine the requirement for the implementation of mitigation measures to reduce adverse impacts on receptors which are sensitive to changes in air quality.

10.5.1 Woodsmith Mine and Ladycross Plantation

427. Mitigation measures to control dust and fine particulate matter emissions and from NRMM exhaust releases are required to be set out in a Dust Management Plan and a Construction Vehicle and Plant Management Plan (to comply with conditions imposed via the extant Planning Permission), respectively. These mitigation measures are currently applied as part of the Approved Development, the implementation which is demonstrably effective as evidenced by monitoring data showing compliance with the action level and there being no complaints received to date. It is therefore proposed that these conditions are to be retained in their current form in the amended Planning Permission associated with this application. This will ensure that the same level of effective controls will continue to be implemented as the Approved Development progresses.

10.5.2 Lockwood Beck

428. Mitigation measures to control dust and fine particulate matter emissions are required to be set out in a CEMP (to comply with conditions imposed via the extant Planning Permission). Retention of and ongoing compliance with the Planning Conditions will ensure that the same level of control and mitigation will apply to the amendments to the currently Approved Development, and the objectives of the conditions will be retained.

11 Archaeology and Heritage

11.1 Introduction

429. This Chapter outlines the scope and methodology for the assessment of the impacts on Archaeology and Heritage receptors arising from the construction, operation and decommissioning of the amendments to the currently Approved Development.
430. Tocketts Lythe, within the administration area of RCBC, is being removed from the currently Approved Development. This will result in any adverse effects predicted on archaeology and cultural heritage receptors for both construction and operational phases being avoided entirely.
431. It is not anticipated that any significant adverse effects will arise on archaeology and cultural heritage receptors from the amendments to the currently Approved Development at Woodsmith Mine, Ladycross Plantation or Lockwood Beck. Therefore, it is proposed to scope all such effects out of further consideration in the EIA. The detailed rationale for this decision is set out below, but to summarise:
- Any archaeological remains within Woodsmith Mine, Ladycross Plantation and Lockwood Beck are considered to have already been disturbed, subject to agreed Written Schemes of Investigation and relevant finds protocols. No new areas of the sites, beyond those originally approved are planned to be disturbed. Those areas of site that are still to be developed, remain subject to the mitigation agreed as a result of methodologies approved in partial discharge of Planning Conditions within the extant Planning Permission and, consequently, no adverse impacts on archaeological remains will arise; and
 - The scale and appearance of the amendments to the currently Approved Development would not differ from the currently Approved Development sufficiently to give rise to any increased effect and as a result, the worst-case magnitude of change in setting of heritage assets will remain unchanged from that of the currently Approved Development.

11.1.1 Legislation, policy, and guidance

432. The following national legislation, policy and guidance has been considered within this section in relation to the currently Approved Development:
- National Heritage Act 1983 (amended 2002).
 - Ancient Monuments and Archaeological Areas Act (1979).
 - Principles of Cultural Heritage Impact Assessment in the UK (IEMA, IHBC and ClfA, 2021).
 - Town and Country Planning Act (1990).
 - Planning (Listed Buildings and Conservation Areas) Act (1990).
 - National Planning Policy Guidance: Conserving and enhancing the historic environment
 - National Planning Policy Framework Conserving and enhancing the historic environment (NPPF, 2025).
 - Historic England Conservation Principles: policies and guidance for the sustainable management of the historic environment (2008).
 - The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning 3 (Historic England, 2017).
 - Standard and Guidance for Historic Environment Desk-Based Assessment (ClfA, 2020).
 - The Design Manual for Road and Bridges (2019), LA 116 – Cultural heritage asset management plans.
 - The Design Manual for Roads and Bridges (2020) LA 106 – Cultural heritage assessment.

433. This list draws on the legislation, planning and guidance informing the Cultural Heritage chapter within the 2014 ES submitted for the currently Approved Development. Since the 2014 planning submission, policy has been updated; this list has been amended with the policies and any changes reviewed accordingly.
434. Local planning policy of relevance to Woodsmith Mine and Ladycross Plantation includes the following policies in the NYMNPA Local Plan (2020):
- Strategy Policy I – The Historic Environment.
 - Policy ENV9 – Historic Landscape Assets.
 - Policy ENV11 – Historic Settlements and Built Heritage.
435. The prior iteration of this policy, The NYMNPA Local Development Framework (LDF): Core Strategy and Development Policies (2008), was considered within the prior assessment of the potential impacts of the currently Approved Development on the historic environment. The North York Moors National Park special qualities, addressed in **Chapter 17 Special Qualities**, have been re-stated with a slightly different emphasis from the earlier iteration of the plan, and the scoping assessment presented below considers those aspects of the special qualities relating to archaeology and heritage identified in the 2020 NYMNPA Local Plan.
436. For Lockwood Beck, relevant local policy includes The Redcar and Cleveland Local Plan (2018) of which Section 8 focuses on the historic environment. An additional policy considered not mentioned within **Chapter 3 Policy Framework** is Policy HE3 Archaeological Sites and Monuments.
437. The 2018 LDF supersedes the Development Policies of the 2007 Redcar and Cleveland LDF, which provided the policy context for the 2014 ES. The policies within the 2018 document are little changed from those considered within the 2014 ES and provide equivalent protection for elements of the historic environment.
438. It is therefore not anticipated that the above policy changes will make a substantive change to the scope of the assessment, methods or results undertaken in the 2014 ES.

11.2 Overview of the existing environment and receptors

439. The understanding of the existing environment for Woodsmith Mine, Ladycross Plantation and Lockwood Beck has been informed by the 2014 ES baseline submitted for the 2014 planning application (NYM/2014/0676/MEIA).
440. A 6km study area for Woodsmith Mine, Ladycross Plantation and Lockwood Beck was used for all Scheduled Monuments, Grade I and II* Listed Buildings and Conservation Areas, whilst a 2km study area from Woodsmith Mine, Ladycross Plantation and Lockwood Beck was used for Grade II Listed Buildings.
441. A 500m study area was established across Woodsmith Mine, Ladycross Plantation and Lockwood Beck for all non-designated heritage assets. These studies included an analysis of data from various sources, such as the North York Moors National Park Historic Environment Record (HER), The National Heritage List for England (NHLE) and relevant archival and cartographic materials.
442. Additionally, site walkovers were conducted in July 2012, September 2012 and April 2014. Geophysical surveys took place from September to October 2012, while watching briefs occurred between November 2012 and March 2013, and between June to July 2014. Finally, a Light Detection and Ranging (LiDAR) survey also formed part of the assessment.

11.2.1 Woodsmith Mine

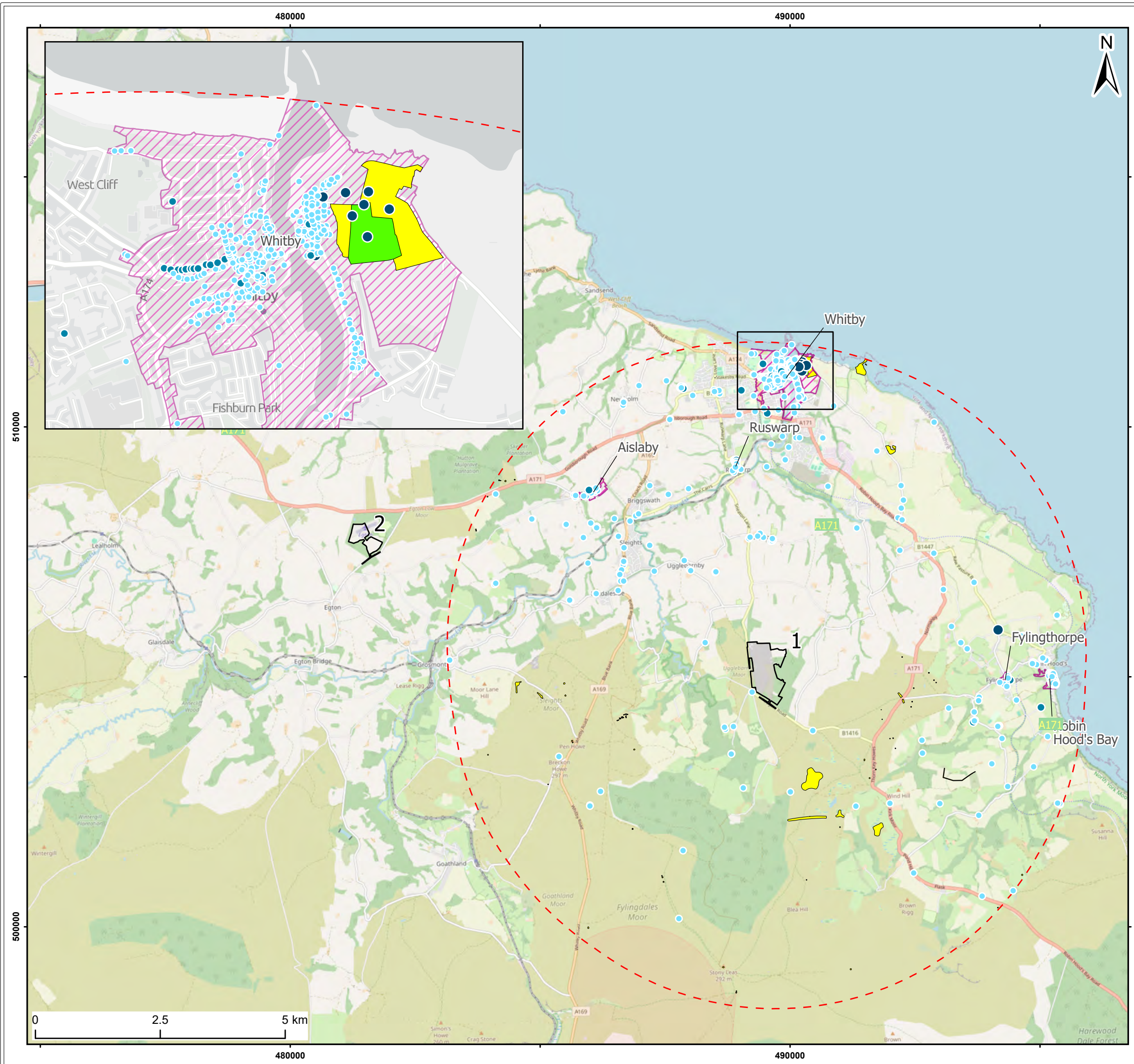
443. A small number of non-designated heritage assets were identified in the 2014 ES, making them susceptible to impact, including:
- A possible undated enclosure in the north of Woodsmith Mine.
 - A modern enclosure within the northeast of Woodsmith Mine.
 - A possible undated earthen mound to the west of Whinny Wood.
 - Doves Nest Farmhouse, 19th century.
 - A post-medieval embanked boundary within the south of Haxby Plantation.
 - An undated earthwork within the west of Haxby Plantation.
444. These assets were removed during the construction/ groundworks following the consented 2014 planning application. Archaeological mitigation for this work was carried out by Cotswold Archaeology and included watching briefs at various locations and strip, map and sample excavations (Cotswold Archaeology, 2018a, 2018b, 2019b, 2020, 2023a & 2023b).
445. A number of designated heritage assets were identified through the use of a Zone of Theoretical Visibility (ZTV) (York Potash Limited, 2014) as potentially being subject to impacts from permanent changes to setting as a result of the Woodsmith Mine, including:
- A group of Scheduled Monuments, predominantly prehistoric barrows, on Low Moor, c.2.8km southeast of the currently Approved Development (NHLE 1011974, 1011960, 1011971, 1011973, 1011961, 1011976, 1011966, 1011972, 1011959, 1011964, 1011975).
 - Hawsker Wayside Cross, c.3.5km northeast of the currently Approved Development (NHLE 1009858).
 - A Scheduled moated site at Low Laithes Farm, c.4.7km northeast of the currently Approved Development (NHLE 1020402).
 - Grade I Listed Whitby Abbey, its associated Grade I and II* Listed Buildings and Whitby Conservation Area, c.5.5km north of the currently Approved Development (NHLE 1017941, 1055872, 1148373, 1148375, 1316347).
446. The Woodsmith Mine was identified as being perceptible in the settings of a large number of assets/ groups of assets during the construction phase including the presence of three winding towers within their settings.
447. A revised search of the NHLE has been undertaken for this ESR, to ensure that the baseline for designated heritage assets remains current. No designated heritage assets are located within the Woodsmith Mine (**Figure 11-1**). There is a single designated heritage asset within the study area which has been designated since the 2014 ES. The Grade II Listed Church of St Bartholomew, Ruswarp (NHLE 1481984) is located approximately 3.5km to the north of Woodsmith Mine.
448. The Historic Landscape Character of the area identifies the farmland, i.e. non-plantation land, within the Woodsmith Mine as planned, large-scale post-medieval/ modern parliamentary enclosure dating from 1824. It is noted that the area within the Woodsmith Mine currently consists of an industrial works area.

11.2.2 Ladycross Plantation

449. There is a large body of evidence for prehistoric funerary activity within the local area. This evidence largely comprises funerary monuments, such as barrows, cairns, ring ditches and cists, as well as numerous enclosures. No designated or non-designated heritage assets were identified within the extent of works at Ladycross Plantation including in archaeological investigation. Mitigation works carried out by Cotswold Archaeology in 2021 and 2022 in the form of an

archaeological watching brief during three phases of groundworks identified no archaeological remains pre-dating the modern period (Cotswold Archaeology, 2021, 2022).

- 450. The Settings Assessment conducted as part of the 2014 ES considered the wider impact of the Ladycross Plantation on the setting of heritage assets using mapped ZTVs. This was to aid the identification of assets, as Ladycross Plantation had the potential to affect the values underpinning the significance of visible heritage assets.
- 451. The Settings Assessment identified one designated heritage asset, in the form of two scheduled round barrows, on which the currently Approved Development was found to have the potential to have a small, temporary effect. A scheduled monument comprising two round barrows 400m north-east of Horse Mire Head Farm (NHLE 1004168), dates to the prehistoric period with the barrows situated 275m and 335m east, respectively, of the currently Approved Development.



Hartlepool

Middlesbrough

Whitby

North York Moors National Park

Scarborough

Pickering

Thirsk

A167

15

Legend:

- Extent of Works
- 6km Study Area
- Conservation Areas
- Registered Parks and Gardens
- Scheduled Monuments

Listed Buildings

Grade

- I
- II
- II*

Source: © Haskoning UK Ltd, 2025. © Historic England, 2025.
Base map: © OpenStreetMap (and) contributors, CC-BY-SA, Contains OS data © Crown Copyright and database right 2025
Contains data from OS Zoomstack, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

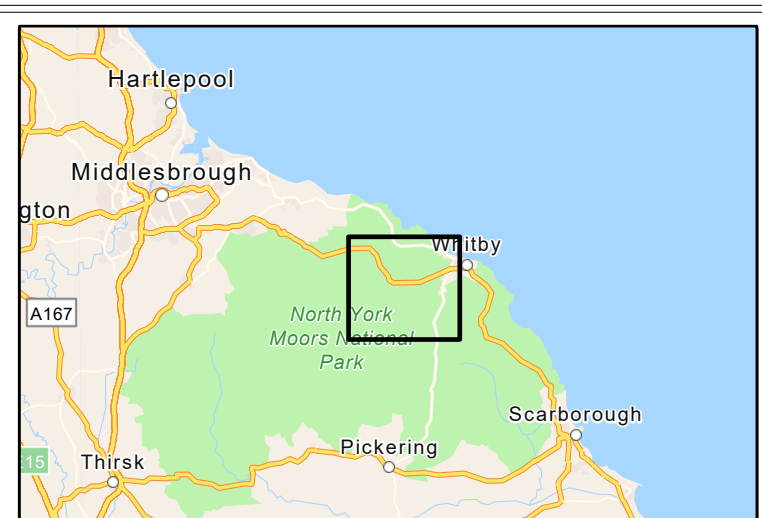
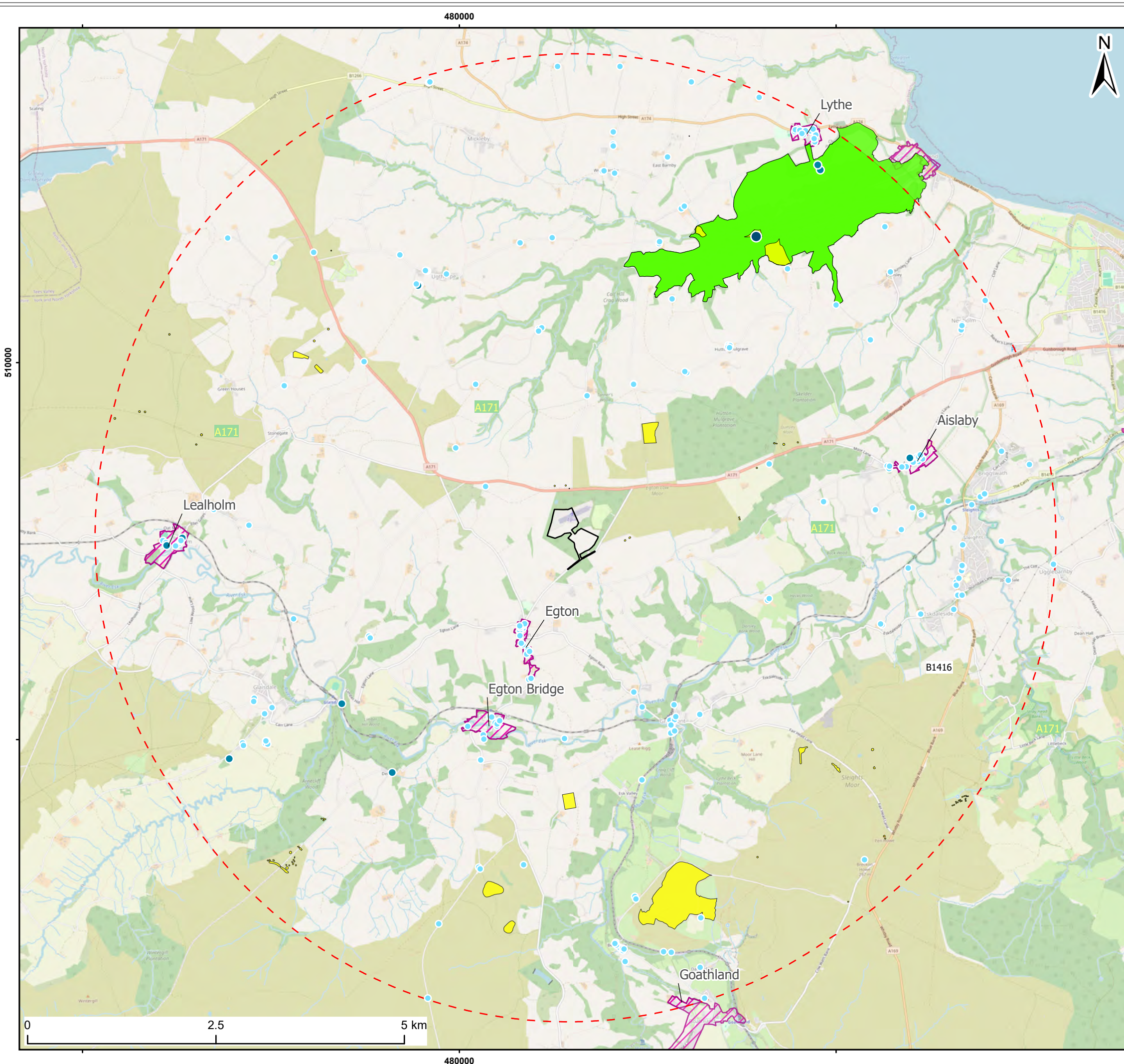
Project: Anglo American Woodsmith Project - Woodsmith Mine and Mineral Transport System

Title: Designated Heritage Assets within 6km of Woodsmith Mine

Figure: 11-1	Drawing No: PB1110-HAS-XX-ZZ-D-Z-0006				
Revision: 01	Date: 06/10/2025	Drawn: DL	Checked: CL	Size: A3	Scale: 1:75,000
02	17/11/2025	DL	CL	A3	1:75,000

Co-ordinate system: OSGB 1936 British National Grid





Legend:

- Extent of Works
- 6km Study Area
- Conservation Areas
- Registered Parks and Gardens
- Scheduled Monuments

Listed Buildings

Grade

- I
- II
- II*

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Project: Anglo American Woodsmith Project - Woodsmith Mine and Mineral Transport System

Title: Designated Heritage Assets within 6km of Ladycross Plantation

Figure: 11-2	Drawing No: PB1110-HAS-XX-ZZ-D-Z-0007				
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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02	17/11/2025	DL	CL	A3	1:50,000

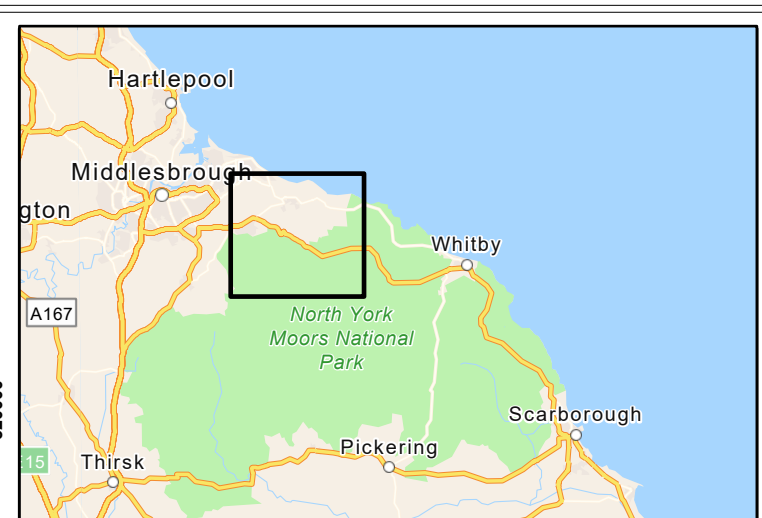
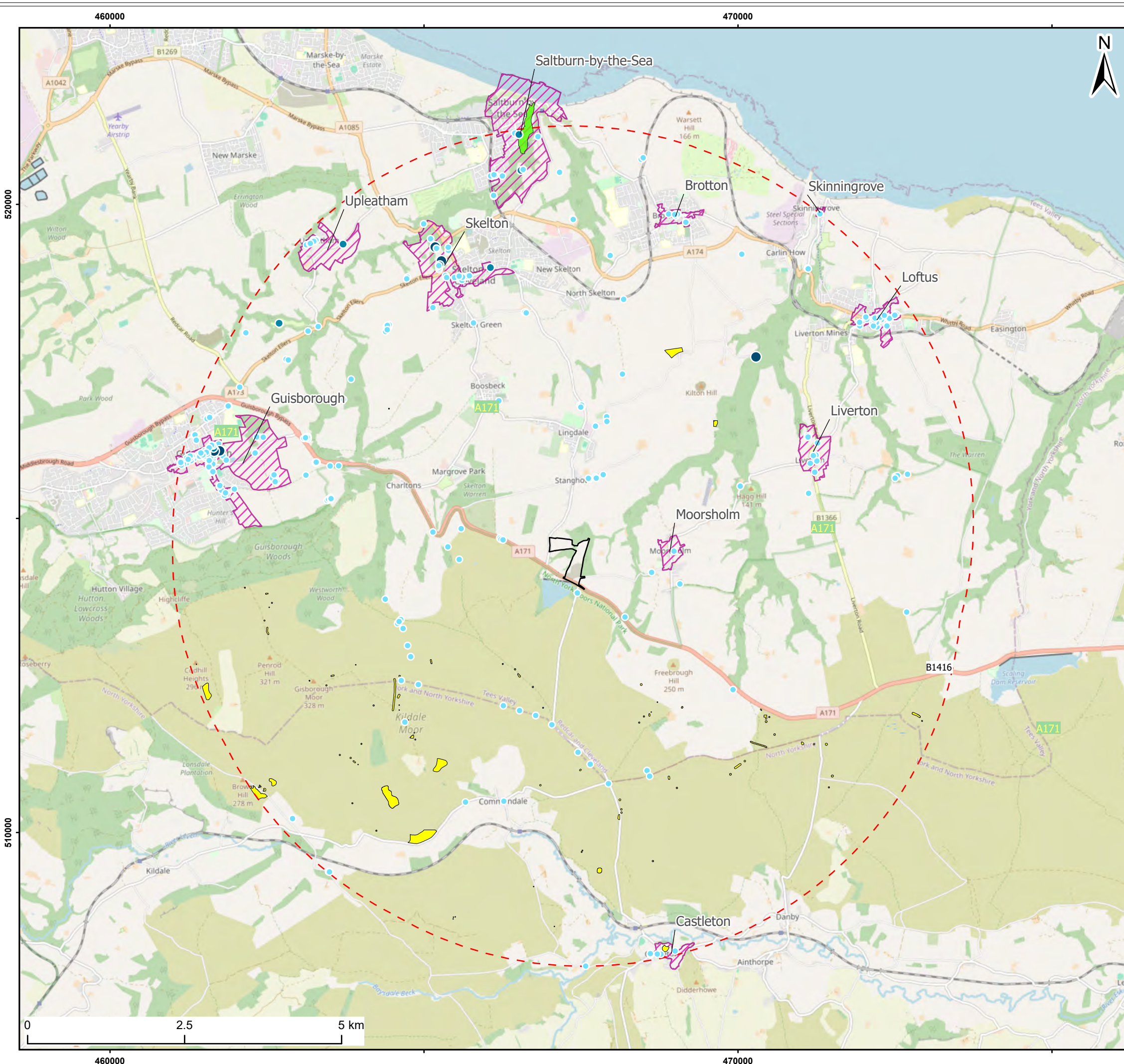
Co-ordinate system: OSGB 1936 British National Grid



452. As part of this ESR, a revised search of the 6km designated heritage assets was undertaken (**Figure 11-2**). The following heritage assets have been designated since the 2014 ES:
- One Scheduled Monument (Roman Fort on Lease Rigg, NHLE 1428339), 2.9km south of Ladycross Plantation.
 - Three Listed Buildings (Memorial Cross for Probationary Flight Officer Francis Titcomb (the Swinstry Cross), NHLE 1453942; Lealholm War Memorial, NHLE 1441704; and Glaisdale War Memorial NHLE 1440078). These listed buildings are located 4km south, 4.8km west and 4.3km southwest of Ladycross Plantation respectively.

11.2.3 Lockwood Beck

453. No designated assets are located within Lockwood Beck.
454. A small number of non-designated assets comprising of both known and possible archaeology were identified within Lockwood Beck, including:
- Kateridden medieval settlement (R&C HER 4490).
 - A possible medieval road (NYM HER 8287).
 - Several medieval field systems.
455. No evidence of the medieval road was identified within Lockwood Beck using geophysical survey, aerial photography, LiDAR or field visits.
456. When considering the wider impact of Lockwood Beck on the setting of heritage assets, several assets were noted to be minimally impacted. The ZTVs aided the identification of the following assets to sustain a slight temporary adverse impact during construction:
- Scheduled prehistoric funerary monuments (consisting of a series of Round Barrows located between 2-4km southeast of the currently Approved Development at Lockwood Beck, NHLE 1018798, 1018801, 1018804, 1018805, 1018743, 1018802).
 - Red Hall Farmhouse and Farm Cottage Grade II Listed Building (NHLE 1136465).
 - Moorsholm Conservation Area.
457. Since the initial assessment was conducted, a further three designated heritage assets have been added to the NHLE that are situated within the 6km Study Area (**Figure 11-3**). These include:
- Two Listed Buildings comprising:
 - o Commondale War Memorial (NHLE 1440919) situated within Commondale Village green, 3.4km southwest of the currently Approved Development; and
 - o Commondale Shepherd's Memorial (NHLE 1436162) situated on Skelderskew Moor, north of Ingls Farm, 3.6km southwest of the currently Approved Development.
 - One Scheduled Monument (late prehistoric settlement and field system on the southern edge of Commondale Moor, 450m northeast of Wayworth Farm, NHLE 1425711), situated 4.5km southwest of the currently Approved Development.



Legend:

- Extent of Works
- 6km Study Area
- Conservation Areas
- Registered Parks and Gardens
- Scheduled Monuments

Listed Buildings

Grade

- I
- II
- II*

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Project: Anglo American Woodsmith Project - Woodsmith Mine and Mineral Transport System

Title: Designated Heritage Assets within 6km of Lockwood Beck

Figure: 11-3	Drawing No: PB1110-HAS-XX-ZZ-D-Z-0008				
Revision: 01	Date: 06/10/2025	Drawn: DL	Checked: CL	Size: A3	Scale: 1:60,000
Revision: 02	Date: 17/11/2025	Drawn: DL	Checked: CL	Size: A3	Scale: 1:60,000

Co-ordinate system: OSGB 1936 British National Grid



11.3 Potential environmental impacts

11.3.1 Woodsmith Mine

458. Potential impacts to heritage assets include physical impacts, as well as changes in the setting of heritage assets which could affect heritage significance.
459. A physical impact is one in which construction of the proposed amendments to the currently Approved Development, e.g. excavations and groundworks, result in a direct physical change to the fabric of a heritage asset, e.g. partial or complete removal. These effects will primarily arise during construction from intrusive groundworks requiring excavation, compaction or other modification of deposits containing archaeological remains, with operational effects being unlikely, as any intrusive works in this period will be limited and confined to areas already disturbed during construction.
460. Direct physical impacts to the non-designated heritage assets identified within the Woodsmith Mine have occurred during enabling and ongoing construction works for the currently Approved Development. These assets have been removed, and effects have been mitigated following a programme of archaeological monitoring/ recording (Cotswold Archaeology, 2018a, 2018b, 2019b, 2020, 2023a & 2023b). The main programme of work carried out between 2015 and 2017 identified one post-medieval field boundary ditch depicted on an OS map of 1853 and one undated field boundary ditch, likely forming a continuation of the boundary. Two small undated pits were also recorded towards the northeastern part of Woodsmith Mine. A watching brief was carried out during the demolition of Dove's Nest Farmhouse confirming the farmhouse was constructed during the modern period, with no elements pre-dating the modern period observed (Cotswold Archaeology 2018). Suitable mitigation has been carried out during the removal of recorded non-designated archaeological remains within the Woodsmith Mine. Some further clearance of modern forestry is required, and these works would be subject to the provisions of the agreed WSI for the Approved Development. It is anticipated that there is a limited potential for archaeological remains to survive in this area of the site and any effects would be effectively managed by the agreed controls set out in the agreed WSI. Consequently, it is not anticipated that any adverse effects will arise from the amendments to the currently Approved Development.
461. Impacts to the significance of a heritage asset may also occur if a development changes the surroundings in which the asset is located, experienced, and appreciated. This change is most often related to perceptibility of the currently Approved Development, but can also arise from associated activities, in this case through increased construction and operation vehicle movements. Similarly, historic character may also be affected if the Woodsmith Mine results in a change to the prevailing landscape character of the area. These effects may arise during construction, but will normally be most apparent during operation, as construction represents a relatively short-lived increase on the magnitude of any lasting change.
462. The Woodsmith Mine was identified as being perceptible in the settings of a large number of assets/groups of assets during the construction phase, specifically when the taller temporary headgear was in place during construction; with the removal of this element from the design, effects could be expected to be reduced somewhat from those predicted in 2014. Overall, the amendments to the currently Approved Development will have no higher than a slight temporary impact on any surrounding heritage assets. In most instances, the temporary impact via the alteration to setting will be of negligible significance.
463. The form and location of the proposed surface development at Woodsmith Mine, including the high level of natural and proposed screening, means that only a small number of assets/ groups of assets will feature the operational surface development within their settings. This conclusion is

also predicted to apply to the recently designated Grade II Listed Church of St Bartholomew, Ruswarp (NHLE 1481984).

- 464. In terms of change to setting, the proposed, permanent development will be within the parameters considered in the 2014 ES. In all cases, perceptual change in the settings of heritage assets will be no greater than, and in some cases will be reduced from those presented by the currently Approved Development.
- 465. There would be an increase in HGV movements along the B1416 and A171 above those permitted by the currently Approved Development. It is, however, considered that this increase would not be sufficient to give rise to change to the designated heritage assets close to these roads having regard to the scale and duration of the increase over consented vehicle movements, the nature of those heritage assets and their settings and the existing character and use of the road.
- 466. No significant adverse effects will arise on heritage assets as a result of change to setting during the construction, operation and decommissioning of the Woodsmith Mine.

11.3.2 Ladycross Plantation

- 467. Potential impacts include both physical impacts as well as changes that could impact the setting of heritage assets within the vicinity of Ladycross Plantation that could affect heritage significance. It is not anticipated that there will be any direct physical impacts to heritage assets within Ladycross Plantation. The assessment of effects within the 2014 ES noted there would be no anticipated physical impacts upon recorded heritage assets during the construction phase of Ladycross Plantation. Works outwith these areas to develop waste handling and storage facilities are no longer proposed and any effects assessed as arising from these works in the 2014 ES would be avoided.
- 468. In terms of setting, the proposed construction works, operations and decommissioning will be within the parameters considered in the 2014/ 2015 assessment. In all cases, perceptual change in the settings of heritage assets will be no greater than, and in some cases will be slightly reduced from those presented by the currently Approved Development. Consequently, no significant adverse effects will arise on heritage assets as a result of change to setting during the construction, operation and decommissioning of Ladycross Plantation. This conclusion is also predicted to apply to the recently designated assets within the Ladycross Plantation study area, which are all recorded as c.4km or further away from Ladycross Plantation.

11.3.3 Lockwood Beck

- 469. Potential impacts include both physical impacts as well as changes that could impact the setting of heritage assets within the vicinity of Lockwood Beck that could affect heritage significance.
- 470. Direct physical impacts to the non-designated heritage assets identified within Lockwood Beck have occurred during the enabling works and ongoing construction from the currently Approved Development. As suitable archaeological works were carried out during groundworks within Lockwood Beck, there is no pathway for further direct physical impacts to below ground heritage remains and no adverse effects will arise. Works outwith these areas to develop waste handling and storage facilities are no longer required and any effects assessed as arising from these works in the 2014 ES would be avoided.
- 471. The proposed construction works, permanent development and decommissioning will be within the parameters considered in the 2014/15 assessment. In all cases, perceptual change in the settings of heritage assets will be no greater than, and in some cases will be discernibly reduced from, those presented by the currently Approved Development. Consequently, no significant

adverse effects will arise on heritage assets as a result of change to setting during construction, operation and decommissioning of Lockwood Beck.

11.3.4 Tocketts Lythe

472. No works are proposed at Tocketts Lythe and any anticipated effects arising from this element of the currently Approved Development identified in the 2014 ES would be avoided entirely.

11.4 Approach to EIA

473. It is not anticipated that any significant adverse effects will arise to archaeology or cultural heritage receptors as a result of the amendments to the currently Approved Development at the Woodsmith Mine, Ladycross Plantation or Lockwood Beck, and as a result it is proposed to scope all such effects out of further consideration in the EIA.

12 Traffic and Transport

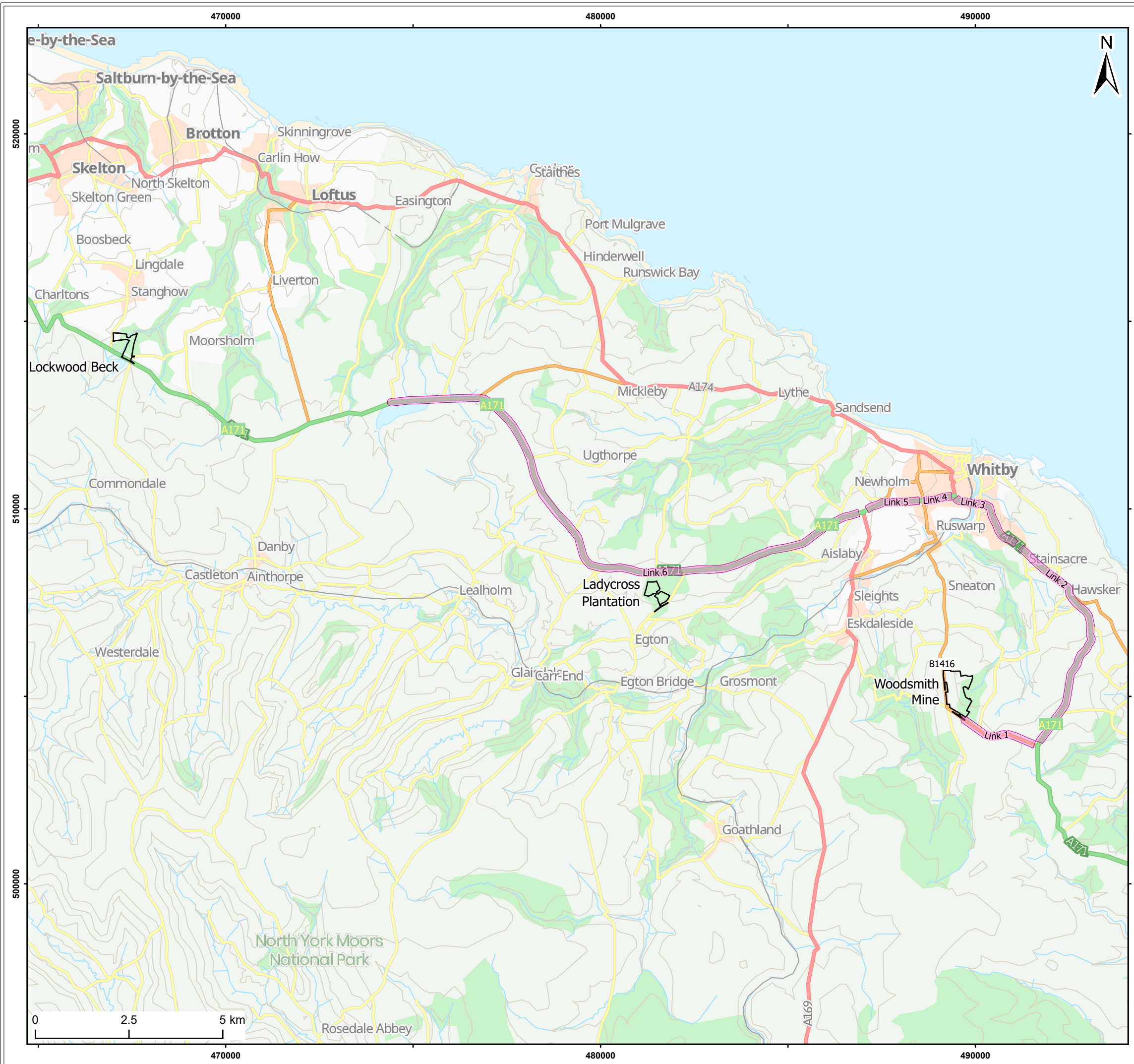
12.1 Introduction

- 474. This Chapter outlines the scope and methodology for the assessment of the impacts on Traffic and Transport receptors arising from the construction, operation and decommissioning of the amendments to the currently Approved Development.
- 475. The extant Planning Permissions for the currently Approved Development were supported by an ES and Transport Assessment (TA) (Royal HaskoningDHV, 2014a, 2014b) that concluded that with the introduction of a package of mitigation measures (developed and agreed with statutory stakeholders) the residual effects were negligible to minor adverse, i.e. not significant in EIA terms.
- 476. Three locations are being considered by this ESR, with two (Woodsmith Mine and Ladycross Plantation) located within the local highway authority administration area of NYC and one (Lockwood Beck) located within the administration area of RCBC.
- 477. Tocketts Lythe, within the administration area of RCBC, is being removed from the currently Approved Development. This will result in a beneficial impact of reducing traffic movements along the A173 for both construction and operational phases.
- 478. A detailed description of the amendments to the currently Approved Development is provided within **Chapter 1 Introduction**. A brief summary of the changes from a traffic and transport perspective are provided in Section 12.4.1 for Woodsmith Mine, Section 12.4.3 for Ladycross Plantation and Section 12.4.4 for Lockwood Beck.

12.2 Overview of existing environment and receptors

12.2.1 Woodsmith

- 479. Access to Woodsmith Mine is provided from a ghost island priority junction on the B1416, with all HGV construction traffic routed approximately 2.3km east towards the junction with the main A171. All HGV traffic is then routed north along the A171 towards Whitby and then west onward via the A171 towards Middlesbrough. This section of the ESR considers the extents of the A171 within the administration area of NYC (to the boundary with RCBC at Scaling Dam).
- 480. The extents of the proposed Traffic and Transport Study Area (TTSA) are depicted in **Figure 12-1**. The following section provides a review of the baseline characteristics for each of the main roads within this TTSA. This review has been informed by traffic count data captured in May 2024 by Haskoning and collision data for the latest five-year period (2019 – 2023) sourced from crashmap (www.crashmap.co.uk).



Legend:

- Extent of Works
- Links forming the traffic and transport study area

Source: © Haskoning UK Ltd, 2025
Base map: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Contains OS data © Crown Copyright and database right 2023
Contains data from OS Zoomstack

Project: Anglo American Woodsmith Project - Woodsmith Mine and Mineral Transport System

Title: Traffic and Transport Study Area

Figure:	12-1	Drawing No:	PB1110-HAS-XX-ZZ-D-Z-0001			
Revision:	Date:	Drawn:	Checked:	Size:	Scale:	
01	17/09/2025	DL	ST	A3	1:100,000	
02	17/11/2025	DL	CL	A3	1:100,000	

Co-ordinate system: OSGB 1936 British National Grid



12.2.1.1 B1416

481. Traffic count data was historically captured for the B1416 to inform the 2014 TA (for the currently Approved Development). These counts demonstrated that in 2014 there were 2,357 vehicle movements per day along the B1416 of which 49 vehicles were HGVs. New 2024 traffic counts show that there was an average of 3,748 vehicle movements per day along the B1416 of which approximately 144 per day were HGVs (excluding approximately 59 HGVs travelling to Woodsmith Mine).
482. It can therefore be evidenced that there has been an increase in total and HGV background traffic flows along the B1416 since 2014.
483. The 2014 TA identified seven collisions along the B1416 from the junction with the A171 to Foss Lane over the proceeding five-year period. The latest collision data covering a five year period indicates that for the same study area there have been only two collisions, located at the junction of the B1416 and A171. No collisions have been recorded along the B1416, or at the access to Woodsmith Mine.
484. In summary, it is evidenced that there has been an increase in baseline traffic and HGV movements via the B1416 in the last ten years, but road safety has improved.

12.2.1.2 A171 (from B1416 to Whitby)

485. In 2016, the junction of the A171 and B1416 was upgraded as part of the pre-construction works for Woodsmith Mine, to provide a ghost island right turn lane to facilitate safe access for construction and operational traffic.
486. The A171 continues north from the B1416 towards Whitby where it intersects with the A174 at the Mayfield Road junction. In 2017 the junction of the A171 and A174 was upgraded by Woodsmith Mine, to mitigate construction and operational traffic impacts by improving capacity and improving accessibility for non-motorised users.
487. Within the built-up area of Whitby, further improvement works along the A171 have been implemented or funded by the Woodsmith Mine with the same objectives. These comprise:
- A new signalised crossing outside Helredale Stores (Helredale Road).
 - A new footway between Fairfield Way and Enterprise Way (Stainsacre Lane).
 - Dropped kerbs and tactile paving at side roads along the A171.
 - Reconfiguration of the on-street parking and footway improvements (Helredale Road).
488. Traffic count data was historically captured for the A171 to the south of the B1416 and A171 within Whitby to inform the 2014 TA; these demonstrated that in 2014 there were 7,944 and 15,416 vehicle movements per day respectively. 2024 counts show slightly reduced average vehicle movements of 7,160 and 13,797 per day respectively.
489. With regard to road safety, during the preparation of the 2014 TA NYC raised concerns for the potential for additional HGVs to induce overtaking collisions along the A171 (south of the B1416 to the built-up urban area within Whitby). **Table 12-1** provides a comparison of number of collisions and calculated collision rate for this (4.3 mile long) section of the A171 for the 2014 baseline and for a 2024 baseline.

Table 12-1 Comparison of 2014 and 2024 baseline collision rates

No. of recorded collisions (2014 baseline)	No. of recorded collisions (2024 baseline)	Collision rate per billion vehicle miles (2014 baseline)	Collision rate per billion vehicle miles (2024 baseline)	Percentage change between 2014 and 2024 no. of collisions	Percentage change between 2014 and 2024 collision rate
24	19	385	338	-20.8%	-12.2%

490. **Table 12-1** illustrates that there has been an overall reduction in the number of collisions and a corresponding reduction in the collision rate.
491. The 2014 TA also reviewed the potential for Woodsmith Mine traffic to exacerbate collisions at existing collision clusters¹³ and identified a cluster at Normanby Bends (eight recorded collisions within five years). The latest collision data indicates that there have been only three collisions in the latest five-year period. As such the location would no longer represent a collision cluster.
492. One new 'emerging' cluster of four collisions has been identified to the south of Normanby Bends at the junction of the A171 and Fylingthorpe Road. Two of the collisions were classified to have resulted in serious injuries and two in slight injuries.
493. The collision data notes that the causal factors for these collisions is primarily *"failed to look properly"* and *"poor turn manoeuvre"*. A review of the baseline highway environment at this junction has not identified any obstructions to forward visibility and noted that appropriate signage and road markings are present. The collisions can therefore be reasoned to be attributed to driver inattention rather than a defect in the highway environment.
494. In summary, it is evidenced that Anglo American has provided substantial improvements to enhance safety and accessibility along the A171 and that since the commencement of construction there has been an overall improvement in road safety. It can also be evidenced that there has not been a material change in baseline traffic movements via the A171 to the south of the B1416 in the last ten years and that traffic flows within Whitby have decreased.

12.2.1.3 A171 (A174 to A169)

495. Outside of the Whitby School, a central crossing island is provided to assist pedestrians crossing the road. This crossing was implemented through funding provided by Anglo American.
496. Traffic count data captured in 2014 for this section of the A171 demonstrated that there were 12,159 vehicle movements per day. New counts show an average of 14,252 vehicle movements per day.
497. With regard to road safety, the 2014 TA noted a cluster of six collisions at the junction of the A171 and A169 and seven collisions at the junction of the A171 and B1460. The latest collision data indicates that there has been only one collision at the junction of the A171 and A169 and no collisions at the junction of the A171 and B1460. These two roundabouts would therefore no longer constitute collision clusters. No new collision clusters have emerged.
498. In summary, is evidenced that Anglo American has provided improvements to enhance

¹³ The 2014 TA adopted a definition for a collision cluster as: A location where there have been four or more personal injury collisions within a 100m radius during a three year period and the speed limit is <40mph, or one at which there have been four or more personal injury collisions within a 50m radius during a three year period and the speed limit is >40mph.

accessibility along the A171 and that since the commencement of construction there has been an improvement in road safety. This is despite an increase in baseline traffic movements in the last ten years (excluding Woodsmith Mine traffic).

12.2.1.4 A171 (between the A169 and Scaling Dam)

499. Traffic count data captured for the A171 as part of the 2014 TA demonstrated that in 2014 there were 6,689 vehicle movements per day. Recent counts show that there was an average of 8,986 vehicle movements per day.
500. With regard to road safety, similar to the A171 to the south of the B1416, concerns were historically raised regarding the potential for HGVs to induce overtaking collisions.
501. No collision clusters were previously identified within this section, and no new clusters have been identified from the latest available five years of collision data. **Table 12-2** provides a summary of the number of collisions and calculated collision rate for this (8.8 mile long) section of the A171 for the 2014 baseline and for a 2024 baseline.

Table 12-2 Comparison of 2014 and 2024 baseline collision rates (A171 west of the A169)

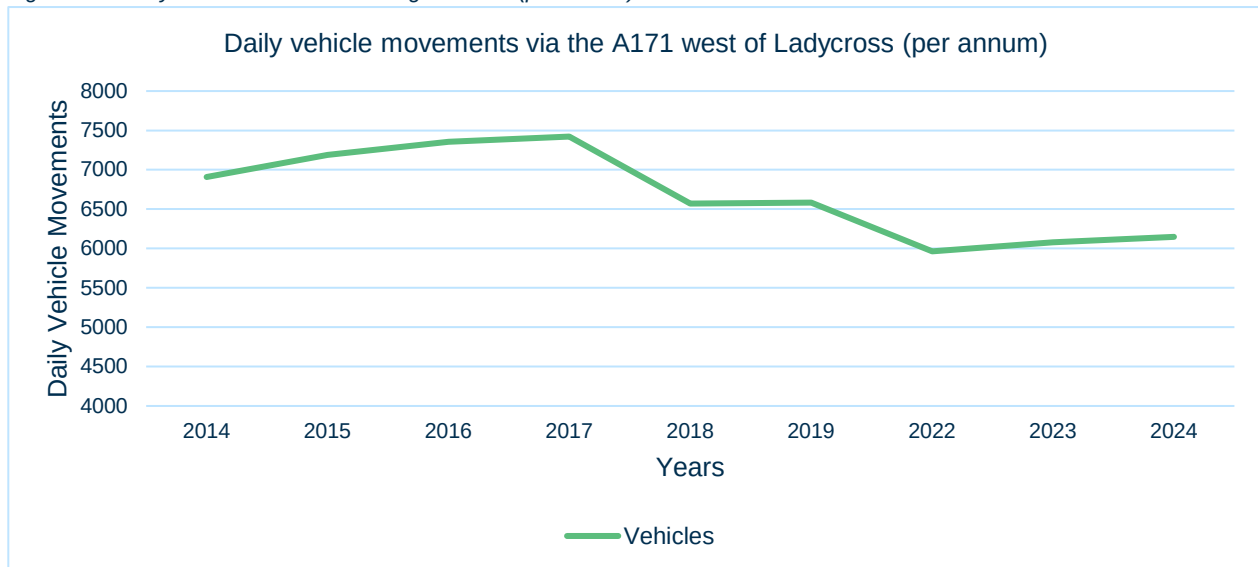
No. of recorded collisions (2014 baseline)	No. of recorded collisions (2024 baseline)	Collision rate per billion vehicle miles (2014 baseline)	Collision rate per billion vehicle miles (2024 baseline)	Percentage change between 2014 and 2024 no. of collisions	Percentage change between 2014 and 2024 collision rate
38	28	354	194	-26.3%	-45.2%

502. It is evidenced that since the commencement of construction there has been an improvement in road safety. It can also be evidenced that there has been an increase in baseline traffic.

12.2.2 Ladycross Plantation

503. Access to Ladycross Plantation is provided from a priority junction with the C82, approximately 1.2km south of the junction with the main A171.
504. Traffic count data captured for the C82 to inform the 2014 TA demonstrated that there were 1,102 vehicle movements per day. In comparison, recent counts show that there was an average of 1,175 vehicle movements per day and that average speeds were 45mph. It can therefore be evidenced that there has been no material change in traffic movements via the C82 in the last ten years and since the start of construction works at Ladycross Plantation.
505. Annual average daily flow (AADF) count data for the A171 to the west of Ladycross Plantation has also been captured from the Department for Transport (DfT) (2014 to 2014, excluding 2020 and 2021 due to Covid-19 lockdowns) and is presented in **Figure 12-2**. This demonstrates that since the submission of the TA and commencement of construction of the Woodsmith Mine there has been an overall reduction in traffic movements.

Figure 12-2 Daily Vehicle Movements along the A171 (per annum)

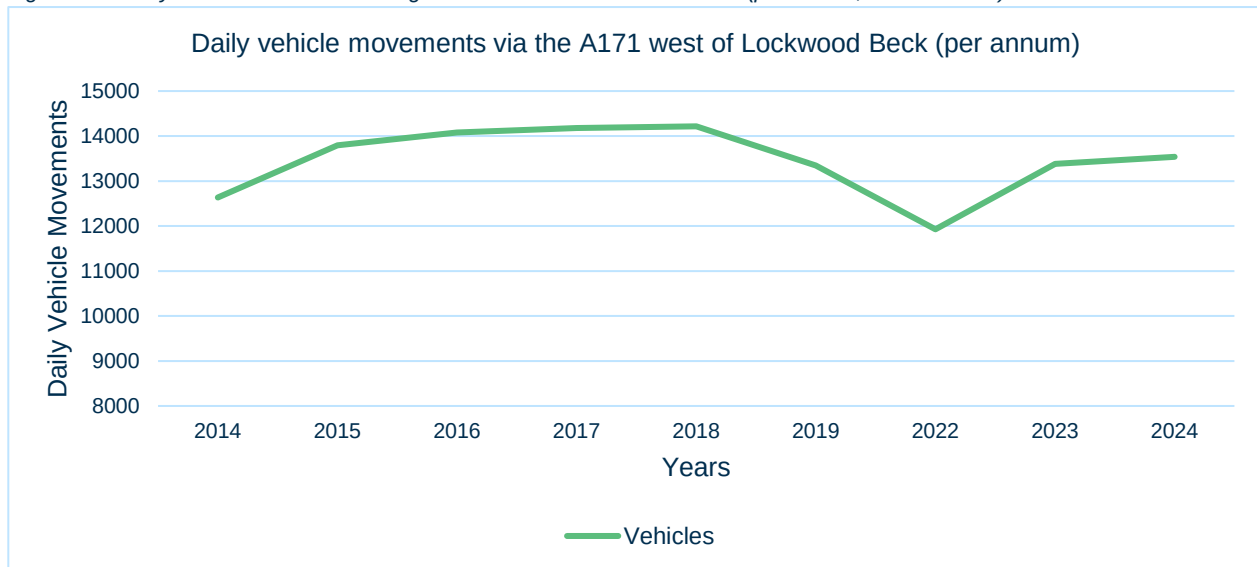


506. In 2021 the junction of the A171 and C82 was widened and also upgraded (by Anglo American) to provide a ghost island right turn lane to facilitate safe access for construction and operational traffic associated with Ladycross Plantation. Following completion of the road improvements and commencement of construction, data show that there continue to be no collisions along the C82, within the vicinity of the A171/C82 junction or the access to Ladycross Plantation.
507. It is evidenced that Anglo American has provided improvements to enhance road safety along the C82 and A171 and that since the commencement of construction there have been no recorded collisions. It can also be evidenced that there has been no material change in baseline traffic movements via the C82 and a reduction in total traffic movements along the A171.

12.2.3 Lockwood Beck

508. Lockwood Beck is located at the junction of the A171, Swindale Lane and Smeathorns Road ('the Lockwood Junction'). Prior to the commencement of construction of Lockwood Beck, road safety improvements were implemented at this junction by RCBC (funded by Anglo American) in 2017. These improvements realigned Swindale Lane to remove the existing crossroad junction with the A171 and Smeathorns Road and create a safer staggered junction with right turn lanes.
509. A review of collision data highlights that in the five years prior to the implementation of the road safety improvements (2012 to 2016) there were three collisions at the Lockwood Junction and following the completion of construction there has been only one collision (2017 to 2023).
510. AADF count data for the A171 to the west of Lockwood Beck since 2015 for all vehicles (excluding 2020 and 2021 due to Covid-19 lockdowns) is presented in **Figure 12-3**. This demonstrates that since the commencement of construction of Woodsmith Mine (2015) and Lockwood Beck (2017) there have been fluctuations in traffic movements along the A171, but no overall increase in traffic.

Figure 12-3 Daily Vehicle Movements along the A171 west of Lockwood Beck (per annum, data from DfT)



511. In summary, it is evidenced that Anglo American has provided improvements to enhance road safety along the A171 and at the junction with Lockwood Beck and that since the commencement of construction there has been a reduction in the numbers of recorded collisions. It can also be evidenced that there has been a reduction in total traffic movements along the A171.

12.3 Potential environmental impacts

512. The 2014 ES and TA for the currently Approved Development considered the effects of peak construction and operational traffic movements upon the following impacts (no impacts were scoped out):
- Pedestrian severance.
 - Amenity.
 - Fear and intimidation.
 - Pedestrian delay.
 - Driver delay.
 - Road safety.
513. The 2014 ES and TA for the currently Approved Development detailed that with the introduction of a package of mitigation measures (developed and agreed with statutory stakeholders) the residual effects were negligible to minor adverse, i.e. not significant in EIA terms.
514. The following sections consider the recorded changes in the traffic environment since 2014, and the amendments proposed to the Approved Development, and outline the proposed scope and methodology for assessing these amendments.

12.4 Approach to EIA

12.4.1 Woodsmith Mine

12.4.1.1 Construction

515. A review of the amendments to the currently Approved Development has identified that there could be a requirement to increase HGV movements to Woodsmith Mine from 126 currently approved to 140 per day, i.e. a net increase of 14 two-way HGV movements per day above consented levels. No increase in the forecast numbers of construction employees is proposed.

516. Anglo American has also identified the requirement for a short-term (five to six months) increase in HGV movements to support the early development stage of the Mine, on completion of shaft sinking. This could lead to an increase in HGV movements of up to approximately 200 two-way HGVs per day, i.e. a net increase of 74 two-way HGV movements per day above consented levels.
517. Whilst the forecast average numbers of HGVs for remaining duration of the construction phase would remain below the levels permitted by the extant permissions, it is proposed that the assessment would consider a worst case of an increase in the permitted day to day HGV numbers from 126 to 140. The assessment would also consider the effects of a short-term increase in HGV movements to 200 per day. The proposed approach to this is outlined in Section 12.4.2.

12.4.1.2 Operation

518. The amendments to the currently Approved Development could require additional operational traffic movements above those levels previously consented, specifically increases in:
- Peak employees of 79 (from 483 to 562), spread across at least three shifts; and
 - The permitted number of daily (Monday to Saturday) two-way HGV movements from nine to 80, i.e. an increase of 71 vehicles per day above approved levels. Sundays would continue to be reserved for incidental deliveries.
519. To reduce the impact of employees driving direct to Woodsmith Mine, the 2014 ES and TA for the currently Approved Development outlined a strategy to limit the number of parking spaces at Woodsmith Mine with the remainder of employees parking at either the private Cross Butts park and ride (P&R) site in Whitby or the existing NYC Scarborough A64 P&R site.
520. Anglo American has identified that the existing NYC P&R site at Scarborough may not align with where employees live and that alternative measures may be available (e.g. car-sharing, minibus pickups and/ or alternative P&R sites). It is therefore proposed that the travel plan strategy is developed and evolved following the commencement of operations as part of a Woodsmith Operations Travel Plan (OTP). This approach would be similar to that successfully adopted for the construction phase where the travel plan measures for construction employees have been refined as numbers have increased at Woodsmith.
521. In support of this strategy, it is proposed that an updated outline Woodsmith OTP will be submitted alongside the EIA. This update to the approach adopted for the Approved Development would enable the strategy to evolve as employee numbers increase, whilst ensuring suitable safeguards and oversight to manage impacts on the transport network.

12.4.1.3 Decommissioning

522. On the basis that the 2014 ES and TA for the currently Approved Development concluded that the decommissioning phase would have similar effects to the construction phase, it is considered that decommissioning of Woodsmith Mine could result in a significant change in peak vehicle movements and therefore traffic and transport decommissioning effects are scoped in.

12.4.2 Woodsmith Mine – approach to EIA

523. For the purposes of the assessment, it is proposed to acknowledge that the average Woodsmith Mine HGV demand is now an integral component of baseline (existing) conditions. Accordingly, the baseline conditions will utilise the May 2024 surveys and latest collision data outlined in **paragraphs 465 to 495** inclusive of the average 32 two-way HGV movements per day generated by Woodsmith Mine for the last three years (up to quarter 1 2024), a 'typical baseline'.
524. The principal guidelines that will inform the assessment are the 'Environmental Assessment of Traffic and Movement' (EATM), (Institute of Environmental Management and Assessment, July

2023). EATM represents an update from the guidelines¹⁴ that informed the 2014 ES for the currently Approved Development.

525. It is proposed that the traffic and transport study area will comprise the six main links from Woodsmith Mine toward Scaling Dam (outlined in **Figure 12-1**), notably this will include:

- Link 1: the B1416 east from Woodsmith Mine to the A171.
- Links 2 and 3: the A171 north from the B1416 toward Whitby.
- Links 4 and 5: the A171 west from Whitby toward the A169.
- Link 6: the A171 west from the A169 to Scaling Dam.

12.4.2.1 Pedestrian severance and delay

526. Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself and EATM identifies that pedestrian delay and severance are closely related and can be grouped together.

527. EATM suggests that changes in total traffic flow of 30 per cent, 60 per cent and 90 per cent are considered to be minor, moderate and major severance impacts respectively.

528. The change in total daily traffic relative to the typical baseline conditions traffic will be derived to facilitate an assessment of the magnitude of impact by applying the following thresholds detailed in **Table 12-3** which have been (derived from EATM).

Table 12-3 Severance magnitude of impact thresholds

Impact	Magnitude of Impact			
	Negligible	Low	Medium	High
Severance	Change in total daily traffic flow of less than 30%.	Change in total daily traffic flow of 30 to 60%.	Change in total daily traffic flow of 60 to 90%.	Change in total daily traffic flows of over 90%.

12.4.2.2 Amenity

529. Amenity is broadly defined as the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition, and separation from traffic. It can affect a range of non-motorised users such as pedestrians, cyclists, and equestrians).

530. EATM suggests that a tentative threshold of a doubling of total traffic flow or the HGV component may lead to a negative effect upon amenity. However, EATM notes that this threshold should be used cautiously, and the assessment should pay full regard to specific local conditions.

531. The change in total daily traffic and HGV component relative to the typical baseline traffic will be derived to facilitate an assessment of the magnitude of impact by applying the thresholds detailed in **Table 12-4** (derived from EATM).

Table 12-4 Amenity magnitude of impact thresholds

Impact	Magnitude of Impact			
	Negligible	Low	Medium	High
Amenity	Change in daily traffic flow (or HGV component less than 100%).		Greater than 100% increase in daily traffic (or HGV component) and a review based upon the quantum of vehicles, vehicle speed and pedestrian footfall.	

¹⁴ The Guidelines for the Environmental Assessment of Road Traffic, Institute of Environmental Assessment, 1993.

12.4.2.3 Fear and intimidation

532. Pedestrians can experience fear and intimidation related to changes in traffic conditions including traffic volumes, speed and HGV composition. The levels of fear and intimidation experienced can also be influenced by the proximity of people to traffic.
533. EATM recommends deriving a baseline level of fear and intimidation (known as the degree of hazard) by appraising 'hazard elements'. **Table 12-5** (derived from EATM) provides details of the approach to defining the degree of hazard score for each of the three hazard elements.

Table 12-5 Fear and intimidation degree of hazard

Degree of hazard elements			Degree of hazard score
(a) Average traffic flows over an 18hour day	(b) Total hourly HGV flow over an 18 hour day	(c) Average vehicle speed (mph)	
+ 1,800	+ 3,000	>40	30
1,200 – 1,800	2,000 to 3,000	30 – 40	20
600 – 1,200	1,000 to 2,000	20 – 30	10
< 600	< 1,000	< 20	0

534. The change in total traffic, average HGV traffic and speed for a typical baseline with and without construction traffic will be derived to facilitate a degree of hazard score by applying the scoring system in **Table 12-5**. The scores for all three hazard elements will then be combined to provide a 'level' of fear and intimidation using the definitions in **Table 12-6** (reproduced from EATM).

Table 12-6 Level of fear and intimidation

Level of fear and intimidation	Total hazard score (a) + (b) + (c)
Extreme	71+
Great	41 – 70
Moderate	21 – 40
Small	0 - 20

535. Having derived the level of fear and intimidation for both the baseline and proposed situation the magnitude of impact can be derived by comparing the two hazard scores and applying the following magnitude of impact thresholds in **Table 12-7** (derived from EATM).

Table 12-7 Fear and intimidation magnitude of impact thresholds

Magnitude of Impact			
Negligible	Low	Medium	High
No change step changes between levels of fear and intimidation	One step change in level of fear and intimidation, with <400 vehicle increase in average 18hr all vehicle flows; and/or <500 HGV increase in total 18hr HGV flows	One step change in level of fear and intimidation, with >400 vehicle increase in average 18hr all vehicle flows; and/or >500 HGV increase in total 18hr HGV flows	Two or more step changes in level of fear and intimidation

12.4.2.4 Road safety

536. During the development of the 2014 TA a detailed review of the baseline road safety record for the TTSA was undertaken to ascertain the potential for Woodsmith Mine construction and operational traffic to exacerbate existing trends. This approach identified that impacts would be no greater than minor adverse and there was no requirement for mitigation beyond that which had already committed to by Anglo American ('embedded' into the design), e.g. right turn lanes from the A171 to the B1416.

537. It was agreed with NYC Highways to monitor and review accident trends during the course of the construction and implement targeted mitigation if required. The current Woodsmith Mine Construction Traffic Management Plan (CTMP) therefore includes a requirement for Anglo American and its contractors to monitor and report all collisions and near misses to the Traffic Management Liaison Group (TMLG)¹⁵ and if emerging issues are identified to implement targeted mitigation. To date, noting the improvements in road safety since the commencement of construction (outlined within **paragraphs 477 to 505**), the TMLG has not considered it necessary to implement further mitigation.
538. Noting that there has been a material improvement in the road safety baseline along all links within the TTSA since the commencement of construction of Woodsmith Mine it is proposed that road safety matters continue to be best addressed through the ongoing CTMP (and similarly through the proposed future operational Travel Plan) monitoring and management processes. It is therefore proposed to scope out further consideration of road safety impacts.

12.4.2.5 Driver Delay

539. EATM outlines that values for driver delay can be determined by the use of junction modelling packages, however, it is noted that delays are only likely to be significant when the surrounding highway network is at, or close to capacity.
540. The 2014 TA identified four junctions within the proposed TTSA that could be susceptible to increases in traffic. **Table 12-8** provides a description of these four junctions and details of the potential net increases in traffic through each of them. A summary of daily and hourly flows from Sections 12.4.1.1 and 12.4.1.2 is provided as follows:
- The construction phase is forecast to result in a worst-case net increase of seven vehicle movements in any one hour, comprising:
 - o A peak net increase in HGV flows of 74 two-way HGV movements per day, equivalent to approximately seven additional vehicle movements per hour; and
 - o No increase in employee numbers is forecast.
 - The operational phase is forecast to result in a worst-case net increase of 32 vehicle movements per hour, comprising:
 - o A peak net increase in HGV flows of 71 two-way HGV movements per day, equivalent to approximately seven additional vehicle movements per hour; and
 - o A net increase of additional 74 employees per day (split across at least three shifts), equivalent to an additional 25 additional vehicle movement per hour (assuming no car-sharing).

Table 12-8 Summary of potential driver delay impacts

Location	Summary
Whitby, junction of the A171, A174 and Waterstead Lane (Mayfield Road junction)	This junction was upgraded prior to the commencement of construction of Woodsmith Mine (by Anglo American) to improve capacity and pedestrian connections. The signal improvements were designed to accommodate the peak forecast demand that would be generated by the construction and operation of Woodsmith Mine. Subsequent to the commencement, permission for 180 private parking spaces were secured at the Cross Butts park and ride (P&R) site for use by Anglo American. The use of this park and ride site effectively intercepts employees who would have previously been assessed to

¹⁵ The purpose of the TMLG is to facilitate liaison between Anglo American, planning authorities, highways authorities and other key stakeholders in relation to the transportation aspects of the construction and operation of Woodsmith.

Location	Summary
	have travelled through the Mayfield Road junction on their way to the original location of the proposed P&R site to the south of Whitby (opposite Sainsbury's). The interception of at least 180 vehicles per day is therefore reasoned to result in an equivalent reduction of up to 360 traffic movements per day through the Mayfield Road junction above consented levels. It is therefore considered that the proposed net increase of approximately seven vehicles per hour during the construction phase and 32 over three hours during the operational phase would be offset by the change in location of the P&R site. Furthermore, whilst the net increase in HGVs would all be forecast to travel via this junction, the majority of the additional employee trips in the operational phase would be expected to be intercepted at the Cross Butts P&R (thus avoiding this junction). In summary, it is considered that the proposed changes would have an indiscernible impact upon highway capacity.
South of Whitby, junction of the A171 and B1416	During the construction phase the proposed net increase of approximately seven HGVs per hour would all be forecast to travel via this junction. This level of increase would however be considered to have an indiscernible impact upon highway capacity. During the operational phase, the proposed net increase of approximately seven HGVs per hour would all be forecast to travel via this junction, however, the majority of the additional employee trips would be expected to be intercepted at the Cross Butts P&R. The residual net increase in trips passing through this junction would therefore be considered to have an indiscernible impact upon highway capacity.
West of Whitby, junction of the A171 and A169	It is considered that the proposed net increase of approximately seven vehicles per hour during the construction phase and 32 vehicles across three hours during the operational phase would have an indiscernible impact upon highway capacity.
West of Whitby, junction of the A171, B1460 and Cross Butts P&R	

541. Noting that **Table 12-8** outlines that the amendments to the currently Approved Development would have an indiscernible impact, it is proposed to scope out further consideration of driver delay impacts.

12.4.2.6 Identification of sensitive receptors

542. EATM identifies that it is necessary to identify particular groups ('receptors') and associated locations, which may be sensitive to changes in traffic conditions and provides a checklist of sensitive locations and groups (however, the list is not exhaustive and can be added to by the assessor). Applying the EATM principles, **Table 12-9** provides broad definitions of the different sensitivity levels that would be adopted.

Table 12-9 Proposed sensitivity levels

Sensitivity	Description
High	High concentrations of sensitive receptors (e.g. hospitals, schools, residential dwellings areas with high footfall) and limited separation provided by the highway environment; or a low concentration of sensitive receptors and no separation from traffic provided by the highway environment.
Medium	A low concentration of sensitive receptors (e.g. residential dwellings, pedestrian desire lines, etc.) and some separation from traffic provided by the highway environment.
Low	Few sensitive receptors.

12.4.3 Ladycross Plantation

12.4.3.1 Construction

543. The 2014 ES and TA for the currently Approved Development outlined that one of the principal means of managing environmental impacts from construction traffic to Ladycross Plantation would be the CTMP controls. Following commencement of construction, a series of CTMPs have been submitted and approved by NYC and the NYMNP to manage the traffic movements from Ladycross Plantation within the bounds of the worst-case parameters outlined in the 2014 ES and TA for the currently Approved Development.
544. A review of the amendments to the currently Approved Development has identified that the required levels of traffic demand associated with the amendments can be accommodated within the current consented levels, i.e. there would be no increase in the number of vehicle movements compared to the currently Approved Development.
545. It is proposed to scope out the assessment of construction traffic and transport effects for Ladycross Plantation noting that there would be no increase in the numbers of permitted vehicle movements and that there has been no material increase in background traffic flows and no recorded road safety matters. Vehicle movements would also continue to be managed through the Ladycross Plantation CTMP.

12.4.3.2 Operation

546. The 2014 ES and TA for the currently Approved Development outlined that the operation of Ladycross Plantation would not require a permanent workforce with only occasional maintenance visits and on this basis operational impacts were not considered further. Anglo American has confirmed that this assumption remains valid.
547. The TA for the currently Approved Development proposed that following completion of the construction phase, the construction access would be removed and a new operational access created from the C82, approximately 500m north of the existing construction access. **Chapter 1 Introduction** outlines that it is now proposed that the construction access is instead retained as the operational access.
548. The design of the Ladycross Plantation construction access was agreed with NYC via a Section 278 (Highways Act, 1980) agreement. It is reasoned that the construction access would be suitable for the operational phase noting that:
- Visibility splays for a design speed of 100kph (62.5mph) are provided in both directions (noting measured average speeds on the C82 are approximately 45mph).
 - The junction geometry has been constructed to allow the swept path of two HGVs.
 - The junction has been constructed as a permanent standard, i.e. the access is not constructed to a lesser temporary specification.

- 549. This strategy is proposed noting that the access is of a suitable permanent construction for the proposed levels of operational traffic, there have been no recorded collisions in the vicinity of the access, and it would avoid the environmental impacts and disruption to highway users of having to remove and then construct a new access.
- 550. Noting that there would be no material change in forecast operational vehicle movements and that the transition to the operational phase at Ladycross Plantation will reduce vehicle movements on the C82 and A171, it is proposed to scope out consideration of operational traffic and transport impacts from Ladycross Plantation.

12.4.3.3 Decommissioning

- 551. On the basis that the 2014 ES and TA for the currently Approved Development concluded that the decommissioning phase would have similar effects to the construction phase, it is considered that decommissioning of Ladycross Plantation would not result in a significant change in peak vehicle movements and therefore traffic and transport decommissioning effects are scoped out.

12.4.4 Lockwood Beck

12.4.4.1 Construction

- 552. The 2014 ES and TA for the currently Approved Development outlined that one of the principal means of managing environmental impacts from construction traffic to Lockwood Beck would be the CTMP controls. Following commencement of construction, a series of CTMPs have been submitted and approved by RCBC to manage the traffic movements from Lockwood Beck within the bounds of the worst-case parameters outlined in the 2014 ES and TA for the currently Approved Development.
- 553. A review of the amendments to the currently Approved Development has identified that the required levels of traffic demand associated with the amendments can be accommodated within the current consented levels, i.e. there would be no increase in the number of vehicle movements compared to the currently Approved Development.
- 554. It is proposed to scope out the assessment of construction traffic and transport effects for Lockwood Beck noting that there would be no increase in the numbers of permitted vehicle movements and that there has been no material increase in background traffic flows and an improvement in baseline road safety conditions. Vehicle movements would continue to be managed through the Lockwood Beck CTMP.

12.4.4.2 Operation

- 555. The 2014 ES and TA outlined that the operation of Lockwood Beck would not require a permanent workforce with only occasional maintenance visits and on this basis operational impacts were not considered further. Anglo American has confirmed that this assumption remains valid. Noting that there would be no material change in forecast operational vehicle movements and that as activities at Lockwood Beck transition to the operational phase there will be a reduction in vehicle movements on the A171, it is proposed to scope out consideration of operational traffic and transport impacts from Lockwood Beck.

12.4.4.3 Decommissioning

- 556. On the basis that the 2014 ES and TA for the currently Approved Development concluded that the decommissioning phase would have similar effects to the construction phase, it is considered that decommissioning of Lockwood Beck would not result in a significant change in peak vehicle movements and therefore traffic and transport decommissioning effects are scoped out.

12.5 Potential mitigation measures for key impacts

557. Section 12.2 outlines that prior to commencement of construction of the currently Approved Development, a significant package of physical highway mitigation measures have been agreed with highway stakeholders and implemented by Anglo American to improve safety, capacity, and accessibility for non-motorised users.

12.5.1 Traffic and transport (Woodsmith Mine)

558. The key component to realising the construction traffic forecasts will be the continuous use and evolution of the Woodsmith Mine CTMP which sets out the measures, controls and monitoring processes to manage the numbers of construction employee vehicle trips and HGV movements.
559. To manage the numbers of vehicle movements to Woodsmith Mine during the operational phase an Interim Mine OTP (Royal HaskoningDHV, 2014c) was submitted with the currently Approved Development in 2014. However, noting the proposals to amend the operational travel plan strategy and the evolution of transport policy in the proceeding ten years it is proposed to submit an updated Woodsmith Mine OTP.
560. The proposed Woodsmith Mine OTP will set out a range of measures, controls and monitoring processes to manage the numbers of employees and delivery trips to Woodsmith Mine.

12.5.2 Ladycross Plantation

561. The key component to realising the traffic forecasts will be the continuous use and evolution of the Ladycross Plantation CTMP to manage, monitor and control LV and HGV movements.

12.5.3 Lockwood Beck

562. The key component to realising the traffic forecasts will be the continuous use and evolution of the Lockwood Beck CTMP to manage, monitor and control LV and HGV movements.

13 Climate Change

13.1 Introduction

563. This Chapter outlines the scope and methodology for the assessment of the impacts on Climate Change receptors arising from the construction, operation and decommissioning of the amendments to the currently Approved Development.
564. Evaluating climate change as part of an EIA typically comprises two elements; a greenhouse gas (GHG) assessment, which considers the effects of a project on climate change, and a climate change resilience (CCR) assessment, which evaluates the effects of climate change on a project.
565. The 2014 ES, which was produced to support the 2014 planning application was lawfully prepared under the 2011 EIA Regulations (Royal HaskoningDHV, 2014). As such, there was no requirement to undertake a GHG or CCR assessment at the time, and the 2014 ES was deemed to be satisfactory for Planning Permission to be granted. Since then, the 2017 EIA Regulations have deemed climate change a mandatory consideration for projects likely to have significant environmental effects. Consequently, the SES will include a high-level assessment of carbon emissions in reference to the currently Approved Development and the amendments to the currently Approved Development. In addition, the requirement for a CCR assessment is discussed in this ESR.

13.2 Overview of existing environment and receptors

13.2.1 GHG Assessment

566. As the 2014 ES did not include a GHG assessment, an emissions baseline for the currently Approved Development has not formally been established (Royal HaskoningDHV, 2014). Prior to granting of Planning Permission, the boundary of the currently Approved Development formerly comprised farmland and greenfield areas, where there would have been emissions associated with agricultural use. Woodsmith Mine comprised mixed arable land and grass grazed by cattle, while Ladycross Plantation and Lockwood Beck consisted of arable land and grass that was grazed. Therefore, an accurate quantification of historical GHG emissions within the spatial boundary of Woodsmith Mine, Ladycross Plantation and Lockwood Beck is not possible.
567. It is acknowledged that construction activities have been ongoing at Woodsmith Mine, Ladycross Plantation, and Lockwood Beck since 2017, following Planning Permission approval granted in 2015, subject to conditions, which have resulted in the release of GHG emissions. These activities will continue as part of ongoing construction of the amendments to the currently Approved Development.

13.2.2 CCRA

568. The receptors that are considered as part of a CCR assessment are site workers, and infrastructure and assets associated with the currently Approved Development, which could be vulnerable to the projected effects of climate change and extreme weather events over the construction, operational and decommissioning phases.

13.3 Potential environmental impacts

13.3.1 GHG Assessment

569. The amendments to the currently Approved Development may introduce additional sources of GHG emissions and extend the duration over which construction phase GHG emissions will arise. As detailed in **Chapter 12 Traffic and Transport**, there will be an increase in the maximum

number of Heavy Goods Vehicle (HGV) movements per day, from 126 to 140 (with an increase to 200 movements for a time limited period). It is, however, considered to be likely that average HGV movements per day across the remainder of the construction phase are not predicted to increase. In addition, it is anticipated that there will be a small increase in vehicle movements from construction employees.

- 570. It should be noted that there will be a reduction in scale of construction activities at Ladycross Plantation and Lockwood Beck. At Woodsmith Mine, the construction activities associated with the amendments to the currently Approved Development will not differ in nature to those originally projected in the 2014 ES (Royal HaskoningDHV, 2014).
- 571. With respect to the operational phase, it is proposed to increase the maximum number of HGV and employee movements. The proposed increase in the maximum number of consented HGV movements is from 9 to 80 per day. There is also proposed to be an increase of approximately 100 light vehicle movements by employees. There will also be other minor sources of operational phase GHG emissions, particularly from energy consumption at the Woodsmith Mine site.
- 572. There is the potential for emissions to arise from decommissioning of the currently Approved Development, although a detailed inventory of activities that will take place during this phase is not known at this stage. Decommissioning of the currently Approved Development would not be anticipated until the 2070's, at the earliest and, more likely beyond, where there is considerable uncertainty regarding the emissions intensity of sectors within the UK, or national or international policies that will be in place with respect to GHG's. Given the uncertainties with regard to the required activities, the UK economy and policy drivers during the decommissioning, an assessment of GHG emissions during this phase is proposed to be scoped out.
- 573. It is therefore proposed to carry out a high-level assessment of GHG emissions arising from the construction and operational phases of the currently Approved Development and the amendments to the currently Approved Development.

13.3.2 CCR Assessment

- 574. Potential impacts to the currently Approved Development associated with climate change include acute extreme weather events such as heatwaves, and chronic hazards that involve gradual changes to climate averages.
- 575. The currently Approved Development will likely be operational for at least 65 years, and therefore, is assumed to be operational until the 2090's. The main climate hazards likely to affect the Approved Development and the wider region in the northeast of England are increased heatwaves and drought conditions. The above ground infrastructure is not anticipated to be vulnerable to flooding, as detailed in **Chapter 4 Water Resources, Flood Risk, Drainage and Water Environment Regulations**.
- 576. An FRA will be undertaken for the currently Approved Development, across Woodsmith Mine, Ladycross Plantation and Lockwood Beck, which will inherently consider the potential effects of climate change over its design life. Further details regarding the approach to the FRA, along with Water Resources and Drainage are provided in **Chapter 4 Water Resources, Flood Risk, Drainage and Water Environment Regulations**.

577. Additionally, the infrastructure and assets for the currently Approved Development will be designed to account for other extreme climate hazards, such as overheating, and therefore are not considered to be vulnerable to the projected effects of climate change.
578. In summary, the currently Approved Development is considered to have a high degree of resilience to the potential impacts from climate change, and further consideration of climate resilience through a CCR assessment is proposed to be scoped out.

13.4 Approach to EIA

13.4.1 GHG Assessment

579. As discussed in Section 13.2, a GHG assessment of the currently Approved Development was not carried out as part of the 2014 ES. As a result, there is no baseline GHG emissions total for scenarios without and with the implementation of the currently Approved Development. A high level GHG assessment of the currently Approved Development and the amendments to the currently Approved Development will therefore be carried out.
580. The receptor for the assessment is the global atmosphere, and each unit of GHG that enters it has the same contribution to global climate change, irrespective of where it is released. The outcomes of a GHG assessment as part of the EIA process are typically evaluated based upon a project's contribution towards emission reduction trajectories or targets, as stated in IEMA guidance, "*The crux of significance therefore is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*" (IEMA, 2020). Therefore, when determining the GHG effects of the amendments to the currently Approved Development, wider sectoral or national context is required.
581. Anglo American reports its corporate Scope 1 and Scope 2 GHG emissions on an annual basis, which includes ongoing construction activities from the currently Approved Development. These emission values will be used to determine the baseline for construction phase emissions, and where feasible, the change in emissions associated with the amendments to the currently Approved Development will be quantified.
582. A qualitative review of operational phase GHG emissions associated with the currently Approved Development and the amendments to the currently Approved Development will be undertaken. This will include wider context, such as:
- Anglo American is decarbonising its operations and has committed to a corporate carbon neutrality target by 2040.
 - Since consent for the currently Approved Development was awarded, there have been some notable design changes that will result in a decrease in GHG emissions, such as switching the fuel mix powering Woodsmith Mine, Ladycross Plantation and Lockwood Beck to primarily mains power instead of diesel, which are greater than 90% renewable as of 2025. Diesel generators are still in use, but at much lower capacities, as is LNG and battery storage (at Woodsmith Mine). The carbon intensity of construction activities at those sites will now therefore decrease in line with the decarbonisation of the UK grid.
 - The removal of Tocketts Lythe has reduced the release of potential construction and operational emissions associated with the currently Approved Development.
 - The Woodsmith Project has committed to a tree planting scheme to boost carbon sequestration, as part of the current Section 106 agreement with the NYMNP, with approximately 245,000 trees planted to date.

- The road vehicle fleet is likely to decarbonise over the duration of the operational phase in line with national policies and changes in consumer choice.
583. Significance criteria for the operational GHG assessment will evaluate whether the implementation of the amendments to the currently Approved Development would affect the UK's ability to meet its emission reduction and Net Zero targets.
584. The GHG assessment will be presented in a standalone chapter as part of the SES.

14 Socio-economic

14.1 Introduction

585. This Chapter outlines the scope and methodology for the assessment of the impacts on Socio-Economic receptors arising from the construction, operation and decommissioning of the amendments to the currently Approved Development.
586. The 2014 planning application for the currently Approved Development included assessment of the likely significant socio-economic impacts of the Mine and MTS application, together with the overall impact of the Woodsmith Project. An assessment of cumulative impacts of the Project with other planned and foreseeable developments was also undertaken.
587. In addition to the technical assessment, An Economic Report that sets out the impacts of the amendments to the currently Approved Development will be produced. In particular, the local benefits and the actions programmes that Anglo American has and will continue to implement to ensure local residents and businesses have the opportunity to benefit.

14.2 Scope and structure

588. The 2014 ES scoped in assessment of the socio-economic impacts of the development relating to the following:
- Peak Construction Employment.
 - Impact on temporary accommodation supply (construction).
 - Impact of construction employees on demand for social and community infrastructure.
 - Induced employment effects resulting from construction expenditure.
 - Increase in Gross Value Added (GVA) resulting from construction expenditure.
 - Indirect effects of construction on the local economy – tourism.
 - Tax effects resulting from construction expenditure.
 - Crime and fear of crime (construction).
 - Special Qualities (construction).
 - Employment effects during operation.
 - Impact on the labour market.
 - Demand for accommodation by operational employees.
 - Impact of operational employees on demand for social and community infrastructure.
 - Indirect employment effects resulting from operational expenditure.
 - Increase in GVA resulting from operation expenditure.
 - Tax effects resulting from operation.
 - Indirect effects on the local economy.
 - Crime and fear of crime (operation).
 - Special qualities.
 - Decommissioning.
 - Cumulative assessment.

14.2.1 Likely effects

589. The scope of assessment as presented in the 2014 Socio-economic ES chapter that remains valid and unchanged, is as follows:
- Peak Construction Employment.
 - Construction Spending/ Investment.
 - Induced employment effects resulting from construction expenditure.

- Increase in GVA resulting from construction expenditure.
- Employment effects during operation.
- Impact on the labour market.
- Increase in GVA resulting from operation expenditure.
- Special Qualities.
- Decommissioning.
- Cumulative assessment.

590. The above will be assessed using the same methodology as the 2014 Socio-economic ES chapter.

14.2.2 Approach and methodology

591. The impact assessment will identify the duration (temporary or permanent), direction (positive or negative) and magnitude (negligible, minor, moderate or major) of any impacts. Where there is uncertainty about impacts, or where they are based wholly on assumptions, sensitivity testing will be undertaken.

592. The methodology will remain as for the 2014 ES, except where assumptions are required to be updated to reflect the latest baseline context, and for the following changes:

- The Doves Nest Commuting Zone will be updated and referred to as the Woodsmith Mine Commuting Zone, but the boundary will remain the same.
- A further assessment zone will be added, the Local Employment Catchment Zone. This is the zone within which the majority of Home-Based Workers live, as evidenced by data collected from construction employees to date. This zone extends slightly further than the Woodsmith Mine Commuting Zone.
- The York, North Yorkshire and East Riding Local Enterprise Partnership will be replaced in the assessment by the York and North Yorkshire Combined Authority.
- The updated baseline and policy sections will be limited to those changes that could have a material impact on the assessment of scale or significance of likely effects.

14.2.3 Matters to be scoped out

593. The following assessment areas are proposed to be scoped out of the SES:

- Impact on temporary accommodation supply (construction).
- Impact of construction employees on demand for social and community infrastructure.
- Tax Effects resulting from construction expenditure.
- Indirect effects of construction on the local economy – tourism.
- Tax Effects resulting from operation.
- Crime and fear of crime.
- Special Qualities.

594. Assessment of impact of construction employees on demand for social and community infrastructure and for accommodation is proposed to be removed from the scope of the SES. The effects previously identified were negligible and further significant effects are very unlikely. This is as a result of the low percentage of Non Home-Based Workforce on the project to date and the negligible impact the construction employees have had on demand for social and community infrastructure.

595. Assessment of impact of tax effects resulting from both construction and operation is also proposed to be scoped out of the SES chapter as this is not considered necessary in providing a robust assessment of socio-economic effects of the amendments to the currently Approved

Development. The effect would be beneficial, but its scale cannot be predicted with enough accuracy to attribute a significance to it.

596. The indirect effects of construction on tourism are proposed to be scoped out on the basis that the 2014 assessment predicted these to be insignificant and the currently Approved Development delivered to date has resulted in negligible impact on the local tourism economy since construction began following the permission being granted in 2015, and because embedded mitigation for potential tourism effects is already provided as part of the Section 106 Agreement.
597. Assessment of impacts of crime and the fear of crime is proposed to be scoped out of the SES on the basis the original assessment predicted these to be negligible and, to date, there have been negligible impacts relating to the impacts of crime and fear of crime related to the Woodsmith Project since construction began.
598. Assessment of the impact of either construction or operation on the Special Qualities of the NYMNP is proposed to be scoped out because the previous assessment identified no likely significant effects and the proposed amendments to the currently Approved Development will not materially change the scale or significance of the influencing factors (mainly the number of non-home-based workers).

14.2.4 Summary of SES Scope

599. The SES will include assessment of the following:
- Policy (limited to those changes that could have a material impact).
 - Baseline (limited to those changes that could have a material impact).
 - Peak Construction Employment.
 - Induced employment effects resulting from construction expenditure.
 - Increase in GVA resulting from construction expenditure.
 - Employment effects during operation.
 - Impact on the labour market.
 - Increase in GVA resulting from operation expenditure.
 - Decommissioning.
 - Mitigation and s106.
 - In combination effects.
 - Cumulative assessment.

15 Recreation and Access

15.1 Introduction

600. This Chapter outlines the scope and methodology for the assessment of the impacts on Recreation and Access receptors arising from the construction, operation and decommissioning of the amendments to the currently Approved Development.
601. The sites that comprise the currently Approved Development are situated on private land located within the NYMNP (Woodsmith Mine and Ladycross Plantation) and RCBC (Lockwood Beck) administrative boundaries, and, as such, do not provide any access or facilities for recreational activities.
602. Tocketts Lythe, within the administration area of RCBC, is being removed from the currently Approved Development. This will result in a beneficial impact of no effect on recreation and access.
603. Where relevant, recreational and access impacts will be assessed and considered within the relevant technical chapters, where applicable, i.e. **Chapter 10 Noise and Vibration**, **Chapter 11 Air Quality** and **Chapter 12 Traffic and Transport**, including the identification of relevant mitigation.

15.2 Overview of existing environment and receptors

15.2.1 Woodsmith Mine and Ladycross Plantation

604. Recreational receptors located in proximity to Woodsmith Mine and Ladycross Plantation include:
- The North York Moors National Park, in which both are located; and
 - Two privately owned recreation facilities, both caravan parks, located within 800m of Woodsmith Mine, and one privately owned recreation facility, also a caravan park, located immediately north of Ladycross Plantation.
605. Several Public Rights of Way (PRoWs) are located within in the vicinity of Woodsmith Mine and Ladycross Plantation including (NYMNPA, 2025):
- Woodsmith Mine:
 - o A PRoW (bridleway) located to the immediate northwest (path number 30.7/029/1).
 - o Two PRoWs (bridleways) located approximately 500m west (path numbers 30.7/031/1 & 30.7/201/1).
 - o A PRoW (footpath) located approximately 500m southwest (path number 30.50/022/1).
 - o The Coast-to-Coast Walk is located approximately 600m south on Sneaton Low Moor.
 - o The Esk Valley Walk is located approximately 3km northwest.
 - o The Cleveland Way is located approximately 5km east.
 - Ladycross Plantation:
 - o A PRoW (footpath) is located immediately adjacent to the western boundary of the Site, trending approximately north-south (path number 310049/ 30.33/049/1). While the footpath lies outside of both the construction and operational boundaries, it is located within the extent of works. This PRoW provides a link between the A171 and the public highway that links the village of Egton to the A171.
 - o A PRoW (footpath) located immediately south of Ladycross Plantation (path number 310050/ 30.33/050/1).

15.2.2 Lockwood Beck

606. One public footpath (Path number 126/5/3) section was identified within the Site boundary, with cycle routes located immediately north on Stanghow Road, and immediately south on Swinedale Lane. No other PRowS were identified in the immediate vicinity of Lockwood Beck (RCBC, 2025).
607. Lockwood Beck Reservoir, which provides opportunities for fishing and walking, is located immediately south of the Site, on the opposite side of the A171 public highway, and within the boundary of the Noth York Moors National Park.

15.3 Potential environmental impacts

608. There are several recreation and access receptors located in proximity to Woodsmith Mine, Ladycross Plantation and Lockwood Beck. While these are important and sensitive receptors, the ongoing construction activities are not having an adverse impact, in part due to the controls applied through the Planning Permissions.
609. The 2014 ES identified the following environmental impacts on reaction and access receptors:
- With the exception of the Cleveland Way, Esk Valley Way and Coast to Coast path, all other local PRowS are of local (low) importance.
 - No obstructions to PRowS were identified at Woodsmith Mine and Lockwood Beck.
 - The temporary, short-term loss of 707m of a PRow at Ladycross Plantation and the obstruction of a single 992m-long stretch of footpath (of which the 707m forms part thereof) (path number 310049) during the construction phase.
 - The magnitude of impact (in the 2014 ES) was determined by calculating the permanent loss (for the lifespan of the proposed scheme) of this PRowS in the context of the available PRow asset, considering that there is 523.9km of PRow available within the study area located within the National Park. This loss of PRow equates to 0.001% of the available resource.
 - No obstructions to sports and recreation facilities, and open access land/ public open space were identified at the Sites
 - Temporary, short-term obstruction to cyclists and equestrians were during the construction and decommissioning phases as Woodsmith Mine.
 - No obstructions to cyclists and equestrians were identified at Ladycross Plantation and Lockwood Beck.
610. The nature and scale of the amendments to the currently Approved Development would not differ from the currently Approved Development sufficiently to give rise to any increased effect and as a result, the worst-case magnitude of change will remain unchanged from that of the currently Approved Development

15.4 Approach to EIA

611. It is not anticipated that any significant adverse effects will arise on recreation and access receptors from the proposed amendments to the currently Approved Development at Woodsmith Mine, Ladycross Plantation or Lockwood Beck. Therefore, it is proposed to scope all such effects out of further consideration in the EIA.

16 Health Impact Assessment and Accident Risk

16.1 Overview of existing environment and receptors

- 612. This Chapter outlines the scope and methodology for the assessment of the impacts on Health Impact and Accident Risk receptors arising from the construction, operation and decommissioning of the amendments to the currently Approved Development.
- 613. The potential effects on human health and the risk of environmental consequences of major incidents associated with a development were first introduced as topics for consideration under the 2017 EIA Regulations.
- 614. As the Approved Development is already consented, the application will seek permission for the proposed amendments to Woodsmith Mine, Ladycross Plantation and Lockwood Beck as described in **Chapter 1 Introduction**. In this context, the amendments to the currently Approved Development will take place within a population adjusted to the ongoing construction and eventual operation of the wider Woodsmith Project.

16.2 Potential environmental impacts

- 615. In terms of local population health considerations, potential effects may be direct or indirect, short or long-term. Potential and perceived risks will be associated with a certain combination of aspects of the environmental characteristics, emanating from additional emissions, highways activities, and construction phase disruptions, as well as the longer-term employment and economic benefits that the Woodsmith Project will bring to the area.
- 616. As set out in relevant IEMA guidance, major accidents and disasters can be considered within an EIA as any such incidents associated with the currently Approved Development that have “*the potential to cause the loss of life, permanent injury and/ or temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration*”. The overall operations of conveyor transfer and storage of the polyhalite product are not associated with such potential high risks to the environment or to major hazard or process safety risks.

16.3 Approach to EIA

- 617. Impacts to human health, will be assessed and considered within the relevant technical chapters, where applicable, in which relevant health and environmental-based impact benchmarks will be applied, i.e. **Chapter 4 Water Resources, Flood Risk, Drainage and Water Environment Regulations, Chapter 6 Soils, Land Quality and Waste, Chapter 9 Noise and Vibration, Chapter 10 Air Quality and Chapter 12 Traffic and Transport**. Each assessment will include the mitigation measures necessary to reduce any significant impacts to acceptable levels.
- 618. The design of Woodsmith Mine, Ladycross Plantation and Lockwood Beck infrastructure, as well as a comprehensive, planned preventative maintenance regime, will ensure that significant environmental releases will not materialise. Therefore, major accidents associated with the construction and operation of Woodsmith Mine, Ladycross Plantation and Lockwood Beck operations, which have a potential to impact on the wider environment, are very unlikely to occur.
- 619. On this basis it is proposed to scope out health impacts and accident risk from the EIA.

17 Cumulative Impacts

17.1 Background to cumulative impact assessment

620. No legislation specifically applies to cumulative impact assessment (CIA) or outlines how such an assessment should be undertaken. However, the EIA Directive (2014/52/EU) and associated EIA Regulations (2017) require consideration of direct impacts and any indirect, secondary, and cumulative effects of a project.
621. The CIA assesses the potential impacts of a project with other past, present (current), and reasonably foreseeable (proposed) plans and projects.
622. With respect to 'past' projects, the environmental impacts of schemes that have been completed and are operational will be included within the environmental baseline; as such, these impacts are already considered in the EIA process. Consequently, generally completed projects can be excluded from the scope of CIA. Projects that are currently being constructed or that are in the planning process, where sufficient information is publicly available, as well as ongoing activities that have the potential to influence the same environmental parameters as the amendments to the currently Approved Development, are the focus of the CIA.
623. Cumulative impacts that are of very large, large or moderate significance will be significant in EIA terms, as defined in **Table 17-1**.

Table 17-1 Cumulative Impact Assessment criteria

Significance Criteria	Impact Descriptor
Very large (usually adverse)	Where the combined impacts of the amendments to the currently Approved Development with other development at an environmental receptor would be very highly significant (potentially beneficial but typically adverse only). Effects would be permanent for receptors of very high sensitivity.
Large (adverse or beneficial)	Where the combined impacts of the amendments to the currently Approved Development with other development at an environmental receptor would be highly significant (beneficial or adverse). Effects would be widespread/ large-scale and/ or permanent for receptors of high sensitivity, and localised and/ or temporary for receptors of very high sensitivity.
Moderate (adverse or beneficial)	Where the combined impacts of the amendments to the currently Approved Development with other development at an environmental receptor would be significant (beneficial or adverse). Effects would be permanent for receptors of medium-high sensitivity, and localised and/ or temporary for receptors of high sensitivity.
Slight (adverse or beneficial)	Where the combined impacts of the amendments to the currently Approved Development with other development at an environmental receptor would be potentially identifiable but not significant (beneficial or adverse). Effects would be permanent for receptors of medium-low sensitivity, and localised and/ or temporary for receptors of medium sensitivity.
Negligible or neutral	Where the combined impacts of the amendments to the currently Approved Development with other development at an environmental receptor would be negligible and not significant.

17.2 Potential for cumulative impacts

624. Of particular importance in defining potentially significant cumulative impacts are the following aspects, all of which are important in deriving the overall cumulative impact significance:
- The temporal and geographic (spatial) boundaries of the effects of each project.
 - The interactions between relevant activities of each project and the overall environment/ecosystem.
 - The thresholds of sensitivity of the existing environment.
625. Generally, measures to avoid or minimise significant adverse impacts at the project level will also tend to reduce or avoid the potential for any accumulation of impact with other plans or projects.

17.3 Approach to EIA

626. A request has been made to the relevant planning authorities for a list of development projects within its jurisdiction that might be considered for potential cumulative effects with the amendments to the currently Approved Development.
627. Presently, no development projects have been proposed by either NYMNPA or RCBC to form part of the CIA. Therefore, the CIA will focus on proposed amendments to the currently Approved Development from traffic.

18 Special Qualities

628. The North York Moors Management Plan sets out a list of special qualities (SQ1 to SQ14) that comprise the essential characteristics of the National Park. The potential impacts on the above special qualities were considered for each technical topic and in a standalone chapter (combination effects) within Part 3 of the 2014 ES for both the mine and MTS.
629. The largest magnitudes of impact were predicted to occur during the construction phase; special qualities SQ2, SQ12 and SQ14¹⁶ were considered to be of moderate to major adverse significance. Impacts associated with SQ2, SQ12 and SQ14 were predicted to occur as a result of landscape, visual and noise effects – these include those associated with the impact on landscape character, views and night-time effects. Landscape, visual effects and noise are proposed to be scoped into the SES and therefore the interaction with special qualities will be considered under each topic.
630. Effects on special qualities were predicted to be of minor adverse significance as a result of land use and soils, ecology and cultural heritage aspects in the 2014 ES. However, as set out above, the amendments to the currently Approved Development associated with these topics will not lead to impacts above those presented in the 2014 ES. There are also a number of existing planning conditions relating to these topics that include the provision of mitigation and control measures. These conditions would be applied to the amended scheme and therefore provide for adequate management and control of special qualities in relation to these aspects, and no further assessment is required.
631. As a result, it is considered that a discrete analysis of the Special Qualities of the National Park can be scoped out of the SES. However, the interaction with special qualities as part of the landscape and visual impact and noise and vibration topics will be assessed individually within the specific chapters.

¹⁶ SQ2 - Wide sweeps of open heather moorland; distinctive dales, valley and inland headlands SQ12 - Tranquillity; dark skies at night and clear unpolluted air SQ14 - A place of artistic, scientific and literary inspiration; a heritage of authors, artists, scientists and explorers

19 Summary of Proposed Scope

632. The information in this ESR is provided to support Anglo American's formal request to both NYMNPA and RCBC for a Scoping Opinion for the amendments to the currently Approved Development, landscaping and associated infrastructure.
633. This ESR sets out the specific topic baseline conditions and a proposed approach to the assessment of the potential environmental impacts arising from the amendments to the currently Approved Development and represents the first reporting stage in the EIA process.
634. The process of EIA is an iterative and evolutionary one that builds up layers of information as the assessment progresses. Many of the surveys and investigations necessary to provide the baseline data for the assessment of potential impacts have been undertaken, or relevant data is already available information on these studies and is included in **Chapters 4-17** along with an outline of the key environmental impacts envisaged to be associated with the amendments to the currently Approved Development.
635. The SES will build on this work and present a comprehensive account of the potentially significant environmental impacts, both adverse and beneficial, and will identify measures to prevent, reduce, offset or enhance the potential impacts of the amendments to the currently Approved Development, where appropriate.
636. Based upon the current description of the amendments to the currently Approved Development and potential impacts upon the key receptors in the study area, **Table 19-1** details the environmental parameters that are proposed to be scoped in, or scoped out of further assessment during the EIA process.

Table 19-1 Summary of environmental topics proposed to be scoped in and scoped out of the EIA and proposed approach

Topic	Scoped into EIA
Water Resources, Flood Risk, Drainage and WER	Yes
Geology and Hydrogeology	Yes
Soils, Land Quality and Waste	No
Terrestrial Ecology	No
Landscape and Visual Impact	Yes
Noise and Vibration	Yes
Air Quality	Yes
Archaeology and Heritage	No
Traffic and Transport	Yes
Climate Change (GHG Assessment)	Yes
Climate Change (CCRA)	No
Socio-economic	Yes
Recreation and Access	No
Health Impact Assessment and Accident Risk	No
Cumulative Impacts	Yes (traffic and transport only)

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Appendix A – Woodsmith Project – A summary of ecological monitoring, surveys and observations at Woodsmith Mine, Ladycross Plantation and Lockwood Beck 2017-2025

WOODSMITH PROJECT

A summary of ecological monitoring, surveys and observations at Woodsmith Mine, Ladycross Plantation and Lockwood Beck 2017-2025

REF: 0000-PCA-EN-RP-00001 - Rev 1



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1 INTRODUCTION

This document provides a summary of the results of ecological monitoring, surveys and observations undertaken at Woodsmith Mine, Ladycross Plantation and Lockwood Beck as part of the overall Woodsmith Project.

A variety of monitoring surveys have been completed across the Woodsmith Project sites. This has included baseline surveys, undertaken between 2012 and 2014 to inform the original Planning Application, surveys carried out to comply with the requirements of extant Planning Permission(s) and licenses and those undertaken voluntarily by Anglo American. The latter surveys provide the majority of records to date and have been undertaken to further understanding of the effectiveness of mitigation measures designed to minimise the impacts of construction activities and the ongoing development of Anglo American's biodiversity enhancement plans for the Project.

Wherever practicable, in order to enable a direct comparison between seasons and years, where baseline surveys are available, an identical approach to the survey has been followed. These methodologies are all standard approaches that were agreed in advance with the National Park Authority and other key consultees as part of pre-application discussions.

Regarding personnel, wherever possible, continuity has been maintained throughout the lifespan of the Project. For example, bird, bat and botanical monitoring surveys are undertaken by Paul Chester, Director of Paul Chester & Associates (PCA). Paul is an ecologist with over thirty years professional experience and a Member of the Chartered Institute of Ecology and Environmental Management since 1995. Specific to the Woodsmith project, along with PCA associates, he was responsible for completing the ecological surveys and associated technical ecology reports submitted to inform the original planning application. He is assisted in bird monitoring surveys by Chris Bradshaw, a leading UK professional ornithologist, with more than thirty years' experience of ornithological fieldwork and guiding throughout the UK and overseas, who was part of the team of ornithologists involved in the baseline breeding bird surveys for the project in 2012, 2013 and 2014.

The above surveys were supported and supplemented by ecologists from the Industry Nature Conservation Association (INCA), with INCA ecologists also undertaking standalone surveys, as required. Bat surveys were led by an ecologist and Chartered Environmentalist who has held a bat survey license for 25 years and has previously been a trainer for the Bat Conservation Trust on its National Bat Monitoring Programme.

INCA ecologists also carried out reptile and moth surveys with the latter being carried out by a lepidopterist who is also the official moth recorder for Vice County 62 (VC62), North-east Yorkshire and the microlepidoptera recorder for the entire area of Yorkshire.

The 2022 and 2023 invertebrate surveys of the Woodsmith Mine meadow, ponds and wetland habitat were carried out by an invertebrate ecologist with over 50 years' experience in the field of invertebrate studies, including many published journal articles and two books on certain families of diptera (true flies).

2 WOODSMITH MINE

2.1 Habitats

At the time of the baseline survey, development at what is now Woodsmith Mine was limited to the farmhouse and other buildings associated with Dove's Nest Farm. The farm was a mixed holding and, during any given year, in addition to cattle grazing, a proportion of the fields were utilised for arable farming, including silage production.

As a mixed farm, pastures were present, predominantly heavily improved grasslands that were managed to maximise their productivity. Examples of poor semi-improved grassland were present rarely, whilst damp neutral grassland and rush pasture habitats were also present locally. Very rarely, open damp grasslands were present at the woodland edge and were not used for agricultural purposes. In the absence of any agricultural usage, these were less improved and botanically more diverse.

Field boundaries typically comprised of post and wire fences which often had associated scattered trees and shrubs. Ditches were present rarely along these boundaries. A variety of other habitat types were present locally within the study area. These were particularly associated with nutrient enriched and/or disturbed habitats around farm buildings and elsewhere.

The farm was enclosed on three sides by woodland. The Belt Plantation, an even-aged mixed plantation woodland was located along the western, south western and southern boundary. A small area of mature damp willow dominated woodland was present to the north-east of the Dove's Nest Farm buildings. This remains immediately outside of the perimeter security fence. Beyond this, Haxby Plantation, an even-aged forestry block, extended from the south to the north of the site, where the composition changes to the predominantly native broadleaved trees of Whinny Wood.

Changes have occurred across all habitats at Woodsmith Mine since the commencement of construction in May 2017.

Supplementary planting of the Belt Plantation with deciduous species, particularly including Goat Willow *Salix caprea*, Pedunculate Oak *Quercus robur* and Rowan *Sorbus aucuparia* has improved the diversity and age of the woodland. This is reducing the previous sparse and open structure of the block. Unlike in previous years, natural regeneration, particularly of oak, is being now being observed.

These plantings have seen good survival and are now well-established. Along with supplementary nest boxes, these woodlands now seeing an enhancement in their value to breeding and wintering birds. Of note is the successful breeding of Spotted Flycatcher *Muscicapa striata* in both 2024 and 2025 in the woodland to the west of the main office/welfare building. This represented a new location for this nationally rapidly declining species.

"Bund A", in the north-west of the site, is the only landscape screening bund, required as mitigation for the construction of Woodsmith Mine that is currently in its fully formed state, with restoration soils placed and planting undertaken. "Bund A" is developing towards its final habitat objective of becoming a scrub-woodland-grassland mosaic, albeit one where the scrub and woodland components are the dominant habitat. In its evolving condition, it has established as a relatively species-rich neutral grassland which includes numbers of characteristic species that were not present or were present very rarely at Doves Nest Farm in the baseline survey. These include Common Bird's-foot-trefoil *Lotus corniculatus*, Common Knapweed *Centaurea nigra*, Meadow Barley *Hordeum secalinum*, Oxeye Daisy *Leucanthemum vulgare*, Meadow Vetchling *Lathyrus pratensis*, Meadowsweet *Filipendula ulmaria*, Red Clover *Trifolium pratense* and Smaller Cat's-tail *Phleum bertolonii*. Tree and shrub plantings as well as naturally establishing Gorse *Ulex europaeus* are seeing year-on-year establishment.



Plate 1: Bund A area preconstruction (top) and developing habitat on completed Bund A (bottom)

Possibly the most notable habitat change at Woodsmith Mine has been associated with the establishment of a meadow in what was an arable field in 2012. The meadow is formed around three ponds and a wetland, constructed to provide surface water attenuation for the Project. The meadow was developed using a combination of a commercial seed mix (Emorsgate Wild Seeds EM4 Meadow Mixture for Clay Soils) that was supplemented with green hay from a local donor meadow near to Fylingthorpe. The meadow is now a well-established and species-rich grassland. It supports in excess of 70 species of plant, many of which are characteristic meadow species. These include uncommon grasses such as Meadow Barley, Quaking-grass *Briza media* and Smaller Cat's-tail along with forbs such as Common Bird's-foot-trefoil, Common Knapweed, Common Sorrel *Rumex acetosa*, Common Spotted-orchid *Dactylorhiza fuchsii*, Cowslip *Primula veris*, Cuckooflower *Cardamine pratensis*, Lady's Bedstraw *Galium verum*, Meadowsweet, Oxeye Daisy, Ragged-Robin *Silene flos-cuculi*, Red Clover and Yellow-rattle *Rhinanthus minor*.



Plate 2: Woodsmith Mine meadow, ponds and wetland area – pre-construction (top) and 2025 (bottom)

Several newly created ponds are now a present in parts of the site. All have seen some establishment of aquatic and marginal vegetation and provide a valuable habitat. Broad-leaved Pondweed *Potamogeton natans* is an often abundant and locally dominant aquatic. Robust emergent species are present and abundant, particularly Bulrush *Typha latifolia* and Common Club-rush *Schoenoplectus lacustris*. More open margins support species such as Creeping Bent *Agrostis stolonifera*, Creeping Buttercup *Ranunculus repens*, Curled Dock *Rumex crispus*, Floating Sweet-grass *Glyceria fluitans*, Great Willowherb *Epilobium hirsutum*, Jointed Rush *Juncus articulatus*, Marsh Foxtail *Alopecurus geniculatus*, Soft-rush *Juncus effusus*, Tufted Hair-grass *Deschampsia cespitosa* and Water-plantain *Alisma plantago-aquatica*. More rarely occurring marginal species include Celery-leaved Buttercup *Ranunculus sceleratus*, Common Fleabane *Pulicaria dysenterica*, Common Yellow-sedge *Carex demissa*, False Fox-sedge *Carex otrubae*, Hard Rush *Juncus inflexus*, Plicate Sweet-grass *Glyceria notata* and Purple-loosestrife *Lythrum salicaria*.



Plate 3: Establishing vegetation at the wetland

A large pond in the woodland north of Haxby Plantation, historically a duck shoot, was open, with a relatively limited vegetation. In the interim period, this has subsequently been left to develop, unmanaged, enabling a significant increase in the amount and diversity of the associated flora. Broad-leaved Pondweed, Canadian Waterweed *Elodea canadensis* and Jointed Rush are locally abundant with frequent Water Horsetail *Equisetum fluviatile* and locally frequent Common Water-starwort *Callitriche stagnalis sens. lat.* and Greater Bird's-foot-trefoil *Lotus pedunculatus*. More occasional species included Common Marsh-bedstraw *Galium palustre subsp. palustre*, Cuckooflower *Cardamine pratensis*, Lady-fern *Athyrium filix-femina*, Lesser Spearwort *Ranunculus flammula*, Marsh Willowherb *Epilobium palustre*, Ragged-Robin *Silene flos-cuculi*, Sharp-flowered Rush *Juncus acutiflorus*, Water Mint *Mentha aquatica* and Wild Angelica *Angelica sylvestris*, with more rarely occurring Common Hemp-nettle *Galeopsis tetrahit*, Marsh Thistle *Cirsium palustre*, Square-stalked St John's-wort *Hypericum tetrapterum*, Tufted Hair-grass, Water Forget-me-not *Myosotis scorpioides* and Yellow Iris *Iris pseudacorus*. Of note is the presence of a sizeable colony of the regionally rare Musk *Mimulus moschatus*.



Plate 4: Developing habitat at the former duck shoot

Within Haxby Plantation existing woodland rides display some signs of a more typical wet heath vegetation. To inform future management options, a small area of Downy Birch *Betula pubescens* was cleared from an area of secondary woodland adjacent to one of the rides which showed signs of heathland establishment. This cleared area subsequently saw the rapid establishment of a typical wet heath, with species such as

Bilberry *Vaccinium myrtillus*, Cross-leaved Heath *Erica tetralix*, Hard-fern *Blechnum spicant* and Heather *Calluna vulgaris*. Since its establishment this area has been a favoured habitat for Adder *Vipera berus*, previously only rarely recorded. Based on the effectiveness of this trial, options to extend areas of heathland in this plantation woodland will be a consideration in the finalisation of future management objectives.

No true hedgerows were present at Dove's Nest Farm. However, linear boundaries that were present in the north-east of the farm have been retained. Formerly open and poorly structured, these are now better established. The most substantial hedgerow block forms the western boundary of the established meadow and extends north to the north-east corner of the site. This feature now comprises a mature tree and shrub line that is typically 7-9m height and 4-6m wide. Supporting species such as Grey Willow *Salix cinerea*, Gorse, Goat Willow, Dog-rose *Rosa canina* and Downy Birch, the habitat is considered to be of higher quality and complexity than previously, providing greater opportunity for a range of species, particularly breeding birds.

Of note between the baseline and current existing environment, the highly invasive shrub *Rhododendron Rhododendron ponticum* was present in woodlands at various locations around the site. This has been subject to ongoing removal, such that it is now much reduced when compared with baseline survey.

2.2 Breeding Birds

Fifty species were considered to be breeding within the Woodsmith site in 2025 with an additional two species, Crossbill *Loxia curvirostra* and Red-legged Partridge *Alectoris rufa*, considered to be probably breeding. Of these 52 species, 14 were not recorded as breeding in 2012. These were Barn Owl *Tyto alba*, Collared Dove *Streptopelia decaocto*, Feral Pigeon *Columba livia*, Garden Warbler *Sylvia borin*, Goldfinch *Carduelis carduelis*, Goshawk *Astur gentilis*, Grey Wagtail *Motacilla cinerea*, House Martin *Delichon urbicum*, Meadow Pipit *Anthus pratensis*, Moorhen *Gallinula chloropus*, Nuthatch *Sitta europaea*, Red-legged Partridge, Reed Bunting *Emberiza schoeniclus* and Stock Dove *Columba oenas*.

Particularly noticeable for certain species was an increase in breeding numbers when compared with the 2012 baseline. Also of note was that several of the nationally declining species of high and moderate conservation concern have maintained or increased in numbers. This contrasts with the more typical pattern of continuing national declines displayed by these species. This is almost certainly associated with the removal of intensive farming practices and an increase in the number and improving quality of different habitat types present.

Regarding individual species, of particular note is the presence of breeding Goshawk. A single pair of this specially protected species successfully raised a single chick in 2021, two chicks in 2022, and single chicks in 2023, 2024 and 2025. The specially protected Barn Owl *Tyto alba* also now breeds, or attempts to do so, on an annual basis.

Of the other notable species that bred, or potentially bred in 2025, NERC S41 Species of Principal Importance were represented by Bullfinch *Pyrrhula pyrrhula* (four territories), Dunnock *Prunella modularis* (10 territories), Linnet *Linaria cannabina* (six territories), Redpoll *Acanthis flammea* (two territories), Reed Bunting (two pairs), Skylark *Alauda arvensis* (three territories), Song Thrush *Turdus philomelos* (17 territories), Spotted Flycatcher (three territories) and Yellowhammer *Emberiza citrinella* (three territories). British Trust for Ornithology Red List Species of High Conservation Concern were Greenfinch *Chloris chloris* (two territories), House Martin (five nests), Mistle Thrush *Turdus viscivorus* (four pairs) and Woodcock *Scolopax rusticola* (minimum of two territories).

Species of conservation concern that have seen particularly notable population increases include Song Thrush (17 territories in 2025 compared with seven in 2012), Linnet (six territories in 2025 compared with one in 2012), Spotted Flycatcher (three territories in 2025 compared with one in 2012) and Reed Bunting (two territories in 2025 compared with zero in 2012). The BTO Red Listed Mistle Thrush (four pairs in 2025 compared with one in 2012) and Amber listed Meadow Pipit (24 territories in 2025 compared with 0 in 2012) have also seen significant increases.

Six species recorded as breeding in the baseline survey were not reconfirmed in 2025. These were Green Woodpecker *Picus viridis*, House Sparrow *Passer domesticus*, Jackdaw *Coloeus monedula*, Sparrowhawk

Accipiter nisus, Starling *Sturnus vulgaris* and Tree Sparrow *Passer montanus*. Of these, Jackdaw, Sparrowhawk and Starling were recorded during the surveys, albeit with no evidence of breeding.

2.3 Wintering Birds

Sixty species were recorded during the 2024/25 surveys. Monthly totals ranged from 36 species in October 2024 to 45 in March 2025. The March increase in species was probably a reflection of this being a somewhat transitional month, which includes both true wintering species along with early nesting species.

Whilst there were some similarities between the 2024/25 and 2013/2014 baseline surveys, there were also variations. Given that western half of the site has been transformed from an operational farm to a large construction site, this is to be expected.

An additional 24 species were recorded in 2024/25 that were not recorded in the baseline. These were Barn Owl, Chiffchaff *Phylloscopus collybita*, Collared Dove *Streptopelia decaocto*, Common Crossbill *Loxia curvirostra*, Feral Pigeon, Golden Plover *Pluvialis apricaria*, Goshawk, Grey Heron *Ardea cinerea*, Grey Wagtail, Hawfinch *Coccothraustes coccothraustes*, Hen Harrier *Circus cyaneus*, Herring Gull *Larus argentatus*, Jackdaw, Kestrel *Falco tinnunculus*, Lapwing *Vanellus vanellus* (over), Lesser Black-backed Gull *Larus fuscus*, Marsh Tit *Poecile palustris*, Moorhen, Nuthatch, Redpoll, Stonechat *Saicola rubicola*, Skylark, Water Rail *Rallus aquaticus* and Yellow-browed Warbler *Phylloscopus inornatus*.

Whilst the occurrence of most of the additional species can be readily explained, of more interest are those records which are either new or involved increasing numbers of species and which are associated with habitat change. Of these, the habitat is greatly improved as a feeding resource for passerine species. This is evidenced by the presence of much larger feeding flocks. For example, the peak count for Meadow Pipit in the 2024/25 survey was 138 birds, in February. This compares with a peak count of three in January, February and March 2014. Other examples include Goldfinch (peak count of 20 in November 2024 and March 2025 compared with a peak of five in March 2014) and Yellowhammer (peak count of 21 in February 2025 compared with a peak of one in March 2014). The habitat is also now much improved for species such as Barn Owl which is now a resident breeding species. Other species such as Moorhen have been able to colonise the site due to the presence of several new ponds. Changes to woodland species include the notable addition of Goshawk as a resident breeding species.

House Sparrow was the only species that was recorded in 2013/14 that was absent in 2024/25. This is to be expected, as there was a small resident breeding colony that was present around the former farm buildings. With the buildings, now removed, this habitat is no longer available.

2.4 Bats

Ongoing bat monitoring surveys have confirmed that the Woodsmith Mine site is used by a number of different species. Whilst Common Pipistrelle *Pipistrellus pipistrellus* is by far the most frequently encountered species, others that have been recorded are Brown Long-eared Bat *Plecotus auritus*, Daubenton's Bat *Myotis daubentonii*, Noctule *Nyctalus noctula* and Soprano Pipistrelle *Pipistrellus pygmaeus*. Other *Myotis* species are also recorded and are likely to include Brandt's *Myotis brandtii* and Natterer's *Myotis nattereri*.

As a habitat, whilst this has improved in quality when compared with the previous intensive farming use, it is important to note that the site is at a relatively high elevation, is exposed and is surrounded by moorland or agricultural land. Consequently, it is a peripheral bat habitat, which can support good numbers of bats when foraging conditions are close to optimal but is less well used at other times.

2.5 Reptiles

During the 2014 baseline survey, Adder, Common Lizard *Zootoca vivipara* were recorded rarely from the open rides and cleared woodland in Haxby Plantation. This continues to be the case. Initial clearance adjacent to the northern ride has established an area of wet heath which has proven to be an excellent habitat for Adder, with surveys and anecdotal reports in 2024/25 demonstrating that the species is now breeding in that area. A first record of Slow Worm *Anguis fragilis*, was also obtained from this same small

area in 2024. Whilst covering only a small area, this provides a good indication of what may be achievable on a larger scale for this group of species in the future.



Plate 5: Juvenile adders in area of regenerating wet heath

2.6 Amphibians

The baseline survey confirmed moderate numbers of Common Toad *Bufo bufo* and Palmate Newt *Lissotriton helveticus* as well as smaller numbers of Common Frog *Rana temporaria* from in the pond on site. A pond outside of the site to the east of Haxby Plantation supported a much larger population of Common Toad. With additional potential breeding habitat and an improving terrestrial habitat, these species continue to thrive. Whilst more detailed survey would be required to properly evaluate the size of the Common Toad population, incidental observations would suggest a larger population.

2.7 Invertebrates

Invertebrate surveys were completed in 2022 and 2023, focussing on the meadow, pond and wetland habitats created in the former arable field to the northwest of the site. This area provides the surface water management facilities for Woodsmith Mine and prior to its transformation would have held limited value for invertebrates. These surveys have found that the attenuation ponds and surrounding habitats had developed and are continuing to develop in importance for invertebrates. This includes three fly species which currently have nationally significant status and several others that are new to the Watsonian ecological recording area VC62 (North-east Yorkshire) and to Yorkshire. In total, over 440 species of invertebrate were recorded from the habitats in the ponds area of the site over the two years of the study. The view of the specialist completing the surveys is that it would be reasonable to conclude that at least 75% of the recorded species would not have been present when the land was grazed or in arable use.

Some larger, more readily identified Odonata species included three dragonflies recorded for the first time in 2023. These were Ruddy Darter *Sympetrum sanguineum*, Common Hawker *Aeshna juncea*, and Golden-ringed Dragonfly *Cordulogaster boltonii*.



Plate 6: Golden-ringed Dragonfly recorded from the meadow

Other notable invertebrates recorded in 2023 were Silver-washed Fritillary butterfly *Argynnis paphia*, and the Hornet *Vespa crabro*. Silver-washed Fritillary is becoming established along the southern edge of the North York Moors, particularly in Cropton and Dalby forests, but remains infrequent on the northern edge. Hornet is a recent colonist in the region with less than 10 locations for the North York Moors.

Moth surveys in Haxby Plantation through 2022 and 2023 have found 168 species, including nine that were of local (VC62) significant status. These included Red Sword-grass *Xylota vetusta* and Scarce Prominent *Odontosia carmelita* which are associated with birches. This group of locally significant species included two that are nationally notable, Angle-striped sawfly *Enargia paleacea*, another birch-feeding species and *Caryocolum blandella* on Greater Stitchwort.



Plate 7: Red Sword-grass moth recorded at Woodsmith Mine

2.8 Other Mammals

Two notable changes relate to a significant increase in the Brown Hare *Lepus lepus* population and to the establishment of an apparently thriving population of Harvest Mouse *Micromys minutus*. Whilst Brown Hare population was recorded only very rarely from Dove's Nest Farm in the baseline survey, it is now a common species that is regularly seen, particularly in the grasslands around the construction site. Harvest Mouse was not recorded in the baseline surveys but has established in dense emergent vegetation, particularly Reed Sweet-grass *Glyceria maxima*, around the wetland in the meadow. Further searches have confirmed that it is now spreading into other habitats around the site, particularly well-structured grasslands with robust species such as Cock's-foot *Dactylis glomerata* and Tufted Hair-grass.

Regarding other mammals, whilst a peripheral habitat, field signs indicate that Otter *Lutra lutra* passes along Sneaton Thorpe Beck at times.

2.9 Ugglebarnby Moor - Habitats

As part of the original Planning Permission, Natural England requested that impacts to possible groundwater fed habitats on Ugglebarnby Moor were monitored. This was to be with particular regard to a shallow valley to the south of Lousy Hill Lane, which supports a moderately diverse marsh/rush-pasture vegetation and which was considered at this time to potentially be ground water fed. This habitat, on a highly precautionary basis, was treated as a potential 'Spring Flush'.

To fully investigate this, twenty fixed quadrats were established in 2014. These quadrats were subject to detailed botanical survey in accordance with the National Vegetation Classification. Following the establishment of the baseline, the quadrats have been monitored annually since 2017.

The monitoring has found no evidence of any adverse impact. Indeed, the botanical surveys, in combination with ongoing monitoring of groundwater levels, spring flow rates and water chemistry in the shallow valley when considered alongside soil survey information confirms that the vegetation communities are surface water fed habitats as opposed to groundwater fed. The damp ground conditions which dictate the overlying vegetation is therefore because of rainfall and not driven or sustained by groundwater within the Moor Grit Aquifer. The persistence of very similar and thriving plant communities year on year therefore, indicates a surface water dependent system. Characteristic species are typically those which can thrive in a variety of habitats and under differing degrees of soil wetness. Any observable spatial variation is a result of ground level and subtle variation in soil type, with drier heath and Bracken dominated habitats on the valley sides and the predominantly rush dominated habitat in the valley base. There is no evidence to suggest that groundwater makes any notable contribution to the origin or maintenance of the habitat.

2.10 Ugglebarnby Moor – Nightjar

Prior to the granting of the original Planning Permission, concern had been raised by the NYMNPA and Natural England regarding the impact of the Woodsmith Mine construction activities on Nightjar *Caprimuglus europaeus*, which were considered to have potential to breed on Ugglebarnby Moor.

Surveys of Ugglebarnby Moor were conducted in 2014, to inform the baseline for the original Environmental Impact Assessment. Surveys were carried out by Paul Chester and Chris Bradshaw, as described for other Project breeding bird surveys. A pre-construction survey was carried out by INCA ecologists during the 2016 breeding season, followed by repeat surveys, by Paul Chester and Chris Bradshaw in 2022, 2023 and 2024.

The baseline surveys did not record any evidence of breeding territories, with the conclusion being that there was no established breeding on Ugglebarnby Moor in 2014. The pre-construction surveys in 2016 recorded two territories with a high degree of certainty. A potential third territory was also identified and, given the size of Ugglebarnby Moor, was not considered to be unreasonable. On a precautionary basis, a total of three territories was therefore assumed. Repeat surveys of the 2013 baseline were undertaken in 2022, five years following the commencement of construction, and again in 2023 and 2024. Both the 2022 and 2023 surveys saw an increase in the number of established territories, with nine counted in each year. Similar numbers of territories were recorded to be established or establishing in the early surveys of 2024; however, adverse weather conditions in July, comprising very heavy rainfall, which resulted in extensive areas of standing water on the flat, open areas

of the moor, were considered to have almost certainly resulted in the failure of the majority of the nest sites. Overall, two territories were estimated to have been successful in 2024.

Discounting the weather affected 2024 season, the increase in Nightjar territories on Ugglebarnby Moor, from a baseline of zero to a sustained peak of nine in 2022 and 2023, considered to be close to the carrying capacity of the site, is a positive record. This provides good evidence that the construction of Woodsmith Mine has not had an adverse impact on breeding Nightjar.

3 LADYCROSS PLANTATION

3.1 Habitats

At Ladycross Plantation, the current fenced construction area was used for arable farming. The area was split into two areas with the southern section used for oat cultivation and the northern section seeded with an agricultural ley.

In the intervening period, areas around the construction site have been seeded and are now established as areas of moderately species-rich grassland. This is particularly associated with the grassland immediately to the north and east of the security fence. These grasslands are characterised by a good range of typical grassland forbs, for example, Cat's-ear *Hypochaeris radicata*, Common Knapweed, Common Mouse-ear *Cerastium fontanum*, Creeping Buttercup, Dandelion *Taraxacum agg.*, Red Clover, Ribwort Plantain *Plantago lanceolata*, Selfheal *Prunella vulgaris*, Wild Carrot *Daucus carota subsp. carota* and Yarrow *Achillea millefolium*.

The northern field, which remains outside of the construction area, and which was used for silage production in 2014, remains as a species-poor grassland. Locally the structure of the grassland is beginning to break up, and this should improve the field as a habitat for certain ground nesting birds.

More noticeable and positive change has occurred in northern part of the site in what was previously a fenced section within the northern field that was rush-pasture habitat with locally abundant Sharp-flowered Rush, frequent Soft-rush and more occasional Compact Rush *Juncus conglomeratus*. Other species included locally frequent Yorkshire-fog *Holcus lanatus* along with more rarely occurring Jointed Rush, Heath Rush *Juncus squarrosus*, Lesser Spearwort, Marsh Willowherb and Oval Sedge *Carex leporina*.

In the intervening years, the habitat has been allowed to develop naturally. In the absence of grazing, this has seen the establishment of heathland species such that the habitat is now better described as moderately species-rich grassland and heath mosaic. Heather is locally abundant with frequent Cat's-ear, Marsh Thistle, Purple Moor-grass *Molinia caerulea* and Yorkshire-fog. Sharp-flowered Rush and Soft-rush are occasional and locally abundant with occasional Common Bent, Common Mouse-ear, Common Sorrel *Rumex acetosa*, Creeping Buttercup, Cross-leaved Heath, Dandelion., Heath Wood-rush *Luzula multiflora*, Lesser Trefoil *Trifolium dubium*, Marsh Willowherb, Red Fescue *Festuca rubra*, Scots Pine *Pinus sylvestris* (seedlings), Selfheal *Prunella vulgaris*, Sweet Vernal-grass *Anthoxanthum odoratum*, Tufted Hair-grass, Velvet Bent *Agrostis canina* and White Clover *Trifolium repens*. Rarely occurring species include Bramble *Rubus fruticosus agg.*, Carnation Sedge *Carex panicea*, Common Bird's-foot-trefoil, Common Ragwort *Jacobaea vulgaris*, Common Spotted-orchid, Greater Bird's-foot-trefoil, Heath Rush, Sheep's-fescue *Festuca ovina* and Tormential *Potentilla erecta*.

Whilst there has been no extensive woodland management at Ladycross Plantation, some trial thinning and coppicing was completed in an area of dense even-aged Downy Birch dominated woodland to the west of the security fence. This has proven to be successful and has improved the structure of the woodland, whilst also delivering some enhancement to the ground flora. This has benefited a variety of associated fauna and is the type of management that could be extended as part of the longer-term enhancement plans for the site.

Regarding new species, a particularly notable addition to the site's flora is from damp marshy grassland in the south-western corner of the northern field. This area supports several plants considered to be examples of Marsh Stitchwort *Stellaria palustris*. Whilst once widespread, this is now a rare and rapidly declining species with no post-2000 records from the North York Moors National Park and recent records from only two tetrads in the wider Vice County 62.



Plate 8: The northern field at Ladycross Plantation – April 2021 (top) and June 2024 (bottom)

3.2 Breeding Birds

Thirty species were considered to be breeding within or in the immediate vicinity of the Ladycross site in 2025. In addition, Tawny Owl *Strix aluco* was considered likely to be breeding, albeit without confirmed evidence of this. Virtually all breeding records were associated with the woodland habitat. The fields were found to be a habitat that was little used. Of the 30 species, 10 were not recorded in the 2014 baseline. These were Barn Owl, Bullfinch, Buzzard *Buteo buteo*, Chiffchaff, Jay, Meadow Pipit, Mistle Thrush, Pied Wagtail, Red-legged Partridge and Swallow *Hirundo rustica*.

Regarding notable species, the specially protected Barn Owl now breeds, or attempts to do so, on an annual basis. Regarding other notable species, NERC S41 Species of Principal Importance were represented by Bullfinch (one territory), Dunnock (one territory) and Song Thrush (three territories). Curlew *Numenius arquata* has established territories at the start of the nesting season in each of the last two years, albeit without any confirmed evidence of successful breeding. British Trust for Ornithology Red List Species of High Conservation Concern were Mistle Thrush (three territories) and Woodcock *Scolopax rusticola* (two territories).

Whilst having a lower diversity of habitats and fewer notable species than the Woodsmith Mine site, those that are present are typically maintaining or increasing their numbers. The exception to this is Mistle Thrush which, with an increase from a single pair in 2014 to 3 in 2025 has seen a noteworthy increase that contradicts the rapid national decline of this species.

Skylark and Redpoll were the only species recorded in 2014 that were not recorded in 2025. In 2014 both species were very rare with single territories of each species.

3.3 Wintering Birds

Annual monitoring surveys have been completed since 2023/24. The most recent wintering bird survey that was completed during the period October 2024 to March 2025, recorded 40 species across the survey period. Monthly totals ranged from 11 species in February to 24 in December.

Whilst limited by the range of habitat types and therefore supporting a relatively low diversity of resident and true wintering species, more notable feeding flocks of several species were recorded occasionally. This is indicative of an improving foraging resource, particularly for passerine species. Of note was a feeding flock

of 58 Meadow Pipit (BTO Amber List), from the grassland to the east of the construction area in March 2025. A smaller feeding group of five Linnet were also present in this area in November 2024. A small group of four Redpoll from the perimeter woodland in November was also an encouraging record for the site.

3.4 Bats

No bat roosts were found within the Ladycross Plantation site. Surveys in 2023, 2024 and 2025 confirmed Common Pipistrelle as the most frequently encountered species. Other species included Myotis bats, which had a restricted distribution, particularly utilising the central section of woodland. The level of bat activity was not high, but this is expected considering the poor quality of much of the current habitat on the site. Virtually all activity is associated with the woodland edge habitats. In future years, monitoring of bat presence will continue, and it is hoped that the improvement of the habitats, over time, will result in increasing numbers and diversity.

3.5 Reptiles

Common Lizard was recorded in the baseline survey in habitat on the western boundary of the site. Whilst this remains the case, updated surveys have also found the species to be much more widespread, with animals recorded from much of the peripheral grassland/woodland interface along the southern boundary, as well as along the northern and western boundaries of the field in which it is currently approved to develop an extractive material waste facility. Common Lizard was also present in an area of heathland habitat in the same field.

3.6 Amphibians

Whilst there is no viable amphibian breeding habitat within the site, a large pond immediately outside the north-western boundary supported small numbers of Common Frog, Common Toad and Palmate Newt during the baseline survey. Whilst no update surveys have been completed, there is no reason to believe that this would not still be the case.

3.7 Invertebrates

During the original baseline survey, the fields and plantation woodlands were found to be of very limited value to invertebrates. The peripheral heathland and occasionally herb rich grassland provided some more valuable habitat. Whilst no rare or nationally scarce taxa were recorded, several more local species were recorded, for example, Black Darter *Sympetrum danae*, Four-barred Major *Beris vallata*, Hieroglyphic Ladybird *Coccinella hieroglyphica*, the ant *Formica lemani*, the hopper *Eupelix cuspidata*, the rove-beetle *Anthrophagus caraboides* and the tachinid fly *Tachina grossa*. More recently, Dark Bush Cricket *Pholidoptera griseoaptera* was confirmed from the site. This is an uncommon species, with very few records from Vice County 62.

Surveys carried out in 2023 recorded 101 species of moth from the birch woodland at Ladycross Plantation, including the nationally notable Angle-striped Sallow *Enargia paleacea*, a moth with a very restricted range in the UK and only found in this type of habitat. Areas of regenerating heathland were found to have a less diverse moth fauna, with 79 species recorded. Given that this habitat was in the early stages of regeneration it was encouraging to see that some of the more localised heathland species were starting to colonise, including The Anomalous *Stilbia anomala*.



Plate 9: Moth survey at Ladycross Plantation

3.8 Other Mammals

Brown Hare is now seen regularly within the site. It appears to have seen an increase in numbers when compared with the baseline when it was recorded only very rarely. Hedgehog was also recorded rarely in the baseline.

4 LOCKWOOD BECK

4.1 Habitats

At Lockwood Beck, the main construction area is in what was previously an area of arable farmland divided by stone walls. Adjacent fields to the east and north of the construction area were all intensively farmed up to the commencement of construction. Since this time, they have had no chemical inputs of any kind. Whilst they often remain species-poor and continue to show the effects of nutrient enrichment, most fields are now seeing some changes in their botanical composition and diversity. This is evidenced by the increasing establishment of typical grassland forbs. These include Autumn Hawkbit *Scorzonoides autumnalis*, Common Bird's-foot-trefoil, Common Knapweed, Cowslip *Primula veris*, Field Horsetail *Equisetum arvense*, Marsh Ragwort *Jacobaea aquatica*, Meadow Vetchling, Oxeye Daisy, Ribwort Plantain, Silverweed *Potentilla anserina* and Yarrow *Achillea millefolium*. The occurrence of additional new plants in the grasslands is likely to increase in the future.

Given the level of nutrients, there has also been some increase in ruderals, particularly Creeping Thistle *Cirsium arvense*. These have typically been allowed to grow and have provided a valuable nectar and food source for several species of butterflies and birds. Even within those fields where botanical change is less apparent, monitoring surveys have noted some changes, particularly an increased usage by wintering flocks of feeding birds. Whilst the precise reasons for this are unknown, feeding is certainly improving and is assumed to be related to an improved soil fauna and subsequent increase in the volume of invertebrates in grasslands etc. as agrochemicals are removed.

In more recent years, a former arable field in the north-west has been established as a meadow. Whilst initially slow to develop, monitoring in 2025 has indicated that the meadow is now becoming established, with a more closed sward and good range of characteristic species. In excess of thirty species are now established including Common Bird's-foot-trefoil, Common Knapweed, Lady's Bedstraw, Oxeye Daisy Ragged-Robin,

Red Clover, Wild Carrot and Yellow-rattle. The meadow should continue to see a year-on-year improvement as it becomes fully established.

Whilst there has been no extensive woodland management at Lockwood Beck, some clearance was undertaken on the northern side of the stream where both Blackthorn *Prunus spinosa* and Gorse scrub was becoming dominant. Established as a trial to help to inform long-term management, initial results are positive results and has established this area as a more complex mosaic of scrub, marshy grassland and locally species-rich unimproved grassland. The damper grassland supports a range of species that are restricted to better quality habitats. These include Bugle *Ajuga reptans*, Common Spotted-orchid, Ragged-Robin Sneezewort *Achillea ptarmica* and Wild Angelica. Of particular note has been the establishment of a large colony of the very uncommon Fragrant Agrimony *Agrimonia procera*. With regard to fauna, it is also a favoured habitat for several notable breeding species, for example, Bullfinch and Song Thrush. It is also an area that has been frequented in the last two years by Willow Tit *Poecile montanus*. These were presumed to be dispersing juveniles from the wider local area. Whilst breeding has not been established to date, their occurrence demonstrates the favourability of the habitat for what is one of the project's priority species.

Whilst the hedgerow network has been retained in its entirety, this is now subject much more sensitive management. Hedgerows have been allowed to grow and future management will be based upon long five to seven year rotations. Previously flailed on an annual basis, this has seen an improvement in hedgerow structure which in turn has improved these as a habitat for nesting birds and other species. The longer rotation has also enabled hedgerow shrubs to fruit more consistently which in turn has enhanced the foraging resource, particularly for wintering birds.



Plate 10: Lockwood Beck – Pre-construction (top) and 2025 (bottom)

4.2 Breeding Birds

At the time of the most recent 2025 breeding bird monitoring survey, 47 species were considered to be breeding within the Lockwood Beck site, with an additional four species considered to be possibly breeding. These were Buzzard, Magpie, Siskin *Spinus spinus* and Tawny Owl *Strix aluco*. Four of the recorded species were associated only with the farmhouse and associated buildings (which were not included in the baseline survey). These were House Sparrow, Pied Wagtail, Starling and Swallow.

Of the forty-seven confirmed or possible breeding species within the remainder of the survey area, sixteen were species that were not recorded as breeding in the 2014 baseline. These were Barn Owl, Garden Warbler, Goldfinch, Greenfinch, Grey Wagtail, Jackdaw, Kestrel, Lapwing, Linnet, Little-ringed Plover *Charadrius dubius*, Mallard *Anas platyrhynchos*, Moorhen *Gallinula chloropus*, Red-legged Partridge, Siskin, Tree Sparrow and Tawny Owl.

Regarding notable species that bred at the Lockwood Beck site in 2025, these included the specially protected Barn Owl and Little-ringed Plover. NERC S41 Species of Principal Importance were represented by Bullfinch (two territories), Dunnock (five territories), House Sparrow (four pairs), Lapwing (at least three nests but only one which was not predated), Linnet (one pair), Skylark (one territory), Song Thrush (12 territories), Starling (one pair) and Tree Sparrow (three pairs). British Trust for Ornithology (BTO) Red List Species of High Conservation Concern were Greenfinch (one territory), Mistle Thrush (four territories) and Woodcock (two territories).

Three species recorded as breeding in the baseline survey were not reconfirmed in 2025. These were Redstart *Phoenicurus phoenicurus*, Spotted Flycatcher and Willow Tit. Of these, Willow Tit has been recorded in the July survey in both 2024 and 2025 with these birds associated with dispersing juvenile birds. Recorded from same habitat each year (an area of part cleared scrub/open woodland), this indicates that the habitat is potentially suitable and that there remains a viable breeding population locally (thought to be Slapewath/Margrove Ponds, to the north). Whilst the chances of recolonisation are remote, this remains a target species for the project's conservation initiatives. Regarding Spotted Flycatcher, this successfully bred on site in 2024 but was not present in 2025. This mirrors national and local declines with the species now virtually absent from the Cleveland bird recording area. Successful breeding was confirmed in 2025 from the adjacent Lockwood Beck reservoir, and it is hoped that the species may return to breed within the site in 2026.

Whilst less marked when compared with the Woodsmith site, Lockwood Beck has also seen some notable increases in species when compared with the baseline survey. This includes several declining species of high conservation concern, for example, Song Thrush (12 territories in 2025 compared with four in 2014) and Mistle Thrush (four pairs in 2025 compared with one in 2014). The populations of other nationally declining species, for example, Dunnock (five territories in 2014 and 2025) and Willow Warbler (eight territories in 2025 compared with seven in 2014) have remained approximately constant.

4.3 Wintering Birds

Whilst not subject the survey as part of the planning application for the project, annual monitoring surveys have been completed since 2022/23. The most recent wintering bird survey that was completed during the period October 2024 to March 2025, recorded sixty-three species across the survey period. Monthly totals ranged from twenty-three species in February to forty-four in October.

Whilst supporting a typical range of resident and true wintering species, more notable feeding flocks of species of high conservation concern were recorded occasionally. This included a flock of 58 Linnet in October 2024, a flock of 12 Redpoll in January 2025 and flock of five Tree Sparrow in November 2024. These species are all NERC S41 Species of Principal Importance. Regarding other such species a site-wide total of 17 Bullfinch in December 2024 represented a locally significant count. This was also the case with regard to a count of eight Mistle Thrush in October 2024 (BTO Red List). A December flock of 49 feeding Siskin also represented a significant flock for the local area. Other notable records included a single Willow Tit in October. It is presumed that this was a dispersing bird from successful breeding in 2024 in the wider local area. Whilst it was hoped that it may stay to establish a breeding territory, it was not recorded after his time. The record

of a single Yellow-browed Warbler *Phylloscopus inornatus* in October 2024 represented the first site record of this scarce although increasing autumn visitor to the UK.

4.4 Bats

No bat roosts have been found within the site. Foraging surveys have confirmed parts of the site to be well used, particularly the wooded stream corridor associated with Lockwood Beck and Hagg Beck. The most frequently encountered species was Common Pipistrelle. Brown Long-eared Bat, Noctule and Soprano Pipistrelle. Daubenton's Bat were recorded from the stream corridor.

4.5 Reptiles

During the 2014 baseline survey, Adder, Common Lizard and Slow-worm were recorded rarely from the species-rich grassland west of Dale Beck with Slow-worm recorded from the upper northern edge of Kateridden Wood. These areas are either outside or not impacted by the proposed works. A more detailed survey would be necessary to determine reptile presence and likely abundance within the development boundary, but there is no evidence to suggest there have been adverse impacts on reptiles as a result of the works at Lockwood Beck.

4.6 Amphibians

There are no viable amphibian breeding ponds within or close to the site. Surveys of a pond in the wider local area which was relevant to the currently approved site design but not to the amended development supported small numbers of Common Frog, Common Toad and Smooth Newt *Lissotriton vulgaris*. No Great Crested Newt *Triturus cristatus* were, however, recorded. This pond is located approximately 500m north-west of the site. In the more immediate local area, Lockwood Beck Reservoir supports a large population of Common Toad. The A171 is, however, likely to be a significant barrier to dispersal of toads towards the site.

4.7 Invertebrates

At the time of the original survey, the species-rich grassland to the west of Dale Beck supported several local species including the hoverflies *Chrysotoxum arcuatum* and *Sericomyia* (= *Arctophila*) *superabiens*. Other uncommon species included the northern picture winged fly *Tephritis conura* and the plant bug *Macrotylus solitarius*. The ancient woodland habitats supported the Nationally Scarce B false darkling beetle *Orchesia minor*. Other regionally rare saproxylic species associated with the woodland included *Biphylus lunatus* and the rove beetle *Siagonum quadricorne*. The ground flora yielded the local English Chrysalis Snail *Leiostyla anglica*. Waterfall habitats associated with Kateridden Beck yielded several local species, for example, the camphor beetle *Stenus guynemeri*.

The diverse mixed deciduous woodlands of Lockwood provided the best overall results in that location for moths with more than 110 moth species recorded from Sweet Hill Wood and 100 species from Kateridden Wood. Of these Blomer's Rivulet *Venusia blomeri*, which was found in the latter, is listed as 'notable b' and is a scarce species nationally. In Yorkshire its stronghold is very much in the woods of the north-east, where its larval foodplant, Wych Elm, is well-established. Square-spotted Clay *Xestia stigmatica* and *Caryocolum blandella* are also nationally notable and were found in Sweet Hill Wood. Both are rare species in Yorkshire, with the former being associated with a range of woodland floor plants and the latter associated with Greater Stitchwort. More than 10% of the species found in both woodland complexes are regionally significant.

Other than the moth surveys, no recent invertebrate surveys have been carried out within the Lockwood Beck development area. However, several years of natural recovery/regeneration and habitat improvement in the areas outside of the development platform, combined with the long-term removal of agrochemicals, would reasonably be expected to have resulted in a more diverse and abundant invertebrate assemblage.

4.8 Other Mammals

Signs of Otter, including via camera trap and eDNA survey, have been found on the main stream of Lockwood Beck. It is assumed that otter feed at the nearby Lockwood Beck reservoir.

Brown Hare and Hedgehog are both present rarely.