Submission by South Crofty Ltd

Town and Country Planning (General Permitted Development) (England) Order 2015
Notification to the Mineral Planning Authority to carry out a Programme of Exploration Drilling at South Carn Brea, Carnkie, Cornwall

DATE ISSUED: **24 August 2021**

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1 Introduction

South Crofty Ltd ("SCL"), a subsidiary company of Cornish Metals Inc. ("Cornish Metals"), wishes to conduct mineral exploration via a drilling program on various individual sites on the southern flank of Carn Brea in mid-Cornwall. Three surface drilling sites are planned, which will be utilised to drill multiple diamond drillholes predominantly of relatively short depths.

The drillholes are primarily designed to target a specific section of the Great Flat Lode that has not been previously mined. Diamond drilling conducted in the 1960's proved the existence of this unmined portion of the lode, with some promising results. SCL is planning a series of diamond drill holes to follow up on these historic drilling results and better understand the strike, dip, grade and subsequent economic potential of the Great Flat Lode and its associated mineralised structures in this area.

SCL are seeking to undertake the exploratory drilling programme under Schedule 2, Part 17 (Section K) of The Town and Country Planning (General Permitted Development) (England) Order 2015. Under the terms of this Order, SCL are obliged to notify the Mineral Planning Authority ("MPA"), Cornwall Council, that it is proposed to undertake such works and to confirm that such activities may be undertaken. This document represents SCL's notification to the MPA as required under this Order.

2 Company Overview

South Crofty Ltd operates the South Crofty project which is a former producing tin mine situated between the towns of Camborne and Redruth in Cornwall, UK. The project has a long history of operation until closure in March 1998, at which point the pumps were switched off and the mine was left to flood. The mine has been flooded since closure, except near surface workings which lie above the effective water table.

Since closure, an attempt has been made to recommence mining operations through various backers. Cornish Metals Inc. (formerly known as Strongbow Exploration Inc.) acquired a 100% interest in the project and its associated mineral rights in 2016. Since

2016, Cornish Metals has obtained all the necessary permissions to dewater the mine, construct new mining and mineral processing facilities and take the project into production.

In addition to actively pursuing the reopening of South Crofty, Cornish Metals and SCL also have interests in further developing resource potential within the company's large portfolio of mineral rights holdings elsewhere in Cornwall.

The area around South Carn Brea contains the Great Flat Lode, which was formerly one of the richest tin producing mineralised structures in Cornwall. The economic concentrations of tin within the Great Flat Lode were noted to occur in distinct zones of mineralisation, known as 'payshoots'. Many of the known economic parts of the Great Flat Lode have been worked out, but this drill program targets a specific 'payshoot' that was previously unmined and formed the target of a successful exploration campaign in the 1960's.

SCL wish to build on the historic drilling results to better understand the initial economic potential of this area around the Great Flat Lode, particularly given the proximity of the project area to the nearby fully permitted South Crofty Mine.

SCL has a team of geologists and mining engineers with extensive experience and access to a large historical database of information with potential relevance to interpreting the results that this proposed drilling program may yield.

The information gained from this proposed drilling program will be used to determine the initial economic potential of this structure, which, if encouraging, could lead to further exploration drilling in the area to better define and quantify the nature of any potential mineral resources that are currently unexploited.

3 Property Description and Location

SCL has identified three potential sites from which to drill multiple mineral exploration boreholes as part of this initial programme (see Figure 1) Agreements with the relevant landowners have been finalised (see Section 7.2) and SCL has the required agreements with the mineral rights owners (See Section 4).

A comprehensive photographic record of all proposed drilling sites will be compiled prior to commencement of any drilling activities to ensure all areas are suitably remediated and any affected structures suitably restored to a standard commensurate with their prior state within 28 days of the conclusion of drilling activities on each site.

Figure 1: South Carn Brea Proposed Drill Sites

Site 1: Farmland at Carnkie off Carn Lane

The drill site location is roughly central within an arable agricultural field that has previously supported a lucerne crop. Access to the field can be made via an existing gateway in the far north-eastern corner of the land. No modifications to any existing access routes or hedgerows are envisaged to be required during the proposed drilling program.

Site 2: Farmland at Carnkie off Carn Lane

The drill site location is close to the south-eastern boundary of a semi-improved grassland field. Access to the field can be made via an existing gateway further along the south-east boundary. No modifications to any existing access routes or hedgerows are envisaged to be required during the proposed drilling program.

Site 3: Farmland at Carnkie

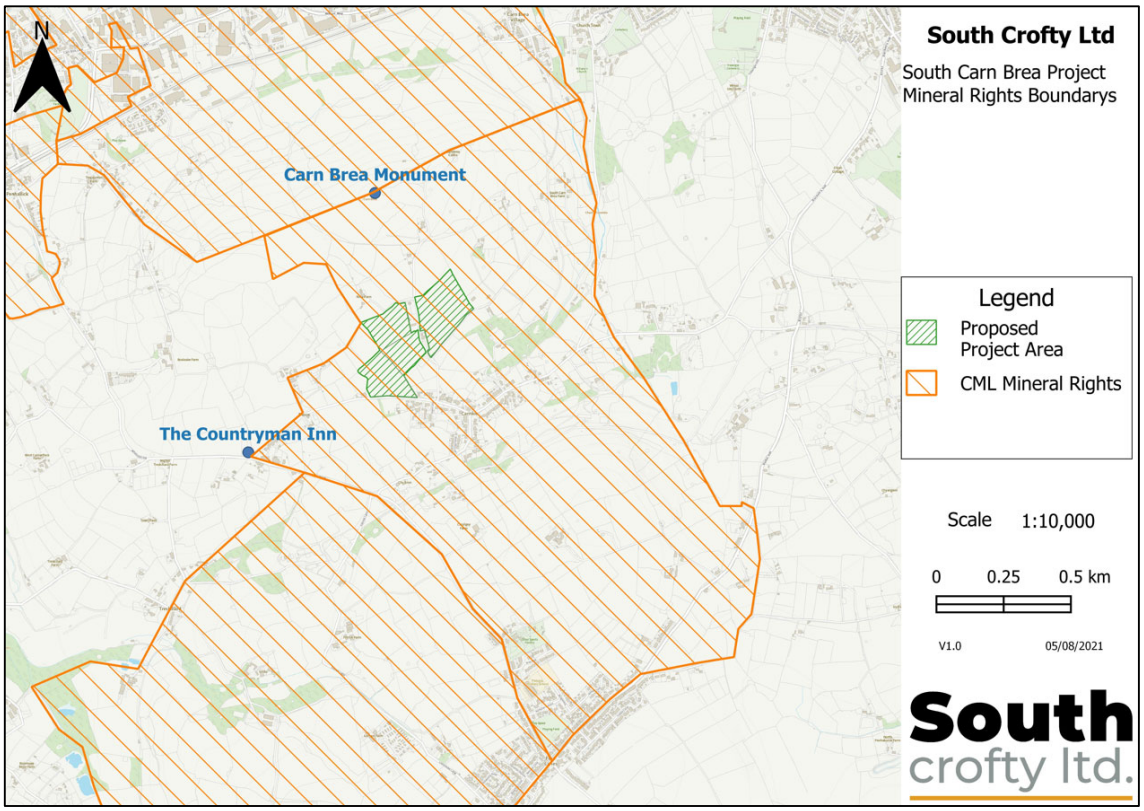
The drill site location is approximately 25m away from the eastern boundary of the field, which is an arable agricultural field that has previously supported a lucerne crop. Access to the field can be made via several existing gateways, with the most likely route using a gateway directly connecting on to the national road through Carnkie village. No modifications to any existing access routes or hedgerows are envisaged to be required during the proposed drilling program.

4 Mineral Ownership

The proposed mineral exploration drilling programme sites are contained within mineral rights owned by SCL's parent company – Cornish Metals Inc, through its subsidiary Cornish Minerals Ltd.

Figure 2 shows the location of the exploration area and the relevant mineral rights boundaries.

Figure 2: Relevant Mineral Rights Boundaries



The relevant CML owned mineral rights are registered at the Land Registry under title CL68199.

SCL has identified and approached the relevant surface landowner associated with the proposed drilling sites and has entered into an agreement with the individual landowner to cover access, drilling and associated activities (as outlined in Section 7.2).

5 Historic Mining & Exploration around South Carn Brea

The southern flank of the granite outcrop of Carn Brea has been mined relatively extensively in the past, initially with several small independent mining operations, some of which were later operated under the auspices of a larger, amalgamated concern. Underground mining in the area on an industrial scale commenced primarily for copper, with several narrow, steeply dipping mineral veins mined for this metal in the 18th and 19th centuries.

The discovery of a significant tin lode lying at a relatively shallow angle beneath these copper veins during the 1860's, at a time when many of Cornwall's copper mines were closing down due in part to competition from abroad, led to a resurgence in fortunes for the district. This tin lode became known as the Great Flat Lode and developed into one of the most productive areas of tin production in the Duchy during the latter part of the 19th century. The downturn in global tin prices during the early years of the 20th century resulted in the closure of the last tin mines on the Great Flat Lode and despite much exploration interest at times during the intervening period, no mining has occurred on this structure around the South Carn Brea area since the 1920's.

During the period of upturn in Cornish minerals exploration in the 1960's, several areas along the Great Flat Lode became of interest once more, with a number of diamond drilling programs proposed. One of the programs which went ahead was focused on a suspected 'payshoot' of the Great Flat Lode that due to circumstance of history had been left untouched between surface and approximately 200m in depth. The drilling produced some very encouraging results, proving the presence of the suspected payshoot and demonstrating the continued high-grade nature of the Great Flat Lode.

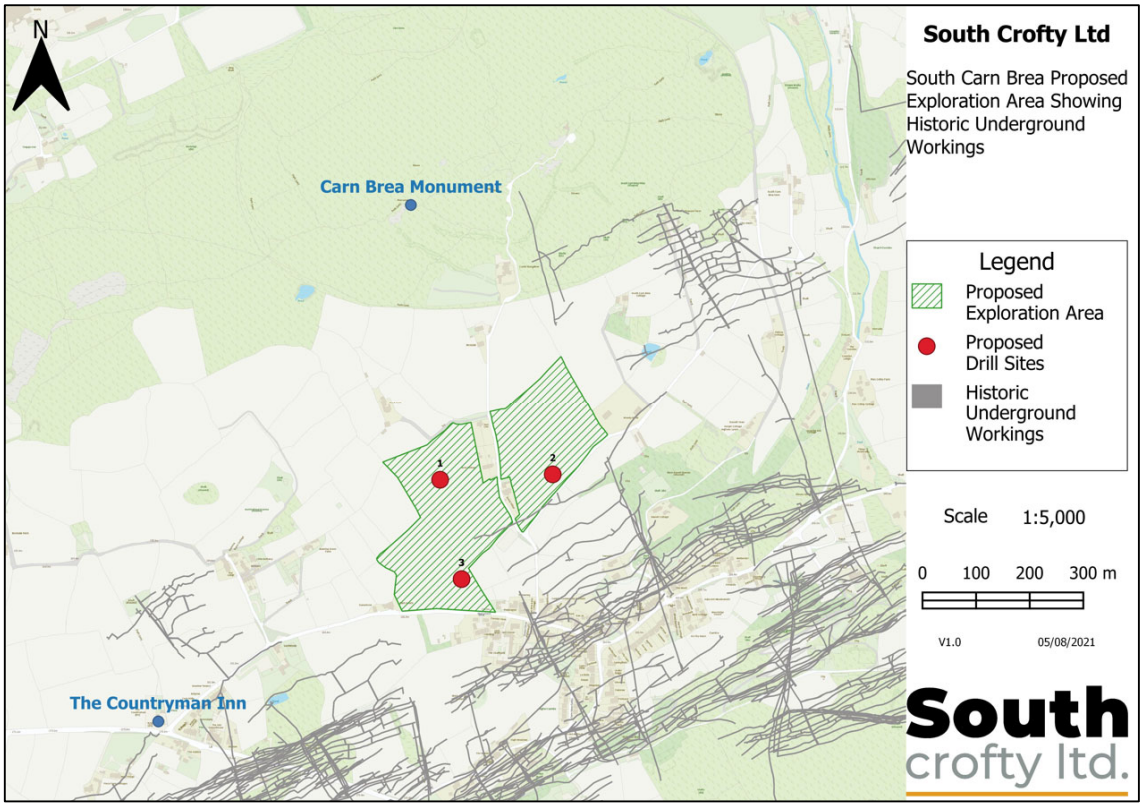
Further drilling was planned in the years following the discovery by South Crofty Mine, but no further work was conducted despite the promising results.

In light of the significantly increased prevailing tin price, South Crofty Ltd is interested in further developing resource potential within the company's large portfolio of mineral rights holdings. The known payshoot remaining on the Great Flat Lode at South Carn Brea

is worthy of investigation considering its high-grade, large-width nature and its' proximity to the Company's fully permitted South Crofty operations approximately 1.8km to the west.

The proposed drilling covered by this submission will be focused on assessing the grade, width, dip and strike extents of the economic zone of the Great Flat Lode in this location, in addition to investigating any other associated mineralisation in the vicinity not previously identified.

Figure 3: South Carn Brea Drill Sites Relative to Historic Mine Workings



6 Land Designation over Areas to be Drilled

SCL has made appropriate checks to ensure that all land designations are respected during the drilling program. Where contact has been made with the relevant

stakeholders, discrete sections are provided as below, for all other land designations refer to Table 6.1

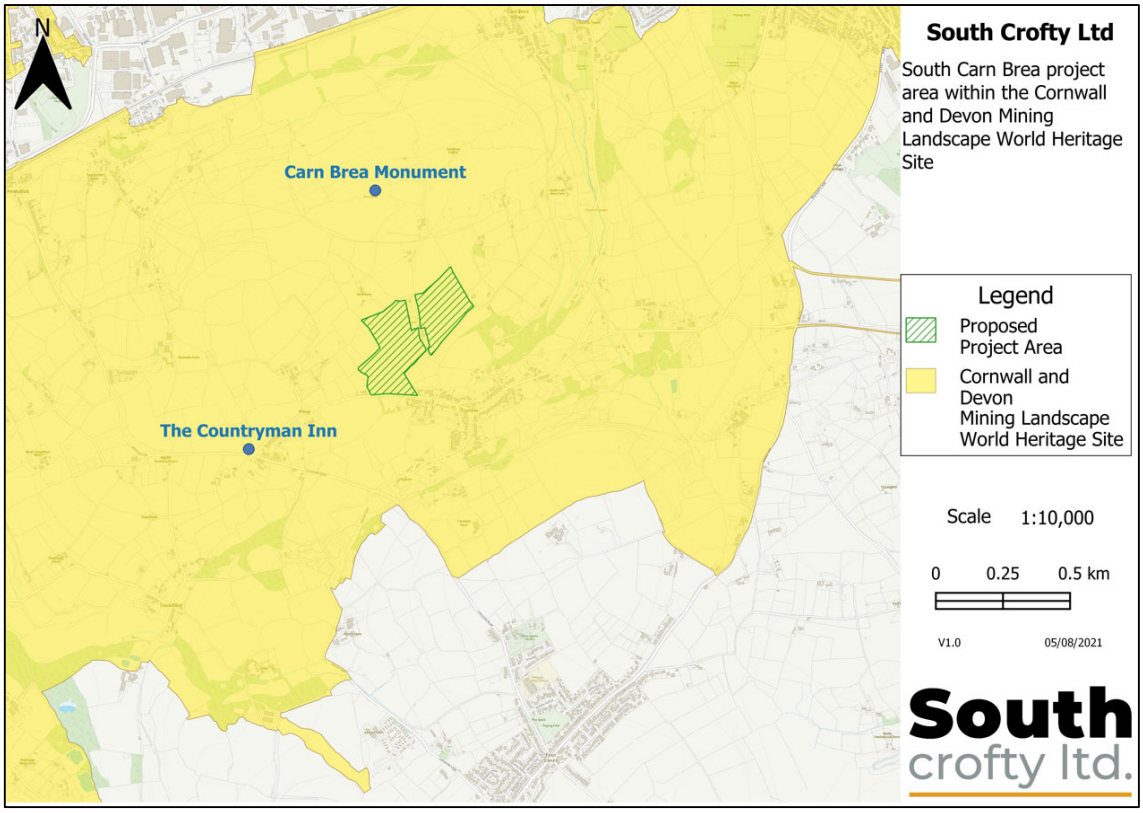
6.1 Landscape Characterisation

All the proposed drilling sites are situated on land designated under Cornwall Council's Landscape Characterisation system as 'hard rock uplands with impoverished humic soils on igneous rocks'. Historically the land is classified as 'Post Medieval Enclosed Land', indicating land typically enclosed during the 17th, 18th and 19th centuries, usually from land that was previously Upland Rough Ground and often medieval commons.

6.2 World Heritage Site

The three proposed mineral exploration drilling sites are located within the *Camborne and Redruth Mining District* of the *Cornwall and West Devon Mining Landscape World Heritage Site (WHS)* as demonstrated in Figure 4.

Figure 4: World Heritage Site Boundary Relative to Drill Sites



The WHS Management Plan 2013 – 2018, Section 5.2.3 (Protection of Mineral Resource) states 'As an evolving, living landscape, it is not the intention of the WHS to sterilise or deny access to mineral resources for the future underlying the designation area, providing the features of Outstanding Universal Value (OUV) are protected.'

There is one particular World Heritage site feature containing a listed building located in the vicinity of the drill sites within the adjacent WHS; West Basset Stamps Engine House and associated remains (HER:1160461). This site lies approximately 150m away from the nearest proposed drill site and will not be affected by any of the proposed works.

None of the proposed drill sites contain any recorded OUV features or additional items with recorded protection status. During correspondence with WHS, it has been requested that SCL ensure the drill sites, and the drill holes themselves are not located along the route of a historical drainage leat that ran across the fields containing Site 2 and Site 3.

It is SCL's firm commitment to ensure that there will be no permanent negative impact on any of the WHS features in the proximity of any of the drilling sites. Following discussion and correspondence between SCL and Mr Ainsley Cocks of WHS, no objections have been raised to the exploration drilling plans within the proposed drill sites. Mr Cocks' comments related to the proposals are included in Appendix II.

6.3 Mineral Safeguarding

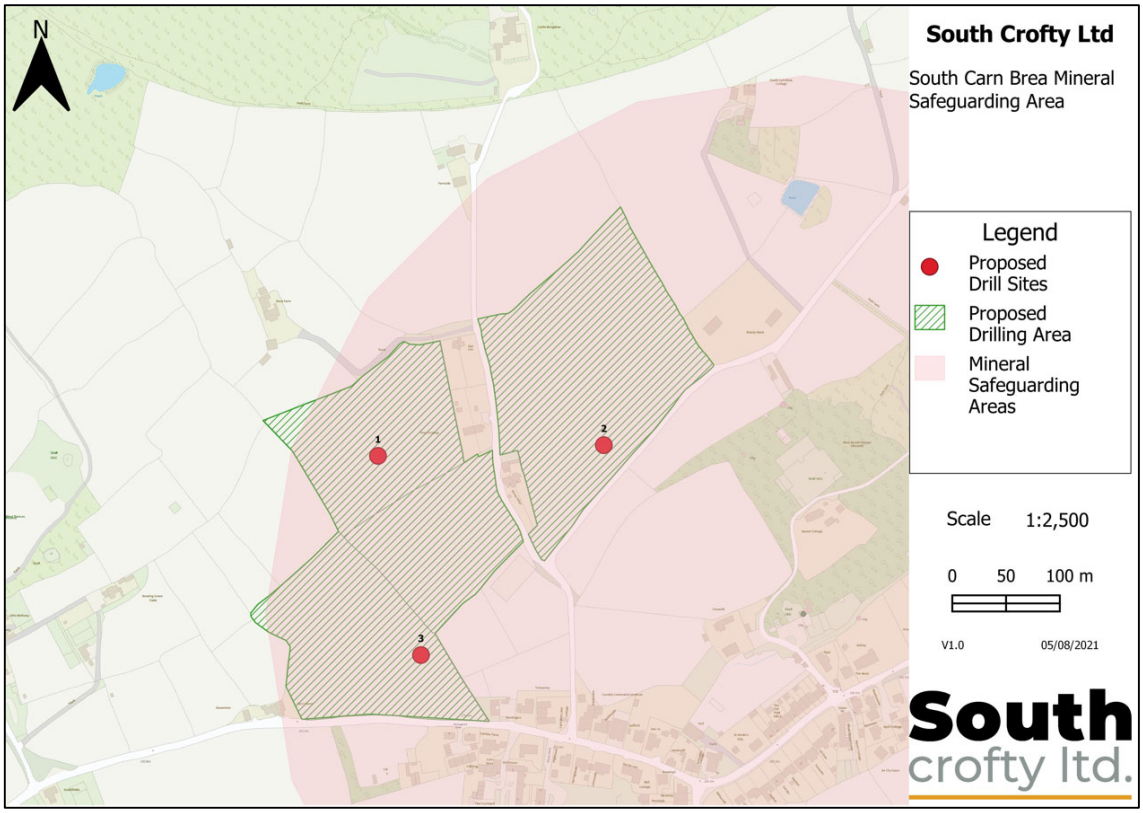
The Mineral Safeguarding Development Plan Document (DPD) identifies that the proposed mineral exploration drilling programme sites and their projected boreholes are located within the *North Wheal Basset, Wheal Uny Mines, Carn Brea (M12)* Mineral Safeguarding area (Figure 5).

The vision of the Mineral Safeguarding Area is outlined in the associated DPD. The concept draws on the vision outlined in the Cornwall Local Plan stating, "Cornwall will have a world class thriving minerals industry that serves local needs as well as exporting minerals to serve regional and national markets by encouraging the sustainable use of

resources." With this in mind, the objective of the DPD is primarily "To safeguard mineral resources, sites and infrastructure from other forms of incompatible development.".

Being located both within an identified Mineral Safeguarding Area shows that Cornwall Council recognises the potential economic and strategic mineral value of the land surrounding the proposed exploration drilling site areas.

Figure 5: Mineral Safeguarding Areas Relative to Drill Sites



6.4 Other Designations

Table 6.1: List of Land Designations

Designation	Name of Nearest Designation	Distance to nearest anticipated borehole	Comments
Ancient Woodlands	Oak Wood – Tehidy Park	4.8 km	
Areas of Outstanding Natural Beauty (AONB)	Cornwall North Coast – Godrevy to Portreath	4.8km	
Common Land	Carn Brea	300m	*Drilling is not anticipated to affect common land*
Conservation Areas	"Carn Brea"	70m	
County Wildlife Sites (CWS)	Carn Brea Penventon Moor Newton Moor	300m 450m 1.1km	 *Drilling is not anticipated to affect County Wildlife Sites*
Listed Buildings	Grade II: West Basset Stamps Site Lyle's Shaft Pumping Engine House Lyle's Shaft Winding Engine House	 150 m 230 m 250 m	*Drilling is not anticipated to affect these structures.* List Entry Number: 1160461 List Entry Number: 1142619 List Entry Number: 1328155
Local Nature Reserves	Red River Valley	3.2km	
National Parks	There are no National Parks within Cornwall		
Ramsar Sites	There are no Ramsar sites on mainland Cornwall. The nearest Ramsar sites are located on the Isles of Scilly		
Royal Society for the Protection of Birds (RSPB) Reserves	Hayle Estuary	12 km	
Schedule of Ancient Monuments (SAM)	Carn Brea Castle (DOC1602)	300m	
Sites and Monuments	Bowling Green; Early-Medieval field system (MCO37573) Rock Farm; Post-Medieval Spoil Heap, Undated Bank (Earthworks) (MCO 37565)	Site 3 Located adjacent to Site 1	*All the Sites and Monuments have no recorded protection status, but they have all been discussed with WHS, and the proposed boreholes have been located to avoid them*
Sites of Special Scientific Interest (SSSI)	West Cornwall Bryophytes Site	80m	*Drilling is not anticipated to affect this site.*
Special Areas of Conservation (SAC)	Fal & Helford Marine Area	12 km	
Special Protection Areas (SPA)	Falmouth Bay to St Austell Bay	15 km	
Tree Preservation Orders (TPO)	St Uny Crescent, Carn Brea Village TPO 2001	1.1km	*SCL do not intend to fell or disturb any trees or forestry during our drilling programme.*
Zones of Influence Natura 2000	All sites are in excess of 300m outside the Zones of Influence Natura 2000 network for Fal & Helford. Nonetheless, all 3 sites have been subject to an ecological walkover survey which have identified that there are no valuable and threatened species or habitats on the sites that will be endangered by the proposed drilling.		

7 Proposed 2021 Mineral Exploration Drilling Program

7.1 Program Details

South Crofty Ltd (SCL) wishes to carry out a mineral exploration program in the South Carn Brea area, predominantly targeting lode mineralisation associated with the historic 'Great Flat Lode'. Program commencement is expected to take place in late 2021/early 2022. Three surface sites have been identified and from each of these multiple drillholes, mostly of relatively short length, may be drilled. It is anticipated that one drill rig will be working at any one time in order to complete the program within the required six-month time period.

Boreholes will be sited at least 50m from confirmed dwellings, but typically will be further away from them. A summary of the initial planned drillhole particulars is included in Table 7.1. It should be noted that some minor adjustments may be made to the final borehole locations within each proposed site as more geological information becomes available as the exploration program develops.

Table 7.1: Summary of Planned Mineral Exploration Drillholes

Drill Site	Hole ID	Easting	Northing	Length (m)	Azimuth	Dip	Approximate Distance to Nearest Dwelling (m)
Site 1	1	168400	40210	220	008°	45°	80
	2			200	010°	65°	
	3			900	025°	88°	
Site 2	4	168610	40220	250	297°	46°	85
	5			250	323°	49°	
	6			300	323°	90°	
Site 3	7	168440	40025	300	344°	55°	75
	8			280	155°	71°	

Please note, drill hole angles, depths and locations may change slightly as further geological information becomes available during the drilling program. Also note, Hole ID's are reflective of the potential sequence they are planned to be drilled but this may change depending on results and other geological factors.

7.2 Landowners

SCL has contacted the landowner and relevant stakeholders associated with each site. Agreements with the landowner have been reached with a formal Land Access Agreement finalised for each site. This Land Access Agreement covers site access and preparation, drilling activities, site rehabilitation post-drilling and appropriate compensation.

Thorough site visits will be made to each location prior to drilling to locate services and utilities and to co-ordinate mobilisation/drilling activities in such a way as to minimise interference between stakeholders.

7.3 Selection of Contractors and Equipment

The drilling contractor has been confirmed as Priority Drilling Ltd (PDL) of Ireland.

SCL have worked with PDL to successfully deliver several previous diamond drilling programs over the past twelve-months, and their continued selection is based on their ability to safely complete the job required, consistently meet the environmental and community standards required when drilling in proximity to neighbouring stakeholders and their proven compliance with high OH&S standards. PDL use local labour wherever possible and are compliant with all UK HSE HMIM competency frameworks.

A photograph of the rig currently being utilised by South Crofty Ltd on a separate drilling program at United Downs is shown in Appendix III. It is likely that any drill rig used during this proposed drilling program will be the same machine, or similar, as that shown in Appendix III.

7.4 Drillhole Design

The drill holes will be fully diamond cored at various diameters, with holes likely being collared in HQ (96mm) diameter and stepping down to NQ (75.7mm) diameter after the first 50-100m, approximately. All drilling is rotary diamond drilling, with no percussive drilling required.

7.5 Sampling

Rock core produced by drilling will be transported in boxes back to SCL's offices at South Crofty Mine, Camborne, where it will be processed and sampled. The core from the intervals of interest will be split into half or quarter core pieces. Samples will be sent to off-site independent laboratories for assaying and further testing.

7.6 Drillhole Completion and Site Restoration

Drillholes will be adequately capped at surface and the sites rehabilitated within 28 days of the completion of drilling at each site. In locations of potential agricultural use, drillholes will be capped at least 0.6m below surface and subsequently covered with topsoil. Any waste material will be removed from the site and properly disposed of.

7.7 Public Safety

There are no public rights of way crossing any of the sites and all sites are located on private agricultural land.

Drilling operations at each location will consist of the drill site itself being securely fenced using temporary 'Heras' type fencing to restrict site access to relevant personnel only. During hours of operation, the drill sites will be fully supervised, whilst during non-operating hours, motion-sensitive security cameras will trigger alarms and send footage to the Drilling Supervisor if any significant motion is detected.

8 Environmental Management and Community Relations

8.1 Working Hours

In order to ensure the drilling is completed within a six-month time frame, operations related to the program will be conducted on 12-hour shifts, running from 07.00 to 19.00 hours, seven days per week (Monday to Sunday). Care will be taken to monitor noise levels and keep disturbance to minimum. In exceptional circumstances, some site activity may be required to be conducted outside these hours, but in this event, any additional

disturbance will be kept to a minimum. Drilling activities may be scheduled during Public Holidays if required.

8.2 Noise

A baseline noise survey was carried out in July 2021 as per Appendix I. The results from three monitoring stations established an existing daytime level range of between 38-46dB Laeq, and 29-31dB LA90 in the area immediately surrounding the proposed drill sites (Appendix I). The relevant monitoring positions are shown in Figure 6.

Figure 6: Monitoring Locations from Inacoustic Baseline Noise Survey July 2021.

Reproduced from "Inacoustic Noise Assessment for South Carn Brea Exploration Boreholes July 2021"

Considering the measured ambient sound levels recorded, results of a thorough noise assessment conducted by specialist consultants on behalf of South Crofty Ltd indicate that noise limits during the respective periods, as defined in BS5228-1:2009+A1:2014, should be set in accordance with 'Category A' at all receptors. As such, the noise limits at the closest receptors technically applicable to this noise assessment are 65 dB LAeq,t during daytime weekday (07:00-19:00) and Saturday (07:00-13:00) working hours, and 55 dB LAeq,t during weekday evenings (19:00-23:00), Saturdays (13:00-23:00), and Sundays

(07:00 to 23:00) (Appendix I). As the drilling operations are not necessarily able to vary the level of noise made by the rig dependant on the day of the week, SCL and PDL will therefore aim to limit noise levels at the nearest receptor below 55dB at all operational times.

South Crofty Ltd will take all appropriate mitigations to drill well within the proposed set limits and will at all times abide by the working hours set out in Section 8.1. Although not required to ensure compliance with the predicted noise levels set out in the report, SCL will ensure hay/straw bales are installed at each drilling location to further attenuate the noise levels. The drilling contractor will be contractually obliged to meet the relevant noise limits.

8.3 Ground Vibrations

As mentioned in 7.4 only rotary diamond coring rigs will be used which do not create any discernible ground vibrations. No blasting will be conducted.

8.4 Health and Safety

The drilling contractor shall be designated as 'The Operator' under the Borehole Sites and Operations Regulations 1995, Health and Safety at Work Act and will be responsible for notifying the Health and Safety Executive prior to drilling commencement.

8.5 Buried Pipelines, Cables and overhead lines

A survey will be made of each drill site prior to rig mobilisation to confirm locations of all buried cables or gas/water/sewage pipelines and also a check made for clearance of drilling equipment under overhead lines prior to commencing activity at each drill site.

8.6 Mud and Dust

Diamond drilling is a wet operation, and no significant dust will be generated during the program. If dust is created by the movement of vehicles during dry weather, then water will be used to act as a suppressant.

SCL will ensure the use of mud mats where required at the drill sites to minimise the amount of mud carried back onto the roads and to limit damage to the surface of the fields. Visitors to the sites will also be encouraged to park on harder standing where possible to avoid further land disturbance. Any mud carried on to public roads will be cleaned immediately to ensure the safe movement of traffic.

8.7 Site Access and Traffic Management Plan

The largest equipment associated with the drilling program is the drill rig itself, which will initially require a trailer to mobilise to the first drill site. As the rig is crawler mounted, once it has been delivered to the site, it can propel itself around on its own power and move to the adjacent drill sites thus. Rig moves between each site will typically only occur once, so will not be a regular occurrence.

Access to all three drilling sites can be made via Carn Lane, with Site 3 also having an additional access route directly to the national road running through Carnkie village. Carn Lane itself is used by agricultural equipment and will require no modifications to enable access for the drill rig and associated vehicles.

Light vehicle movements to and from the drilling sites will be limited, with typically no more than four movements per day by South Crofty Ltd personnel and less than a dozen movements each day by the Drill Site Operators' personnel. Visitors external to the project are not anticipated, particularly considering the potential for the operations to be conducted during the ongoing pandemic.

SCL have agreed use of a mains water connection adjacent to the entrance of Site 1, which would enable all drilling water to be sourced via the mains and piped to the rig. This would remove the requirement for transporting water to site via a bowser and telehandler, thereby further reducing vehicular traffic.

All sites will be subject to a full internal Risk Assessment by South Crofty Ltd and the Drill Site Operator prior to each site move, which will fully assess, detail and assign controls to traffic movements and providing safe access to all sites.

Details regarding each individual drill site's access and traffic management considerations are detailed below:

8.7.1 Site 1:

The most northerly site of the drill program will likely be the first site to drill from. The drill rig will access Site 1 via the gateway located in the north-east corner of the field and accessed via Carn Lane. This gateway is wide enough to ensure no modifications are needed to hedgerows or gateways to access this site.

This same route can be used for additional vehicular traffic throughout the program, provided the route through the fields does not disrupt the landowners' agricultural works. The water mains connection to be utilised for the duration of the drill program is located a short distance from the gateway accessing this field. Water will be piped from this connection along a similar route to that proposed for vehicular access.

Figure 7: Site 1 Vehicular Access Route

8.7.2 Site 2:

Site access for Site 2 is most likely to occur through a 16ft gateway in the south-western corner of the field housing the drill site. In the event that this is temporarily unsuitable, access can be gained via a separate gateway in the north-western corner of the field, adjacent to the entrance for Site 1 on the opposite side of Carn Lane.

Figure 8: Site 2 Vehicular Access Point

8.7.3 Site 3:

All vehicular traffic associated with the drill program can access Site 3 through the gateway located at the south-western edge of the field housing the drill site. This gateway provides access straight on to the national road leaving Carnkie.

Dependant on the sequence of drilling operations, it may be possible that drill rig mobilisation for Site 3 will occur through the gateway in the north-eastern corner connecting the fields containing Site 1 and Site 3, rather than through the access off the national road. If required for any operational or agricultural reason, light vehicles can also use this alternative route at the discretion of the landowner as required.

Figure 9: Site 3 Vehicular Access Point

The location of the proposed drill sites within the fields has been chosen to reduce the influence of the drilling operations on the agricultural operations, whilst still providing adequate geological drilling conditions.

Mud mats will be used where necessary to limit deterioration of the ground along traffic routes and to prevent movement of mud from the drilling sites.

Parking for visitors to any of the drill sites is to be encouraged on the hardstanding area associated with the layby located at the entrance of Site 2.

8.8 Water

Water is required during diamond drilling and along with designated drilling fluids will lubricate the drill steels and drill bit, whilst also ensuring the drill cuttings are removed from the hole and the walls of the hole remain stable. The walls of the drill holes are effectively cased by the drill rods, enabling water from the drilling to be recycled, and consumption levels are not large. All drilling fluids will be collected at the surface in tanks as part of a closed-circuit system. A small amount of waste (muds and drill cuttings) will be removed from site to licenced disposal sites and the water recycled. No discharge of cuttings, drilling muds or drilling water should occur from the drill sites.

Two specific specialised drilling fluids are used, namely AMC Torque Guard and AMC LiquiPol. Both products are non-toxic and represent no threat to any existing groundwater in the area. Data sheets for these two products have been provided to the Environment Agency in advance of this submission.

For remote sites such as this, typically a water bowser or tank will be filled with water from a mains supply, which will be used to provide water for drilling operations. However, for this drill program, SCL have permission from the landowner to use a metered water connection located adjacent to the entrance of Site 1. Water can be piped using temporary hoses from here to each of the three drill sites when required, thus

removing the need for regular water bowser movements. Use of this metered connection will see the owner suitably compensated for this water usage.

South Crofty Ltd have liaised with the Environment Agency (EA) in this regard ahead of this GPDO submission and have submitted a pre-notification copy of the required WR-11 Notice accordingly. This will be followed up by an official submission at least 30 days prior to drilling once a proposed start date for the program can be confirmed.

The geological results and subsequent design proposals for capping and sealing the drill holes when completed will be discussed and confirmed with the EA prior to demobilisation from each site.

8.9 Light Pollution

Portable lighting towers are typically required during hours of darkness and if used, these will be directed away from properties and away from hedgerow and treeline habitats as well, in order to minimise light pollution.

The lights that are used by Priority Drilling Ltd are no brighter than 4200 lumens, which is comparable to a single standard streetlight bulb when subject to no mitigation. The lights on the drill site can be shrouded and targeted at the working area only in order to mitigate any spread away from the direct working area. The strategic positioning of the 3m hay/straw bales around the drill sites can also be used to further attenuate light levels reducing impact on any nocturnal wildlife and neighbouring properties.

8.10 Ecology

All three proposed drill sites were subject to an ecological walkover survey. The survey work undertaken notes that the residual impact of the proposed exploratory drilling is considered likely to be of **neutral impact, at a local scale,** on the ecology of the site, subject to the successful implementation of mitigation measures outlined within the ecological report included in Appendix IV.

South Crofty Ltd commits to following best ecological practise at all times and to implement the mitigation recommendations of the ecological walkover survey report, including, but not limited to; covering pits and providing escape ramps from any excavations associated with the drilling operations in order to ensure animals do not become trapped; ensuring the presence of invasive plant species are noted and avoided where practicable; working with the landowner and an Ecological Clerk of the Works to manage appropriate sward/grass cutting works; and using mud mats where required to enable re-growth following the conclusion of drilling activities. All drill sites and associated infrastructure will be sited at least 20m distance from any established hedgerow, ensuring suitable buffer zones are left from these habitats.

If drilling activities commence later than eight (8) weeks following the date the ecological walkover survey was conducted (5th July 2021), SCL commits to commission a subsequent pre-construction walkover survey to ensure the results of the previous survey remain accurate, specifically in relation to mammal burrows and habitats.

Post-development monitoring will be conducted to ensure vegetation suitably recovers and to assess whether any additional measures (such as re-seeding, targeting of weedy species control, etc.) to aid recovery are required.

9 Public and Stakeholder Consultation

South Crofty Ltd has agreed terms with the directly affected landowner regarding access to the land, with a finalised Land Access Agreement in place covering each drill site.

South Crofty Ltd presented the drilling proposals for South Carn Brea to Carn Brea Parish Council on 15th July 2021. Further updates will be provided at the monthly Parish Council meetings throughout the course of the proposed program.

Since July 2021, SCL has been conducting a program of house-to-house visits in the local community focused around Carnkie. This approach has proved invaluable during previous drilling programs as it allows SCL representatives the opportunity to discuss the

details of the drilling proposals with neighbouring stakeholders and answer any questions they may have regarding the proposals. Community Newsletters are delivered to households and businesses during these engagements and a useful point of contact established between stakeholders and SCL representatives.

Residents in areas adjacent to the proposed South Carn Brea drilling sites will continue to be visited personally in advance of, and during, the drilling operations to discuss the proposals, update them on plans and to maintain open lines of communication between the nearest residents and South Crofty Ltd. All visits are being held in a socially distant and responsible manner following government guidelines.

An Information Open Day is being held at Carnkie Village Institute on 13th September between 11am and 8pm in order to reach any local stakeholders who have not been informed about the proposals through SCL's other aforementioned communication efforts.

SCL also conduct educational events with local primary schools adjacent to our active project areas. In relation to the proposed drilling at South Carn Brea we conducted outreach educational talks at Pencoys CP School in Four Lanes in June 2021. All visits to local educational facilities are conducted in a manner befitting government guidelines related to the ongoing Covid-19 pandemic at the time.

In the wider Camborne and Pool area, SCL has previously held regular liaison meetings with the community at the South Crofty site. The continuing pandemic has impacted the ability of SCL to hold these meetings in person to-date. Regular newsletters have been provided in lieu of being able to host physical open forums. Details regarding the proposed drilling at South Carn Brea have been circulated with these newsletters in addition to the specific South Carn Brea Community Newsletters circulated in the Carnkie area.

10 Complaints Procedure

If there are any issues or concerns at any stage during the drilling campaign, then SCL should be contacted at their South Crofty offices so that the matter can be addressed. Contact details will be displayed on the perimeter of each drill site in proximity to public thoroughfares.

11 Permitted Development under General Permitted Development Order (GPDO) Requirements

The Town and Country Planning (General Permitted Development) (England) Order 2015 Schedule 2, Part 17 (Class K), advises that Permitted Development is;

Development on any land consisting of—
(a) the drilling of boreholes;
(b) the carrying out of seismic surveys; or
(c) the making of other excavations,
for the purposes of mineral exploration, and the provision or assembly on that land or on adjoining land of any structure required in connection with any of those operations.

SCL wish to undertake an exploratory mineral borehole drilling programme on land near South Carn Brea in accordance with the above.

It should be noted that development is not permitted under Section K if;

a) It consists of the drilling of boreholes for petroleum exploration.

The proposed mineral exploration drilling programme is targeting hard rock mineralisation, specifically hard rock metal resources primarily focusing on tin deposits. This condition is therefore met.

b) ***The developer has not previously notified the mineral planning authority in writing of its intention to carry out the development (specifying the nature and location of the development).***

This submission has been prepared and submitted by the developer (South Crofty Ltd) and contains the information required to constitute such notification. This condition is therefore met.

c) The relevant period has not elapsed.

The relevant period will normally elapse 28 days after the notification given to the MPA. This condition will therefore normally be satisfied within this prescribed time period.

d) Any explosive charge of more than 2 kilograms would be used.

No explosive charges are proposed as part of this exploratory mineral borehole drilling programme. This condition is therefore met.

e) ***Any excavation referred to in Class K(c) would exceed 10 metres in depth or 12 square metres in surface area.***

Minimal site levelling for drill site access and drill pad setup may be required, however, any such excavations will be constrained by the area and depth limits defined above. This condition is therefore met.

f) Any structure assembled or provided would exceed 12 metres in height.

All erected structures will be less than 12 meters. The proposed drilling rig has a maximum height of under 12 metres. This condition is therefore met.

By ensuring each of the above points is addressed and adhered to by SCL, the proposed development should therefore be eligible to be undertaken under the terms of Schedule

2, Part 17 (Section K), of the Town and Planning, General Permitted Development Order (England) 2015.

11.1 GPDO Conditions

The GPDO advises that development by Class K is subject to a number of conditions;

a) The development is carried out in accordance with the details in the notification referred to in paragraph K.1(b) unless the Mineral Planning Authority have otherwise agreed in writing;

b) No trees on the land are removed, felled, lopped or topped and no other thing is done on the land likely to harm or damage any trees, unless specified in detail in the notification referred to in paragraph K.1(b) or the Mineral Planning Authority have otherwise agreed in writing;

c) Before any excavation other than a borehole is made, any topsoil and any subsoil is separately removed from the land to be excavated and stored separately from other excavated material and from each other;

d) Within a period of 28 days from operations ceasing, unless the Mineral Planning Authority have agreed otherwise in writing –

i. Any structure permitted by Class K and any waste material arising from other development so permitted shall be removed from the land;

ii. Any borehole is adequately sealed;

iii. Any other excavations is filled with material from the site;

iv. The surface of the land is levelled and any topsoil replaced as the uppermost layer, and;

v. The land is, so far as is practicable, restored to its condition before the development took place, including the carrying out of any necessary seeding and replanting;

e) The development ceases no later than a date six months after the elapse of the relevant period, unless the Mineral Planning Authority have otherwise agreed in writing.

South Crofty Ltd will undertake the Trenares Lode mineral exploration drilling programme as detailed within this notification in accordance with all these conditions.

11.2 Use of GPDO for Similar Minerals Exploration Projects in UK

GPDO's have been successfully used for similar mineral exploration drilling programmes elsewhere in the UK. Notable examples are:

- South Crofty Ltd, who are currently diamond drilling on 'Lithium Lode' and 'Trenares Lode' in the United Downs area, with both programs covered under individual GPDO submissions.
- Cornish Lithium, who have been actively drilling in the United Downs area for several months and whose drillhole GWDD-002 discovered the lode structure that was the focus of SCL's' 'Lithium Lode' exploration program in 2021.
- Cornwall Resources who have completed two phases of exploration drilling on the Redmoor Project near Callington using a GPDO.
- South Crofty Ltd (under the previous operating name of Western United Mines) conducted a diamond drilling program at South Crofty under the auspices of GPDO PA20/02143 during the summer of 2020.

11.3 Other Regulatory Notifications

South Crofty Ltd will also provide standard notifications to the British Geological Survey and Her Majesties' Inspectorate of Mines (HMIM HSE) prior to drilling commencement.

APPENDICES

Appendix I

Noise Baseline Study and Assessment for GPDO Application by "inacoustic" – July 2021

South Carn Brea Exploration Boreholes

Noise Assessment for GPDO Application

9th August 2021

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Version	1	2	3
Comments	Noise Assessment	Client Comments	
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Project Number	21-175	21-175	

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The findings and opinions expressed are relevant to the dates of the site works and should not be relied upon to represent conditions at substantially later dates. If additional information becomes available which may affect our comments, conclusions or recommendations, the author reserves the right to review the information, reassess any new potential concerns and modify our opinions accordingly.

Contents

Figures

Tables

1. INTRODUCTION

1.1. Overview

inacoustic has been commissioned by South Crofty Limited to prepare a noise assessment covering the receptors surrounding the proposed exploration boreholes on South Carn Brea, near Carnkie, Redruth, Cornwall.

The following technical noise assessment has been produced to accompany the GPDO Application to the Mineral Planning Authority. This report details the existing background sound climate at the nearest receptors, as well as the sound emissions associated with the works during the construction phase.

This noise assessment is necessarily technical in nature; therefore a glossary of terms is included in Appendix A to assist the reader.

1.2. Scope and Objectives

The scope of the noise assessment can be summarised as follows:

- A baseline sound monitoring survey undertaken in the vicinity of the closest noise-sensitive receptors to the Site;
- Detailed sound modelling using the iNoise 2021 modelling suite and ISO9613[1] prediction methodology to predict sound levels at the closest noise-sensitive receptors to the Site;
- A detailed assessment of the suitability of the Site, in accordance with relevant standards in respect of sound from the proposed sources; and
- Recommendation of mitigation measures, where necessary, to comply with the requirements of the National Planning Practice Guidance in England: Minerals and Noise [2] and BS5228:2009+A1:2014[3].

[1] International Standards Organisation. ISO 9613-2:1996: Acoustics - Attenuation of sound during propagation outdoors - Part 1: Calculation of the absorption of sound by the atmosphere.
[2] Department for Communities and Local Government (DCLG), 2014/2019. National Planning Practice Guidance for England: Minerals and Noise. DCLG.
[3] British Standards Institution. BS5228:2009+A1:2014 – Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise.

2. LEGISLATION AND POLICY FRAMEWORK

2.1. National Policy

2.1.1. National Planning Policy Framework, 2021

The *National Planning Policy Framework* (NPPF)[4] sets out the Government's planning policies for England. Planning policy requires that applications for planning permission must be determined in accordance with the development plan, unless material considerations indicate otherwise.

The NPPF is also a material consideration in planning decisions. It sets out the Government's requirements for the planning system and how these are expected to be addressed.

Under Section 15; *Conserving and Enhancing the Natural Environment*, in Paragraph 174, the following is stated:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability".

Paragraph 185 of the document goes on to state:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason"

Paragraph 185 refers to the Noise Policy Statement for England, which is considered overleaf.

[4] Ministry of Housing, Communities and Local Government (MHCLG), July 2021. National Planning Policy Framework. HMSO. London.

2.1.2. Noise Policy Statement for England, 2010

The underlying principles and aims of existing noise policy documents, legislation and guidance are clarified in *DEFRA: 2010: Noise Policy Statement for England* (NPSE)[5]. The NPSE sets out the *"Long Term Vision"* of Government noise policy as follows:

"Promote good health and good quality of life through the effective management of noise within the context of Government policy on sustainable development".

The NPSE outlines three aims for the effective management and control of environmental, neighbour and neighbourhood noise:

- *"Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life; and*
- *Where possible, contribute to the improvement of health and quality of life".*

The guidance states that it is not possible to have a single objective noise-based measure that defines *"Significant Observed Adverse Effect Level (SOAEL)"* that is applicable to all sources of noise in all situations and that not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

2.1.3. National Planning Practice Guidance in England: Noise, 2019

Further guidance in relation to the NPPF and the NPSE has been published in the *National Planning Practice Guidance in England: Noise* (NPPG Noise)[6], which summarises the noise exposure hierarchy, based on the likely average response. The following three observed effect levels are identified below:

- **Significant Observed Adverse Effect Level**: This is the level of noise exposure above which significant adverse effects on health and quality of life occur;
- **Lowest Observed Adverse Effect Level**: This is the level of noise exposure above which adverse effects on health and quality of life can be detected; and
- **No Observed Adverse Effect Level**: This is the level of noise exposure below which no effect at all on health or quality of life can be detected.

[5] Department for Environment, Food and Rural Affairs (DEFRA), 2010. Noise Policy Statement for England. DEFRA.
[6] Department for Communities and Local Government (DCLG), 2019. National Planning Practice Guidance for England: Noise. DCLG.

Criteria related to each of these levels are reproduced in Table 1.

TABLE 1: SIGNIFICANCE CRITERIA FROM NPPG IN ENGLAND: NOISE

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not Noticeable	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Noticeable and Not Intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and Intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and Disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and Very Disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

2.1.4. National Planning Practice Guidance in England: Minerals, 2014

Technical guidance on noise was provided in more detail in the accompanying document *Technical Guidance to the National Planning Policy Framework*, dated March 2012, which was superseded in March 2014 by the *Planning Practice Guidance*.

Paragraphs 19 to 22 inclusive of the *Minerals*[7] (NPPG Minerals) chapter of the *National Planning Practice Guidance* are under the heading *Noise Emissions* within the section "*Assessing Environmental Impacts from Mineral Extraction".*

Paragraph 19 states:

"How should minerals operators seek to control noise emissions?

Those making mineral development proposals, including those for related similar processes such as aggregates recycling and disposal of construction waste, should carry out a noise impact assessment, which should identify all sources of noise and, for each source, take account of the noise emission, its characteristics, the proposed operating locations, procedures, schedules and duration of work for the life of the operation, and its likely impact on the surrounding neighbourhood.

Proposals for the control or mitigation of noise emissions should:

- *consider the main characteristics of the production process and its environs, including the location of noise-sensitive properties and sensitive environmental sites;*
- *assess the existing acoustic environment around the site of the proposed operations, including background noise levels at nearby noise-sensitive properties;*
- *estimate the likely future noise from the development and its impact on the neighbourhood of the proposed operations;*
- *identify proposals to minimise, mitigate or remove noise emissions at source; and*
- *monitor the resulting noise to check compliance with any proposed or imposed conditions"*

Paragraph 20 states:

"How should mineral planning authorities determine the impact of noise?

Mineral planning authorities should take account of the prevailing acoustic environment and in doing so consider whether or not noise from the proposed operations would:

- *give rise to a significant adverse effect;*
- *give rise to an adverse effect; and*
- *enable a good standard of amenity to be achieved.*

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy."

Paragraph 21 of the Planning Practice Guidance states:

[7] Department for Communities and Local Government (DCLG), 2014. National Planning Practice Guidance for England: Minerals. DCLG.

"What are the appropriate noise standards for mineral operators for normal operations?

Mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) during normal working hours (0700-1900). Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) $L_{Aeq,1h}$ (free field). For operations during the evening (1900-2200) the noise limits should not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) and should not exceed 55dB(A) $L_{Aeq,1h}$ (free field). For any operations during the period 22.00 – 07.00 noise limits should be set to reduce to a minimum any adverse impacts, without imposing unreasonable burdens on the mineral operator. In any event the noise limit should not exceed 42dB(A) $L_{Aeq,1h}$ (free field) at a noise sensitive property.

Where the site noise has a significant tonal element, it may be appropriate to set specific limits to control this aspect. Peak or impulsive noise, which may include some reversing bleepers, may also require separate limits that are independent of background noise (e.g. L_{max} in specific octave or third-octave frequency bands – and that should not be allowed to occur regularly at night.)

Care should be taken, however, to avoid any of these suggested values being implemented as fixed thresholds as specific circumstances may justify some small variation being allowed."

Interpreting the guidance given in the NPPG Minerals, with consideration of the guidance given in the NPSE and NPPG Noise, an estimation of the impact of the rating sound is summarised in the following text:

- A rating sound level greater than $L_{Aeq,1h}$ 55 dB is likely to be an indication of a **Significant Observed Adverse Effect Level**;
- A rating sound level that is +10 dB above the background sound level, up to a maximum of $L_{Aeq,1h}$ 55 dB, is likely to be an indication of a **Lowest Observed Adverse Effect Level**; and
- The lower the rating sound level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating sound level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, and would therefore classified as a **No Observed Adverse Effect Level**.

Finally, Paragraph 22 of the NPPG Minerals recognises that some operations may give rise to particularly noisy short-term activities, and states:

"What type of operations may give rise to particularly noisy short-term activities and what noise limits may be appropriate?

Activities such as soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance.

Increased temporary daytime noise limits of up to 70dB(A) $L_{Aeq,1h}$ (free field) for periods of up to eight weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs.

Where work is likely to take longer than eight weeks, a lower limit over a longer period should be considered. In some wholly exceptional cases, where there is no viable alternative, a higher limit for a very limited period may be appropriate in order to attain the environmental benefits. Within this framework, the 70 dB(A) $L_{Aeq,1h}$ (free field) limit referred to above should be regarded as the normal maximum."

2.2. British Standards

2.2.1. BS5228-1:2009+A1:2014

BS 5228:2009+A1:2014[8] sets out a method for measuring and predicting sound from construction works. The method considers, amongst other things, the sound emission level of the plant, the separation distance between the source and receiver, the effect of the intervening topography and structures.

This Standard sets out techniques to predict the likely sound effects from construction works, based on detailed information on the type and number of plant being used, their location and the length of time they are in operation. The sound prediction method is used to establish likely sound levels in terms of the $L_{Aeq,T}$.

This standard also documents a database of information, including previously measured sound pressure level data for a variety of different construction plant undertaking various common activities.

Sound levels generated by the proposed site operations and experienced at local receptors will depend upon a number of variables, the most important of which are the:

- amount of sound generated by plant and equipment being used at the site, generally expressed as a sound power level;
- periods of operation of the plant at the site, known as the 'on-time';
- distance between the sound source and the receptor, known as the 'stand-off';
- attenuation due to ground absorption or barrier screening effects; and
- reflection of sound due to the presence of hard vertical faces such as walls.

In order to determine the likely effect of sound during the construction of the Proposed Development, sound predictions have been carried out in accordance with the procedures presented in BS5228, taking full account of Best Practicable Means (BPM). The prediction method described in BS5228 has comprised taking the source sound level of each item of plant and correcting it for:

i. distance effects between source and receiver;
ii. percentage operating time of the plant; and
iii. barrier attenuation effects.

This assessment considers the criteria set out in Section E.3.2 of BS5228, which considers impact significance based upon the change in ambient sound associated with construction activities. It is stated that this can be considered as *"an alternative and/or additional method to determine the significance of construction noise levels"*.

Example Method 1 (The ABC Method) considers the existing ambient sound environment (the L_{Aeq} sound level environment) at the neighbouring sensitive receptors and proposes levels that are not to be exceeded.

Table E.1 of BS5228 sets out significance effect threshold values at receptors. The process for determining this requires the determination of the ambient sound level at the relevant receptor (rounded to the nearest 5dB), which is then compared to the total sound level, including the predicted construction noise level. If the combined sound level exceeds the appropriate category

[8] British Standard Institution. BS 5228-1:2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Part 1: Noise.

value, then the impact is deemed to be significant. The relevant statistics from Table E.1 are set out in Table 2:

TABLE 2: EXAMPLE THRESHOLD OF POTENTIAL SIGNIFICANT EFFECT AT DWELLINGS

Assessment category and threshold value period	Threshold value, in decibels (dB) ($L_{Aeq,T}$)		
	Category A[A)]	Category B[B)]	Category C[C)]
Night-time (23:00-07:00)	45	50	55
Evenings and weekends[D)]	55	60	65
Daytime (07:00-19:00) and Saturdays (07:00-13:00)	65	70	75
NOTE 1 A potential significant effect is indicated if the $L_{Aeq,T}$ *noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.*			
NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient *noise level is higher than the above values), then a potential significant effect is indicated if the total* $L_{Aeq,T}$ *noise level for the period increases by more than 3 dB due to site noise.*			
NOTE 3 Applied to residential receptors only. *A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.* *B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.* *C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.* *D) 19:00-23:00 weekdays, 13:00-23:00 Saturdays and 07:00-23:00 Sundays.*			

2.3. Discussion and Assessment Criteria

This GPDO Application is being considered by the Mineral Planning Authority, so it is therefore clear that NPPG Minerals should be a consideration in this assessment.

The works are proposed to be very short-term, relative to the lifetime of a typical minerals site, as the works are only exploratory at this stage. As such, there is merit in adopting an alternative assessment methodology, which recognises the relative short-term nature of the activities. It is therefore proposed that BS5228-1:2009+A1:2014 should form the basis of the noise assessment, which recognises that the works a short-term and transient, whilst still offering protection to neighbouring residential receptors to the works.

The methodology adopted in this assessment was accepted by the Mineral Planning Authority for the GPDO application made by Cornish Lithium Limited for a similar process in 2019 for their drilling at United Downs, as well as for South Crofty Limited, for several drill programs in the local area between 2020 and 2021. Consequently, this precedent is considered to be well-established.

3. Site Description

The GPDO Application considers three locations for the exploratory boreholes.

It is proposed to use an Epiroc Christensen CS-14 Rig to drill the exploratory boreholes. There are two main sources of noise associated with the Epiroc Christensen CS-14; engine and drill noise.

The location of the exploratory boreholes can be seen below in Figure 1.

Figure 1: Site Location Plan

The grid reference coordinates associated with the proposed exploratory boreholes have been detailed in Table 3, below.

TABLE 3: EXPLORATORY BOREHOLE GRID REFERENCES

Site ID	Grid Reference Coordinates	
	Easting	Northing
Site 1	168400	040210
Site 2	168610	040220
Site 3	168440	040025

There are numerous residential receptors interspersed in the locality of the proposed exploratory boreholes. The residential receptors considered in this noise assessment are outlined in Table 4, below.

TABLE 4: RESIDENTIAL RECEPTORS

Site ID	Grid Reference Coordinates	
	Easting	Northing
R1: Rock Farm	168301	040334
R2: San Lou	168464	040307
R3: Rose Cottage	168476	040233
R4: 1 Doroy Villas	168514	040186
R5: 2 Doroy Villas	168532	040184
R6: Woody Nook	168756	040329
R7: Basset Cottage	168793	040153
R8: Trenwith	168713	040057
R9: Pendragon	168502	039984
R10: Monument View	168469	039954
R11: Carn Haven	168310	039982
R12: Bowling Green Farm	168171	040095

4. Measurement Methodology

4.1. General

The prevailing noise conditions in the area have been determined by an unattended environmental noise survey conducted during both daytime and night-time periods between Friday 16th July 2021 to Tuesday 20th July 2021.

4.2. Measurement Details

All noise measurements were undertaken by a consultant certified as competent in environmental noise monitoring, and, in accordance with the principles of BS 7445[9].

All acoustic measurement equipment used during the noise survey conformed to Type 1 specification of British Standard 61672[10]. A full inventory of this equipment is shown in Table 5 below.

Table 5: Inventory of Sound Measurement Equipment

Position	Make, Model & Description	Serial Number	Calibration Certificate Number	Calibration Due Date
MP1	Larson Davis 820 Sound Level Meter	A1110	190487	29/07/2021
	PRM 828 Preamplifier	3029	190487	29/07/2021
	PCB 377B02 Microphone	171603	190487	29/07/2021
MP2	Brüel & Kjær 2238 Sound Level Meter	2812838	1107108	14/12/2022
	Brüel & Kjær ZC 0030 Preamplifier	-	1107108	14/12/2022
	Brüel & Kjær 4188 Microphone	2793282	1107108	14/12/2022
MP3	Brüel & Kjær 2238 Sound Level Meter	2756961	1107107	14/12/2022
	Brüel & Kjær ZC 0030 Preamplifier	-	1107107	14/12/2022
	Brüel & Kjær 4188 Microphone	2407240	1107107	14/12/2022
All	Rion NC-74 Acoustic Calibrator	34904966	1110274	15/03/2022

The sound measurement equipment used during the survey was field calibrated at the start and end of the measurement period. A calibration laboratory has calibrated the field calibrator used within the twelve months preceding the measurements. A drift of less than 0.2 dB in the field calibration was found to have occurred on the sound level meter.

The long-term background sound survey was conducted at speeds of typically less than 5 ms^{-1}, as measured on site with an anemometer. There were no periods of precipitation during the background sound survey, as measured on-site with a rain-tipping gauge.

[9] British Standard 7445: 2003: Description and measurement of environmental noise. BSI
[10] British Standard 61672: 2013: Electroacoustics. Sound level meters. Part 1 Specifications. BSI.

The microphone was fitted with a protective windshield for the measurements, which is described in Table 3, with an aerial photograph indicating its location shown in Figure 2.

TABLE 3: MEASUREMENT POSITIONS DESCRIPTION

Receptor			Grid Co-ordinates	
Measurement Position	Address	Type	Easting	Northing
MP1	Land Adjacent to Rose Cottage	Residential	168468	040221
MP2	Land Adjacent to Woody Nook	Residential	168697	040300
MP3	Land Adjacent to Pendragon	Residential	168480	039983

FIGURE 2: MEASUREMENT POSITIONS

4.3. Summary of Measurement Results

The summarised results of the environmental noise measurements are presented in Table 6.

TABLE 6: SUMMARY OF NOISE MEASUREMENT RESULTS

Measurement Position	Period	Sound Level, dB	
		L_{Aeq}	L_{A90}
MP1	Day	42	31
	Evening	38	29
	Night	40	21
MP2	Day	39	29
	Evening	38	28
	Night	38	21
MP3	Day	46	31
	Evening	43	29
	Night	40	21

5. CALCULATIONS

5.1. Proposed Operations Overview

It is proposed to use an Epiroc Christensen CS-14 Rig to drill the exploratory boreholes. There are two main sources of noise associated with the Epiroc Christensen CS-14 Rig; engine and drill noise.

It is proposed to operate the drilling rig 7-days a week, from 07:00 to 19:00. The operator is seeking the ability to temporarily operate into the evening period, as defined by BS5228-1:2009+A1:2019, in exceptional circumstances, should completion of the drilling program overrun. No works are proposed during the night time period.

5.2. Methodology

5.2.1. Source Data

The source data associated with the Proposed Development, as measured from an operational Hanjin D&B 35-M Rig, can be seen below in Table 7.

TABLE 7: SOURCE DATA

Noise Source	Sound Power Level (dB)
Epiroc Christensen CS-14	103

5.2.2. Calculation Process

Calculations were carried out using iNoise 2021, which undertakes its calculations in accordance with guidance given in ISO9613-1:1993 and ISO9613-2:1996.

Daytime specific sound levels have been calculated to a height of 1.5 m above ground level.

5.2.3. Assumptions

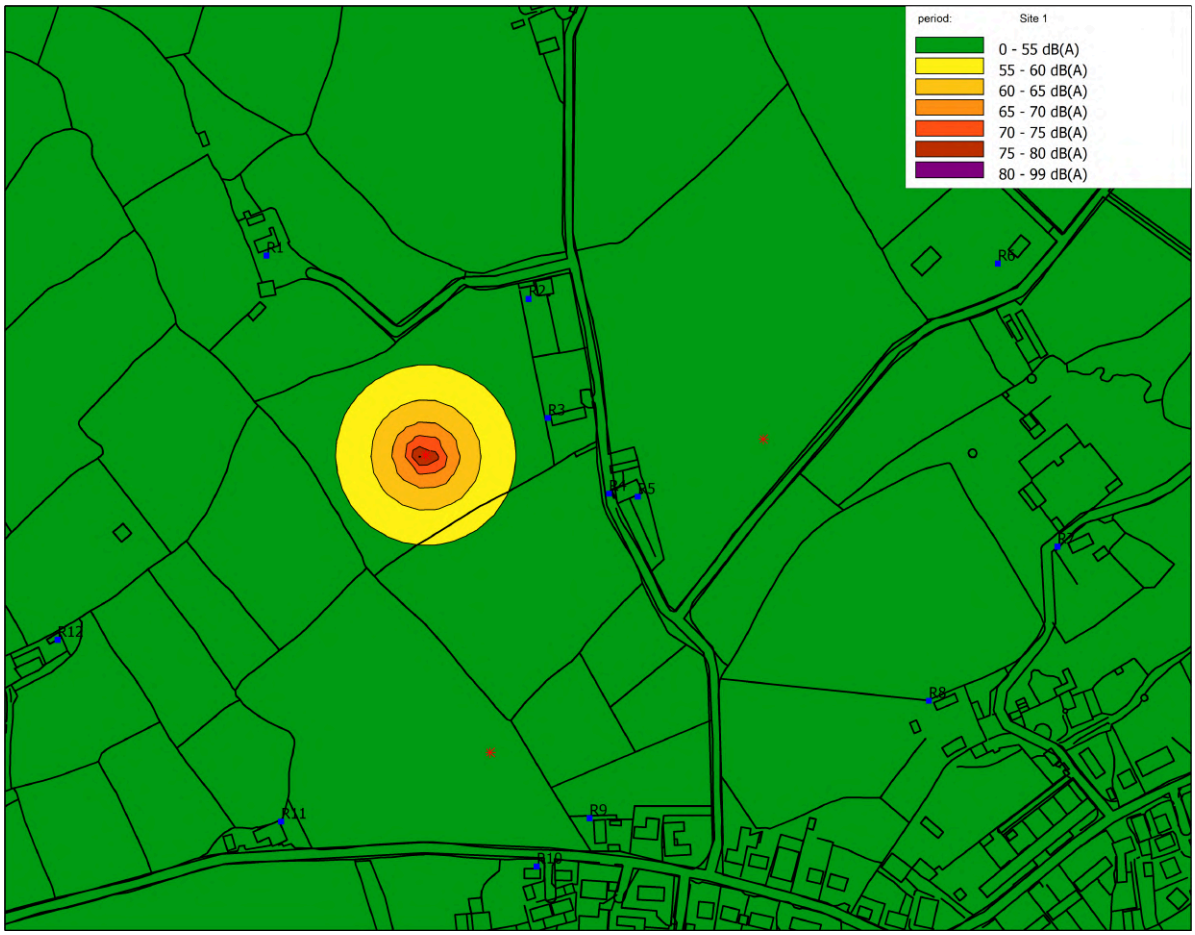
Given that the land between proposed development and nearest receptors is mixed, the ground factor has been set according to ground type, using 'ground areas' in the calculation software. The ground area associated with the Proposed Development has been set to 'hard'.

It has been assumed that all processes will occur simultaneously, representing a worst-case scenario. In order to accurately model the land surrounding the development, an AutoCAD DXF drawing was produced, which was based on data provided by the Ordnance Survey.

5.2.4. Specific Sound Level Map – Site 1

The sound map showing the specific sound level emissions from Site 1 during the daytime period at 1.5 m above ground level, can be seen below in Figure 3.

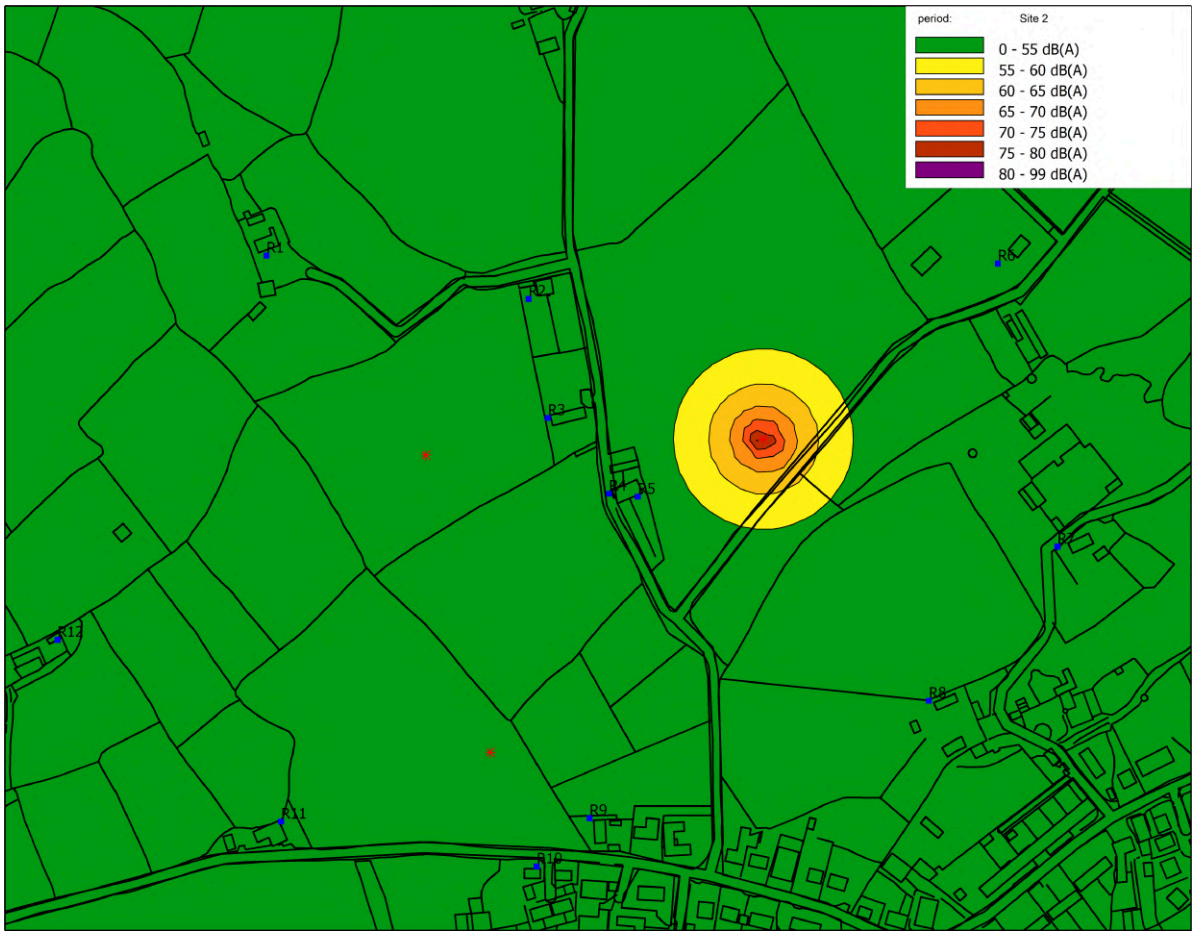
FIGURE 3: SPECIFIC SOUND LEVEL MAP FOR SITE 1



5.2.5. Specific Sound Level Map – Site 2

The sound map showing the specific sound level emissions from Site 2 during the daytime period at 1.5 m above ground level, can be seen below in Figure 4.

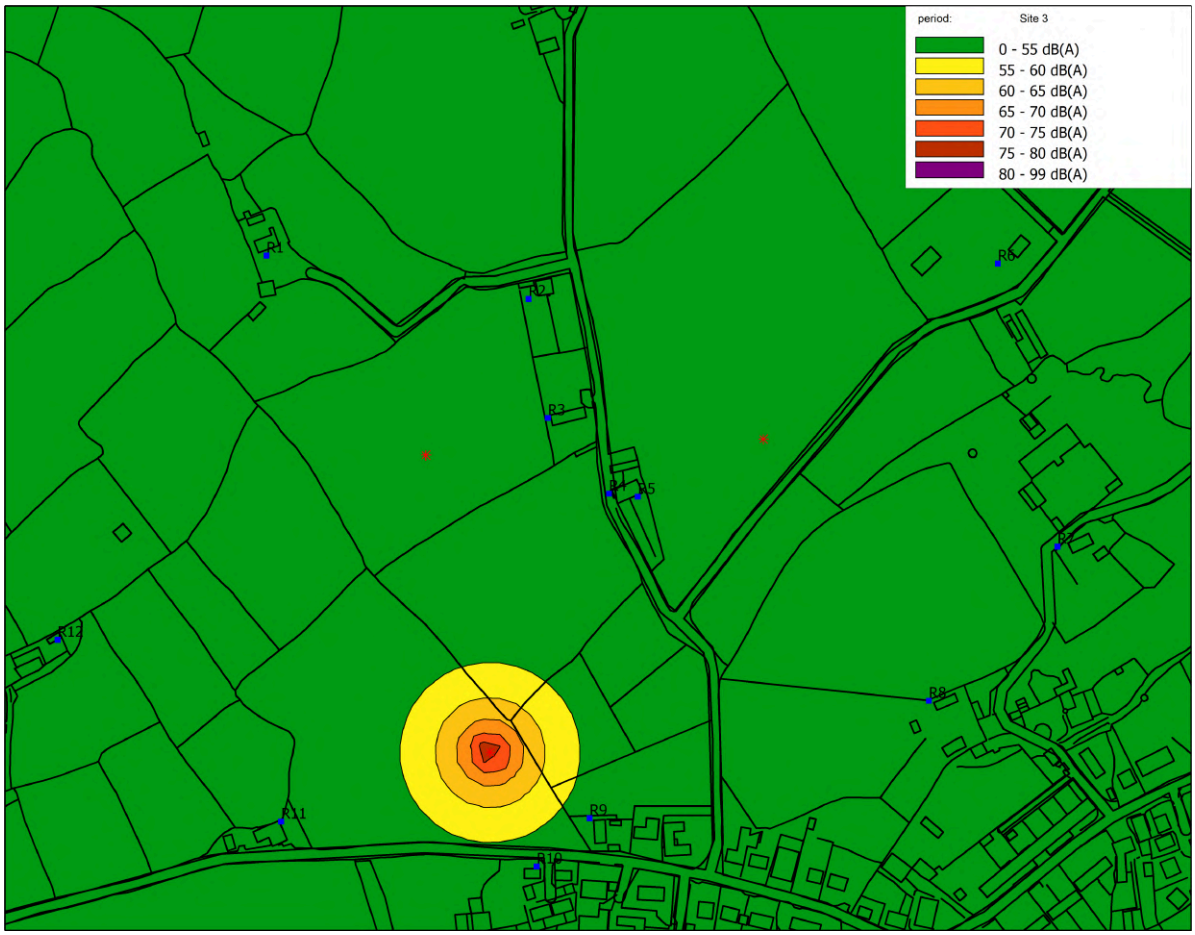
FIGURE 4: SPECIFIC SOUND LEVEL MAP FOR SITE 2



5.2.6. Specific Sound Level Map – Site 3

The sound map showing the specific sound level emissions from Site 3 during the daytime period at 1.5 m above ground level, can be seen below in Figure 5.

FIGURE 5: SPECIFIC SOUND LEVEL MAP FOR SITE 3



5.2.7. Specific Sound Level Summary

A summary of the predicted specific sound levels at the NSRs, based on the sound maps shown in Figure 3, Figure 4, and Figure 5, can be seen below in Table 8.

TABLE 8: PREDICTED SPECIFIC SOUND LEVEL SUMMARY

NSR	Specific Sound Level (dB)		
	Site 1	Site 2	Site 3
1	45	34	37
2	48	44	39
3	52	46	42
4	48	49	44
5	47	51	44
6	36	44	35
7	32	43	33
8	34	43	40
9	41	40	52
10	40	39	52
11	41	33	46
12	40	31	39

6. ASSESSMENT

6.1. BS5228-1:2009+A1:2014

6.1.1. Overview

Inspection of the measured ambient sound levels indicates that noise limits during the respective periods, as defined in BS5228-1:2009+A1:2014, should be set in accordance with 'Category A' at all receptors.

As such, the noise limits applicable to this noise assessment are defined in Table 9, below.

TABLE 9: BS5228-1:2009+A1:2014 DERIVED NOISE LIMITS

Period	BS5228-1:2009+A1:2014 Noise Limit, $L_{Aeq,T}$ (dB)
Daytime (07:00-19:00) and Saturdays (07:00-13:00)	65
Weekday Evenings (19:00-23:00), Saturdays (13:00 to 23:00), and Sundays (07:00 to 23:00)	55

6.1.2. Assessment – Site 1

The assessment of the predicted specific sound levels from Site 1 at the nearest residential receptors can be seen below in Table 10.

TABLE 10: BS5228-1:2009+A1:2014 ASSESSMENT – SITE 1

Receptor	Predicted Specific Sound Level, L_{Aeq} (dB)	BS5228-1:2009+A1:2014 Noise Limit, $L_{Aeq,T}$ (dB)	Excess over Noise Limit (dB)
R1	45	65/55	-20/-10
R2	48	65/55	-17/-7
R3	52	65/55	-13/-3
R4	48	65/55	-17/-7
R5	47	65/55	-18/-8
R6	36	65/55	-29/-19
R7	32	65/55	-33/-23
R8	34	65/55	-31/-21
R9	41	65/55	-24/-14
R10	40	65/55	-25/-15
R11	41	65/55	-24/-14
R12	40	65/55	-25/-15

It can be seen that, at all receptors, both noise limits have been achieved for Site 1. Furthermore, it should be noted that the predicted specific sound level from Site 1 at all non-financially involved receptors achieves the upper noise limit of L_{Aeq} 55 dB, as outlined in NPPG Minerals, which equates to a *Lowest Observed Adverse Effect Level* (LOAEL).

6.1.3. Assessment – Site 2

The assessment of the predicted specific sound levels from Site 2 at the nearest residential receptors can be seen below in Table 11.

TABLE 11: BS5228-1:2009+A1:2014 ASSESSMENT – SITE 2

Receptor	Predicted Specific Sound Level, L_{Aeq} (dB)	BS5228-1:2009+A1:2014 Noise Limit, $L_{Aeq,T}$ (dB)	Excess over Noise Limit (dB)
R1	34	65/55	-31/-21
R2	44	65/55	-21/-11
R3	46	65/55	-19/-9
R4	49	65/55	-16/-6
R5	51	65/55	-14/-4
R6	44	65/55	-21/-11
R7	43	65/55	-22/-12
R8	43	65/55	-22/-12
R9	40	65/55	-25/-15
R10	39	65/55	-26/-16
R11	33	65/55	-32/-22
R12	31	65/55	-34/-24

It can be seen that, at all receptors, both noise limits have been achieved for Site 2. Furthermore, it should be noted that the predicted specific sound level from Site 2 at all non-financially involved receptors comfortably achieves the upper noise limit of L_{Aeq} 55 dB, as outlined in NPPG Minerals, which equates to a *Lowest Observed Adverse Effect Level* (LOAEL).

6.1.4. Assessment – Site 3

The assessment of the predicted specific sound levels from Site 3 at the nearest residential receptors can be seen below in Table 12.

TABLE 12: BS5228-1:2009+A1:2014 ASSESSMENT – SITE 3

Receptor	Predicted Specific Sound Level, L_{Aeq} (dB)	BS5228-1:2009+A1:2014 Noise Limit, $L_{Aeq,T}$ (dB)	Excess over Noise Limit (dB)
R1	37	65/55	-28/-18
R2	39	65/55	-26/-16
R3	42	65/55	-23/-13
R4	44	65/55	-21/-11
R5	44	65/55	-21/-11
R6	35	65/55	-30/-20
R7	33	65/55	-32/-22
R8	40	65/55	-25/-15
R9	52	65/55	-13/-3
R10	52	65/55	-13/-3
R11	46	65/55	-19/-9
R12	39	65/55	-26/-16

It can be seen that, at all receptors, both noise limits have been achieved for Site 3. Furthermore, it should be noted that the predicted specific sound level from Site 3 at all non-financially involved receptors achieves the upper noise limit of L_{Aeq} 55 dB, as outlined in NPPG Minerals, which equates to a *Lowest Observed Adverse Effect Level* (LOAEL).

7. CONCLUSION

inacoustic has been commissioned to prepare a noise assessment for proposed exploration boreholes on South Carn Brea, near Carnkie, Redruth, Cornwall.

Current guidelines on noise are contained in the Planning Practice Guidance, dated March 2014, and BS5228-1:2009+A1:2014.

Noise limits at the nearest noise-sensitive receptors to the Site are presented, based on recent local precedent, the guidance contained within the Planning Practice Guidance, BS5228-1:2009+A1:2014 and having regard to the measured background sound levels at locations representative of the dwellings selected for this assessment.

The specific sound levels comply with the relevant guidance contained within the National Planning Practice Guidance, without placing *"unreasonable burdens"* on the operator of the Site, as well as comfortably achieving the requirements of BS5228-1:2009+A1:2014.

Providing that the cumulative rating sound level from the plant items does not exceed the stated source levels in Table 7, whether through the application of noise control techniques or otherwise, the impact of sound from such sources is predicted to be at the *Lowest Observed Adverse Effect Level* (LOAEL).

Whilst not strictly required to demonstrate compliance with the relevant noise limits, incorporating hay bales to a height of 3 m in close proximity to the drill rig will likely reduce noise levels at the receptors by around 5 dB.

Finally, given that the Proposed Development is inherently time-limited, this further reduces the impact significance upon the surrounding area.

Since the Proposed Development conforms to the advice set out in the Planning Practice Guidance and BS5228-1:2009+A1:2019, it is considered that the exploratory boreholes can be drilled while keeping noise emissions to within environmentally acceptable limits, as such; it is recommended that noise should not be a constraint to the approval of this GPDO Application.

8. APPENDICES

8.1. Appendix A – Definition of Terms

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20µPa ($20x10^{-6}$ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20µPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS 5969.

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

TABLE 13: TYPICAL SOUND LEVELS FOUND IN THE ENVIRONMENT

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

In accordance with logarithmic addition, combining two sources with equal noise levels would result in an increase of 3 dB(A) in the noise level from a single source.

A change of 3 dB(A) is generally regarded as the smallest change in broadband continuous noise which the human ear can detect (although in certain controlled circumstances a change of 1 dB(A) is just perceptible). Therefore, a 2 dB(A) increase would not be normally be perceptible. A 10 dB(A) increase in noise represents a subjective doubling of loudness.

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs.

For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest. In the UK, traffic noise is measured as the L_{A10}, the noise level exceeded for 10% of the measurement period. The L_{A90} is the level exceeded for 90% of the time and has been adopted to represent the background noise level in the absence of discrete events. An alternative way of assessing the time varying noise levels is to use the equivalent continuous sound level, L_{Aeq}.

This is a notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound.

To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3 dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1 dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

Note that the time constant and the period of the noise measurement should be specified. For example, BS 4142 specifies background noise measurement periods of 1 hour during the day and 15 minutes during the night. The noise levels are commonly symbolised as $L_{A90,1hour}$ dB and $L_{A90,15mins}$ dB. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125 ms.

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Appendix II

World Heritage Site Correspondence

Our mining culture shaped your world

Mr Steve Tarrant
Mine Manager
South Crofty Ltd,
South Crofty Mine,
Dudnance Lane,
Pool,
Cornwall, UK
TR15 3QT

Your ref:
My ref: WHS/04/29/07/21
Date: 29 July 2021

Dear Mr Tarrant,

South Crofty Ltd. Exploration drilling: South Carn Brea

Thank you for your communication regarding the impending GPDO submission for the proposed exploratory drilling programme at the sites entitled South Carn Brea and Mount Wellington Deeps. Both sites are located within the Cornwall and West Devon Mining Landscape World Heritage Site, and specifically Area A5 – 'The Camborne and Redruth Mining District with Wheal Peevor and Portreath Harbour' (South Carn Brea), and Area A6 – 'The Gwennap Mining District with Devoran, Perran and Kennall Vale' (Mount Wellington Deeps).

It is noted that five borehole sites have been proposed across the two target locations above and these are considered below in the context of the World Heritage Site. Consultation with the public and relevant parish councils is understood to be underway regarding the proposed drilling, which is welcome.

Site name: South Carn Brea

The document 'South Carn Brea - Finalised Design Locations 19.07.21', as submitted, indicates that Drill sites 1, 2 and 3 are located on the southern flank of Carn Brea and approximately between the De Dunstanville Memorial at the summit (within a Scheduled Monument, 1006704) and the village of Carnkie. The drill sites are located within open farmland and appear to be located at some distance from Cornish hedges (stone-faced earth banks) or other above-ground structures. It should be noted that this outline assessment is based solely on the information provided as no national grid reference or other locational co-ordinates have been supplied.

- **Drill site 1**

The Illogan Parish Tithe Map and Apportionment (1840 – TA/88) identify the location of Drill site 1 as being within the former smallholding plot 253, which was then named 'House and land'. Plot 253 was within the tenement of Great Nancekuke and leased and occupied by a Thomas Martin in 1840. Further research relating to Thomas Martin is set out within the appendix.

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Modern mapping indicates that Tithe plot 253 has been combined with plot 252 (adjoining to the north) to form a single arable field.

An analysis of modern and historic Ordnance Survey mapping alongside aerial photos (dating from 2016) indicates no above-ground mining related features in the immediate vicinity of the Drill site.

- **Drill site 2**

The Illogan Parish Tithe Map and Apportionment (1840 – TA/88) identify the location of Drill site 2 as being within what appears to have been plot 256, which was then named 'Land Part of Carnbrea'. Plot 256 was within the tenement of Great Nancekuke and leased and occupied by a Henry Martin in 1840. Further research relating to Henry Martin is set out within the appendix.

The Illogan Tithe indicates that a leat formerly crossed plot 256, flowing from the south west to the north east. The Ordnance Survey 25-inch to 1-mile scale mapping of c.1880 indicates that this leat (with a nominal centre point within the field at BNG: SW 68603 40245) was feeding a reservoir by this date, located at BNG SW 68793 40451. While there is no evidence of the leat on modern mapping or aerial photography, the former course of this may intersect with that of Drill site 2 as proposed. It is recommended that the location of Drill site 2 be adjusted to be located no further than 20m distant from the southern field boundary to avoid intersecting any sub-surface remains of leat banks. Drill site 2 is also noted to be located around 100m west of the West Basset Stamps site, which is a Grade II Listed complex (1160461).

- **Drill site 3**

The Illogan Tithe indicates that the leat noted under Drill site 2 (above) also formerly crossed two adjoining plots, both recorded as 252, and the approximate location of Drill site 3. It is recommended that the location of Drill site 3 be relocated to a point at least 20m to the north of its current location to avoid intersecting any sub-surface remains of leat banks.

With regards to the drilling at South Carn Brea, it is noted within your email of 19 July 2021 that '…access to each field is through 16ft farm gates and therefore our activities will require no modifications to hedgerows or existing structures in the area.' This is welcome. It is also noted that it is envisaged the '…drilling will take place over the autumn/winter period, with the most likely timelines being between October and March.' It is understood that the drilling programme is estimated to take around three months to complete.

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Concluding statement – South Carn Brea

On the basis of this purely desk-based analysis using available electronic mapping, aerial photography, and the information provided, we have no concerns regarding the South Carn Brea drilling programme as proposed subject to the adjustment of the drilling locations for Drill sites 2 and 3 as indicated. It is understood that no field gateways or hedges will be disturbed as part of the drilling programme.

I trust this advice is of assistance but please contact me if anything is unclear or requires further explanation.

Regards,

Ainsley Cocks

World Heritage Site Research & Information Officer
Cornish Mining World Heritage Site Office
Tel: 01872 322585
Email: ainsley.cocks@cornwall.gov.uk

Appendix

Additional research relating to land tenements

Thomas Martin

The Illogan Parish Census Returns for 1841 indicate that Thomas Martin (aged 40) was a 'Copper Miner' at this time and his son Samuel (aged 15) was also a 'Copper Miner' – see below.

The Illogan Parish Census Returns 1841

Book 5 Folio 37 Page 29

Carnbrea,1, Thomas Martin, 40, Copper Miner, In county
Frances Martin, 35, In county,
Samuel Martin,15, Copper Miner, In county

Henry Martin

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The Illogan Parish Census Returns for 1841 indicate that a family with the name Martin were resident at nearby Tregajorran (Trigajorran) and these *may* be related to the Henry Martin identified in the Tithe Apportionment.

The Illogan Parish Census Returns 1841

Book 5 Folio 31 Page 16

Trigajorran,1, John Martin, 30, Master Ore Dresser, In county
Mary Martin, 30, In county
Henry Martin, 7, In county
William Martin, 2, In county
Mary Martin, 4, In county
James Martin, 1m, In county
Ann Carthew, 15, Female Servant, In county

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From: Ainsley Cocks
To: Steve Tarrant
Cc: Ben Dancer
Subject: RE: Cornish Metals Drilling Update and Future Proposals
Date: 16 August 2021 12:06:28

Information Classification: CONTROLLED

Re. South Crofty Ltd. Proposed exploration drilling programmes at South Carn Brea and Mount Wellington Deeps

Hi Steve,

Thank you for your emails regarding the proposed exploratory drilling at South Carn Brea and the Mount Wellington Deeps sites.

Regarding the course of the former leat which crossed the open fields in the proximity of drill sites 2 and 3 at South Carn Brea, I note your comments concerning the drill collar locations as being at least 10m away from the historic course of the route. Through consulting Cornwall Council's current vector and historic raster mapping (online) I estimate that the collar for site 2 appears to be to around 10m south east of the leat course and the the collar for site 3 to be to around 7.5m south east of the leat course, when allowing for the map displacement visible due to the error inherent in the raster image rectification. This slight discrepancy in measurement should not present any issues however if the ground is not disturbed north of the respective drill collar locations, with these understood to be at SW 68610 40220 (site 2) and SW 68440 40025 (site 3).

For your information, the World Heritage Site Office has now been informed of the Pre-Submission Draft GPDO document relating to the South Carn Brea site and I am copying this response to Ben Dancer the World Heritage Site Planning Advice Officer.

I hope this is of assistance.

Regards,

Ainsley

Ainsley Cocks
Research and Information Officer

Cornish Mining World Heritage Site Office / Sodhva Tyller Ertach an Bys Balweyth Kernewek

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Appendix III

Photograph Showing Diamond Drill Rig at Site 4 of Cornish Metals' (SCL's) Drilling Program at United Downs in May 2021.

Photograph Showing Diamond Drill Rig at Site 3 of Cornish Metals' (SCL's) Drilling Program at United Downs in May 2021.

Appendix IV

Ecological Walkover Survey – July 2021

Ecological Impact Assessment (EcIA)

Site:

Land at South Carn Brea, Cornwall (Exploration Drilling)

Grid Reference: SW 685 402

12th July 2021 Version 2

Plan for Ecology Ltd

Tremough Innovation Centre

Tremough Campus, Penryn, Cornwall, TR10 9TA

Tel: 01326 218839

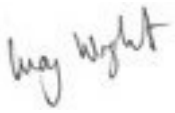
www.planforecology.co.uk

Document Control:

Site Name:	Land at South Carn Brea, Cornwall
OS Grid Reference:	SW 685 402
Report Author:	Dr Kim Jelbert BSc (Hons) MSc PhD MCIEEM
Document Approved by:	Dr Lucy Wright BSc (Hons) MSc PhD MCIEEM
Client:	Cornish Metals Inc (Applicant)
Report Reference Numbers:	P4E2363
Version:	02
Date:	12th July 2021

Declaration:

"The information, evidence and advice, which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology & Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions."

Kim Jelbert	
Lucy Wright	

Report Lifespan:

Ecological features can change over time, particularly if Site management/ use changes. Typically, EcIAs are valid for one year (until July 2022).

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CONTENTS

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Plan for Ecology Ltd, Tremough Innovation Centre, Tremough Campus, Penryn, Cornwall, TR10 9TA; Tel 01326 218839; Email info@planforecology.co.uk; Web www.planforecology.co.uk

1.0 Non-Technical Summary

Steve Tarrant, on behalf of the applicant Cornish Metals Inc, commissioned Plan for Ecology Ltd to undertake an Ecological Impact Assessment (EcIA) of land at South Carn Brea, Cornwall (OS Grid Ref: SW 685 402) in June 2021. The applicant proposes to submit a General Permitted Development Order to permit exploratory drilling at three locations within the site. The Ecological Impact Assessment (EcIA) comprised an extended Phase 1 Habitat Survey of land within the orange line boundary provided by Cornish Metals Inc, and where accessible, 30m beyond this area for the purpose of identifying badger setts and Sch. 9 WCA (1981) invasive plant species. The likely access routes were also surveyed for the purpose of identifying ecological constraints. This EcIA report describes and evaluates the results of the assessment in accordance with the CIEEM Guidelines for Ecological Impact Assessment (CIEEM, 2018).

There are four habitat features of ecological importance within the site: native species rich Cornish hedgerow with and without trees (J2.1.1 & J2.3.1), arable (J1.1) and poor semi-improved grassland (B6). The site is confirmed to support badger, and also has potential to support bats (EPS; S41 NERC Act, 2006; Annex II), reptiles, breeding birds, hedgehog, invertebrates, amphibian species and notable plant species (S41 NERC Act, 2006). Dormouse and otter (EPS; S41 NERC Act, 2006; Annex II) are likely to be absent.

Ecological constraints and opportunities are detailed on the accompanying 'Ecological Constraints and Opportunities Plan' (ECOP) (below). The proposed development incorporates the following mitigation measures:

- **Hedgerow (degradation):** All hedgerows are retained under the proposals. Minimum working distances and protective fencing are recommended. Follow BS5837: 2012 Trees in relation to design, demolition and construction. Commission a specialist arboricultural survey if BS5837 cannot be followed. NB: following consultation with Cornwall Council, all drill rig compounds have been located at least 20m from hedgerows.
- **Poor semi-improved grassland/ arable (temporary loss and degradation):** Mud mats will be used to spread the load of vehicles and minimize damage to the sward/ ground beneath. Soils contain the seed bank of the existing plant community, which will regenerate following cessation of works. Post-development monitoring will be implemented to ensure that vegetation recovers and additional measures (i.e. seeding) are not required. Some targeted control of plant species listed as injurious (harmful) under the Weed Act (1959) will likely be required as these tend to 'boom' in response to disturbance. Furthermore, care should be taken not to introduce Schedule 9 WCA (1981) invasive plant species. High visibility fencing will be installed around access routes and manoeuvring space. Store materials in a designated, fenced storage area.
- **Badger (disturbance):** A single entrance badger outlier sett was observed in the west site boundary of the most north westerly poor semi-improved grassland field. Currently, the nearest indicative drill location is located *c.* 198m south of the confirmed badger sett. No further action is required because the badger sett will not be impacted.
- A pre-construction walkover survey is recommended if site set up and drilling are not implemented within 8 weeks of the most recent site survey (5th July 2021). This will identify any new active badger setts that may be created in the time elapsed between this survey and the commencement of drilling.
- **Badger, hedgehog, otter, and other mammals:** Implement measures to prevent harm during construction and to provide continued access post-development.

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- **Bats (forging and commuting)**: Detailed bat surveys are not recommended because the process of exploratory drilling is unlikely to negatively impact foraging and commuting bats.
- **Bats (roosting):** No potential bat roost features have been identified within 50m of the proposed drill compounds. Roosting bats are unlikely to be impacted by the proposals subject to confirmation from Cornish Metals Inc that no uncapped shafts or mine workings are present within at least 50m of the proposed drill locations. Evidence suggests this is the case, but this is to be confirmed by Cornish Metals Inc.
- **Birds:** Detailed breeding bird surveys are not recommended. Adopt a precautionary approach during disturbance of grassland and arable. An ecologist will walk the proposed access route on the day of site set-up (if undertaken between March and September) to ensure that no ground nesting birds are present. The route across grassland habitats will then be mowed in phases to make it unsuitable for breeding birds and reptiles.
- **Reptiles and amphibians:** Detailed reptile surveys are not recommended but precautionary reptile avoidance measures must be implemented.
- **Invasive plants:** The Schedule 9 WCA (1981) invasive plants, montbretia, wall cotoneaster and rhododendron are present within hedgerows on the site. Hedgerows will not be directly impacted by the proposals and proposals are, therefore, considered unlikely to inadvertently spread Schedule 9 WCA (1981) invasive plant species throughout the drilling area. Three plants listed as injurious (harmful) under the Weed Act (1959) are also present on-site: broad-leaved dock, ragwort and creeping thistle. Exploratory drilling will include measures to control these species post-completion.
- **Further surveys:** No further surveys are recommended to inform the planning application subject to confirmation from Cornish Metals Inc that no uncapped shafts or mine workings are present within at least 50m of the proposed drill locations.
- **Biodiversity Enhancements**: There is opportunity to incorporate some features to enhance aspects of the site for ecology. See the 'Ecological Constraints and Opportunities Plan' (ECOP) below.

The baseline statement of predicted change (habitat losses and gains) resulting from the proposed development is summarised below (PTO):

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Baseline statement of predicted change (habitat losses and gains):

Ecological Receptor	Ecological Value	Loss (approximate)	Gain (approximate)
Native species-rich Cornish hedgerow with and without trees (J2.3.1 & J2.1.1)	Parish Value; Section 41 NERC Act (2006)	0m	0m
Arable (J1.1)	Local Value	1215m^2 (access) 240m^2 (compounds)	1455m^2
Poor semi-improved grassland (B6)	Within the Zone of Influence	532m^2 (access) 120m^2 (compounds)	652m^2

The residual impact of the proposed exploratory drilling is considered likely to have a neutral impact, at a local scale, on the ecology of the site, subject to the successful implementation of the mitigation outlined in this report, and subject to confirmation from Cornish Metals Inc. that no mine shafts or workings are located close to the proposed drill sites. There is potential to incorporate some measures/ features that would enhance aspects of the site for ecology.

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2.0 Ecological Constraints and Opportunities Plan

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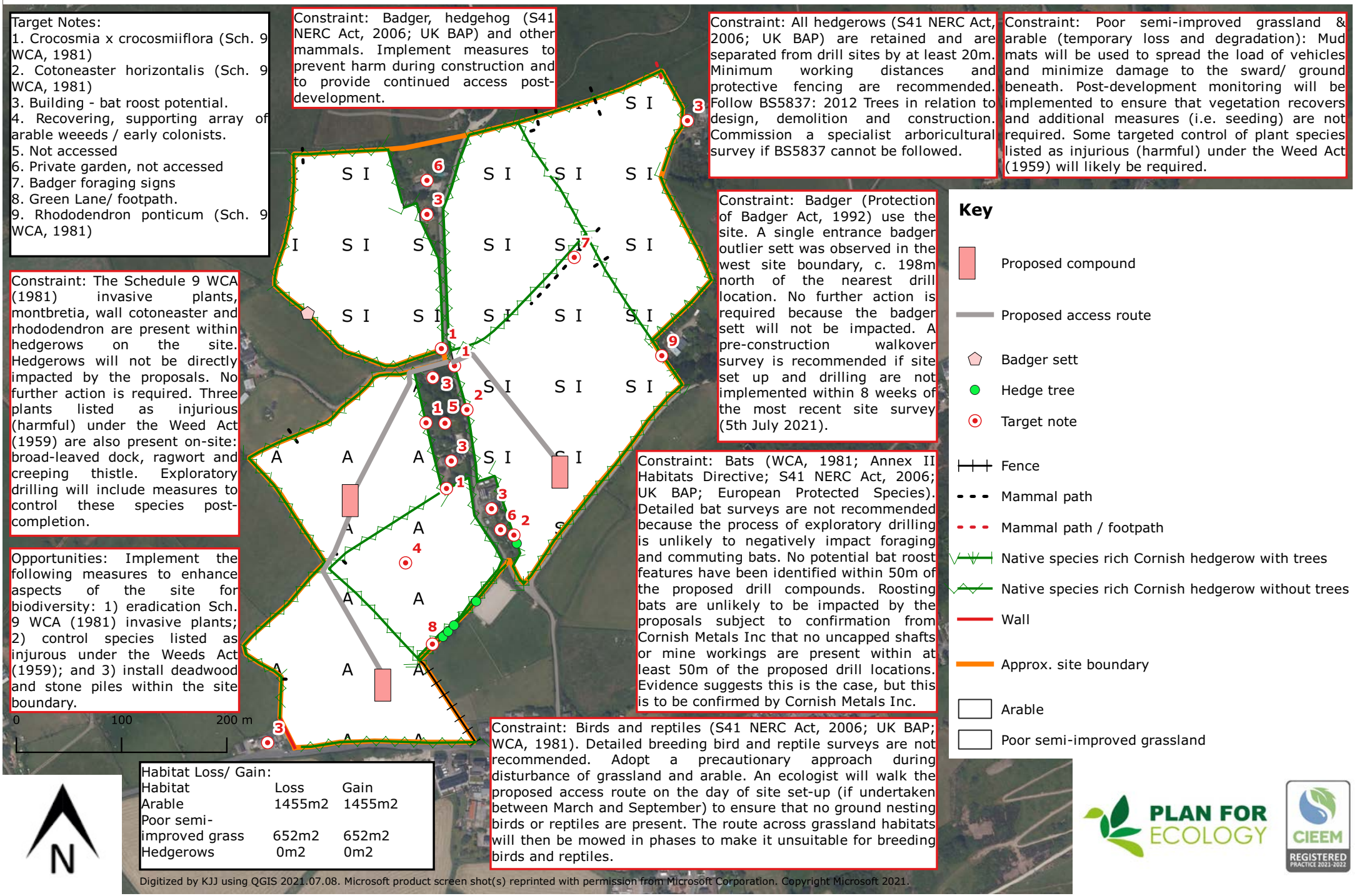
Map 1: Land South of Carn Brea, Cornwall - Phase 1 Habitat Distribution and Ecological Constraints and Opportunities Plans (ECOP).



3.0 Introduction

3.1 Background & Purpose of Survey

Steve Tarrant on behalf of the applicant, Cornish Metals Inc, commissioned Plan for Ecology Ltd to undertake an Ecological Impact Assessment (EcIA) of land at South Carn Brea, Cornwall (OS Grid Ref: SW 685 402) in June 2021. The applicant proposes to submit a General Permitted Development Order to permit exploratory drilling at three locations within the site. The location of the site and each proposed drill location is shown on Map 1 above.

3.2 Site Location & Description

The proposed exploratory drill sites are located on land at South Carn Brea, on the outskirts of the village of Carnkie, approximately 1.9 km southeast of Pool, and c. 2 km southwest of Redruth, Cornwall.

The indicative proposed drill sites are located in arable (two sites) and poor semi-improved grassland (one site). Plan for Ecology Ltd surveyed all accessible land within the orange site boundary, and where accessible, 30m beyond the site boundary for the purpose of locating badger setts and Schedule 9 Wildlife and Countryside Act (WCA), 1981 invasive plant species. Possible access routes were surveyed for the purpose of identifying ecological constraints. The location of possible access routes is shown on Map 1 above.

The site, defined as all land within the orange line boundary, comprises four poor semi-improved grassland fields and two arable fields bound by native species-rich Cornish hedgerows with and without trees. The Phase 1 Habitat Distribution is shown on Map 1 above.

3.3 Proposed Site Plans

The applicant proposes to submit a General Permitted Development Order to permit exploratory drilling at three locations on land at South Carn Brea, Cornwall. The location of the site and each drill location is shown on Map 1 above. Following consultation with Cornwall Council, drill locations and compounds have been positioned at least 20m from hedgerows so to minimize impact on hedgerow biodiversity. Drill sites will be accessed via existing farm access tracks and gateways (see Map 1 for possible routes). No hedgerows will be removed to facilitate access.

The drill rig is track mounted and of a size that can be transported by tractor and trailer. Once in situ, the drill rig is enclosed with straw/ hay bales to minimise noise emission, or fence, and should not need to be moved until drilling has finished (estimated duration: 4 – 6 weeks at each site). Mud mats will be used to minimise disturbance caused by vehicle movements. It is understood that the drill rigs are self-contained; water is used in the drill holes to recover drill cuttings and the water is recycled from plastic containers; no dust is produced. The drill rigs are fuel driven and suitable fuel storage will be created on-site including spillage kits for oil and diesel. It is understood that drill holes measure approx. 125mm in diameter, extend *c.* 200m below the surface and that drilling will occur between September and April with minimal use of artificial lighting, which would be directed away from hedgerows. Once complete, each exploratory drill hole is plugged to a depth of 20m including *c.* 1m of concrete and *c.* 60cm of soil to permit ploughing in the future.

It is understood that a typical diamond drilling compound measures approx. 15 x 8m. Access is required by support vehicles on a daily basis. The perimeter of the drill site is secured with Heras type fencing at all times. Welfare facilities for the drilling team (toilet, handwashing, First-Aid provision, eating facilities) are provided on site in a self-contained Welfare Cabin. All drilling fluids are captured and removed from site for proper disposal. All drilling is rotary and not percussive (uses no 'hammer') and is, therefore, relatively quiet when in operation. Additional noise

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attenuation can be installed if drilling in close proximity to residential dwellings. This information has been provided by Cornish Metals Inc.

3.4 Project Administration

Site Name:	Land at Carn Brea, Cornwall
OS Grid Reference:	SW 685 402
Client:	Cornish Metals Inc
Planning Authority:	West 2
Report Reference Number:	P4E2363
Site proposals:	Exploratory drilling (see Section 2.3 above)
Survey Dates:	5th July 2021 (Extended Phase 1 Habitat Survey, Badger Survey and Schedule 9 WCA invasive plants)
Surveyors & Licence Numbers:	Kim Jelbert BSc (Hons), MSc, PhD, MCIEEM (Bat licence no: 2015-10444-CLS-CLS; Barn owl licence no. CL29/00037; Dormouse license no: 2016-22394-CLS-CLS)

4.0 Methodology

This assessment has been carried out in accordance with the 'Guidelines for Preliminary Ecological Appraisal' produced by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017); BS42020-2013 Biodiversity – Code of Practice for Planning & Development, as adopted by local planning authorities (British Standard, 2013); and the CIEEM Guidelines for Ecological Impact Assessment (CIEEM, 2018).

4.1 Extended Phase 1 Habitat

The Ecological Impact Assessment (EcIA) comprised a desk study and a site survey. The desk study is a search of all ecological records and site designations held by the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS, to 2019) within a 2km radius centred on the site (Appendix 1). The distance between the site boundary and nearby European sites was measured using MAGIC http://www.magic.gov.uk to determine whether the Site falls within a European site Zone of Influence.

The survey comprised an extended Phase 1 Habitat Survey of land within the orange line boundary provided by Cornish Metals Inc, and where accessible, 30m beyond this area for the purpose of identifying badger setts and Sch. 9 WCA (1981) invasive plant species. The two possible access routes (existing farm tracks surfaced with hard core and bound by hedgerows) were also surveyed for the purpose of identifying ecological constraints. The location of possible access routes is shown on Map 1 above.

The site, for the purpose of this report, is defined as all land within the orange line boundary shown on Map 1. The survey area is defined as all land within the orange line boundary and where accessible, 30m beyond the red line boundary for badger and Sch. 9 WCA (1981) invasive plants.

The Phase 1 Habitat Survey identifies the habitats present and their associated plant species (JNCC, 2010), and assesses the potential of the site to support protected species and species of conservation concern, as well as plant species listed on Schedule 9 WCA (1981) and as injurious (harmful) under the Weed Act (1959). Data were collected in the field using QField and were digitized using QGIS.

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4.2 Ecological Impact Assessment (EcIA)

Within the Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018), produced by the Chartered Institute of Ecology and Environmental Management (CIEEM), CIEEM recommend an approach to ecological evaluation that utilises available guidance and information, such as the distribution and status of the species or features within the locality of the site, and professional judgment.

The methods and standards for site evaluation within the British Isles are defined in 'A Nature Conservation Review' (Ratcliffe, 2009). They are broadly used across the United Kingdom to rank sites, so priorities for nature conservation can be attained. The criteria are size, diversity, naturalness, rarity and fragility, with secondary criteria of typicalness, potential value, intrinsic appeal, recorded history and the position within the ecological / geographical units.

The assessment judges features within the site in relation to other sites because a number of habitats may be of nature conservation importance when combined. Habitats of local importance are often highlighted within a local BAP.

Levels of importance can be determined within a defined geographical context from the immediate site or locality through to the international level.

The legislative and planning policy context are important and have been given full consideration in this assessment.

The likely value of ecological features is determined within a geographical context in accordance with the CIEEM Guidelines for Ecological Impact Assessment (CIEEM, 2018). Value is assigned in decreasing order of importance as follows: International/ European, UK, Regional (southwest), County, District, Parish, Local, within the Zone of Influence and Negligible.

There are also a number of other important considerations as follows:

- Designated Sites and Features (e.g. Special Protection Areas, SPA; SAC; Sites of Special Scientific Interest, SSSI; ecologically important hedgerows etc.);
- Biodiversity Value (use of BAP and local development plans);
- Potential Value;
- Secondary or Supporting Value;
- Social or Economic Value; and
- Legal Designation.

Ecologically important features to be affected by the proposed development were identified using the criteria described above. Likely impact upon a feature(s) was determined to be significant or not by considering the factors that categorize its ecological structure and function.

Where an impact (positive or negative) on the integrity of a defined feature (habitat, species or ecosystem) was identified, the impact significance has been described in the following terms: major, moderate, minor and negligible. The likelihood of the impact occurring was described as: certain / near certain (probability estimated at 95% chance or higher), probable (probability estimated above 50% but below 95%), unlikely (probability estimated above 5% but below 50%) and extremely unlikely (probability estimated below 5%). Reference has also been made to the extent and magnitude of impact (i.e. area affected) and duration (short-term impacts associated with construction and long-term impacts associated with the operational phase of the development). A significant effect is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general (CIEEM, 2018).

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The impact significance of the proposed development on the integrity of the site as a whole has been determined using the framework described above. Site integrity has been defined as follows: 'The integrity of a site is the coherence of its ecological structure and function, across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified (CIEEM, 2018). Site integrity is dependent on the extent, magnitude and duration of impacts upon each ecological feature (habitats or species). The accumulative impact, across all features, is therefore used to determine overall impact significance on the integrity of the site, and in EIA terms. Available guidance and information, such as the distribution and status of the species or features, and professional judgment have been used to determine impact significance. Where an identified adverse impact cannot be fully mitigated, the residual impact remains. This residual impact in combination with similar impacts locally could constitute a cumulative impact. Due to the small scale and nature of the proposed development, only cumulative impact arising from potential development of adjoining land is considered within this assessment.

This report describes and evaluates the ecological interest of the site, identifies potential impacts that the works may have on wildlife, and details adopted recommendations to avoid, mitigate and/or compensate for these impacts, in accordance with BS42020-2013 Biodiversity – Code of Practice for Planning & Development (British Standard, 2013) and the CIEEM Guidelines for Ecological Impact Assessment (CIEEM, 2018).

Recommendations are provided using the Mitigation Hierarchy (British Standard, 2013; CIEEM, 2018). The Mitigation Hierarchy seeks to avoid impacts, then to mitigate unavoidable impacts, and, as a last resort, to compensate for residual impacts that remain after implementation of avoidance and mitigation measures. Biodiversity enhancements are also detailed.

4.3 Limitations

July is a suitable time of year to undertake vegetation surveys (Phase 1 Habitat and invasive plant surveys) because most species will visible, and many will be in flower/ near flowering, enabling species identification and habitat classification. In general, Phase 1 Habitat surveys can be undertaken at any time of year because vegetative characteristics enable categorisation of Phase 1 habitat types.

The applicant, Cornish Metals Inc, provided Plan for Ecology Ltd with the site boundary encompassing land in which drilling is proposed, together with the indicative location of drill sites.

Where access to land outside of the orange line boundary was not available, the land was viewed from adjacent accessible land or a public right of way/ highway. Absence of badger setts and invasive plant species in these areas cannot be assumed.

Buildings, mine shafts and trees considered to be a material consideration (i.e. potential bat roost) are target noted.

Dense vegetation associated with hedgerows has some limited potential to obscure features of ecological importance (i.e. badger setts).

Three properties and associated gardens sit within the orange site boundary. It was not possible to access the properties or associated grounds; instead, the ecologist viewed these areas from the adjacent fields to identify potential ecological constraints.

Weather conditions during the survey were in line with seasonal norms. There are no limitations to the survey associated with weather conditions.

Ecological features can change over time, particularly if Site management/ use changes. Typically, Ecological Impact Assessments are valid for one year (until July 2022). A search for Tree Preservation Orders (TPO's) or Conservation Area status does not form part of this assessment.

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5.0 Assessment Results

5.1 Designated Sites and Local Conservation Initiatives

The site is not located within a designated site of nature conservation importance. There is one statutory designated site (International, National, Regional or Local), and three non-statutory designated sites of nature conservation importance located within 1km of the site: West Cornwall Bryophytes SSSI (statutory), Penventon Moor, Carn Brea Moor and Newton Moor County Wildlife Sites (CWS). These are briefly described below:

- West Cornwall Bryophytes SSSI: is located *c.* 59m southeast of the southeast site boundary. This site is designated as such due to its population of rare and scarce bryophytes (mosses and liverworts) which are adapted to growing on copper-rich substrates. Nationally rare species include the liverworts *Cephaloziella nicholsonii*, *C . integerrima*, *C. massalongi* and the moss *Scopelophila cataractae*. The composite site supports over 20% of all known British populations of these four species, *C. integerrima* has been confirmed at only two other sites in the British Isles since 1950 and *C. nicholsonii* is a British endemic.
- Penventon Moor CWS: This site, located c. 59m southeast of the southeast site boundary, is designated due to the presence of lowland heathland (S41 NERC Act, 2006 Habitat of Principal Importance; UK BAP) and small heath (*Coenonympha pamphilus*).
- Carn Brea Moor CWS: This site, which adjoins the north site boundary, is designed due to the presence of lowland heathland (S41 NERC Act, 2006 Habitat of Principal Importance; UK BAP) and several S41 NERC Act (2006) Species of Principle Importance and/or UK BAP including grayling (*Hipparchia Semele*), heath rustic (*Xestia agathina*), toad (Bufo bufo), adder (*Vipera berus*), linnet (*Carduelis cannabina*), yellowhammer (*Emberiza citronella*), grasshopper warbler (*Locustella naevia*), hedgehog (Erinaceus europaeus) and greater horseshoe bat (*Rhinolophus ferrumequinum*).
- Newton Moor CWS: This site, located *c*. 800m south of the south site boundary, is designated due to the presence of wet woodland and lowland fen (S41 NERC Act, 2006 Habitats of Principal Importance) and otter (S41 NERC Act, 2006 Species of Principal Importance; European Protected Species).

The proposed exploratory drilling sites are considered to be sufficiently distant, and the constructional impacts significantly minor, not to impact the nearby designated sites listed above.

The site fall within the Zone of Influence for the Fal and Helford Special Area of Conservation (SAC). The SAC is vulnerable to recreational pressure associated with residential developments, which can increase the local population density. The site is located *c.* 9.1 km west of the nearest part of the Fal and Helford SAC. Exploratory drilling as described in Section 2.3, will not result in an increase in the local population. It is, therefore, reasonable to assume that the proposals will not contribute to recreational pressure impacting the Fal and Helford SAC.

5.2 Phase 1 Habitat Distribution

A total of five Phase 1 Habitats were recorded within the site during the Phase 1 Habitat Survey: native species rich hedgerow with and without trees (J2.1.1 & J2.3.1) poor semi-improved grassland (B6) (Figs. 3 – 5), arable (J1.1) (Figs. 1, 2 & 6) and fence (J2.4) (Fig. 6). **Of the habitats within the site, native species rich hedgerow with and without trees (J2.1.1 & J2.3.1), arable (J1.1) and poor semi-improved grassland (B6) are considered to be of significant ecological value**. Fence (J2.4) is considered to be of low ecological value and is

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briefly described below. NB: Habitats of low ecological value may support protected or notable species; see section 6.4 in relation to species.

Fence (J2.4):

A short length of timber post and rail fence occurs within the most south-easterly arable field (Fig. 6). This habitat is typically devoid of vegetation and is of **negligible** ecological value.

The assemblage of vascular plant species associated with each habitat including Latin names is provided in the table at Appendix 2. Habitats that lack vegetation are not listed in the table at Appendix 2. A description of notable habitats and species is provided below.

Figure 1: View west over recovering arable land left to revegetate naturally following tilling; see Figure 2 below for close up of sward, which is dominated by arable weeds with few grasses present. Proposed drill location in far left.

Figure 2: Typical arable sward.

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Figure 3: View east over poor semi-improved grassland enclosed with native species-rich Cornish hedgerows without trees.

Figure 4: View north over poor semi-improved grassland in northern most field compartment.

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Figure 5: View southeast towards likely drill site location within the most southerly poor semi-improved grassland field.

Figure 6: View northeast towards likely drill site location within most southerly arable field.

5.3 Notable Habitats

Native species-rich hedgerows with and without trees (J2.3.1/ J2.1.1):

Native species-rich hedgerows with and without trees enclose field compartments throughout the site (Map 1) (Figs. 1 – 6). All hedgerows are Cornish hedge banks characterised by stone-faced, earth-centred banks sparsely topped with shrubs (J2.1.1) or trees (J2.3.1). Sections of hedgerow without trees typically support a similar suite of herbaceous species but lack all but a few, sparsely distributed woody shrubs.

Woody species present comprise frequent bramble; occasional hawthorn and European gorse; and locally frequent bilberry, blackthorn, honeysuckle, and alder. Sycamore, buddleia, wall cotoneaster (Schedule 9 WCA, 1981), ash, garden privet, Monterey pine, grey willow, and Rhododendron (Schedule 9 WCA, 1981) occur rarely within hedgerows on-site. Herbaceous species present

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include abundant cleavers; frequent sweet vernal grass, cock's foot, fox glove and common nettle; occasional Devil's-bit scabious, broad-leaved dock, bristly oxtongue, forget-me-not, hedge bedstraw, fumitory species, red fescue, broad-buckler fern, scaly male fern, hawk's-beard and black mustard.

The native species-rich Cornish hedgerows with a sufficient number and density of woody species are likely qualify as the UK BAP priority habitat /Section 41 NERC Act (2006) habitat of principle importance 'hedgerow'. All are likely to score highly under the Hedge (and wall) Importance Test (HIT) criteria.

Hedgerows enhance connectivity across the site, providing a corridor through which wildlife can travel. Hedgerow vegetation provides potential habitat for nesting birds, dormouse, reptile species, invertebrate species, badger, and commuting and foraging bat species.

Native species-rich hedgerow habitat within the site is considered to be of up to '**Parish Value'** for biodiversity.

The proposed exploratory drilling has potential to indirectly negatively impact hedgerows through degradation caused by storage of materials, vehicle movement and proximity of drilling. Following consultation with Cornwall Council, drill locations and compounds have been positioned at least 20m from hedgerows so to minimize impact on hedgerow biodiversity. Drill sites will be accessed via existing farm access tracks and gateways (see Map 1 for possible routes). No hedgerows will be removed to facilitate access.

In the absence of mitigation, the impact of exploratory drilling on hedgerows is **predicted to be short-term negative of unlikely occurrence, and of minor significance on a Parish scale.** Mitigation measures are provided in Section 6.2 below.

Poor semi-improved grassland (B6):

Four field enclosures support poor semi-improved grassland (Fig. 3 - 4). The grassland sward within these fields is currently left long, but is likely due to be cut for hay in the near future. Poor semi-improved grassland is typified by dominant perennial rye grass; abundant white clover; frequent broad-leaved dock (Weeds Act, 1959) and ribwort plantain; occasional common mouse-ear, greater plantain, common sorrel, ragwort (Weeds Act, 1959), dandelion and red clover; and locally frequent creeping buttercup, Yorkshire fog, crested dog's tail, creeping thistle (Weeds Act, 1959) and sweet vernal grass. Cock's foot and common nettle occur rarely within the sward.

Poor semi-improved grassland increases the structure and diversity of vegetation within the site, and provides potential shelter and foraging habitat for a range of species including badger, hedgehog, nesting birds, reptiles, amphibians, and invertebrates.

Poor semi-improved grassland is considered to be of **'Local Value'** for biodiversity.

Exploratory drilling will negatively impact poor semi-improved grassland habitat through storage of materials, vehicle movement and drilling.

In the absence of mitigation, the impact of exploratory drilling on poor semi-improved grassland is **predicted to be short-term negative of likely occurrence, and of minor significance on a local scale.** Mitigation measures are provided in Section 6.2 below.

Arable (J1.1):

Three field enclosures support arable habitat, which appears to be undergoing natural re-colonisation following tilling and to have previously supported a lucerne crop (Fig. 3 - 4). Arable is typified by dominant lucerne; abundant corn spurrey, scented mayweed and redshank; frequent ribwort plantain and buck's horn plantain, pineapple weed and shepherd's purse; occasional common mouse-ear, fumitory species, cut leaved crane's bill, barley, bristly oxtongue, greater

plantain, creeping buttercup, smooth sow thistle and common nettle; and locally frequent white clover, red clover, dandelion, common chickweed, broad-leaved dock and creeping thistle (both listed under the Weeds Act, 1959), red deadnettle, toad rush, Yorkshire fog and red fescue.

Arable increases the structure and diversity of vegetation within the site, and provides potential ephemeral habitat for notable arable weeds, and habitat for a range of species including badger, hedgehog, nesting birds, reptiles, amphibians, and invertebrates.

Arable is considered to be of **'Local Value'** for biodiversity.

Exploratory drilling will negatively impact arable habitat through storage of materials, vehicle movement and drilling, though it should be noted that disturbance associated with drilling is unlikely to exceed in magnitude disturbance associated with tilling.

In the absence of mitigation, the impact of exploratory drilling on arable is **predicted to be short-term negative of likely occurrence, and of minor significance on a local scale.** Mitigation measures are provided in Section 6.2 below.

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5.4 Notable Species

Notable species and species groups with potential to use the site are described below:

Badger

The mix of grassland and arable enclosed with hedgerows provides good quality habitat for badger (*Meles meles*), a common and widespread species in Cornwall. There are 18 records for badger within 2km of the site (ERCCIS, 2021). During the Phase 1 Habitat Survey one badger sett was found within the west site boundary hedgerow of the northernmost poor semi-improved grassland field. The badger sett comprises a single entrance with spoil and badger hair at the entrance. The level of activity around the single entrance sett is indicative of outlier badger sett. Elsewhere, mammal paths (well-worn tracks over hedgerows and across field enclosures) transverse the site. Evidence of badger foraging was found in the most north-easterly poor semi-improved grassland field. Furthermore, badger are known to be present within the Carn Brea CWS, which adjoins the northern site boundary.

The site is considered to be of **'Local Value'** for badger.

Badgers and their setts are legally protected under the Protection of Badgers Act 1992 (HM Government, 1992) (see Appendix 3). Measures to avoid or mitigate for any potential impacts on badger are provided in section 6.3 below.

Access tracks and drill compounds will be positioned at least 35m from the confirmed badger sett. Currently, the nearest indicative drill location is located *c.* 198m south of the confirmed badger sett.

In the absence of mitigation, exploratory drilling is likely to have a **short-term, negative impact, of unlikely occurrence, and of minor significance on a local scale** on a badger group, and/or individual animals.

Bats (Foraging and Commuting)

The mix of arable and poor semi-improved grassland enclosed with hedgerows provides good quality habitat for foraging and commuting bats, albeit potentially slightly reduced by the exposed location.

The ERCCIS desk study revealed records for seven bat species within 2km of the site: common pipistrelle bat (*Pipistrellus pipistrellus*), soprano pipistrelle bat (*Pipistrellus pygmaeus*), whiskered bat (*Myotis mystacinus*), natterer's bat (*Myotis nattereri*), brown long-eared bat (*Plecotus auritus*), (EPS; CRDB; UK BAP priority species/ Section 41 NERC Act (2006)), lesser horseshoe bat (*Rhinolophus hipposideros*) and greater horseshoe bat (*Rhinolophus ferrumequinum*) (EPS; CRDB; UK BAP priority species/ Section 41 NERC Act (2006); Annex II). In accordance with the Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016) the site was assessed as being of 'low suitability' for foraging and commuting bats on the basis of the exposed location and low hedgerows with few woody species. Detailed bat surveys are not recommended because the process of exploratory drilling is unlikely to negatively impact foraging and commuting bats. Following consultation with Cornwall Council, drill locations and compounds have been positioned at least 20m from hedgerows so to minimize impact on bats (and other species). Minimal artificial lighting is required to facilitate drilling. Any lighting will be directed onto the compound away from hedgerows, which will be located at least 20m from the drill sites.

Overall, the site is considered likely to be of **'Local Value'** for foraging and commuting bats. NB: this is based on the quality of habitat present as opposed to the species recorded within 2km of the site or detailed survey.

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In the UK all bat species are European Protected Species (EPS) protected under both UK and European Legislation; for further information on legal protection see Appendix 3.

In the absence of mitigation, the impact of exploratory drilling on foraging and commuting bats is considered to be a **short-term, negative impact, of unlikely occurrence, and of minor significance on a local scale**.

Measures to avoid or mitigate any potential impacts on foraging and commuting bats are provided in section 6.3 below.

Bats (Roosting)

Buildings, comprising a mixture of agricultural buildings, barns and residential buildings, are present within the orange site boundary, but these are located in excess of 100m from the indicative drill locations. Private properties and gardens could not be accessed as part of this assessment, but these were viewed from the adjacent field. All buildings appear to support features with potential to support roosting bats, though the exposed location slightly reduces their overall suitability as bat roosts. Exploratory drilling and associated access requirements are considered unlikely to impact any bats that may be using these buildings due to their distant proximity. No trees with potential to support roosting bats were identified during the Phase 1 Habitat survey. Open mine shafts have potential to support roosting bats, particularly during winter (November – March/ April) when bats use mine shafts and other underground structures as hibernation sites. Cornish Metals Inc are not aware of any open (or capped shafts) within the site boundary, but will undertake a detailed search for mine shafts and mine workings within 100m of the site boundary in due course. On the basis that no historic underground mine workings have been identified within the site boundary, and subject to further confirmation from Cornish Metals Inc following completion of the detailed search, exploratory drilling in this location is considered unlikely to impact roosting bats.

The site is considered to be of likely **'Local Value'** for roosting bats (if present).

In the UK all bat species are European Protected Species (EPS) protected under both UK and European Legislation; for further information on legal protection see Appendix 3.

In the absence of mitigation, the impact of exploratory drilling on roosting bats is considered to be a **short-term, negative impact, of unlikely occurrence, and of minor significance on a local scale**.

Precautionary measures to avoid or mitigate any potential impacts on roosting bats are provided in section 6.3 below.

Dormouse

The hazel dormouse occurs within woodland, hedgerows and scrub habitats. Within the site, hedgerows have some potential to support dormouse but typically lack sufficient density and diversity of important food plants for dormouse. The ERCCIS desk study, however, revealed no records for dormouse within a 2km radius of the site, and evidence (absence of validated dormouse records southwest of Truro) suggests that dormouse are not found this far west in Cornwall.

The site is considered to be of **'Negligible Value'** for dormouse due to the likely absence of this species.

In the absence of mitigation, **the nature of the identified impacts on dormice is considered to be negligible because of the likely absence of this species from the site.**

Precautionary measures are provided in Section 6.3 below.

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The hazel dormouse is a European Protected Species (EPS) protected under both European and UK Legislation; see Appendix 3 for further information on legal protection in the UK. Dormice and their nests are legally protected under the Conservation Regulations 2019 (see Appendix 3); they are also UK and Cornwall BAP priority species for conservation.

Hedgehog

The ERCCIS desk study revealed 37 records for hedgehog (*Erinaceus europaeus*) (UK BAP priority species/ Section 41 NERC Act (2006)) within 2km of the site. Hedgerow, arable and grassland habitats provide potentially suitable foraging, resting and hibernation sites for hedgehog.

The site is considered to be of **'Local Value'** for hedgehog (if present).

Exploratory drilling will require disturbance of poor semi-improved grassland and arable within the vicinity of the proposed drill sites and accesses. Following consultation with Cornwall Council, drill locations and compounds have been positioned at least 20m from hedgerows so to minimize impact on biodiversity. No artificial lighting is required to facilitate drilling.

In the absence of mitigation, the nature of the identified impacts on hedgehog is considered to be **short-term, negative, of unlikely occurrence, and of minor significance on a local scale**.

Section 6.3 for mitigation recommendations.

Otter

There is one record for otter (*Lutra lutra*) (EPS; UK BAP priority species/ Section 41 NERC Act (2006)) within a 2km radius of the site (ERCCIS 2021). Otters occupy linear home ranges that incorporate watercourses and standing water bodies. Watercourses and standing water bodies that support abundant fish and amphibian species are particularly important because these species groups are the dominant dietary component for otter. These features are absent from the site.

The site is considered to be of **'Negligible Value'** for otter due to the likely absence of this species.

In the absence of mitigation, **the nature of the identified impacts on otter is considered to be negligible because of the likely absence of this species from the site.**

Precautionary measures are provided in Section 6.3 below.

The otter is a European Protected Species (EPS) protected under both European and UK Legislation; see Appendix 3 for further information on legal protection in the UK. Otter and their resting places are legally protected under the Conservation Regulations 2019 (see Appendix 3); they are also UK and Cornwall BAP priority species for conservation.

Reptiles and Amphibians

The ERCCIS desk study revealed records for common lizard (*Lacerta vivipara*), slowworm (*Anguis fragilis*) and adder (*Vipera berus*) (UK BAP priority species/ Section 41 NERC Act (2006); Schedule 5 WCA, 1981) within a 2km radius of the site. On-site, hedgerows and grassland margins have potential to support adder, slow worm, common lizard and grass snake (*Natrix natrix*) due to their proximity to nearby heathland, notably within Carn Brea CWS, which adjoins the north site boundary.

The desk study revealed records for common toad (*Bufo bufo*), palmate newt (*Lissotriton helveticus*) and common frog (*Rana temporaria*) within a 2km radius of the site. Standing water is a prerequisite for breeding amphibians. No standing water is present within the site, but hedgerows and field margins have potential to support these species during their terrestrial life phase.

The survey is considered to be of '**Local Value'** for reptile and amphibian species.

Impacts associated with exploratory drilling, notably movement of vehicles, have potential to injure or kill individual animals. Exploratory drilling will require disturbance of poor semi-improved grassland and arable within the vicinity of the proposed drill sites and accesses. Following consultation with Cornwall Council, drill locations and compounds have been positioned at least 20m from hedgerows so to minimize impact on biodiversity. Vehicle movement close to hedgerows is restricted to where vehicles will pass through existing farm gateways (see Map 1). Based on this, a detailed reptile survey is not recommended but precautionary reptile avoidance measures must be implemented. These measures will also protect any amphibian species present.

In the absence of mitigation, the nature of the identified impacts on reptiles and amphibians is considered to be **short-term in duration, of unlikely occurrence, negative on a local scale, and of minor significance.**

Reptiles: slowworm, adder, common lizard and grass snake, the four commonly occurring reptile species in the UK, are protected under Schedule 5 of the WCA (1981, as amended); see Appendix 3 for further details of legal protection. See section 6.3 for mitigation recommendations.

Birds

A large number of bird species have been recorded within a 2km radius of the site. Of the species recorded, 66 have potential to use the site on occasion. Suitable bird nesting habitat is present in hedgerows and poor semi-improved grassland. Species of conservation significance recorded within a 2km radius of the site and with potential to breed within habitats in the site, are as follows: house sparrow (*Passer domesticus*), song thrush (*Turdus philomelos*), hedge sparrow (*Prunella modularis*), bullfinch (*Pyrrhula pyrrhula*), skylark (*Alauda arvensis*), yellowhammer (*Emberiza citronella*), linnet (*Linaria cannabina*), grey wagtail (*Motacilla cinerea*), mistle thrush (*Turdus viscivorus*), grasshopper warbler (*Locustella naevia*) (RSPB Red List; CRDB; UK BAP/ Section 41 NERC Act (2006)), dunnock (*Prunella modularis*) and willow warbler (*Phylloscopus trochilus*) (RSPB Amber List; CRDB; UK BAP/ Section 41 NERC Act (2006)). Buildings within the site boundary, but not accessible for survey, may have potential to support roosting and breeding barn owl (*Tyto alba*) (Schedule 1 WCA, 1981; CRDB; UK BAP/ Section 41 NERC Act (2006)).

Based on the size of the site, the habitat types present, and the number and species of bird recorded within the desk study, the site is considered likely to be of **'Local Value'** for birds.

Impacts associated with exploratory drilling include indirect disturbance associated with noise and vibration and direct disturbance associated with movement of vehicles across grassland. Following consultation with Cornwall Council, drill locations and compounds have been positioned at least 20m from hedgerows so to minimize impact on breeding birds (and other species). Vehicle movement close to hedgerows is restricted to where vehicles will pass through existing farm gateways and access tracks (see Map 1). Detailed breeding bird surveys are not recommended but a precautionary approach to works is required.

In the absence of mitigation, the nature of the identified impacts on birds is considered to be **short-term in duration, of unlikely occurrence, negative on a local scale and of minor significance.**

Mitigation recommendations are provided in section 6.3.

Invertebrates

The ERCCIS desk study revealed many records for invertebrate species of conservation significance within a 2km radius of the site. Those with potential to occur within the site are listed as follows: small square spot (*Diarsia rubi*), small heath (*Coenonympha pamphilus*), wall butterfly (*Lasiommata megera*), beard chestnut (*Agrochola lychnidis*) (Near threatened; S41 NERC Act, 2006), dingy skipper (*Erynnis tages*), grayling (*Hipparchia semele*) (Vulnerable; S41 NERC Act, 2006), garden tiger (*Arctia caja*), autumnal rustic (*Eugnorisma glareosa*) and mullein wave

(*Scopula marginepunctata*) (S41 NERC Act, 2006), buff-tailed mining bee (*Andrena humilis*) (Notable B), and lesser cockroach (*Ectobius panzeri*) (Nationally Scarce).

The site, supporting native species-rich Cornish hedgerows with and without trees, arable and poor semi-improved grassland, has potential to support a diverse invertebrate assemblage, particularly given its proximity to heathland within the adjacent Carn Brea CWS.

The site is considered to be of '**Local Value'** for invertebrates.

Impacts associated with exploratory drilling include indirect disturbance associated with noise and vibration and direct disturbance associated with movement of vehicles across grassland. Following consultation with Cornwall Council, drill locations and compounds have been positioned at least 20m from hedgerows so to minimize impact on biodiversity. Vehicle movement close to hedgerows is restricted to where vehicles will pass through existing farm gateways and access tracks (see Map 1). Exploratory drilling and site set up have potential to disturb / kill individual animals but, due to the temporary nature of works and minor land take, negative impacts on a population level are considered unlikely.

In the absence of mitigation, the nature of the identified impacts on invertebrate species is considered to be **short-term in duration, of unlikely occurrence, negative on a local scale and of minor significance.**

Mitigation recommendations are provided in section 6.3.

Vascular Plants

A total of 78 vascular plant species were recorded within the site during the Phase 1 Habitat survey (see Appendix 2). This is in line with the number of species that would be expected within an area of this size and character. Native species-rich Cornish hedgerow with and without trees are the most botanically diverse habitats on-site. Two species of conservation significance were recorded within the site:

- Corn spurrey - UK Red Data List Vulnerable; present in arable.
- Devil's bit scabious – UK Red Data List Near threatened; present in hedgerows.

The ERCCIS desk study revealed records for 25 species of conservation significance with potential to occur within hedgerow habitat on the site: Kilarney fern (*Trichomanes speciosum*) (Bern-A1; HabDir-A2*; HabDir-A4; HabReg-Sch5, WCA-Sch8), heather (*Calluna vulgaris*), bloody crane's-bill (*Geranium sanguineum*), field pepperwort (*Lepidium campestre*), Darnel (*Lolium temulentum*) (Near Threatened, RDB), bindweed (*Calystegia sepium subsp. roseata*), western ramping fumitory (*Fumaria occidentalis*), white horehound (*Marrubium vulgare*), balm leaved figwort (*Scrophularia scorodonia*), rock stonecrop (*Sedum forsterianum*) (National scarce), chicory (*Cichorium intybus*), sheep's bit (*Jasione montana*), corn marigold (*Glebionis segetum*), night flowering catchfly (*Silene noctiflora*) (Vulnerable, RDB), bell heather (*Erica cinerea*), cross-leaved heather (*Erica tetralix*), small cudweed (*Filago minima*), wild strawberry (*Fragaria vesca*), field woundwort (*Stachys arvensis*) (Near Threatened, RDB), purple ramping fumitory (*Fumaria purpurea*), grape hyacinth (*Muscari neglectum*) (S41 NERC Act, 2006; UK BAP; NS; vulnerable, RDB), small flowered catchfly (*Silene gallica*), (S41 NERC Act, 2006; UK BAP; NS; endangered, RDB) bluebell (*Hyacinthoides non-scripta*) (Sch. 8 WCA, 1981), annual knawel (*Scleranthus annuus subsp. annuus*) (Endangered, NRD; UK BAP) and pale dog violet (*Viola lactea*) (Nationally Scarce; CRDB; S41 NERC Act, 2006).

Based on the size of the site, habitats present, and species recorded locally, the site is considered to be of '**Local Value'** for vascular plant species.

Impacts associated with exploratory drilling, notably the movement of vehicles over grassland and arable have potential to disturb / uproot and kill plants, but, due to the temporary nature of works

and minor land take, negative impacts on a population level are considered unlikely. Following consultation with Cornwall Council, drill locations and compounds have been positioned at least 20m from hedgerows so to minimize impact on biodiversity.

In the absence of mitigation, the nature of the identified impacts on vascular plant species is considered to be **short-term in duration, of probable occurrence, negative on a local scale and of minor significance.**

Mitigation recommendations are provided in section 6.3.

Invasive Plants

In the UK a number of 'invasive plant species' are listed on Schedule 9 of the WCA (1981, as amended) making it an offence to cause them to spread to the wild. The ERRCIS desk study revealed records for the following Schedule 9 invasive plant species within a 1km radius of the site: entire-leaved cotoneaster (*Cotoneaster integrifolius*), holly berry cotoneaster (*Cotoneaster bullatus*), Himalayan cotoneaster (*Cotoneaster simonsii*), Himalayan balsam (*Impatiens glandulifera*), Japanese knotweed (*Fallopia japonica*), giant knotweed (*Fallopia sachalinensis*), montbretia, rhododendron three cornered garlic (*Allium triquetrum*), variegated yellow archangel (*Lamiastrum galeobdolon subsp. argentatum*), New Zealand pigmy weed (*Crassula helmsii*) and wall cotoneaster. Montbretia, wall cotoneaster and rhododendron were recorded within hedgerows during the Phase 1 Habitat Survey.

Three plants listed as injurious (harmful) under the Weed Act (1959) are present on-site: broad-leaved dock, ragwort, and creeping thistle. These species are present in grassland, arable and hedgerows on site. Steps should be taken to control these species; see section 6.3 for mitigation recommendations.

Non-Vascular Plants

A specialised survey for non-vascular plants, bryophytes and lichens was outside the scope of this study. The desk study revealed many records for lower plant species of conservation concern, but all are typically associated with heathland and metalliferous mining spoil. This habitat is absent from the site but occurs within the wider area, notably within the nearby West Cornwall Bryophytes SSSI.

Based on the size of the site, habitats present, and the species recorded locally, the site is considered to be of up to '**Local Value'** for non-vascular plant species.

Impacts associated with exploratory drilling, notably movement of vehicles over grassland have potential to disturb / kill non-vascular plants but, due to the temporary nature of works and minor land take, negative impacts on a population level are considered unlikely. It is understood that no dust is generated during drilling.

In the absence of mitigation, the nature of the identified impacts on non-vascular plant species is considered to be **short-term in duration, of unlikely occurrence, negative on a local scale and of minor significance.**

Follow mitigation recommendations for habitats (see Section 6.2).

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6.0 Mitigation Recommendations

Recommendations are provided using the Mitigation Hierarchy in accordance with BS42020-2013 (British Standard, 2013). The Mitigation Hierarchy seeks to avoid impacts, then to mitigate unavoidable impacts, and, as a last resort, to compensate for residual impacts that remain after implementation of avoidance and mitigation measures.

6.1 Designated Sites

There is one statutory designated site (International, National, Regional or Local), and three non-statutory designated sites of nature conservation importance located within 1km of the site: West Cornwall Bryophytes SSSI, Penventon Moor, Carn Brea Moor and Newton Moor County Wildlife Sites (CWS).

The proposed exploratory drilling sites are considered to be sufficiently distant for proposed constructional activities and subsequent operational use not to impact nearby designated sites.

The proposed drill sites fall within the Zone of Influence for the Fal and Helford Special Area of Conservation (SAC). This SAC is vulnerable to recreational pressure associated with residential developments, which can increase the local population density. Exploratory drilling as described in Section 2.3, will not result in an increase in the local population. It is, therefore, reasonable to assume that the proposals will not contribute to recreational pressure impacting the Fal and Helford SAC.

Mitigation not required.

6.2 Habitats

Of the habitats within the site, native species rich Cornish hedgerow with and without trees (J2.1.1 & J2.3.1), poor semi-improved grassland (B6) and arable (J1.1) are considered to be of significant ecological value. Mitigation recommendations are detailed below.

1. **Hedgerows (J2.3.1 & J2.1.1) (degradation):** Exploratory drilling has potential to degrade hedgerow habitat through storage of materials, vehicle movement and proximity of drilling. Following consultation with Cornwall Council, drill locations and compounds have been positioned at least 20m from hedgerows so to minimize impact on biodiversity. All hedgerows will be retained unaltered. NB: vehicles will be permitted within 5m of hedgerows when accessing field compartments via existing gateways/ tracks; these access features are regularly used by farm machinery. Use by the drill rig and supporting vehicles should not increase disturbance beyond the level currently experienced by the features (and adjacent hedgerows).
2. Implementation of a 20m development free buffer will ensure that hedgerow trees (which are few within the site) are adequately protected in accordance with BS5837: 2012 Trees in relation to design, demolition and construction. Commission a detailed arboricultural assessment if BS5837 cannot be followed. Access tracks across pasture must be demarcated to ensure that the 20m development free buffers between site activities and hedgerows are not accidently breached. Storage of materials has potential to degrade hedgerow habitat. Store any materials at least 20m from the base of hedgerows, and within designated, fenced storage areas.
3. **Poor semi-improved grassland (temporary loss and degradation):** Mud mats will be used to spread the load of vehicles and minimize damage to the sward/ ground beneath. Soils contain the seed bank of the existing plant community, which will regenerate following cessation of works. Post-development monitoring will be implemented to ensure that vegetation recovers and additional measures (i.e. seeding) are not required. Some

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targeted control of plant species listed as injurious (harmful) under the Weed Act (1959) will likely be required as these tend to 'boom' in response to disturbance. Furthermore, care should be taken not to introduce Schedule 9 WCA (1981) invasive plant species (see Section 6.3). To prevent wider degradation of retained grassland, it is recommended that access routes and manoeuvring space be demarcated. Store materials in a designated, fenced storage area. NB: the sward will likely be cut for hay prior to drilling activities.

4. **Arable (temporary loss and degradation):** Some targeted control of plant species listed as injurious (harmful) under the Weed Act (1959) will likely be required following cessation of drilling activities as these tend to 'boom' in response to disturbance. Requirement for remedial management will be dictated by the post-drill crop regime. See points 5 and 16 below.
5. **All Habitats (and Species):** Post-development monitoring will be implemented to ensure that vegetation recovers and additional measures (i.e. seeding) to aid recovery are not required.

6.3 Species

The site has potential to support badger, hedgehog, reptile and amphibian species, breeding birds, bats (foraging and commuting and roosting) and notable plant species; impact on these species/ species groups will be avoided and/or mitigated by following the recommendations below.

6. **Badger (disturbance):** A single entrance badger outlier sett was observed in the west site boundary of the most north-westerly poor semi-improved grassland field. Currently, the nearest indicative drill location is located *c.* 198m south of the confirmed badger sett. No drilling is currently proposed in the field compartment supporting the badger sett. No further action is required because the badger sett will not be impacted. Consult a suitably qualified ecologist if it becomes necessary to drill within the most north-westerly poor semi-improved grassland field supporting the badger sett. In the unlikely event that a mammal burrow (potential badger sett) is uncovered during works, works must stop immediately, and a suitably qualified ecologist consulted to determine burrow status. A Natural England badger licence would likely be required to permit drilling within 30m of a badger sett. **NB:** Natural England will only grant licences for works between 1st July and 30th November.
7. A pre-construction walkover survey is recommended if site set up and drilling are not implemented within 8 weeks of the recent site survey (5th July 2021). This will identify any new active badger setts that may be created in the time elapsed between this survey and the commencement of drilling.
8. **Badger, hedgehog and other mammals:** All excavated pits associated with the proposed development must be covered overnight and all trenches must have sloping planks (no greater than 45° angle) placed in them as a means of escape so that animals will not become trapped.
9. All fences (temporary and permanent) must have a minimum 25cm gap below to permit movement of faunal species (notably badger).
10. **Bats (forging and commuting)**: Detailed bat surveys are not recommended because the process of exploratory drilling is unlikely to negatively impact foraging and commuting bats. Following consultation with Cornwall Council, drill sites have been located at least 20m from hedgerows to minimize impact on bats. No artificial lighting is required to facilitate drilling. Follow recommendations for habitats in Section 6.2.

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11. **Bats (roosting):** Buildings, comprising a mixture of agricultural buildings, barns and residential buildings, are present, but not accessible, within the orange site boundary; all are located in excess of 100m from the indicative drill locations. Exploratory drilling and associated access requirements are considered unlikely to impact any bats that may be using these buildings due to their distant proximity. No trees with potential to support roosting bats were identified during the Phase 1 Habitat survey. Cornish Metals Inc are not aware of any open (or capped shafts) within the site boundary, but will undertake a detailed search for mine shafts and mine workings within 100m of the site boundary in due course. On the basis that no historic underground mine workings have been identified within the site boundary, and subject to further confirmation from Cornish Metals Inc following completion of the detailed search, exploratory drilling in this location is considered unlikely to impact roosting bats. No further actions are required subject to confirmation from Cornish Metals Inc that the assumptions about mine shafts and mine workings are accurate. If drill holes were to be relocated, and sited closer to the potential bat roost features identified above, then some further survey work (Preliminary Roost Inspection and bat emergence/ re-entry surveys) would be required. Drilling within 50m of open shafts or open mine workings would warrant further survey (emergence/ re-entry and static detector surveys).
12. **Birds:** Impacts associated with exploratory drilling include indirect disturbance associated with noise and vibration, and direct disturbance associated with movement of vehicles across grassland/ arable. Detailed breeding bird surveys are not recommended but a precautionary approach to works is required. Adopt a precautionary approach during disturbance of poor semi-improved grassland and arable. If drilling is to be undertaken between May and September, then an ecologist will walk the proposed access route on the day of site set-up to ensure that no ground nesting birds are present. The route will then be mowed, slowly and in a single direction to a height of 200mm above ground level. After leaving the mown area undisturbed for a few hours/ overnight, repeat the cut to a height of 100mm. This process will ensure that the access track is not suitable for nesting birds (and reptiles). If an active bird nest is uncovered, then works within 5m of the nest must stop until nesting activity has ceased/ the access track re-routed to avoid the nest. Works are most likely to be delayed between April and July.
13. **Dormouse:** This species is likely to be absent from the site. No suitable dormouse habitat will be disturbed or lost as a result of drilling. In the unlikely event that a dormouse / dormouse nest is uncovered, then works must stop and Natural England must be consulted. Continuation of works may be contingent on obtaining a European Protected Species Mitigation Licence from Natural England. This is considered highly unlikely as evidence indicates dormouse to be absent from the site and no suitable dormouse habitat will be disturbed. Follow recommendations for habitats in Section 6.2 above.
14. **Reptiles and amphibians (disturbance):** Impacts associated with exploratory drilling, notably movement of vehicles over grassland, have potential to injure or kill individual animals. Disturbance of the sward will be kept to a minimum to provide only access (vehicle width track), a vehicle manoeuvring space and sufficient space for the drilling rig. Based on this, a detailed reptile survey is not recommended but precautionary reptile avoidance measures must be implemented. Mow the vehicle access route slowly and in a single direction, to a height of 200mm above ground level during the reptile active season (April – early October). Any reptiles present will be able to relocate to undisturbed areas. After leaving the mown area undisturbed for a few hours/ overnight, repeat the cut to a height of 100mm. Thereafter, maintain sward height at 100mm until exploratory drilling is complete. This process will ensure that the access track is not suitable for reptiles (and nesting birds). Follow recommendations for habitats above (Section 6.2).

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15. **Invasive plants:** A pre-construction invasive plant survey has been undertaken to ensure that drilling activities do not inadvertently spread Schedule 9 WCA (1981) invasive plant species throughout the drilling area. Three invasive plant species are present within the site: montbretia, rhododendron and wall cotoneaster. All are located within hedgerows, which will not be disturbed for the purpose of site set up or drilling. No further action is required.
16. Three plants listed as injurious (harmful) under the Weed Act (1959) are also present on-site: broad-leaved dock, ragwort, and creeping thistle. Exploratory drilling will include measures to control these species post-completion. Cut disturbed areas of grassland (and arable if appropriate) in September and March post-completion of works. Arisings must be collected and composted on-site. A suitable location for composting will be identified during site set-up. Post-development monitoring will identify if further targeted weed control (i.e. pulling or herbicide application) is required.
17. **Vascular and non-vascular plants; and invertebrates (disturbance):** Follow recommendations for habitats and species above.

6.4 Biodiversity Enhancements

Biodiversity net gain is described as a measurable target(s) for development projects where impacts on biodiversity are outweighed by the mitigation hierarchy approach to first avoid, and then minimise, impact including through restoration and/ or compensation (Baker *et al.,* 2019). Here we seek to incorporate biodiversity net gains in accordance with the 'Biodiversity Net Gain: Good Practice Principles for Development' (Baker *et al.,* 2019). Exploratory drilling could incorporate the following biodiversity enhancements:

18. Eradication of Schedule 9 WCA (1981) invasive plant species from within the site.
19. Control of plant species listed as injurious (harmful) under the Weed Act (1959).
20. The value of the Site for invertebrates, amphibians, reptiles and lower plants could be enhanced by providing piles of deadwood or stones post-development.

6.5 Further surveys

No further surveys are required to inform the planning application provided all the mitigation recommendations detailed in this report are successfully implemented. A pre-construction walkover survey is recommended if site set up and drilling are not implemented within 8 weeks of the recent site survey (5th July 2021). This will identify any new active badger setts that may be created in the time elapsed between this survey and the commencement of drilling. Cornish Metals Inc are not aware of any open (or capped shafts) within the site boundary, but will undertake a detailed search for mine shafts and mine workings within 100m of the site boundary in due course. On the basis that no historic underground mine workings have been identified within the site boundary, and subject to further confirmation from Cornish Metals Inc following completion of the detailed search, exploratory drilling in this location is considered unlikely to impact roosting bats. No further actions are required subject to confirmation from Cornish Metals Inc that the assumptions about mine shafts and mine workings are accurate. Drilling within 50m of open shafts or open mine workings would warrant further survey (emergence/ re-entry and static detector surveys).

6.6 Monitoring

Post-development monitoring will be implemented to ensure that vegetation recovers and additional measures (i.e. seeding/ planting) are not required. **A monitoring visit will be undertaken by an ecologist at 6 months post-completion of works.** The ecologist will visit

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site following practical completion of drilling, and record the extent of disturbance, vegetative ground cover, species composition and vegetation height. The ecologist will either recommend no further action on the basis that vegetation is recovering; or recommend further monitoring or remediation with seeding and/or targeted control of weedy species (see point 16 above). NB: remediation measures to be agreed with the landowner.

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7.0 Impact Assessment

Table 2: Assessment of Impact of the proposed development on features of ecological importance before and after mitigation.

Feature	Characterisation of unmitigated impact	Effect without mitigation	Mitigation (Points 1 – 21 Sections 6.1 – 6.4)	Significance of effect of residual impact after mitigation
Hedgerows (native species rich)	Degradation (construction and operational)	Short-term negative of unlikely occurrence, and of minor significance on a Parish scale	1, 2, 5	Neutral
Poor semi-improved grassland	Degradation (construction and operational)	Short-term negative, of likely occurrence, and of minor significance on a local scale	3, 5	Neutral
Arable	Direct loss (construction) Degradation (construction and operational)	Short-term negative of likely occurrence, and of minor significance on a local scale	4, 5	Neutral
Badger	Loss of or disturbance to a sett (construction) Harm or disturbance to individual animals (construction)	Short-term, negative impact, of unlikely occurrence, and of minor significance on a local scale	6 – 9	Neutral
Hedgehog	Harm or disturbance to individual animals (construction)	Short-term, negative, of unlikely occurrence, and of minor significance on a local scale	8, 9, 20	Neutral
Bats (foraging and commuting)	Degradation of hedgerow habitat (construction and operational)	Short-term, negative impact, of unlikely occurrence, and of minor significance on a local scale	10	Neutral
Bats (roosting)	Disturbance to roosting habitat (construction) Harm or disturbance to individual animals (construction)	Short-term, negative impact, of unlikely occurrence, and of minor significance on a local scale	11	Neutral
Birds	Loss or disturbance to nesting habitat (construction)	Short-term in duration, of unlikely occurrence, negative on a local scale and of minor significance	12	Neutral
Reptiles	Loss of or degradation of suitable habitat	Short-term in duration, of	14, 20	Neutral

Feature	Characterisation of unmitigated impact	Effect without mitigation	Mitigation (Points 1 – 21 Sections 6.1 – 6.4)	Significance of effect of residual impact after mitigation
	(construction and operational) Harm or disturbance to individual animals (construction)	unlikely occurrence, negative on a local scale, and of minor significance		
Amphibians	Loss of or degradation of suitable habitat (construction and operational) Harm or disturbance to individual animals (construction)	Short-term in duration, of unlikely occurrence, negative on a local scale, and of minor significance	14, 20	Neutral
Invertebrates	Loss of or degradation of suitable habitat (construction and operational)	Short-term in duration, of unlikely occurrence, negative on a local scale and of minor significance	17, 20	Neutral
Otter	Harm or disturbance to individual animals (construction)	Negligible	8, 9	Neutral
Dormouse	Degradation of suitable habitat (construction and operational) Harm or disturbance to individual animals (construction)	Negligible	13	Neutral
Vascular plants	Loss of or degradation of suitable habitat (construction and operational)	Short-term in duration, of probable occurrence, negative on a local scale and of minor significance	17, 18, 19	Neutral
Non-vascular plants	Loss of or degradation of suitable habitat (construction and operational)	Short-term in duration, of unlikely occurrence, negative on a local scale and of minor significance	17, 18, 19, 20	Neutral

7.1 Residual Impacts

The residual impact of the proposed exploratory drilling is considered likely to have a neutral impact, at a local scale, on the ecology of the site, subject to the successful implementation of the mitigation outlined in this report, and subject to confirmation from Cornish Metals Inc. that no mine shafts or workings are located close to the proposed drill sites. There is potential to incorporate some measures/ features that would enhance aspects of the site for ecology.

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9.0 Appendix 1: Designated Sites Plan

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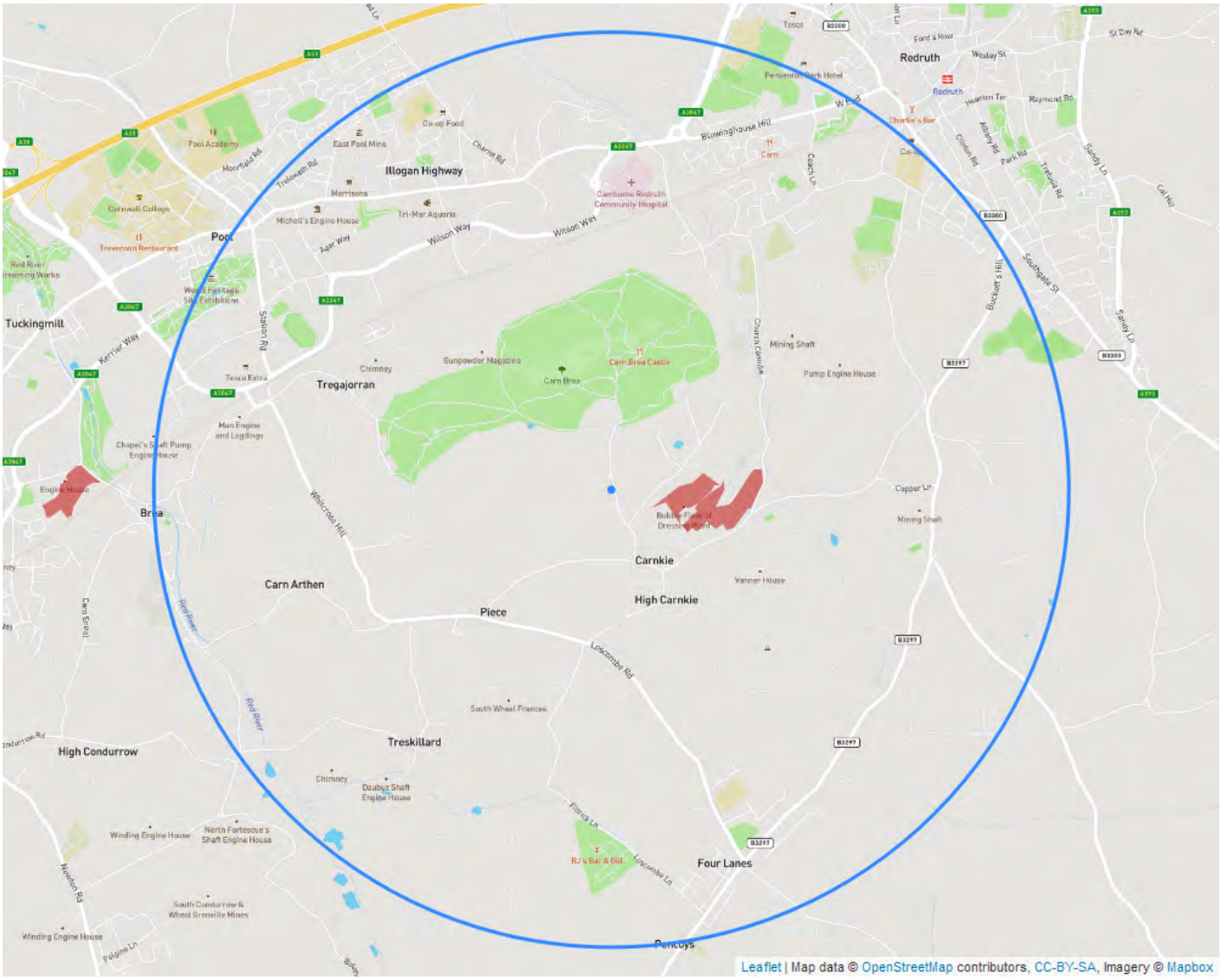
Statutory Sites within the search area

Statutory sites are those given level protection aimed at preventing activities that may damage features of interest. Further details can be found in the ERCCIS report summary .pdf or from Natural England and The National Association for Areas of Outstanding Natural Beauty.

Site Type	Site Code	Site Name	Hyperlink	Site Area (ha)
SSSI	1007092	West Cornwall Bryophytes	https://www.orks.org.uk/sites/default/files/EDS_Links/SSSIs/West%20Cornwall%20Bryophytes%20SSSI.pdf	29.07

Statutory Sites Map



Location	Site Code	Colour
1	1007092	

Non-Statutory Sites & Reserves

Non-statutory sites are sites that have wildlife or habitat interest, but lack a legal protection. These sites form part of the natural environments wider ecological network

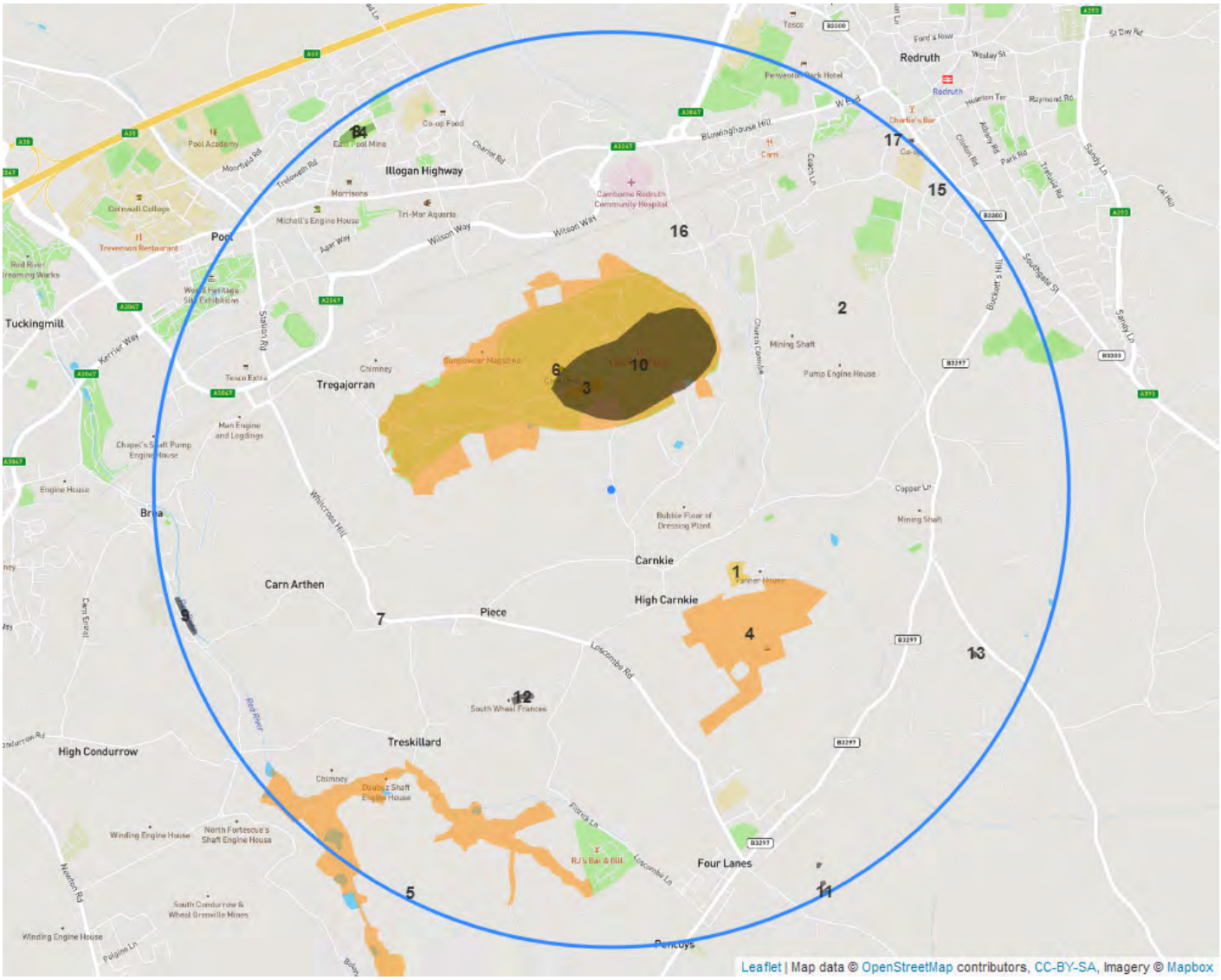
The report summarises all County Wildlife & Geology Sites which are sites recognised for wildlife or geological value and the Local Sites partnership in Cornwall is coordinated by Cornwall Wildlife Trust. It also includes summaries of the Road Side Verge Inventory; Voluntary Marine Conservation Area; Ancient Woodland; Ancient Monuments and the Reserves of Cornwall Wildlife Trust; National Trust; Woodland Trust and the Royal Society for the Protection of Birds (RSPB).

Further details can be found in the ECCRIS report summary .pdf, but for specific information on a site listed below you might need to contact the relevant organisation.

Site Type	Site Code	Site Name	Hyperlink	Site Area (ha)
CGS	K/1	Wheal Basset	https://intranet.cornwallwildlifetrust.org.uk/cgs/update.aspx?objectID=79	0.74
CGS	K/2	Wheal Uny	https://intranet.cornwallwildlifetrust.org.uk/cgs/update.aspx?objectID=44	0.01
CGS	K/4	Carn Brea	https://intranet.cornwallwildlifetrust.org.uk/cgs/update.aspx?objectID=48	0.95
CWS	K38	Penventon Moor	https://www.orks.org.uk/sites/default/files/EDS_Links/CWS/K38%20-%20Penventon%20Moor.pdf	17.98
CWS	K6	Newton Moor	https://www.orks.org.uk/sites/default/files/EDS_Links/CWS/K6%20-%20Newton%20Moor.pdf	30.70
CWS	K7	Carn Brea	https://www.orks.org.uk/sites/default/files/EDS_Links/CWS/K7%20-%20Carn%20Brea.pdf	77.90
Monument	31840	31840	n/a	0.01
Monument	32988	32988	n/a	0.73

Monument	36048	36048	n/a	0.42
Monument	CO79	CO79	n/a	21.95
Monument	CO939	CO939	n/a	0.20
Monument	CO953	CO953	n/a	0.32
Monument	CO989	CO989	n/a	0.07
RESERVE_NT	NT10951	Cornish Engines	n/a	1.30
TPO	K14/128	Tree Preservation Order	n/a	0.00
TPO	K14/145	Tree Preservation Order	n/a	0.00
TPO	W6/10/11	Tree Preservation Order	n/a	0.00

Non-Statutory Sites & Reserves Map



Location	Site Code	Colour
1	K/1	
2	K/2	
3	K/4	
4	K38	
5	K6	
6	K7	
7	31840	
8	32988	

9	36048	
10	CO79	
11	CO939	
12	CO953	
13	CO989	
14	NT10951	
15	K14/128	
16	K14/145	
17	W6/10/11	

10.0 Appendix 2: Phase 1 Habitat Plant List

Latin Name	Common Name	Native species-rich hedgerows with & without trees (J2.3.1 & J2.1.1)	Poor semi-improved grassland (B6)	Arable (J1.1)
Acer pseudoplatanus	Sycamore	R		
Alnus glutinosa	Alder	LF		
Anthoxanthum odoratum	Sweet vernal grass	F	LF	
Arrhenatherum elatius	False oat-grass	LF		
Brassica nigra	Black mustard	O		
Bromus hordeaceus	Soft brome	LA		
Buddleja davidii	Buddleja	R		
Capsella bursa-pastoris	Shepherd's purse			F
Centaurea nigra	Black knapweed	LF		
Cerastium fontanum	Common mouse-ear		O	O
Chenopodium album	Fat hen			R
Cirsium arvense	Creeping thistle	LF	LF	LF
Convolvulus arvensis	Field bindweed	LF		
Cotoneaster horizontalis	Wall cotoneaster	R		
Crataegus monogyna	Hawthorn	O		
Crepis sp.	Hawk's-beard	O		
Crocosmia x crocosmiiflora	Montbretia	LF		
Cynosurus cristatus	Crested dog's-tail		LF	
Dactylis glomerata	Cock's-foot	F	R	
Digitalis purpurea	Foxglove	F		
Dryopteris affinis	Scaly male fern	O		
Dryopteris dilatata	Broad buckler fern	O		
Epilobium sp.	Willowherb	LF		
Euphorbia species	Spurge species			R
Festuca rubra	Red fescue	O		LF
Fraxinus excelsior	Ash	R		
Fumaria spp.	Fumitory species	O		O
Galium aparine	Cleavers	A		
Galium mollugo	Hedge bedstraw	O		
Geranium dissectum	Cut leaved crane's-bill			O
Geranium robertianum	Herb-robert	LF		
Hedera helix	Ivy	LF		
Heracleum sphondylium	Hogweed,cow parsnip	LF		
Holcus lanatus	Yorkshire fog	LF	LF	LF
Hordeum sp.	Barley			O
Juncus bufonius	Toad rush			LF
Lamium purpureum	Red dead-nettle			LF
Lapsana communis	Nipplewort	LF		

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Latin Name	Common Name	Native species-rich hedgerows with & without trees (J2.3.1 & J2.1.1)	Poor semi-improved grassland (B6)	Arable (J1.1)
Ligustrum ovalifolium	Garden privet	R		
Lolium perenne	Perennial rye-grass		D	R
Lonicera periclymenum	Honeysuckle	LF		
Matricaria discoidea	Pineappleweed			F
Matricaria recutita	Scented mayweed			A
Medicago sativa	Lucerne			D
Myosotis spp.	Forget-me-not	O		
Asplenium scolopendrium	Hart's tongue	LF		
Picris echioides	Bristly oxtongue	O		O
Pinus radiata	Monterey pine	R		
Plantago coronopus	Buck's-horn plantain			F
Plantago lanceolata	Ribwort plantain		F	F
Plantago major	Greater plantain		O	O
Polygonum persicaria	Redshank			A
Potentilla reptans	Creeping cinquefoil	LF		
Prunus spinosa	Blackthorn	LF		
Pteridium aquilinum	Bracken	LF		
Ranunculus repens	Creeping buttercup	LF	LF	O
Rhododendron ponticum	Rhododendron	R		
Rubus fruticosus agg.	Blackberry/bramble	F		
Rumex acetosa	Common sorrel		O	
Rumex acetosella	Sheep's sorrel	LF		
Rumex obtusifolius	Broad-leaved dock	O	F	LF
Salix cinerea	Grey willow	R		
Senecio jacobaea	Ragwort		O	
Silene dioica	Red campion	LF		
Sonchus oleraceus	Smooth sow-thistle			O
Spergula arvensis	Corn spurrey			A
Stachys sylvatica	Hedge woundwort	LF		
Stellaria media	Common chickweed			LF
Succisa pratensis	Devil's-bit scabious	O		
Taraxacum officinale agg.	Dandelion		O	LF
Teucrium scorodonia	Wood sage	LF		
Trifolium campestre	Hop trefoil	R		
Trifolium pratense	Red clover		O	LF
Trifolium repens	White clover		A	LF
Ulex europaeus	European gorse	O		
Umbilicus rupestris	Navelwort	LF		
Urtica dioica	Common nettle	F	R	O
Vaccinium myrtillus	Bilberry	LF		

DAFOR is a nominative scale where D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare. L = Locally; or combination of.

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11.0 Appendix 3: Legislation and Planning Policy

Protected Habitats, Species and Designated Sites

- The Conservation of Habitats and Species Regulations (HM Government, 2019) (as amended) encompasses Special Areas of Conservation (SACs) and provides additional protection for Special Protected Areas (SPA's), RAMSAR Sites and European Protected Species (EPS).
- The Countryside and Rights of Way (CRoW) Act (HM Government, 2000, as amended) provides additional protection for Sites of Special Scientific Interest (SSSIs) and threatened species; under the CRoW Act (2000) Local Authorities have a statutory duty to consider UK BAP priority habitats and species as part of planning applications.
- The Hedgerows Regulations (1997) protects ecologically/ historically important hedgerows.
- The Natural Environment and Rural Communities (NERC) Act (HM Government, 2006) bestows a legal duty on public authorities to conserve biodiversity. Section 41 includes a list of habitats and species of principle conservation importance.
- The Protection of Badgers Act (1992) protects badgers as specified below.
- The Wildlife and Countryside Act (HM Government 1981, as amended) encompasses the protection of wildlife (fauna and flora), SSSIs, SPAs, National Nature Reserves (NNRs) and RAMSAR Sites.

Badgers: Badgers are legally protected under the Protection of Badgers Act 1992. As a result of this statutory legislation, it is an offence to:

- Purposely kill, injure or take a badger;
- Intentionally or recklessly damage, destroy or obstruct access to a badger sett;
- Disturb a badger when occupying a sett.

Birds: In Britain the nests (whilst in use or being built) and eggs of wild birds are protected against taking, damage and destruction under the Wildlife and Countryside Act 1981 (as amended) (HM Government, 1981).

Some species (i.e. barn owl) are also listed on Schedule 1 of the Wildlife and Countryside Act (HM Government, 1981 as amended); it is an offence to:

- Intentionally capture, injure or kill a Schedule 1 listed species;
- Intentionally or recklessly disturb a Schedule 1 listed species whilst nesting;
- Intentionally or recklessly disturb a dependent young Schedule 1 listed species.

European Protected Species (EPS) (Bat, dormouse, otter, water vole & great crested newt): EPS are listed on Annex IV(a) of the European Communities Habitats Directive.

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In Britain protection of EPS is achieved through their inclusion on Schedule 2 of the Conservation and Habitats Regulations 2010, Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 12 of the Countryside and Rights of Way Act 2000 (HM Government, 1981, 2000 & 2010).

As a result of this statutory legislation it is an offence to:

- Deliberately capture, injure or kill an EPS;
- Intentionally or recklessly disturb an EPS in its place of rest/ breeding Site;
- Intentionally or recklessly damage, destroy or obstruct access to a EPS place of rest/ breeding Site (even if the EPS is not occupying the resting / breeding place at the time);
- Possess or sell or exchange an EPS (dead or alive) or part of an EPS.

Reptiles (species found in Cornwall: adder, common lizard, slow worm and grass snake): reptiles are protected under Schedule 5 (section 9(1) and 9(5)) of the Wildlife and Countryside Act 1981 (as amended). This legislation makes it an offence to kill and/ or injure reptiles, and sell or transport for the purpose of sale.

Statutory Designated Sites

Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are of International nature conservation importance.

Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs) are of National importance. Development proposals with potential to affect a SAC, SSSI or NNR require permission from Natural England.

Local Nature Reserves (LNRs) are protected from development; the Local authority is responsible for LNRs.

Non-Statutory Designations

Non-statutory Sites include **County Wildlife Sites (CWS)**, **County Geology Sites (CGS)**, **Roadside Verge Audit Biological Sites** and **Ancient Woodlands**. CWSs and CGSs are of at least county importance for wildlife/geology in Cornwall; all are given increased protection through the planning process.

Biodiversity Action Plans (BAPs): BAPs distinguish National and County level priority habitats and species for conservation. The Local Authority has a duty to conserve UK BAP priority habitats and species under Section 74 of the CRoW Act (2000).

Red Data Books & Lists: detail the status of species in relation to threat.

Planning Context

The local planning authority has a statutory obligation to consider impacts upon protected species resulting from development. Planning permission will not be granted with outstanding ecological surveys, and if applicable an appropriate mitigation plan (except under exceptional circumstances as set out in ODPM Circular 06/2005).

National Policy: The revised National Planning Policy Framework (NPPF) was published on 24 July 2018 and sets out the government's planning policies for England and how these are expected to be applied. This revised Framework replaces the previous National Planning Policy Framework published in March 2012. Chapter 15 of the NPPF 'Conserving and enhancing the natural environment' is detailed below:

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

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a) protecting and enhancing valued landscapes, Sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;

c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;

d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

171. Plans should: distinguish between the hierarchy of international, national and locally designated Sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.

172. Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads. The scale and extent of development within these designated areas should be limited. Planning permission should be refused for major development other than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest. Consideration of such applications should include an assessment of:

a) the need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy;

b) the cost of, and scope for, developing outside the designated area, or meeting the need for it in some other way; and

c) any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.

173. Within areas defined as Heritage Coast (and that do not already fall within one of the designated areas mentioned in paragraph 172), planning policies and decisions should be consistent with the special character of the area and the importance of its conservation. Major development within a Heritage Coast is unlikely to be appropriate, unless it is compatible with its special character.

174. To protect and enhance biodiversity and geodiversity, plans should: a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated Sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and b) promote the

conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

175. When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative Site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the Site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

176. The following should be given the same protection as habitats Sites:

a) potential Special Protection Areas and possible Special Areas of Conservation;

b) listed or proposed Ramsar Sites; and

c) Sites identified, or required, as compensatory measures for adverse effects on habitats Sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar Sites.

177. The presumption in favour of sustainable development does not apply where development requiring appropriate assessment because of its potential impact on a habitats Site is being planned or determined.

178. Planning policies and decisions should ensure that:

a) a Site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and

c) adequate Site investigation information, prepared by a competent person, is available to inform these assessments.

179. Where a Site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

180. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health,

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living conditions and the natural environment, as well as the potential sensitivity of the Site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

181. Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual Sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.

182. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

183. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be reviSited through the permitting regimes operated by pollution control authorities.

Local Policy: The new Local Plan was adopted on the 22nd November 2016.

The key relevant policies from the Local Plan relating to ecology and nature conservation are Policy 22 (European Protected Sites) and Policy 23 (Natural Environment).

Policy 22 is detailed below:

- For residential development and student and tourist accommodation, mitigation measures for recreational impacts on European Sites will be required where development is proposed within the identified zones of influence around those European Sites that are vulnerable to adverse recreational impacts. Residential development, student and tourist accommodation within these zones of influence will be required to provide for appropriate management, mitigation and monitoring on Site, and/ or financial contributions towards off Site mitigation and management. This will need to be agreed and secured prior to approval of the development.

Policy 23 comprises a number of measures for development proposals including:

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- Development should conserve, protect and where possible enhance biodiversity and geodiversity interests and soils commensurate with their status and giving appropriate weight to their importance (3).
- All development must ensure that the importance of habitats and designated Sites are taken into account and consider opportunities for the creation of a local and county-wide biodiversity network of wildlife corridors which link County Wildlife Sites and other areas of biodiversity importance (3);
- The highest level of protection will be given to potential and existing Special Protection Areas, candidate and existing Special Areas of Conservation and listed or proposed RAMSAR Sites (3a).
- Development proposals within or outside an SSSI or Marine Conservation Zone which would be likely to adversely affect the Site (either individually or in combination with other developments) will not be permitted unless the benefits of the development, at this Site, clearly outweigh both the adverse impacts on the Site and any adverse impacts on the wider network of SSSI and Marine Conservation Zones (3b).
- Development likely to adversely affect locally designated Sites, their features or their function as part of the ecological network, including County Wildlife Sites, Local Geological Sites and Sites supporting Biodiversity Action Plan habitats and species, will only be permitted where the need and benefits of the development clearly outweigh the loss and the coherence of the local ecological network is maintained (3c).
- Adverse impacts on European and UK protected species and Biodiversity Action Plan habitats and species must be avoided wherever possible (i) subject to the legal tests afforded to them, where applicable (ii) otherwise, unless the need for and benefits clearly outweigh the loss (3d).
- Development must avoid the loss or deterioration of ancient woodland and veteran trees, unless the need for, or benefits of, development on that Site clearly outweigh the loss (3e).
- Development should avoid adverse impact on existing features as a first principle and enable net gains by designing in landscape and biodiversity features and enhancements, and opportunities for geological conservation alongside new development. Where adverse impacts are unavoidable they must be adequately and proportionately mitigated. If full mitigation cannot be provided, compensation will be required as a last resort (4).

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Appendix V

Shaft Collar Assessment of Adjacent Disused Shafts for Ecological Information

Report by
South Crofty Ltd

Shaft Collar Assessment for Ecological Information
South Carn Brea Diamond Drilling Program

DATE ISSUED: **17 August 2021**

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1 Introduction

South Crofty Ltd ("SCL"), a subsidiary company of Cornish Metals Inc. ("Cornish Metals"), wishes to conduct mineral exploration via a drilling program on various individual sites on the southern flank of Carn Brea in mid-Cornwall. Three surface drilling sites are planned, which will be utilised to drill multiple diamond drillholes predominantly of relatively short depths.

The drillholes are primarily designed to target a specific section of the Great Flat Lode that has not been previously mined. Diamond drilling conducted in the 1960's proved the existence of this unmined portion of the lode, with some promising results. SCL is planning a series of diamond drill holes to follow up on these historic drilling results and better understand the strike, dip, grade and subsequent economic potential of the Great Flat Lode and its associated mineralised structures in this area.

SCL are seeking to undertake the exploratory drilling programme under Schedule 2, Part 17 (Section K) of The Town and Country Planning (General Permitted Development) (England) Order 2015. Under the terms of this Order, SCL are obliged to notify the Mineral Planning Authority ("MPA"), Cornwall Council, that it is proposed to undertake such works and to confirm that such activities may be undertaken.

As part of the GPDO submission, ecological walkover surveys have been conducted in the vicinity of the proposed drill sites and have not identified any species or habitats that will be negatively affected by the propose drilling.

In addition to the walkover surveys, an additional survey assessing the status of known mine shafts in the area has been conducted to determine if any suitable potential bat roosts are in the vicinity of the drill sites, and if so, at what distance. This report provides information to this end, specifically in relation to potential bat roosts associated with disused mine shafts in the area of the proposed drilling operations and how operations have been sited to minimise any interaction with such species that have the potential to inhabit the area accordingly.

2 Drilling Program Overview

SCL has identified up to three potential sites (Figure 1) from which to drill multiple mineral exploration boreholes as part of this programme, with access to all sites agreed and finalised with the relevant landowner.

Figure 1: South Carn Brea Proposed Drill Sites

The drilling program is designed to target a specific mineral lode structure along a part its projected strike. The likely strike of this structure is already relatively well understood, and drill collar locations can therefore be designed in advance.

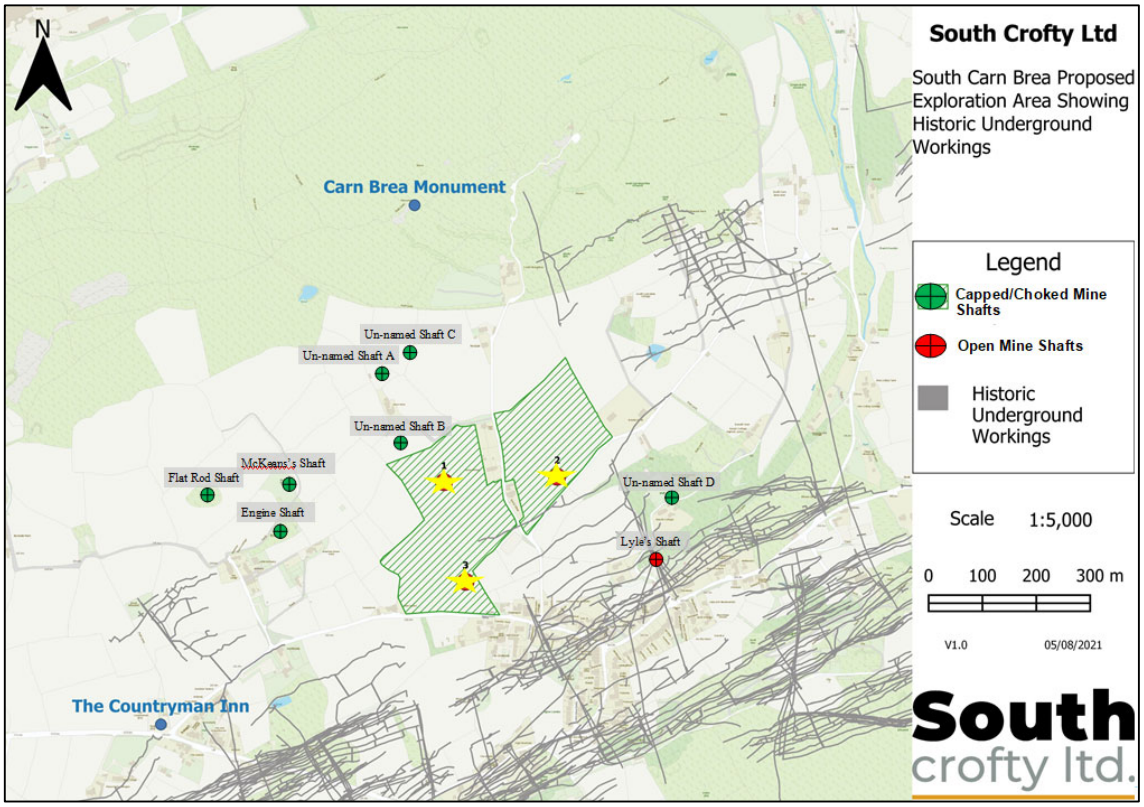
As bats are a protected species that are known to roost in open mine shafts, due consideration must be given in this regard when assessing drill collar locations. To ensure drilling activities do not materially affect any potentially roosting or hibernating bats, SCL will ensure no drill collar sites are located within 50m of any open mine shafts that may support bat populations. SCL has conducted the following survey of the surrounding area accordingly to ensure the location of any uncapped mine shafts are known and documented.

3 Shaft Identification

Following a review of archive records documenting the historic mine workings in the area and subsequent site investigation, SCL have identified all known shafts adjacent to the proposed drilling sites, (Figure 2). Shafts that have been found to be capped, or at least blocked at surface, are indicated by the green crosshair, whilst those that are uncapped, open and fitted with a Clwyd cap are indicated by the red crosshair.

The three western shafts form part of the old North Wheal Frances Mine and have been surrounded by active agricultural works for several decades. The three un-named shafts to the north of the proposed drilling sites are part of ancient workings most likely associated with South Carn Brea mine. No evidence of two of these sites now exists, with only a burrow marking the location of the other. The two shafts to the east of the exploration area were part of Wheal Basset mine.

Figure 2: Recorded Shafts Adjacent to Drill Sites



4 Shaft Assessment

Table 4.1: Identified Shafts and their Status

Shaft Name	Status	Plate Reference
Flat Rod Shaft – North Wheal Frances	Choked, with some subsidence, but infilled with vegetation and impenetrable	1
Engine Shaft - North Wheal Frances	Choked and completely overgrown	2
McKean's Shaft - North Wheal Frances	Choked and completely overgrown	3
Un-named Shaft A – South Carn Brea	No longer visible at surface	N/A
Un-named Shaft B – South Carn Brea	Burrow visible but shaft completely choked	N/A
Un-named Shaft C – South Carn Brea	No longer visible at surface	N/A
Lyle's Shaft – Wheal Basset	Grated, open to 90ft then capped below	4
Un-named Shaft D – Wheal Basset	Choked and not discernible amidst undergrowth.	5

Shafts that are confirmed as capped or choked and not open at surface cannot be viewed as potentially providing access to bats.

The three shafts of the old North Wheal Frances Mine have all been obscured by vegetation and agricultural activity over the years and appear to have been choked with debris or possibly capped, Flat Rod Shaft does appear to have experienced some subsidence around the collar area, but there is no clear opening into a shaft void below. None of these shafts can be viewed as being able to provide access for bats.

Two of the three unnamed shafts assumed to belong to ancient workings associated with South Carn Brea Mine have been completely obscured by agricultural activity and cannot now be traced on surface. The one shaft of this mine that is still evident,

possesses an unlevelled burrow, however, the shaft collar is not open due to having been infilled over many years and subsequently overgrown with vegetation. For reference, this shaft is approximately 110m away from Drill Site 1.

Of the two shafts associated with Wheal Basset to the east of Drill Site 2, only one, Lyle's Shaft remains open. The collar of this shaft is grated and open, with a plug fitted approximately 30m down the shaft. Whilst the limited open portion of this shaft could potentially facilitate bat roosting, for reference it is located approximately 240m distant from to Drill Site 2. The other shaft in the vicinity could not be identified as it appears to have been overlain by later development.

Following research and associated fieldwork, South Crofty Ltd have identified no mine shafts, open at the collar or otherwise, within 50m of any of the proposed drill sites at South Carn Brea.

APPENDIX I – Photographic Survey

Plate 1: Flat Rod Shaft – North Wheal Frances Mine – Choked at collar, with some signs of subsidence. Not sure if capped but well covered with vegetation and overgrowth

Plate 2: Engine Shaft – North Wheal Frances Mine – Choked and completely overgrown

Plate 3: McKean's Shaft – North Wheal Frances Mine – Choked and completely overgrown

Plate 4: Lyle's Shaft – Wheal Basset Mine – Open to 90ft depth and capped below this point.

Plate 5: Un-named Shaft D – Wheal Basset Mine – Shaft indistinguishable amongst undergrowth. Choked and not open.