

Our ref: AF/CW/220379
Your ref: 2382/APP/2023/2906
Email: angie.fenton@quod.com
Date: 13th February 2026



Planning Department
Hillingdon Council
Civic Centre
High Street
Uxbridge
UB8 1UW

For the attention of Michael Brigginsshaw

Dear Michael,

Planning application reference 2382/APP/2023/2906
Broadwater Lake, Moorhall Road, Harefield, UB9 6PE
Applicant response to London Borough of Hillingdon Planning Policy

We write on behalf of the London Borough of Hillingdon (LBH) ('the Applicant'), in response to the comments received by the LBH Planning Policy Team, issued to the Applicant on Monday 2nd February with regard to planning application ref. 2382/APP/2023/2906 for the proposed Hillingdon Water Sports Facility and Activity Centre (HWSFAC) at Broadwater Lake, Moorhall Road, Harefield, UB9 6PE ('the Site').

The Planning Policy Team raises no objections in principle to the Proposed Development. The points raised relate to matters of coordination and clarification. These points are addressed below.

1 Development within the Green Belt

The proposed development constitutes "appropriate development" in accordance with Paragraph 154 of the National Planning Policy Framework (NPPF) (December 2024). Even if considered "inappropriate development", Very Special Circumstances (VSC) exist to justify approval.

We welcome the Planning Policy Officer's acknowledgement that the proposed development would deliver significant social benefits for the borough. Whilst the economic benefits relate to the creation of apprenticeships, transferable skills, and attracting visitors to stimulate local businesses and the wider economy, these are positive aspects of the proposed development, which cumulatively contribute to very special circumstances along with the social and environmental benefits, such as the ecological enhancement works and significantly positive impacts on biodiversity.

As set out in the planning application, the social, economic and environmental benefits cumulatively outweigh any negative impacts on the Green Belt and meet the definition of VSC, in accordance with Paragraph 153 of the NPPF (2024).



Environmental Benefits

The Environmental Statement concludes at Paragraph 11.1.9 that the Proposed Development will not result in any likely significant adverse effects. Construction impacts will be temporary and reversible, while longer term impacts will be of low / negligible magnitude at worst and in most cases a net positive.

In responding to the planning application, Natural England have concluded that they have no objection, subject to appropriate mitigation being secured. Natural England confirm in their response that they have worked with the Applicant to develop a package of mitigation and enhancement measures as part of the proposal, as well as ongoing monitoring and management on the site.

The mitigation and enhancement measures are set out in the submitted Outline Mitigation, Enhancement and Management Plan.

2 Alternative Sites Assessment

Clarification on Scoring System

The Planning Policy Team have requested clarification regarding the scoring methodology used within the Alternative Sites Assessment (ASA).

Section 8 of the ASA sets out the scoring methodology using a Red, Amber, Green (RAG) framework. This system assesses the degree of difficulty in overcoming site constraints through mitigation or design, rather than ranking constraints against each other.

Shortlisted sites were subject to a Stage 2 Assessment, which includes Nature Conservation. Table 6 of the ASA states that this criterion requires that:

“The site must be able to be developed without having a significant impact on areas of ecological sensitivity including those of national importance, i.e. Site of Special Scientific Interest (SSSI) and National Nature Reserves (NNR)”.

Broadwater Lake scored ‘0’ under this criterion because ecological specialists had previously advised that the development would not result in significant impacts on the SSSI or sensitive ecological areas, particularly if disturbance is focused within the south-east corner of the Site. This conclusion has since been substantiated in the submitted Environmental Statement and Natural England’s formal confirmation of no objection, subject to appropriate mitigation being secured.



Omission of Ecological & Landscape Impacts in Planning Statement

The Planning Policy Team notes that Paragraph 6.68 of the Planning Statement does not explicitly reference ecological and landscape impacts on Broadwater Lake.

While this specific paragraph does not detail these matters, the ecological and landscape impacts of the Proposed Development are comprehensively assessed throughout the Planning Statement, the ASA and the Environmental Statement. These impacts have therefore been fully considered within the overall planning balance. This is a highly complex planning application and all documents must be reviewed in order to understand the effects and benefits of the proposed development.

Denham Quarry Viability Evidence

Denham Quarry was considered as a potential alternative location. However, this site is not financially viable, with estimated costs exceeding £26.5 million, which is the agreed maximum cost of the relocated scheme between HS2 Ltd, the Secretary of State for Transport and LBH.

This is evidenced in a publicly available report¹ prepared by HS2 which confirms that the estimated relocation cost of the former HOAC facility to New Denham Quarry would cost £55.1 million. The report includes a letter from the Secretary of State (dated October 2016) confirming the decision not to pursue the relocation of the former HOAC facility to New Denham Quarry. The letter states:

“...the expected cost of the Denham Quarry site, including optimism bias, is now £55.1m. This means there is a very real prospect of a significant expenditure of public money on relocation that will result in HOAC facing severe operating difficulties or failing to operate.

...For these reasons I have with regret decided we cannot pursue the Denham Quarry option further...”

The HS2 report – which includes detailed cost estimates and the Secretary of States’s letter - is enclosed with this response.

3 Conclusion

In summary, the Planning Policy Team raises no objection in principle to the Proposed Development, and the matters identified have been fully clarified in this response. We trust that this addresses the outstanding points and supports the positive determination of the application.

¹[https://www.parliament.uk/globalassets/documents/lords-committees/High-Speed-Rail/HOL-00823 The Colne Valley Park Promoter.pdf](https://www.parliament.uk/globalassets/documents/lords-committees/High-Speed-Rail/HOL-00823%20The%20Colne%20Valley%20Park%20Promoter.pdf)



Please do not hesitate to contact me should any further clarification be required.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Angie Fenton'.

Angie Fenton
Director

enc. HS2 Report (HOL/00823)



Appendix 1

Denham Quarry Viability Evidence

EXHIBIT LIST

Reference No: HOL/00823

Petitioner: The Colne Valley Park Community Interest Company

Published to Collaboration Area: Wednesday 23-Nov-2016

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2	P5745 ColneValleyPark_02_Construction.pdf (P5745)	4
3	P5746 ColneValleyPark_03_Operation.pdf (P5746)	5
4	P5747 ColneValleyPark_04_HS2_ColneValleyRegionalParkPanel_Tern	6 - 12
5	P5748 ColneValleyPark_05_Langley_Construction.pdf (P5748)	13
6	P5749 ColneValleyPark_06_Langley_Operation.pdf (P5749)	14
7	P5750 ColneValleyPark_07_HOAC_Summary.pdf (P5750)	15 - 23
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9	P5752 ColneValleyPark_09_HOAC_Noise_LikelyNoiseImpacts.pdf (P5	29
10	P5753 ColneValleyPark_10_HOAC_Noise_SiteSpecific.pdf (P5753)	30 - 53
11	P5754 ColneValleyPark_11_HOAC_Noise_Comparative.pdf (P5754)	54 - 60
12	P5755 ColneValleyPark_12_HOAC_HoC_Report_Feb2016.pdf (P5755)	61 - 63
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14	P5757 ColneValleyPark_14_HOAC_DfT_SOS_Letter.pdf (P5757)	66 - 67
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17	P5760 ColneValleyPark_17_HOAC_BucksCC_Letter_SOS_211016.pdf	72 - 73
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19	P5762 ColneValleyPark_19_NoiseMap1.pdf (P5762)	75
20	P5763 ColneValleyPark_20_NoiseMap2.pdf (P5763)	76



EXHIBIT LIST

Reference No: HOL/00823

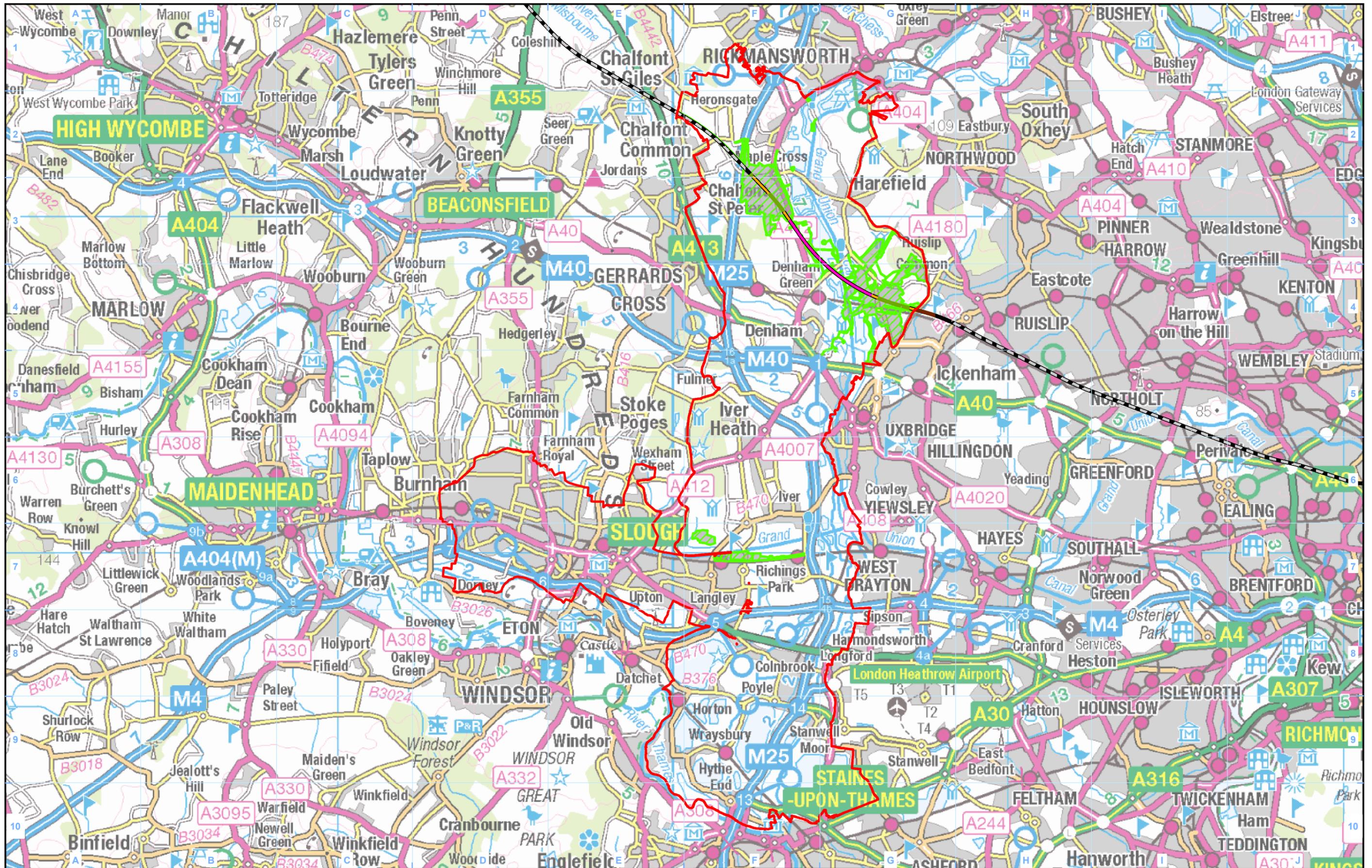
Petitioner: The Colne Valley Park Community Interest Company

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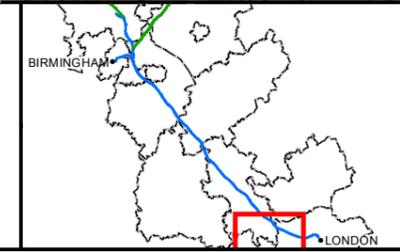
No	Exhibit Name	Page
21	P5764 ColneValleyPark_21_Letter_23Nov16.pdf (P5764)	77 - 79





Legend

- | | | |
|--------------------------------------------------|-----------------|--------------------------------------------|
| Phase One SES3 and AP4 ES alignment October 2015 | — Tunnel Portal | □ Area of Interest |
| — Bored Tunnel | — Viaduct | ▨ Area of Interest affected by Hybrid Bill |
| — Cutting | — Embankment | □ Hybrid Bill Limits |
| — Retaining Wall | | |



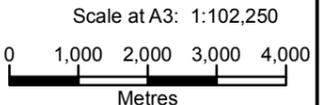
High Speed Two
Petitioner Location Plan
Reference Drawing

SC-04-816
Petitioner
Colne Valley Park CIC
Petition number
HS2-HS2-HY-PET-HOL-000823



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Doc Number: PH1-HS2-HY-MAP-000-005131



HS2 Colne Valley Regional Park Panel –Terms of Reference

4 March 2016 (Published Version)

Introduction

This document sets out the terms of reference for the HS2 Colne Valley Regional Park Panel following assurances by the Promoter to South Bucks District Council (and other parties) dated 8th June 2015 and the House of Commons Select Committee in June 2015. The terms of reference also build on the statement dated the 15 July 2015 from the House of Commons Select Committee responding to the request for a tunnel for the Colne Valley.

The Terms of Reference have been developed and agreed in a collaborative way with all members of the Panel and now take precedent over the assurances offered on the 8th June 2015 by the Promoter of HS2.

Membership

Membership of the Colne Valley Regional Park Panel (the Panel) will, with attendance as appropriate, consist of representatives of the following organisations:

- a) High Speed Two (HS2) Limited;
- b) Department for Transport;
- c) London Borough of Hillingdon;
- d) South Bucks District Council;
- e) Chiltern District Council
- f) Three Rivers District Council;
- g) Hertfordshire County Council;
- h) Buckinghamshire County Council;
- i) Natural England;
- j) Environment Agency (with knowledge of the local area);
- k) The Herts and Middlesex Wildlife Trust,
- l) The Bucks, Berks and Oxfordshire Wildlife Trust;
- m) The London Wildlife Trust and
- n) The Colne Valley Regional Park Community Interest Company.

An independent chair will be appointed for the Panel. Panel members will be involved in the appointment of this person.

Each member will submit a named individual to act as their 'lead' representative. A substitute for each member will also be named, to deputise if/when required, but all participants should aim to achieve continuity in the work of the Panel as far as practically possible.

During the lifetime of the Panel, additional members may be recruited/co-opted for their expert or unique insight, at the discretion of the Panel Chair for attendance at specific meetings. This may include members from the HS2 Design Panel, who will independently be considering the design proposals for the Colne Valley Viaduct and associated infrastructure

Function

Through collaboration and in a non-statutory role (and recognising that some members have a separate statutory role), the Panel will work in partnership to seek to harness local knowledge and pro-actively input into the design development of new landscape and ecological mitigation and enhancement, land use development and HS2 structures, (including the proposed Colne Valley viaduct), brought forward as part of HS2's Proposed Scheme in the Colne Valley Regional Park. This collaboration will be in recognition of the wider objectives of the Colne Valley Regional Park (listed in Annex A) and the requirements for HS2 stipulated by the HS2 Bill and its supporting documentation.

To complement this, the Panel will develop an 'HS2 Additional Mitigation Plan for the Colne Valley', which will identify additional landscape and ecological mitigation and enhancements within the Colne Valley Regional Park (geographic boundary as defined in Annex B to these terms of reference). These enhancements will be in furtherance and beyond the mitigation proposed within the HS2 Proposed Scheme. This may encompass proposals both within and outside the present HS2 Bill limits (in the case of the latter separate planning approvals and delivery mechanisms may be required).

In all it does the Panel will consider how best to respond to the social, economic and ecological aspects of the locality in addition to environment matters to achieve a more distinctive and sensitive outcome within the Colne Valley Regional Park.

The Panel will work collaboratively and in a timely way to consider the following:

1. Develop and co-ordinate recommendations to the relevant local planning authorities regarding HS2 Ltd's proposed landscape design within the Colne Valley Regional Park.
2. Develop and co-ordinate recommendations to HS2 Ltd for appropriate "Additional Mitigation Measures" for both the construction period and subsequent operation of the railway, subject to the accepted limitation that proposals 'do not unreasonably impact on the timely, economic and safe delivery and operation of the railway'.
3. Review proposals put forward by HS2 Ltd and other bodies, including the Colne Valley viaduct design, and co-ordinate recommendations across its members to the relevant local planning authorities.
4. To proactively input to and review design principles, policies and guidance produced by or on behalf of HS2 Ltd for the Colne Valley Regional Park.

To be effective the Panel will be kept informed as and when appropriate about other relevant HS2 fora and decision-making processes, including the HS2 Design Panel, the Ecology Technical Group, Growth Taskforce, LA Planning Forum, etc.

In assurances already given to some of the local authorities, the Secretary of State has confirmed that he will require the nominated undertaker to have regard to the comments made by the Panel as far as is reasonably practicable, and so far as it does not impact the timely economic and safe delivery and operation of the railway, and is relevant to the grounds on which the relevant planning authority would be entitled to refuse approval under Schedule 16 to the Bill.

Outputs

Over time the outputs of the Panel will change. Any such change will be subject to the agreement of its members.

The Panel will agree a 'Forward Plan' to outline the scope its work over a period of time. Starting at the end of 2015, it will continue throughout 2016 and into the detailed design phase post-Royal Assent. This Forward Plan will incorporate HS2 Ltd's latest construction programme for the area.

The Panel will be responsible for defining the scope and producing the 'HS2 Additional Mitigation Plan for the Colne Valley Regional Park' (or similarly titled document). This will include the development of additional landscape, ecological/bio-diversity, land-use and design proposals in areas of the Colne Valley Regional Park that are affected by HS2 Ltd (including the production of site design briefs for defined areas). The Panel will work collaboratively to identify how these proposals will be delivered and identify the necessary approvals that would need to be sought to facilitate this delivery.

The Panel will produce a communication strategy which will define how it will communicate its outputs to local communities and the frequency of these communications.

Management of information and input from members

HS2 Ltd will endeavour to make available all relevant project survey and technical information pertaining to the Colne Valley Regional Park area, where this would support the function and outputs of the Panel.

Any information provided to the Panel should be provided by the nominated undertaker in a timely manner to allow its members to have sufficient time to consider it in advance of meeting.

In the event that all members do not reach consensus on any particular matter then this will be appropriately minuted.

Comments/feedback received and given by DfT/HS2 Ltd will also be minuted.

It is recognised that the Panel members will have their own decision making constraints and processes that have to be followed in accordance with their organisation's procedures. Nevertheless, each member should take reasonable steps to ensure any formal views are provided in a timely manner that does not adversely affect the delivery programme, and represent the settled views of the organisation they represent.

Decisions

The Panel Chair will aim to reach a consensus amongst members and will provide recommendations to HS2 Ltd/the nominated undertaker as well as to the relevant local planning authorities.

HS2 Ltd/the nominated undertaker will have due regard as far as is reasonably practical to the outputs of the Panel, and so far as it does not impact the timely economic and safe delivery and operation of the railway, and is relevant to the grounds on which the relevant planning authority would be entitled to refuse approval under Schedule 16 to the Bill.

Chair

The position of the Independent Chair Person will be advertised and appointed by HS2 Ltd as soon as reasonably practicable, through a transparent recruitment process. He/she will need to have credibility amongst the Panel membership in relation to its terms of reference, including relevant local knowledge.

The Chair Person will be responsible for facilitating discussions and working with the members to help them reach consensus. The Chair shall be appointed for the duration of the Panel, unless otherwise agreed by the Panel members.

Meetings

The expectation is that the Panel will meet as appropriate to support its function and outputs, although this will usually be every 6 to 8 weeks. A standard meeting will be no longer than 2 hours duration.

Any Task and Finish Groups convened to drive forward specific proposals or pieces of work will need to meet as required to deliver outputs relating to the overall work programme.

The intention will be to hold all meetings within the Colne Valley area, either at the Denham Country Park Visitor Centre or other venues nearby.

Record keeping

HS2 Ltd will at its own cost provide secretariat for the Panel. In this capacity, HS2 Ltd will endeavour to:

- Circulate draft meeting minutes and any material discussed (including presentation slides and agreed changes to the forward agenda) at the previous meeting within two weeks of the date of the meeting;
- Circulate the draft agenda for the upcoming meetings two weeks prior to meeting for consideration by members of the Panel;
- Circulate the final agenda and any, non-sensitive materials one week prior to the Panel meeting;
- Ensure circulation to the agreed points of contact for each of the organisations invited to attend the Panel, and;
- Publish unless otherwise agreed by the Panel the final agreed minutes of meetings on HS2 Ltd's website and keep organisations, who have so requested, kept updated on matters considered by the Panel (please see Confidentiality section below).

Reimbursement of Costs

In accordance with the letter from Michael Hurn dated 16 December 2015 HS2 Ltd / the nominated undertaker will fund the production of the HS2 Additional Mitigation Plan for the Colne Valley Regional Park and related site specific design briefs (subject to the costs being reasonable and having been agreed by HS2 Ltd in advance). This will include local input into the landscape, land-use and design proposals for individual areas.

Reasonable administrative costs of the Panel including the direct actual expenses incurred by its members will be met by HS2 Ltd.

Any reimbursement of costs to members of the Panel will be administered by a separate agreement/memorandum of understanding with HS2 Ltd. Whilst these agreements will be subject to their own discussions, the level of re-imburement will be limited to the actual costs incurred by that member, so far as those costs are reasonable, appropriate and are required to support the function and outputs of the Panel.

By way of managing the costs incurred, member organisations should seek to limit the number of attendees that attend the Panel to that which is necessary and appropriate. In most part it is anticipated that no more than two staff members per organisation would need to attend meetings.

Confidentiality

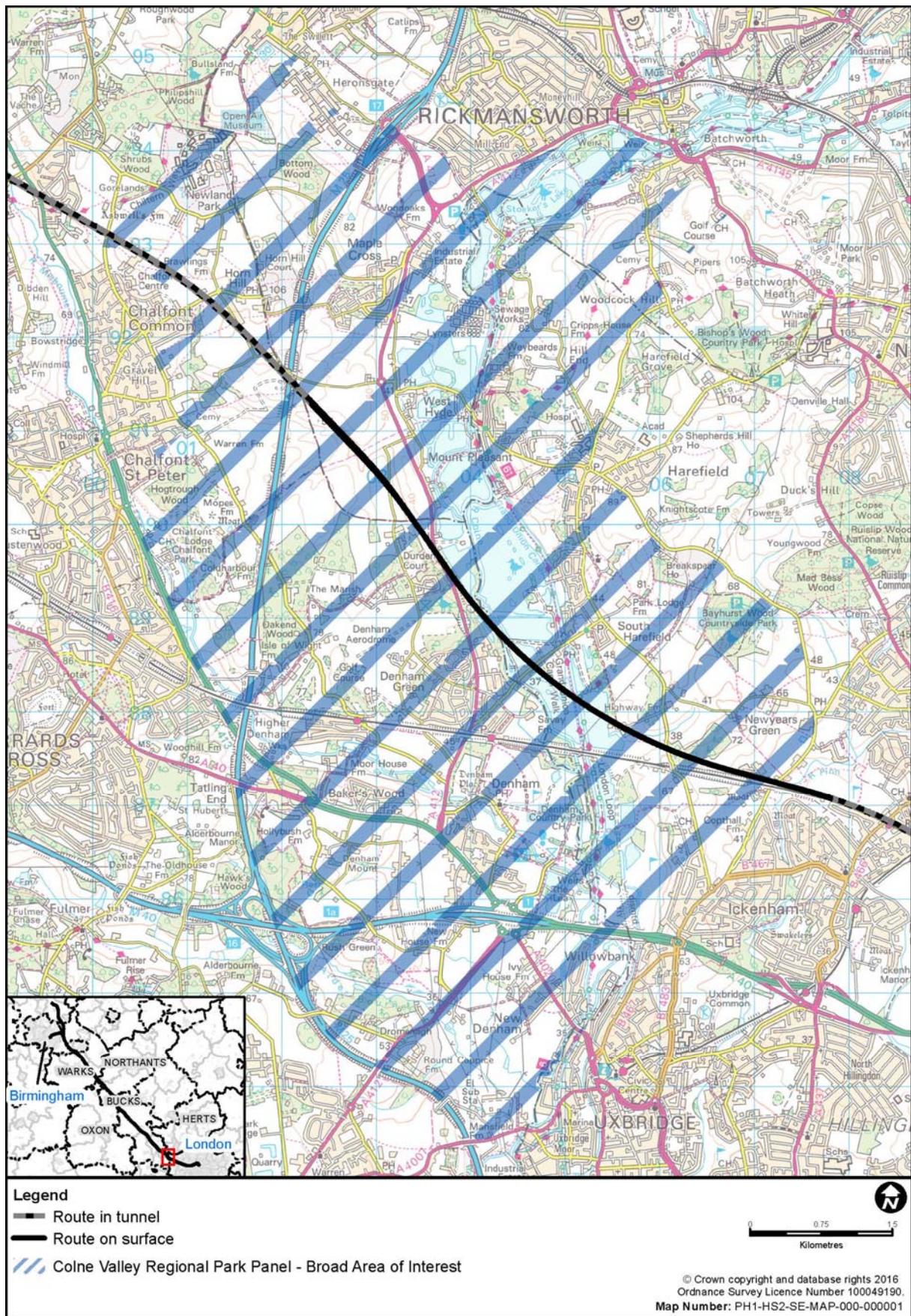
Meetings of the Panel are intended to be open and transparent. However, in some instances, to ensure that certain discussions can take place in a timely way and recognising the sensitive nature of some HS2 proposals it may be necessary to discuss and share information that is confidential in nature. In the event that this situation arises, HS2 Ltd will firstly confirm that the intention is to discuss confidential matters. Confidential information will only be discussed and shared with members of the Panel that have entered into a separate confidentiality agreement with HS2 Ltd.

Annex A

Objectives for the Colne Valley Regional Park:

1. **To maintain and enhance the landscape**, historic environment and waterscape of the Park in terms of their scenic and conservation value and their overall amenity
2. **To safeguard the countryside** of the Park from inappropriate development. Where permissible it will encourage the highest possible standards of design.
3. **To conserve and enhance biodiversity** within the Park through the protection and management of its species, habitats and geological features.
4. **To provide opportunities for countryside recreation** and ensure that facilities are accessible to all.
5. **To achieve a vibrant and sustainable rural economy**, including farming and forestry, underpinning the value of the countryside.
6. **To encourage community participation** including volunteering and environmental education. To promote the health and social wellbeing benefits that access to high quality green space brings.

Annex B



Hillingdon Outdoor Activity Centre (HOAC)

- In response to the Commons HS2 Select Committee Report in March, HS2 agreed to pursue relocation of HOAC to the New Denham Quarry site, but made it clear at the time that this proposed relocation could not be at any cost.
- Further work on the New Denham Quarry relocation option was therefore undertaken to develop a Planning Application and this was completed and an application made to BCC in June 2016. This is due to be determined late November early December 2016.
- The development of the scheme continued and terms for the necessary leasehold agreement and compensation arrangements were progressed to enable a fuller assessment of the scheme to be made in order to seek financial approval to proceed.
- The estimated cost of relocation of HOAC to New Denham Quarry has increased from initial estimates to c £55m.
- The proposed Denham Quarry relocation option presents a risk that HOAC would face severe operating difficulties in the future.
- Secretary of State wrote to HOAC (October 2016) advising them of his decision not to relocate to new Denham Quarry
- The Promoter has developed an alternative option to retain HOAC at Harefield number 2 lake. This reconfiguration scheme would allow HOAC to continue to operate throughout the HS2 construction and operational phases.

HOAC – Current Location



HOAC

New Denham Quarry Option

Rejected due to Cost and Operational Risk



New Denham Quarry – Cost Estimate

NEW DENHAM QUARRY RELOCATION

		Latest Est	Feb 2016 Estimate	Difference
COST SUMMARY				
Item description	Works	£k Cost		
Site clearance		170.4	157.2	13.2
Stage 1 Excavation		10,663.8	3,388.3	7,275.5
Stage 2 Excavation		4,254.1	1,398.8	2,855.3
Stage 1 Landscaping & Environmental works		1,158.2	1,019.2	139.1
Stage 2 Landscaping & Environmental works		1,499.2	1,390.4	108.8
Fencing		551.3	396.8	154.5
Highways, Tracks and Car parks		5,707.1	5,776.2	-69.1
Utilities and external lighting		2,384.2	2,194.5	189.7
Security CCTV		370.4	341.6	28.8
Clubhouse/Pavillion		2,437.5	1,178.8	1,258.7
Workshop and yard		1,344.5	2,730.8	-1,386.3
Rowing Club Boathouse		872.7	689.1	183.7
Shelters		319.9	1,171.5	-851.6
Fixed facilities		1,609.4	1,484.3	125.1
Waterfront stabilisation		1,417.4	1,376.3	41.1
Pontoons and Boat Launch Area		2,175.1	1,324.9	850.2
Staff Accommodation and Campsite		1,696.3	503.0	1,193.3
Sundry activity facilities		370.7	198.0	172.7
Land and property Compensation/works		5,099.8	0.0	5,099.8
Subtotal		44,102.1	26,719.7	17,382.4
Optimism Bias		11,025.5	-	11,025.5
Total Scheme Cost		55,127.7	26,719.7	28,408.0

Headline Cost Increases

Increase in Stage 1 and Stage 2 Excavation

Increase in all other areas

Increase in land and Property

P5750 (4) as a result of Optimism Bias

HOAC – Reconfiguration Option



Legend

- (e) = Existing / retained
- (r) = Relocated / New

Site Facilities / Activities

1. Existing storage (e)
2. Existing indoor space (e)
3. Overflow parking (e)
4. Relocated pontoons & Boat launch area (e)
5. Boat yard (e)
6. Entrance Plaza (r)
7. Main office / Clubhouse (r)
8. Piled pontoon (e)
9. 'Tunnelling' activity (e)
10. 'Low-ropes' activity (e)
11. 'Juggernaut' (e)
12. 'Giant Swing' (e)
13. Archery (e)
14. Staff accommodation (Including social area and drying facilities) (r)
15. Staff accommodation vehicle parking (r)
16. Boat storage including rowing boats (r)
17. Weighted rowing pontoons to lake (r)
18. Mitigation planting (r)
19. Parking for Angling (r)
20. Access road for Angling parking (r)
21. Campsite parking and drop-off area (r)
22. Camp-fire location (r)
23. Camping (r)
24. Camping facilities (washing/toilet block) (r)
25. Woodland activities (r)
26. Open-space activities (inc. 'Sheep pen') (r)
27. Ecological pond (inc. dipping platforms) (r)
28. Pedal karting track (r)
29. High ropes and climbing wall (e)
30. Zip-line (e)
31. Workshop and facilities (e)
32. Existing vehicle parking facilities (e)
33. Vehicle barrier (e)
34. Main entrance (e)

Existing Shelters - Retained (e):

- S1. 'Mayflower' Shelter
- S2. 'Discovery' Shelter
- S3. 'Cutty Sark' Shelter
- S4. 'Endeavour' Shelter
- S5. Reception Shelter
- S6. 'Victory' Shelter
- S7. 'Smugglers' Shelter
- S8. 'Everest Camp' Shelter
- S9. Archery Shelter.

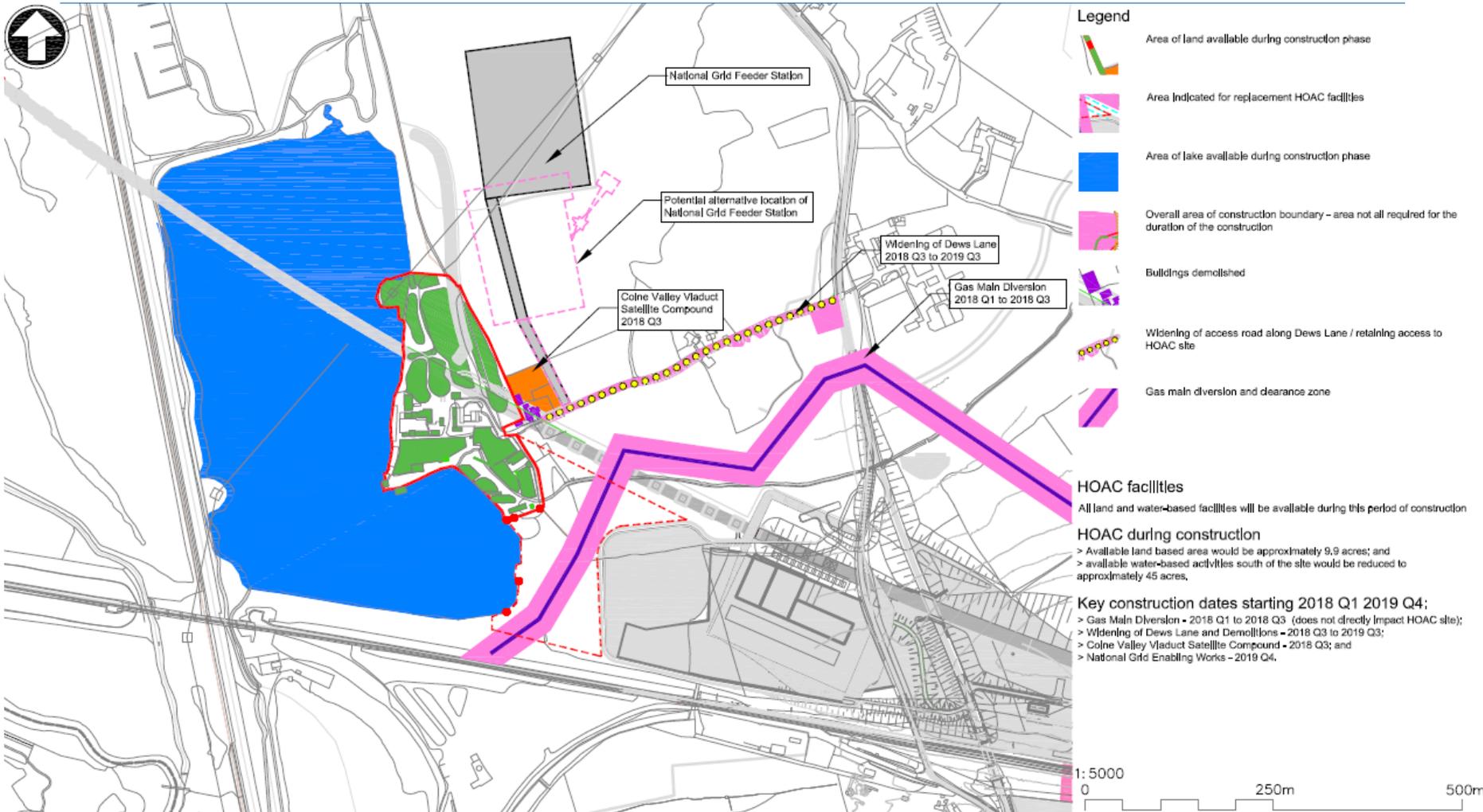
Relocated Shelters - New (r):

- S10. 'Grandstand' Shelter
- S11. Rowing Shelter
- S12. Camping Shelter no.1
- S13. Camping Shelter no.2

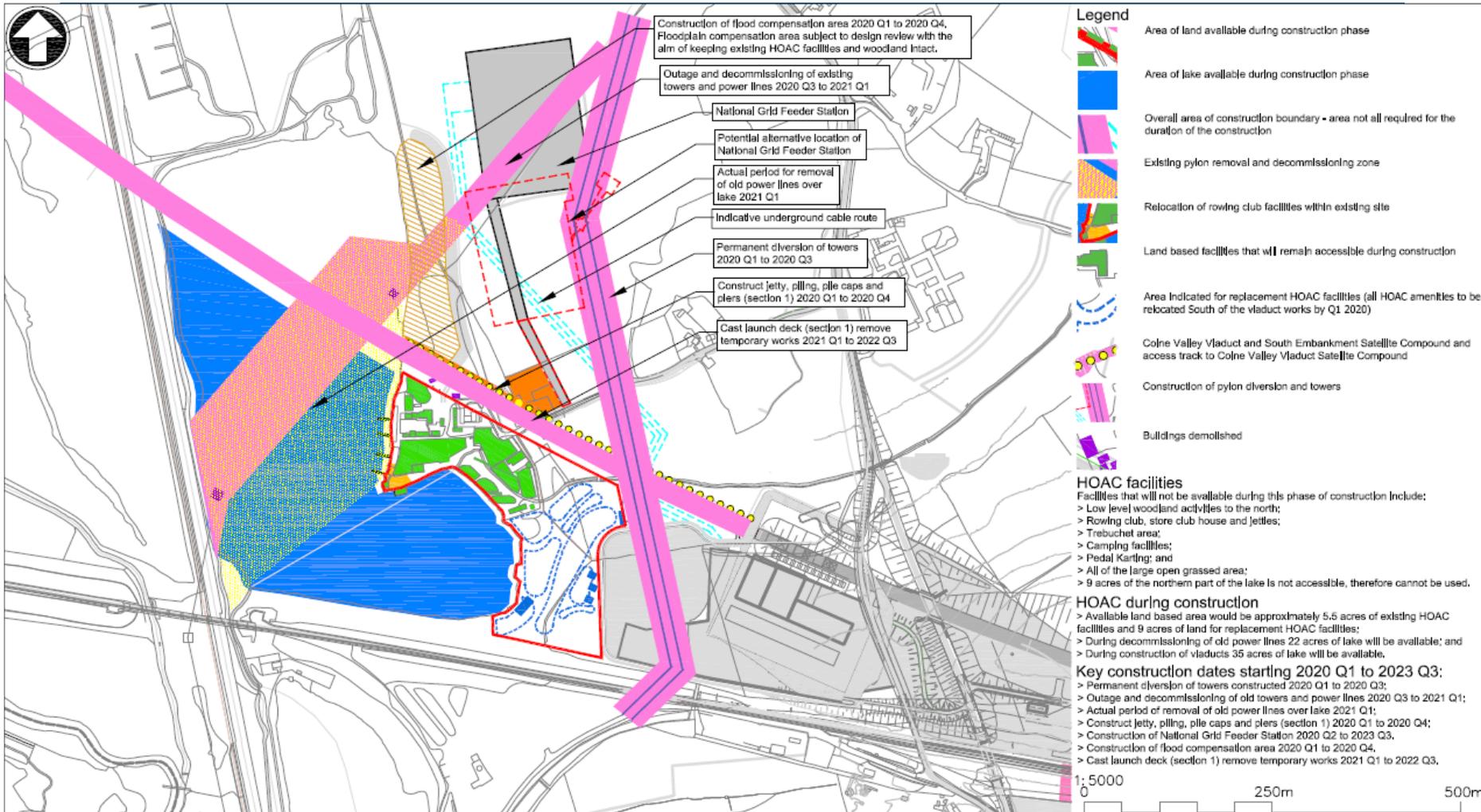
- Existing woodland to be retained
- Proposed mitigation woodland planting
- Relocated HOAC facilities
- Public Right of Way
- Footbridge

P5750 (5)

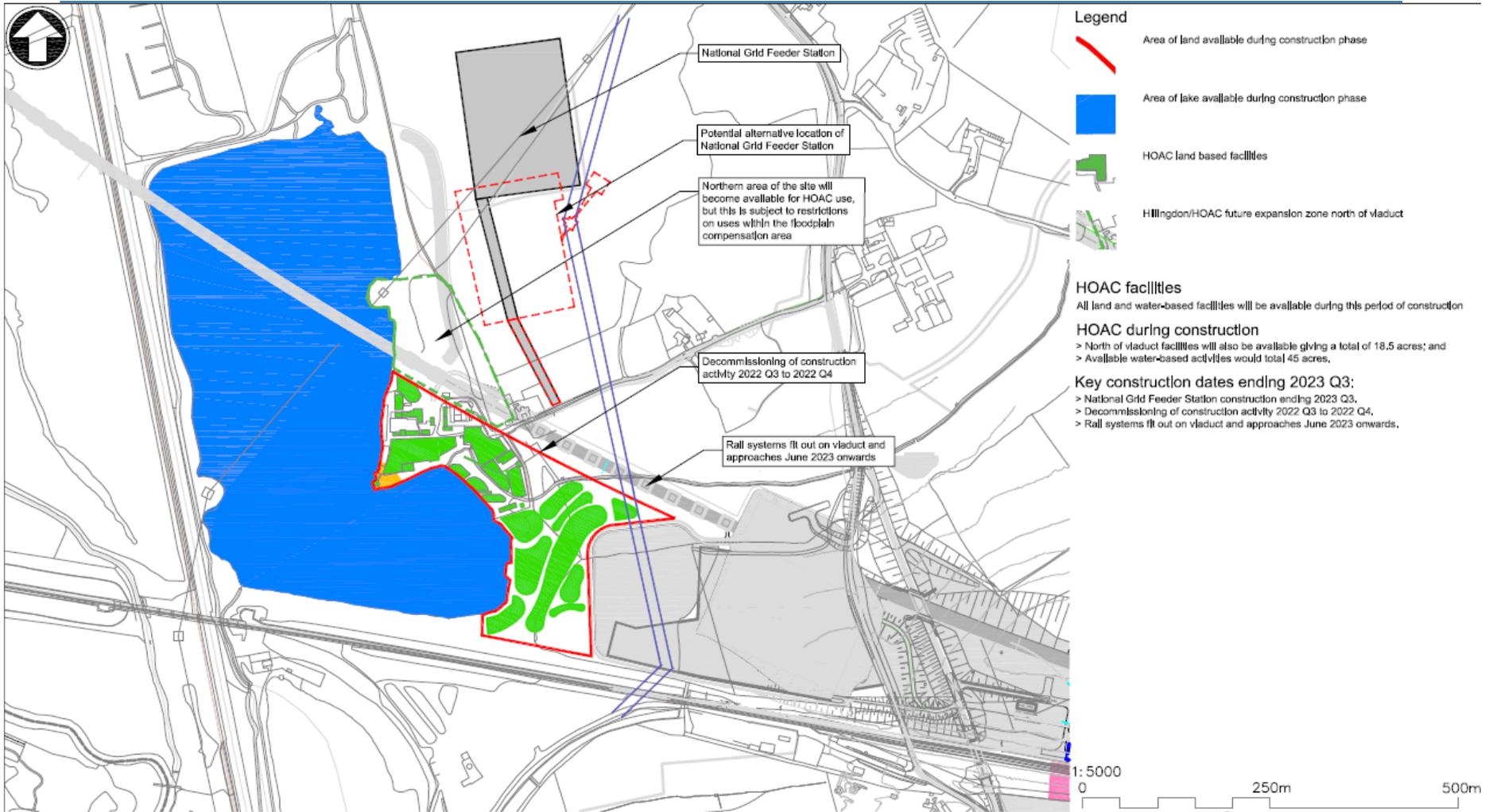
HOAC – Reconfiguration Option – Phase 1



HOAC – Reconfiguration Option – Phase 2



HOAC – Reconfiguration Option – Phase 3



HOAC – Reconfiguration Option

HILLINGDON OUTDOOR ACTIVITY CENTRE

Reconfiguration Options - Remain at Harefield

COST RANGE SUMMARY		
Item Description	£k Cost	£k Cost
Site Clearance	151.0	151.0
Planting and grassland	34.9	34.9
Fencing	313.9	313.9
Safety Booms for lake	417.1	417.1
Roads, tracks and car park	535.2	535.2
Culverts and bridges	298.5	298.5
Utilities	337.8	337.8
External Lighting & CCTV	349.4	349.4
Buildings and shelters	4354.3	320.0
Waterfront and Pontoons	924.8	688.5
Activity Facilities	725.2	651.5
Noise barrier	0.0	336.4
Total Scheme Costs Range	8442.0	4434.2

Aerodynamic Effects Study of the proposed HS2 viaduct over Harefield no. 2 lake on sailing activities

Introduction

- In order to more completely understand the impact of the HS2 viaduct on the sailing potential at Harefield a search of potential consultants and organisations was instigated.
- The renowned Wolfson Unit at Southampton University in conjunction with RWDI (Consulting Engineers and scientists) were selected
- The two organisations have previously worked on similar studies and HS2 agreed a contract in September for them to construct a model of the existing HOAC centre and lake and test it in a wind tunnel with and without a viaduct in order to understand the viaduct impact.

Study objectives:

- To understand the impact of the HS2 viaduct will have upon the sailing activities of HOAC;
- To quantify the wind environment of the lake in the current and post viaduct construction configurations;
- To offer recommendations to minimise the impact on sailing activities;
- To highlight areas of change to areas of sailing for inexperienced people and for other watersports

Study timeframe:

- Wind tunnel experiment test – Completed Nov 2016
- Sailing analysis – Dec 2016
- Study completion date – Dec 2016

University of Southampton's Wolfson Unit - Marine & Industrial Aerodynamics consultant

Website of the University of Southampton's Wolfson Unit

<http://www.wumtia.soton.ac.uk/>

WOLFSON UNIT
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OUTLINE PROPOSAL

Date 25th May 2016

Our Ref 4438

Your Ref Abdul Salique

Client	HS2 Ltd.
Title	Study of the aerodynamic effects of the proposed Viaduct over Harefield No. 2 Lake on sailing activities

1 INTRODUCTION

This proposal outlines a programme of work to inform HS2 and other parties including the Hillington Outdoor Activity Centre (HOAC) on the aerodynamic effects of the proposed HS2 Railway Viaduct. It has been prepared following a conversation with Abdul Salique of HS2 Ltd.

The aim of the work is to provide information on the extent to which the proposed viaduct will affect the sailing and watersport activities of the HOAC on its adjacent lake and to offer recommendations with regards to minimising the impact.

2 BACKGROUND

HOAC is a sailing and water sports centre adjacent to Harefield No. 2 Lake, in the Colne Valley regional park. It has been proposed that as part of the high speed rail link (HS2) between London and Birmingham a 15m high Viaduct will be constructed across the lake.

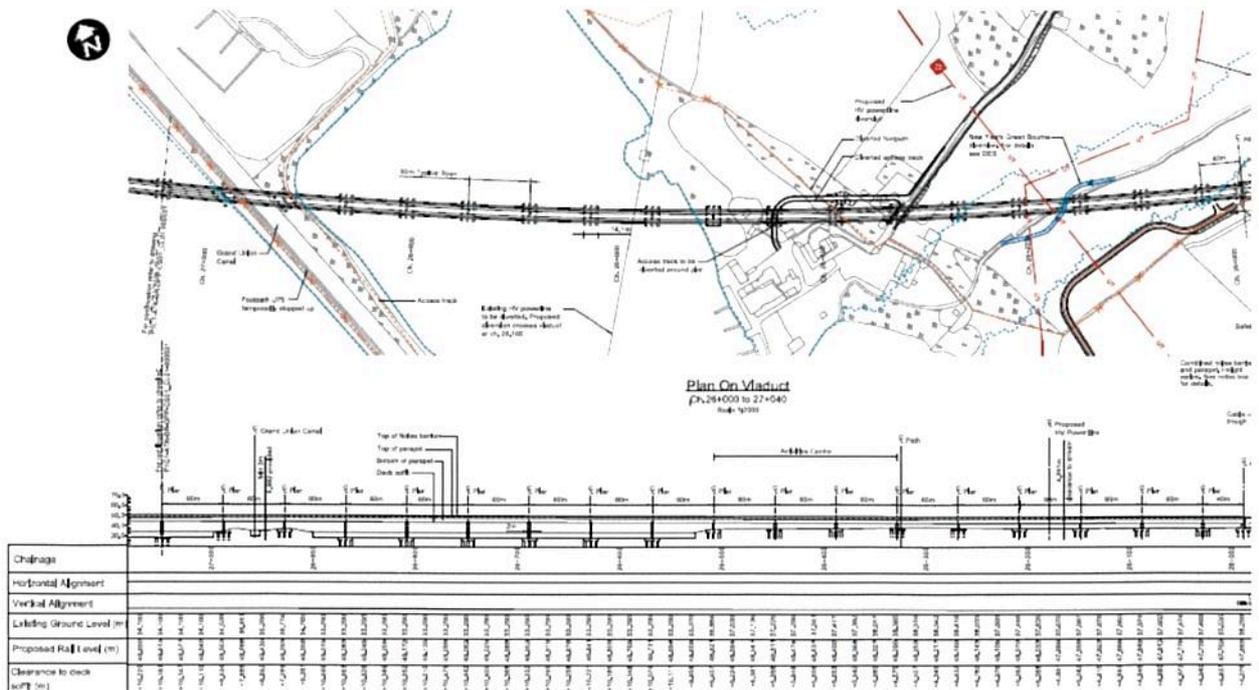


Figure 1: Map of the Lake and the proposed Viaduct

In order to understand the impact that the viaduct will have upon the sailing activities of HOAC a study is to be commission as part of the HS2's environmental impact assessment.

3 WORK PROGRAMME

It is proposed that wind tunnel tests are to be conducted to quantify the wind environment of the lake in the current and post viaduct construction configurations.

3.1 Experimental Testing

It is necessary to construct a scale model of the lake, surrounding buildings and topology and to test through 360 degrees of wind angles at 10 degree intervals. The scale model will be constructed on a turntable which can be rotated through 360 degrees to get the full range of wind data. The wind speeds and direction at a range of locations will be measured using suitable instruments positioned across the entire sailing area.

A greater density of measurements including a measure of the levels of fluctuation will be required in the vicinity of the Viaduct to determine the flow speeds, directions and variation over time that would be experienced if vessels were to navigate through or nearby.

The Wolfson Unit does not have the facilities to recreate and conduct an environmental wind tunnel test. On previous projects, the Wolfson Unit have used data from RWDI Ltd.

The tests will be conducted at a single true wind speed and therefore the ratio between true wind speed and local wind speed and direction will be determined for each measurement location.

It will be possible to source meteorological data on the wind environment with regards to direction, speed and frequency throughout the year at this geographical area.

Information on the dinghy classes sailed and typical areas and methods of operation in the dock will be sought by direct approach to their representative, if appropriate.

3.2 Sailing Analysis

The sailing analysis uses the Wind Tunnel data and our techniques to quantify the effects of the changes to the wind environment. Unlike other planning areas, such as pedestrian comfort or guidelines relating to levels of loss of light, the impact of developments on sailing activities has no published guidelines. The objective of this sailing analysis is to provide a method with supporting evidence which can inform all related parties.

The effects of the development on the wind environment will be considered in terms of the likely impact on sailing activities. The Wolfson Unit is has a wealth of experience in the areas sailing performance, vessel stability and safety assessment. There are highly skilled and experienced dinghy sailors among the Wolfson Unit staff and their views on the effects of the changes will also be incorporated. The factors considered will include the ease and safety of sailing and highlight areas where this will change as a result of the proposed development, durations/percentage of time of this change, potential actions and guidance for operation that will reduce the impact. This will be presented in a report including graphical plots and tables to communicate the information clearly to a range of readers.

Due to the positioning of the viaduct and its orientation across the lake, an assessment will also be made into the changes in good quality available sailing area based upon wind direction.

Particular attention will be given to the fact many sailors will be inexperienced due to the sailing centre training people to sail and how this impacts of what would be acceptable.



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CONSULTING ENGINEERS
 & SCIENTISTS



8th June 2016

Tom Partington
 Wolfson Unit
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Dear Tom,

Re: **Fee Proposal for Harefield Outdoor Activity Centre**
RWDI Reference No. 1603279

Email: T.C.Partington@soton.ac.uk

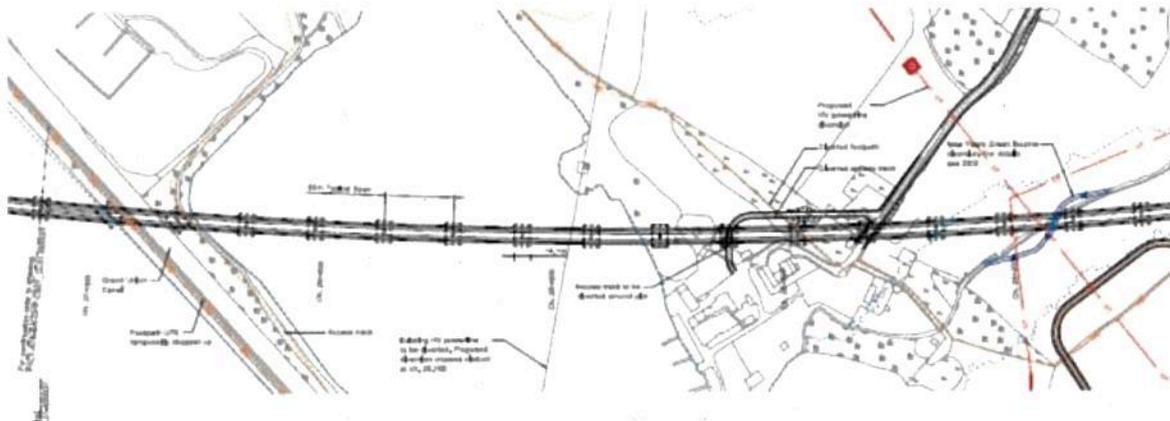
Thank you for your recent enquiry of 2nd June 2016 requesting confirmation of fees for a Pedestrian Comfort and Sailing Assessment on the Harefield Outdoor Activity Centre.

The Harefield Outdoor Activity Centre is a sailing and water sports center adjacent to Harefield No2 lake, in the Colne Valley regional park. It has been proposed that as part of the high speed rail link (HS2) between London and Birmingham a 15m high Viaduct will be constructed across the lake.

You have requested that we undertake the following Wind Tunnel Studies:

- Wind Assessment on the lake for the current condition.
- Wind Assessment on the lake including the proposed Viaduct
- Additional measurements adjacent to the viaduct (Pedestrian Comfort Assessment)

We would build a scale model of the HOAC site. A grid of measurement points would distributed across the sailing area to measure the wind speed and direction for both the before and after construction of the Viaduct. *A plan showing the location of the Viaduct is shown below.*



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HOAC – Likely Noise Impacts

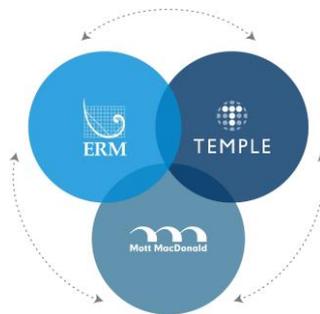
- A comparison of the day-time noise climate at HOAC during railway operations with that at similar facilities has been carried out using publically available information :Technical Note TN-HOAC Other sailing clubs
- Under Option 2 daytime predicted LAeqs are in the range of 55-60 dB at the assessment locations to the south of the railway and are similar to those at Datchet sailing club and Longridge activity centre
- Given the potentially safety critical nature of warnings from supervisors to students a site specific noise risk assessment was undertaken into this aspect : C252-ETM-EV-REP-020-000257_P03
- The maximum noise level during an HS2 train pass-by results in the Speech Interference Level being assessed as 'Fair' to 'Good' compared with the minimum standard considered acceptable of 'Poor' (BS EN ISO 9921:2003 Ergonomics – Assessment of speech communication)
- The safety of students using the facility is not predicted to be compromised by the operation of HS2 trains
- Construction noise will be managed in accordance with the requirements of the local authority under a CoPA Section 61 consent



C252–Country South

HOAC Site specific noise risk assessment

Document Number: C252-ETM-EV-REP-020-000257_P03



Document History:

Revision	Date	Prepared by	Checked by	Approved by	Reason for Issue
P01	23/9/2016	John Fisk	Dani Fiumicelli	Chris Thomas	Draft for discussion
P02	3/10/2016	John Fisk	Dani Fiumicelli	Chris Thomas	Draft for discussion
P03	13/10/2016	John Fisk	Dani Fiumicelli	Chris Thomas	For issue

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1 Scope and Methodology

The following report assesses the effect on urgent safety related speech communication during HOAC activities. This report covers the effect on short verbal safety warnings from a supervisor to a student undertaking an activity at relatively close distances. This involves calculation of the Speech Interference Level (SIL¹) to assess the likely intelligibility of a communication based on various assumptions including the distance between speaker and listener, the loudness of the speaker's voice and the level of extraneous ambient noise. Based on this type of communication, the SIL performance rating corresponding to a subjective intelligibility description of Poor is considered acceptable.

The report assesses the SIL during urgent verbal alerts and warnings at short distance at the existing HOAC site based on existing ambient noise levels measured during a noise survey (details are provided in the report). The effect on the SIL during typical and highest noise level months of construction is assessed as well as during operation of HS2 from train pass-bys.

Potential mitigation measures are presented for both construction and operation phases in order to minimise so far as is reasonably practicable the adverse effect on speech intelligibility at the site to determine whether the acceptability criterion is met

¹ BS EN ISO 9921:2003 Incorporating Corrigenda Nos. 1 and 2 - Ergonomics - Assessment of speech communication

2 Standards and Guidance

2.1 BS EN ISO 9921:2003 Incorporating Corrigenda Nos. 1 and 2 - Ergonomics - Assessment of speech communication

The aim of standardization in the field of the ergonomic assessment of speech-communication is to recommend the levels of speech-communication quality required for conveying comprehensive messages in different applications. The quality of speech communication is assessed for the following cases:

- warning of hazard;
- warning of danger;
- information messages for work places, public areas, meeting rooms, and auditoria.

For some applications, direct communication between humans is considered while, in others, the use of electro-acoustic systems (e.g. PA systems) or personal communication equipment (e.g. telephone, intercom) will be the most convenient means of informing and instructing or exchanging information.

It is essential that, in the case of verbal messages, a sufficient level of intelligibility is achieved, in the coverage area. If this cannot be achieved, non-voice warning signals or visual warning signals may be preferable.

The communications might be directly between humans, through public address or intercom systems or by pre-recorded messages.

This International Standard specifies the requirements for the performance of speech communication for verbal alert and danger signals, information messages, and speech communication in general. Methods to predict and to assess the subjective and objective performance in practical applications are described and examples are given.

In order to obtain optimal performance in a specific application, three stages can be considered:

- a) specification of the application and definition of the corresponding performance criteria;
- b) design of a communication system and prediction of the performance;
- c) assessment of the performance for *in situ* conditions.

Table 1 below summarises recommended minimal performance ratings for intelligibility and vocal effort in various applications.

Table 1: Recommended minimal performance ratings for intelligibility and vocal effort in various applications

Application	Minimum intelligibility rating	Maximum vocal effort
Alert and warning situations (correct understanding of simple sentences)	Poor (SIL ¹ 3 to 10dB)	Loud (L _{s,A,1m²} 72dB)
Alert and warning situations (correct understanding of critical words)	Fair (SIL 10 to 15dB)	Loud
Person-to-person communications (critical)	Fair	Loud
Person-to-person communications (prolonged normal communication)	Good (SIL 15 to 20dB)	Normal (L _{s,A,1m} 60dB)
Public address in public areas	Fair	Normal
Personal communication systems	Fair	Normal

Notes: 1 – Speech Interference Level (SIL); 2 - $L_{S,A,1m}$ Equivalent continuous A-weighted sound-pressure level of the speech at a distance of 1 m in front of the mouth.

The intelligibility is related to the speech interference level (SIL) which is a method to predict or to assess the speech intelligibility in cases of direct communication in a noisy environment. For people with a slight hearing disorder (in general the elderly) or non-native speakers or listeners, or for both in combination, a 4 dB to 5 dB improvement in the signal-to noise ratio is required for similar intelligibility. The intelligibility rating relates to the SIL as shown in **Table 2**, below.

Table 2: Intelligibility Rating related to SIL

Intelligibility rating	SIL, dB
Excellent	> 21
Good	15 to 21
Fair	10 to 15
Poor	3 to 10
Bad	< 3

The noise level of speech at the listener ($L_{S,A,L}$) depends on the vocal effort which is expressed as the sound level 1m in front of the mouth ($L_{S,A,1m}$). The vocal effort may need to increase in areas of high ambient noise level. Point source distance attenuation is used to calculate the speech level at the listener from the speech level at 1m; this is applicable up to around 8m.

The SIL can be calculated from determination of the speech interference level of noise L_{SIL} which is the arithmetic average of the ambient noise in four octave bands with the central frequencies 500 Hz, 1 000 Hz, 2 000 Hz and 4 000 Hz. The SIL is given by the difference between the speech level $L_{S,A,L}$ and the speech interference level of noise L_{SIL} , both determined at the listener’s position ($SIL = L_{S,A,L} - L_{SIL}$).

2.2 Alternative speech sound pressure levels

A previous assessment of speech interference levels has been carried out for HS2 at the Dallas Burston Polo Club. This uses alternative speech sound pressure levels based on a large study that was undertaken by Pearsons, Bennett and Fidell² during the 1970s investigating the “usual” speech levels in a range of contexts, including classrooms, homes, hospitals, trains, and airplanes. The speech level at 1m ($L_{S,A,1m}$) is 89dB for shouted male voices and 82dB for shouted female voices. When the correction provided in BS 9221:2003 for the quality of human speech decreasing for vocal efforts in excess of 75dBA is applied this is $L_{S,A,1m}$ 83dB for male voices and 79dB for female voices. For simplicity based on this study, an average $L_{S,A,1m}$ of 81dB may be used for assessment.

3 HOAC Activity Description

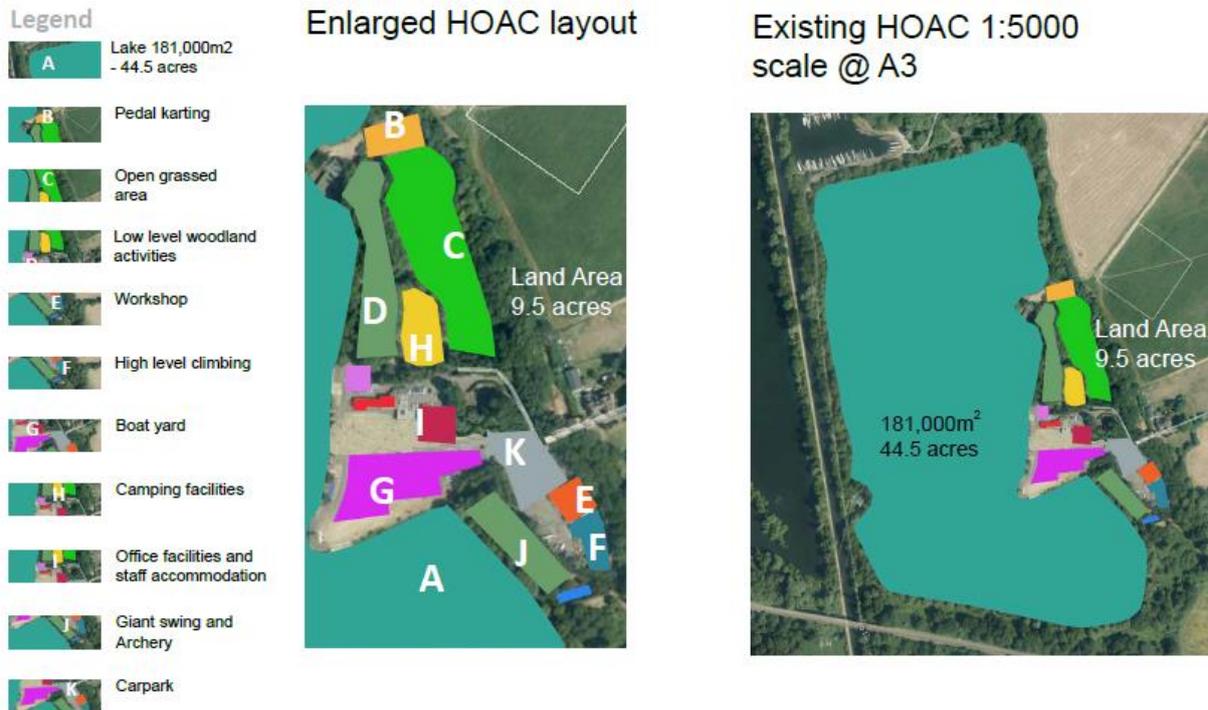
The HOAC provides water-based and land-based outdoor activities all year round. Users include local people, education groups, community groups and those with disabilities for whom specific facilities are in place.

²Pearsons, Bennett and Fidell (1977). Speech Levels in Various Noise Environments. United States Environmental Protection Agency, Report EPA-600/1-77-025.

Land based activities include archery, a swing complex, woodland activity area, low and high ropes, caving, climbing/bouldering, pedal karting, BBQ area and a campsite.

Water based activities include windsurfing, canoeing, power boating, dinghy sailing as well as floating/rowing pontoons and a slipway for launching boats. **Figure 1**, below, shows the location of activities on site.

Figure 1: HOAC site layout



4 HOAC Safety Critical Communications

During supervision of activities, there may be a need for a supervisor to alert or warn a student of a hazard. In general, clearly pronounced short messages are required for alert and warning situations. Hence, simple sentences should be understood correctly even under adverse conditions, high environmental-noise levels, the speaker shouting, etc. This is equivalent to the requirements of “Alert and warning situations (correct understanding of simple sentences)” in **Table 1**.

The scope of this assessment is to concentrate on the most safety critical communications which are considered to be alert and warning situations (correct understanding of simple sentences) during supervision of activities. Based on the above and observations of activities on site, **Table 3**, gives assumptions regarding the alert and warning communications which have been used in the assessment.

Table 3: Assumptions regarding HOAC safety critical communications

Activity	Minimum intelligibility rating & Speech Interference Level (SIL, dB)	Maximum Vocal effort & L _{S,A,1m} , dB	Typical Distance of speaker to listener (m)	Typical Length of communication (typical example communication)	Speech level at maximum distance L _{S,A,L} , dB
Supervision – alert/ warning on Land	Poor (SIL3 to 10dB)	Loud (L _{S,A,1m} 81dB)	Approximately 3m	1 to 5 seconds (“Name’ ...Stop!”)	72
Supervision – alert/ warning on Water	Poor (SIL3 to 10dB)	Loud (L _{S,A,1m} 81dB)	Approximately 3m	1 to 5 seconds (“Name’ ...Stop!”)	72

5 HOAC Safety Impact Criteria

The HOAC safety assessment impact criteria will be based on achieving the speech interference level (SIL) for activities listed in table 2 also accounting for the following:

- ‘typical’ noise during construction (plant noise) and operation (as per existing);
- ‘typical’ noise events during construction (piling) and operation (train pass by);
- Length of communication and events and therefore:
 - how likely the communication will be interrupted by events;
 - how much of the communication will be interrupted by events.

Consideration will also be given to the existing conditions, and therefore what the HOAC currently operates under and the change which may be brought about from construction and operation of HS2.

6 Baseline Survey Methodology

6.1 Method

6.1.1 Overview

The baseline noise survey at the HOAC site is to check existing noise levels experienced at current locations of activities and proposed activity locations. This will indicate whether impact thresholds are currently exceeded at locations currently used for activities or proposed to be used for activities.

The survey involved short term measurements completed at measurement positions across the site representative of both existing activity locations and potential future activity locations. The measurements include two locations on the lake. Measurements of both ambient noise (without activity noise) and activity noise have been completed. Measurements at each position have generally been repeated at least twice as appropriate.

6.1.2 Measurement Positions

Figure 2 shows the measurement positions. The locations were based on where activities take place in addition to a measurement at the south of the site for an idea of worst case noise exposure to the site.

Figure 2: measurement locations



6.1.3 Measurements

Weather conditions such as rainfall and wind speed was noted during the survey and measurements were discontinued where conditions are not suitable (generally it was dry with light wind).

Measurements were between 5 and 15 minutes period as appropriate. All measurements included octave band and A-weighted L_{eq} , $L_{max,F}$, L_{10} and L_{90} .

Noise sources were noted during each measurement, in particular the activities ongoing during the survey, the railway line and the aggregate facility to the south of the site.

6.1.4 Equipment

The measurement equipment used is detailed in **Table 4**. The measurement system was field calibrated before and after measurements. There was no significant change in calibration levels. All the measurement equipment is subject to current certificates of periodic validation traceable to national and international standards. Copies of calibration certificates are available upon request. In addition, an anemometer was used to check wind speeds during the measurements.

Table 4: Survey equipment

Manufacturer	Item	Type	Serial Number	Calibration date
01dB	Sound level meter	SOLO	65546	15/06/2016
01dB	Sound level meter	SOLO	65554	12/07/2016
01dB	Sound level meter	SOLO	65547	12/07/2016
Rion	Calibrator	NC 74	34773047	19/01/2016

6.2 Baseline Survey results

Detailed survey results are contained in **Appendix 1** including $L_{Aeq,T}$, L_{AFmax} of each attended measurement along with a description of the noise sources contributing to the measurement. As summer activities were ongoing on both the land and lake during the survey, most measurements were affected by noise from these activities. Some measurements were not affected, however, and are representative of the typical ambient noise levels at those locations. Measurements have been compared to the results of the ambient noise survey undertaken for the HS2 environmental statement on Dews Lane to check whether ambient noise levels are typical and they were similar. For those measurement positions of ambient noise only, mid frequency octave band $L_{eq,T}$ and L_{Fmax} are also presented in **Appendix 1**.

7 Baseline Assessment

7.1 Assessment locations

Assessment locations are illustrated on the attached **Figure 3**. Locations have been chosen to reflect locations throughout the site which are where different activities are carried out both currently and in a proposed alternative layout when HS2 is under construction or in operation.

Table 5 below gives the activities assumed to be carried out at each location and therefore the main safety critical communications which may be required at the locations. Table 5 also present the baseline noise levels at each location due to both general ambient noise (L_{Aeq}) and typical noise events (L_{Amax}). Also included is the speech interference level of noise (L_{SIL}) for both ambient noise and noise events calculated from the measured octave band data presented in **Appendix 1**.

Table 5: Baseline noise levels at assessment locations

Location ID	Safety critical communications relevant to location	Activity	Typical Daytime Baseline Ambient L_{Aeq} , dB	Typical Baseline Event noise level L_{AFmax} , dB	Speech interference level of noise L_{SIL} , dB (Ambient)	Speech interference level of noise L_{SIL} , dB (Events)	Baseline Measurement used as representative of location
I (711001)	Supervision on Land	-	53	64	45	59	A1
E5	Supervision on Land	Cutty Sark	53	64	45	59	A1
J	Supervision on Land	low ropes	53	64	45	59	A1
F	Supervision on Land	high ropes	53	64	45	59	A1
B2	Supervision on Land	pedal karting	53	64	45	59	A1
L2	Supervision on Land	rowing / jetties	51	70	44	63	S2

Location ID	Safety critical communications relevant to location	Activity	Typical Daytime Baseline Ambient L_{Aeq} , dB	Typical Baseline Event noise level L_{AFmax} , dB	Speech interference level of noise L_{SIL} , dB (Ambient)	Speech interference level of noise L_{SIL} , dB (Events)	Baseline Measurement used as representative of location
W1	Supervision on Water	Water Activities	56	71	48	65	W1

7.2 Baseline Noise Assessment

The existing speech interference level (SIL) has been calculated at each assessment location based on the speech level ($L_{S,A,L}$) at the typical maximum distance from speaker to listener (see **Table 3**), and the baseline ambient noise levels measured during the survey (see **Table 5**). The SIL has been calculated for both typical ambient noise which will be the situation for the majority of the time and during typical noise events which are of short duration. The calculated SIL and intelligibility rating is presented in **Table 6** below along with the SIL target for safety critical communications (see **Table 3**). Note that the higher the SIL the better intelligibility, therefore the aim is to be within or exceeding the target range.

Table 6: Existing speech interference level (SIL) at assessment locations

Location ID	Safety critical communications	During ambient SIL, dB (Intelligibility rating)	During event SIL, dB (Intelligibility rating)	Target SIL, dB (Intelligibility rating)
I (711001)	Supervision on Land	27 (Excellent)	13 (Fair)	3 to 10 (Poor)
E5	Supervision on Land	27 (Excellent)	13 (Fair)	3 to 10 (Poor)
J	Supervision on Land	27 (Excellent)	13 (Fair)	3 to 10 (Poor)
F	Supervision on Land	27 (Excellent)	13 (Fair)	3 to 10 (Poor)
B2	Supervision on Land	27 (Excellent)	13 (Fair)	3 to 10 (Poor)
L2	Supervision on Land	28 (Excellent)	9 (Poor)	3 to 10 (Poor)
W1	Supervision on Water	24 (Excellent)	7 (Poor)	3 to 10 (Poor)

Based on the results in Table 6 the recommended speech interference level for short safety alert communications at short distance is currently achieved at all locations during general ambient noise and during short noise events.

8 Construction Noise Assessment

8.1 Calculations of construction noise levels at assessment locations

Predictions of noise due to the construction of HS2 have been completed at each of the assessment locations based on the methodology and assumptions of the main ES (for further information see HS2 ES Volume 5 SV-001-000 - Methodology, assumptions and assessment (route-wide) and HS2 ES Volume 5 SV-003-007 CFA7). Calculations have assumed the implementation of best practicable means as described in the draft CoCP; this includes the implementation taller screening in the form of 3.6m barriers at the south boundary for the HS2 construction site.

Table A3 in Appendix 2 includes the results of the construction noise predictions at each location. These are A-weighted monthly $L_{Aeq, daytime}$ noise levels. Façade noise levels are calculated for the HS2 ES assessment, however a -3dB correction has been applied to convert

to free field noise levels representative of those likely to be experienced outside. The typical and highest monthly noise levels are presented for the construction period. It should be noted that construction activities vary, therefore noise levels vary throughout the construction period; the duration of construction noise above the ambient noise level is given to indicate how long noise may be elevated at any one location.

In order to calculate the L_{SIL} of the construction noise, the octave band spectrum of the activity which leads to the loudest noise level has been used (this includes contribution from all items of plant operating during that activity). The octave band spectrum has been corrected to the L_{Aeq} of both the typical and highest monthly noise levels.

In order to indicate the L_{SIL} of a worst case single event noises during construction the octave band spectrum of the loudest item of plant within the activity has been used and a correction of +10dB to the highest predicted monthly L_{Aeq} has been used. Note that this correction is subject to significant uncertainty as there is no direct relation between L_{Aeq} and L_{Amax} but may be used for a general indication of the interference single events may cause.

Table 7 below gives the results of the calculation of the typical and highest L_{SIL} during construction as well as the indicative event L_{SIL} of a single plant item. **Table A4 in Appendix 2** gives the octave band noise levels.

Table 7: Existing speech interference level (SIL) at assessment locations

Location ID	Typical Month Speech interference level of noise L_{SIL} , dB	Highest Month Speech interference level of noise L_{SIL} , dB	Single Item Event Speech interference level of noise L_{SIL} , dB	Loudest plant Item (used for single item event level)
I (711001)	47	56	66	Vibratory Piling Rig
E5	44	56	66	Vibratory Piling Rig
J	37	49	59	Vibratory Piling Rig
F	36	48	58	CFA Piling Rig
B2	38	50	60	Wood Chipper (veg clearance)
L2	30	42	49	hand held tools
W1	42	52	62	Vibratory Piling Rig

8.2 Speech interference level during construction

Table 8 gives the calculated speech interference level (SIL) due to construction noise only during typical and highest noise level construction months based on the speech level ($L_{S,A,L}$) at the typical maximum distance from speaker to listener (see **Table 3**), and the predicted L_{SIL} in **Table 7**. This has been presented alongside the baseline ambient SIL previously calculated in **Table 6** and the target SIL.

Table 8: Speech interference level (SIL) at assessment locations during construction

Location ID	Safety critical communications	Baseline SIL, dB(Intelligibility rating)	Typical Month Construction noise SIL, dB(Intelligibility rating)	Highest Month Construction noise SIL, dB(Intelligibility rating)	Target SIL, dB (Intelligibility rating)
I (711001)	Supervision on Land	27 (Excellent)	25 (Excellent)	16 (Good)	3 to 10 (Poor)
E5	Supervision on Land	27 (Excellent)	28 (Excellent)	16 (Good)	3 to 10 (Poor)
J	Supervision on Land	27 (Excellent)	35 (Excellent)	23 (Excellent)	3 to 10 (Poor)
F	Supervision on Land	27 (Excellent)	36 (Excellent)	24 (Excellent)	3 to 10 (Poor)
B2	Supervision on Land	27 (Excellent)	34 (Excellent)	22 (Excellent)	3 to 10 (Poor)
L2	Supervision on Land	28 (Excellent)	42 (Excellent)	30 (Excellent)	3 to 10 (Poor)
W1	Supervision on Water	24 (Excellent)	30 (Excellent)	20 (Good)	3 to 10 (Poor)

The predictions in **Table 8** indicate that during typical months, construction noise is only likely to lead to negligible (less than 3dB) changes to the SIL currently experienced at the assessment locations across the site, and in most cases there will be no change compared to the baseline.

During the month with the highest construction noise levels, the SIL reduces typically by around 12dB compared with the typical month. However, the recommended speech interference level for short safety alert communications at short distance is achieved at all locations during the month with highest construction noise levels.

Table 9 gives the calculated speech interference level (SIL) due to construction noise only during single construction noise events based on the speech level ($L_{S,A,L}$) at the typical maximum distance from speaker to listener (see **Table 3**), and the predicted L_{SIL} in **Table 7**. This has been presented alongside the baseline ambient SIL previously calculated in **Table 6** and the target SIL.

Table 9: Speech interference level (SIL) at assessment locations during construction events

Location ID	Safety critical communications	Baseline during event SIL, dB (Intelligibility rating)	Single Item Event Construction noise SIL, dB(Intelligibility rating)	Target SIL, dB (Intelligibility rating)
I (711001)	Supervision on Land	13 (Fair)	6 (Poor)	3 to 10 (Poor)
E5	Supervision on Land	13 (Fair)	6 (Poor)	3 to 10 (Poor)
J	Supervision on Land	13 (Fair)	13 (Fair)	3 to 10 (Poor)
F	Supervision on Land	13 (Fair)	14 (Fair)	3 to 10 (Poor)
B2	Supervision on Land	13 (Fair)	12 (Fair)	3 to 10 (Poor)
L2	Supervision on Land	9 (Poor)	23 (Excellent)	3 to 10 (Poor)
W1	Supervision on Water	7 (Poor)	10 (Fair)	3 to 10 (Poor)

The predictions in **Table 9** indicate that during construction noise events the SIL reduces by more than 3dB at all locations on land near the water (i.e. I, E5) when compared to the SIL during baseline noise events. However, the recommended speech interference level for short

safety alert communications at short distance is achieved at all locations during construction noise events.

At locations based further in land, which benefit from the taller screening (i.e. J, F and B2) and location W1 and L2, which are far from the works, the SIL during construction events is no worse than the SIL during existing baseline noise events.

Best practicable means mitigation measures will be implemented to minimise the effect on safety communications as far as is practicable. The draft COCP and BS5228 includes various best practicable means (BPM) measures including control of noise at source (e.g. choosing quieter equipment or methods) and controlling the spread of noise (e.g. using noise barriers).

BPM mitigation measures

BPM mitigation measures have been assumed to be implemented in the predictions of construction noise used for the assessment. This includes taller screening applied to the boundary of the construction site. Taller screening has not been assumed for activities carried out on the water including vibratory piling and hammer piling; these activities are therefore likely to lead to the greatest level of speech interference particularly to activities undertaken on the water. Due to the nature of the activities, however, such as the height of the mechanical plant, it may not be practicable to provide screening, but the possibility can be explored.

Otherwise further refinements to BPM can be made as the construction methodology is designed in greater detail, such as follows:

- The layout of the site to locate plant items further from the HOAC's activity areas or provide further screening from site cabins etc.
- The selection of quieter mechanical plant or methodologies

8.3 Discussion

Typically during construction speech intelligibility for short safety alert communications at short distance is not substantially altered except at locations near the water near to vibratory and hammer piling works to construct cofferdams.

During the months with the highest construction noise levels the safety communications may be undermined further than they are currently by construction noise from HS2 at all locations except for those farthest from the construction site to the south. However, the recommended speech interference level for short safety alert communications at short distance is achieved at all locations during construction noise events.

It should be noted that construction noise varies considerably throughout as different activities occur. Typically the assessment suggests that noise from construction is not likely to undermine the safety critical messages which may be required during operation of the HOAC, however during particular activities such as piling activities the ability to communicate these messages may be reduced.

9 Operational Noise Assessment Method

The future operational airborne sound levels, dB L_{AFMax} , during a mitigated train pass-by at a height of 1.5m above local ground / water level has been predicted for the following mitigation options:

- Option 1 - hybrid Bill scheme (1.4m above rail kerb barrier between chainage 26+000 and 26+730); and
- Option 2 - 4m above rail viaduct barrier between chainage 26+000 and 26+730 and 4m above rail trackside barrier between chainage 25+800 and 26+000.

HS2 aim to reduce any reduction in the SIL as far as is reasonably practicable.

A summary of the results for each of the assessment location, for each mitigation option is presented in **Table 10** below.

Table 10: Speech interference level (SIL) at assessment locations during train pass-by

Location	Safety critical communications	Baseline during event	Future - during train pass-by - Option 1	Future - during train pass-by - Option 2	Target SIL, dB (Intelligibility rating)
		SIL, dB (Intelligibility rating)	SIL, dB (Intelligibility rating)	SIL, dB (Intelligibility rating)	
I	Supervision on Land	13 (Fair)	5 (Poor)	10 (Fair)	3 to 10 (Poor)
E5	Supervision on Land	13 (Fair)	9 (Poor)	16 (Good)	3 to 10 (Poor)
J	Supervision on Land	13 (Fair)	3 (Poor)	10 (Fair)	3 to 10 (Poor)
F	Supervision on Land	13 (Fair)	6 (Poor)	13 (Fair)	3 to 10 (Poor)
B2	Supervision on Land	13 (Fair)	3 (Poor)	11 (Fair)	3 to 10 (Poor)
L2	Supervision on Land	9 (Poor)	10 (Fair)	17 (Good)	3 to 10 (Poor)
W1	Supervision on Water	7 (Poor)	12 (Fair)	18 (Good)	3 to 10 (Poor)

Summary of the results for the locations on land:

- **Current situation on land (locations I – L2).** During a current maximum noise level event at this location, the speech interference level (SIL) for short safety alert communications at short distance is 7 to 13dB.
- **Future scenario at Location I.** Mitigation option 1 results in an 8dB reduction in the SIL compared to the existing event level. Option 2 results in a 3dB reduction in the SIL compared to the existing event level.
- **Future scenario at Location E5.** Mitigation option 1 results in a 4dB reduction in the SIL compared to the existing event level. Option 2 results in the same or better SIL compared to the existing event level.
- **Future scenario at Location J.** Mitigation option 1 results in a 10dB reduction in the performance. Option2 results in a 3dB reduction in the SIL compared to the existing event level.
- **Future scenario at Location F.** Mitigation option 1 results in a 7dB reduction in the performance. Option 2 results in the same reduction in the SIL compared to the existing event level.

- **Future scenario at Location B2.** Mitigation option 1 results in a 10dB reduction in the performance. Option 2 results in a 2dB reduction in the SIL compared to the existing event level.
- **Future scenario at Location L2.** In the future scenario, the SIL is no worse than the existing event scenario.

Summary of the results for the locations on water:

- **Current situation at location W1.** During a current maximum noise level event at this location, the speech interference level (SIL) is 7dB.
- **Future scenario at Location W1.** In the future scenario, the SIL is no worse than the existing event scenario.

Proposed mitigation

The Intelligibility level is reduced at most land based locations during train pass-bys with option 1. With Option 2 the intelligibility is marginally reduced at some locations close to the line, but otherwise is no worse than during existing noise events. Mitigation option 2 is therefore recommended, considering the use of the particular area and the nature of the activities being undertaken.

10 Conclusions

The assessment is based on calculation of the speech interference level (SIL) during urgent verbal alerts and warnings at short distance. The SIL is calculated from the difference in the noise level of intrusive noise in the frequency range of speech (L_{SIL}) and the speech noise level $L_{S,A,L}$, both experienced at the listener.

A baseline noise survey has been carried out to inform a baseline assessment at the site. The recommended SIL for this type of communication is currently achieved at all locations during general ambient noise and during short noise events.

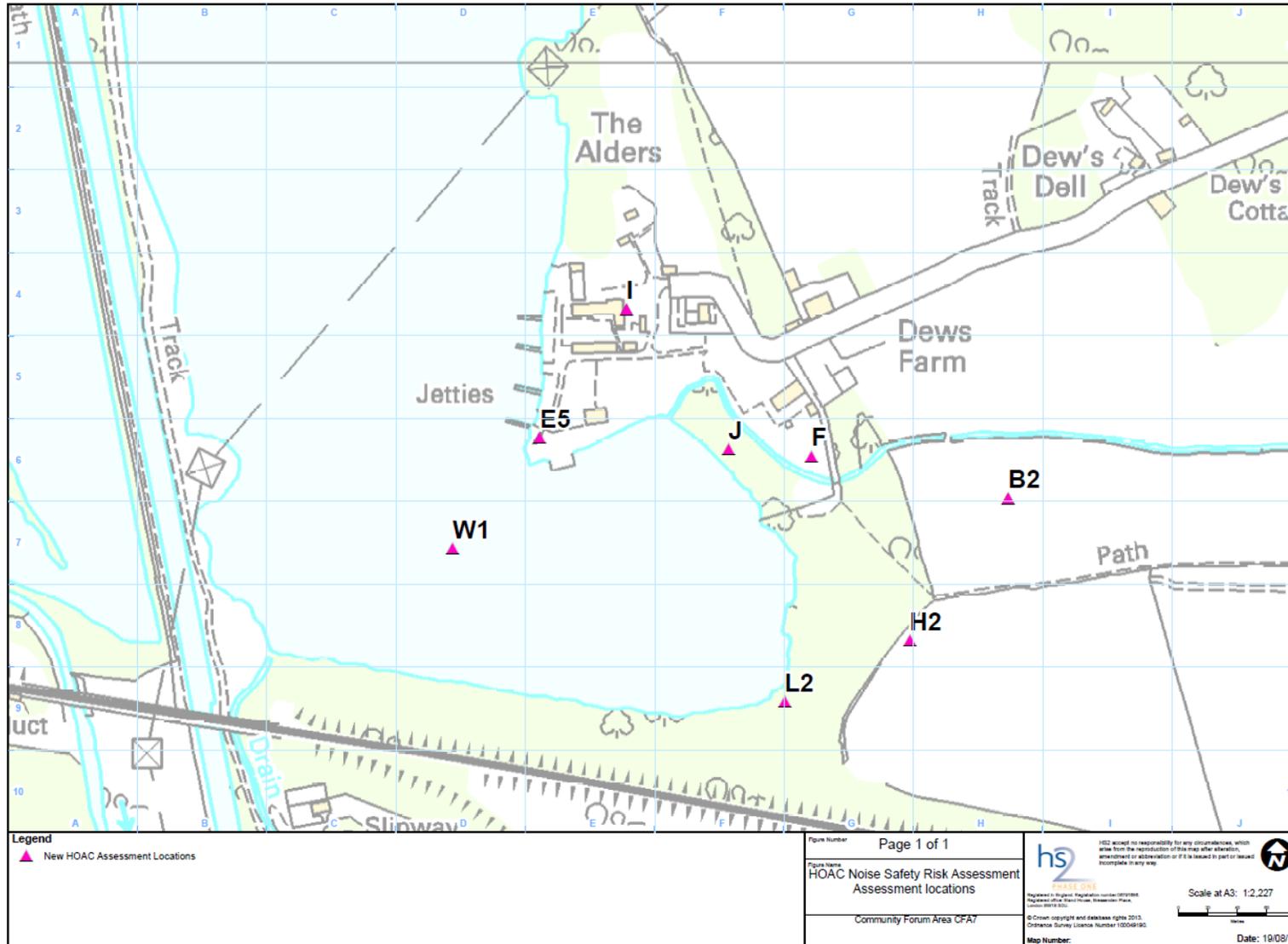
Typically during construction the SIL will not be substantially altered except at locations near the water near to vibratory and hammer piling works to construct cofferdams. Despite this the predicted SIL during the months with the highest construction noise levels is still within target levels at all locations including during estimated maximum construction noise events. Best practicable means mitigation measures will be implemented to minimise the effect on speech intelligibility as far as is practicable.

The draft COCP and BS5228 includes various best practicable means (BPM) measures including control of noise at source (e.g. choosing quieter equipment or methods) and controlling the spread of noise (e.g. using noise barriers). Generally these are assumed to be implemented in the predictions including taller screening, however further refinements may be achieved.

When construction methods are confirmed this assessment will be reviewed and site specific risk management action plans developed in collaboration with site management as necessary.

During operation of HS2, it is proposed that any reduction in the SIL is reduced as far as is reasonably practicable. In order to achieve this mitigation options are explored and Option 2 is recommended - 4m above rail viaduct barrier between chainage 26+000 and 26+730. The predicted SIL values are better than the minimum acceptable level and the design will continue to be reviewed in order to ensure it meets the objectives described in HS2 Information Paper E20.

Figure 3: Assessment locations



Appendix 1: Noise Survey Results

Table A1: Noise Survey results and notes

Position	Meter	Start Time	duration (min)	L _{eq} , dB	L _{AFmax} , dB	Activity or ambient	Notes
A1	SOLO-3	11:37	5	56.5	87.7	activity - close	Speech from activity, trains, freight train
A1	SOLO-3	12:47	5	52.6	63.5	ambient	Trains, aggregate facility
A2	SOLO-2	14:44	15	54.4	72.9	activity - close	Speech from activity, trains
A3	SOLO-3	13:58	5	56.9	73.8	activity - close	Trains, aggregate facility, some speech from activities, zipline
A3	SOLO-2	15:12	15	50.8	70.2	activity	Trains, aggregate facility, some speech from activities
S1	SOLO-3	14:25	5	54.4	63	activity - close	Speech noise from Sailing lesson, engine of boat
S1	SOLO-3	15:38	5	62.6	76.4	activity	Speech from boat lesson, tractor pass by
S2	SOLO-2	14:25	5	51.7	70	ambient	Aggregate facility, trains, distant helicopter
S2	SOLO-2	15:43	05:05	50	65.8	ambient	Water movement, trains
W1	SOLO-3	12:05	5	55.6	71.1	activity - distant	Speech, instructor horns
W1	SOLO-3	12:26	5	55.4	70.4	activity - distant	Speech, instructor horns, aggregate facility, trains
W2	SOLO-3	12:34	5	52.3	65.7	ambient	Boats moving, distant speech, aggregate facility, trains

Table A2: Noise Survey Octave Band Data at Ambient Noise Measurements

		L_{eq}, dB at octave band centre frequency, Hz				L_{Fmax}, dB at octave band centre frequency, Hz			
		500	1000	2000	4000	500	1000	2000	4000
A1	Solo 3 - 12:47	48	49	45	40	61	64	58	53
S2	Solo 2 - 14:25	48	48	45	35	65	66	65	57
W1*	Solo 3 - 12:05	52	52	47	39	72	70	64	55
W2	Solo 3 - 12:34	49	49	43	35	64	63	60	51

* measurements at W1 include distant activity noise, for the purposes of assessment, assumed to be ambient only.

Appendix 2: Construction noise calculations

Table A3: Construction noise predictions at assessment locations

Location ID	Typical monthly outdoor $L_{pAeq, day}$ [dB] (free field)	highest monthly outdoor $L_{pAeq, day}$ [dB] (free field)	Impact duration (above ambient) - months	Construction activity leading to highest monthly noise level
I	53	63	8	Viaduct Section 1 -South Abutment to Grand Union Canal - Construct Northern Jetty & Temp Trestles – Vibratory Piling
E5	52	63	7	Viaduct Section 1 -South Abutment to Grand Union Canal - Construct Northern Jetty & Temp Trestles – Vibratory piling
J	47	56	9	Viaduct Section 1 -South Abutment to Grand Union Canal - Construct Northern Jetty & Temp Trestles – Vibratory piling
F	50	62	13	Viaduct Section 1 -South Abutment to Grand Union Canal - Piling to Piers – CFA Piling
B2	55	65	31	Viaduct Section 1 -South Abutment to Grand Union Canal - Site Clearance
L2	45	55	8	Harvil Road Overbridge - Deck installation
W1	49	59	5	Viaduct Section 1 -South Abutment to Grand Union Canal - Construct Northern Jetty & Temp Trestles – Vibratory piling

Table A4: Predicted Octave Band Spectrum Construction Noise Levels

Location ID	Typical Month L_{eq} , dB daytime at octave band centre frequency, Hz				Highest Month L_{eq} , dB daytime at octave band centre frequency, Hz				Indicative Single Item L_{max} , dB daytime at octave band centre frequency, Hz			
	500	1k	2k	4k	500	1k	2k	4k	500	1k	2k	4k
I	47	50	47	42	57	59	57	52	67	69	67	62
E5	45	47	45	40	57	59	57	52	67	69	67	62
J	38	40	38	33	50	52	50	45	60	62	60	55
F	40	39	34	29	52	51	46	41	63	60	56	51
B2	40	41	39	34	52	52	51	45	60	62	62	56
L2	22	27	31	38	34	40	43	50	39	46	52	60
W1	43	45	43	38	53	55	53	48	63	65	63	58

Appendix 3: Operational Noise Calculations at Assessment Locations

I

Scenario	Total Noise level	Ls,A,L	L, SIL (dB)				L, SIL (dB)	SIL (dB)
			500	1k	2k	4k		
Future - during train pass-by - Option 1	76	72	75	71	65	57	67	5
Future - during train pass-by - Option 2	71	72	70	66	60	52	62	10

E5

Scenario	Total Noise level	Ls,A,L	L, SIL (dB)				L, SIL (dB)	SIL (dB)
			500	1k	2k	4k		
Future - during train pass-by - Option 1	72	72	71	67	61	53	63	9
Future - during train pass-by - Option 2	65	72	64	60	55	47	56	16

J

Scenario	Total Noise level	Ls,A,L	L, SIL (dB)				L, SIL (dB)	SIL (dB)
			500	1k	2k	4k		
Future - during train pass-by - Option 1	78	72	77	73	67	59	69	3
Future - during train pass-by - Option 2	71	72	70	66	60	52	62	10

F

Scenario	Total Noise level	Ls,A,L	L, SIL (dB)				L, SIL (dB)	SIL (dB)
			500	1k	2k	4k		
Future - during train pass-by - Option 1	75	72	74	70	64	56	66	6
Future - during train pass-by - Option 2	68	72	67	63	57	49	59	13

B2

Scenario	Total Noise level	Ls,A,L	L, SIL (dB)				L, SIL (dB)	SIL (dB)
			500	1k	2k	4k		
Future - during train pass-by - Option 1	78	72	77	73	67	59	69	3
Future - during train pass-by - Option 2	70	72	69	65	59	51	61	11

L2

Scenario	Total Noise level	Ls,A,L	L, SIL (dB)				L, SIL (dB)	SIL (dB)
			500	1k	2k	4k		
Future - during train pass-by - Option 1	71	72	70	66	60	52	62	10
Future - during train pass-by - Option 2	64	72	63	59	54	45	55	17

W1

Scenario	Total Noise level	Ls,A,L	L, SIL (dB)				L, SIL (dB)	SIL (dB)
			500	1k	2k	4k		
Future - during train pass-by - Option 1	69	72	68	64	59	50	60	12
Future - during train pass-by - Option 2	62	72	62	58	53	44	54	18

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Project title	HS2 Phase 1	Job number	230514-50
cc	Phil Brewer	File reference	TN - HOAC Other sailing clubs
Prepared by	Harry Murfet	Date	8 November 2016
Subject	HOAC - SIL assessments at other sailing clubs		

1 Introduction

This technical note presents speech interference assessments for activity centres similar to HOAC.

The first section presents a summary of the speech interference assessment at the HOAC site, full details of which are provided in HS2 report 'HOAC Site specific noise risk assessment'¹. The following three sections present comparative assessments at Datchet Water Sailing Club, Queen Mary Sailing Club and Longridge Activity Centre.

Speech interference assessments at comparative centres have been carried out in accordance with the methodology given in HS2 report 'HOAC Site specific noise risk assessment'. Speech inference level (SIL) calculations are based on the same assumptions presented in Table 3 of the report.

The assessment at the comparative centres is based on baseline noise levels extracted from Defra noise map information. Spectral information for road noise is based on normalised traffic noise spectrum data from BS EN 1793-3:1998². Spectral information for aircraft overflights is based on Arup measurement data.

2 HOAC

Table 1 provides a summary of the speech interference assessment at HOAC as presented in HS2 document 'HOAC Site specific noise risk assessment'. The baseline scenario represents the current conditions and is also representative of the future conditions during periods while trains are not passing. Option 1 and Option 2 are described as follows:

¹ ERM-Temple Group-Mott MacDonald, HOAC Site specific noise risk assessment C252-ETM-EV-REP-020-000257_P03, Oct 2016

² British Standards Institute, BS EN 1793-3:1998 Road traffic noise reducing devices - Test method for determining the acoustic performance Part 3. Normalised traffic noise spectrum

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- Option 1 - Hybrid Bill scheme (1.4m above rail kerb barrier between chainage 26+000 and 26+730)
- Option 2 - 4m above rail viaduct barrier between chainage 26+000 and 26+730 and 4m above rail trackside barrier between chainage 25+800 and 26+000.

Scenario	SIL	Intelligibility
Baseline noise	7-13	Poor to Fair
During train pass-by (Option 1)	3-12	Poor to Fair
During train pass-by (Option 2)	10-18	Fair to Good

Table 1 Summary of speech interference assessment at HOAC

The SIL assessment presented in Table 1 is based on baseline and predicted pass-by noise levels and not the daytime HS2 rail noise dose, expressed as $L_{Aeq,16hr}$. However, the information for the facilities presented as part of the comparative study, is expressed as $L_{Aeq,16hr}$ and therefore in order to enable comparison, Figure 1 shows the HS2 rail noise for option 2 expressed as $L_{Aeq,16hr}$.

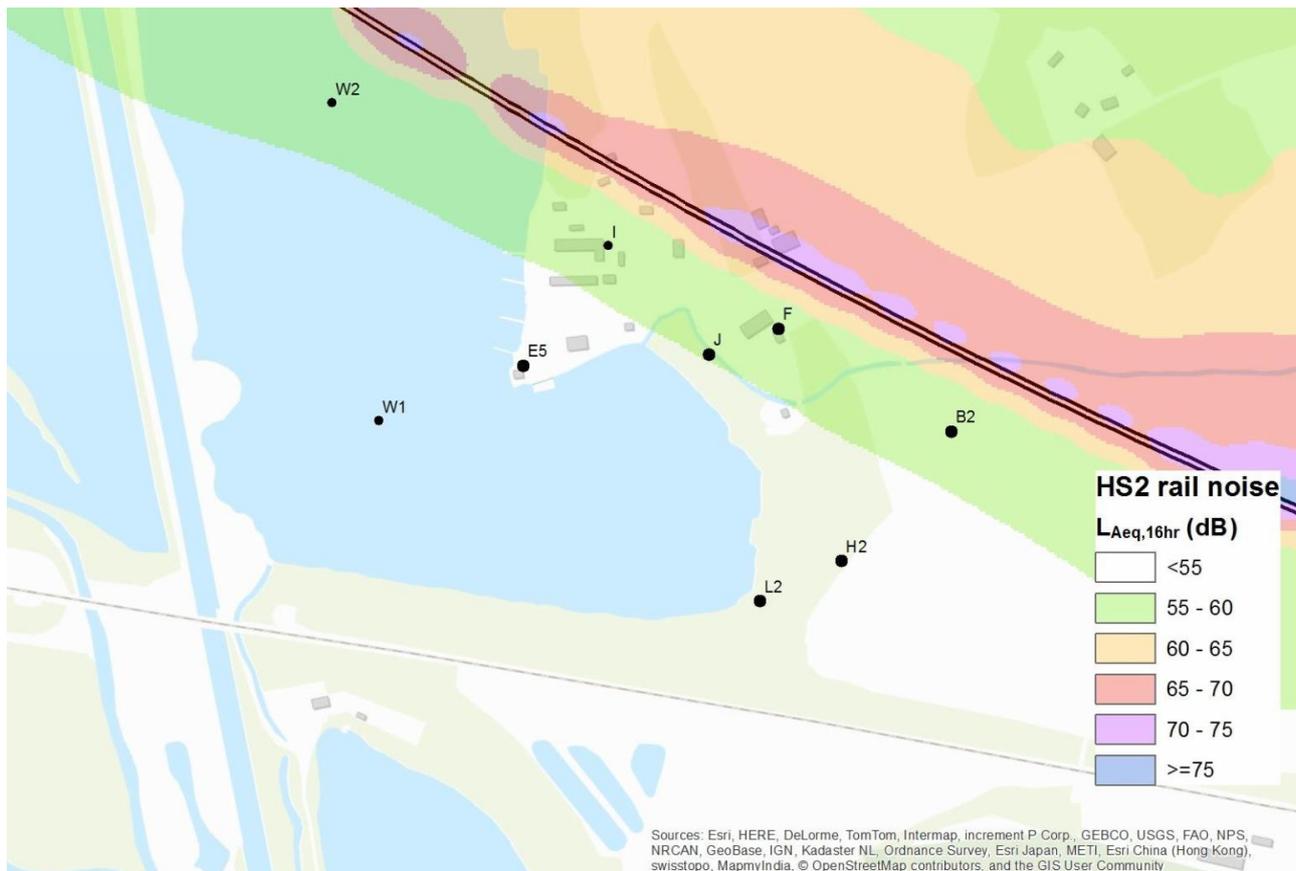


Figure 1 HS2 rail noise at the HOAC site for Option 2

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3 Datchet Water Sailing Club

3.1 Location

Datchet Water Sailing Club is located on the Queen Mother Reservoir in Colnbrook. The site is approximately 3.3km to the west of the end of Heathrow's north runway, 750m from the M4 and 390m from the A4.

Figure 2 shows the location of the site with Defra noise mapping daytime $L_{Aeq,16hr}$ contours for road noise. Figure 3 shows the site with Defra noise mapping L_{den} contours for aircraft noise overlaid.

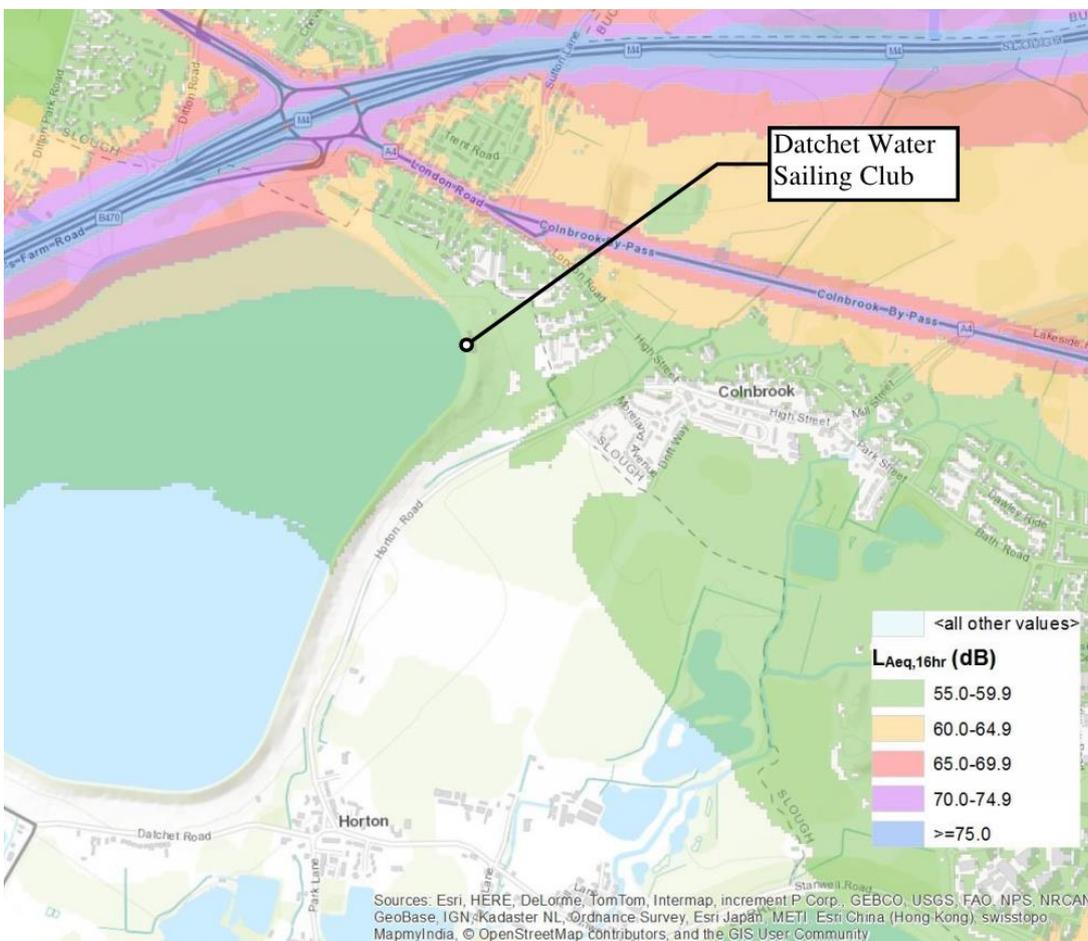


Figure 2 Datchet Water Sailing Club site location and Defra noise map road noise contours

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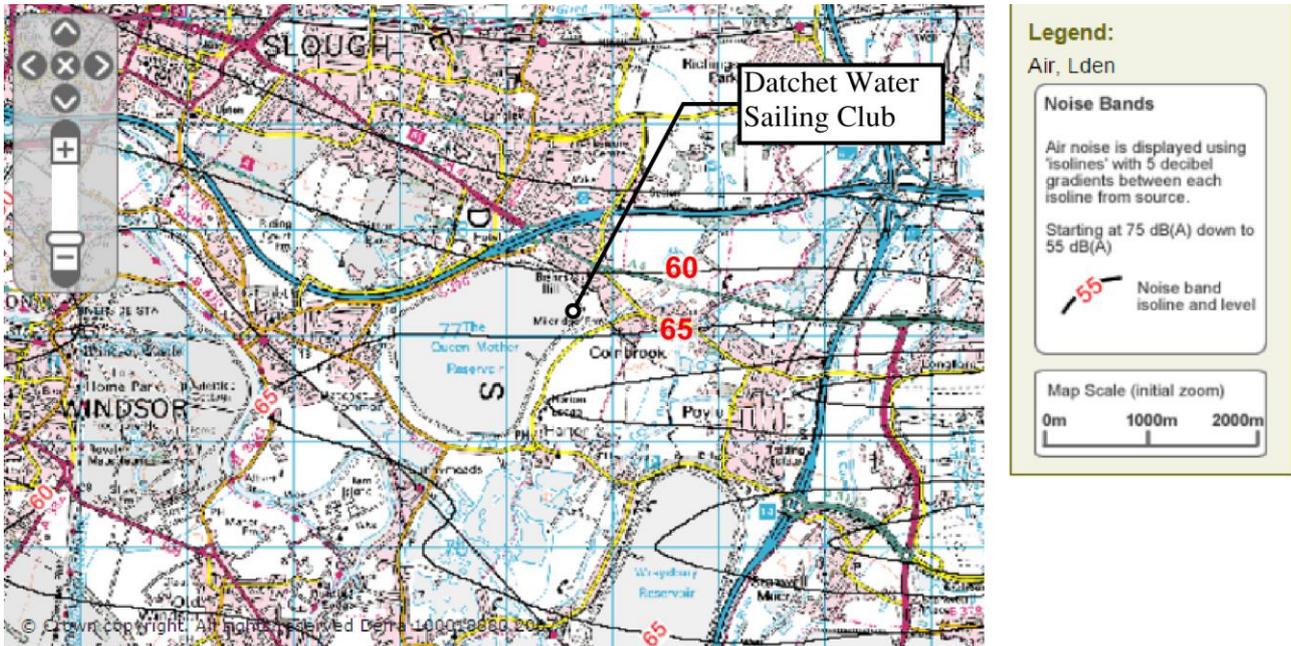


Figure 3 Datchet Water Sailing Club site location and Defra noise map aircraft noise contours

3.2 Results

Defra noise maps indicate a daytime road traffic noise level of between 55 and 60dBL_{Aeq16hr} and aircraft noise level of between 60 and 65dBA L_{den} at Datchet Water Sailing Club. SIL calculations are provided for road only (i.e. when there are no aircraft overhead) and for road and aircraft noise combined assuming a daytime noise level of 63-65dBL_{Aeq16hr}.

The assessment of aircraft noise is based on ambient noise which is an equivalent continuous level throughout the entire daytime period. Noise levels specifically during flyovers are not part of the available Defra noise data and would be variable depending on aircraft and proximity to the site. Associated noise levels during an overflight would be expected to result in an SIL rated in the 'poor' intelligibility range.

SIL assessment results are presented in Table 2.

Scenario	SIL	Intelligibility
Road traffic noise only	19-24	Good to Excellent
Overall road traffic and aircraft noise	15	Fair*

* Likely to be 'poor' during the majority of overflights

Table 2 Speech interference assessment at Datchet Water Sailing Club

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4 Queen Mary Sailing Club

4.1 Location

Queen Mary Sailing Club is located on the Queen Mary Reservoir in Ashford Kent. The site is located adjacent to the A308. Figure 4 shows the location of the site with Defra noise map road noise contours overlaid.

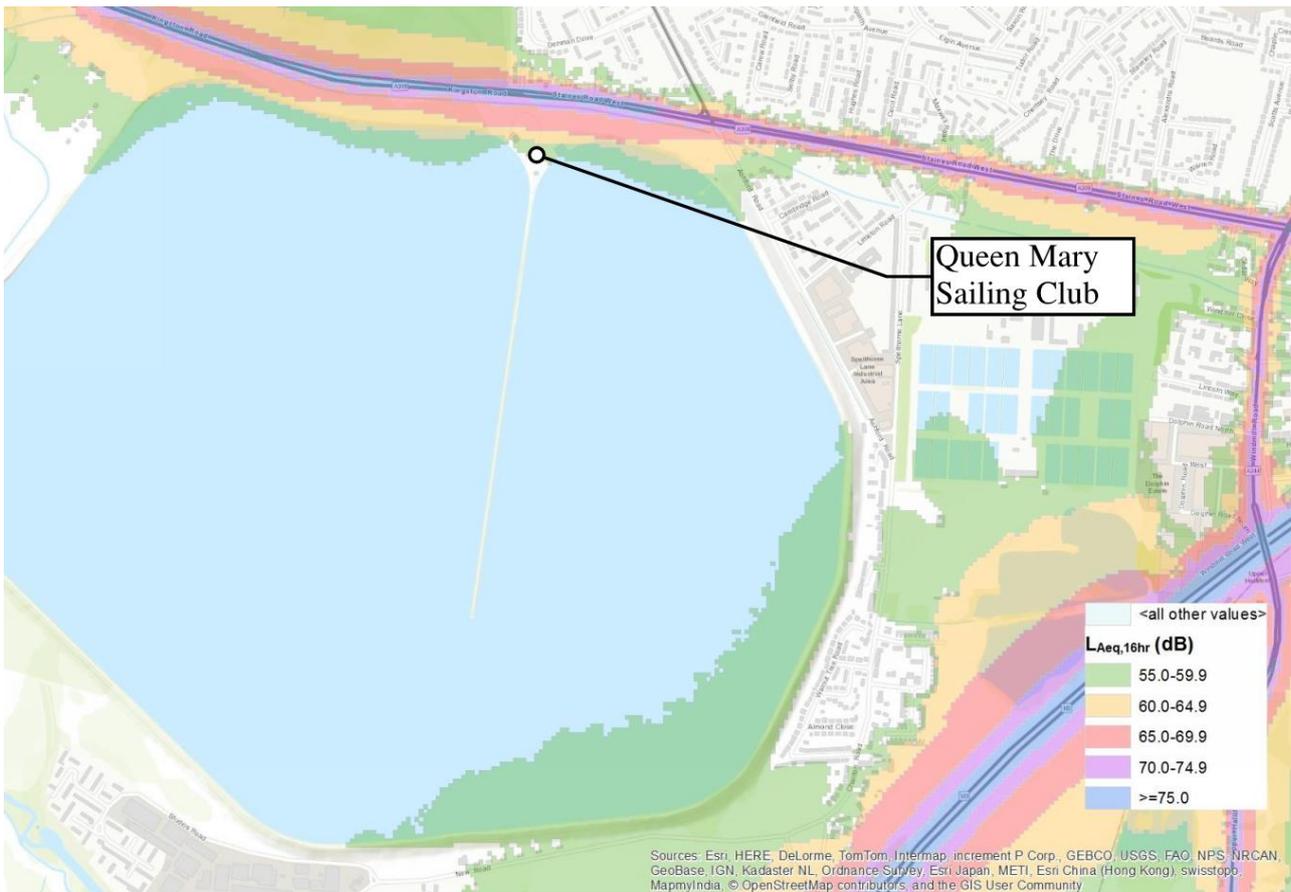


Figure 4 Queen Mary Sailing club with Defra noise map road noise contours

4.2 Results

Defra noise maps indicate daytime road traffic noise levels of around $55\text{dB}_{\text{L}_{\text{Aeq},16\text{hr}}}$ and below on the site. Table 3 gives the calculated SIL and intelligibility based on this level.

SIL	Intelligibility
24+	Excellent

Table 3 Speech interference assessment at the Queen Mary Sailing Club

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5 Longridge Activity Centre

5.1 Location

Longridge Activity Centre is located near Marlow approximately 125m from the A404. Figure 5 shows the location of the site with Defra noise map road noise contours overlaid.

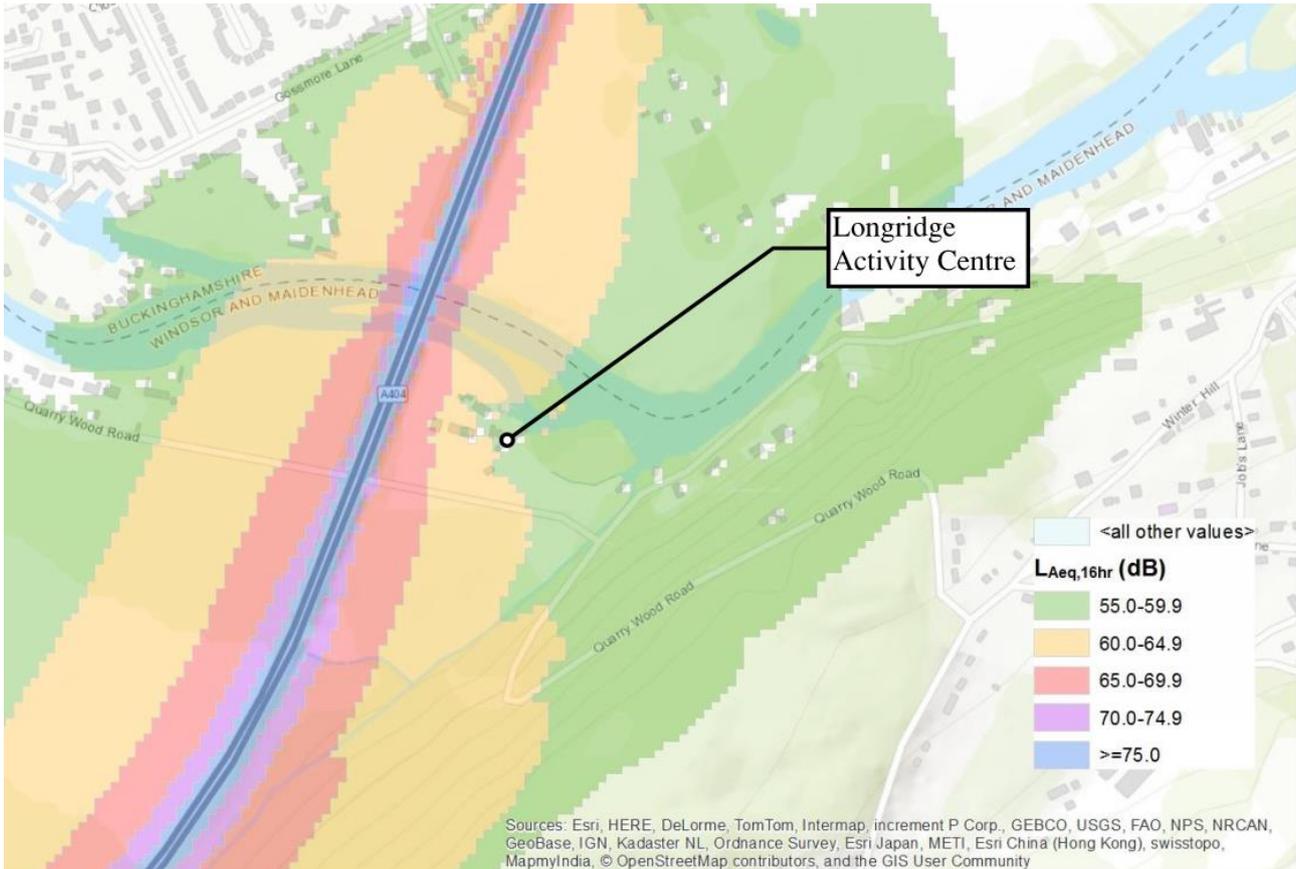


Figure 5 Longridge Activity Centre site location and Defra noise map road noise contours

5.2 Results

Defra noise maps indicate daytime road traffic noise levels of 58-65dB_{L_{Aeq,16hrs}} across the site. Table 4 gives the calculated SIL and intelligibility based on this level.

SIL	Intelligibility
14-21	Fair to Good

Table 4 Speech interference assessment at Longridge Activity Centre

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8 November 2016

DOCUMENT CHECKING (not mandatory for File Note)

	Prepared by	Checked by	Approved by
Name	Harry Murfet	David Owen	David Owen
Signature			



House of Commons
Select Committee on the
High Speed Rail (London - West
Midlands) Bill

**High Speed Rail
(London - West
Midlands) Bill**

**Second Special Report of
Session 2015–16**

*Special Report, with Annexes, together with
formal minutes relating to the report*

*Ordered by the House of Commons to be printed
22 February 2016*

192. Access to walks along and around the Grand Union Canal was a particular priority. We are pleased that London Borough of Hillingdon was offered satisfactory assurances by the Promoter on local public rights of way, including their restoration after construction. Better than satisfactory restoration of the West Hyde compound would be another way for the project to address local concerns for the long term.

193. A Colne Valley Park Regional Panel is to be established comprising local authorities, Natural England and the Hertfordshire and Middlesex Wildlife Trust, with an independent chair and funding from the Promoter. There will be consultation on its terms of reference. Through that body, the project should work to bequeath positive environmental legacies to Hillingdon and its environs. The panel may also want to consider projects such as improved user access, better visitor facilities and sensible footpath reconfigurations following HS2 construction. We hope that the Promoter will consider funding for those aspirations. There will also be assistance with effects on local golf facilities. We address the Hillingdon Outdoor Activities Centre separately.

Harefield

194. Harefield villagers shared the concerns of the area on traffic, particularly on its possible impact on business and access to the famous hospital. Construction traffic will not go through the village itself, although we heard that Harvil Road is considered part of the village. There were concerns about a large (25ha) sustainable placement site but AP4 has addressed those. A 3m-high noise barrier has been proposed to address noise impacts on 48 residential properties which were assessed as being subject to minor noise impacts.

195. For engineering reasons, a feeder station providing electrical power to the railway requires to be built near the village of South Harefield. Residents objected to its location at the northerly end of South Harefield Road, which provides a relatively rural approach to the village. They sought its relocation alongside the autotransformer station at Ickenham. Tim Smart of HS2 Ltd explained why this was not feasible.³⁶ We brought pressure to bear on the Promoter to find a solution that would accommodate concerns. Subject to feasibility and an environmental assessment, the Promoter has provided an assurance that the feeder station will instead be relocated to a less obtrusive, more southerly location on South Harefield Road. We think the language qualifying this assurance by feasibility is reasonable. We welcome the progress made on relocation. We trust that a solution will be found for an acceptable relocation and appropriate mitigation screening.

Hillingdon Outdoor Activities Centre (HOAC)

196. HOAC is a sailing and outdoor activities centre situated on Harefield No. 2 lake, which is one of the Colne Valley lakes formed from gravel extraction. The proposed HS2 viaduct crosses the lake. Construction of the viaduct will take place from a site immediately adjacent to its premises. We heard a great deal about the value of this amenity, which is used by 40,000 people a year and has created the equivalent of 30 jobs. There was wide support for the work it undertakes with children, including disadvantaged children. There is also a rowing club.

197. HS2 Ltd's position until 2014 had been that the centre might be able to continue in use during and after construction. The operators were adamant that this would not be

³⁶ Oral evidence taken on 25 January 2016, HC (2015–16) [129](#)

feasible. Some of its coaching and camping activities require tranquility. Nick Hurd MP and the former Member for Uxbridge, Sir John Randall, pressed the need for a solution.

198. An alternative location for the centre has been identified at another gravel extraction site, in Denham. Planning consents are still required. The alternative location would not initially provide the same area of water as the current facility but there is potential for expansion to an area of similar size. The Promoter has given assurances of support in taking this forward, and for funding. We understand that the funds required are likely to be of the order of tens of millions of pounds. To permit a staged move, the Promoter has also given assurances that would allow the centre to remain active on its current site until 2018.

199. We welcome the work that has been done in developing this possible alternative for a valued and valuable amenity. We hope it comes to fruition. The way forward will be in determining the most that can be achieved and who can contribute. Subject to planning approvals being obtained in sufficient time, the Committee would wish to see HOAC relocated to the Denham Quarry Site, if HOAC decide that that is preferable to staying put.

Other issues

200. The Denham Water Ski clubhouse is located essentially underneath the north-western end of the proposed viaduct and will require relocating. We commend its owner on developing a successful undertaking which sits successfully alongside several artificially created sites of special scientific interest. The owner should expect cooperation from the Promoter in pursuing a planning application for an alternative clubhouse.



Department
for Transport

House of Commons High Speed Rail (London -
West Midlands) Bill Select Committee

Promoter's Response to the Select Committee's Second Special Report of Session 2015-16

March 2016

amenity and well-being uses within the LBH, including potential reconfiguration of the golf courses.

In paragraph 199 of the report, in relation to the Hillingdon Outdoor Activity Centre (HOAC), the Select Committee notes:

“We welcome the work that has been done in developing this possible alternative for a valued and valuable amenity. We hope it comes to fruition. The way forward will be in determining the most that can be achieved and who can contribute. Subject to planning approvals being obtained in sufficient time, the Committee would wish to see HOAC relocated to the Denham Quarry Site, if HOAC decide that that is preferable to staying put.”

60. The Promoter acknowledges the Select Committees wishes to see the proposal for HOAC to be relocated to the Denham Quarry site come to fruition. Whilst the Promoter recognises that relocation is not the most economic course of action, we understand that this is an important community asset for Hillingdon and the surrounding area and the strong commitment to the ongoing operation of HOAC made by Hillingdon, and others, in front of the Committee.
61. This is why the Promoter continues to progress work to relocate this facility and to this end we have recently commenced public engagement on the proposed planning application.
62. However, relocation cannot be at any cost - it needs to balance the needs of the community against the need to protect the public purse. Success in this regard will depend upon all parties acting reasonably and reassurance on the longer term ongoing financial support for any new centre akin to their current operating model.

In paragraph 200 of the report, the Select Committee notes:

“The Denham Water Ski clubhouse is located essentially underneath the north-western end of the proposed viaduct and will require relocating. We commend its owner on developing a successful undertaking which sits successfully alongside several artificially created sites of special scientific interest. The owner should expect cooperation from the Promoter in pursuing a planning application for an alternative clubhouse.”

63. The Promoter will fund the reasonable costs for a planning application by the petitioner for an alternative clubhouse.

In paragraph 201 of the report, the Select Committee notes:

“... we visited the proposed locations of three vent shafts in the Ealing and Northolt areas: at Mandeville Road, Green Park Way and Westgate near Hanger Lane... We encourage the Promoter to consider how to reduce the impact of spoil removal and to examine ways in which spoil might be deployed usefully.”



Department
for Transport

Karen Smaggasgale
Chair of the Trustees
Hillingdon Outdoor Activities Centre
Dews Lane
Harefield
UB9 6JN

From the Secretary of State
The Rt. Hon. Chris Grayling

Great Minster House
33 Horseferry Road
London
SW1P 4DR

Tel: 0300 330 3000
E-Mail: chris.grayling@dft.gsi.gov.uk

Web site: www.gov.uk/dft

18th October

Proposed relocation of Hillingdon Outdoor Activity Centre to Denham Quarry

As you know, following the report of the High Speed Rail (London – West Midlands) Select Committee in the Commons we agreed to progress the relocation of the Hillingdon Outdoor Activity Centre (HOAC) to the Denham Quarry site in South Buckinghamshire. Therefore, in June 2016 HS2 Ltd submitted a planning application to amend the Denham Quarry restoration scheme and have negotiated heads of terms on a lease with Buckinghamshire County Council as freeholder of the site.

However, throughout this process we have been clear that while we are committed to the on-going successful operation of HOAC this needs to be compatible with our duty to provide value for public money. I am writing to inform you that despite our best efforts, as negotiations have progressed it has become clear this relocation arrangement is at great risk of not being financially sustainable. The anticipated cost has more than doubled and the deal carries a clear risk that HOAC will face severe operating difficulties further down the line.

The lease conditions required by Buckinghamshire County Council for the Denham Quarry site are more commercial than those you currently have. This means that, assuming the same turnover, your lease costs will be £20,000 higher. In addition, Hillingdon Council has been clear that the £54,600 per annum grant, which represents 8% of HOAC's current income, will cease if HOAC move out of their administrative boundary. Buckinghamshire County Council and South Buckinghamshire District Council have been clear that they will not replace this funding. In addition, it is not clear whether South Buckinghamshire will require HOAC to pay business rates at Denham Quarry unlike in Hillingdon. This represents a clear threat to the on-going viability of HOAC at the Denham Quarry site. Furthermore, the expected cost of the

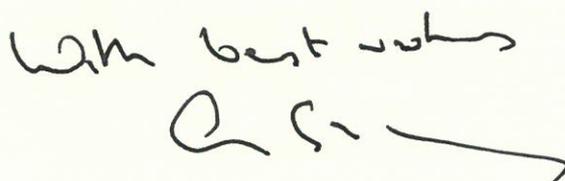
Denham Quarry site, including optimism bias, is now £55.1m. This means there is a very real prospect of a significant expenditure of public money on relocation that will result in HOAC facing severe operating difficulties or failing to operate.

My aim, and yours, is the on-going operation of HOAC, but I also have a responsibility to the tax payer. The relocation to Denham Quarry does not appear to meet either of these. In parallel with developing the Denham Quarry scheme HS2 Ltd have also been exploring options for maintaining HOAC on their current site. This work has revealed that not only will it be possible to maintain HOAC on their existing site until 2019, there is also a reconfiguration option that will provide segregated access to the HOAC site and a level of noise mitigation so there are unlikely to be any significant adverse noise effects on its activities. This option would remain within Hillingdon Council's administrative area and be located on land owned by Hillingdon Council, albeit requiring additional land than that which HOAC currently occupy, therefore, the issues of increased rent and reduced grant should not apply. This option also comes at a significantly lower cost to the public purse than the relocation option. In my view the reconfiguration option offers a far better option for HOAC's on-going viability than the relocation to Denham Quarry.

For those reasons I have with regret decided we cannot pursue the Denham Quarry option further and have asked HS2 Ltd to progress the reconfiguration on the existing site. Clearly this will be very disappointing to all those concerned but I wanted to make very clear that our commitment to pursue a relocation was made in good faith. It is only in the past few weeks that the full extent of the problems have come to light.

I am keenly aware of how highly valued HOAC is and I see the reconfiguration on site as the best option to ensure that HOAC can continue. We are absolutely committed to working with you to find a solution that will allow it to continue operating at its current site. I am aware that you did not petition against the HS2 Phase One hybrid Bill in the Lords, possibly on the basis of the Denham Quarry relocation being progressed. However, Hillingdon Council did petition and did include HOAC as part of that petition. We would have no objection to HOAC appearing with Hillingdon Council, if you wish to present your views on this development to the Lords Select Committee.

I am copying this letter to Nick Hurd MP, the Rt Hon Boris Johnson MP, Cllr Martin Tett, Cllr Ray Puddifoot and Neil Maddock.



Rt Hon Chris Grayling MP

SECRETARY OF STATE FOR TRANSPORT

Hillingdon Outdoor Activities Centre

The Colne Valley Youth and Community Association, Registered Educational Charity No. 1012242 in Partnership with the London Borough of Hillingdon

Dews Lane, Harvil Road,

Harefield, Middlesex. UB9 6JN

Tel/Fax: 01895 824171 / 824273

The Secretary of State
The Rt. Hon. Chris Grayling
Great Minster House
London
SW1P 4DR

21st October 2016

Re: Proposed relocation of Hillingdon Outdoor Activities Centre to Denham Quarry

Following the announcement that the Department for Transport has decided not to pursue the relocation of HOAC I would like to put on record HOAC's position.

Since the first visit by HS2 to HOAC's site we have been clear that HOAC cannot co-exist with HS2. The disruption to the centre during construction and during operation due to adverse noise effects and the visual impacts the construction work and subsequent viaduct will render HOAC's operations unviable. The physical presence of the viaduct across the lake will interfere with all water activities especially sailing to which the wind effects due to the viaduct will have a major adverse effect. During construction there are likely to be health and safety risks due to the proximity to a major construction site not only from the physical presence of the works but also from pollution from noise, dust etc.

Hs2 have repeatedly pushed different options for remaining on site but none have provided any reassurance that HOAC's users would wish to remain at a site and continue to use HOAC which in itself this makes the option of remaining at our current site during construction as non-viable and would leave HOAC facing severe operating difficulties and would eventually fail to operate. This is a view that has been shared by all who have visited the site, MP's, members of the House of Lords and other dignitaries who have visited the site and seen the proposals.

HOAC is currently in an ideal location offering peace and serenity so close to major areas of population, a building site and subsequent railway will remove the key attributes that makes the centre work for all of its users.

If the decision remains to not relocate HOAC then the centre will close before any building operations start. This would leave approximately 25,000 users (school groups, members, scouts, guides, volunteers, employees) with a loss of provision that cannot be replicated elsewhere.

The highlighted issues regarding HOAC's future financial viability at the Denham site have been accounted for and the trustees of HOAC are confident that the centre will remain viable taking into account the extra financial pressures the Denham Quarry site proposes, steps have already been taken to ensure HOAC remains financially stable at the new site. The negotiations with Buckinghamshire County Council were made with HOAC's input so we are fully aware of the implications of all the extra costs. In the long term the Denham site, with its larger size, offers opportunities for HOAC to grow and generate new revenue streams.

HOAC also question the proposed cost of the Denham Quarry build which has doubled from £25million in just a few weeks and would request that the proposed costs be independently verified to ensure that the proposed move isn't being unnecessarily inflated.

In summary, HOAC are extremely disappointed that the decision has been made not to relocate the centre. As it stands HOAC will stop operating before HS2 commence any construction work on the HOAC site and request that the centre is given a firm commencement of works date so we can make provision to terminate staff contracts, cancel future group bookings and inform members and users so they can make alternative arrangements.

I am copying this letter to Nick Hurd MP, the Rt Hon Boris Johnson MP, Cllr Martin Tett, Cllr Ray Puddifoot

Signed

A handwritten signature in black ink, consisting of a large, stylized initial 'K' followed by a long horizontal line extending to the right.

Karen Smaggasgale

Chair of Colne Valley Youth and Community Association (HOAC)



Department
for Transport

Karen Smaggasgale
Hillingdon Outdoor Activities Centre
Dews Lane
Harvil Road
Harefield
Middlesex
UB9 9JN

From the Secretary of State
The Rt. Hon. Chris Grayling

Great Minster House
33 Horseferry Road
London
SW1P 4DR

Tel: 0300 330 3000
E-Mail: chris.grayling@dft.gsi.gov.uk

Web site: www.gov.uk/dft

Our Ref: MC/179715

1 NOV 2016

Thank you for your letter of 21 October about the Hillingdon Outdoor Activities Centre (HOAC).

I have noted your concerns regarding the ability of HOAC to continue its operations during the construction and operation of the HS2 project. However, I believe that it would be premature for the HOAC Trustees to conclude the HOAC should stop operating before the HS2 construction works commence, without first fully considering the alternative reconfiguration option being proposed by HS2 Ltd.

I am strongly committed to supporting the on-going operation of HOAC. In relation to the construction impacts highlighted in your letter, more detailed noise assessment work undertaken by HS2 Ltd indicates that noise mitigation can be provided so that HOAC would not experience a significant adverse noise effect on the operation of their activities at the proposed reconfigured site, either during construction or operation.

In addition, the HS2 construction schedule is now I understand, likely to enable HOAC to continue to operate on its current site until the end of your 2019 season without significant interference from HS2 construction activities. This should allow sufficient time for the alternative reconfiguration option developed by HS2 Ltd, to be refined and implemented, allowing HOAC to continue its operations throughout the HS2 construction period and beyond.

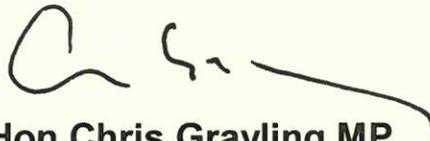
I understand that HS2 Ltd have already been in touch with you to provide more information about the alternative reconfiguration option and have offered to meet at HOAC's convenience to explain, discuss and progress the further development of this option. I hope that you will take them up on this offer.

I have noted your concerns regarding the estimated cost of the Denham Quarry option, but I am not convinced of the need for these costs to be independently verified and I understand that HS2 Ltd has provided you with a cost breakdown for the Denham Quarry option.

In closing may I reiterate that I do not want to see HOAC close and highlight that HS2 Ltd are standing ready to provide appropriate assistance and support to help secure the ongoing operation of HOAC.

I am copying this letter to Nick Hurd MP, the Rt Hon Boris Johnson MP, Councillor Martin Tett and Councillor Ray Puddifoot.

W.L. best wish



Rt Hon Chris Grayling MP

SECRETARY OF STATE FOR TRANSPORT

Leader of the Council

Martin Tett

Buckinghamshire County Council

County Hall, Walton Street
Aylesbury, Buckinghamshire HP20 1UA

Telephone 01296 382302
Email mtett@buckscc.gov.uk
www.buckscc.gov.uk

21 October 2016

The Rt. Hon. Chris Grayling
Secretary of State
Department for Transport
Great Minster House
London
SW1P 4DR

Dear Mr Grayling,

Proposed relocation of Hillingdon Outdoor Activity Centre (HOAC) to New Denham Quarry

Thank you for copying me into your letter of 18 October to Karen Smaggasgale, Chair of the Trustees of HOAC.

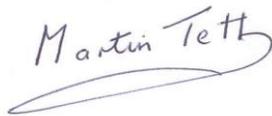
I was very disappointed to read that you say you cannot pursue the relocation of HOAC to New Denham Quarry. I was also surprised that the letter intimated that the local authorities have not acted reasonably. I believe we have actively tried to facilitate the relocation and nobody has to date suggested otherwise.

I have seen the letter to you direct from HOAC and it is clear to me that they do not believe that they will be able to remain on their current site during construction, despite your new proposals.

I believe the House of Commons Select Committee was very clear in its recommendations that, *'the Committee would wish to see HOAC relocated to the Denham Quarry Site, if HOAC decide that that is preferable to staying put'*.

Please could you facilitate a meeting between the parties to discuss whether the proposal can be salvaged.

Yours sincerely,



Martin Tett



Leader

CC

Rt. Hon. Nick Hurd MP

Rt. Hon. Boris Johnson MP

Rt. Hon. Dominic Grieve MP

Karen Smaggasgale, Chair of the Trustees, HOAC

Cllr Ray Puddifoot, LB Hillingdon

Cllr Ralph Bagge, South Bucks District Council



Department
for Transport

Councillor Martin Tett
Leader of the Council
Buckinghamshire County Council
Walton Street
Aylesbury
HP20 1UA

From the Secretary of State
The Rt. Hon. Chris Grayling

Great Minster House
33 Horseferry Road
London
SW1P 4DR

Tel: 0300 330 3000
E-Mail: chris.grayling@dft.gsi.gov.uk

Web site: www.gov.uk/dft

Our Ref: MC/180133

6 na

D. Ch. Tett

Thank you for your letter of 21 October 2016, about the Hillingdon Outdoor Activity Centre (HOAC).

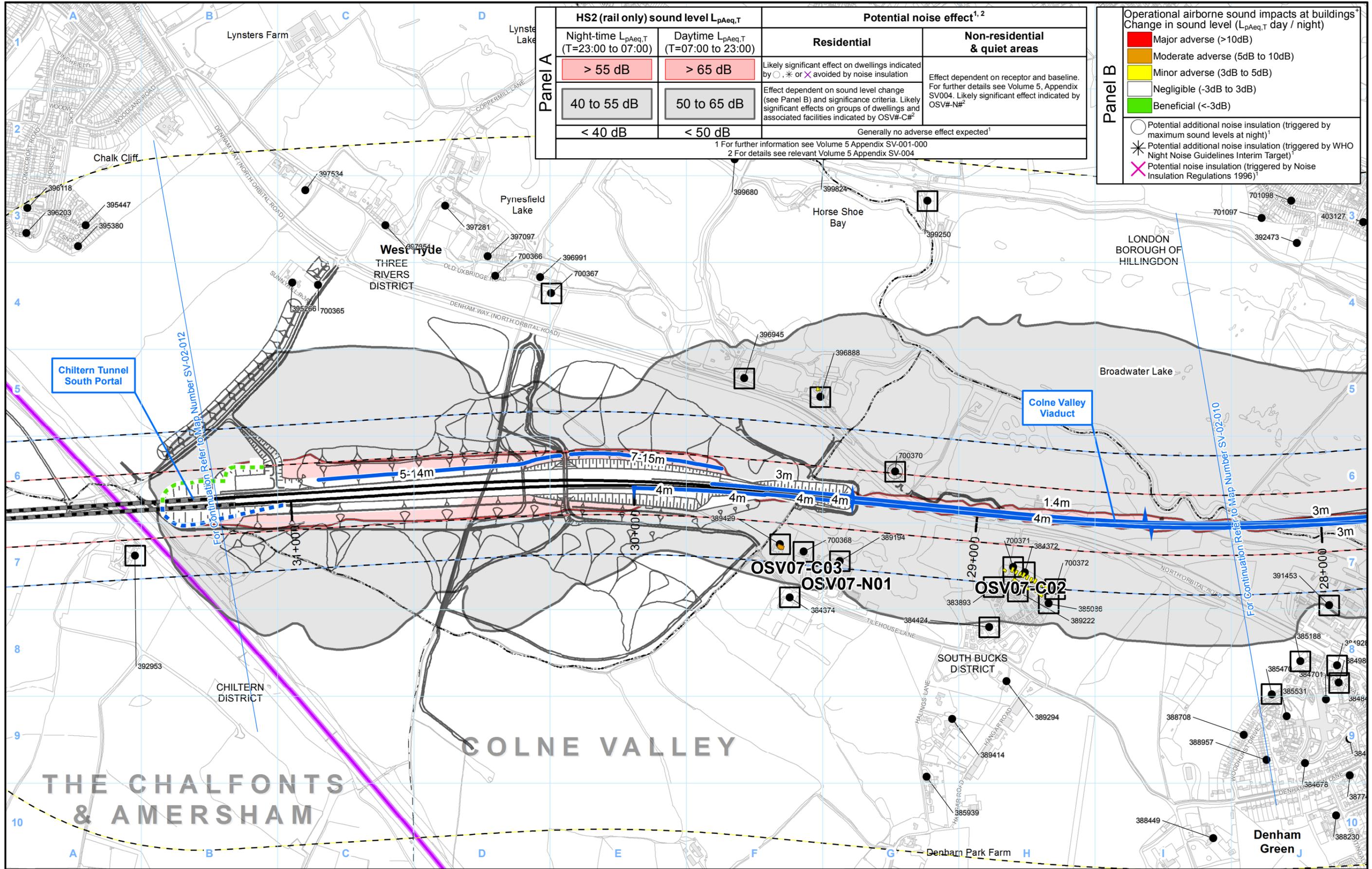
I am grateful for the active and constructive support of Buckinghamshire County Council in seeking to relocate HOAC to the New Denham Quarry site in South Buckinghamshire. However, as explained in my letter of 18 October to Chair of the HOAC Trustees, it has become clear this relocation arrangement is at great risk of not being financially sustainable. The anticipated cost has more than doubled and the deal carries a clear risk that HOAC will face severe operating difficulties further down the line.

In response to the recommendation of the Commons HS2 Select Committee we had agreed to pursue the relocation of HOAC to the New Denham Quarry site, but made clear at the time that this proposed relocation could not be at any cost. I understand that HS2 Ltd has forwarded Buckinghamshire County Council a breakdown of the £55.1 million cost estimate.

I am strongly committed to supporting the on-going operation of HOAC. HS2 Ltd has developed an alternative option to retain HOAC at its existing location that would allow HOAC to continue to operate throughout the HS2 construction and operation phases, provides better value for money and better supports the long term, sustainable operation of HOAC.

W. L. best wish
Chris Grayling
Rt Hon Chris Grayling MP

SECRETARY OF STATE FOR TRANSPORT



HS2 (rail only) sound level L _{pAeq,T}		Potential noise effect ^{1,2}	
Night-time L _{pAeq,T} (T=23:00 to 07:00)	Daytime L _{pAeq,T} (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or ✕ avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	
< 40 dB	< 50 dB	Generally no adverse effect expected ¹	

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-004

Operational airborne sound impacts at buildings⁺
Change in sound level (L_{pAeq,T} day / night)

- Major adverse (>10dB)
- Moderate adverse (5dB to 10dB)
- Minor adverse (3dB to 5dB)
- Negligible (-3dB to 3dB)
- Beneficial (<-3dB)

Panel B

- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- * Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- ✕ Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

* Residential buildings only
* Labelled with total barrier height above rail level

Legend - Sound related features

- Committed developments (label as CFA#/#) - SV Only
- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
 - Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- Airborne sound study area
- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Minor ground-borne noise or vibration impact*

Map Number: SV-02-011

Map Name: Operational Airborne Noise & Vibration Impacts & Likely Significant Effects (with Assessment Locations) Post-AP Petitions

Community Forum Area CFA7: Colne Valley

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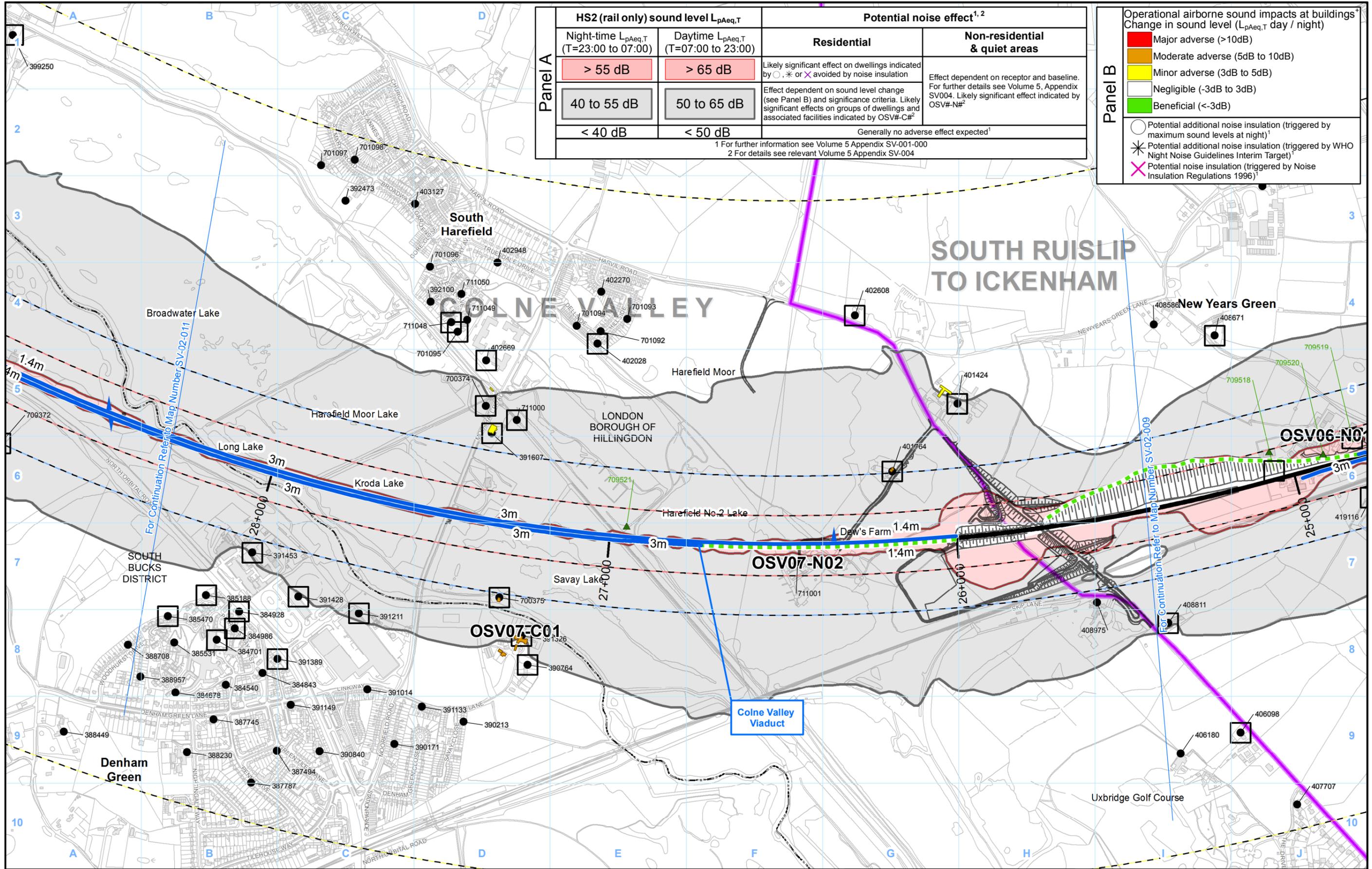
HOL/00823/0075

HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
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< 40 dB	< 50 dB	Generally no adverse effect expected ¹	

1 For further information see Volume 5 Appendix SV-001-000
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Major adverse (>10dB)	Minor adverse (3dB to 5dB)
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Legend - General features

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- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

* Residential buildings only
* Labelled with total barrier height above rail level

Legend - Sound related features

- Committed developments (label as CFA#/#) - SV Only
- Envisaged mitigation to avoid / reduce significant noise effects:
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 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- Airborne sound study area
- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Minor ground-borne noise or vibration impact*

Map Number: SV-02-010

Map Name: Operational Airborne Noise & Vibration Impacts & Likely Significant Effects (with Assessment Locations) Post-AP Petitions

Community Forum Area CFA7: Colne Valley

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Doc Number: -AP05-P01

HOL/00823/0076

Sanctuary Buildings
5th Floor
20 Great Smith Street
London
SW1P3BT

Colne Valley Park CIC
Colne Valley Park Visitor Centre
Denham Court Drive
Denham
Buckinghamshire
UB9 5PG

By email: colnevalley@groundwork.org.uk

23 November 2016

Dear Colne Valley Park CIC,

**High Speed Rail (London – West Midlands) Bill – House of Lords
Petition reference HoL823: Colne Valley Park Community Interest Company**

I am the Director of Hybrid Bill Delivery at HS2 Ltd, which is acting on behalf of the Promoter of the High Speed Rail (London – West Midlands) Bill ('the Bill') currently before Parliament. I understand that you have a number of concerns about the impact of Phase One of HS2 (known as 'the Proposed Scheme') and have submitted a petition on that basis to the House of Lords.

I am writing to set out our position in relation to the issues you have raised and the measures identified to address your concerns. I understand that you met with HS2 Ltd on 28 October 2016. At that meeting you discussed:

- a community liaison group for the Langley area;
- floodplain mitigation in the vicinity of the proposed Heathrow Express depot;
- the local application of funding or mitigation required through Environment Agency enforcement undertakings; and
- turbidity treatment at Springwell Lake

I have summarised HS2 Ltd's position on each of these matters below.

Community liaison group

You requested funding from HS2 Ltd to establish a community liaison panel for all construction projects in the area around Langley, which would assist residents in communicating their concerns of these projects. It is important to note that the Promoter has already committed to a number of measures regarding community liaison, including the development of a locally agreed liaison plan and the provision of dedicated community relations personnel. This will involve managing compliance with undertakings and commitments offered by the Promoter and ensuring that the local community is informed in advance of works taking place locally.

Floodplain mitigation

We discussed the floodplain mitigation and woodland habitat creation proposed to the east of the proposed Heathrow Express Depot at Langley. It will be located on land currently owned by a private landowner, Thorney Lane LLP, who you heard in the House of Commons Select Committee on 26 January 2016 and have also petitioned the Bill in the House of Lords, and are yet to appear before the House of Lords Select Committee. Thorney Lane LLP have requested that this land is not permanently acquired and therefore remains in their ownership. We are still in discussion on this matter and therefore are not in a position to confirm the ongoing management arrangements for the floodplain mitigation and woodland habitat creation at this time, nor who would be responsible for the long term management of ecological habitat.

After Royal Assent the Promoter will use powers granted under the Bill to ensure that environmental commitments are met. Colne Valley Park CIC's offer to be the organisation that maintains the environmental mitigation is welcomed and it is possible that they, or a similar organisation, may be well placed and ideal to perform this function if required, but this is not a decision that the Promoter can make at this time. This is reflected in Information Paper E16, Maintenance of landscaped areas, which sets out the process for establishing and maintaining this mitigation. It states, in paragraph 2.6 that:

"After an initial period of maintenance, the nominated undertaker will seek to return the majority of land to previous landowners or other interested parties (such as local wildlife trusts, woodland trust, local authorities), where agreement can be reached that will ensure the continued objectives of the landscaping are maintained into the future."

Enforcement undertakings

You requested that HS2 Ltd ensure any remediation work undertaken by the Environment Agency (EA) or costs recovered by the EA following a pollution event caused by HS2 Ltd, should be undertaken in the area local to the pollution event. We have considered this further, but we note that the EA have an established process for pollution incident cost recovery and as such, it is their prerogative as to how mitigation measures are implemented following a pollution event.

Community environment fund

I also wish to note that on 12 October 2016, indicative regional allocations were announced for the Community and Environment Fund and Business and Local Economy Fund. The Phase One route was divided into three broad areas for the purpose of the regional indicative allocations, with £15 million allocated for the Central Area, £7.5 million for Greater London area and £7.5 million for the West Midlands area. £10 million will remain unallocated to allow flexibility to fund bids for cross border or route-wide projects, as well as to fund bids from areas affected by the construction of the Proposed Scheme, but geographically separated from the main route. As such, the following statement was added to Information Paper C12, Community and Environment fund and Business and Local Economy fund, which is relevant to communities close to the Heathrow Express depot:

"7.4 For communities experiencing demonstrable disruption from construction works which are considered 'off-route,' but are contained within the High Speed Rail Bill, successful projects will receive funding from the unallocated £10 million element of the funds."

Springwell Lake

You also raised concerns about the Turbidity Treatment plant proposed at Springwell Lake, because the Environmental Statement does not identify protection for the fishery (North Harrow Watonians), the habitat/environment that will be lost and the permissive footpath around the lake.

Temporary provision of turbidity treatment equipment is required to treat abstracted water as a consequence of tunnelling and piling impacts on groundwater resources. The equipment will be located within the existing utility provider's land at Springwell Lake and will be connected with existing abstraction and discharge points present within the pumping station facilities. The temporary treatment equipment will be installed on existing hardstanding and there will be no change to the existing site drainage.

If backwashing of temporary filters is required during their operation, the backwash will either be discharged to the sewer or will be tinkered to a suitable disposal point. The treatment plant design (including mode and size) will be finalised during detailed design.

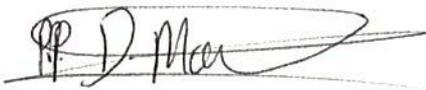
Noise and vibration from the turbidity pumps to be installed will be controlled through their design, the specification of noise, vibration emission requirements and the provision of enclosures or barriers as appropriate to avoid significant adverse noise and vibration effects at nearby dwellings. The equipment will be installed in accordance with the measures contained in the draft Code of Construction Practice (CoCP). The latest version of the draft CoCP can be found at <https://www.gov.uk/government/publications/environmental-minimum-requirements>.

I hope that the progress set out above in relation to the issues raised in your petition to the House of Lords gives you the comfort.

Petitions may be withdrawn by depositing a letter (or requisition) in the House of Lords Private Bill Office, signed by the Petitioner or agent. This may also be faxed to the House of Lords Private Bill Office. Please refer to the Lords petitioning guide at <https://www.parliament.uk/documents/Lords-HS2/House-of-Lords-HS2-petitioning-kit-guide.pdf> for further details.

If you have further queries about this letter please contact Derrick Morris on 020 7944 0176 or derrick.morris@hs2.org.uk for questions on the Harefield area and Daryl Henahan on 0207 944 8038 or daryl.henahan@hs2.org.uk for questions on Langley.

Yours sincerely

A handwritten signature in black ink, appearing to read 'R. Hargreaves', written over a horizontal line.

Roger Hargreaves
Director
Hybrid Bill Delivery