Submission ID: 33211

The Applicant requested further detail on the operations at Burn Airfield to assist its consultant.
The enclosed document responds to that request.
The Applicant has now submitted a further report (EN010140/APP/8.2.1) from its consultant which Burn Gliding Club is reviewing.

Burn Gliding Club - Further Information in Response to The High Level Investigative Report Produced for Stantec UK Ltd for The Helios Renewable Energy Project.

INTRODUCTION

1. PagerPower produced a high level investigative Report for Stantec in support of The Helios Renewable Energy Project in February 2024. We at Burn Gliding Club have detailed our issues with the report following Zoom calls on the 19th of April and 14 November. They do not appear to have been addressed in any detail. We do not have confidence that PagerPower understands the unique features of a Gliding Club operation as opposed to a powered aircraft operation. The two are significantly different. There appears to be no precedent for a solar farm installation so near to a gliding site. Consequently, the need for a detailed examination by the applicant of any flight safety impacts and consequent mitigation is paramount. This report aims to inform the applicant in more detail about gliding as a sport, the specific operations at Burn Gliding Club and our concerns about safety issues which need to be addressed.

ABOUT GLIDING

2. Going back to basics - Gliding is a type of flying in which a specially designed aircraft, called a glider or sailplane, flies without using an engine. Instead of being powered by a motor, a glider relies on natural forces, like gravity and air currents, to stay in the sky and travel long distances. The performance of different glider types are markedly different in terms of their glide ratios and the demands of flying them.

3. Here's how it works:

a. Launch: The glider is initially towed into the air by another aircraft or a ground-based winch. Once at a certain altitude, it releases from the tow line and starts gliding on its own.

b. Gliding: After release, the glider descends gradually, using its wings to turn the forward motion into lift. Pilots control the glide by adjusting the angle of the wings and the speed of the aircraft.

c. Staying in the Air: To stay aloft longer, glider pilots look for rising air currents, called lift. These can come from:

> Thermals: Warm air rising from the ground, often under sunny conditions - this is the usual form of updraft at Burn and in the local area..
>
> Ridge lift: Air pushed upward by hills or ridges - This type of updraft will not be present at Burn.
>
> Wave lift: Stable airwaves created by wind flowing over mountains - we do experience this at Burn but infrequently.

4. Landing: Once the flight is over, the glider is brought back to the ground in a controlled landing, usually on an airstrip but it could be in a field too.

5. Gliding is both a sport and a skill. Pilots rely on their knowledge of weather, aerodynamics, and navigation to make the most of the air currents. It's quiet and peaceful since there's no engine noise as it is a very pure form of flying. The pilot has limited instrumentation and is required to keep a good lookout at all times, often flying 'by the seat of his or her pants' to the feel of the aircraft. The sport is regulated by The Civil Aviation Authority (CAA) through The British Gliding Association (BGA). All pilots are subject to regulated and formatted training throughout their career in the sport to ensure safe operations at all times.

BURN GLIDING CLUB

6. Burn Gliding operates from the 6 runway directions available at Burn Airfield, a former WW2 No4 Group Bomber airfield.While the runways are in a poor condition, the centre of each runway and 4 of the 6 stubs have been maintained and resurfaced to allow gliding operations to take place. We are able to operate all year round as the runways do not flood when the surrounding fields become waterlogged during periods of wet weather.

7. Burn Gliding Club is recognised by the British Gliding Association (BGA) offering training in flying gliders and some aspects of powered flying. We operate 2 seat training gliders, Touring Motor Gliders and Light aircraft used as "Tugs" for aerotow launching and private gliders owned by club members.

8. The range of experience at Burn Gliding Club ranges from experienced cross country glider pilots with more than a 1000 hours in gliders to beginners learning to fly gliders, and age ranging from 14 to 84.All members are volunteers and the Club is run on a wholly voluntary basis. Because of the very different levels of competency across the gliding members the tolerances in flying accuracy is wide but this tolerance is also proportional to the weather conditions and the type of glider being flown.

9. The Images 1 to 5. Below to indicate some examples of the circuit patterns flown by the different gliders and pilots at Burn to land at the designated areas. A trainee pilot will typically fly less uniform circuits requiring more height and room than a competent pilot with hundreds of flights in his log book.

10. Gliders operate under VFR (Visual Flight Rules) They cannot be controlled by air traffic control and manage safe transit by good look out. The area around Burn is class G (uncontrolled) airspace, Sherburn and Leeds East airfields are within the local soaring areas and consequently the volume of general aviation aircraft is high. Good lookout is essential to maintain aircraft separation.

OUR SAFETY CONCERNS

11. We have the following concerns about the impact of the project

Engine failure after take-off (EFATO) - Reduction in land out options

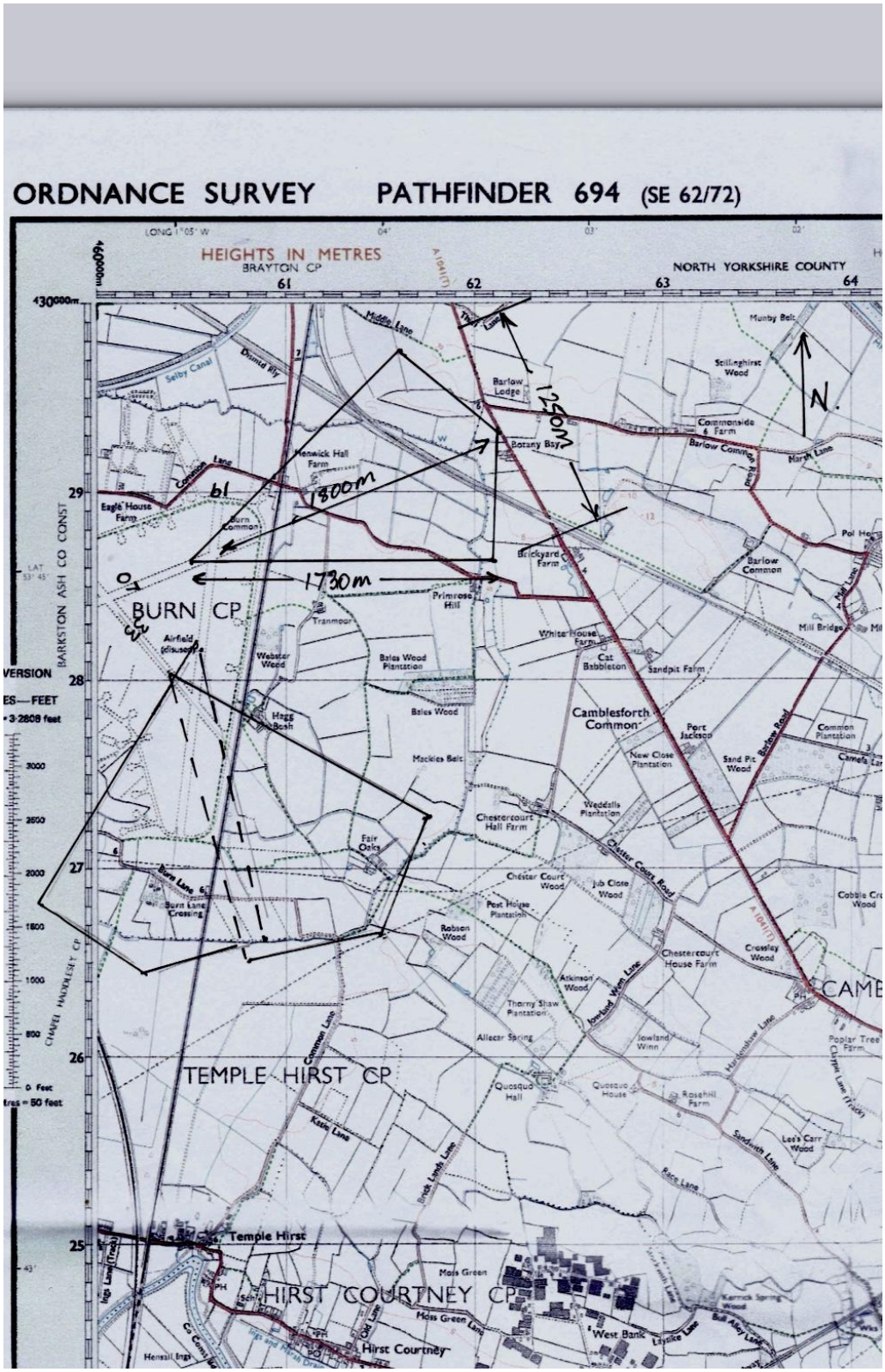
Glint and Glare on approach or on a downwind leg

The effect of thermal updrafts on approach or on a downwind leg

To take each point in turn:

EFATO REDUCTION IN LANDOUT OPTIONS

12. Below is a diagram showing the areas we need landing options where the panels may be sited in the event of an aerotow launch failure. Based on a Janus Glider.



13. From 500 ft then we have the option of returning to the airfield, below that we should be looking at landing ahead or either side within an increasing angle up to 45 degrees. Using the figures again for the Janu,s the distance to approach, land and stop from different heights are below:

400ft ...1100m
300ft 800m
200ft 600m
100ft 400m.

14. While these figures are typical, we need a clear approach and manageable surface ground run of 200m but ideally 400m. width 100m. These forced landings don't have the luxury of a huge amount of time for planning.

GLINT AND GLARE ON APPROACH

15. The PagerPower Report addressed Temporary visual impairment caused by glint and glare. Any impairment is totally unacceptable on the circuit where pilot lookout is critical as the whole circuit is judged by eye and we will only see other aircraft through lookout.

15. A circuit allows an organised separation of aircraft into a single point, essential for a gliding site such as Burn where the landing area is narrow and options limited where the landing area is blocked by aircraft. The Approach shown in the Solar Photovoltaic Glint and Glare Study June 2024 Fig 10 is a generic and simple approach for a powered aircraft into a General Aviation (GA) airfield not a gliding airfield.

16. From the environmental report. Solar Photovoltaic Glint and Glare Study june 2024 section 5.1.2 the statement made *The height of the aircraft is determined by using a 3-degree descent path relative to the runway threshold height does* not apply to a glider circuit. This was explained to PagerPower following their High Level report dated February 2024. PagerPower appears to lack knowledge of a gliding site operation yet have made the statement in the **Executive Summary '*Solar reflections with 'potential for temporary after-image' are predicted towards runways, 01,07, 15, 19, 33, However, following further assessment of the predicted reflections in an operational context, it can be concluded that the glare is operationally accommodatable'. We are not convinced.***

17. Temporary after image is a term meaning "Something you see when it is no longer there" (Cambridge Dictionary definition) This would suggest that pilot vision will be affected in a critical part of the circuit caused by the solar reflections.

18. All gliding sites affiliated to the BGA teach the standard gliding circuit consisting of a downwind leg, diagonal leg, Base leg and final approach. The dimensions on the circuit will be suited to the ability of the pilot, the glider type, the weather conditions and the landing area including the surrounding ground features, topography. Each circuit is flown by eye with turns and lengths of the different legs being determined visually while monitoring the airspeed at regular intervals. This means the glider pilot has to carry out 3 turns with accurate direction and speed control, each turn preceded and followed by visual lookout to ensure that there are no other aircraft in a position which might lead to a collision and to judge the progress around the circuit. Any reduction in vision caused by solar reflections will reduce the effective look out by a pilot.

19. The Solar Photovoltaic Glint and Glare Study June 24 , section 6.4 to 6.9 suggests there is a potential of Temporary Afterimage on approach to runways 07, 25, 15, 33, 01, 19. (See also Solar Photovoltaic Glint and Glare Study June 2024 section 7.1.2) where 7 mitigation items are listed where only one is a possible solution for us. The inclusion of the others demonstrate a total lack of understanding of gliding.

20. This assessment is based on the straight in powered aircraft approach, again the gliding circuit follows a different pattern and this has not been assessed. PagerPower profess that they have done other studies involving aviation, there is little evidence these involved any gliding airfields.The primary means of mitigating mid air collisions in unclassified airspace (Class G) such as Burn, Hemingbrough and Sherburn is 'See and Avoid'. Any reduction in vision caused by solar reflections will reduce the effective lookout.

Summary. Glint and Glare.

21. PagerPower have determined the results of the Glint and Glare study using the approach flight paths of powered aircraft, which are different to the circuits taught and flown by gliders. Where they have determined potential "Afterimage" (The third highest level of their impact rating) they downplay it and suggest 7 points on mitigation, all to be taken by Burn Gliding Club and only 1 would be feasible and 3 would seriously impede our ability to fly.

THE EFFECT OF THERMAL UPDRAFTS ON APPROACH AND DOWNWIND LEG

22. Warm air parcels are more buoyant than cooler air parcels and will rise once able to break away from the surface. Natural thermals can be very powerful allowing gliders to gain height by circling in the rising air parcel. These thermals can be turbulent and require a lot of control inputs to keep the glider within a safe flight envelope.

23. We have questioned what effect the solar panels will have on gliders where the gliding circuit is overhead the solar farm. The BGA training manual states that the final turn onto the approach shall not be lower than 300 ft above ground level (AGL). In practice circuits begin at a point up wind and to the side of the landing area. Height is lost as the glider travels downwind and the glider will turn on to the diagonal leg then onto a base leg (90deg to the final approach). Before intersecting the final approach the final turn is completed and should be above 300 ft. The heights and progress around the circuit depends on pilot ability, glider type, weather and wind conditions. It is good practice to fly the circuit with sufficient options to change the landing area if required. **In light of these requirements it is important that turbulence from the solar panels do not create unstable air requiring additional control to maintain a safe circuit and approach.**

24. PagerPower refer to Thermal updrafts caused by the solar panels in the High Level Investigative Report (February 2024) but discount the effects on gliders as being '***Manageable'*** Paragraph 5.2.2 and suggest the air brakes could be used to counteract this. They consider this as manageable? This is another example of PagerPower appearing not to understand a gliding site operation and not recognising the serious nature of turbulence when a glider is low in the circuit.

25. Below are 5 3D actual representations of glider flight tracks on different runways at Burn to indicate where they may interact with the proposed location of solar panels.

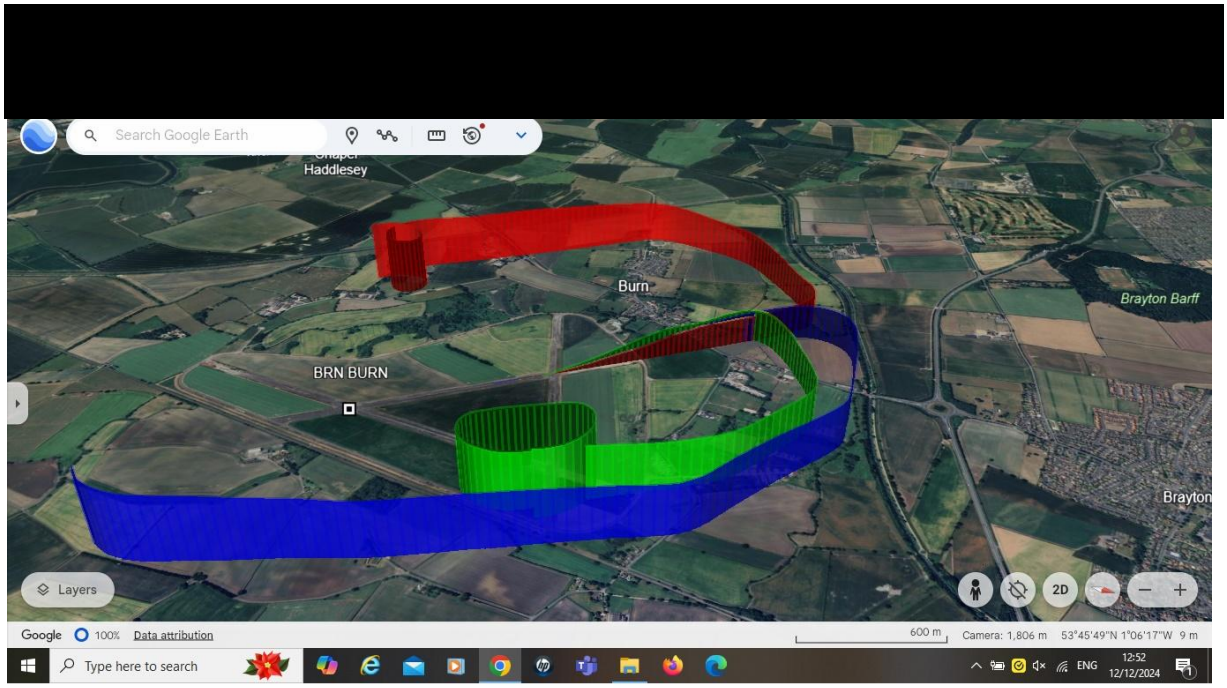


Image 1. 3 circuits onto runway 15, looking south west. Notice the decrease in height as the circuit progresses

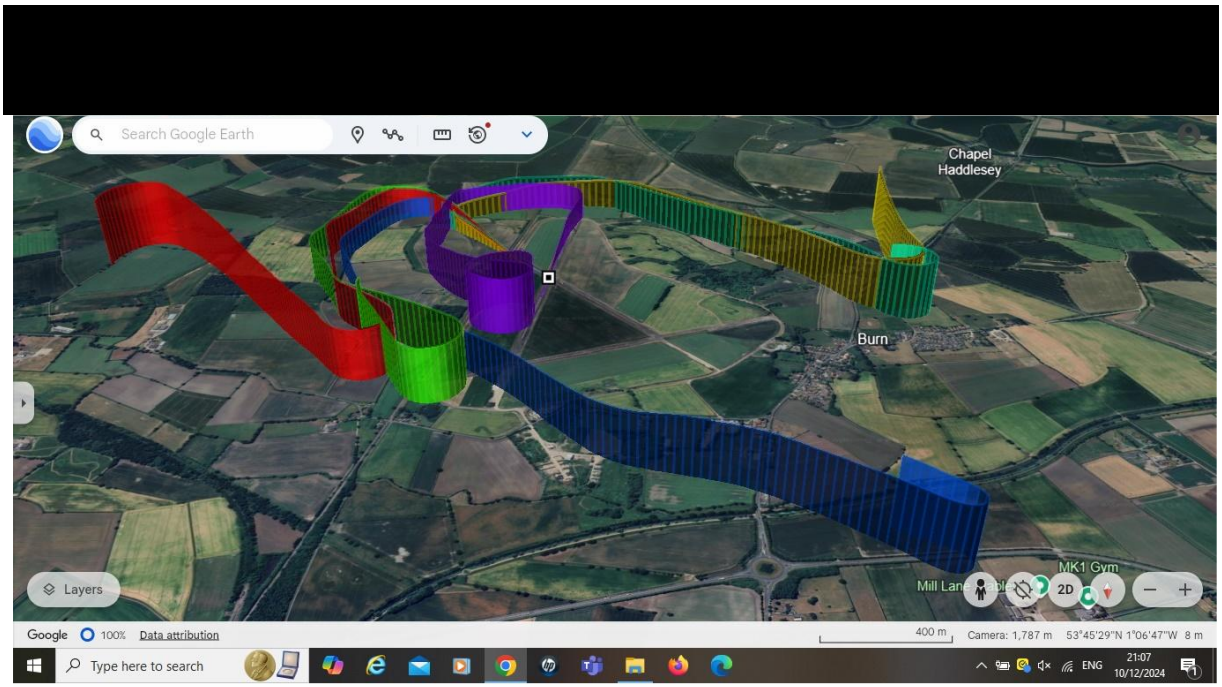


Image 2. Circuits onto runway 33, looking south. The right hand Red, Green and Blue tracks show height decreasing over the solar panels

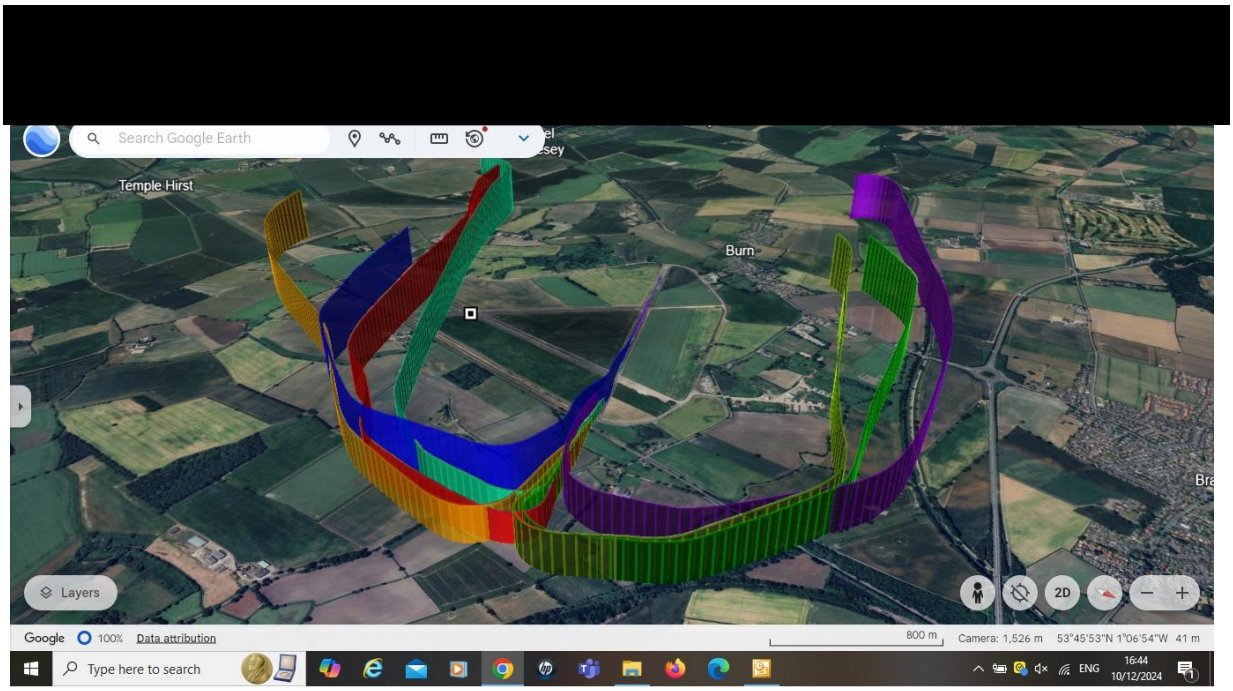


Image 3. Circuits onto runway 25 looking south west. The left hand red,turquoise,blue and orange tracks all pass over the solar panels

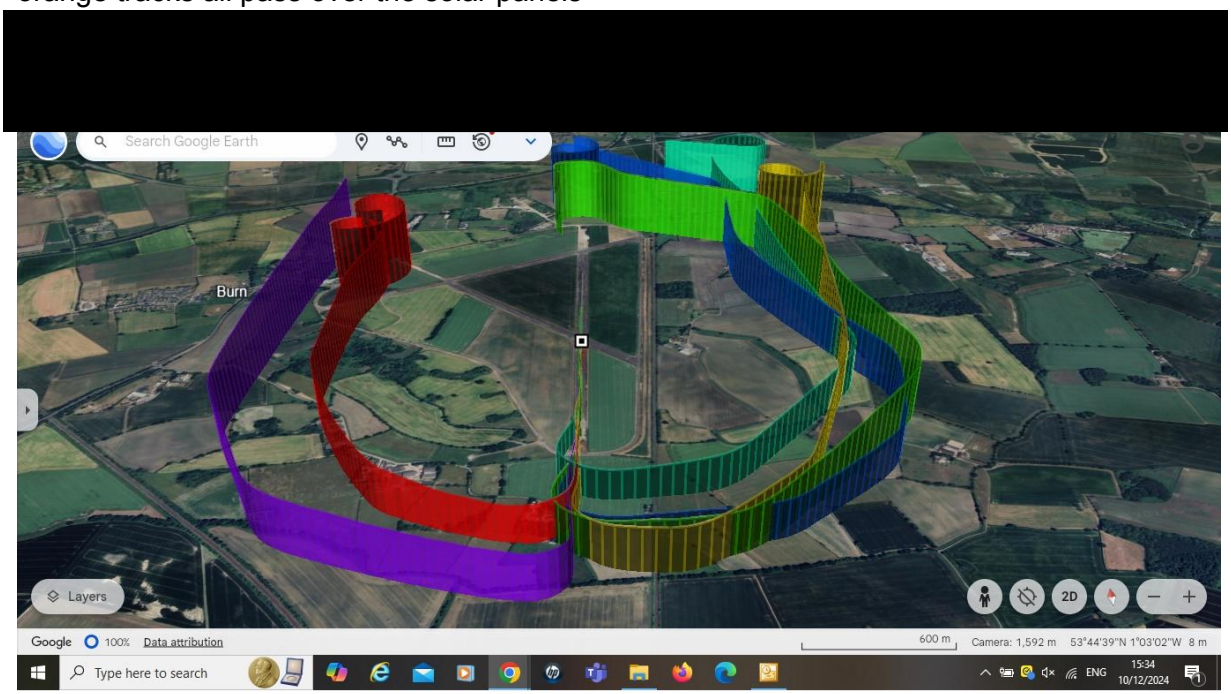


Image 4. Circuits onto runway 01 looking North. The 4 right hand tracks descend over the solar panels.

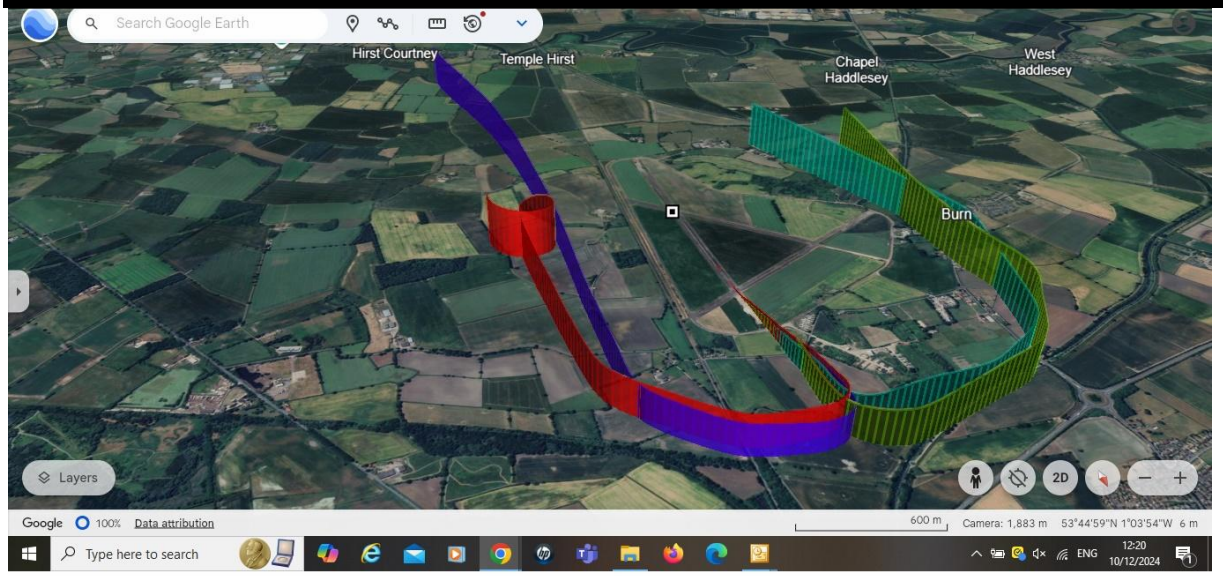


Image 5. Circuits onto runway 19 looking south south west. The Left hand circuits blue and red are descending over the solar panels.

CONCLUSION

26. In conclusion, we consider that PagerPower has failed to carry out a site specific and detailed assessment of the likely impacts of EFATO land out options, glint and glare and thermal updrafts on our safe operations. It is essential this is done as the planned siting of a large solar array so near to a gliding site appears to be a precedent and thus experience of the likely impacts is very limited. There are no similar situations to inform us. We have attempted to expand on our concerns above and sought to provide detailed information to assist with such a detailed study. We stand ready to assist or to arrange a site visit to examine our concerns in greater detail.