Greatford Parish Council Written Representation to Planning Inspectorate with regards to the proposed Mallard Pass Solar Farm.

This written representation covers in more detail the issues raised during the open floor hearing of 17/05/2023.

The primary concern of Greatford Parish Council is the potential effect this proposed development could have upon increasing the flood risks from the West Glen river that runs through Greatford, other significant concerns include the loss of BMV agricultural land, traffic implications and the degrading of local amenity space, these issues are covered in detail in the following written representation.

Contents.

1. Flooding:

1a) **Run-off water from the solar panels.**

From the limited details available from Mallard Pass in the EIA about the type of solar panels that may be installed by Mallard Pass we are able to ascertain that a total of 530,303 panels will be deployed over an undisclosed area within the order limits.

Having looked at the various sizes of panels offered by Canadian Solar, we have used their panel with the dimensions 2384mm x 1303mm (3.06m^2) for the calculations below. This panel size represents a mid-point in the range of panel sizes offered.

530,303 panels x 3.06m^2 = 16,222,727m^2 which is 162.27Ha civered with solar panels.

The above numbers mean that the proposed area that will actually covered by solar panels is 162.27ha of the quoted 420ha of solar panels within the order limits.

The quoted design of the solar arrays means that each panel will drain from its lower edge which (using our assumed panel dimensions) measures 1.303m. Therefore there will be 690,984m of drip lines across the development.

We calculate (using a reasonable assumption) that the water from these drip lines will drip onto a 15cm wide strip of soil underneath the drip lines. For each panel this represents an area of 0.195m^2.

Therefore the area receiving the water is from all of the panels will be 530,303 x 0.195m^2 = 103409 m^2 or 10.3Ha.

Therefore 6.37% of the area underneath the solar panels will receive 100% of the rainfall that falls onto the solar panels.

This means that the soil beneath the drip lines needs to be able to cope with (or absorb) **15.75** times more water than is currently the case.

1b) Soil infiltration rates

Mallard Pass have provided is no data for the water infiltration rates for the different clay based soil types associated with the proposed development, however Food Agriculture Organisation (FAO) data suggests that clay loam soils have infiltration rates of 5 to 10mm of water per hour, and clay soils have infiltration rates of 1 to 5mm per hour.

Most of the proposed site has been classed as medium clay loam, heavy clay loam or clay and will thus have a relatively low water infiltration rate. This will be even lower if the soil is compacted. We have covered the impacts of construction, including compaction upon the soil later in this document.

Using the metric of 1mm of rain across an area of 1Ha being equivalent to 10m^3 of water (10,000 litres), then the area covered with solar panels will receive a total of 1650m^3 of water for each millimetre of rain falling onto the solar panels of the proposed site.

This 1mm of rainfall will be concentrated into **15.75mm** of rainfall in the area below the drip lines.

Using the higher FAO infiltration rate of 10mm per hour, it would take the soil 1 hour 34minutes to absorb 1mm of rainfall. In reality the soil below the drip lines would quickly become saturated and the excess water will start to move down slope towards drier soil, or if none is available over land.

If we take a moderately wet day that led to significant flooding in Greatford such as 20/12/2020 when 12.9mm of rain fall was recorded, 12.9mm of rain across 162.27Ha of panels is 20,932m^3 of water.

In this scenario the area underneath the drip lines would receive in the equivalent of 203mm of rain fall which would take over 20 hours to infiltrate at 10mm per hour, but if a mid-point FAO infiltration rate of value of 5mm per hour were used than this would take more than 40 hours to infiltrate. With a very low infiltration rate, such as in a compacted clay soil, the infiltration rate can be as low as 1mm per hour, where it would take over a week to infiltrate the rainfall received during one wet day.

In all of these scenarios a significant proportion of the water falling onto the panels and running off of them would run to other (lower) areas with the potential to cause rilling and erosion, unless the water can be intercepted by appropriate and established vegetative cover.

This vegetative cover <u>must</u> be in place before any construction commences, if the vegetative cover is not present, and a significant rain-fall event occurs, the impact on the soil and the local hydrology could be severe. We consider the establishment of suitable vegetative cover essential and cover this aspect later in this document.

The outline surface water drainage strategy, file number 000159, page 16 states that:- *"the run off rate from the panels may increase by 14,147 litres per second across the footprint compared to the baseline, which would equate to an approximate 256% increase in runoff rates".*

This is broadly in line with the calculations presented above, however:-

The next paragraph of the outline surface water drainage strategy states that "the raised nature of the PV arrays will not prevent the soil from absorbing rainwater as the panels will not be placed on the ground and each PV row will be separated, with the same area of soil available for infiltration as per the baseline scenario.

This in our opinion is incorrect. The water running off the driplines of the solar panels will fall vertically under gravity onto a small area of soil immediately below the drip lines. A small proportion of the water may disperse locally from the area under the drip line through rain splash or be deflected by the wind, however the majority of the water will fall under gravity straight down onto the ground, and then either infiltrate into the soil, or runoff.

The outline surface water drainage strategy, file number 000159, page 16 then goes on to suggest that "once rainfall has fallen on a PV array, the water will be able to spread and flow along the ground under the PV arrays evenly into the rain-shadow of the row below so as to mobilise the same percentage of the ground for infiltration as was available prior to the installation of the PV arrays.

This is in our opinion incorrect. Water will move downwards under gravity and infiltrate into the soil at a rate defined by the (predominately clay) soil type and the level of soil compaction. It may move slightly sideways through capillary action.

If it begins to flow along the ground under the PV arrays as suggested above then it has the potential to cause erosion, rilling, and a loss of soil which will impact the local hydrology and wider ecosystem.

In a prolonged wet period 14,147 litres per second (Mallard Pass own figures) will be pouring off the panels into a concentrated area of slowly permeable soil that will not be able to absorb this quantity of water.

It is a significant omission that Mallard Pass have not undertaken a proper assessment of the soil infiltration capacities across the site, and restricted this work only to the area where they plan to build the substation. The outline surface water drainage strategy file number 000159, page 7 the paragraph states *"The implementation of PV Arrays will not result in substantial increases in hardstanding foot print and the infiltration capacity will behave as per the baseline scenario"*.

Given that 162Ha of the soil will be covered with 503,303 impermeable solar panels (as detailed above) and no data is offered for the infiltration capacity of baseline scenario (the various clay based soil types across the proposed site) we consider this to be a wholly erroneous statement.

In order to provide an accurate assessment of how the soils of the site would react to the increased runoff from the panels we would have expected Mallard Pass to have used modelling tools applicable to this scenario and type of run-off, especially in the event that the soil is compacted.

Modelling tools that could have been applied include:-

i). Hydrology of Soil Types (HOST) which has a dataset of 29 soil classes and their hydrological properties, particularly their ability to transmit water both vertically and horizontally (see Boorman, D B, Hollis, J M & Lilly, A 1995. Hydrology of soil types: a hydrologically based classification of the soils of the United Kingdom. Institute of Hydrology Report No. 126. 137pp)

ii) . Winter Rain Acceptance Potential (WRAP) which was the forerunner of HOST.

there is no evidence that any modelling for the water running off the panels has been undertaken by Mallard Pass.

1c) Increased Flood Risk

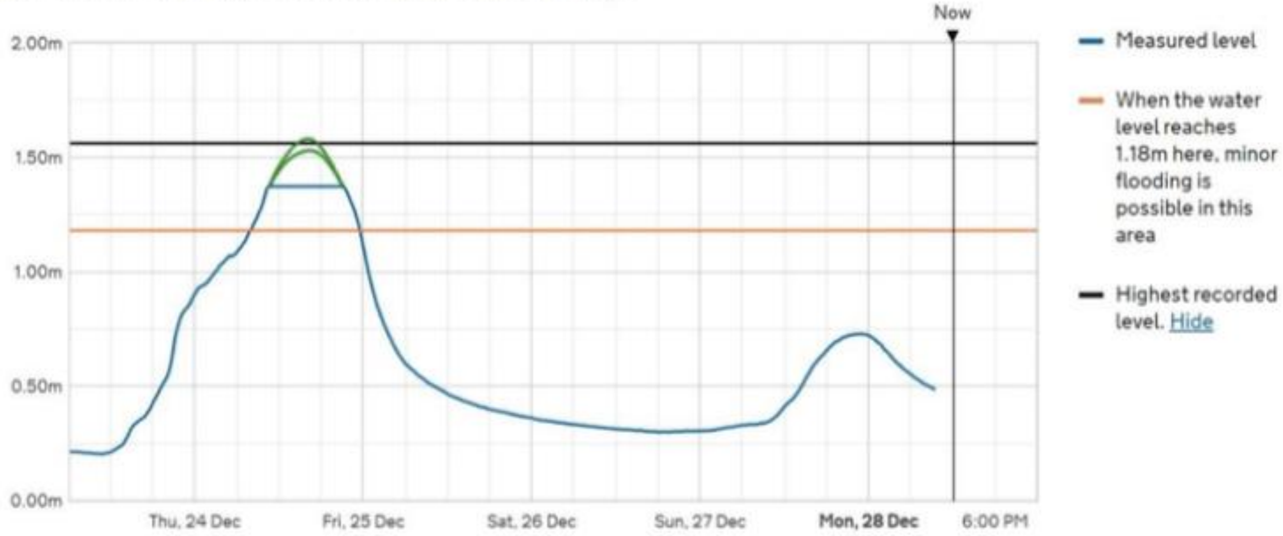
This is of great concern to the Parishioners of Greatford as the potential speed that this water will be delivered to the drainage systems of the proposed solar array area and then onward into the West Glen river will be significantly faster than is the case under the current land use.

In the absence of any data to suggest otherwise It could be likely that water from the solar arrays will enter the drainage system more quickly than is currently the case, as less of the soil surface area is available to absorb the received rainfall.

If this happens then the drainage water will affect the river level in the West Glen much more quickly than the current land use, and thus the gradient of the curves shown on the river level graphs below (from periods of actual flooding in Greatford) will steepen, which will lead to more rapid flooding with less warning for residents to take appropriate flood precautions.

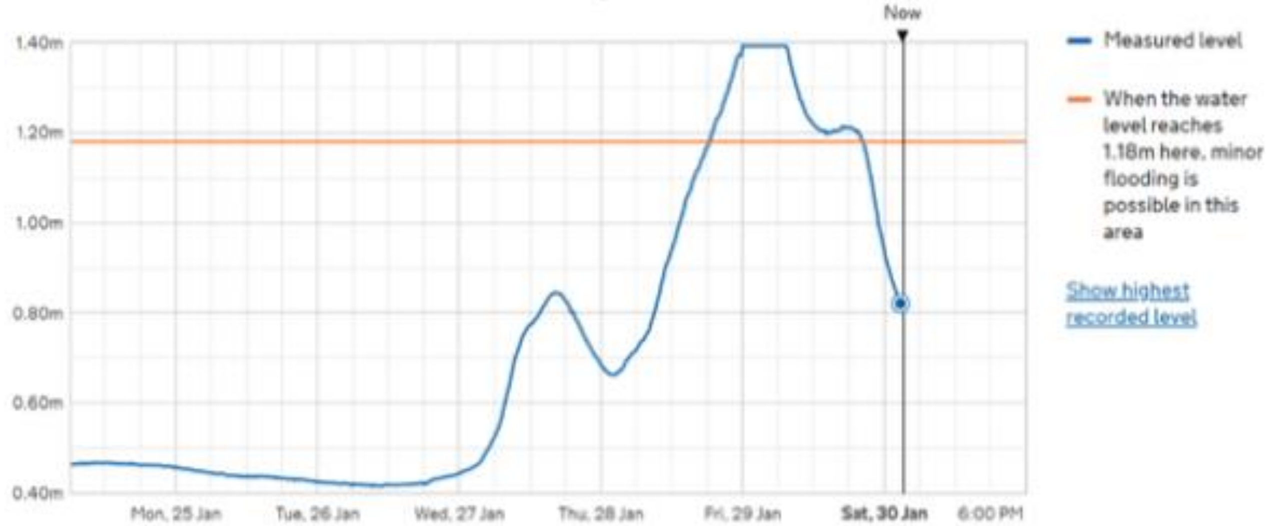
Latest recorded level **0.48m** at **9:30am Monday 28 December 2020**.

River levels at this location in the last 5 days



Latest recorded level **0.82m** at **2:45am Saturday 30 January 2021**.

River levels at this location in the last 5 days



Source Environment Agency river level data.

The potential for flooding outside of the boundary of the proposed solar farm has not been properly considered by Mallard Pass and we believe that this is an error as the potential damaging effects from the water draining from the site, upstream of Greatford is significant in the short, medium, and long term.

1d) Establishing vegetative cover.

In the outline surface water drainage strategy file number 000159, page 17 there is reference to Natural England Technical Information Note 101 (TIN101)

TIN101 states:

"The key to avoiding increased run-off and soil into watercourses is to maintain soil permeability and vegetative cover. Permeable land surfaces underneath and between panels should be able to absorb rainfall as long as they are not compacted and there is some vegetation to bind the soil surface".

As MP are quoting this in their outline surface water drainage strategy it should absolutely be adhered to in that vegetation should be well established and soils not compacted. To properly establish a hard wearing grass ley will take two years and this needs to be done prior to construction.

The outline surface water drainage strategy (page 17) goes on to confirm that:

The energy of the flow which drains from PV Arrays will be greater than that of the rainfall. Therefore, this could result in erosion under the driplines and possibly lead to ground instability. In addition, intensification of the runoff from panels, along the 'drip line', into small channels / rivulets, could be exacerbated where PV Arrays are not positioned in alignment with topography.

In order to avoid increased erosion rates, the grass beneath the panels would be well maintained throughout the lifetime of the Proposed Development.

1e) The potential damaging impacts of construction upon soil function & quality.

During the construction, operation and decommissioning phases of the planned Mallard Pass solar farm the agricultural soils upon which the solar farm may be built will be subject to extensive disturbance and trafficking by the vehicles and equipment used to carry out construction operations.

The soils across the site are predominately clay based, and as such will be vulnerable to compaction and damage if trafficked when wet and in a plastic state. A clay soil that is trafficked in a plastic state will deform under the weight of the traffic causing compaction and other soil structure issues.

Compacted soils are compromised in terms of their ability to absorb water as the air spaces into which water percolates are filled with compacted soil.

As a large area will be covered by solar panels, rainwater falling onto the panels and then running off will be concentrated onto a smaller area of soil than is currently the case, in addition this soil may have been compacted by construction activities and be even less able to absorb the runoff water.

Runoff water that cannot be absorbed into the soil will then begin to move elsewhere and potentially cause problems such as erosion, siltation and flooding.

This issue is of vital importance to the residents of Greatford as any increase in runoff from the site could lead to a subsequent increase in the speed and severity of flooding in Greatford. Increased siltation in the West Glen will reduce the volume of water that can be contained within its banks which will also increase flooding, and also damage the gravel river bed which is of high value as a habitat.

It is our contention that this issue has in no way been properly addressed by Mallard Pass and we present our reasoning as follows:

1f) The classification of soil types across the proposed site.

Table 3.7 (page 11) of the Outline Soil Management Plan classifies the soils across the proposed site as Medium Clay Loam, Heavy Clay Loam and Clay (see below).

3.7 The predominant soils for the topsoil and upper subsoil in each area are recorded in the table below.

Table 1: Predominant Soil Type

Area	Topsoil		Upper Subsoil	
	Depth (cm)	Predominant Texture	Depth (cm)	Predominant Texture
A (North)	0-35	HCL/C	30-60 (occ deeper)	C
A (South)	0-35	MCL and HCl	35-60	MCL/HCL/C
B	0-35	MCL and HCL	35-60+	MCL/HCL/occ C
C	0-35	MCL/HCL, C to the south	35-50+	C
D	0-25	HCL/C	25-50	C,
E	0-30	MCL/HCL/C	30-50+	C, occ SLC
F	0-30	MCL/C	30-60	HCL/C
G	0-30	MCL/HCL	30-60	MCL/HCL/C
H	0-25/30 (variable)	MCL/HCL/C	25-50+	HCL/C
I	0-25	C	25-50+	C
J	0-25	HCL/C	25-50+	C
K	0-30	C	25-50	C

Mallard Pass Solar Farm – oSMP
7

Application Document Ref: EN010127/APP/7.12
Planning Inspectorate Scheme Ref: EN010127

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It is clear from this summary of the soil survey work undertaken by Mallard Pass that the soils are all clay based.

1g) Soil resilience to damage.

The Environmental statement Volume 1 Chapter 12 – Land Use and Soils, quotes from table 4 of the IEMA Guide ‘A New Perspective on Land and Soil in Environmental Impact assessment’ (inserted below). This table classifies the clay based soils found across the site (detailed in the preceding table) as having medium sensitivity to structural damage.

This classification also means these soils also only have medium resilience to damage and are susceptible to damage of both the top and sub-surface soil layers if handled inadequately, or more importantly, trafficked in wet conditions.

Table 4: Sensitivity of Soil Receptors (Table 7.2 Reproduced from the ICE Environmental Impact Assessment Handbook – A Practical Guide for Planners, Developers and Communities (3rd Edition).

Sensitivity of Topsoil and Subsoil	Soil Texture, Field Capacity Days and Wetness Class
High sensitivity (low resilience to structural damage)	Soils with high clay and silt fractions (clays, silty clays, sandy clays, heavy silty clay loams and heavy clay loams) and organo-mineral and peaty soils where the Field Capacity Days (FCD) are 150 or greater. Medium-textured soils (silt loams, medium silty clay loams, medium clay loams and sandy clay loams) where the FCDs are 225 or greater. All soils in wetness class (WCV or WCVI).
Medium sensitivity (medium resilience to structural damage)	Clays, silty clays, sandy clays, heavy silty clay loams, heavy clay loams, silty loams and organo-mineral and peaty soils where the FCDs are fewer than 150. Medium-textured soils (silt loams, medium silty clay loams, medium clay loams and sandy clay loams) where FCDs are fewer than 225. Sands, loamy sands, sandy loams and sandy silt loams where the FCDs are 225 or greater or are in wetness classes WCIII and WCIV.
Low sensitivity (high resilience to structural damage)	Soils with a high sand fraction (sands, loamy sands, sandy loams and sandy silt loams) where the FCDs are fewer than 225 and are in wetness classes WCI to WCII.

The outline soil management plan section 3.8 (page 11) states that the clay and heavy clay soils in the proposed development have a medium resilience to soil damage where the FCD (field capacity days) are <150.

Section 3.9 of the outline soil management plan refers to *"lighter soils including medium clay loams are of medium resilience where field capacity days are less than 225 are at low risk of structural damage"*.

This is incorrect (as highlighted by Natural England in their consultation response), all of the clay based soil types found throughout the proposed development should be classed in the above tables as medium to heavy clay soils that have medium or high sensitivity to structural damage.

Note: The word sensitivity is not used in the outline soil management plan.

1h) Preventing damage to soils (part 1).

The Environmental statement Volume 1 Chapter 12 para 12.4.8 states:-

The potential for adverse effects on agricultural land is during the construction phase listed in order as:-

a) the construction & use of temporary compounds.

b) the construction of access tracks and solar stations.

c) the installation of PV arrays.

d) the trenching of electrical cabling

e) site fencing

f) the on-site substation

There is no prior to construction consideration that could help prepare the ground for construction. This is a significant omission.

The above list should be preceded by the establishment of a suitable, hard wearing grass ley capable of withstanding the associated rigours of the construction phase as discussed above, and also as mentioned in Natural England's relevant response (below).

A key mitigation measure to minimise the potential detrimental impact of construction activities on the soil resource is to ensure that the grass sward is fully established (i.e., no bare ground), prior to the installation of the panels and associated infrastructure. This should be specified in the Outline Soil Management Plan.

There is a huge difference in the potential damage to soils where work is undertaken on bare ground compared with work undertaken on an established grass sward.

The establishment of a suitable grass sward 18 to 24 months prior to starting construction should be a condition of any planning consent that may be granted.

1i) Damage to soils at depth.

The outline soil management plan, section 2.3 (page 7) states:- "*The installation of the mounting structures and the assembly of PV tables does not require movement or disturbance of soil….*"

We disagree strongly with this statement, pile driving thousands of posts into the soil will cause significant soil disturbance. As will removing them at the decommissioning phase.

Driving so many posts into the soil to depth will cause local soil disturbance throughout the soil profile. There is also the likelihood of damage to land drains during this activity as these important hydrological features have not been mapped.

Furthermore removing these posts during decommissioning will inevitably lead to soil disturbance and this aspect of soil disturbance has also not been addressed.

Additionally there is evidence from the soil infiltration test pits dug by Mallard Pass that the legs of the mounting structures will encounter ground water as it was obviously present in two of the six infiltration test pits dug for the EIA (images below).

From the Outline Surface Water Drainage Strategy (pages 45 &51)

This is contrary to the information presented in Appendix 11.3 Water Resources and Ground Conditions – Consultation Summary Consultation responses, where, in a response to PINS (Scoping opinion) regarding steel mounting posts being driven into the ground and having an effect upon ground water, MP addressed the matter by referring to an absence of ground water within the trial pits dug for infiltration testing (see extract below).

> Due to the overlying superficial geology across the Order Limits and absence of groundwater encountered within the trial pits for infiltration testing, groundwater is unlikely to be present at depths at which the PV Array racking system will be driven into the ground. As such, there is limited potential for effects, including cumulative effects, on groundwater resources and receptors which rely on the resource.

This clearly isn't the case as trial pits 2 & 5 had water present in them as can clearly be seen in the images above taken from the soil infiltration testing report in the Outline Surface Water Drainage Strategy (pages 45 &51). These photos were taken in March 2022 following a relatively dry winter when ground water levels would be expected to be below average.

1j) Preventing soil damage (part 2).

The soils across the site are clearly sensitive to structural damage if handled or trafficked in a wet state.

Any DCO granted must clearly limit when trafficking and construction of the proposed solar farm can take place. Construction should only be undertaken when the soil is dry enough to not be damaged, and should cease if the soil becomes too wet.

In response to concerns raised during relevant representations Mallard Pass amended the Outline Soil Management Plan oSMP (section 1.4, page 5) and added "A suitably-experienced soil specialist will be engaged to advise on soil handling, including advising on when soils are sufficiently dry to be handled as required".

Section 4.24.3 (page 13) of the oSMP states that "Soil handling, movement and trafficking will be undertaken under the supervision of an appropriately experienced soil specialist to advise on and supervise soil handling, including identifying when soils are dry enough to be handled".

The Environmental statement Volume 1 Chapter 12 para 12.3.4 outline soil management plan details when and how soils can be worked, and advises on the periods when soils are suitable for being handled or trafficked.

There are no measurements or metrics of soil moisture content considered to control when soils can be handled or trafficked; other than a rather vague statement construction will not be carried out when the soil is wet, from early November to end of February.

There should be an agreed metric for soil water content and trafficability across each of the different soil types that have been identified within the ALC soil survey. A soil moisture content below which trafficking & construction can proceed, and above which construction and trafficking should cease should be set by a suitably qualified expert.

Mallard Pass have tried to address this in section 4.11 of the oSMP as follows: *"Soils that are too wet can usually be rolled into a sausage shape, or become rutted when trafficked. If water is sitting in the tramlines or standing on the surface of the land the soils will likely be too wet for handling. These soils often stick to boots when crossing arable land"*.

This far too simplistic as a methodology to control trafficking of land in wet conditions and in the case of 'becoming rutted when trafficked' is completely unacceptable as it is shutting the stable door after the horse has bolted!

A more reliable methodology would be the deploying of remote soil moisture monitoring equipment across the site. Such equipment is relatively inexpensive and easy to deploy, it is widely used in the sports turf and agriculture industries, it can be deployed to different soil depths, and monitored remotely which could allow both the developer, and interested stakeholders to monitor soil moisture content to ensure that the soil is not being adversely affected by solar farm activities during construction, operation, and decommissioning. This equipment, in addition to hand assessment of soil moisture and conditions (rolling into a sausage etc) would provide better protection of the soil during all phases of operation and should form part of the DCO should a DCO be granted.

1k) Controlling construction activities.

Not constructing when the soils are wet will potentially impede Mallard Pass' build progress and potentially extend their expected build time of 2 years; in our opinion this is why Mallard Pass appear to be under reporting the sensitivity of these soils to trafficking and structural damage.

Section 4.44.5 of the oSMP headed Timing states that: *"If the construction work takes place when soil conditions are dry, then damage from vehicle trafficking and trenching will be minimal*". We fully agree with this statement.

However, the following statement in section 4.54.6 of the oSMP states *"The soils are relatively resilient to vehicle passage for much of the year.*

We dispute the assertion that the soils are relatively resilient to vehicle traffic for much of the year and agree with the Natural England's assessment that the soils are of medium sensitivity (or resilience) to structural damage, and will be susceptible to damage for a significant proportion of the year.

Section 4.54.6 of the oSMP then goes on to state: *Under the ALC the field capacity period, ie the days in the year when soils are saturated, is about 104 to 111 days per year. This is normally between the beginning of November and the end of February".*

It is assumed that the meaning of this statement is that Mallard Pass will not traffic the fields from the 1st of November until the 1st of March.

This simple approach to when soils will, and will not be trafficked could lead to significant damage occurring in the event sudden intense downpours, or prolonged periods of wet weather that can and do occur in the spring, summer and autumn. Trafficking medium sensitivity to damage soils in these conditions will lead to soil damage and associated problems into the future.

In our opinion Mallard Pass are repeatedly trying to downplay the sensitivity of the soils to trafficking so as to reduce downtime and costs in their construction schedule.

The trafficking of soils when wet should not be compromised upon as creating compaction during the build phase will adversely affect the soil quality and also drainage and hydrology of the area for the long term.

Trafficking damage and compaction could also affect the ALC grading when the land is returned to agricultural use if and when the site is decommissioned as natural soil processes that rely upon the free, unimpeded movement of water and air through the soil profile will be significantly compromised by the compacted layers within the soil profile.

1l) Repairing compaction damaged soils.

The proposed remediation of compaction in section 4.134.17 of the oSMP suggests that compaction can be ameliorated by using power harrows. Power harrows operate only at the surface of the soil, this machine will merely level the soil surface and do nothing to relieve the compaction caused to soil layers below the soil surface.

Remediation of compaction can only be achieved by deploying a subsoiler to lift and shatter the compacted soil profile. However this will only be effective if undertaken when the soils are dry as this technique relies upon the soil profile being lifted and shattered by a subsoiler blade travelling below the compacted layer. The lifting and shattering effect of a subsoiler blade can only occur if the soil is dry, in wet conditions when clay soils are in a plastic state (like plastecine) it will have no effect.

NB: In agriculture subsoiling is typically done in the summer after harvest when the soils are dry.

If soil on the site were to be compacted by trafficking in wet conditions it would not be possible to remediate this until the soil dries out sufficiently, in this case a soil trafficked and compacted in the Autumn would remain in a compacted state until it can be subsoiled in dry conditions, likely the following summer. These areas would have slow water infiltration rates and be at risk of increased ponding leading to run-off, potential erosion and further issues downstream in the catchment such as siltation and flooding.

Furthermore remediation of any compacted soils beneath the panels will not be possible at all, leaving the soils below the panel arrays in a compacted state for many years to come.

1m) Preparing the soils for trafficking through sowing grass.

Mallard Pass have provided very little detail as to how or when the grassland will be established. This will be critical as to how the soil will be maintained in good health both during the construction phase, and afterwards in the operational and decommissioning phases. A well established grass sward will be significantly more resilient to trafficking and damage than bare soil or a green stubble left over from the last arable crop.

The revised oSMP at section 4.64.7 has some limited detail regarding the sowing of grass prior to construction, this was recommended by Natural England in their relevant representation however section 4.64.7 has far too many caveats around when and where grass will be sown to be of any value (see below).

"Where it can be achieved, advanced sowing with grass is advantageous for construction purposes. However, in some areas that will not provide the best outcome, and a successful sward may be better achieved by sowing following installation and when trenching has been completed. As much advance-sowing of the Site as possible will be carried out. This will not be possible in all areas and the decision over which areas to sow will be a local decision, to be taken closer to the start of works. The decision will be influenced by the expected timing of construction works, the weather, the time of the year and the date when previous agricultural crops are harvested".

There is too little detail in this statement and no clear plan as to how the grassland will be planted. Advanced sowing will be of little or no benefit if the grass sward is not well established before construction commences. Establishing a good quality, resilient grass sward will take 18 to 24 months as the aim is to gain as much root structure as possible in order to provide a resilient cushion in the soil, this can be achieved by careful mow & mulch management or light grazing when the grass has sufficient root mass to anchor it into the soil so as not to be pulled out by the action of grazing.

The caveat that local decisions will be made close to the start of the works is completely unacceptable as it clearly means grass will not be established (or adequately established) well enough to prevent soils from being damaged by construction activity.

Waiting to establish grass until after the previous crops have been harvested will not give enough time for a resilient sward to become established.

1n). An appropriate grass seed mixture.

The Mallard Pass documents make no reference to sward composition, sward establishment or sward management. Proprietary solar farm seed mixes are available from seed suppliers but there is no mention of the seed mix to be used in either the PEIR or the EIA which is a glaring omission in the DCO application.

Grass seed mixtures developed specifically for solar farms by companies such as Hurrells Specialist Seeds or Cotswold Seeds are made up of hard wearing, shade & drought tolerant species such as creeping red fescue, meadow fescue, tall fescue, hard fescue, timothy, chewings fescue late perennial ryegrass (diploid) and white clover. These are all slow growing species.

Establishment of these slow growing species should commence 24 months prior to construction so that they have time to establish properly, and be resilient to trafficking which will enable them to recover should any damage be caused during construction.

1o) Maintaining a grass good sward.

In ‘The Environmental statement Volume 1 Chapter 12 – Land Use and Soils’, para 12.3.6 there is reference to sheep grazing, or fodder production within the solar array area.

There is no detail as to how this will be managed. This is a significant omission as poorly managed grazing can result in surface compaction (commonly referred to a ‘poaching’) if livestock are present. especially on wet, clay soils. This could adversely affect the soil and lead to problems with drainage and runoff from the soil.

There is no reference to a proposed stocking density for grazing animals in the DCO application, this will also be critical to maintaining a good grass sward and healthy soils during the operational phase. Overstocking in wet weather will create poaching. Overstocking could also lead to the close cropping of grass, reducing sward height, which could potentially allow the runoff of water from heavy rainfall events to occur.

Stocking rates of 4 to 8 sheep per hectare are recommended in generally available literature but not referenced in the Mallard Pass documents.

In addition to this it should be noted that there is very little livestock grazing in the area and to graze the proposed solar panel area of 420Ha would require between 1680 & 3360 sheep at the recommended stocking densities.

There is no reference as to how the welfare of the grazing animals will be maintained or managed, for example there is no detail as to the provision of water for livestock across the area.

1p) Flooding conclusions.

As can be seen from the above sections the complex interactions between water and the soils of the site is key to how the proposed development could impact upon the lives of the residents of Greatford. The management of the land before, during and after construction are of critical importance to ensure the soil is healthy and able to cope with the changes in water flows that this proposed development could produce. The DCO should not be granted on the basis that this has not be adequately considered in documents presented to support the DCO application.

2. Agricultural Land Classification and the use of BMV soils.

2a) BMV policy

BMV is a key determining factor in the decision making process, so ensuring it is scoped, correctly surveyed and assessed, is critical to the outcome of the application. This is confirmed in the IEMA Land and Soils Guidance which states that: “The Planning Practice Guidance for the Natural Environment advocates use of the ALC to enable informed choices to be made about planning decisions on the future use of agricultural land. Therefore, the ALC of the site must be known, to determine whether the requirements of planning policy are being met”.

Draft NPS EN-3 recognises that while the applicant’s development may use some agricultural land, applicants should explain their choice of site, noting preference to be on brownfield and non-agricultural land. Agricultural land should only be used where that has been shown to be necessary, and even in that case poorer quality land should be preferred (para 3.10.14).

Natural England determines that the loss of more than 50Ha of BMV land is considered to be a large/major magnitude. The 20Ha threshold is the trigger point for consultation with Natural England on losses of BMV agricultural land.

In this instance 216Ha of land is classed as BMV by Mallard Pass.

National and local policy clearly state Best & Most Versatile (BMV) land should not be developed on in preference to lower grade land and brownfield land.

The level of BMV land loss is completely unacceptable, particularly when considered alongside the numerous other proposed developments that are also taking large areas of this nationally significant resource out of agricultural production for long(often indeterminate) periods of time.

2b) Quantification of BMV across the site.

We have identified significant irregularities in the sampling and assessment methodologies for establishing the ALC grades of the soils across the site and the results of the auger and soil sampling tests, both in Phase 1 and 2 are questionable.

Natural England Guidance for ALC soil surveys clearly states "For a detailed ALC assessment, a soil specialist should normally make boreholes every hectare on a regular grid on agricultural land in the proposed development area and up to 1.2m deep using a hand-held auger.

In direct contravention with Natural England guidelines Mallard Pass carried out a semi-detailed survey in late 2021, rather than consulting Natural England in advance of any survey work.

In total 217 observations were made across the whole site of 906Ha, giving an observation density of 1 sample every 4 hectares vs 1 sample every 1 hectare, ie 25% of the number of samples required to properly establish the ALC grading of the site.

Having realised that the phase 1 auger testing produced a result that classified 53% of the site as BMV (grade 3a or above) more testing was conducted by Mallard Pass. In phase 2 a further 117 auger samples were taken in autumn 2022 at the correct density of 1 sample per hectare.

This further, limited survey showed the soils surveyed to be more variable, but only 5 of the 11 sample blocks designated by Mallard Pass were sampled at the correct sample frequency.

The total auger samples amounted to 334 of the recommended 906 samples increasing the percentage number od samples that should have been taken across the whole site from 25% to 37%, still woefully inadequate to properly establish the ALC grading for the whole site.

The areas re-sampled at a higher density appear to be targeted at BMV land with the objective of down-grading the original BMV result, otherwise a more representative re-sampling would have taken place across the whole site.

The Phase 2 sampling resulted in a reduction of BMV from 53% of the solar area to 41%, but did result in some areas being re-graded to a higher grade as they were originally. This highlights the inadequacy of the semi-detailed surve as some land was downgraded while other areas were upgraded. This could be the case for other areas graded at 3b that could in fact be 3a but have not yet been sampled.

The diluting of the BMV area by targeted sampling still resulted in still a huge 216Ha of the site being classed as BMV but this figure could be higher (or lower) if the survey work is carried out correctly to the required sampling density.

2c) BMV & site selection

The above shows that little importance was given to the likely extent of BMV when the site was selected, and only the proximity of the Ryhall sub-station was considered to be important in site selection.

BMV is a key determining factor in the decision making process, so ensuring that it is scoped, and correctly surveyed and assessed, is critical to the outcome of the application.

The IEMA Land and Soils Guidance which states that: "The Planning Practice Guidance for the Natural Environment advocates use of the ALC to enable informed choices to be made about planning decisions on the future use of agricultural land. Therefore, the ALC of the site must be known, to determine whether the requirements of planning policy are being met".

2d) Agricultural Land Classification (ALC) conclusions

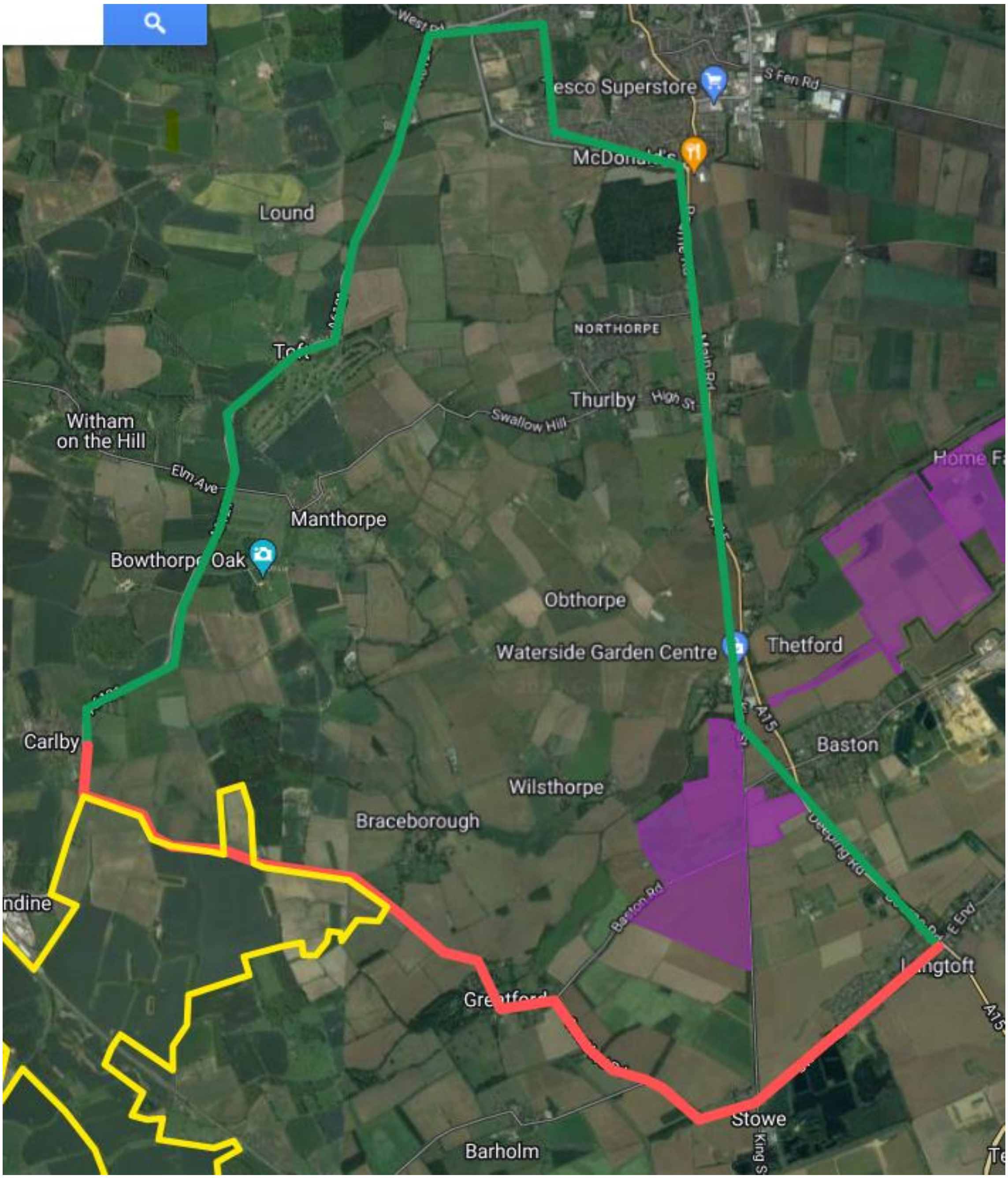
Our conclusion is that the ALC grading has not been properly undertaken and that the results presented are not accurate enough to determine this application.

3. Traffic concerns

3a) HGV traffic

HGV traffic, and specifically tipper trucks associated with local quarrying operations is an ongoing concern of Greatford parishioners and Greatford Parish Council. HGVs are unable to negotiate the T junction in the village without using all of the road, in the event of meeting oncoming traffic the HGVs are forced to mount the pavement causing significant danger to an pedestrians present, and also they are a hazard to oncoming traffic as the roads in the area are not wide enough to safely accommodate this typppe of volume of traffic.

The village is blighted HGV traffic using the village as a shortcut from the A6121 near Carlby, through to the A15 at Langtoft (the red line on the map below), instead of routing through Bourne (the green line on the map below).



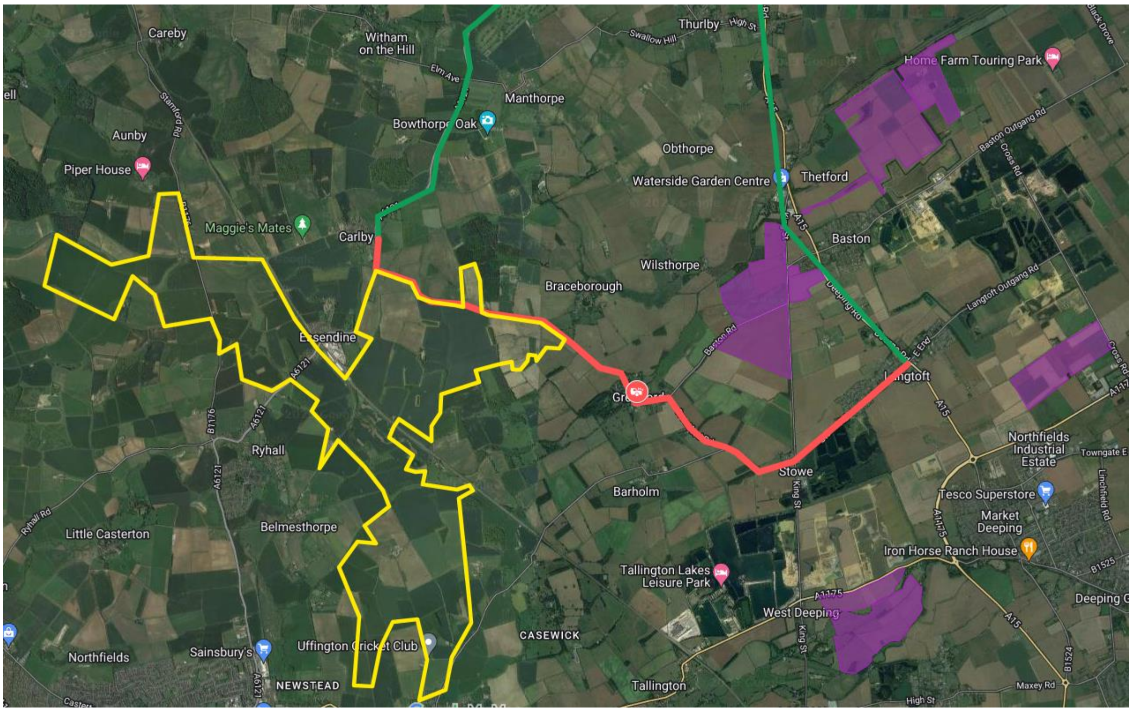
This shortcut saves the hauliers around 8km and local quarry trucks transporting aggregates are the primary concern (though other HGVs use the village also).

During May 2023 the village saw a significant increase in the number of quarry trucks using the village with a truck using the village every 9 minutes (figures obtained during a community speedwatch session). Some investigation revealed that these trucks were delivering aggregate from limestone quarries to the north west of Greatford, to the construction compounds associated with the building of the new Anglian Water Grantham to Bexwell pipeline.

The Parish Council asked Anglian Water to route these trucks via the main A road network, and also contacted South Kesteven District Council (SKDC) in an effort to re-route this traffic, to the date of writing this (11/06/2023) neither party was able to advise if a routing agreement is in place or enforce a routing agreement.

The same issue arises with some quarry traffic associated with the local gravel quarries. In this case there are section 106 agreements in place to route this traffic away from local B roads, however this does not deter the some of the HGV traffic and the village still sees significant HGV traffic on some days.

Our primary concern around the proposed Mallard Pass development is that Greatford is the obvious route for local gravel deliveries to their sites the map below shows the site of future gravel abstraction (coloured purple), the outline of the Mallard Pass proposed development (yellow), and the current HGV shortcut (in red), the red marker is Greatford.

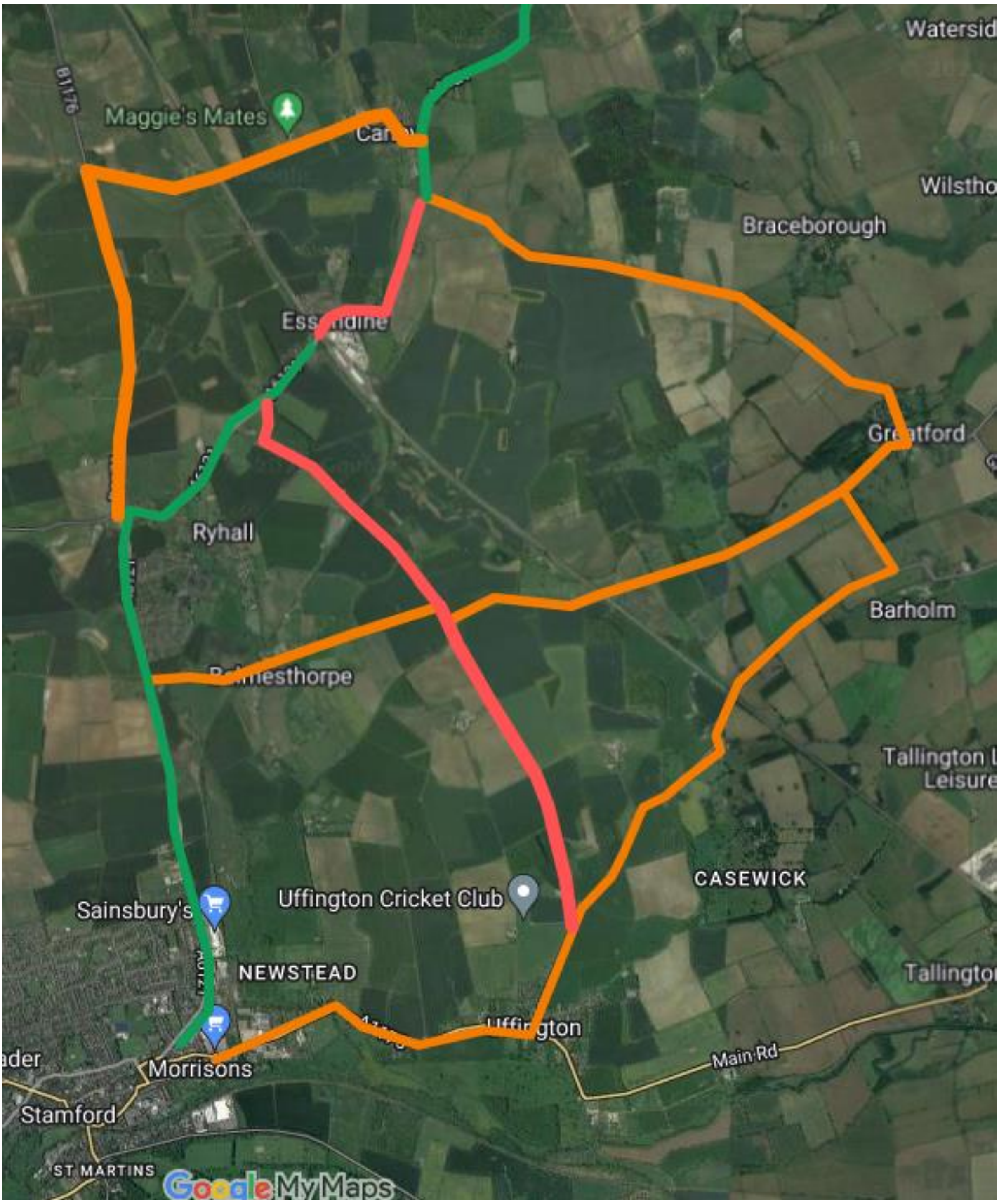


Mallard Pass assurances regarding routing agreements secured through the DCO will not (in our opinion) prevent hauliers using Greatford as the main route to deliver local gravel aggregate to their construction sites, routing agreements for other developments have not prevented traffic issues in the village and it is likely that any agreement secured through a DCO will not be enforced as SKDC and LCC have no resources to do so and rely entirely upon information gathered by residents.

3b) Traffic avoiding road works in Essendine.

We would like to draw the inspectorate's attention to potential traffic problems that could be caused by Mallard Pass's intention to route cables along the A6121 and through Essendine, and also the proposed changes and closure of Uffington Lane (in red on the map below).

This has the potential to divert the traffic that currently uses the A6121 (in green below) to use the next available shortcuts through Greatford, Carlby and Belmesthorpe (the orange lines below) in the event of significant delays being caused along the A6121.

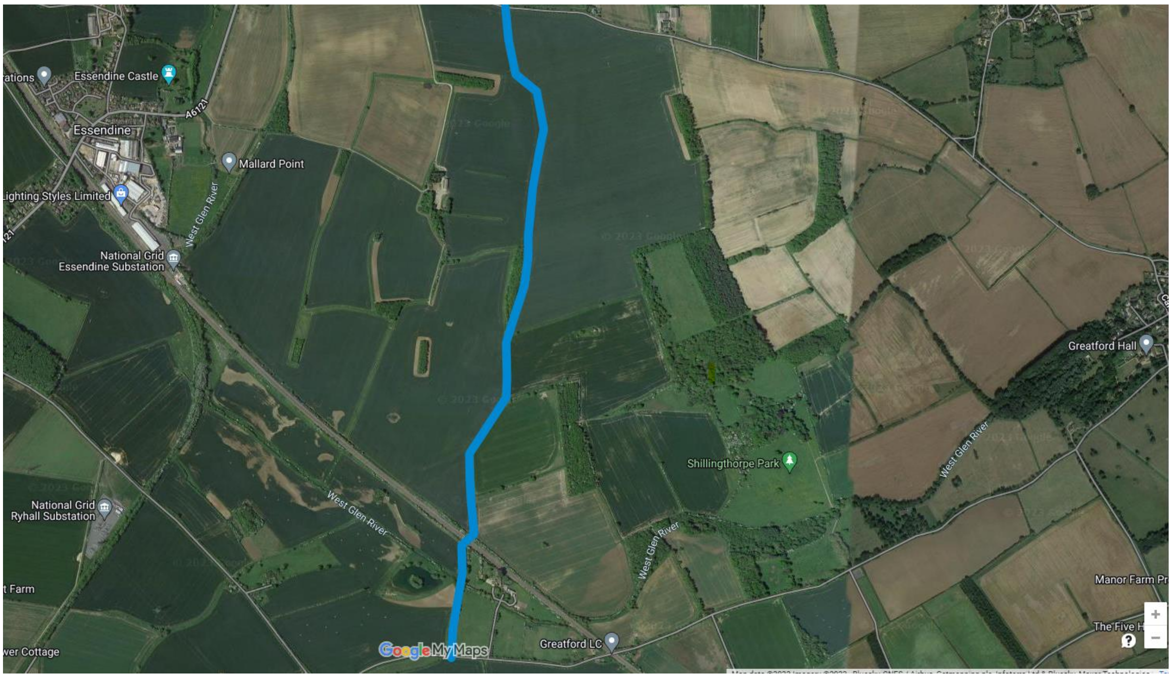


These alternative routes are along B roads are not suitable for the type and volume of traffic that will look to detour around the Mallard Pass roadworks, and road closures. These routes will become more dangerous for the cyclists and local traffic that currently uses them.

Mallard Pass have not addressed this issue that could affect Greatford or users of the roads around Greatford in any of their documentation.

4a. Reduced amenity value for a cherished local bridleway.

The bridleway indicated in blue on the map below is a much used and highly valued local walking and cycling route for the Parishioners of Greatford as it offers a space with attractive open views of the local gently rolling countryside, and is used year round owing to the grassy nature of the route which is passable when other footpaths across local fields are muddy and unpleasant to negotiate.



The proposed development would significantly diminish the amenity value of this bridleway as the views would be completely obscured by large solar arrays and panels of tall security fencing. The proposed additional permissive path does not compensate for the loss of amenity value that will caused by the proposed development.

5a. Conclusions.

The soils over the proposed development site are of good agricultural quality with around 50% classed as BMV, these soils should not be developed and should continue in food production.

If the site is to be developed the soils need to be protected from long term damage that could over the 40 year (or longer) term of this development affect their ALC grading, and in the short, medium and long term affect the local environment through their impact upon the hydrology of the local and wider area in terms of flooding and siltation in the West Glen river.

The soils need to be in a suitable state to cope with the rigours of construction well before any construction commences, not fixed afterwards as this will not be effective in maintaining these valuable BMV soils in good health, or protecting the local hydrology from potential water runoff.

Sowing a suitable grass ley 24 months prior to development should be a condition of any DCO granted as this will enhance soil resilience, help to prevent soil damage, and protect the soils in the long term, provided the soil is not worked or trafficked when it is not fit to do so.

A soil moisture content measuring and monitoring system, together with agreed limits on soil moisture limits governing when the soil cannot be worked or trafficked should be deployed as part of any DCO granted to ensure soil compaction does not affect the long term health of the soil, its functionality and its key role in influencing the local hydrology of the area.

More detail is required as to how the grass swards within the solar arrays are to be managed, and if grazed, how the animals grazing these swards will be managed.

The proposed traffic management plan does not sufficiently consider the ramifications of any roadworks or closures on the A6121 from Carlby through Essendine towards Ryhall and specifically the alternate routes drivers may take in order to avoid the delays associated with roadworks and road closures.

The changes to the only local bridleway within easy reach of Greatford, a route with open views and year round accessibility will be a great loss to the local community and is not being sufficiently compensated for.

Greatford Parish Council Oppose this proposed development as it will lead to increased flooding of the village, and ruin a valuable area of countryside.

Greatford Parish Council

13/05/2023