

Planning Application :

20/00463/FUL | Erection of 2 x 3-bed semi detached dwelling houses (Use Class C3). Provision of bin and cycle storage and alterations to landscaping. | 2 Dynham Place Oxford Oxfordshire OX3 7NL. Applicant: Oxford Housing Association

This is an Objection to this application from Friends of Lye Valley (FoLV).

Summary

We object to this application mainly on the grounds of the hydrological effect on the Lye Valley SSSI (which supports a very special fen habitat, the rarest habitat in all England) and nearby LNR/LWS – however there are also other issues. The site is a green (undeveloped) permeable area in the catchment of the Lye Valley. Water from the site will be feeding the springs that provide the vital water supply for the fen and as such should remain undeveloped so that it continues to supply water to these protected areas. There is potential sub-surface water-flow under the proposed site for the houses (the site is in fact old fen habitat). House foundations could interrupt this flow and the water flow may cause problems to the foundations. Run-off water from the house roofs should not be directed to the drain system that outfalls at the head of the valley, as this will increase the already damaging erosion of the SSSI and LWS fen. Proposed permeable paving SUDS (infiltrating rainwater) with the houses cannot be guaranteed to have future maintenance, rendering this development mitigation ultimately useless. Right to buy may operate in future meaning no control over extensions and paving of back-gardens, further limiting essential rainwater infiltration.

Extra sewage input (however small) from the proposed dwellings to ageing sewers in the valley which **go through the SSSI fen** to the south is also a concern.

Parking problems locally will be exacerbated by proposing a no-car development, car ownership cannot be prevented.

We understand the need for new housing in Oxford. We are not against development on suitable sites. Indeed some types of **re-development of sites within the rainwater catchment of the Lye Brook and the springs which feed the Lye Valley fens can actually help and be beneficial to the rare fen habitat, but only if as part of the development water infiltration into the ground is increased.** Green, currently fully-permeable areas in the Lye Brook and Valley fens catchment, such as the garden of 2 Dynham Place, are not suitable for development because of the potential impact on the vital springs that supply the fen habitats.

Confusing Documentation for this Application, Clarification on Impacts Required

Documents relating to two different housing proposals for this site are presented at the same time. Ground investigation documents submitted obviously relate to a previous proposed (now not relevant) three-home development with car parking, a very different scenario to the more recent two-house proposal. All **superseded** diagrams from the three house proposal should not form any part of any documents submitted with a planning application unless they are very clearly marked '**Superseded**'. This would save a great deal of confusion and wasted time by people trying to understand and comment on complex important documents relevant to an application. Also the

change from 3 house plan to a 2 house plan may have substantially changed the potential impacts of the development on the Lye Valley Fen habitats and/or the required mitigation required. We need **clarification with respect to the impacts of the current actual proposal**.

Hydrological issues

A. Run-off from proposed development should not enter the Lye Brook

A full explanation of our objection due to hydrological issues is below, but briefly, this application site is very near the Lye Valley North Fen SSSI and LNR/LWS owned by Oxford City Council. Not only is it near to, but it is in the centre of the rainwater catchment of these fen areas, so is strongly hydrologically-linked to the protected site. In the whole of the fen catchment area it is crucial to maximise rainwater infiltration to feed the fen springs and at least produce no extra run-off water into the surface-water drain system which emerges into the head of the Lye Brook - which continues to damage the SSSI through erosion of the Lye Brook and consequent drying-out of the SSSI fen habitats (further detail below). The proposal for the two houses indicates a diversion of the old surface water drain which travels north to south under the development site (the current route is under/through the site of the proposed houses). Roof run-off from these houses is shown as being directed to this surface water drain system (piped) before travelling on towards the valley. Therefore this proposal will increase the **direct flow** of water into the Lye Brook, adding more water after storms and increase the problems of bank erosion and other damage to the fen habitats; **therefore it is an unacceptable solution**. For the future survival of the very special habitats in the Lye Valley, all activities in the catchment should achieve a reduction in the direct run-off into the brook, not an increase (see full discussion below and Appendices).

To deal with the water flows off the site will require either infiltration (which may not work well enough) and/or piping water away - both of which could damage the adjacent fen habitats in the Lye Valley. Therefore for this (ecological) reason the site is therefore unsuitable for development. The reasons for this are discussed more fully in section B below and in the Appendices.

B. The proposed development site is on old fen area with suspected underground spring water flow, unknown consequences for housing and potential unsuitability of any SUDS

Ground investigations state the site is on the upper gorge of the Lye Valley. Borings and a test pit show the proposed houses would be over what is probably a major source spring/seepage zone feeding water underground towards the Lye Valley brook and springs. The evidence is:

- i) **peat or peaty silty clay is present in the bore holes**, indicating past wetland pool or fen environment. Peat accumulates in a waterlogged habitat, here produced from spring or seepage flow.
- ii) **Water strike or water levels encountered in boreholes 1 and 2 at a highish level** at, or actually within, the made ground above the level of the natural geology (which is superficial deposits over Beckley Sands).

The surface water drain which currently runs in a north-south location under these two proposed houses was inserted at the time of the construction of the Town Furze estate in the 1950s (from plans for the site available on the OCC Planning Website). The bore-holes and test-pit for this application are not in the centre of the lowest point of the garden near this drain. Evidence from

this central area would likely show more peat and an even higher water level. The north-south drain was laid at the time that sandy-clayey soil was imported and laid across the gorge (and spring zone) as firm made-ground to make a level base for the construction of the access road for the Town Furze estate (now Girdlestone Road). This surface water drain would have gathered and concentrated the natural Lye spring water-flow from the north (the brook source area) and the pipe's purpose was (and presumably still is) to pass the collected spring water through the made-ground of the ridge under Girdlestone Road, and emit it below the allotments (and below a second clayey bank under a footpath) and into the Lye Brook. It gets rid of 'problem' water from an old wet fen area, which would originally have percolated gently south before the road construction. Road construction would have restricted this flow. Without the insertion of this drain pipe under the Girdlestone Road in the 1950s, it is possible that spring water would have ponded in the garden on the north site of the clayey made ground under the road, ponding in exactly the position of the unused long garden of 2 Dynham Place, in the area where these two new houses are now proposed. Water flow through the ground in the whole of this area may be diffuse and not all collected and concentrated into this drain pipe.

Depending on their position, were infiltration soakaways to be placed in the post-development gardens; these may not work (see full discussion below) and simply put, the water table here may be **too** high in both current **and future** winters for infiltration systems to work). Also as regards the protection of water flow to an important spring-fed fen, there is no proof that artificial drainage systems (SUDS) can adequately replicate the natural processes of gentle infiltration of rainwater from all over the current undeveloped green site.

This is not a place for any housing, there are no guaranteed solutions to dealing with the runoff water that are practicable and will not cause damage to Lye Valley habitats.

C Piling

We note the ground investigation documents recommend piling, and piles are shown in the house plan diagram P.1381_009 Proposed section AA. Piles would mean fewer problems for houses caused by underground water flow, but piling will interrupt and change the pattern of such water flow. Natural water flow underground to the fens must be preserved. Piling is therefore out of the question owing to the proximity to the Lye Valley SSSI.

Parking issues

The proposed 2 x 3-bedroom houses are stated to be a car-free development. This seems completely unrealistic. Residents cannot be prevented from owning cars, restrictions cannot be enforced and car parking problems in the neighbourhood will be increased.

Sewage from the development

Sewage from the proposed development will be routed to the old sewer system which travels south, **actually going through the SSSI fen.** These sewers (one either side of the brook) are old, leaky and maybe near end of their life (suspected leakage already evident in the fen). If they are to carry more and more sewage (there will never be less), any future overloading of these sewers, such that raw sewage issues from manholes located in the SSSI, would be disastrous for the fen habitat. Overall

planning policy should be to reduce input to these sewers, not increase it.

'Affordable housing', right to buy and future lack of control over SUDS maintenance, paving/extensions in gardens

We note that this housing proposed is not to be social rented housing; and this means importantly it will not in future be under the council control. 'Right to buy' may apply in future, with no control over residents' building extensions into gardens, restricting rain infiltration by reduction of green area (soft landscaping). Nor could annual maintenance of the permeable paving SUDS be enforced, meaning they provide no mitigation when they inevitably silt-up.

We ask that the Committee refuse this application on all the above grounds.

Yours sincerely

The Committee of the Friends of Lye Valley (FoLV):

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Appendix 1

Full Explanation of Hydrological Issues on development sites in the catchments of the Lye Brook and the Lye Valley fens

Importance of Lye Valley SSSI & LWS

The Lye Valley fen is an example of an extremely rare wetland habitat: a valley-head, calcareous (tufa-forming) alkaline spring-fen on a depth of more than one metre of peat and tufa sediments which means the fen has a history back to the end of the last ice age, 10,000 years ago. The Lye Brook runs through the North Fen area, but the **brook water does not directly supply the rare fen habitat, its water supply comes from valley-side springs (and seepage zones).**

The alkaline fen habitat type found in this SSSI has suffered very large losses nationally, such that it has been assessed in 2013 as now the rarest habitat in all England (National Vegetation Classification type M13b - only 19.2ha of this are calculated to remain, of which 1ha is now within the Lye Valley North Fen SSSI (TRATT, R., PARNELL, M., EADES, P. & SHAW, S. (2013) 'Development of Inventories for Annex 1 habitats 'Alkaline Fens' and 'Transition Mires & Quaking Bogs' in England', Report to Natural England). The Lye Valley also contains European Priority Habitats - two wetland Annex I Priority habitats are present: H7230

Alkaline fens and H7220 Petrifying springs with Cratoneurion). Therefore, it is of the very highest conservation priority and the precautionary principle should apply. More information on the rare species present is available on the FoLV website (<http://www.friendsoflyevalley.org.uk/>). This rare fen habitat is completely dependent on the special local geology and rainfall infiltration from the **area surrounding the actual designated protected fen site**. The essential water for the fen wildlife comes from high-calcium ground water flow from spring/seepage zones on the valley sides at the junction of permeable Wheatley limestone or Beckley Sands with the underlying impermeable Oxford Clay. The groundwater that feeds the fen is produced from an underground aquifer in the limestone and Beckley sands. For a good water supply in this aquifer (and good spring flow in the fen) there must be sufficient rainwater infiltration in the fen catchment. The surface and groundwater catchment of the fen has been calculated by C. Lamberth in his Hydrology Report to Oxford City Council dated 2007. See:

<http://www.oxford.gov.uk/Direct/72511FINALAssessmentofhydrologicalimpactofdevelopmentonLyeValleySSSI.pdf>). Simple catchment diagrams based on the Lamberth work are viewable on the FoLV website at <http://www.friendsoflyevalley.org.uk/about/index.html>).

It is also the **most improved** calcareous fen site (mostly due to volunteer conservation work) in Oxfordshire and holds an important reservoir of rare plant species now extinct in all other county calcareous fen sites. Crucial to the fen's survival is its complex hydrology and hydrochemistry.

The importance of the SSSI, policies and laws that should protect it, and the duty of Oxford City Council to protect biodiversity

The Lye Valley SSSI is of national importance and the alkaline fen habitat it contains is of international importance (EC Habitats Directive, Priority Annex I Habitats)

SSSI Designation and the Law

Any area designated a Site of Special Scientific Interest (SSSI) has protection under UK law. **The Wildlife & Countryside Act 1981** (amended and strengthened by the **Countryside and Rights of Way (CROW) Act 2000**) provides national protection for SSSIs, placing a statutory duty on Local Authorities to further the conservation and enhancement of SSSIs both in carrying out their operations and in exercising their decision-making functions. Oxford City Council is subject to this Act because it is a public authority. Under Section 28G of the Act, Oxford City Council has a duty to "take reasonable steps... to further the conservation and enhancement of the flora, fauna or geological or physiographical features by reason of which the site is of special scientific interest".

Section 55 of the Act addresses offences on SSSIs. It clearly states that it is an offence for a public body to "*Carry out or authorise operations likely to damage a SSSI....*" and to "*Fail to minimise any damage to a SSSI...*"

Furthermore, section 40 of the Natural Environment and Rural Communities (NERC) Act, 2006 states:

- Every public authority must, in exercising its functions, have regard... to the purpose of conserving biodiversity; and
- Conserving biodiversity includes... restoring or enhancing a population or habitat.

Therefore Oxford City Council would be wilfully acting against its legal duties, if the development of '2 Dynham Place' failed to protect the Lye Valley SSSI North Fen from any future harm. The Council would be committing an offence against the Wildlife & Countryside Act 1981 (as amended) and be acting against the direction of the Government's Biodiversity 2020 ambitions.

Lye Valley brook and fens catchment infiltration issues

Wetlands live or die by their water supply. The ideal situation for the maximum spring-flow and best health of the spring-fen habitat is a green, completely unbuilt-over catchment; as was the situation 100 years ago when fully permeable rough grazing pasture, allotments and arable fields filled the whole of the area. This would have allowed all rainfall to penetrate into the ground and subsequent water storage in the limestone underground aquifer (which then could then amply supply calcium-rich water to the fen springs). Since the 1920s, successive urban development has encroached into the surrounds of and up to the edge of the valley, such that it is now mostly surrounded by housing, paving and roads. The high level of hard-surfacing limits the amount of rainfall infiltration into the ground to feed the aquifer and springs, so these no longer produce the amount of water the fen really needs (original unbuilt catchment **0.75 km²**; present day permeable catchment with development estimated **0.50 km²**, calculated by the firm MWH Global for TW in 2012). Therefore there has been a loss of a third of the original unbuilt rain catchment to development with hard surfacing within an expanding city. Only green permeable back gardens, allotments, playing fields and verges now supply the essential rain infiltration to the source of the Lye Brook and the fen springs. The springs obviously produce less than they used to before urban development, the result is the fens are now becoming too dry every summer. This spring-water flow reduction will get worse with accelerating Climate Change leading to reduced summer rainfall and extended summer months of hot and dry conditions annually. Preservation of the remaining green permeable catchment is paramount if the Lye Valley wetlands are to survive.

Additionally, rain water run-off from hard surfaces in the developed areas of the catchment (house roofs, paved and tarmacked surfaces) is now directed not into the ground, but to a historic surface water drain network (Thames Water) with three main outfall pipes (largest with a 60cm diameter) at the head of the Lye Valley, which flow directly into the Lye Brook. The 'catchment' of the drain system which emerges here collects hard-surface run-off water from a much bigger area than the original natural rainwater catchment of the Lye Valley brook and springs. This storm drain network catchment is calculated (in 2012) to be **0.92km²** and to be **37.5% impermeable** hard surface and only **62.5% permeable**. Indeed this drain catchment is so large that **more than 46 roads and all associated buildings** in east Oxford from as far away as beyond Bury Knowle Park, the edge of the eastern by-pass, Town Furze and Wood Farm estates, contribute run-off water into this drain network (see list of contributing roads in the **Appendix 2**; all this information from unpublished report by firm MWH Global to Thames Water, 2012). After rainfall events, this drainage system can result in extremely high storm water flows emerging from the outfalls into the Lye Brook (calculated in 2012 at an almost incredible maximum output rate of **1,750 litres per second** (that is 105,000 litres per minute). These extremely high storm flows (200 times the natural base flow of the brook in dry weather) entering a small brook have caused damaging flash-flooding and heavy bank erosion within the SSSI and wider LNR/LWS; such that the bed of the brook has been gouged down over a metre deeper and wider than it would have been because of the force of the water from this storm drain (to see what this ferocious peak storm flow actually looks like, see videos available on the FoLV website). Attempts to mitigate the damage caused by this flow in the 1980s are now mostly ineffective and these flows are damaging more recent restoration attempts. To restore the channel of the Lye Valley to its former (natural) condition would require the elimination the high water flows and/or one or more structures that controlled flows at or above the head of the valley such that flow rates were reduced to the original or similarly slow rates even during / soon after heavy rain.

As the deepened brook channel passes through the north fen SSSI, the peat banks are eroded and damaging drying-out of the adjacent fen has occurred for at least 5-6m distance either side of the brook into the SSSI fen (J A Webb unpublished report to Natural England, 2015). The flora in this zone is currently detrimentally changed to a common dry land flora with the loss of rare fen species and this is the major reason this SSSI is designated by Natural England as 'Unfavourable Recovering'. The 'Recovering' aspect of this designation is due only to the excellent habitat management work of a number of voluntary groups (including FoLV) over the last 10 years, working in conjunction with Oxford City Council. Management work includes remedial cutting and raking of the fen habitat, such that the remaining still-wet sections of the fen are in the best condition they have been since SSSI designation. A major aim of remedial conservation work recently is to where possible re-wet parts of the fen and also retain water in and control the high storm flows in the brook by using leaky log dams (and other structures) constructed by grant funding from Natural England. These structures slow the flow, but do not hold the water up to re-wet fen. Increasing the water storage volume in the interception ponds at the head of the valley (funded by Thames Water) would slow the storm flow. Hopefully, this work is due to happen soon. Once the peak flows are controlled the log dams may be made more impermeable to raise the water level in the brook and permanently re-wet the damaged, dried-out sections and more fully restore the rare fen habitat here. **However all these actions will fail if outflow from the surface water drains at the head of the valley continues to increase rather than decrease.**

Ground investigation documents presented with this application (**Report on desk study and site investigation 1 -3**) state on page 49 of the first report that the ground on site is suitable for infiltration as assessed in a trial test pit. The infiltration study on made ground indicate good permeability with an infiltration rate of 1.85×10^{-4} m/sec in Feb 2019 (page 31). Therefore, soakaways are suggested in these documents. British Geological Society advice is that there should be a minimum thickness of 1m between the base of an infiltration system and the water table. Therefore, despite the apparent site suitability for infiltration the water table here may be too high in winters for an infiltration system to work all the time (especially with current Climate Change to more intense heavy rainfall in winter, producing high groundwater levels).

Lye Valley Fens into the Future, Adaptation and Resilience to Climate Change

Spring/seepage flow in the fens will inevitably decrease because of predicted lack of rainfall during long, hot and dry summers. This is the future. But it is possible to get what rainfall occurs more efficiently into the ground within the catchment. If the rare Lye Valley fen habitats are to survive into the future, despite the pressures of increasing urbanisation within the city and accelerating Climate Change (we are in a Climate Emergency, with limiting temp rise to only 1.5 degrees C globally looking increasingly unlikely in the future, most estimates now suggest we must face a 2 degree temp rise) - then there needs to be a strong and robust plan of action in place to help the site. We have designed a Strategy outlined in Draft below to help the fens and look forward to discussing it with all stakeholders. Without such a positive approach to actions in the fens catchment, species losses within the fen are almost certain in the near future.

The death of the Lye Valley fens from drying would result in a great and much regrettable loss of this biological heritage for Oxford City – a rare and beautiful place for local Oxford people to enjoy, a place for special species to survive and the loss of educational benefit from the site to local young

people in the two city Universities (currently four undergraduate or post graduate studies of the Lye Valley fens are in progress for Brookes University). Additionally, re-wetting dry peat sections in the Lye Valley fens stops oxidation and carbon dioxide emission (there is a vast carbon store in the peat) and instead enables valuable carbon-capture and sequestration. Carbon-capture in growing wet peat in the valley will assist greatly with the Council's targets in addressing demands of its declaration of a Climate Emergency.

Appendix 2

Title: 'Proposed Lye Valley Innovative Catchment Strategy' (Version 1) by FoLV

Summary

This document describes the FoLV's aims for the future of the Lye Valley fens, i.e. to preserve their health into the future by actions to enhance and/or restore high levels of water infiltration in both the natural catchment and the artificial catchment of the Thames Water surface drains.

[There are two main strands to all the actions listed below. What is suggested here in this strategy is innovative for the Lye Valley, but all the actions discussed below are well-known, tried and tested sustainable urban drainage (SUDS) solutions and references or examples of how they work in other cities can be supplied.]

- Restore infiltration to currently impermeable catchment areas to provide more groundwater to the Lye Valley SSSI/LNR/LWS springs. This action will also reduce hard surface run-off to the surface water sewer which outfalls into the Lye Brook.
- Reduce the water volume in the outflow from Thames Water surface water drains delivering storm water to the brook at the head of the Lye Valley above the SSSI. Do this by the re-direction of surface water run-off in sections of the network to other structures (where it can infiltrate naturally).

The problem

Without innovative and strong positive actions, the springs within the Lye Valley fens will be increasingly starved of groundwater and the storm peak output of the Thames Water surface drains at the head of the valley will not reduce, but is likely (with infill development) to continually increase; with continual damage to the SSSI Fen habitats, erosion of the Lye and Boundary Brooks and potential for flooding of properties further down the Lye and Boundary Brooks. Accelerating Climate Change means increasingly heavy winter rainstorms are likely (e.g. where a month's rain might fall in 24 hours, as evidenced in winter 2019-2020) - generating high peak flows from these outfalls. These high peak flows are the most damaging to the brook banks and the fens. This situation will only get worse in coming years, unless positive policies to reduce the problem are adopted.

The Strategy Actions:

1. Within the calculated natural catchment; gardens, lawns, play parks, recreational fields and verges should be kept green. Paving, housing, even extensions and garages onto green areas, are obviously contrary to this aim. Conversion of any green area to allotments is an

acceptable change of use as this preserves rain infiltration. Developments with SUDS on private property are always proposed as a solution but they are not a good solution, because annual SUDS maintenance cannot be enforced; and without maintenance SUDS silt up and become non-functional after as few as 20 years and infiltration is thus ultimately lost.

2. Within the Thames Water surface drain catchment (natural and extended), opportunities should be sought to construct flood basins or swales in appropriate green areas that do not have other uses and/or can be adapted for this use. Such structures do not need to be large to be effective. A section of drain run-off water can then be diverted to the surface and allowed to run into the shallow flood basin/swale and infiltrate rather than continue on into the drain system to emerge into the brook at the head of the Lye Valley. With enough of such SUDS basins in the catchment, the total output of run-off water into the Lye Brook can, over time, be significantly reduced; with resulting lower damaging peak flows after rainstorms. This will allow the completion of full fen restoration by re-wetting and enable the fen to achieve favourable condition status in the SSSI. This action has costs and will need a commitment (including financial) to future maintenance of these basin structures. In effect we are proposing a policy of retrospectively changing the pipe-based treatment of run-off water to one of other structures spread throughout the catchment, which allows for a much greater amount of natural infiltration.
3. In any brown-field re-development within both natural and additional water catchment areas, the conversion from the historic system of directing housing/paving/road run-off to a foul sewer or to a surface water drains to one of 100% (where possible natural) ground infiltration (full SUDS **with annual maintenance**). This should be mandatory as it will be hugely beneficial to the Lye Valley spring water supply. No run-off to the road surface drains should be allowed. Within the development soakaways of as large a capacity as possible to allow for future climate changes would usually be sufficient OR if this is not the case the development should not use all the space for houses but leave sufficient undeveloped space for a swale. Within such re-development, green roofs could be used to slow the run-off into the SUDS system, so that it will be able to better cope during high flows. Sedum (stonecrop) and *Sempervivum* (houseleek) plants on green roofs are recommended because only succulent drought and/or heat tolerant plants like these are likely to survive the high temperatures and drought in summer that are to be faced with in the very near future. However we note that the same issue as in point 1 applies to private developments i.e. annual SUDS maintenance cannot be enforced; and without maintenance SUDS silt up and become non-functional (i.e. provide no mitigation) after as few as 20 years, infiltration is ultimately lost. Ensuring maintenance of green roofs in private development into the future is also unreliable.
4. Within the catchment (either the natural fen catchment or the surface water drain catchment) any area that for no particular reason is currently concrete / tarmac (i.e. zero infiltration) that can be broken up and partially or wholly restored to a green landscape (full infiltration) with installation of living plants should be so. A suggested first target for example could be the concrete 'drying areas' (where there are washing lines up) in the Town Furze estate. Replacing hard surfacing with green regularly-mown grass should be

acceptable here, as would be any type of “green” habitat to enhance wildlife e.g. wildflowers or trees, allotments or gardens (all soft landscapes). General actions could include ‘tree pockets’ in pavements i.e. an area up to 1 metre diameter surrounding each street tree, where the tarmac often currently extends right to the tree trunk. (The types of trees used could include a variety of sizes and species, including smaller shrubs.) The tarmac should be removed and tree surrounds be restored to permeable soil. The area surrounding the tree (if not too shaded) could be planted with attractive flowers to increase their appeal and wildlife value. Where a street does not have trees, planting of such trees in ‘permeable tree pockets’ could be encouraged by donation of trees (e.g. sourced via grant funding) with cooperation from the council in preparation of the planting sites and aftercare. More street trees in the city will also enable carbon capture and cooling of the locality to help counter the ‘Urban Heat Island’ effect of hard-surfacing which will be an increasing problem with climate change.

5. Residents of streets where all rainwater run-off currently goes to the surface water drain network and finally emerges at the head of the Lye Valley (see list in Appendix 3), should be encouraged to adopt the following voluntary measures. Residents are currently mostly ignorant of the effect of their street run-off water as a damaging factor to the Lye Valley. Sources of information (e.g. leaflets) highlighting the issue and how they could help the valley wildlife (and wider environment) by these actions would be useful. Actions could include:
 - Interruption of roof-water down-pipes and direction to small infiltration ‘rain gardens’ within the property – ideally both to the front **and** to the rear. (Rainwater is an ideal clean supply of water for garden ponds. Mains water has high levels of nutrient and is too rich for good wildlife wetland habitats.)
 - Interruption of roof-water down-pipes to collect water in one or more water butts which then can provide water for watering garden plants in dry summers (an increasingly likely scenario). An offer of a free water butt per household would encourage their take up (perhaps a small grant could be applied for to part or wholly fund these?)

6 Some Other Benefits of this Strategy

This strategy is primarily concerned with but NOT only just about protecting / saving Lye Valley, as important as this site is nationally, and internationally, in Oxford. Other valleys around Oxford and in City itself have very similar issues, problems and potential gains. There are also wider benefits to this kind of approach to managing water across the whole of the city and beyond.

More infiltration and less piped run-off mean less flooding downstream of Lye and Boundary Brooks and in the main river (Thames) valley. It is beneficial to slow water run-off as early as possible and not speed water as fast as possible to the main river and downstream where it may cause problems for other people.

A similar approach to managing run-off feeding other valleys will create wider benefits – less flooding, improve biodiversity, a greener urban environment making people feel better, etc. In light of the Oxford City Council declaration of a Climate Emergency, this strategy will help fulfil their aims to adapt to and mitigate for the impacts of changing weather patterns etc.

Each individual project could be small and/or relatively cheap.

Each project can be carried out as opportunity allows, either as targeted work and/or on the back of other works (done for other reasons).

By adopting numerous smaller scale actions in the upper part of catchments it may be possible to avoid the need for and/or reduce the scale of bigger (usually expensive and often ecologically damaging) schemes such as the current proposed Oxford Flood Relief Scheme.

Creation of wetland habitats which act as carbon sinks will help achieve climate change targets, far better than many much heralded but often ineffective actions such as tree planting.

APPENDIX 3

ROADS AND ROAD SURFACE DRAINS IN EAST OXFORD CONNECTED TO THE LYE VALLEY, WATER EMERGING INTO THE LYE BROOK

[List of roads where housing, paving, drives and road tarmac currently contribute run-off mainly to two Thames Water surface drains that have outfalls at the head of the Lye Valley and put storm water into the Lye Brook. Information collated from the Appendix to the unpublished report commissioned by Thames Water in 2011-2012 - 'Thames Water Utilities Ltd: Lye Brook SSSI Catchment Investigation Final Report', MWH Global, February 2012]

Roads listed from the north, going south towards Lye Valley. Note, not all small side roads included as their names do not appear on Google mapping and could not be named:

NORTHERN SECTION, NORTH OF OLD ROAD (Headington Area)

Chestnut Avenue (south section only)
Hawthorn Avenue
Barton Road (south section only)
Stow Wood Close (south section only)
Gurdon Place
Northfield Road
Sefton Road
London Road (Ring road roundabout to west edge Bury Knowle Park)
Coleman's hill
Gladstone Road (north section only)
Ramsey Road
Wharton Road
St Leonard's Road
Margaret Road (east section only)
Weyland Road
Mark Road
Quarry Road
Binswood Avenue
Larkfields
York Avenue
Rock Edge

Stansfield Close
Old Road (section from ring road west to Churchill Drive) 22 roads to here

SOUTHERN SECTION (Wood Farm estate,)

Upper Meadow
Titup Hall Drive
Masons Road
Stansfeld Place
Wood Farm Road
Nuffield Road
Bonar Road
Pether Road
Atkyns Road
Leiden Road (N section only)
Pauling Road
Palmer Road
Rede Close
Calcot Close 14 roads to here

THE ABOVE DRAIN NETWORK FROM 36 ROADS AND HOUSING ALL EXITS TOGETHER FROM THE MAIN LARGE 60CM DIAMETER THAMES WATER DRAIN OUTFALL AT THE HEAD OF THE LYE VALLEY

SOUTHERN SECTION, SOUTH OF OLD ROAD (Town Furze estate side; water exits from a separate smaller dia drain at LV head)

Girdlestone Road
Coolidge Close
Massey Close
Shelford Place
Flexney Place
Warren Crescent
Heath Close
Dynham Place
Slade (Old Road to edge Cinnaminta Road) 9 roads to here

PEAT MOORS ROAD HAS A SEPARATE SINGLE DRAIN THAT EXITS INTO THE VALLEY FROM ANOTHER OUTFALL TO THE LYE BROOK, JUST AT THE TOP EDGE OF THE NORTH FEN SSSI SECTION

TOTAL NUMBER OF ROADS WITH SURFACE AND ALL PROPERTIES DRAINING SURFACE WATER RUN-OFF INTO THE LYE BROOK IN THE NORTH FEN AREA IS THUS **AT LEAST 46**