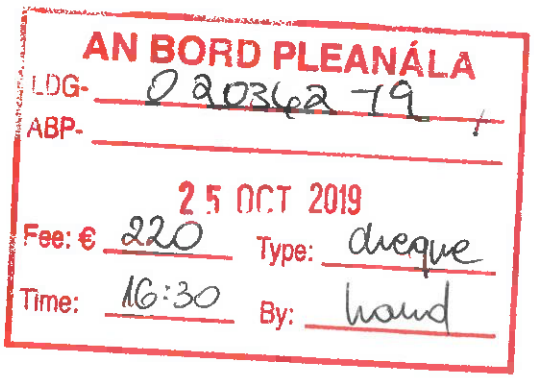
Emer O'Siochru

39 Windsor Road, Rathmines, Dublin 6 • Phone: 01 497256 • Mobile: 0868267555 • E-mail: emerosiochru@gmail.com

Date: 25 October 2019

Re: Agricultural shed at Gigginstown

An Bord Pleanala
64 Marlborough Street
Dublin 2



Dear Sir/Madam,

I enclose my application to Westmeath Co Co for a Section 5 letter of confirmation that planning permissions is not required for the construction of an agricultural shed at Liosul, Gigginstown. I also enclose the refusal by Westmeath Co Co (S5-19-19) which states inter alia that the activity proposed for the shed is not agricultural. This is the second refusal for a Section 5 for this shed. In the first application (SF-7-19) I filled in all the information indicated on the official form which did not require me to quote my herd number nor did it require me to make the case it was an agricultural activity. It had never occurred to me that biochar production could be considered as anything other than an agricultural activity, probably because I was so immersed in the subject. In the second application I made sure to include plenty of evidence of my farming status and further information about biochar's agriculture provenance and products.

Biochar has been used in animal feed for over a hundred years, which is why it is already recognized under the term 'vegetal carbon' by the EU animal feed regulations. That fact however, is not generally known and in this instance was not accepted by the Planning Department of Westmeath Co Co despite our supporting evidence. The use of biochar in farming has further benefits for the environment not least as a safe form of Co2 capture and sequestration in the soil which can be counted towards our agricultural sector targets. This environmental use is new and understandably presented a difficulty for Westmeath County Council. Given due recognition in planning law and regulations, biochar production and use on the farm has potential to become a major GHG abatement practice and to avoid EU fines from missing climate change targets. I have confidence that An Bord Pleanala has the requisite technical expertise to examine our request for a Section 5 confirmation and overturn Westmeath Co Co decision and so doing signal that biochar production and use will be encouraged in rural areas to benefit farmers, local communities and the planet.

Please note that contrary to the bulleted points in Westmeath Co Co Section 5 Declaration

- We do not intend to make, crush or bag *biomass* for the production of charcoal. The biomass is simply collected from farms and forestry in its fallen or cut state and we use it largely unmodified in our open kilns. We make, crush and bag *biochar* aka *'vegetal carbon'* for cattle feed.

- We could not find Limitation 1, Class 9 of Part 3, Schedule 2 in the Planning and Development Act 2001 as Amended 2001. If it pertains to the Wakely grinder 0130 indicated in the shed

layout; this is a grain grinder designed for farmers. See http://wakelyengineering.ie/roller-grinder-0130/.

- The concrete strip at the shed is desirable but not essential and we are happy to eliminate and replace it with compacted hardcore as specified elsewhere in the submission. It should have been conditioned as part of a positive Section 5 Decision by Westmeath Co Co.

- We do not accept that our supporting information indicated extra vehicular movements over that described in our first Section 5 submission (S5-7-19) in which traffic hazard and movements were not cited as reason for rejection. I engaged consultant engineers Muir Associates to examine the entrance road and provide advice on traffic and specification for entrance and lane surfaces. They did not raise traffic hazard as an issue. Westmeath Co Co provided no supporting evidence for their conclusion.

- Vehicle movements caused by the transition to new low-carbon closed-loop farming can be minimized by widely distributing, small-scale agricultural services such as at our proposed shed at Liosul, Gigginstown. This activity is an appropriate and desirable use in the rural countryside, which should not require a full Planning Application by farmers if they meet the other Section 5 criteria.

Yours sincerely

Emer O'Siochru

WESTMEATH COUNTY COUNCIL
Comhairle Chontae na hIarmhí

Ms. Emer O'Siochru,
39 Windsor Road,
Rathmines,
Dublin 6.

4th October 2019

Our Ref: S5-19-19

RE: Section 5 Declaration to determine whether the construction of agricultural steel shed with paint finish corrugated panels to roof and walls 9m x12m x3.6m eaves height and yard in the back filed; extension of access lane 3.4m wide to existing lane and existing entrance gate to road for making, crushing and bagging for agricultural and horticultural uses is or is not exempted development at Liosúl Cottage, Gigginstown, Mullingar, Co. Westmeath.

Dear Sir,

Westmeath County Council has examined your application for a declaration under Section 5 of the Planning & Development Act 2000 as amended and has decided that the subject of your application constitutes development and is not exempt development for the reasons set out in the attached Schedule.

A Declaration made by the Planning Authority may be appealed to An Bord Pleanála with the required fee within four weeks of the date of the issuing of the Declaration in accordance with Section 5(3) (a) of the Planning & Development Act 2000 as amended.

Yours sincerely,

Eamonn Brennan, AO.,
Planning Department,
Tel No: 044-9332165
Fax No: 044-9342330
E-Mail: ebrennan@westmeathcoco.ie
Enc

AN BORD PLEANÁLA
25 OCT 2019
LTR DATED _____ FROM _____
LDG- _____
ABP- _____

Schedule

WESTMEATH COUNTY COUNCIL
Planning and Development Act 2000 as amended

Section 5 Declaration Reference: S5-19-19

Section 5 Declaration

Whereas a question has arisen as to whether the construction of agricultural steel shed with paint finish corrugated panels to roof and walls 9m x 12m x 3.6m eaves height and yard in the back field: extension of access lane 3.4m wide to existing lane and existing entrance gate to road for making, crushing and bagging for agricultural and horticultural uses at Liosúl Cottage, Gigginstown, Mullingar is or is not exempted.

And whereas the said question is the subject of a request under Section 5 of the Planning and Development Act 2000, as amended.

And whereas Westmeath County Council, in considering this request had regard particularly to:

a) Sections 2, 3 and 4 of the Planning and Development Act 2000, as amended.

b) Articles 6 and Article 9 of the Planning & Development Regulations 2001, as amended.

c) Class 9 of Part 3 of Schedule 2 to the Planning & Development Regulations 2001, as amended.

And whereas Westmeath County Council in considering this request has concluded that:

- the making, crushing and bagging of biomass for the production of charcoal, is an industrial process and does not fall within the definition of agriculture as contained within Section 2 of the Planning and Development Act 2000, as amended, and
- the internal layout of the shed and the nature of the use as proposed does not comply with condition and limitation no. 1 attached to Class 9 of Part 3 of Schedule 2 of the Planning and Development Regulations 2001, as amended, and,
- the proposed yard would be works and would be development associated with an industrial use, and
- the proposed development based on the supporting submission would increase traffic movements in and out of the site and would result in a traffic hazard and would not be exempt by virtue of Article 9(1)(a)(iii) of the Planning and Development Regulations 2001 as amended.

Westmeath County Council, in exercise of the powers conferred on it, by Section 5 of the Planning & Development Act 2000, as amended, hereby decides that:-

the construction of agricultural steel shed with paint finish corrugated panels to roof and walls 9m x 12m x 3.6m eaves height and yard in the back field: extension of access lane 3.4m wide to existing lane and existing entrance gate to road for making, crushing and bagging for agricultural and horticultural uses at Liosúl Cottage, Gigginstown, Mullingar is development and is **not** Exempted Development.

Copy 1

WESTMEATH COUNTY COUNCIL

PLANNING DEPARTMENT
SECTION 5 APPLICATION

ECLARATION ON DEVELOPMENT AND EXEMPTED DEVELOPMENT

me: Emer O'Siochru Herd No V1411160

lress: Liosúl Cottage, Gigginstown,
Mullingar, Co Westmeath

267555 Fax. No. _____ E-Mail emerosiochru@gmail.com

t (if any): N/A

AN BORD PLEANÁLA
25 OCT 2019
LTR DATED _____ FROM _____
LDG-
ABP-

_____ Fax. No. _____ E-Mail _____

lress to which notifications should be sent:

'Siochru

dsor Road,

nes,

6

oposed Development: Liosúl cottage
Gigginstown, Mullingar Co Westmeath

Description of Proposed Development: Construction of agricultural steel shed with paint finish corrugated panels to roof and walls 9m x 12m x 3.6m eaves height and yard in the back field; extension of access lane 3.4m wide to existing lane and existing entrance gate to road for making, crushing and bagging for agricultural & horticultural uses

6. Is location a Protected Structure or within the curtilage of a Protected Structure? YES/NO (delete as appropriate)

7. If yes to 6 above, has a Declaration under Section 57 (works affecting the character of a Protected Structure(s) or Proposed Protected Structure(s)) of the Planning and Development Act 2000-2010 been requested or issued for the property by the Planning Authority?

~~YES~~ / NO (delete as appropriate)

8. Applicants Interest in site: Freehold owner since 1998

9. List of plans, drawings etc. submitted with this application: 1: Description of Proposed Use
2: Site Layout 1:500 2: Location Plan :2500
3: Plans and Elevations 1:100

9. Signature of Applicant (or Agent)

AN BORD PLEANÁLA
25 OCT 2019
LTR DATED FROM
LDG-
ABP-

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NOTES: (a) Application must be accompanied by fee of €80.00

(b) Application must be accompanied by a copy of the following documentation:

(i) site location map to scale 1:2500 clearly showing the site outlined in red and the extent of the site boundaries, the position of existing structures, etc., and the proposed work.

(ii) site layout plan to scale 1:500 of the proposed development. All drawings to differentiate between the original building, all extensions and proposed development. Please indicate position of proposed development relative to premises and adjoining properties.

(iii) Drawings, plans, photographs and other particulars necessary to identify and describe the matter to which the question relates

(iv) Any relevant planning history (including details of any previous requests for related Section 5 requests/declarations)

****

OFFICE USE ONLY

Ref. No. _____ Date Received: _____

Fee Received: € _____ Receipt No. _____

Liosul Cottage
Gigginstown
Mullingar
Co Westmeath

Westmeath County Council
Planning Department

7th September 2019

Re Section 5 Application: Background To and Description of Proposed Uses for Agricultural Shed

I, Emer O'Siochru have been farming (Herd no V1411160) a 43-acre farm at Coumnageeha, Upperchurch, Thurles Co Tipperary for over 10 years. Our family farm is certified organic hosting a pedigree native breed Dexter beef suckler herd. We also own a 1¾-acre permaculture and pasture smallholding at Gigginstown, Mullingar, Co Westmeath for over 20 years.

Ireland has EU obligations to reduce ESR (Effort Sharing Regulation) emissions by 20% compared to 2005 levels by 2020, and by 30% by 2030. The agricultural sector contributes 32% of national emissions, but 45% of the emissions that are regulated by EU legislation. Assessing the impact of Irish agriculture on global warming is complicated by the fact that methane, a short-lived greenhouse gas, makes up 60% of its total emissions. In its recent Climate Action Plan, the Irish government spelled out detailed sectoral targets for 2030 for the first time. In terms of a carbon budget, the challenge for agriculture is to achieve 16.5-18.5 Mt CO2eq. cumulative methane and nitrous oxide emissions abatement between 2021 and 2030. The Climate Councils annual review 2019 calls, inter alia, for increased research into longer-term mitigation options giving a high priority to technologies to reduce methane emissions from ruminant livestock including feed additives.

As a committed environmentalist for many years, I became concerned about the climate impact of our beef production. It is an inescapable fact that even though we use no artificial fertilizers, our herd graze entirely on grass, their grazing and dung build soil carbon and Irish cattle produce a fraction of GHGs of other countries, our cattle will have a negative impact on Co2equ reduction efforts in the 11 years the Earth has left. About 6 years ago I discovered that Biochar, a clean form of charcoal, offers an effective mechanism to reduce the impact of cattle (and other agricultural practices) on the climate. The International Biochar Initiative (IBI) https://biochar-international.org/about-ibi/ leads the campaign that is gaining global recognition for biochar as a major climate mitigation technology. The following are IBI main objectives; -

1. Help solve the global food security crisis and ensure soil security with the use of biochar to:

- enhance soil fertility and crop and agroforestry productivity;
- raise the fertility of degraded and marginal soils
- enhance mitigation and adaptation to climate change in agricultural systems.

2. Help solve the global climate change crisis with the use of biochar to:

- safely and effectively draw down greenhouse gas (GHG) emissions in stable soil sinks;
- alleviate GHG emissions associated with decomposition of waste from urban and rural sources
- offset fossil fuel use through high value bioenergy and bio-products.

3. Help make agricultural production at all scales more sustainable by:

- maintaining production with lower chemical fertilizer inputs;
- more productively recycling agricultural and organic waste materials, and aid in land remediation
- enhancing water quality by reducing nutrient leaching into water bodies and supplies.

In 2016 a small group of farmers, environmentalists, and scientists, with the help of ICOS, incorporated the Irish Biochar Cooperative Society Ltd (Reg No. 5660 R) to develop biochar use in Ireland. I am the current Chair of the Cooperative. In the early years we concentrated on research and demonstration through the EPA funded *'Agrichar Project'* and *'Pyrolysis of Biomass for Biochar and Power'*, a SEAI funded report. In addition I personally ran trials of biochar application to silage on the farm for the last 5 years, with positive results for cattle health and grass growth. These research reports can be found at our website under our trading name PlusChar (www.pluschar.ie). The Department of Agriculture recognised our work in December 2019, by awarding us an EIP funded project called 'Biomass to Biochar for Farm Bio economy' (BBFB) that will trial nuisance biomass for biochar production (www.biomasstobiochar.ie)

Biochar has also attracted the attention of the mainstream Irish agricultural research sector in recent years. A study by G.Lannigan et al of Teagasc of a selection of slurry amendments published in PLOS ONE | DOI:10.1371/journal.pone.0111965 June 8, 2015 concluded that

> *There was no significant effect of slurry amendments on global warming potential (GWP) caused by slurry land application,* ***with the exception of biochar****. After considering pollution swapping in conjunction with amendment effectiveness, the amendments recommended for further field study are PAC, alum and lime. This study has also shown* ***that biochar has potential to reduce GHG losses (- 63%*** N_2O***) arising from slurry application.***

Despite these very positive findings by Teagasc for a biochar application to slurry, the benefit to the planet is not yet reflected in an adequate price/subsidy to recompense the biochar producer. In contrast biochar as a feed ingredient already has market recognition for its benefits to the farmer because of its ability to preserve silage quality and improve ruminant gut health; the fact that it reduces methane, adds to soil carbon and biome health comes as a bonus. Biochar feed ingredient products have the added advantage of delivering on a stated recommendation of the Climate Council 2019 Report as noted before. For these reasons the Biochar Coop decided to concentrate efforts on animal feed for its first biochar product introduction to the Irish agricultural market.

This conclusion was supported by independently by Re-Direct, a EU project of which the Western Development Commission is the Irish partner and the Irish Biochar Cooperative a junior participant. RE-Direct focuses on a holistic approach to promote the efficient use of natural resources and materials by converting residual biomass into carbon products and activated carbon at smart regional decentralised units. The WDC produced the report 'Biochar and Activated Carbon Market Study for the Island of Ireland', Novemebr 2019. Its main conclusion is as follows:

Biochar is identified as a material with potential for utilisation in a range of sectors, encompassing agriculture (as a feed additive, a co-fertilising product etc.), horticulture, landscaping, land conditioning, soil remediation and others, with these combined markets being worth in excess of €2 billion annually. While values of biochar can vary considerably dependent on production method, end use, etc. biochar is identified as a valuable product, with an approximate value of €1,750/tonne identified, based on published values. Potential areas of focus for the development of the biochar sector in Ireland, as informed by engagement with stakeholders during the undertaking of this study, are considered to be as follows:

- *The adoption and/or acknowledgement of the benefits of biochar in relevant national policy, legislation, support schemes, etc. - central to this is the ability to accurately quantify the value benefits arising from biochar use, and the development of such a mechanism to quantify these benefits that is supported by all stakeholders.*
- *The identification of 'target applications' where most value can be realised from the utilisation of biochar, be this as an activated carbon material, a feed additive, a fertilising co-product, a horticultural product, etc. in order that engagement, investment, marketing etc. can be focussed on the development of products relevant for these specific applications.*
- *The requirement for the 'raising of the profile' of biochar as a product amongst potential end users through, among other things, the continued undertaking of demonstration projects, such as the RE-DIRECT project to which this study is related, and the promotion of the findings of such studies.*
- *Continued collaboration between relevant stakeholders to build on the significant activities undertaken to date in the biochar sector, to utilise resources, experience, contacts, lobbying abilities etc. – the preparation of a Biochar Sectoral Development Plan or Action Group, led by an appropriate organisation and supported by relevant governmental department(s), that ties in the various activities and projects currently ongoing, could be a central 'driver' for sectoral development.*

Animal feed category products require specialised premises and HACCP Plan to meet Department of Agriculture standards for inputs into the food chain including animal feed under European Communities Regulation No. 183/2005 of the European Parliament and of the Council of 12th January 2005 laying down requirements for food hygiene.

The use of biochar (i.e. vegetal carbon) as a feed is already authorized by the EU-Feed Regulation. The analytical parameters, methods, and thresholds for biochar used as feed are different than those used in soil according to EU-Regulation 2002/32/EC of 7 Mai 2002 on undesirable substances in animal feed and EU-Regulation 396/2005 of 23 February 2005. Our products must meet these standards as well as the standards of the

EBC (2012) 'European Biochar Certificate - Guidelines for a Sustainable Production of Biochar.' European Biochar Foundation (EBC), Arbaz, Switzerland to enter the food chain. http://www.europeanbiochar.org/en/download. Version 8.3E of 1st September 2019, DOI: 10.13140/RG.2.1.4658.7043

The Biochar Coop will pay a set price to independent producer members for their biochar, which the Coop will market at an agreed premium to cover its fixed overheads, research, marketing, certification and other services. We looked for a pilot production and processing unit or 'biohub' near our HQ in Tipperary to start the ball rolling. The two available sites, including on my farm, were soon ruled out because of poor road access or lack of suitable level site for the shed. At that point I decided that my smallholding at Gigginstown, was a better choice for the pilot despite its distance from North Tipperary. Gigginstown has good road access and proximity to a range of beef, dairy farms as well as forestry and tillage. The cottage would also be useful for occasionally training and demonstration purposes. I intend use some of the biochar on my farm in Tipperary but the greater part will be sold to the Coop for marketing to local cattle and dairy farmers in Westmeath.

Biohubs must necessarily be small scale and geographically distributed so that the Co2 used in travel from the source of biomass to the production site and to its final incorporation in the soil is minimised to enhance its carbon-offset value. The Irish Biochar Cooperative's eventual vision is for hundreds of small biohubs throughout the Irish countryside, serving an optimal area of 10-20 kilometres in radius.

The Coop has identified potential for sophisticated pyrolysis reactors co-producing heat, bio oil and electricity, as well as biochar, but these will be fixed, larger scale, industrial in nature and so better located near settlements or in industrial parks. The Co2 used for the higher transport distances from feedstock source to end use in the soil can be mitigated by the renewable energy produced by the larger reactor.

Please note that this Section 5 Application for an agricultural shed is for my own and local agriculture and forestry use only and should not be conflated with pyrolysis reactors co-producing bioenergy. The Biochar Coop – and a follow on EU project from the Re-Direct project - will support members to identify and develop sites for larger reactors when the biochar market is better developed and the appropriate incentives in place – both these preconditions are not yet in place.

Feedstock will come from woody biomass sourced locally from hedgerows, forestry brash or nuisance plants such as rushes and bracken. The feedstock will be pyrolysised in 3 mobile open-air kilns on-site and occasionally off-site at the feedstock locations. The kilns, approx. 2m x 2m in height and width, are of simple round steel dish design that maximise low carbon semi-activated biochar production at the expense of energy. **Their current design cannot capture or otherwise utilise the heat or gases produced in the process**. Named 'Kon Tiki' by its designer Hans Peter Schmidt of the Ithaka Institute, they are manufactured in Thurles Co Tipperary by Premier Green Energy. The proposed Section 5 agricultural shed is required under Department of Agriculture animal feed regulations for the drying, grinding and bagging of the biochar or 'vegetal carbon' a EU recognised animal feed. **This activity differs in no practical way from the simple drying, crushing and storing of oats for animal feed.**

The biohub at Gigginstown will directly create 1 full time and 2/3 part time jobs and will contribute to the economic security of many local beef and dairy farmers as they transition to a low carbon future.

Notes in Conclusion:

1. This Section 5 application is made by a **reg. organic farmer (Herd No V1611140)** of 10 years standing.
2. The smallholding at Gigginstown has been farmed and/or **sublet to a farmer Paul McGrath (Herd No. X162026X)** for circa 20 years

3. This Section 5 application fully conforms with **PLANNING AND DEVELOPMENT ACT, 2000 Section 2 P.18** definition of agriculture;
*"agriculture" includes **horticulture, fruit growing, seed growing, dairy farming, the breeding and keeping of livestock** (including any creature kept for the production of food, wool, skins or fur, or for the purpose of its use in the farming of land), the training of horses and the rearing of bloodstock, the use of land as grazing land, meadow land, osier land, market gardens and nursery grounds, and "agricultural" shall be construed accordingly;*

4. Ditto it conforms with the criteria for **exempted development**
*"4.—(1) The following shall be exempted developments for the purposes of this Act— development consisting of the use of any land for the purpose of agriculture **and development consisting of the use for that purpose of any building occupied together with land so used;"***

5. Ditto it also conforms to **the Planning and Development Regulations as amended 2001; Exempted Development. Section 6. CLASS 9**

    1. *"Works consisting of the provision of any **store, barn, shed**, glass-house or other structure, not being of a type specified in class 6, 7 or 8 of this Part of this Schedule, and having a gross floor space **not exceeding 300 square metres**"*
    2. *"No such structure shall be used for any purpose other than the purpose of **agriculture or forestry**, but excluding the housing of animals or the storing of effluent."*
    3. *"The gross floor space of such structures together with any other such structures situated within the same farmyard complex or complex of such structures or within 100 metres of that complex **shall not exceed 900 square metres** gross floor space in aggregate".*
    4. *"No such structure shall be situated within **10 metres of any public road."***
    5. *"No such structure within 100 metres of any public road shall exceed **8 metres in height."***
    6. *"No such structure shall be situated within **100 metres of any house (other than the house of the person providing the structure)** or other residential building or school, hospital, church or building used for public assembly, save with the consent in writing of the owner and, as may be appropriate, the occupier or person in charge thereof".*

7. *"No **unpainted metal sheeting** shall be used for roofing or on the external finish of the structure."*

8. Relevant Section 5 Referral by An Bord Pleanala ABP-300773-18 Rosdooaun, Newport, Co Mayo 2018: A question arose whether an **agricultural barn had to be within a farmyard of the main agricultural holding to be exempted development**. The Planning Authority declared that: -

   It is considered that the proposed works constitute development....It is considered that the proposed agricultural barn is not located within an existing farmyard complex as set out in Article 6, Part 3, Classes 6-9 inclusive, Column 1 & 2 of the Planning and Development Regulations 2011-2015 and therefore the exemption is not applicable due to the conditions and limitations set out and therefore the proposed development is not exempt by the Planning and Development Regulations 2001- 2015.

   The ABP Inspectors Report stated that:-

   *From my reading of Class 9 of the Regulations, **there is no requirement for an agricultural shed to be on an existing farmyard**, as per the decision of the Planning Authority. In assessing the cumulative floor area of a barn, reference is made in the conditions/limitations to Class 9 to the inclusion of other buildings in a farmyard or if close to an existing farmyard inclusion of other structures within 100m, but does not specify the building itself has to be part of an existing farmyard*

   An Bord Pleanala ruled that; -

   (a) construction of an agricultural barn comprises works and these works constitute development within the meaning of Section 3 of the Planning and Development Act, 2000, as amended,
   (b) construction of an agricultural barn, based on the details submitted by the referrer, would come within the scope of exemptions set out in Class 9 of Part 3 of Schedule 2 of the Planning and Development Regulations, 2001, as amended, and
   *(c) **none of the restrictions on exemption set out in Article 9(1)(a) of those Regulations apply in this case:***

Biochar Cattle Feed Production Process

Woody feedstock, dried to 20% moisture content on location where cut, is brought to the site by participating farmers using tractor and trailer or small truck and stacked beside the shed and/or polytunnel. The mobile kilns, which must be used in the open air, are located beside the polytunnel and/or the shed. The process, which is labour intensive, starts with lighting a stack of kindling as a base for the main woody feedstock. When the embers show red the first layer of feedstock is added. Then when the feedstock shows signs of ashing, the next layer of feedstock is added to fully cover the feedstock to restrict oxygen to the layers below and so on until the kiln is nearly full. In this way the oxygen is controlled to maximise the charcoal output, which is almost pure carbon and represents 50% of the Co2 the plant absorbed from the atmosphere during its growth phase.

The fire burns the hot gases rising from the feedstock at a clean temperature of 500-700 degrees C while the feedstock below transforms to charcoal. White smoke consisting mostly of water vapour is emitted during this process. When the kiln is ready, a water hose is connected to the bottom of the kiln and opened to quench the contents from below to semi- activate it i.e. to increase its surface area. When the kiln and contents have cooled and drained, the kiln is turned on a pivot frame and the biochar removed onto a wheeled bin to be brought to drying racks.

The still wet biochar is transferred to the Shed and prepared for processing into 2 proposed products, a) a fodder supplement and b) a silage additive. The biochar is ground in small batches by a Wakely Grinder (Irish manufactured) to a consistency depending on the product. Batches are then further air-dried in the shed, weighed and packed into 25 litre bags and stored ready for dispatch. The Shed and process is designed to meet HACCP standards for food chain products i.e. the premises will be vermin and bird proof and isolated from any other activity that might contaminate the products. It will have an area to store trolleys, lifting machinery, tools etc. separated from the food chain products.

The shed consists of steel portal frames with green and grey paint finish single skin steel corrugated sheeting and fully ventilated to facilitate drying with two large roller shutter doors on two elevations to facilitate movement of trolleys and racks (see drawings 1:100). The shed will include an office area of insulated timber stud wall and ceiling and a mezzanine store above independent of the main structure of the shed. It will include a toilet and cloaks with doors and view window to the main work area. A 3m x 2.4 m roller shutter on the steel façade will provide security.

Related works and activities:

Biochar will also be composted with green horticultural waste in the backfield for a potential organic soil conditioner and fertilizer product. High value vegetables and fruit will be grown in beds beside the Shed to monitor the biochar product in horticulture. The use of biochar products will also be demonstrated in the forest garden and in the more intensive permaculture plots within the round earthen boundary in the front field. Similarly tender seedlings, vegetables and fungi will be grown in the polytunnel.

The existing red storage box for tools and furniture will be removed to clear space for the access route to the backfield, and replaced beside the cottage. A new track, 3.0m wide of compacted selected hard-core (see Spec. by Muirs Associates Engineers below) will be constructed in the back field, running behind the polytunnel to join the existing lane and entrance gate to the side of the cottage and layby at the road. The existing unsatisfactory round pebble surface dressing on the entrance setback, will be replaced with more suitable compacted hard-core thus obviating the need for tarmac surface. We estimate that the Shed and related activities will generate two tractors trailers / trucks movements per week at most, and then only in the winter busier season.

The South and East site boundary hedges will be reinforced with a post and wire sheep fence and native trees and shrubs planted in the gaps to reduce the visual impact of the shed from the surrounding fields. The Shed is already well shielded from view from the road and cottages by the existing mature trees and shrub hedgerows. The existing wire and split timber fence in the front field which currently follows the curved line of the road will be relocated on a straight line from the site corner to join a new rendered concrete wall at the cottage gable. This wall is needed to contain small children and dogs at play and to provide better security to the cottage and garden. The cottage will continue as a family weekend cottage as well as an occasional visitor resource for the biohub business.

Muirs Associates Engineers: Specification for Road works at Gigginstown Biohub

With Ref to 'Specification for Road Works Series 800 - Road Pavements - Unbound and Cement Bound Mixtures' CC-SPW-00800 March 2013

'250 mm of Clause 804 complying with the TII Specification for Road Works; Type B granular material shall be crushed rock. The mixture shall comply with Clause 801 and the overall grading requirements for the mixture shall be as given in Table 8/6 of the with the following sub-clauses.'

801 General Requirements for Unbound Mixtures

1. Unbound mixtures shall be made and constructed to conform to IS EN 13285, the mixture and grading requirement categories in Table 8/1, and Clauses 802 to 809. The permitted alternatives for each part of the permanent Works shall be as described in Appendix 7/1. The Contractor shall ensure that the manufacturer of unbound mixtures has in place a system of factory production control that complies with the requirements of Annex C of IS EN 13242.
2. The properties of aggregates used in unbound mixtures shall comply with the selected requirements of IS EN 13242 listed in Table 8/2.
3. Where recycled coarse aggregate or recycled concrete aggregate is used in unbound mixtures in accordance with Clauses 803 and 807 as appropriate, the constituents of a sample of recycled aggregate shall be classified by hand-sorting the coarse aggregate particles in accordance with IS EN 933-11. The test shall be carried out by a suitably trained laboratory technician who has demonstrated competence in classifying the constituent classes in accordance with the test method. Recycled coarse aggregate and recycled concrete aggregate used in unbound mixtures in accordance with Clause 803 and 807 shall also comply with the additional requirements of Table 8/3.

Table 8/1: Mixture and Grading Requirement Categories for Unbound Mixtures

Table 8/1: Mixture and Grading Requirement Categories for Unbound Mixtures

Unbound mixture	Type A	Type B	Type C (open graded)	Type D (wet mix macadam)	Type E (close graded)
Clause	803	804	805	806	807
Standard	IS EN 13285 Categories for unbound mixture properties				
Mixture requirement category	0/31,5 UF_7 OC_{80}	0/31,5 UF_7 OC_{80}	0/40 UF_7 OC_{80}	0/31,5 UF_7 OC_{85}	0/31,5 UF_9 OC_{90}
Grading requirement category	G_B	G_A	G_A	G_A	G_B

Table 8/6: Granular Material Type B

IS EN 13285 Categories -	
Mix Designation:	**0/31,5**
Oversize Category:	**OC 80**
Overall Grading:	**G_A**

Sieves for Grading / Fines Category	ISO Sieve Size (mm)	Percentage by Mass Passing		
		Overall Grading Range	Supplier Declared Value Grading Range	Tolerance on the Supplier Declared Value
2D	63	100	No Requirement	No Requirement
D	31,5	80 - 99		
A	16	55 - 85	63 - 77	±8
B	8	35 - 65	43 - 57	±8
C	4	22 - 50	30 - 42	±8
E	2	15 - 40	22 - 33	±7
F	1	10 - 35	15 - 30	±5
G	0,5	0 - 20	5 - 15	±5
UF_7	0,063	0 - 7	No Requirement	No Requirement
LF_N	NR	NR		

Grading of individual batches – differences in values passing selected sieves

Retained sieve size, mm	Passing sieve size, mm	Percentage by mass passing	
		Not less than	Not more than
8	16	10	25
4	8	10	25
2	4	7	20
1	2	4	15

NOTE: The particle size shall be determined by the washing and sieving method of IS EN 933-1