

Planning Design and Access Statement

Edge-of-Field Water Safety (E-Flows) Assessment Facility - NAFIC Campus

FS-CE-XX-00-DR-L-PDAS



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This document has been prepared in support of a full planning application, on behalf of FERA Science Ltd (FSL), regarding proposals for an Edge-of-Field Waterbody Safety (E-FloWS) Assessment Facility at The National Agri-Food Innovation Campus (NAFIC), Sand Hutton. The application has been preceded by a formal request for pre-application advice from Ryedale Council. A formal response was received by letter dated 18 Oct 2016 and the issues raised have been taken into account in making this application.

The planning application is accompanied by the following plans and documents:

- Site Location Plan (Ref: FS-CE-XX-00-DR-L-100)
- Landscape Masterplan (Ref: FS-CE-XX-00-DR-L-101)
- Planting Plan (Ref: FS-CE-XX-00-DR-L-102)
- Tree Removal Plan (Ref: FS-CE-XX-00-DR-L-103)
- Indicative Sections (Ref: FS-CE-XX-00-DR-L-104)
- Fencing Details (Ref: FS-CE-XX-00-DR-L-105)
- Site Layout (Ref: FS-CE-XX-01-DR-S-200-201)
- Engineering Layout (Ref: FS-CE-XX-01-DR-S-200-202)
- Mesocosm Details -2 sheets (Ref: FS-CE-XX-01-DR-S-200-203 and 204)
- Typical Drainage and External Details – 3 sheets (Ref: FS-CE-XX-01-DR-S-200-205, 206 and 207)
- Tree Protection Plan (Ref: FER-CAP-00-VES-DR-A-0001)
- Topographical Survey with Services Plan (Ref: 005)
- Planning Design and Access Statement (*This document*)
- Desktop Service Plan Report
- Preliminary Ecological Appraisal Report
- Tree Appraisal and Impacts Assessment
- Woodland Management Report
- Woodland Management Sub-Compartments Plan
- Phase 1 Geo-Environmental Desk Study
- Phase 2 Geo-Environment Desk Study
- Service Water Drainage Discharge Position Statement





The proposed siting of the mesocosm and landscaped buffer zone is shown on the Landscape Masterplan. This part of the site is approximately 2.66 hectares in size and occupies an area of existing plantation woodland that lies immediately beyond the western boundary fence line of the NAFIC operational area. Plant installations associated with the mesocosm will utilize a smaller adjoining area of existing grassland (2656sqm) that lies within the fence line. Both areas will be accessed from within the NAFIC site.

The site was selected following a feasibility study and further considerations pertaining to the need to optimize woodland retention whilst ensuring that the risk of over shading is minimised. The E-FLoWF will be a model ecosystem (Mesocosm) designed to simulate/replicate stretches of edge of field ditch or stream waterbodies. It will be an innovative facility that will assist FSL in its continued pursuit to support its customers through progressive thinking and the gathering and analysis of robust scientific evidence to help understand problems and find sustainable solutions.

The mesocosm will take the form of a series of channels (known as rushes) containing natural communities of aquatic organisms. The rushes can be dosed with novel crop protection products, prior to registration and marketing, in order to assess the risk they pose to the aquatic environment. All dosing will be under strictly controlled conditions to ensure no environmental contamination occurs.





Adjacent is an opportunities plan that was produced for the feasibility study. This highlighted potential opportunities for the proposed site that could be incorporated and taken forward in the stage 2 design.

- Proposed site location. The site would be located in the bottom section of the existing woodland so to retain as much woodland in the top half where it gets thinner. [Red dashed rectangle]
  
- Potential for existing mature woodland to be managed and opened up for amenity use creating woodland walks and open areas. Ecological areas could be introduced by introducing native shrub species and ponds. [Green rectangle]
  
- Existing security [Yellow dashed line]
  
- Existing security fencing to be extended around site creating a secure boundary to the NAFIC campus. [Purple dashed line]
  
- Improvements to woodland edge by introducing native species and under storey planting will improve woodland and create diverse ecological habitats. [Wavy green line]
  
- Opportunity to locate water tanks and other site facilities on area of amenity grass land within the NAFIC campus. This will allow for the large built structures to be contained within the existing NAFIC campus with less intrusive rushes being located within the woodland. [Blue arrow]
  
- Utilise the existing pedestrian link from the main FERA building to the proposed site. [Blue double-headed arrow]
  
- Utilise the existing drainage ditch along the south western boundary. (Discussions are underway with the Foss Internal Drainage Board regarding proposals to direct the outflow to the existing drainage ditch) [Cyan dashed line]
  
- Opportunity to utilise existing ditch along south eastern boundary. [Blue dotted line]
  
- Opportunity to utilise the existing security entrance from A64. All access to the site would be via here maintaining the security of the NAFIC campus. [Orange dashed line]



### Planning Policy Assessment

Planning law requires that applications for planning permission must be determined in accordance with the development plan, unless material considerations indicate otherwise.

In this case, the key document is the Ryedale Plan - Local Plan Strategy adopted in September 2013. The sections below assess the development proposals in relation to planning policies of particular relevance.

### Location of Development

Policy SP1 of the Local Plan Strategy outlines where Ryedale's future development requirements will be distributed within the district, in line with the spatial strategy of the Local Plan and a defined hierarchy of settlements. With regard to proposals within undefined villages, hamlets and in the open countryside, development will be restricted, inter alia, to that which is necessary to support a sustainable, vibrant and healthy economy or which can secure significant improvements to the environment or conservation of heritage assets or is justified through the neighbourhood planning process.

The proposed site lies within the ownership boundary of the National Agri-Food Innovation Campus (NAFIC), Sand Hutton. It is currently occupied by woodland plantation adjoining the existing north-west operational boundary fence of the Campus. Paragraph 5.4 of the Local Plan acknowledges that NAFIC fulfils a nationally important role as a bio-science research facility and is a key example of the economic inter-linkages that exist between Ryedale and the City of York which the district seeks to build upon in order to diversify its economy. The proposed development will provide a valuable contribution towards enhancing this role.

### Employment Land and Premises

Policy SP6 of the 2013 Local Plan Strategy relates to the delivery and distribution of employment/industrial land and premises. It indicates that within the wider countryside, expansion land for existing major employers/established businesses will be supported and Table 1 of the policy identifies the FERA site (now NAFIC) as an 'Existing Core Employment Site to be Retained'. The site is one of several in the District that are acknowledged as Significant Industrial Processes in the open countryside that the policy seeks to support.

NAFIC is a long-established business and a major employer within Ryedale. The proposed development of the Mesocosm is a crucial strand of leading edge scientific investigation into crop development and production, promoted by the Centre for Crop Health and Protection (CHAP) based at NAFIC. Supported by government investment and providing a major collaborative link between academia and industry, CHAP seeks to establish the UK as a world-leader in agri-technology, innovation and sustainability which will help farmers, growers

and the food industry to improve yield, reduce costs and meet the need for sustainable solutions to present and future challenges. The location at NAFIC of the Mesocosm will enable this experimental innovative technology to benefit considerably from existing synergies and scientific knowledge and expertise that the Campus has been justly renowned for since it was established.

### Landscape

Policy SP13 of the Local Plan Strategy is of particular importance in respect of the proposals. The policy relates to Landscapes and emphasises the need for new development to contribute towards the protection and enhancement of distinctive elements of landscape character within the District including:

- The distribution and form of settlements and buildings in their landscape setting;
- The character of individual settlements including building styles and materials;
- The pattern and presence of distinctive landscape features and natural elements (including field boundaries, woodland, habitat types, landforms, topography and watercourses
- Visually sensitive skylines, hills and valley sides
- The ambience of the area, including nocturnal character, level and type of activity and tranquillity, sense of enclosure/exposure.

Policy SP13 also states that the Council will encourage and support proposals that seek to restore areas of degraded landscape or individual landscape elements.

The NAFIC Campus occupies an insular like location which is visible only from the north-east, along the short stretch of road from which the main access into the site is taken. It is screened entirely from view from the A64 by densely planted woodland to the north, west and south. The nearest settlement to the Campus is Sand Hutton which lies 2 km to the east, separated from view by agricultural land and woodland. The proposal therefore will have no adverse effect upon Sand Hutton, in terms of either the form or character of the settlement or its landscape setting.

The location of the Mesocosm has resulted from a careful selection process. Although it involves the removal of 2.66ha of woodland, its position ensures that the current visual screening role that the existing woodland provides will be retained as far as possible. Landscape proposals immediately to the west of the Mesocosm incorporate additional mitigation measures in the form of bunds and native trees and shrub planting to reinforce the screening effect of retained woodland. Meanwhile, landscaping to the south of the Mesocosm will comprise an area of water meadow, incorporating proposed nature ponds, bordered and interspersed by native trees and shrub planting. This in turn will be largely invisible from the A64 due to the density of the remaining woodland to the west and south. Both new and retained woodland will be the subject of careful management to ensure that its long term health, ecology and amenity value and its screening function is maintained and enhanced. Please refer to the Woodland Management Plan for further details

In all, a total of 1.3 ha of water meadow and replacement native shrub and woodland planting is proposed to mitigate the impact of woodland loss required to construct the Mesocosm and limit the incidence of over shading. Please refer to the Landscape Masterplan for further details.

The pre-application written response from the Head of Planning and Housing notes that the Council's Tree and Landscape Officer and Countryside Officer have no objection to the application in landscape terms as the remaining woodland will still offer strong screening from public locations. The officers support a slight thinning of the remaining woodland to introduce a diversity of species with the addition of understory planting of native shrubs and broad leaved trees to ensure long term screening of the development. This is a central facet of the accompanying Woodland Management Plan.

The NAFIC site is relatively flat so the development proposal will have no adverse impact upon visually sensitive skylines, hills and valley sides and will remain essentially hidden from external view from all directions. It will be visible only from within the Campus itself. Similarly, there will be no adverse impact upon the ambience of the surrounding area or its tranquillity. The proposal will form a part of the on-going operational activities of the Campus and will not intrude over and above existing activity or background noise.

The Landscape Masterplan, Arboricultural Report and Woodland Management Plan which accompany this planning application provide further information.

### Bio-Diversity

Policy SP14 of the Local Plan Strategy gives support, in principle, to proposals for development that aim to conserve or enhance biodiversity through the prevention of loss of habitat or species and the incorporation of beneficial biodiversity features. In doing so, it stipulates that:

- fragmentation of habitats should be minimised;
- opportunities for the restoration and enhancement of habitats and improving connectivity between habitats should be maximised;
- a net gain in biodiversity is to be provided as part of new development schemes;
- development proposals that would result in significant loss or harm to biodiversity in Ryedale will be resisted.

The selection of the proposed site for the Mesocosm and the landscaping proposals associated with it have been driven by the intention to retain and to create as much woodland vegetation as possible in order to support and enhance bio-diversity and connectivity between habitats and to minimize potential adverse impacts.

A Preliminary Ecological Appraisal Report forms a key part of this submission, based upon surveys undertaken on 23rd May 2016 and 7th September 2016. It notes that the habitats within the proposed site area comprise of amenity

grassland, plantation woodland, wet ditched, hard standing, landscape planting and tall ruderal vegetation. No evidence of protected species was found on site during the surveys but the site has potential to support nesting birds, badgers, reptiles and great crested newts. Accordingly, recommendations have been made, and action will be taken, in order to reduce the ecological impacts associated with the proposed development of the site. These include:

- Due to the timing of works and the fact that no existing ponds will be lost, Reasonable Avoidance Measures to manage the development are proposed.
- The trees within the woodland are assessed as having low potential for bats and therefore no further surveys (emergence/return to roost) are required; the felling works will be carried out in winter when bats are inactive; no trees are suitable as hibernacula and therefore no surveys are needed.
- The production of a Woodland Management Plan, setting out conservation and management objectives and strategies to enhance bio-diversity through appropriate management of the remaining habitats.
- Clearance of vegetation outside of the bird breeding season.
- Measures required during construction if species are found.
- Lighting schemes are designed to avoid impacts upon foraging bats.
- Landscaping proposals seek to compensate for the loss of woodland, through new native woodland and shrub planting to the west and south of the Mesocosm and a new area of woodland planting on the wider NAFIC site;

For further details please refer to the Preliminary Ecological Appraisal Report and the Woodland Management Plan, together with the Landscape Masterplan.

#### Design and Generic Development Management Issues

Policy SP16 emphasises that to reinforce local distinctiveness, the location, siting, form, layout, scale and detailed design of new development should respect the context provided by its surroundings. The design should also incorporate appropriate hard and soft landscaping features to enhance the setting of the development and/or space.

The content of this Planning Design and Access Statement, together with other supporting documents and plans to which cross reference is made, seek to demonstrate that the requirements of Policy SP16 have been met. As a scientific installation within a much larger scientific establishment, the Mesocosm is entirely compatible with neighbouring land uses and, by careful siting assisted by a new landscaping strategy and woodland management plan, the proposal will remain screened from public view, as will the wider NAFIC Campus.

Policy SP20 of the Local Plan Strategy outlines Generic Development Management Issues that should underpin all new development, in respect of character, design, amenity and safety. The policy is detailed but requires, inter alia, that new development should:

- respect the character and context of the immediate locality in terms of physical features and the type and variety of existing uses;
- be compatible with neighbouring land uses and not prejudice their continued

operation;

- have no adverse impact upon the users or occupants of neighbouring land and buildings by virtue of design, use, location and proximity;
- access to and movement within the site by vehicles, cycles and pedestrians would not have a detrimental impact on road safety, traffic movement or the safety of pedestrians and cyclists. Information will be required in terms of the positioning and treatment of accesses and circulation routes, including how these relate to surrounding footpaths and roads.

The proposed development, including associated plant installations, are designed and positioned in such a way that the physical character and context of the immediate locality beyond the NAFIC Campus will be unaffected. The facility will be virtually unseen from the A64 and landscaping proposals including replacement planting and creation of bunds, together with on-going woodland management, will ensure that the screening role of the existing woodland will not be compromised when the development site is cleared. It will be obscured from view from the east by the existing buildings that occupy the wider Campus and from the south by retained woodland and existing landscaping. There is a private detached property surrounded by woodland that occupies a large triangular site to the north west of the Campus which is separated from the operational boundary by a cul de sac road. The wooded nature of the estate, together with retained woodland to the north of the Mesocosm, mean that the proposal should have no adverse impact on the property or its occupants.

The Mesocosm will be a scientific installation within a much larger scientific establishment and is therefore compatible with surrounding land uses. It will be separated from the existing building complex by extensive car parking. Its presence is therefore unlikely to impact unduly upon the amenity of the wider NAFIC Campus and those employed there.

#### Access Considerations

Policy SP20 of the Local Plan Strategy sets out the planning requirements regarding access to new development. Of particular relevance to this application is the requirement that:

- *Access to and movement within the site by vehicles, cycles and pedestrians should not have a detrimental impact on road safety, traffic movement or the safety of pedestrians and cyclists. Information will be required in terms of the positioning and treatment of accesses and circulation routes, including how these relate to surrounding footpaths and roads.*

Later sections of this Statement explain the access arrangements for the proposed development and the estimated number of vehicular movements that are likely to be generated during enabling works and site construction. Works are scheduled to commence in December 2016 with a view to the site becoming operational, following a testing period, by the end of April. Thereafter, vehicular movement will be limited solely to sporadic effluent tanker visits and routine

maintenance vehicles. The development site will be operated by existing staff based at the NAFIC Campus and in consequence there will be no impact on the existing number of car movements to/from the Campus.

The number of vehicle movements during enabling works and the construction period is considered unlikely to have undue impact upon road safety or other road users and pedestrians.

#### Drainage and Flood Risk

Chapter 10 of the NPPF deals with flood risk and states that inappropriate development in areas at risk of flooding should be avoided, directing development away from areas at highest risk but, where development is necessary, making it safe without increasing flood risk elsewhere.

Policy SP17 of the Ryedale Local Plan Strategy indicates, inter alia, that flood risk will be managed by requiring the use of sustainable drainage systems and techniques, where technically feasible, to promote groundwater recharge and reduce flood risk. Development proposals will be expected to attenuate surface water run-off to the rates recommended in the Strategic Flood Risk Assessment. The policy supports the water efficient design of new development and requires applications for new development to propose mitigation measures to reduce the risk of pollution and a deterioration of water quality. It requires that water treatment infrastructure improvements are provided in tandem with new developments and that proposals can be accommodated without an unacceptable impact on water supply.

The Environment Agency (EA) Flood Maps indicate that the development site lies within Flood Zone 1 (low risk). The mapping also shows the site to be at very low risk from surface water flooding. The need to minimise flood risk, given that areas in the south east part of the NAFIC Campus lie within Flood Zones 2 and 3, was a key consideration in initial feasibility work undertaken to inform the site selection process.

The following section of this Statement provide details of the proposed management of surface water drainage and flood risk.

The use and treatment of water are fundamental elements of the design, function and operation of the Mesocosm as a model ecosystem designed to simulate/replicate stretches of edge of field ditch or stream waterbodies in controlled experiments to test the impact of new crop protection products on the aquatic environment. The process is summarized in section 08 of this Statement which describes the proposal and how it will operate, in compliance with the requirements on Policy SP17.

Proposed Site Boundary

Policy Boundary  
(Central Science Laboratory, EMP14 2002 Ryedale Local Plan)

Green Belt  
(Related Planning Policy - GB1, 2002 Ryedale Local Plan)

**Flood Zones**

(Data extracted from Environment Agency Flood maps)  
(Related Planning Policy - SP17, Ryedale Plan - Local Plan Strategy 2013)

Flood Zone 3

Flood Zone 2

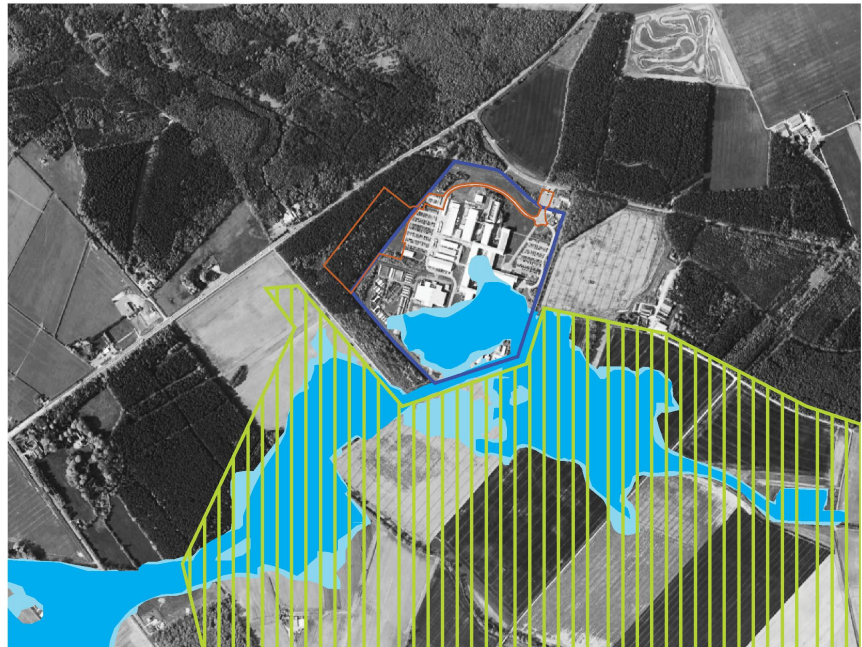
**Flood Risk**

The Environment Agency flood mapping shows that the proposed site lies wholly within flood zone 1 with a less than 0.1% annual probability of fluvial flooding. The mapping also shows the site to be at very low risk from surface water flooding.

Existing site levels show a slight general fall towards the south western area of the site. To further mitigate the risk of overland flows entering the mesocosm the northern and western site boundary will be largely bunded with an earth bund formed from suitable excavated material. Infill sections between the bunds indicated will also be at a raised nominal height of approximately 200mm above surrounding ground levels so as to prevent any overland flows entering the mesocosm. Along the northern site boundary any overland flows towards the bund will be directed towards an existing ditch which runs to the rear of the existing fence line which forms the eastern boundary of the mesocosm.

Within the mesocosm area itself natural rainfall will be directed to land drains/filter trenches within the grassed walkways between the ditches and directed towards the proposed ecological ponds to the south western area of the mesocosm. An emergency overflow from the aging lagoons will also be discharged towards this area.

The Ryedale Local Plan has been reviewed and the key landscape policies have been identified and illustrated on the plan opposite.









- 1 Existing Woodland
- 2 Proposed Mesocosm
- 3 Proposed water tanks associated with site and new grass crete surfacing to act as car park extension in the future.
- 4 Proposed site access through existing security fencing.
- 5 Proposed ecological ponds
- 6 Proposed Large Native Tree Planting towards back of buffer zone to limit over shadowing on mesocosm
- 7 Proposed small tree planting and shrub planting closer to site boundary to limit over shadowing on mesocosm.
- 8 Existing car park associated with NAFIC complex
- 9 Main NAFIC building complex
- 10 Proposed wetland area



Thirty individual rushes will be installed in all, each separated by an area of raised ground no less than 2 metres wide (Fig. 1). Each rush will comprise of an artificial ditch approximately 33 metres long with a V cross section of approximately 2.4 metres width and 0.4 metre depth. The rushes are to be formed using HDPE plastic sections which will ensure an impermeable inert containment for the test areas.

Each rush can be split into three separate 10m long sample areas where required. A sump will be placed at the end of each section for the purpose of capturing and diverting waste water. When the sumps are not required they can be gravel filled and boarded to extend the length of the rush.

Each rush will be weired at the end (or at any selected point, movable for each project) and both rush run and weir will be overlain with a replaceable impermeable membrane. Each will be lined with a coarse net or mesh and this will be overlain by gravel or sediment (according to the needs of individual studies) providing a substrate for macrophyte growth. When in use, the rushes will be netted or covered over to prevent bird ingress but when not in use, the rush complex will be open to birds and insects. The rushes and ageing ponds will be surrounded by amenity grassland.

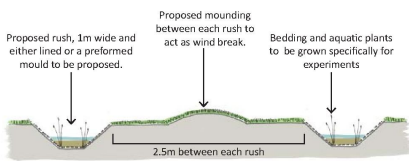


Fig 1. Indicative cross-section through rushed

Each rush will be supplied with a continuous flow of water which can be discharged into the environment or recycled when dosing is not occurring. When dosing is occurring, the outflow from the rushes will be captured and treated prior to discharge. The water supply needs to be of sufficient quality so as not to adversely affect the natural communities or the risk assessment of the chemical being tested. Five interconnected ageing ponds will be installed to fulfill this purpose using water extracted via borehole.

Each pond will be 24m x 24m and 1m deep and will have an approximate capacity of 450m<sup>3</sup>, providing a total storage capacity of 2250m<sup>3</sup>. A variable pressure pumping system will be installed to provide a constant feed of water from the ponds to the rushes. This will be housed within a GRP pump house on a concrete base (design details to be confirmed). A distribution main from the pump house to the rushes will be installed, using either NDPE or stainless steel depending on whether the installation is above or below ground. The design allows for a range of flows to meet the wide ranging requirements of the experimental work to be conducted, with a maximum flow of 15 litres per minute in a single 10m sample area.



Fig 2. Example water storage tank.

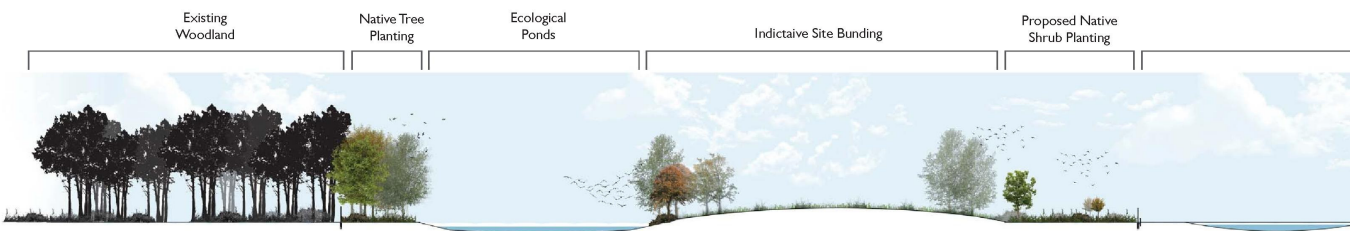
The effluent flow from the mesocosm will be the same volume and rate as the influent flow. When dosing is occurring effluent treatment may be necessary prior to discharge. A coated steel effluent water tank (Fig. 2) will be located within the NAFIC fence line on an adjoining parcel of amenity grassland. The tank will have a capacity of 405m<sup>3</sup> (405,000 Litres) and will be 12.8 metres in diameter and 3.14 metres high. The dimensions are based upon a maximum daily usage of 405m<sup>3</sup>

per day. A treatment plant alongside (approximately 9.5m x 2.5m x 2.6m high) will treat effluent to sufficient quality for discharge to an adjacent watercourse at a maximum discharge of 5 l/second, subject to consent from the Foss Internal Drainage Board (IDB). Initial discussion with the IDB indicated that discharge to ground via soak away would be preferable but the ground conditions are not suited to this option. The precise point of discharge to a suitable watercourse will be determined pending site surveys and agreement with the IDB. For further details, please refer to the Surface Water Drainage Discharge Position Statement that accompanies this planning application.

A sampling chamber will be incorporated prior to discharge.

The filters within the treatment plant require backwashing and are estimated to produce 20m<sup>3</sup> per day of backwash water. This will be stored in a 100m<sup>3</sup> capacity tank, approximately 7.2m in diameter and 3m high, prior to removal by road tanker. The design of the treatment plant remains in development.

The rushes will be rebuilt for each experiment and all materials, soil and plants used for each test will be removed and disposed of as hazardous waste.



A



B



Water Body Safety Assessment Facility - Ageing Ponds

Native Tree Planting

Existing Woodland



AA

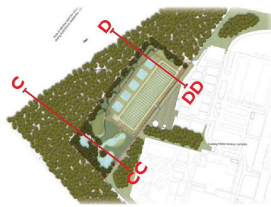
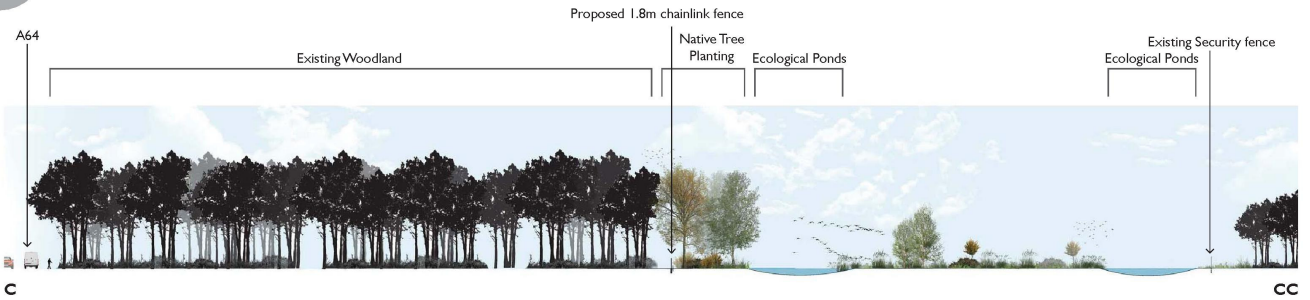
Water Body Safety Assessment Facility - Rushes System

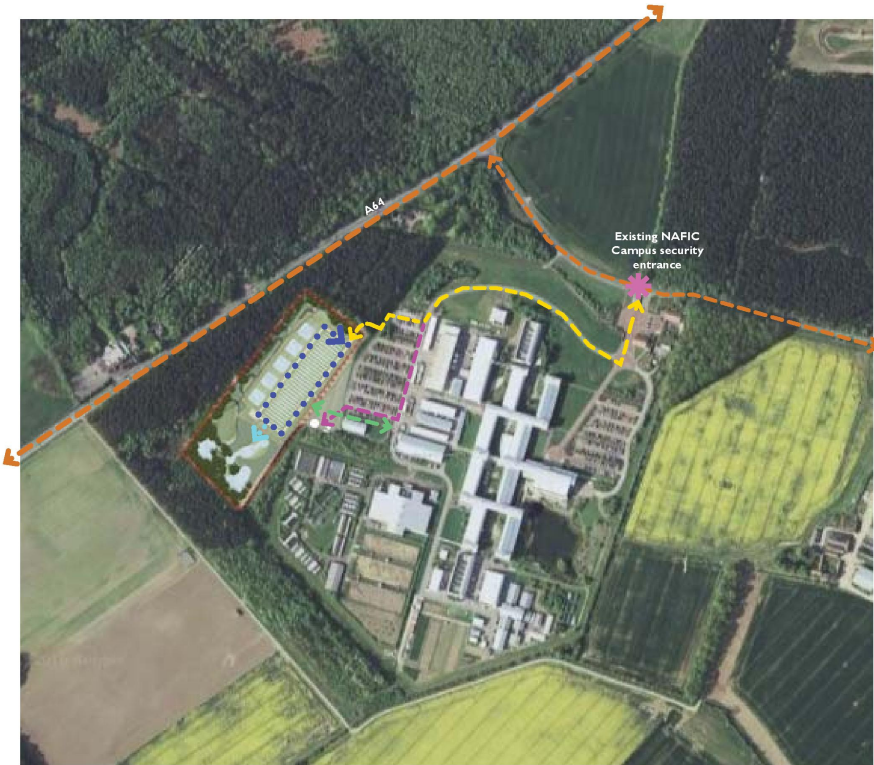
Native Tree Planting

Existing Woodland



BB





**Access and Vehicle Movements**

The development site will be accessed from within the NAFIC Campus. All vehicular movement associated with the enabling works, construction process, effluent removal and maintenance will pass through the main entrance to the Campus which is security controlled and will then head west to join the A64. All vehicular movement will use the internal northern perimeter road to reach the Mesocosm site. Dialogue with Highways England is underway regarding these access arrangements. A new bellmouth entrance will be formed into the car park to facilitate access.

Access to the plant installations to be located within the the NAFIC boundary fence line will also be via an existing car park and a new grasscrete area.

A pedestrian route in to the Mesocosm will be created via the existing pedestrain route adjacent to the gym. Access into the site will be via a gate installed within the existing boundary fence.

For further details please refer to the Proposed Site Plan.

Current estimates of vehicle movements anticipated are outlined in section 15 - Construction Phase.



- ⋯→ Pedestrian access to proposed ponds and woodland
- ⋯→ Internal access arrangement
- ↔ Public Vehicular Access
- ↔ Vehicular access during and post construction
- ↔ Proposed pedestrian access into site.



## Fencing

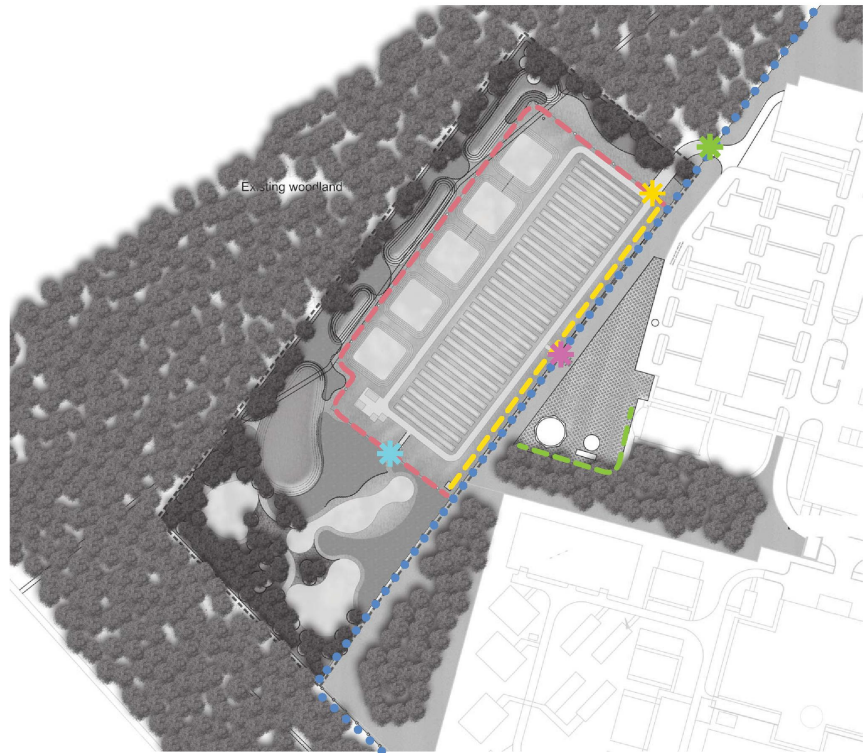
Due to the nature of the site, the fencing proposals have been developed through close consultation with the client and ecologists.

The existing security fence to the NAFIC campus will be retained however there will be a vehicular gate placed in it at the northern car park to allow access during and post construction phase. A pedestrian gate will also be located towards the middle of the site to allow day to day access by the staff running the experiments.

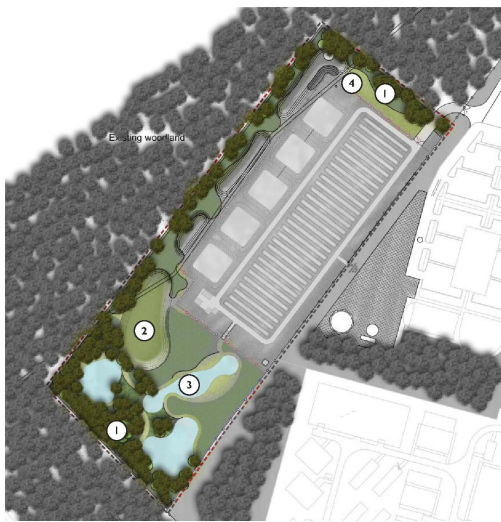
Past this security fence a 1.8m high chain link fence will run around the boundary of the proposed mesocosm. This fence will also incorporate a barrier to badgers and a newt fence. This will keep out any burrowing animals and potential newts from the site which could potentially contaminate the experiments.

Acoustic fencing has also been proposed around the proposed water storage tanks. This will assist in removing any risk of noise disturbance to the adjoining area of the campus.

- Existing Security Fence retained
- Proposed newt barrier
- Proposed 1.8m Chain Link Fence with Badger and Newt Mitigation Measures
- Proposed 2.5m Acoustic Fencing
- ★ Pedestrian Gate within proposed chain link fence
- ★ Vehicular gate within proposed chain link fence
- ★ Pedestrian gate within existing security fence
- ★ Vehicular gate within existing security fence







This planting will include the below species:

- Large trees:** Quercus robur, Fagus sylvatica, Pinus sylvestris, Prunus avium
- Large Shrubs:** Amelanchier canadensis, Corylus avellana, Ilex aquifolium, Sambucus nigra, Ulex europaeus

- Medium trees:** Acer campestre, Taxus baccata, Salix caprea, Sorbus aucuparia
- Medium Shrubs:** Juniperus communis, Rhamnus cathartica, Salix purpurea, Rosa Canina, Viburnum opulus

- Small trees:** Crataegus monogyna, Malus sylvestris, Prunus spinosa, Corrylus Avallana
- Small Shrubs:** Ulex europaeus, Cornus sanguinea, Vaccinium myrtillus, Euonymus europaeus, Lonicera periclymenum

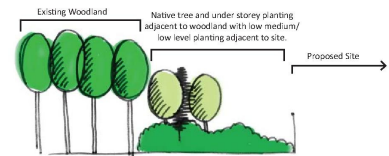
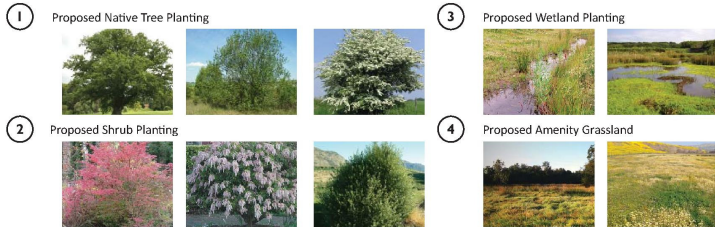
**Proposed Planting**

Due to the extent of existing woodland proposed for removal the proposals provided for a substantial landscape buffer that will run from the north east to the south west of the proposed mesocosm. This buffer zone is approximately 20 metres in width to the north west and to the south west expands to approximately 90m.

This landscape buffer will be planted with native species of trees and shrubs and will have a height hierarchy to limit over shadowing of the site.

A series of bunds will also be created to a maximum height of 1.5m, using material excavated on site during the construction process..

A further landscaped area with a broader extent will be created to the south west of the Mesocosm to ensure that the rushes are not over shadowed. This is necessary as inconsistent shading could affect the outcome of studies. An area of water meadow, incorporating proposed nature ponds, will be created to improve and enhance bio-diversity and to provide ecological and plant stock for use in the Mesocosm experiments and the recovery phase of projects. This will be bordered and interspersed by native trees and shrub planting, again with a height hierarchy to limit any future risk of over shadowing on site.



Indicative illustration of planting heirarchy in proposed landscape buffer zone





Grass-crete.



Self binding gravel pedestrian/vehicular access road.



Chain link fence.



Badger barrier.



Newt fencing.

**Tree felling (enabling works):**

To enable the proposals to be accommodated there is need to remove a substantial section of the existing woodland. The area to be removed equates to approximately 2.66 hectares. As part of the proposals there is also need to remove a small section of existing trees within the NAFIC campus adjacent to the gym. This is to allow the installation of the large water storage tank and associated out buildings.

For more details on the existing woodland please refer to the arboricultural report.

The tree felling operations will be carried out outside of the bird breeding season. During tree felling operations, the delivery of plant (a Forwarder and Harvester) to/from site would involve 4 movements. Approximately 50 timber lorry movements from the site would be required for the removal of felled woodland, estimated at 935 tons @ 20 tons per load.

The project timescale envisages that felling operations will take place during December 2016 and will be completed by Christmas.

**Construction of Mesocosm:**

The construction period is intended to commence in January 2017 with completion by the end of April. The transport of bulk material associated with the required cut and fill process will be primarily focussed during the first 8 weeks of the construction. Thereafter, once the site levels are defined and configured, the subsequent movement of bulk materials is not expected to be significant.

During the construction phase, the majority of excavation work will relate to the construction of the ageing lagoons and nature ponds, along with drainage sump/pump chambers. Current estimated volumes (cu.m.) of excavation and traffic movements associated with this activity are as follows;

	Volume (m3)	Operational weeks	Average Daily movement
Depth of cut	4650	4	23
Depth of fill	6450	4	32

*\*This is based upon the area within the fence line of the mesocosm as shown on the Indicative Landscape Masterplan.*

Once the site is operational, traffic movement will be limited solely to sporadic effluent tanker visits and maintenance vehicles.

**Project Timescale**

The intended project completion date is the end April 2017 in order to avoid the loss of significant projected revenue income for FERA. To achieve this date, construction must commence in early January 2017 and will take 17 weeks, including a testing period. However, this is dependent upon enabling works being completed by Christmas this year, involving trees being felled in order to clear the site.

The applicant hopes that the application can be determined by Planning Committee on 20th December 2016. The urgency of completing enabling works by the end of this year has also prompted a parallel application to the Forestry Commission for a felling licence.

