

SCOTTISH AQUACULTURE INNOVATION CENTRE

BUSINESS PLAN

April 2014

EXECUTIVE SUMMARY

Given the substantial and growing contribution which the Scottish aquaculture industry makes to our economy and to supporting national and international food security, the absence to date of a Scottish centre for aquaculture research and development, knowledge exchange and training has been a major shortcoming.

The Scottish Aquaculture Innovation Centre (SAIC) will address this urgent need by providing innovative technical solutions to key industry challenges and by delivering transformational change in the relationship between the aquaculture industry and the research community, ensuring close and effective collaboration and creating a partnership to drive revenue growth and increased economic impact.

This Business Plan for the SAIC has been developed by an industry-led Interim Board on behalf of a consortium including 26 aquaculture industry members and 13 academic organisation members (Appendix 1). The Plan has thus been developed with a focus on industry needs and aspirations, mindful of the particular requirements of the sector's SMEs, and with recognition of the importance of engaging academia in a genuinely collaborative and mutually beneficial way.

The SAIC will draw upon both public sector and private funding sources. It is proposed that the SAIC is funded in a "just in time" manner, with funds called off as required on a monthly basis. Over a five year period, funding of £11.1million from SFC, alongside significant industry investment, will allow the SAIC to be transformational, linking its major activities of research, knowledge exchange, training and business development to create and deliver the knowledge and skills necessary for a sustainable and globally-competitive Scottish aquaculture industry.

Public sector funding will be channelled through the University of Stirling acting as Administrative Hub on behalf of the SAIC. The SAIC will demonstrate independence in decision-making through its Board structure, with a clear intention of moving to a limited company model on a timescale determined very early in its existence. The SAIC's management and administration will be lean, with much of its impact delivered synergistically through liaison with current infrastructure, e.g. in working to support and further enhance the highly-regarded HIE business development programme. The SAIC will, in this respect, act as a knowledge resource for those involved in supporting aquaculture businesses.

The SAIC will be environmentally aware and responsible, both in its own activities and in the use of generated knowledge to counter misconceptions of the industry. Its physical footprint will be small; with an administration centre in Stirling, it will deliver its outputs close to where the industry operates, but without unnecessary office costs, by utilising and building upon existing physical resources.

The SAIC will, from the outset, have business-related goals. Through a structured system for the submission of ideas or signalling challenges, the SAIC will find creative, collaborative approaches to individual issues, focused on practical solutions. Carefully monitored research projects and rapid dissemination of results, linked to the SAIC's training, KE and business development activities, will ensure that academic activity leads to results which can be

measured in terms of new products, services, processes and jobs, leading to Scottish business revenue growth and economic impact.

The SAIC will develop a fully accredited and comprehensive range of aquaculture-specific skills-development options, from single training modules, through Modern Apprenticeships to post-graduate projects, which is easily navigable by individuals and businesses. A project-specific approach to intellectual property issues, based on the guidance issued to Catapult Centres, will fairly share generated IP and take full commercial advantage of new IP where appropriate, removing perceived obstacles to rapid dissemination and utilisation of new knowledge, skills and techniques.

The industry members of the SAIC consortium have identified four Priority Innovation Actions (PIAs) requiring urgent and sustained attention; work on these will start within the SAIC's first year. They are

- Improved Sea Lice Control in Scottish aquaculture; this addresses a major inhibition on the growth of salmon farming, the economic heart of the Scottish aquaculture industry.
- Alternative sustainable feeds for finfish; highlighting the importance of sustainability which is seen not just in carbon terms but in the optimal utilisation of global resources.
- Rapid detection methods for viral pathogens and diseases; emerging diseases and the appropriate reaction to known and unknown threats is as important to aquaculture as it is in other farming ventures, and the SAIC will draw on knowledge from all academic fields.
- Development of secure health-certified Scottish mollusc spat production systems; Scotland lags behind other countries in this area and making Scotland competitive across all aquaculture sectors will be central to the SAIC's remit.

An early focus will be an Innovation Project to review existing principles around which statutory and voluntary regulation of fish farming operates, and examine a range of options for alternative and more efficient modelling and monitoring. The results of this project should help remove obstacles to the development of new and more efficient salmon production sites; every additional 10,000 tonnes of salmon which reaches market creates an additional £96million for the Scottish economy, of which over £43m is at the farm gate.

The success of the SAIC will therefore be measured through the translation of its activities into growth and increased profitability for existing and new aquaculture businesses, the creation of new, high quality sustainable jobs in all sectors of Scottish aquaculture and a demonstrable positive impact on the Scottish economy.

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1. INTRODUCTION

- 1.1. This Business Plan updates that previously submitted to the Scottish Funding Council (SFC) on 12th February 2014.
- 1.2. The Scottish Aquaculture Innovation Centre (SAIC) was awarded funding on 20th February 2014.
- 1.3. An Interim Board has been appointed to take forward the development and refinement of the business plan and to initiate the actions outlined in the business plan.
- 1.4. The Interim Board has initiated process of recruiting and appointing a Chair and Director and members of the Board.
- 1.5. The membership of the Interim Board and of the Consortium is listed in Appendix 1.

2. ACHIEVING TRANSFORMATIONAL CHANGE

2.1. Industry commitment

- 2.1.1. The aquaculture industry's enthusiasm for a Scottish Aquaculture Innovation Centre is predicated on the understanding that it will bring about transformational change, principally in prospects for substantial growth in production of high quality fish, shellfish and other aquatic products and the wealth creation that accompanies this; and in the relationship between the industry and the Scottish academic and research community which supports it.
- 2.1.2. The industry's expectation is that research funded through the SAIC will be in areas defined by the industry, and that this will be tightly focused on resolving the technical, scientific and related issues that are demonstrably stifling sustainable growth and development in Scotland.
- 2.1.3. The expectation is also that the structure of the SAIC, its conduct, and the way in which its performance will be assessed and evaluated will reflect the needs of Scottish aquaculture businesses. The effectiveness of the SAIC will be judged against the metric of economic and social gains, including demonstrable skills development throughout the industry, rather than by the number of research projects carried out, the number of postgraduate degrees awarded, the number of peer reviewed papers published or the number of training courses delivered.

2.2. Helping academia to help Scottish aquaculture

- 2.2.1. The academic partners in the SAIC Consortium are committed to assisting the development of Scottish aquaculture through a new focus on collaborative research and skills development. This means more effective collaboration between academic institutions in carrying out high quality applicable research but, more importantly, collaboration with the industry at a level not previously achieved.
- 2.2.2. The SAIC will facilitate this through a process which will inform and educate academics in the needs of aquaculture.
- 2.2.3. SAIC staff and industry Consortium members will visit academic institutions throughout Scotland to lead seminars and networking events on the underpinning principles and practices of Scottish aquaculture, its challenges and its priorities for problem-solving research. In this way, scientists not currently aware of the issues and challenges will be alerted to the potential for work in this field.
- 2.2.4. Via the internet and other media, the SAIC will create an accessible portal for enquiries from academics and researchers with an interest in aquaculture generally or in specific areas of potential research.
- 2.2.5. The SAIC will fund, on an annual basis, a number of Conference Bursaries to allow junior researchers with limited exposure to the industry to attend relevant aquaculture conferences and events; this will facilitate a two-way exchange of knowledge between researchers and aquaculturists, informing the latter on research disciplines of which they may be unaware but which could be applied to their benefit.
- 2.2.6. The SAIC will work with the successful Knowledge Transfer Partnership programme to facilitate aquaculture-specific KTP Associates.

- 2.2.7. The SAIC will act as a link to research councils and other public sector bodies which fund and otherwise support research to build aquaculture research capacity in Scotland and improve links with Europe and more globally.
- 2.2.8. The SAIC Board will prioritise early interaction with Interface, particularly to investigate whether an aquaculture-specific extension of the Innovation Voucher scheme can be developed as a mechanism to encourage new collaborations between Scottish HEIs and aquaculture SMEs.
- 2.2.9. The SAIC's funding for successful collaborative research groups, along with its publicity for true high-impact research, will bring direct benefits to Scotland's academics; it will publicly recognise the important work of researchers whose results help transform industry practices as well as the overall contribution of the institutions in which they work.
- 2.2.10. True success in this area will be demonstrated by the creation of Chairs in practically-focussed academic subjects related to aquaculture and by demonstrable career paths which can take undergraduates all the way through to professorships in academic areas directly linked to the success of Scotland's aquaculture industry.

2.3. **Focus on SMEs**

- 2.3.1. Scotland's shellfish sector is almost exclusively comprised of small companies. Aquaculture SMEs tend to be creative and innovative and the SAIC will help them to engage effectively with the Scottish research base on demand-led projects which benefit these businesses.
- 2.3.2. The SAIC will identify common needs and help fund work to address them. This process will be aided by close collaboration with the Ministerial Group on Sustainable Aquaculture, the Shellfish Working Group and The Association of Scottish Shellfish Growers. This will reduce the risks involved in shellfish cultivation, which will in turn allow the industry to grow, in part by increasing investor confidence.
- 2.3.3. The emerging seaweed cultivation sector, whether it be for single species cultivation or part of Integrated Multi-Trophic Aquaculture, will receive a specific focus within the SAIC and there will be on-going horizon scanning to ensure that emerging aquaculture developments are assisted to grow.
- 2.3.4. Outside the companies who supply fish feed, vaccines and medicines, the vast majority of companies which service the Scottish aquaculture industry are SMEs. These range from larger SMEs involved, for example, in the supply of containment facilities for salmon (rafts, nets, anchors, etc.) through to very small local firms involved in maintenance work.
- 2.3.5. Many of these companies have been involved with the industry for decades, but have had very limited access to information and skills which would allow for innovation; other companies have skills and equipment which could readily be adapted to aquaculture use but have no knowledge of the industry. The SAIC will assist at all levels with SMEs who wish either to become involved or to develop their involvement in aquaculture. The SAIC will also assist service companies to take skills and products developed in Scotland onto a global stage.
- 2.3.6. With regard to finances, special arrangements will be available for SMEs to encourage participation and ensure that cost is not a barrier to entry to the SAIC Consortium. Guided by state aid rules, the SAIC will proactively encourage SME

participation in collaborative projects, reducing cost barriers to participation where possible; this will include recognition of the value of non-cash contributions.

3. STRATEGIC AREAS and PRIORITY INNOVATION ACTIONS

- 3.1. Four areas of strategic focus for the SAIC have been identified. These are:
- Fish & Shellfish Health & Welfare
 - Breeding and Stock Improvement
 - Feeding, Quality and Nutrition
 - Engineering Solutions
- 3.2. Within these areas, the industry members of the SAIC consortium have identified four Priority Innovation Actions (PIAs) which require urgent and sustained attention. These are:
- Improved sea lice control in Scottish aquaculture
 - Alternative sustainable feeds for finfish
 - Rapid detection methods for viral pathogens and diseases
 - Development of secure health-certified Scottish mollusc spat production systems.
- 3.3. Researchers working in Scottish HEIs and the specialist industry vets, scientists and fish health managers in the industry already have significant know-how and skills that allow them to make a significant contribution towards problem solving in these areas. The SAIC Board will therefore establish multidisciplinary teams to work on each of the PIAs.
- 3.4. In establishing these teams, the Board will give particular attention to the need to introduce a greater degree of lateral thinking than has existed to date, for example involving veterinary epidemiologists with experience of working on Integrated Pest Management Strategies to inform initiatives on lice control; and engineers to work on mechanical, non-therapeutic lice removal and inactivation.
- 3.5. The creation of multidisciplinary teams will facilitate the involvement of HEIs which have not hitherto been significantly involved in aquaculture-related research, thus increasing the scope of collaborative research.
- 3.6. Within the first twelve months of its establishment, the Board of the SAIC will prioritise research activities and projects capable of delivering material gains against these PIAs. An outline of the process and the way in which the findings from these projects will link with the SAIC's KE and Business Development activities to deliver tangible and quantifiable results for industry is detailed in Section 6.
- 3.7. Details of why these PIAs are of crucial significance are set out below.
- 3.8. **Sea lice and the need for improved control**
- 3.8.1. Sea lice are naturally occurring parasites of wild salmonids, adopting farmed salmon as hosts shortly after salmon farming began. Their position as parasites of farmed fish is no different to that of parasites infesting other food producing animals.

- 3.8.2. The presence of sea lice on farmed salmon has provided opponents of the industry with an opportunity to accuse it of contributing significantly to a decline in numbers of wild salmon and sea trout in areas where salmon farming takes place. While it is widely recognised that global climate change, and its impact on the feeding and survival of salmon at sea, has been the major contributory factor in declining numbers of wild salmon, sea lice emanating from fish farms, and the damage they are accused of doing, is repeatedly cited in objections to new developments and extensions to existing developments.
- 3.8.3. A number of the Scottish planning authorities who consider applications for development consents for salmon farming require assurances that new developments will not impact on wild fish. It is almost impossible to offer guarantees on this because of the level of evidence required to definitively prove lack of impact. As a consequence of this and other factors, very few consents have been granted over the past decade, significantly suppressing opportunities for economic growth.
- 3.8.4. Public and political campaigns by opponents of fish farming over the course of the past two years have succeeded in upping the ante, with Scottish Government introducing the second of two Acts of Parliament inside six years that, in real terms, impact on development potential.
- 3.8.5. In tandem with this, there are still significant technical challenges associated with managing and controlling sea lice in order that their numbers remain low on farmed salmon. Over the past thirty years, the industry has developed a broad range of strategies, including protocols to maximise the effectiveness of licensed sea lice medicines and minimise the potential for the evolution of resistant lice. However the opportunities for substantial improvement are still low, especially when compared with those available to terrestrial farmers.
- 3.8.6. The role of the SAIC in dealing with the sea lice challenge, and its impact on the sustainable growth of farmed salmon production, will be to significantly improve the ability of the farmer and the veterinary surgeon to manage and control lice, to the point that objections to new farming developments based on alleged negative impacts on wild fish are no longer tenable.
- 3.8.7. The success of the SAIC's activities in this sphere will, therefore, be judged more in terms of improvement in sea lice management and control on farms as a consequence of the application of research results, KE and relevant skills development and training, rather than just in the number of scientific papers published, important though these are in attracting attention to industry issues requiring research input. It will be the responsibility of the Board and the Consortium members to ensure that such benefits are delivered.
- 3.8.8. If, through the impact of the SAIC, the concerns over sea lice that give rise to the withholding of planning permissions for new salmon production sites are diminished or removed, the undernoted economic and social benefits, would result for each new site created (based on a cost-effective modern site with 1,500 tonnes holding capacity):
- additional £10.5m pa into the Scottish economy
 - creation of 5-6 new high quality permanent local jobs, with overall salaries of c.£200k pa
 - infrastructure investment with Scottish manufacturers and suppliers of equipment and services of £2.5million

- sourcing £3m worth of feed from Scottish feed manufacturers
- yield from a 1,500 tonnes farm will be an additional 2,100 tonnes of gutted weight salmon, with a farm gate value of £9.1 million, for use by Scottish, UK and overseas processors
- retail value from all markets of £11.8 million, of which it is likely that £8.3 million will come from export markets and £3.5 million in UK domestic market.

Taking account of the Scottish Marine Plan aspiration of 210,000 tonnes of farmed salmon by 2020, the additional farm gate value would be around £220 million, with the other benefits noted above rising proportionately.

3.9. **Alternative sustainable feeds for finfish:**

- 3.9.1. The replacement of marine fishmeal and fish oil has been the subject of extensive applied research for thirty years, and most of the commercial salmonid feeds used today contain a relatively small proportion of fishmeal compared with levels three decades ago. However, as a consequence of demands from the market into which Scottish farmed salmon is sold, Scottish farmers have required that significant proportions of marine fish oil are added to the feeds used to produce their fish.
- 3.9.2. In recent years it has become increasingly obvious that the availability of high quality marine fish oil is now a limiting factor in the production of farmed salmon, because of significantly reduced supply and growing competition from the human nutraceuticals industry. It seems likely that, in the very near future, there will only be sufficient marine fish oil available to allow the nutritional requirements of the fish themselves to be met, and not enough to allow the boosting of the long-chain omega-3 fatty acids EPA and DHA to levels traditionally present in Scottish farmed salmon.
- 3.9.3. For this and related reasons, work to find alternatives to fish oil as a means of guaranteeing high levels of the essential long chain polyunsaturated fatty acids important to human nutrition is urgently required.
- 3.9.4. The SAIC will link into existing projects in this area, including those within the feed companies, to leverage maximum benefit through collaboration. This is an area in which cooperation within the Innovation Centre programme and between ICs and development organisations can act as a multiplier in producing rapid and significant results; the SAIC will, in particular, work with Scotland Food and Drink and with the Industrial Biotechnology IC in this respect.

3.10. **Rapid detection methods for viral pathogens and diseases:**

- 3.10.1. All farmed fish and shellfish are produced in the natural environment, where known and unknown viruses abound. Viral pathogens and diseases of farmed fish and shellfish already present significant challenges to aquaculture; the economic and social implications of the serious viral diseases listed in European, UK and Scottish disease control legislation are enormous.
- 3.10.2. Unlike disease caused by other pathogens, viral diseases cannot be treated using conventional veterinary medicines. The serious viral diseases, which are most often controlled by containment and slaughter, lead to productivity reduction, increased financial risk and increased financial exposure. For example, two documented outbreaks of Infectious Salmon Anaemia (ISA), a viral disease of farmed Atlantic salmon controlled by the slaughter of affected fish without compensation, have cost

the Scottish salmon industry tens of millions of pounds, and worldwide the impact of ISA runs to hundreds of millions of pounds.

- 3.10.3. More recently, the detection of another listed viral disease, Viral Haemorrhagic Septicaemia (VHS), in wrasse deployed as cleaner fish to control lice on farmed salmon, caused significant and unforeseen local problems. Although VHS does not affect salmon, the movement restrictions implemented following detection of VHS apply to the site rather than the fish, so salmon could not be moved off affected sites until the wrasse present on the sites had been removed and disinfection measures satisfactorily applied to allow the pre-existing disease-free status of the zone to be regained.
- 3.10.4. This scenario is compounded by the spectre of the so-called “emerging diseases” caused by pathogenic aquatic viruses that may be present in many different environmental matrices, including the tissues of wild fish. Unknown and, as yet, undescribed diseases caused by viruses that are normal components of aquatic ecosystems have the potential to create enormous problems for fish and shellfish farmers. Work on the rapid detection of known and emerging viral pathogens is clearly a crucially important priority for the growth and development of Scottish fish and shellfish cultivation, where high standards of fish and shellfish health and biosecurity are watchwords.
- 3.10.5. Another major requirement is rapid and effective determination between pathogenic and non-pathogenic viruses which appear virtually identical. It is now recognised that non-pathogenic strains of ISA are relatively common in the wild and that these may infect farmed fish without necessarily causing disease; however, their current detection would result in the slaughter of millions of pounds worth of fish which are completely safe for human consumption. Solving this problem could protect the economy, remove a major cause of stress on those who farm salmon and create an exportable capability or allow the development of a service which a Scottish company could deliver globally.
- 3.10.6. The SAIC can therefore act as a link between researchers, biotechnology firms (such as Stirling-based Aquatic Diagnostics), fish health professionals (such as Inverness’s Fish Vet Group) and farmers to ensure that improved detection of viruses in farmed stock is married to a genuine understanding of the significance of the findings, and that this information is used to bring about practical improvements in the way viral infections are managed.

3.11. **Shellfish hatchery technology:**

- 3.11.1. Scotland is currently the only Pacific oyster producing nation which has not suffered from the Oyster Herpes Virus, which can wipe out Pacific oyster farms. With a national hatchery Scotland would hopefully be able to maintain this status, and potentially export disease free stock. The Pacific oyster industry in Scotland is not large enough to fund a hatchery on its own, but without it growth will be difficult.
- 3.11.2. There is also a need to work on the supply of mussel spat from a hatchery, to reduce dependence on wild caught spat, and avoid further problems such as catching the wrong type of spat, i.e. *Mytilus trossulus*.
- 3.11.3. The Native Oyster industry in Scotland could also potentially grow again if there was a source of seed available.

- 3.11.4. All other serious shellfish producing nations have such a facility; a survey in 2012 identified 65 shellfish hatcheries on the east coast of the USA alone, including 5 specifically involved in research. There is a demonstrable need for at least one research-focussed hatchery facility in Scotland as a catalyst to the growth of this sector, so allowing the industry to achieve its full potential.

4. STRUCTURE AND FUNCTION

4.1. Relationship with University of Stirling

- 4.1.1. The University of Stirling (UoS) will act as administrative hub for the SAIC and is committed to maintaining independence and transparency of decision-making within the SAIC. UoS will adopt an advisory role to the Board over HIE funding regulations and other legal requirements in relation to finances.
- 4.1.2. SFC funds will be released to UoS. There will be formal agreement between the Court of UoS and the SAIC Board; funds will be released to the Board in accordance with this agreement, which will include reporting milestones.
- 4.1.3. Industry investment and other SAIC funding will also be channelled through UoS, who will provide financial administrative services.
- 4.1.4. The Board will develop detailed terms of reference for itself and any required Board committees (e.g. Audit, Nominations, etc.). Such terms of reference will include an appropriate scheme of delegated authority to ensure the Board approves all significant expenditure while allowing the Director to manage the organisation and projects on a timely basis. The Board will have the primary responsibility for establishing and maintaining an effective internal control environment.
- 4.1.5. In considering best options for the on-going effective and efficient operation of the SAIC, in consultation with existing IC management and others, the Interim Board has determined that the SAIC should be operated as a not-for-profit company limited by guarantee.
- 4.1.6. Concerns were raised that such a structure could raise legal issues in regard to the control of public funds and state-aid legislation; the Interim Board's investigations found no evidence that this would be the case. On the contrary, enquiries have indicated that one or more of the ICs already established are now actively pursuing conversion to limited company status. There may, however, be taxation implications, particularly in regard to VAT, and this is discussed in Section 9 below.
- 4.1.7. The SAIC Board will therefore, in its first year of operation, explore the case for early transition to a not-for-profit company; if agreement is reached with SFC, progressing this on an appropriate timescale will be a development priority.

4.2. Board

- 4.2.1. The Board will consist of no more than seven core members, including the Chair, each member having expertise and experience in an area of direct relevance to the activities of the SAIC.
- 4.2.2. The Chair will be appointed through a transparent, international search process instigated by the Interim Board immediately following funding approval for the SAIC. This will be to a tight timescale, with the Chair appointed within the first six

months. The Chair will then lead the transition from Interim Board to full SAIC Board.

- 4.2.3. Four members of the SAIC Board will come from within the aquaculture industry, selected from consortium members and representing both major and SME production companies and the service sector; the make-up of the Board will specifically give voice to small companies and ensure representation from across the aquaculture industry.
- 4.2.4. One Board member will be from the University of Stirling, in recognition of its role as the SAIC's administrative hub.
- 4.2.5. Another will be chosen by election from within the academic members of the consortium. An election process previously used by MASTS will be employed but with the constituency widened to include all academic members of the Consortium, i.e. all those who sign a Collaboration Agreement.
- 4.2.6. Although therefore having a majority of industry-involved Board members, academic representation will be such as to ensure that true collaboration between industry and academia is at the heart of Board decisions.
- 4.2.7. In addition, there will be a Board place for SFC and a joint place for HIE and SE, possibly with Observer status (this will be a matter for discussion).
- 4.2.8. The Board will meet every second month during the first year and quarterly thereafter.

4.3. **Management and Administration**

- 4.3.1. The Board will be supported in the development of the IC's strategy and in its day to day running by the Director, who will be responsible for the management of the SAIC's operational staff. Although, at least initially, an employee of the University of Stirling, the Director will report to the Board and be appointed in accordance with agreed job and person specifications.
- 4.3.2. Paralleling the way in which Scottish aquaculture businesses operate, the costs of administration will be kept as low as possible to ensure maximum funding for research, KE and training activities. While it will not be necessary to retain the services of a significant number of staff, particularly at the start of the SAIC's operations, it is important that staffing levels match the requirement for rapid and meaningful results.
- 4.3.3. The Board, once appointed, will decide upon the staffing required to ensure the effective and cost efficient operation of the SAIC. The Interim Board, has, for the sake of the financial projections, calculated that the initial management team will include a Marketing and Communications Manager, a Training Manager, a Business Development Liaison Manager and a Project Manager. All will be appointed at grades within the University of Stirling pay-scale, at a level to attract the best possible candidates.
- 4.3.4. The Director will be supported in the first year by an Office Administrator, who will also initially support the Board and other senior staff. Further administrative support will be recruited as required. A Research Intern (see 5.2.3 below), will be a first-year appointment whereas an Analyst will only be required once data has been generated.

4.4. **Scientific Advisory Board**

- 4.4.1. To ensure that the scientific quality of the work undertaken under the auspices of the SAIC is maintained at the highest level, an independent Scientific Advisory Board (SAB) will be established.
- 4.4.2. The SAIC Board will recruit six senior scientists, including academics not directly involved in the SAIC Consortium and non-affiliated scientists appointed on the basis of merit, to form the SAB. The Chair of the SAB will liaise directly with the Director and may be invited to join meetings of the Board as required by the agenda.

4.5. **SAIC Consortium**

- 4.5.1. The SAIC Consortium, which has been instrumental in developing the proposal to date, consists of both industry and academic members. At the date of this Business Plan, the Consortium membership (Appendix 1) includes companies and institutions headquartered across Scotland and beyond. It will have an on-going role in the development of the SAIC, most obviously through an annual SAIC conference, designed to maximise the potential for the exchange of ideas between industry and academia, as well as reporting on and building upon successes to date.
- 4.5.2. The Consortium will be open to new industry members to join at any time, upon entering into the financial buy-in appropriate to their sector.
- 4.5.3. Previously non-participating academic institutes will also be welcomed to join the consortium and it is envisaged that the vast majority of Scotland's HEIs with an interest in the sector will join upon seeing the benefits of access to the industry-specific data available through the SAIC. Membership will involve signing a collaboration agreement.

4.6. **Inter-linkage**

- 4.6.1. The SAIC will operate in a synergistic manner with existing bodies which are already involved in the SAIC's fields of activity.
- 4.6.2. For example, the Interim Board is aware of the excellent business support and development services already provided to companies involved in Scottish aquaculture by Highlands & Islands Enterprise and Scottish Enterprise, and wishes to draw attention to the benefits to be gained by maintaining and developing existing relationships with the enterprise companies on this front.
- 4.6.3. Mindful of the opportunities arising from Horizon 2020, the EU Framework Programme for Research and Innovation, the SAIC will develop synergy with other public sector funders including SARF, TSB, and the UK research councils including BBSRC, building upon links which have already been established in the funding of aquaculture-related research.

5. LOCATION

5.1. Administration

- 5.1.1. The administration centre of the SAIC will be based on the University of Stirling (UoS) campus. Being conscious of questions about whether this represents the ideal location for an industry whose activities are concentrated on Scotland's western coast and the islands, the Interim Board strongly supports the concept of using local facilities for the SAIC's research activities, local implementation of the outputs from research and of local delivery centres for KE and training in the Highlands and Islands. Discussions with HIE have focused on a number of options, including Oban, Inverness and Scalloway.
- 5.1.2. The UoS provides an ideal infrastructure for the administration of joint public and industry investment in the SAIC. The Stirling administration hub will facilitate the necessary interactions between SAIC management and the university's administration.

5.2. Research

- 5.2.1. Research will be carried out by collaboration between groups with the best ability to deliver economically significant results, regardless of location. Most commissioned research will be carried out in Scotland but industry investment may be used for projects outside of the country if required (no public funds would be so utilised).
- 5.2.2. There is, however, no intention of repeating relevant work carried out by overseas researchers. A key role of the SAIC will be to monitor and scrutinise the outputs of overseas research groups and support the means of applying useful results within the Scottish industry.
- 5.2.3. The monitoring function will be delivered through the annual appointment of a Research Intern, who will have the relevant education and qualifications and who will report monthly to the Director and to the Scientific Advisory Board. The Intern will also provide administrative support for the SAB. These one-year roles will provide highly useful experience to graduate entrants to the aquaculture field.

5.3. Training, KE and Business development office(s)

- 5.3.1. As detailed in Section 6 below, the true value of the SAIC's commissioned research is realised when the results transform the profitability, efficiency and sustainability of aquaculture activities.
- 5.3.2. The SAIC is committed to reducing barriers to knowledge exchange by bringing activities into close geographic proximity with the industry, but there is an equally strong commitment to avoiding multiple regional offices for their own sake, or a nominal presence represented by "plaques on walls".
- 5.3.3. The SAIC should not duplicate either the facilities or staff already involved in training, KE or business development activities within aquaculture but should seek to fully-utilise, strengthen and support that which already exists. Details around locations and operating models will be developed by the operational team as directed by the SAIC Board.
- 5.3.4. At the time of its formal establishment, the SAIC will negotiate with HIE to establish a small office presence from which the SAIC's Training, KE and Business development functions will operate. Ease of travel to aquaculture locations, along with ready access to those in key collaborative roles, will determine the exact

location. Mobility and flexibility, rather than an established office space, will determine the facilities required.

5.4. Carbon-efficient meetings

- 5.4.1. Although face-to-face meetings will be important in the early stages, as key relationships are developed, the SAIC will strive to maximise the use of technology and minimise the amount of travel time and greenhouse gases generated in the conduct of its business.
- 5.4.2. Investment in video-conferencing, webinar functionality and related equipment is of much greater value than meeting the travel and accommodation expenses of staff and others. However, this will be balanced against the undeniable value of visiting aquaculture and research facilities to discuss problems and solutions.

6. ACHIEVING MEASURABLE SUCCESS

6.1. Business-related goals

- 6.1.1. The Board will have sole and full responsibility for commissioning all research to be funded through the SAIC, taking account of the need to demonstrate that sponsored work is of a nature and quality likely to underpin transformational change within the aquaculture industry.
- 6.1.2. In establishing research goals the Board will, in all cases, consider the broad picture of innovation and improvement to industry performance. For example, as detailed in 3.6 above, the goal of projects within the PIA of “Improved sea lice control in Scottish aquaculture” is not the control of sea lice *per se*, but improving the efficiency of salmon production by reducing the negative effects of lice, thus harnessing the potential to significantly grow salmon farming.
- 6.1.3. Every additional 10,000 tonnes of salmon (equivalent to the production from seven modern sites) which reaches market because sea lice have been controlled creates an additional £96million for the Scottish economy, of which over £43million is at the farm gate. The expectation is however, that the work of the SAIC will facilitate the development of more efficient sites producing tonnages above current levels.

6.2. Assessing and prioritising needs

- 6.2.1. Although the exact process by which ideas will be turned into projects and practical results will be determined by the Board at an early stage in the SAIC’s development, the Interim Board believes that the following represents a realistic protocol, which is also illustrated as a decision making tree in Appendix 2.
- 6.2.2. Problems and issues which should form the subject matter for research will be identified by industry members of the Consortium, whether these are existing industry players focussed on innovation within their sector or new businesses bringing innovative thinking into aquaculture, and will be prioritised by the Board. Funding for defined projects will be generated through contributions from SFC, industry members and other sponsors.
- 6.2.3. Industry members of the Consortium will be able to submit ideas, or highlight problems, via the Director at any time. To ensure that new big ideas in all fields of aquaculture can benefit from the SAIC’s support, there will be an on-going option for anyone to bring innovative ideas to the SAIC, with ease of access ensured through internet resources as well as through identified regional representation.
- 6.2.4. SAIC staff will assist by shaping ideas into proposals to be put to the Board for consideration and development. This process will, where appropriate, involve bringing together academic members of the Consortium to advise on practicalities, consider ways in which research may be focussed on solving the problem and possibly suggesting an appropriate collaborative research group (or groups) for each proposal.
- 6.2.5. This dialogue will ensure that researchers understand the practical issues involved, so that research bids have a built-in element of practicality. It will also expose industry to areas of research with which they may be unfamiliar or unaware.
- 6.2.6. Building trust in this interactive process will be a crucial role for the SAIC, as Scotland’s researchers are encouraged to move to a new collaborative model which

brings demonstrable rewards to them. Over time, this awareness building will result in increasingly creative and collaborative academic solutions to the issues impacting upon the industry.

6.3. **Project initiation**

- 6.3.1. The Board will publicise the proposed projects to the research community, making clear the issue to be addressed and the timescale and criteria by which project bids will be assessed.
- 6.3.2. Research proposals will normally involve a collaboration between groups, based within Scottish institutions, which are academic members of the consortium. Although the SAIC will wish to commission the best-possible research groups for each proposal, in order to encourage involvement in the collaborative process strong justification will be required for proposals involving non-members of the Consortium. The option to become a member of the Consortium will, of course, remain open.
- 6.3.3. Submitted proposals will be fully-costed (using Full Economic Costing standards) and will clearly state how the aims of the project will be met and the skills and expertise within the research groups which will facilitate this delivery. An impact statement, i.e. the way in which the project will address the practical needs of the industry, will be a key element, and bidders may be invited by the Board to present on this topic.
- 6.3.4. The Director will collate bids and submit a list of project proposals to the Board. The Board will screen these initial proposals quarterly and will submit those which they believe have merit to the Scientific Advisory Board for comment and to industry members from the relevant sectors for prioritisation.
- 6.3.5. All proposals, with SAB commentary and industry priorities, will then be considered by the Board and a decision made on those to progress. Review will follow a standard process with projects being scored against criteria decided and publicised by the board
- 6.3.6. There will be flexibility in this process; for example, the Board may consider that a number of bids have merit but none exactly fulfil the need, and may suggest that elements of these bids are combined to form one collaborative bid. The Board, with input from the SAB if appropriate, will assign project work based on their assessment of the proposals.
- 6.3.7. The Board will determine the appropriate funding mix for each project for which they have given approval; the majority will involve a combination of public funding and industry investment but some specific projects may be funded from a single source.

6.4. **Monitoring and fine-tuning**

- 6.4.1. The Director and management team will be responsible for monitoring the progress of funded research projects; this will include agreeing timed milestones within the project and auditing progress against these milestones.
- 6.4.2. Progress against the targets, which will be based on SAB recommendations but set with industry expectations in mind, will be reported monthly to the Board and will be a condition of continued funding. Where appropriate, industry members of the Consortium, and others who are directly funding specified research projects, will be entitled to be involved in steering groups established to oversee work under defined contract.

6.4.3. However, it is recognised that the nature of research is such that its results cannot be accurately foreseen and that findings other than those expected may yet have positive applications. Interim findings from funded projects will therefore be regularly reviewed by the Scientific Advisory Board, who will be able to recommend fine-tuning of projects or suggest how unexpected results might inform future projects or could be implemented quickly by industry with little further development.

6.5. Results evaluation and implementation

6.5.1. End results from funded research projects will be delivered to the Board, who will seek SAB advice if necessary in their consideration of the findings and implications.

6.5.2. By default, results will be relayed to the Consortium members without delay following Board consideration. Where research has been specifically commissioned or where elements of commercial confidentiality apply, the Board will endeavour to maximise the availability of research findings within the set parameters.

6.5.3. As indicated in 5.1.1, rapid and effective practical implementation of the findings from research projects will involve the SAIC's industry members and existing delivery facilities located close to industry, for example at Dunstaffnage (SAMS), Scalloway (NAFC) and Machrihanish (MERL). The SAIC Board will link with local delivery agents, in and via HIE, to monitor and evaluate the efficacy of such implantations, to ensure that projects are indeed delivering transformational change and value for money. The link with the SAIC's KE and Business Development activities is further detailed in Section 7.

6.6. Intellectual Property

6.6.1. The Interim Board appreciates the need to protect IP, largely from the perspective of avoiding possible abuse, and fully recognises that there are likely to be differing views within the Consortium on how IP emerging from the activities of the SAIC should be treated. Ideas and information are the currency in which academics deal and the competitive funding model has had a significant inhibitory effect on the sharing of IP; the SAIC must be instrumental in transforming attitudes while maximising the commercial benefits of IP to the Scottish economy.

6.6.2. The industry as a whole, recognising the nature of the issues that are currently suppressing sustainable growth and development, wishes to follow the principle of making information which is likely to be of practical value in addressing technical production challenges available to all of those who wish to apply this to good effect. The Interim Board therefore supports the principles behind the Easy Access IP initiative but also appreciates that, for commercial reasons, some partners involved in collaborative research may wish to protect the IP generated from project work.

6.6.3. Against this background, a case-by-case approach is advocated and it is proposed that contracts written around specified projects should reflect the needs of those directly involved in funding and carrying out the work.

6.6.4. The Board will develop its IP policy as a high priority and will have the policy in place within six months of operation. The approach will be based on the guidance for management of IP issued to the Catapult Centres, so that by default -

6.6.4.1. where IP is generated exclusively through public funds, the Foreground IP will be owned by the SAIC.

- 6.6.4.2. where IP is generated through joint funding by industry and the public sector, the relevant partners will agree appropriate IP sharing at the initiation of the project.
- 6.6.4.3. where no public funds are involved, the rights to Foreground IP will reside with industrial partner(s) funding the project.
- 6.6.5. The SAIC must balance the importance to Scottish academics of publishing their results in an appropriate way, given the globally competitive nature of research, with the industry's need to have those results drive innovative, practical developments as quickly as possible. Delays caused by the current perceived need to closely guard IP prior to publication can be removed if the issue of shared ownership of IP and recognition for the true impact of research are addressed by the SAIC upfront.
- 6.6.6. The situation around IP ownership may also be significant in taxation terms, particularly in relation to VAT. If IP is the commercial product of the SAIC's research projects, VAT may be reclaimable and this may impact on the SAIC's move towards limited company status. The Board will take full cognisance of this element during its investigation into the status of the SAIC as a new legal entity.

7. DELIVERING AND TRANSFORMING

7.1. Integration

- 7.1.1. The SAIC will be transformational principally by linking its major activities. The findings from commissioned research would obviously have very limited value if not publicised and utilised so the SAIC will link research with its KE, training and Business Development activities to maximise benefits.
- 7.1.2. The SAIC will :
- 7.1.2.1. be fully integrated into the wider innovation environment and system for Scotland.
 - 7.1.2.2. be a key component of the developing single knowledge exchange organisation, Innovation Scotland
 - 7.1.2.3. ensure close integration with business development support provided through Scottish Enterprise, Highlands & Island Enterprise and Business Gateway
 - 7.1.2.4. ensure integrated working with Interface, UT.com, Scotland Food and Drink, Scottish Development International and other relevant agencies.
- 7.1.3. The SAIC will not seek to duplicate current activities in any of the fields in which it becomes active but rather will work to bring an aquaculture-specific focus to existing processes.

7.2. Knowledge Exchange

- 7.2.1. As outlined in the previous Business Plan, the SAIC will promote networking and knowledge exchange within Scotland and internationally.
- 7.2.2. In particular, the SAIC will
- 7.2.2.1. increase knowledge of aquaculture within academia by the means detailed in Section 2.2 above.
 - 7.2.2.2. increase knowledge of research possibilities within the industry, by funding workshops, podcasts and webinars around themes which, through its awareness of Scottish research activities, it believes to be of interest to the industry
 - 7.2.2.3. disseminate new information from its own research projects and from global research scanning.
 - 7.2.2.4. within the bounds of commercial confidentiality, publicise best practice in all forms of aquaculture.
- 7.2.3. The SAIC's KE activities will utilise all forms of media appropriate to the diverse audiences within the industry. This will include regular e-zines, industry placements, an active internet presence and a virtual innovation community using social media.
- 7.2.4. SAIC staff will prioritise liaison with the bodies currently involved in KE within Scotland, to avoid duplication and to ensure that aquaculture interests gain the maximum benefit through existing channels.

7.3. Training

- 7.3.1. From the outset, the SAIC will work with and develop existing assessments of industry demands and will conduct a gap analysis against existing training provision,

in order to develop a fully accredited and comprehensive range of aquaculture-specific training options that is easily navigable by individuals and businesses.

- 7.3.2. The gap analysis will identify weaknesses in current provision and show where the market for training is saturated. Gaps in the training provision may be market opportunities for training providers (including SMEs) but it is also possible that some strategic training might not be economically viable as a stand-alone course for the provider. In this case the SAIC, working with Higher and Further education institutions, would explore options to support the development of the necessary provision.
- 7.3.3. As the SAIC's activities help to transform and develop the aquaculture scene, the need for training and the personal development of those involved in aquaculture at all levels will become increasingly important. New technologies and techniques will require staff training in order to be fully utilised as rapidly as possible. The SAIC will therefore work with Scotland Food and Drink Skills Academy (SFDSA) and others to quickly develop appropriate training programmes to ensure that Scotland's aquaculturists are appropriately trained in any new techniques arising from SAIC research or elsewhere.
- 7.3.4. The SAIC will, where possible, use or tap into existing accreditation schemes; however, it may have to facilitate accreditation of some courses. This will allow individuals or companies to identify options for their training or education needs and accumulate credit to be used for progression through training and education.
- 7.3.5. The training on offer will extend from basic practical skills training, such as first aid and boat handling, through to college courses and university undergraduate and post-graduate training. Individuals will be enabled to enter training at any level appropriate to their existing qualifications and to progress as far as their potential and support allows. An individual may, for example, start with First Aid and work up to a PhD; such individuals may be rare but would have the potential to make important strategic contributions to the industry. However, others who have progressed through education may find it useful to accumulate accredited practical skills; a PhD student may, for example, find need of boat handling skills in order to carry out effective research.
- 7.3.6. The Board will work with academia to modify existing provisions and develop new courses or content to respond to industry needs, including, as an early action, developing a bid for SFC Funded Places in postgraduate subjects of key importance to the aquaculture industry.
- 7.3.7. The SAIC will also support and promote the important recent development in the commitment of a number of Scottish aquaculture companies to Modern Apprenticeships. These provide young people with the opportunity to enter the industry from school and progress all the way through to senior management.
- 7.3.8. Significantly for remote areas, the industry is also now seeing second generation entrants, the sons and daughters of fish farmers, joining businesses and developing careers. The SAIC will offer real career prospects to these and others in some of Scotland's most fragile communities.

7.4. **Business development**

- 7.4.1. Significant business development support is already available to the Scottish aquaculture industry, particularly, given the geographical spread of the industry, through the HIE Business Support programmes.
- 7.4.2. The SAIC will seek to enhance this support by increasing aquaculture-specific expertise within these highly-regarded programmes, thereby helping the already excellent Scottish business development network to further help the aquaculture industry and its supporting businesses.
- 7.4.3. The SAIC will also naturally link with the business development offices of Scotland's universities, assisting in and benefiting from their work.
- 7.4.4. Through these channels, the SAIC will act as a knowledge resource for those involved in supporting aquaculture businesses and will rapidly disseminate new information, arising from its research projects or elsewhere, which may benefit the development of aquaculture businesses. It will also create a feedback loop, whereby development needs are identified and addressed, to ensure the ongoing development of excellence within the Scottish industry.
- 7.4.5. Service SMEs which are part of the SAIC consortium will specifically benefit from the connectivity with academia and production companies within the consortium. Early access to new information, skills and techniques will bring a significant commercial advantage.
- 7.4.6. As mentioned in 2.2.8 above, the SAIC Board will also work with Interface to investigate means to encourage involvement of companies with the SAIC, potentially including implementation of an aquaculture-specific Innovation Voucher scheme to support Scottish SMEs.

7.5. **Marketing, publicity and media relations**

- 7.5.1. It is the intention of the SAIC to create an identity for itself as the one-stop shop and first point of contact for all enquiries relating to research, KE and training for aquaculture and to highlight investment in ideas related to aquaculture. However, the marketing function is not to promote the SAIC *per se* but to promote the benefits of the aquaculture industry to the Scottish economy, through the enhancement of existing business and the involvement of new players.
- 7.5.2. The Communications role within the SAIC will therefore be geared to this end, with the SAIC having a significant role in the dissemination of factual information relating to Scottish aquaculture and in publicising new knowledge. The SAIC will work in close collaboration with industry trade bodies to assist those seeking informed opinion on all issues relating to aquaculture.
- 7.5.3. By promoting facts and the findings of unbiased research, the SAIC will significantly help to counter negative publicity which hinders the development of the aquaculture industry in Scotland. Queries received may reveal areas in which research is required to aid decisions which may previously have been based on speculation or assumption and so will help inform decision making on future research projects.
- 7.5.4. SAIC communications and marketing functions will initially be supplied through the appropriate office in UoS, as part of the university's role as administrative hub, under a communications and marketing plan developed by the SAIC Board.

- 7.5.5. It is expected that the SAIC will be launched by a Scottish Government Minister at the Royal Highland Show to be held in Edinburgh in June 2014. This high profile event represents an opportunity to launch the SAIC nationally and internationally; and the Interim Board will work with UoS staff to this end.

8. SAIC AND THE ENVIRONMENT

8.1. Built-in awareness

8.1.1. The operation of the SAIC itself will, from the outset, be in an environmentally aware manner. Its physical footprint will be small, with additional office facilities utilised only as required. Travel will be kept to the minimum required for effective operation and maximum use will be made of environmentally-efficient communications technology.

8.2. Industry

8.2.1. By producing scientifically-tested facts about the impacts, positive and negative, of all forms of aquaculture activity, balanced with awareness of equally-proven economic and social impacts, truly informed decisions on future developments will be enabled.

8.2.2. In this connection, the interim Board has identified the need for an Innovation Project to review existing principles around which statutory and voluntary regulation of fish farming operates and examine a range of options for alternative and more efficient modelling and monitoring.

8.2.3. It is envisaged that the Innovation Project will encompass a broad range of activities, including

- work on the development of advanced predictive modelling of the fate and behaviour of substances released from farms during fish production,
- developing integrated fish health management techniques and strategies, and
- examining new options for the deterrence of predators.

9. FINANCE

9.1. Cost-efficiency and cost-effectiveness

- 9.1.1. It is a clear intention that the SAIC should deliver the maximum benefit for every pound of funding, irrespective of funding source.
- 9.1.2. Efficiency is reflected in a lean management and operational structure, which utilises resources available in other bodies rather than duplicating them.
- 9.1.3. Effectiveness is reflected in a results-driven process which limits spending on any activity which does not result in tangible benefits to the Scottish economy.

9.2. Financial forecasts and assumptions

- 9.2.1. A financial model for the SAIC has been prepared for the Interim Board by Johnston Carmichael LLP.
- 9.2.2. This model is based upon the Interim Board's predictions of how the SAIC Board will prioritise and determine its spend. These predictions are best estimates of the likely activity and spend but maybe subject to change as and when project applications are received.
- 9.2.3. In the model SAIC funding is targeted at the early achievement of results and that the proportion of funding spent on the SAIC's activities, as opposed to its administration, is significantly increased from earlier models.
- 9.2.4. For the first three listed PIAs (focused on sea lice, alternative feeds and virus detection) it is assumed that spending is initiated in the second half of the first year and increases to a relatively stable level for the next four years. Spending on the fourth PIA (shellfish hatchery) is concentrated in the two years from month six of year one; this PIA will involve capital spending on facility development and the SAIC's funding will parallel that capital funding in order to ensure that the developed facility can deliver results at an early stage.
- 9.2.5. Funding of the Innovation Project will also be front-loaded in order to begin to address real and immediate needs.
- 9.2.6. The financial forecast includes estimates of industry cash investments, largely in the research activities of the SAIC. These are estimates of the minimum amounts that industry will invest. Industry membership fees for the Consortium will be at a relatively low level, representing an "entry ticket" to the forum and used to help fund running costs. Industry investment in projects will be on a case-by-case basis, agreed with the Board at project initiation. It is anticipated that, as projects begin to take shape and industry members of the Consortium are invited to participate, additional investment will be generated.
- 9.2.7. A proportion of the investment made by industry in research projects will be in the form of Non-Cash Contributions. This may include, although will not be limited to, staff time, the running costs of vessels (which, for example in the case of wellboats, can be very considerable), the supply of fish, equipment costs, repairs and maintenance, etc. Such Non-Cash Contributions are essential elements of aquaculture research projects, and represent real costs to industry investors.
- 9.2.8. Similarly, Non-Cash Contributions by academic contributors represent a genuine investment in the SAIC's operations; this will include all costs which fall outside of FEC mechanisms.

- 9.2.9. Over the initial five year period, funding of other projects identified through the SAIC will increase; it is envisaged that some of these projects will attract outside funding specific to their industry sector. Estimates of such funding have a level of uncertainty, but are likely to significantly increase the level of industry funding in the later years of the forecast and beyond, and would be a significant element in the on-going sustainability of the SAIC.
- 9.2.10. Spend on Training and Education and on the Business Development programme starts relatively low and increases over the period, as results from the SAIC's other activities feed into these projects. However, spend on the Knowledge Exchange programme and funding for course and programme development remain relatively uniform over the five years.
- 9.2.11. With the exception of the Board Chairman's stipend, Board and Scientific Advisory Board costs drop as meetings are required less frequently after the initial period of establishment. Please see 9.3.5 below in regard to the handling of Board costs.
- 9.2.12. Salary costs have been matched to the current UoS pay scale and the forecast matches these costs to proposed recruitment dates. Recruitment costs are assumed at 20% of the first year's salary of each new hire.
- 9.2.13. The financial statements do not include inflationary increases as it is not felt that increasing all income and costs lines by 2-3% per annum would provide any additional insight into the projected financial performance of the SAIC.
- 9.2.14. No accruals or prepayments are shown in the forecast as items such as rent and insurance are not considered material enough to necessitate the modelling of prepayments and accruals.
- 9.2.15. No debtors are shown in the financial forecast as it is assumed that funding is such that sales invoices will not be raised. It has been assumed that all creditors will be paid in the month following any purchase.
- 9.2.16. Although it has been assumed that Corporation Tax will not apply, as previously stated there is current uncertainty over the SAIC's ability to reclaim VAT on research spending. The Interim Board will continue to explore this issue with advice from financial and legal specialists. In our financial projections we have assumed that all VAT paid on input costs will be irrecoverable.
- 9.2.17. In the current version of the financial projections irrecoverable VAT is forecast at an average of £367k per annum. This is a worst case scenario and specific VAT advice will be taken by the Interim Board, with the aim of structuring the company's income and costs to reduce the level of irrecoverable VAT.

9.3. Financial requirements and sources of funding

- 9.3.1. The SAIC will draw upon both public sector and private funding sources. The total award over 5 years from SFC is £11.1 million. Over this period, a conservative estimate of industry cash investment is £3 million. For the purposes of the forecast no other funding has been shown.
- 9.3.2. The summary five year funding table is shown below

Year	1	2	3	4	5	Cumulative
	£000s	£000s	£000s	£000s	£000s	£000s
Scottish Funding Council	1,400	2,450	2,510	2,535	2,205	11,100

Industry	228	689	698	743	727	3,085
Non-cash contributions	132	408	401	380	319	1,639
TOTAL INCOME	1,759	3,547	3,609	3,658	3,251	15,824

- 9.3.3. It is proposed that the SAIC is funded in a “just in time” manner, with funds called off as required on a monthly basis. The cash balance amounts are therefore at a level which the Interim Board has been advised is prudent for an operation of the type represented by the SAIC. The total funding of £11.1m has been split across the five years in line with project activity. The level of funding taken in the first half of Year 1 is small, because no project activity is anticipated during this period. The funding then increases from month 7 onwards as project activity commences. In all years the timing of funding is linked to project activity.
- 9.3.4. Public sector funding, initially principally from SFC, will be routed via the University of Stirling. SFC funding will be utilised for initial set-up and salary costs, with a limit of £130K on funding of the Director’s salary costs (including employer’s on-costs).
- 9.3.5. SFC funding’s contribution to Board costs will be limited to 25% of the Chair’s stipend and justifiable expenses; it is proposed that salary costs for individual Board members will be met by their employers in recognition of the value of Board membership.
- 9.3.6. There is recorded industry enthusiasm for the SAIC, based on the expectation of positive impact as previously stated. Industry financial support for the SAIC is therefore in the manner of investment, rather than “funding”. Industry support will be raised either through levy or subscription, depending upon industry sector, and will be principally focussed on project funding.
- 9.3.7. The detailed funding for each project will be decided at initiation on a project-by-project basis and in compliance with state-aid regulations; to ensure consistency, fairness and transparency, the Board will prioritise the publication of their guidelines on project-funding decision-making.
- 9.3.8. By default, projects meeting the needs of the salmon-farming industry will receive half of their funding from industry sources, drawn from a variable mixture of SSPO funds, individual production companies and service companies (feed, pharmaceuticals, engineering, etc.) as appropriate; this funding will be a combination of cash investment and non-cash contribution. Projects related to other production sectors (trout, shellfish, algal culture, etc.) will, in recognition of the economic realities of those sectors, normally receive 15 to 30% of their funding from industry sources, with links to other sources giving the potential for 50% funding of SME-related projects.
- 9.3.9. Other potential sources of funding, from public bodies (other than SFC, SE and HIE) at national and European level, from university strategic funds or from private funding outwith current aquaculture interests, will increasingly be developed over the first five years of the SAIC’s operation. The Interim Board believes that downstream businesses, for example supermarket chains, will increasingly wish to invest in funding research which has demonstrable positive benefits in their sector and it will be a major role of the SAIC to facilitate such investment.
- 9.3.10. It should be noted that industry support for the SAIC proposal has been demonstrated by the SSPO currently covering costs of the activities of the Interim Board, including

consultancy costs and fees for legal and accounting advice, without which the production of this Plan would have been impossible.

- 9.3.11. The SAIC Board will develop and agree a Capital Plan within the first six months of operation; it is anticipated that the submission of a bid for capital funding for appropriate facilities and equipment will form part of this plan. An initial capital expenditure of £35,000 has been assumed, to cover IT equipment and Fixtures & Fittings. A further £20,000 is predicted for the renewal of IT equipment in 2017.

9.4. **Monitoring and reporting.**

- 9.4.1. The Board will be responsible for monitoring the financial health and performance of the SAIC. An effective management accounting system will be established following Board set-up and the Board will commission the preparation of annual accounts.
- 9.4.2. The Board will supply the Court of UoS with such financial and other information as is required to meet the needs of SFC.
- 9.4.3. An annual budgeting exercise will monitor performance against this Business Plan and update financial forecast in detail for the next year and in outline for the following four years.
- 9.4.4. On establishment, the Board will agree financial and non-financial KPIs against which SAIC performance will be measured on an annual basis.

9.5. **Economic impact and the financial sustainability of the SAIC**

- 9.5.1. Given the strategic importance of the Scottish aquaculture industry and the substantial and growing contribution that it will make to the Scottish and UK economies and to supporting national and international food security, the absence to date of a Scottish centre for aquaculture R&D, KE and training has been a major shortcoming that urgently requires to be addressed. The recognition of the benefits of Innovation Centres by Scottish Government, and the activities now in train via SFC, SE and HIE to develop a network of ICs to support innovation and business development in a number of areas, has the potential to unlock huge opportunities for economic growth.
- 9.5.2. The Scottish aquaculture industry has long called for a one-stop shop to help deal with the key obstacles to growth. The Scottish Aquaculture Innovation Centre creates an opportunity to better link industry needs to high quality science; and to join up the problem-solving skills that exist within the industry with the knowledge and know-how in Scottish academic and research institutions to identify, develop and apply solutions to practical problems.
- 9.5.3. As with all business ventures, the credibility, and thus the longer term sustainability, of the SAIC will be measured on results; for the SAIC, this will come as a consequence of it proving its ability to convert science and know-how into problem solving solutions to current and future investors.
- 9.5.4. The success of the SAIC will therefore not be measured by the amount of investment it attracts and spends, by the number of projects it supports, by the number of conferences attended, or by the number of peer reviewed papers published in journals, but through the translation of its activities into growth and increased profitability and the creation of new, high quality sustainable jobs in all sectors of Scottish aquaculture.

- 9.5.5. Short to medium term economic gains over years one to five of the SAIC will show the benefits of the centre as a hub for problem-solving R&D, KE and training and will demonstrate to industry and potential public sector investors that this is a sound investment for the future growth and development of the Scottish aquaculture sector. The expectation is that its positive returns for the Scottish economy will provide justification for continued investment of public funds to supplement industry investment and investment from other UK, European and international initiatives promoting sustainable aquatic food and commodity production.
- 9.5.6. Currently, finfish and shellfish production contributes an aggregate economic impact of over £1,300million per annum to the Scottish economy. The shellfish sector intends to double production by 2020, which will be measured, in terms of both production and jobs, by the Annual Production Survey carried out by Marine Scotland. This ambition should be achievable, although mussel production fell in 2012 due to a spat failure in 2010; a better understanding of why this happened is a defined need. The Scottish industry must, if at all possible, reduce its dependence on natural spat fall; the Dutch and the New Zealand industries are already working on this.
- 9.5.7. Based on the current annual production of around 160k tonnes of high quality Scottish salmon, first sale value exceeds £700m and global retail sales exceed £1 billion pounds per annum. An initial target of 50% growth between now and 2020 equates to an additional £350m in first sale value and an additional retail sales value of over £500 million pounds.
- 9.5.8. Paralleling wealth creation, a substantial number of new, high quality jobs will be created in remote rural locations, bringing with them stability and prosperity to communities; other benefits include significant capital expenditure in equipment, benefitting Scottish manufacturers; and the availability of additional high quality raw materials for processors from the Borders to the Northeast of Scotland to convert into value-added smoked and processed products.
- 9.5.9. Although the initial target of a 50% increase in production by 2020 may, on the surface, seem impressive, the trend in Scottish salmon production over the past decade clearly shows that the sector has stagnated. This is not through a lack of will or shortage of investment from the industry, but because of the hurdles created through a consequence of lack of confidence on the part of Scottish regulators and planners.
- 9.5.10. This trend towards stagnation in production contrasts dramatically with reductions in the availability of wild caught fish, rapidly growing demand from key international customers willing to pay premium prices for high quality farmed fish and shellfish and, signally, with FAO predictions that rapidly increasing world population and increasing *per capita* consumption of fish protein will mean that aquaculture provides the only solution to filling the “fish gap”.
- 9.5.11. The trend in Scottish production also contrasts dramatically with other salmon producing nations. Norwegian output more than doubled between 2001 and 2010 and has grown by over 20% since; their additional 197 thousand tonnes since 2010 is more than the entire current annual Scottish salmon production.
- 9.5.12. The SAIC therefore provides a unique opportunity to develop solutions to the technical challenges to Scottish fish and shellfish production, thereby providing the regulators and planners with the confidence to grant the permissions that will be

necessary to allow the true potential for Scottish aquaculture to be realised, up to and beyond the 2020 targets.

Appendix 1 : Membership of Interim Board and the SAIC Consortium.

Interim Board

Dr John Webster (Chair)
 Professor Jimmy Turnbull (Academic representative)
 Mr. Alan Sutherland
 Mr Jim Gallagher
 Mr Walter Speirs
 Dr John Rogers (UoS administrative hub representative)

The Interim Board were greatly assisted in the preparation of this Plan by:

Scottish Enterprise
 Highlands and Islands Enterprise
 Mr Jack Perry
 Johnston Carmichael
 Mr Ronnie Soutar

The Interim Board worked on behalf of a Consortium of confirmed participant companies and research organisations as follows:

Ace Aquatec	University of Aberdeen
Aquaculture Innovation	University of Edinburgh
Aqualife Services	University of Glasgow
ASSG	University of St Andrews
BigDNA	University of Stirling
Biomar	University of Strathclyde
BTA	University of the Highlands and Islands
Fish Vet Group	Edinburgh Napier University
Fusion Marine	Heriot-Watt University
Knox Marine	Marine Scotland Science
Landcatch	Moredun Research Institute
LANTRA	National Telford Institute
Marine Harvest	Scotland's Rural College (SRUC)
Merck Animal Health	
Novus	
Ocean range	
Salmobreed	
Scanbio	
Scottish Sea Farms	
Seafish	
Shetland Aquaculture	
SSPO	
The Scottish Salmon Company	
Xelect	
Youngs	
Zoetis	

Appendix 2 : Project Decision Tree

