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## List of Acronyms

Abbreviation / Acronym	Description
<b>BG</b>	Background
<b>CA</b>	Consortium Agreement
<b>EC</b>	European Commission
<b>EM</b>	Exploitation Manager
<b>EPC</b>	European Patent Convention
<b>ER</b>	Exploitable Results
<b>FG</b>	Foreground
<b>GA</b>	Grant Agreement
<b>GDPR</b>	General Data Protection Regulation
<b>IP</b>	Intellectual Property
<b>IPR</b>	Intellectual Property Rights
<b>KERs</b>	Key Exploitable Result(s)
<b>M</b>	Milestone
<b>NDA</b>	Non-disclosure agreement
<b>PR</b>	Project Result
<b>R &amp; D</b>	Research and Development
<b>R &amp; I</b>	Research and Innovation
<b>WIPO</b>	World Intellectual Property Organization
<b>WP</b>	Work Package
<b>TBC</b>	To be completed



## Executive Summary

This document describes the Exploitation Strategy and IP Management Plan to be adopted by the INNOAQUA Project. This project has received funding from the European Union under grant agreement number 101084383.

INNOAQUA's exploitation strategy focuses on measures that will allow partners to successfully make use of the knowledge and information generated throughout the project, either for the development of marketable products and services or the non-commercial use of the results.

Alongside the dissemination strategy, this will contribute to the effective use of the project results and contribute towards the achievement of the outcomes and impact. This document will serve as guidelines on the exploitation-oriented activities that will allow the partners to capitalize on their work and turn the specific R&I actions into concrete value and impact for society and the industry.



## 1. Introduction

INNOAQUA is a cross-national 4-year long Innovation Action (06/2023 - 06/2027), supported by the European Union within the framework of the Horizon Europe programme.

The “INNOAQUA – Innovative Approaches for an Integrated Use of Algae in Sustainable Aquaculture Practices and High – Value Food Applications” project plans to pave the path towards the upcoming sustainable and diversified European in-land aquaculture industry. Mostly by means of leaning on the demonstration and mainstreaming of innovative algae-based foods and solutions, as well as ecology, circularity and digitalization concepts.

### **Project objectives are as follows:**

to implement an ecosystem approach for sustainable management of aquaculture production;

- to demonstrate tools limiting the waste in aquaculture cultivation and processing;
- to showcase processing methods to obtain new innovative (algae-based) seafood products;
- to enhance the societal acceptance and market penetration of innovative seafood products through novel social simulation approaches;
- to maximize wider uptake of INNOAQUA’s results during and after the project’s execution.

INNOAQUA capitalizes on a highly experienced team of 17 partners from Norway, Spain, Portugal, France, Germany, Belgium, Slovakia, and Brazil.

### 1.1 Purpose of the document

The partners associated with INNOAQUA are steadfastly dedicated to producing outcomes that endure beyond the project's culmination. They are committed to ensuring that novel concepts, methodologies, and project findings are comprehensively recognized, safeguarded, and systematically evaluated in terms of broader accessibility for pertinent stakeholders. Additionally, where appropriate, these outputs are to be assessed for their potential in commercialization endeavors. To this end, the consortium establishes foundational principles



from the project's inception, serving as a robust management framework encompassing both the Background (BG) and Foreground (FG) Intellectual Property Rights associated with INNOAQUA.

The INNOAQUA strategy lays the groundwork for vigilantly monitoring the protection of Intellectual Property (IP) and Intellectual Property Rights (IPR) within the consortium. This strategic endeavor ultimately aids in cultivating value by safeguarding the exploitable results of the project and fostering the seamless progression of successful innovation.

The present document is intended to pinpoint the project's pivotal assets, establish the groundwork for delineating their inherent intellectual property rights, and foster a collective understanding concerning the framework for their subsequent exploitation post-project work.

## 1.2 Structure of the document

Introduction chapter includes general introduction to INNOAQUA, the purpose of the document, and a short description of its structure. Afterwards the Report on exploitation strategy and IP-related work consists of the following parts:

**Subchapter 2.1** introduces the contextual backdrop within which this section has been developed, along with its intended objectives and overall structure.

**Subchapter 2.2** delineates the IPR management strategy, expounding on the successive phases within the framework of INNOAQUA. It elucidates essential terminology related to the project's IPR management, outlines the fundamental aims, and elucidates the primary intellectual property protection mechanisms to be deployed.

**Subchapter 2.3** expounds upon the methodological approach adopted for this purpose. It introduces the IPR Matrix and expounds on the procedures undertaken to discern the INNOAQUA's background and foreground intellectual property, as perceived at this stage of the project.

**Subchapter 2.4** furnishes an initial overview of the collaborative assets envisaged for co-creation within the project. These assets are identified at the present stage of the project,





along with the underlying background and foreground intellectual property rights as collectively perceived by all INNOAQUA's partners.

**Subchapter 2.5** provides a comprehensive presentation of individualized exploitation plans per each partner within the consortium.

**Conclusion and way forward** culminates in outlining the subsequent actions directed towards harnessing the project's assets for exploitation.

The INNOAQUA Report on exploitation strategy and IP-related work will be subject to systematic updates and further refinement throughout the course of the project. Specifically, an enhanced iteration is anticipated at Months 12, 24, 36 followed by the release of D6.12, the Final Exploitation Strategy and IP Management Plan, at Month 48. These iterations will encompass a comprehensive depiction of the project's ultimate assets, accompanied by the consortium's strategies pertaining to the safeguarding of their intellectual property rights and the delineation of primary avenues for their post-project exploitation, ensuring a seamless continuation of their utility beyond the project's culmination.

### 1.3. Relation to other project deliverables

The INNOAQUA Exploitation and Intellectual Property (IP) Management plan establishes the foundation for overseeing the protection of intellectual property and intellectual property rights within the consortium. This endeavour ultimately aims to foster value generation related to the project's exploitable results and to facilitate the successful advancement of innovation.

The present document's primary objective is to delineate the essential assets of the project and lay the groundwork for determining their underlying intellectual property rights. Furthermore, it seeks to foster a shared understanding regarding the framework for utilizing these assets after the project's conclusion.

As part of the Knowledge Exploitation and IP Management Strategy, a more comprehensive analysis of patents and patent landscapes will be conducted by PEDAL in collaboration with



the consortium partners. This collaborative effort will result in tailored patentability reports and the identification of appropriate patent layers, all of which will be prepared in response to the specific needs of individual project partners.

The finalization of foreground intellectual property and outcome ownership will occur towards the project's conclusion. At that juncture, the Results Ownership List (ROL) will be published as a comprehensive summary, solidifying the ownership and disposition of the project's results.

## 2. Exploitation and IPR Management

### 2.1 IPR Management Overview

#### 2.1.1 Objectives

The IPR management objectives of INNOAQUA reflect the need to protect the entirety of the project's assets. This is aimed at ensuring the efficient management of outcomes arising from project activities and enabling broader accessibility for pertinent stakeholders. Additionally, these objectives encompass the identification of potential for the commercial utilization of INNOAQUA's exploitable results upon project culmination. With these objectives in mind, the main aims of this segment are as follows:

- Establish and endorse the IPR management methodology specific to INNOAQUA, tailored to suit the project's unique context.
- Identify the array of assets that will emerge from the anticipated activities across INNOAQUA's lifecycle, thereby formulating an encompassing assets portfolio from the project's outset.
- Foster a shared comprehension among INNOAQUA partners regarding the nuances and considerations pertaining to Background (BG) and Foreground (FG) Intellectual Property, along with corresponding access rights.
- Devise an initial framework for the intellectual property protection strategies to be implemented for each identified exploitable outcome within INNOAQUA.



- Mitigate, and if necessary, address and resolve any potential conflicts concerning intellectual property within the consortium and its broader implications.
- Forge a collective framework of guiding principles and actions within the consortium to ensure the seamless execution of the envisaged IPR strategies.

The Exploitation and IPR Management chapter delineates how various aspects related to intellectual property within INNOAQUA are to be effectively managed within the project's context. The overarching goal is to pave the way for the subsequent exploitation of relevant assets post-project, encompassing key elements such as Background IP, Foreground IP, Exploitable Results, Access Rights, Protection of Results. These pivotal concepts, integral to designing the Exploitation and IP Management Plan of Horizon Europe projects, have been comprehensively defined and communicated to all INNOAQUA partners within the designated definition section.

### 2.1.2 Definitions

#### Background IP

Background IP can be delineated as encompassing data, know-how, or information, including any associated rights, that is owned or licensed by a project partner prior to the commencement of the agreement. This intellectual property is essential for executing the proposed action or effectively leveraging the project's assets. The requisite background for conducting project activities or capitalizing on resultant outcomes must be made available to fellow project partners without any royalty obligations. Underpinning this framework is the requirement that all project partners acknowledge the pertinent background and extend access rights to this intellectual property.

The identification and alignment of a project's background can be achieved through either of the following approaches:

- **Consortium Agreement:** Determination of relevant assets offered by each project partner to the consortium, a process conducted subsequent to an internal assessment of existing knowledge.



- **Separate Agreement:** Establishment of a distinct accord termed the "agreement on the background."

When navigating the terrain of project background, two fundamental considerations come to the fore:

- **Identification of Background:** The designation of assets, contributed by each project partner, which are indispensably necessary for the efficacious realization and exploration of the project's undertakings.
- **Definition of Access Rights:** Clarity concerning the entitlement to utilize knowledge, guided by stipulated terms and conditions agreed upon within the consortium. These provisions harmonize with the foundational background regulations and obligations stipulated by the European Commission, aimed at ensuring the seamless implementation of the project.

According to the INNOAQUA Grant Agreement "The beneficiaries must give each other and the other participants access to the background identified as needed for implementing the action".

### Foreground IP

Foreground refers to the results and assets that are generated through the implementation of project activities, including pieces of information, materials, and knowledge.<sup>1</sup> These outcomes encompass diverse elements, such as information, materials, and knowledge, and encompass both tangible and intangible forms. They represent the tangible or intangible outputs arising from the project's actions, and they may or may not possess protectable attributes. In this context, foreground intellectual property (IP) may originate from project partners as a means to safeguard and capitalize on the underlying exploitable achievements of the project. It encompasses a spectrum of intellectual property rights, including copyrights, industrial designs, patents, as well as similar forms of protection like database rights, and even

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<sup>1</sup> For a detailed definition of the Foreground see: <https://iprhelpdesk.eu/glossary/foreground>. Last accessed: 3/1/2023.



unprotected know-how, such as confidential information. It is important to note that results generated outside the project' activities do not qualify as foreground.

Under the Annex 5 of INNOAQUA Grant Agreement, the ownership of project results is vested in the partner responsible for their generation. Given the collaborative nature of the project, some results may be jointly developed by multiple partners. In such instances, joint ownership can arise among the contributing partners and is contingent upon an agreement regarding the allocation and terms governing the exercise of this joint ownership. While the INNOAQUA Grant Agreement embeds regulations concerning the framework of joint ownership, it is a must for partners to sign a separate "joint ownership agreement" during project implementation to ensure compliance with their obligations. This agreement serves to define the allocation and conditions for exercising joint ownership. Furthermore, each joint owner has the prerogative to grant non-exclusive licenses to third parties for the exploitation of jointly owned results, unless stipulated otherwise in the Consortium Agreement or the joint ownership agreement.

### Exploitable Results

Exploitation of project results encompasses the utilization of the results in research endeavors beyond the scope of the project action. This involves their application in diverse research activities, including those not directly encompassed by the ongoing action. This could entail integration into other research projects, the development and marketing of products or processes, the provision of services, or even participation in standardization initiatives<sup>2</sup>.

Within this framework, an exploitable result is characterized as a project outcome, whether anticipated or achieved, that satisfies two distinct criteria:

- Possesses commercial, social, scientific or academic significance.

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<sup>2</sup> European Commission, Glossary, Available at: <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/support/glossary>, Last accessed: 6/3/2023.

- Can be independently commercialized or exploited, serving as a standalone entity such as a product, process, or service<sup>3</sup>.

It is important to note that exploitable results can either be a combination of elements or a component of foreground results. Not all foreground outcomes may necessarily align with the aforementioned criteria. Furthermore, it is pertinent to acknowledge that exploitable results need not be market-ready at the outset; they might necessitate subsequent rounds of research and development, engineering, and validation before reaching a state of commercial viability.

### Access rights

Access rights refer to one partner’s rights, enabling them to solicit access to the background and foreground owned by another project partner. This access is sought for the purpose of executing their designated activities within the project, or for utilizing their own results. Moreover, access rights can be exercised for the duration they are necessary to facilitate the exploitation of the project's results.

The framework governing access rights within a collaborative Horizon Europe project adheres to distinct regulations that are pre-established within the Grant Agreement and the Consortium Agreement. In the context of INNOAQUA, access rights are outlined in the tabulated format presented below:

Table 1. Access Rights

Purpose of access	Access to Background	Access to Results
Project implementation	Royalty free Unless otherwise agreed by participants	Royalty free
Exploitation of Own results	Subject on individual agreement Granted under fair and reasonable conditions	

<sup>3</sup> A patent for licensing is also an exploitable result.

## Protection of results

It is important to acknowledge that within the realm of IP protection, the safeguarding of IP assets can entail the utilization of multiple forms of IPR. Consequently, the selection of an appropriate protection strategy necessitates a deliberate choice based on the particular circumstances. The determination of the most suitable form of IP protection hinges upon the inherent nature and distinctive attributes of the specific outcomes in question, as well as the objectives pursued by the owner of the intellectual property.

A diverse array of instruments may be considered for the purpose of protecting intellectual property. Within the context of INNOAQUA, notable IP protection instruments encompass the following:

- Trade and service marks
- Patents
- Utility models
- Copyrights
- Trade secrets
- Confidentiality agreements

Elaborated insights regarding each of the aforementioned protection instruments are expounded upon in the subsequent sections below.

## Trademarks and service marks

- **Trademarks**

A trademark constitutes an exclusive right over the use of a sign in relation to the goods and services for which it is registered<sup>4</sup>. Such trademarks are comprised of signs capable of distinguishing the products, either goods or services, offered by a particular trader from those

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<sup>4</sup> For the definition of trademark in Europe, see: <https://iprhelpdesk.eu/sites/default/files/2018-12/european-ipr-helpdesk-your-guide-to-ip-in-europe.pdf>, Last Accessed: 6/3/2023.

of their counterparts. The fundamental role of a trademark is to establish the commercial origin of a given product. However, this does not entail that the trademark must necessarily convey information regarding the actual manufacturer of the product, or even the entity involved in its trade. What is imperative is that consumers place their trust in a specific enterprise, potentially unfamiliar to them, being responsible for the product that is offered under the trademark.

- **Service Marks**

In modern trade, consumers are presented not only with an extensive choice of diverse goods, but also with an escalating range of services that are increasingly extended on both national and international scales. This needs the establishment of distinctive symbols that enable consumers to differentiate among various services, such as insurance companies, car rental enterprises, airlines, and the like. These symbols, referred to as service marks, serve a function analogous to trademarks in indicating origin and differentiation, albeit for services. Given the inherent similarity between service marks and trademarks, akin criteria can be applied to their protection. Consequently, the introduction of service mark protection has, on occasion, been implemented through concise amendments to existing trademark legislation or by incorporating provisions within trademark laws to specifically extend protection to service marks<sup>5</sup>.

- **Patents**

A patent is an exclusive right granted for the protection of inventions (products or processes) that offers a new technical solution or facilitates a new way of doing something. The patent holder is vested with the sole right to prevent external entities from commercially exploiting their invention for a stipulated period. In exchange for this privilege, the patent holder is required to publicly disclose the particulars of the invention within the patent application. The possessor of a patent enjoys the prerogative to determine which parties may access and utilize the patented invention during the duration of its protection. Furthermore, the patent holder may grant consent to other entities, permitting them to employ the invention based on

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<sup>5</sup>See WIPO Intellectual Property Handbook 2008: Policy, Law, and Use. Chapter 2: Fields of Intellectual Property Protection, p. 68f.



mutually agreed upon terms. Alternatively, the patent owner retains the option to sell the rights to the invention to another party, who then becomes the new owner of the patent. Importantly, patents are granted on a country-by-country basis, with some extending regionally (such as in the European context), and they can also be employed in territories without patent protection (although such regions would not offer the same patent-based protection). Following the expiration of a patent, its protective scope concludes, and the invention is consequently relinquished into the public domain. At this point, the patent holders no longer possess exclusive rights, rendering the invention available for commercial exploitation, free of charge, by others<sup>6</sup>.

- **Utility Models**

Additionally known as a "petty patent," a utility model represents an exclusive entitlement granted for an invention, affording its possessor the authority to preclude unauthorized commercial usage of the protected invention by external parties within a defined time frame. The integration of utility models within certain intellectual property frameworks in various countries serves a paramount purpose—namely, to cultivate the swift advancement of domestic ingenuity, with a specific focus on fostering innovation within small and medium-sized enterprises as well as among individuals.

- **Copyrights**

Copyright, also known as author's right, encompasses the bundle of economic and moral rights that authors hold over their literary, scientific, and artistic creations. It is crucial to underscore that copyright specifically protects the manifestation of ideas presented in a tangible form, while the ideas themselves remain beyond its scope<sup>7</sup>. Furthermore, this protection is contingent upon the expression being original.

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<sup>6</sup> See WIPO Intellectual Property Handbook 2008: Policy, Law and Use. Chapter 2: Fields of Intellectual Property Protection, p. 17.

<sup>7</sup> See WIPO Intellectual Property Handbook 2008: Policy, Law and Use. Chapter 2: Fields of Intellectual Property Protection, p. 40.



While an exhaustive list of copyright-protected works does not exist, various types of works are typically covered by copyright on an international scale, including<sup>8</sup>:

- 1) Literary creations such as novels, poems, plays, and newspaper articles
- 2) Computer programs and databases
- 3) Cinematic productions, musical compositions, and choreographic works
- 4) Artistic expressions like paintings and drawings
- 5) Advertisements, maps, and technical drawings

Copyright protection also encompasses moral rights, encompassing the right to be identified as the author of a work and the authority to object to modifications that could adversely impact the creator's reputation. The creator, or the copyright owner of a work, possesses the means to enforce these rights through both administrative channels and legal avenues. This could involve inspecting premises to gather evidence of unauthorized production or possession of counterfeit goods. The copyright holder is empowered to secure court orders to curtail such illicit activities and may also seek compensation for financial losses and reputational harm. Importantly, it bears emphasis that copyright strictly protects the tangible expression of ideas, not the ideas themselves, and provided the expression is original<sup>9</sup>.

- **Trade Secrets**

A trade secret encompasses any confidential and proprietary business information that provides a competitive advantage to an enterprise. The scope of information that qualifies for trade secret protection is notably broad and encompasses a range of categories. This could encompass various forms of knowledge, technical expertise (which might otherwise be eligible for patent protection), as well as business and commercial data. Such data might comprise

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<sup>8</sup> Definition of copyrights in the European context retrieved from <https://iprhelppdesk.eu/sites/default/files/2018-12/european-ipr-helpdesk-your-guide-to-ip-in-europe.pdf>, Last accessed:6/3/2023.

<sup>9</sup> See WIPO Intellectual Property Handbook 2008: Policy, Law and Use. Chapter 2: Fields of Intellectual Property Protection, p. 40.



customer lists, strategic business plans, proprietary recipes, or intricate manufacturing processes<sup>10</sup>.

- **Confidentiality Agreements**

Confidentiality emerges as a paramount concern for participants engaged in innovation projects, spanning the entire spectrum from inception to implementation and eventual exploitation. In collaborative endeavors, the exchange of valuable information among partners is frequently a necessity. Consequently, due consideration must be accorded to confidentiality considerations and strategies. These measures are vital for the secure exchange of information, the seamless progression of project development, and the protection of sensitive technological, business, or commercially confidential data. Confidentiality agreements assume a pivotal role in protection and security to organizations that contemplate sharing or granting access to information with other entities. These agreements function by ensuring that confidential information is employed solely for the explicitly sanctioned purposes agreed upon between the signatories. Furthermore, these agreements commit the involved parties to refraining from usage or disseminating such information to third parties without prior consent. In essence, the execution of a confidentiality agreement stands as a very important step in upholding the secrecy of confidential information, thereby preserving a competitive advantage.

The legal enforceability of a confidentiality agreement is based on the specific criteria, which encompass:

- 1) The information must indeed remain confidential, signifying that it is not readily accessible to individuals who routinely encounter such data.
- 2) The information must possess commercial value, affirming its importance in the context of business or innovation.
- 3) The proprietor of the information must have undertaken reasonable and appropriate measures to protect its confidentiality.

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<sup>10</sup> Definition of trade secrets in the European context retrieved from <https://iprhelpdesk.eu/sites/default/files/2018-12/european-ipr-helpdesk-your-guide-to-ip-in-europe.pdf>, Last accessed: 6/3/2023.

## 2.2 Approach

Throughout the trajectory of the INNOAQUA project, key IP and exploitation management will build on the pillars of identifying a common understanding concerning the background, foreground, ownership (including joint ownership), access and usage rights, and exploitation during and after the project development. In this respect, the INNOAQUA plan applies on a comprehensive framework which separates the IP management processes of the project in the following stages:

1. Grant Agreement preparation stage;
2. Project implementation stage;
3. Post-project stage.

In this respect, the following figure illustrates the IPR management stages, as considered within INNOAQUA.

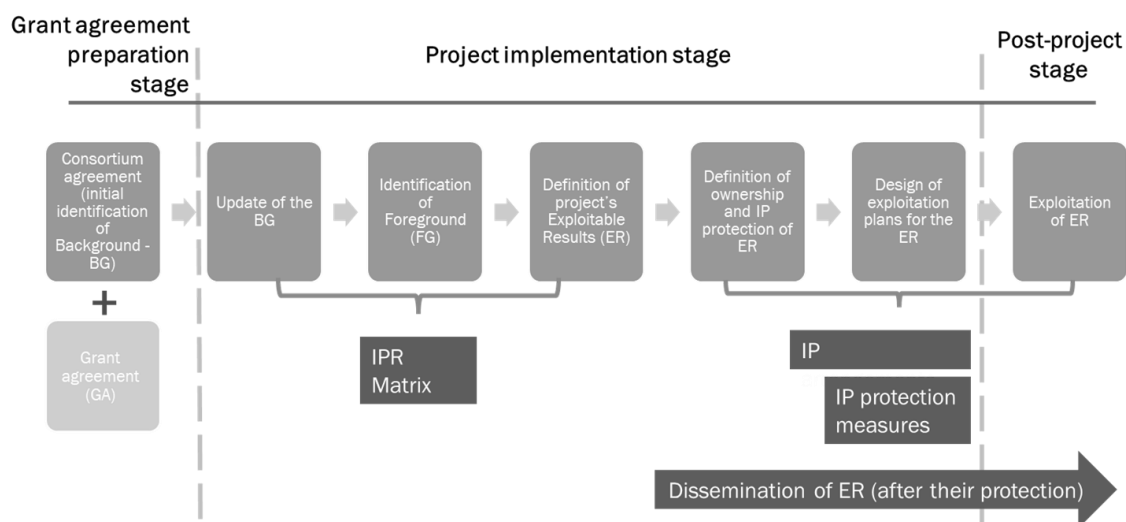


Figure 1. INNOAQUA's IPR management stage

### 2.2.1 Preparation stage

The Grant Agreement and the Consortium Agreement both encompass a range of IPR-related aspects. These distinct provisions serve as the basis for addressing IPR matters among the project partners. Consequently, any forthcoming developments pertaining to IPR initiatives to



be undertaken by project partners will be streamlined in accordance with these foundational provisions.

- **Grant Agreement**

The Grant Agreement serves as a comprehensive contract delineating the fundamental regulations and terms governing the project. This legally binding agreement is executed between the European Commission (EC) and the consortium of INNOAQUA partners. It constitutes the principal contractual framework for the INNOAQUA initiative. Pertinent to intellectual property matters, the core aspects and sections are encapsulated within Article entitled "Intellectual Property Rights (IPR) — Background and Results — Access Rights and Rights of Use." This provision intricately governs the management of INNOAQUA's intellectual property, encompassing the stipulations for access rights and obligations related to the background.

Furthermore, the Grant Agreement explicitly outlines key facts concerning ownership and protection of the outcomes generated by the project. These include provisions that pertain to the protection, exploitation, and dissemination of these results. Finally, the INNOAQUA Grant Agreement distinctly defines parameters regarding the transferability of rights and the access granted to the project's outcomes.

- **Consortium Agreement**

The Consortium Agreement is a contract among INNOAQUA consortium partners, defining rights and responsibilities for project activities. It minimizes disputes by setting rules and responsibilities during the project and outlining access rights. It also outlines IP-related rights and obligations among consortium members.

The INNOAQUA Consortium Agreement main points and sections referring to IPR are included in:

**Section 8 “Results”**, that sets out provisions on ownership and joint ownership of results, as well as on their transfer and dissemination.



**Section 9 “Access Rights”**, which clarifies the access rights governing principles along with the access rights for the exploitation and dissemination purposes.

**Attachment 1 “Background included”** that presents the initial list of usable background.

### 2.2.2 Implementation Stage

During the implementation phase of INNOAQUA, IP management protocols will guide partners in organizing the handling of project results/assets. The project's progression will accentuate activities such as identifying foreground, assets' ownership, access rights, and protective measures, as well as orchestrating the exploitation and commercialization of the project's outcomes. Central to INNOAQUA's IPR management is the establishment of robust procedures that strategically address IPR concerns, facilitating the optimal utilization of results.

Consequently, partners should concentrate on two key aspects:

- 1) Facilitating access rights to their knowledge for other partners' project contributions;
- 2) Instituting early procedures to identify, protect, disseminate, and exploit project assets.

Within this context, significant IP-related considerations during the INNOAQUA implementation phase encompass:

- **Background Identification**

In the initial phases of INNOAQUA, it is crucial to identify relevant knowledge, know-how, and partners' data that form the project's background. Within this context, this background can become linked to the ensuing project assets. This linkage is integral for delineating access rights, resolving ownership matters, and addressing IPR considerations.

- **Foreground Identification**

A fundamental facet of INNOAQUA's IP management involves the systematic identification of project assets. This pivotal process aims to establish a tangible mapping of the project's assets, thereby enriching the INNOAQUA IP portfolio. As such, all valuable intellectual property assets within the project necessitate systematic identification, comprehensive listing, precise naming, detailed description, and thorough analysis.

- **Results' ownership**



Partners have been requested (via the INNOAQUA IPR Matrix) to provide additional insights into the stipulations of the Consortium Agreement pertaining to ownership of project results. Particular emphasis will be placed on effectively addressing matters related to joint ownership.

- **Protection of results**

The successful utilization of inventive concepts and assets cultivated within the scope of INNOAQUA hinges upon the safeguarding of the project's outcomes. Notably, robust protection is imperative under the following circumstances:

- 1) If there is a realistic prospect of commercial exploitation of the project's outcomes;
- 2) If the feasibility, reasonableness, and justifiability of protection can be established within the given context.

In this context, when contemplating IP protection, INNOAQUA partners should diligently factor in their individual interests alongside the collective interests of the consortium. It is incumbent upon project partners to ensure that the discerned exploitable results within INNOAQUA are fortified with appropriate protection mechanisms. Such mechanisms should stipulate a suitable protection period within a specified geographical domain. The determination of this geographical scope should be mutually agreed upon in advance, predicated on the envisaged utilization of the intellectual property.

While Europe conventionally serves as the default territory for safeguarding the identified exploitable INNOAQUA results, the final decision regarding this territory remains subject to the deliberation and consensus of the involved parties.

The ensuing table provides an illustrative roster of distinct protection instruments. Within this compilation, those most pertinent to the INNOAQUA project have been designated, recognizing that not all the instruments listed are anticipated to be employed, given the project's specific nature. Moreover, it is worth noting that as the project's activities evolve, additional protection instruments may be judiciously employed, contingent upon their relevance and suitability.

Table 2. Indicative list of protection instruments

Subject Matter	Patent	Utility	Copyright	Trademark	Confidential Information
Invention	X	X			X
Software <sup>11</sup>	X	X	X		X
Scientific Article			X		
Technology Design			X	X	
Name of Technology				X	
Know How	X	X			X
Website			X	X	

IP protection serves as a pivotal instrument for generating value by enabling the licensing, sale, or commercialization of intellectual property in the form of products and services. The strategic utilization of IP assumes paramount importance in the context of potential commercial or industrial exploitation, serving to bolster the branding of products and services, thereby enhancing their appeal to both customers and investors. However, it is important to underscore that the imperative of IP protection for a given asset is not always obligatory.

- **Exploitation of results**

The identified exploitable results and assets within INNOAQUA will be efficiently harnessed for commercial or any other relevant applications, as anticipated throughout the project's duration. Specifically, the INNOAQUA consortium will actively seek opportunities for the exploitation of project results in the following domains: further research activities; facilitating the development, creation, or marketing of a product or process; creating and providing a service.

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<sup>11</sup> Software patentability is still a debated issue given its exclusion as subject matter as by Article 52(2)(c) and (3) of the European Patent Convention (EPC). Source: IPR Helpdesk.





### **2.2.3 Post project Stage**

Upon the formal conclusion of the project in Month 48, the submission of D6.12 INNOAQUA Final Exploitation Strategy and IP management Plan will ensue. This deliverable will encompass a comprehensive delineation of the intended application of INNOAQUA consortium's exploitable foreground, offering a definitive description along with its designated sector of utilization, accompanied by corresponding plans and a timeframe for their exploitation. D6.12 will provide an elaboration of the forthcoming initiatives to facilitate the exploitation of the project's accomplishments, along with measures devised to ensure the continuity of the project's results. Furthermore, this deliverable will furnish ultimate insights into IP matters and a conclusive update of the IPR Matrix, presenting in detail the applied and registered intellectual property rights. The aforementioned deliverable will culminate in the presentation of an advanced and definitive strategy for the exploitation and management of intellectual property rights, beyond the project's conclusion. This will encompass concrete pathways chosen for commercialization endeavors.

### **2.2.4 Role of the Exploitation Manager**

The role of the Exploitation Manager (EM), i.e., PEDAL, encompasses the formulation of INNOAQUA's Exploitation Plan. This encompasses various responsibilities, such as compiling respective reports and meticulously evaluating newly conceived innovative concepts for potential exploitation within the project. Simultaneously, the EM will oversee the comprehensive management of both project Background (BG) and Foreground (FG) intellectual properties (IPs). In pursuit of these objectives, the Exploitation Manager will maintain a close and constant communication channel with the Project Coordinator (NORCE) and the Steering Committee, thereby ensuring the optimal administration of all intellectual property assets.

The organization and management issues of INNOAQUA's Exploitation Strategy and IP management plan will fall under the purview of the Exploitation Manager and the Project Coordinator. In line with this, it is deemed advisable for a partner to adopt the practice of notifying and seeking consultation with the Exploitation Manager and the Project Coordinator



prior to making determinations regarding the protection of outcomes arising from their respective endeavours. This is especially pertinent if the partner is considering a potential joint IP scheme. Lastly, the Exploitation Manager also assumes a mediating role in instances of intellectual property conflicts, oversees project activities, and contributes to the evolution of subsequent iterations of this report within the context of INNOAQUA.

### **2.2.5 Knowledge Management of the project**

IP management forms an integral component of the overall INNOAQUA project management structure, and as such, it holds significance to institute continual IP monitoring throughout the project's duration. Accordingly, an effective IPR management methodology must be devised, commencing from the project's outset, to delineate the protocols governing the treatment of newly generated or identified outcomes over the course of INNOAQUA 's lifecycle.

Efficient management of intellectual property within INNOAQUA necessitates the adoption of a systematic process that identifies IP outcomes while concurrently determining their suitable handling and protection mechanisms. It is imperative to establish robust mechanisms that ensure accurate and timely acquisition of IP information. In instances where Work Package (WP) Leaders identify fresh assets originating from their respective WP activities, due notification should be communicated to the Exploitation Manager.

The collaborative efforts of the INNOAQUA Exploitation Manager and the Project Coordinator, in conjunction with the partner responsible for producing the recently recognized asset, are instrumental in overseeing the evaluation and management of any newly identified assets and their associated IP considerations. The Exploitation Manager will provide guidance to consortium partners to establish a judicious and effective IPR strategy based on the intrinsic nature of the recently identified asset and the collective objectives of the INNOAQUA consortium.

To facilitate this intricate process, the INNOAQUA Exploitation Strategy outlines the creation and continuous update of a dynamic IPR Matrix. This matrix will undergo periodic review and expansion to accommodate new asset additions and project results (FG).



### 2.2.6 IP Conflicts

To proactively mitigate the risk of IP conflicts, project partners will receive comprehensive information on IP regulations and will be guided through the exploitation process. This guidance will be provided not only through the IPR Matrix but also with the assistance of the Exploitation Manager. Within this framework, project partners will undertake the identification of their respective IPR assets, establish ownership and exploitation assertions, and if warranted, transfer pertinent results to INNOAQUA 's exploitable results. These actions will adhere to the guiding principles and obligations outlined in the project's Consortium Agreement.

**The Exploitation Manager will extend support in various areas, including but not limited to:**

- Addressing potential misunderstandings concerning the definition of exploitable results and related claims;
- Refining exploitation claims for clarity and compatibility assessment by partners;
- Ensuring alignment between projected exploitation claims and partners' ownership assertions (also considering access rights);
- Identifying and addressing confidentiality concerns, such as protection new strategically significant knowledge through confidential agreements;
- Identifying any potential IP conflicts among partners, encompassing ownership, access rights, and exploitation claims.

This collaborative approach, led by the Exploitation Manager, will facilitate transparent communication and ensure that partners' interests are harmonized while navigating the complexities of IP management and exploitation within INNOAQUA.

Should an IP conflict arise, the Exploitation Manager will play a pivotal role in facilitating resolution. The initial step will involve urging the parties involved in the conflict to engage in direct communication, seeking proactive solutions and formalizing agreements in writing as needed. Should this step not yield agreement, an internal mediation process will be initiated in alignment with the guidelines established in INNOAQUA's Consortium Agreement. If resolution remains elusive following the initial internal mediation procedure, a subsequent



mediation process will be pursued in accordance with the WIPO Mediation Rules. This additional mediation process will serve as a structured framework for addressing and reconciling the IP-related concerns that have persisted. Through these systematic approaches, INNOAQUA aims to effectively navigate and resolve IP conflicts, ensuring the sustained progress of the project and the harmonious collaboration among its partners.

### 2.3 IPR Matrix Methodology

The IPR Matrix serves as a central tool within the project's framework to address the key IPR considerations pertaining to the Exploitation strategy. This approach streamlines the process for consortium partners to discern and delineate the background, foreground, and exploitable results.

In parallel, it delineates the IP protection measures and requisite agreements, ensuring the enduring viability of project results beyond its culmination.

**The IPR methodology unfolds through a series of four interconnected steps:**

- 1) Identifying Background IP and outlining access rights for consortium partners;
- 2) Provisionally pinpointing foreground IP generated through project activities;
- 3) Initial designation of exploitable assets/results within the project and gauging their potential for commercialization;
- 4) Specifying the IPR protection strategy for identified exploitable assets/results with potential for consortium partners' commercial exploitation.

At this early project phase, INNOAQUA 's Exploitation plan aims to establish core assets and, in parallel, define both foreground (FG) and background (BG) IPs, along with the corresponding access rights.

As the project advances, the IPR methodology will be adapted to accommodate evolving results and the project's IPR approach.

This evolution will encompass the establishment of ownership frameworks among project partners for each exploitable result, the formulation of access rules and conditions, and

meticulous IPR validation. In this context, the structure of the IPR Matrix to be employed throughout the project's duration is concisely presented in the following table.

Table 3. The structure of the IPR Matrix to be employed throughout the project

Background (BG)	Foreground (FG)	Exploitable results (ER)
<ul style="list-style-type: none"> <li>• BG#</li> <li>• Partner's Background</li> <li>• Contributing Partner</li> <li>• Short Description of BG</li> <li>• Type of Protection</li> <li>• How will it be utilised within INNOAQUA?</li> <li>• Conditions to Use within INNOAQUA</li> <li>• Conditions to use outside of INNOAQUA</li> <li>• Interest in further exploitation through of INNOAQUA results</li> </ul>	<ul style="list-style-type: none"> <li>• FG#</li> <li>• Project Outcome /Achievement/Result</li> <li>• Related WP</li> <li>• Contributing Partners</li> <li>• Short Description of FG</li> <li>• Related BG# (BG owner)</li> <li>• Type of Protection</li> <li>• Conditions to Use within INNOAQUA</li> <li>• Interest in Further Commercialisation of Project Results</li> <li>• Conditions to Use after the end of the Project</li> </ul>	<ul style="list-style-type: none"> <li>• ER#</li> <li>• Exploitable result</li> <li>• Main partner</li> <li>• Further contributing partner(s)</li> <li>• Related FG#</li> <li>• Related project task/deliverable (if applicable)</li> <li>• Related BG# (BG owner)</li> <li>• Proposition for the ER-owner</li> <li>• Short description of the ER</li> <li>• Relevance for IP Protection</li> </ul>

### 2.3.1 Identification of Background IP

In the initial phase of the IPR Matrix, the identified Background assets that will be used during the implementation of the project were identified.

No	Relevant Background (the name of the Background)	Contributing Partner	BG identifier	Short description of BG	Type of protection (e.g., patent, copyright, TM, Utility model)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Conditions to use outside INNOAQUA E.g. Is it confidential? Can it be shared with externals? Is it currently shared with externals? If yes on what conditions?	Interest in further exploitation through INNOAQUAS's results (Yes/ No)

Figure 2. IPR Matrix Background Template

Various details pertaining to the Background IP are documented within the corresponding template. The second column presents a short name for the Background, followed by the

partner responsible and an allocated identifier linked to the Work Package and number of assets. The fifth column offers a short more detailed description regarding the BG is offered. Additionally, partners specify the chosen protection method, encompassing patents, utility models, copyrights, trade and service marks, trade secrets, creative commons licenses, and confidentiality agreements, among others. Within column seven, the intended utilization of this Background within the project is outlined. Columns eight and nine detail the conditions governing the usage of the Background by consortium partners and external stakeholders, respectively. Lastly, partners express their inclination for potential further exploitation of the Background through resultant project outcomes.

### 2.3.2 Identification of Foreground IP

In the second phase of the IPR Matrix, the identified Foreground assets that will be produced during the project’s activities.

W P	N o	Project result (PR)/ Achieve ment	Speci fic proje ct resul t	Main Partne r(s)	Contribu ting partne r(s)	Relat ed BG num ber	Short descrip tion of FG	FG num ber	Type of protect ion (e.g., patent, copyrig ht, TM, Utility model, CC licence )	Conditio ns to use within INNOAQ UA (free to use, licence fee, restricti ons, NDA..)	Interest in Further Commercialis ation of Project Results (Yes/ No)	Conditio ns to use after the end of project (free to use, licence fee, restricti ons, NDA..)
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Figure 3. IPR Matrix Foreground Template

The aforementioned template is used by consortium partners to delineate the foreground IP. The initial four columns catalogue the accomplishments of the INNOAQUA project, aligning them with the relevant Work Package. Subsequently, the principal contributing partner is denoted. Ordinarily, if a Foreground arises directly from a Task, the principal partner assumes the role of Task leader. Furthermore, the remaining contributing partners are also acknowledged. Similarly, the contributing partners typically correspond to those engaged in the Task from which the Foreground emerges. The seventh column designates the corresponding Background IP number, while a succinct description of the Foreground is presented in the eighth column. A Foreground number is similarly assigned to the respective

Foreground. Analogous to the background identification template, partners outline the chosen protection modality, the parameters governing consortium partner usage of the Foreground, and the intention to commercialise it through project outcomes. Ultimately, the final column stipulates the post-project conditions (e.g. unrestricted use, licensing fee, etc.) as determined by the project partners.

### 2.3.3 Identification of Exploitable results

In the third stage and based on the identified FG the consortium partners will define the exploitable results and the IPR management procedures:

- 1) Protection;
- 2) Definition of access rights;
- 3) Exploitation pathways.

The principal objective of this third phase of the IPR Matrix is to establish the definition of exploitable results and their primary contributors. This stage serves the following purposes:

- To ascertain ownership and exploitation assertions for intellectual property (IP) related to each exploitable result, preemptively highlighting potential conflicts;
- To facilitate informed decisions concerning IP protection, ensuring prompt action in this regard, including potential IP agreements such as those for joint ownership, access rights provision, or confidentiality agreements (NDAs).

The forthcoming table will be consistently employed throughout the project's entire duration to facilitate the execution of the third stage of the IPR Matrix and the identification of exploitable results.

No	Exploitable Result	Short description of ER	Main Partner	Contributing Partner(s)	Related FG	Related BG	ER Owner(s)	Potential IP protection	M	U	L	S	O	Most promising concerning M-U-L-S-O (which exploitation path is most promising by the proposed owner)
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Figure 4. IPR Matrix Exploitable Results Template



The initial three columns will present the exploitable result number, a concise designation, and a brief description. Subsequently, the main responsible partner and additional contributing partners will be detailed across the following two columns. The sixth and seventh columns will display the corresponding numbers of the related foreground (FG) and background (BG). Furthermore, in the succeeding column, the proposed owner of the exploitable result will be defined, while column nine (9) will denote the perceived importance of IP protection by the responsible partner. The subsequent five (5) columns correspond to distinct categories of exploitation claims:

*M: Production and sale of a product.*

*U: Internal use of the project result for further development, such as:*

*To develop something else for sale; or*

*Application within R&D departments (public or private) in new research projects.*

*L: Licensing the project result to third parties.*

*S: Rendering a Service, such as consultancy.*

*O: Other*

The partner overseeing the exploitable results, in collaboration with contributing partners, the coordinator, and the exploitation manager, shall determine the most suitable exploitation claims for each ER. Ultimately, the final column will denote the most promising exploitation claim.

### 3. Overview Of INNOAQUA's Key Exploitable Results (KERs), Background And Foreground IP

#### 3.1 Identified KERs of INNOAQUA

The main assets of INNOAQUA, as identified by the consortium at this stage of the project, along with their description are presented in the table that follows:



Table 4: Identified INNOAQUA’s KERs

No	KER’s name	Brief Description	Main Partner
1	ABM of the market diffusion of innovative seafoods	The Agent Based Model and the resulting simulation software will allow to test in silico strategies increasing consumption of innovative seafood products and allow for stakeholder learning. End-users: Innovative seafood producers and social simulation scholars	NORCE
2	Integrated production process of microalgae and RAS-based fish	Currently there is no commercial integrated production process of microalgae cultivation on wastewater from RAS yet. DEMO# will demonstrate the integrated optimized production process at industrial scale tailored to VA’s production system. End-users: Microalgae and fish producers	NORCE, RASLAB, VA
3	SMART-IMTA system for seaweed and fish production	A System for Real Time Monitoring and Control of the seaweed production component of an IMTA operation does not exist presently. Better environmental performance of sole production process and additional marketable product (seaweeds) tailored to SEA8’s production system. End-users: Seaweed and fish farmers	A4F, SEA8
4	Pest control strategies	No single established method for pest prevention control to maximise algae production. Moreover, the effect of land based IMTA on the microbiome and virome of both fish and algae is unknown, Knowledge is important for avoiding decreases in productivity and product quality. End-users: algae and IMTA farmers.	UFRJ, NORCE, A4F
5	Digital Twin Backbone	The DTB will facilitate the ingestion, transformation and storage and availability in near-real time of data flows in the production plants. End-users: System Integrators and software developers aiming to integrate Operational Technology with Information Systems for data streaming, monitoring and decision support.	INESC TEC
6	Multi-sensing Module	Innovative sensors in an integrated configuration with optical signal acquisition, analysis systems and communication with the control system will allow broad the	INESC TEC

No	KER's name	Brief Description	Main Partner
		wavelengths. End-users: (Algae) aquaculture producers, RAS technology developers, water treatment plants.	
7	N,P recovery from RAS sludge	Optimised process to valorise low -quality biomass to produce medium ingredient for algae growth, improving circularity and reducing the need for commercial substrates. End-users: Algae producers	LEITAT
8	Seaweed Biorefinery Processes and Ingredients	Development of adequate extracting procedures for seaweed biomass grown in IMTA system – a new biorefinery approach aiming at full exploitation of the biomass and zero waste. End-users: industries developing food and feed solutions based on algae, algae producers.	A4F
9	Microalgae Biorefinery Processes and Ingredients	Scale up process to obtain ingredients from microalgae grown in RAS system that fit consumer demands for more sustainable and healthy food products that have good flavour, aroma and texture. End-users: Microalgae producers and processors	ALGEMY
10	Functional FPH from fish processing waste	Optimized process for the production of FPH from fish by-products, showing equivalent or better bioactivity to commercial fish protein hydrolysates obtained from whole fish or fish muscle. End-users: Food (ingredient), beverage and feed companies, nutraceutical companies	LEITAT
11	Formulated food products/ingredient blends	Formulated (vegan) products with improved sustainability and techno-functional properties with specific benefits as described in Table 1. Ingredient combinations may be commercialized as blends. For hybrid products (FPHs + algae) it is expected that the combination will create synergies that will further enhance end-product properties and increase the added value, application range and commercial uptake of the blend with respect to their individual use. End-users: Food/ingredient blend producers and retailers, Consumers	VIVA MARIS, PESCANOVA, ALGEMY, LEITAT
12	Bio based packaging solutions	Bio based resins/packaging solutions with better sustainability performance (produced with algae leftovers) and better mechanical	ERANOVA



No	KER's name	Brief Description	Main Partner
		properties than conventional algae alternatives due to increased polysaccharide content.	

## 3.2 Background

The project partners preliminary identified the background IP to be used to achieve the objectives of INNOAQUA. The Background IP is presented in the following table. The table will be completed (TBC) later with the collected information from partners with the project progress.



Table 5: INNOAQUA’s Identified BG

No	Relevant Background (the name of the Background)	Contributing Partner	BG identifier	Short description of BG	Type of protection (e.g., patent, copyright, TM, Utility model)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Conditions to use outside INNOAQUA E.g. Is it confidential? Can it be shared with externals? Is it currently shared with externals? If yes on what conditions?	Interest in further exploitation through INNOAQUAS's results (Yes/ No)
1	EmotiCon HUMAT agent architecture	NORCE	BG1	TBC		Background will be made accessible to project partners to the extent that this is needed for the implementation of the action. Requests to exercise access rights for implementation must be made in writing prior to implementation.	Exploitation involving any of the stated background and results will be subject to contract, in all cases prior consent must be obtained from NORCE.	TBC
2	Formulation of microalgae cultivation media, including the use of aquaculture waste streams as nutrient source	NORCE	BG2	TBC		Background will be made accessible to project partners to the extent that this is needed for the implementation of the action.	Exploitation involving any of the stated background and results will be subject to contract, in all cases prior consent must be obtained from NORCE.	TBC
3	Isolates of own microalgae strains to be used in the project	NORCE	BG3	TBC		Strains and/or microalgal biomass will be made accessible to project partners where this is needed for the implementation of the action	Exploitation involving any of the strains will be subject to contract/Material Transfer Agreement, in all cases prior consent must be obtained from NORCE.	TBC
4	Design and operation of microalgae production processes, including reactor design and	NORCE	BG4	TBC		Background will be made accessible to project partners to the extent that this is	Exploitation involving any of the stated background and results will	TBC

No	Relevant Background (the name of the Background)	Contributing Partner	BG identifier	Short description of BG	Type of protection (e.g., patent, copyright, TM, Utility model)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Conditions to use outside INNOAQUA E.g. Is it confidential? Can it be shared with externals? Is it currently shared with externals? If yes on what conditions?	Interest in further exploitation through INNOAQUAS's results (Yes/ No)
	integration with aquaculture systems					needed for the implementation of the action.	be subject to contract, in all cases prior consent must be obtained from NORCE.	
5	Production data during trial	VIKINGAQUA	BG5	TBC		Production data during the trial as fish data and water quality details, will be made available for the involved tanks during the trial to the project partners to the extent that these are needed for the implementation of the action.	Exploitation involving any of the stated background and results will be subject to contract, in all cases, prior consent must be obtained from Viking Aqua.	TBC
6	Algemy's knowhow about processing microalgae to extract its components and obtain ingredients as a result	ALGEMY	BG6	Algemy has already developed several methods to extract proteins and other ingredients from microalgae biomass and to further purify them. These methods are green and only require mechanical processes and green solvents.	Patent (in progress)	Background and results will be made accessible to project partners to the extent that these are needed for the implementation of the action.	Exploitation involving any of the stated background and results will be subject to contract, in all cases prior consent must be obtained from Algemy.	yes
7	Algemy's knowhow about formulating and making food products such as vegan powdered meals or vegan nutritious snacks.	ALGEMY	BG7	Algemy has previous knowledge on the development of several powdered meals prototypes using microalgae based ingredients blended with other vegan ingredients.	Trade secret	Background and results will be made accessible to project partners to the extent that these are needed for the implementation of the action.	Exploitation involving any of the stated background and results will be subject to contract, in all cases prior consent must be obtained from Algemy.	yes
8	Knowledge on life-cycle control and maternity	A4F	BG8	TBC	TBC	This background will be	If this background is needed	TBC

No	Relevant Background (the name of the Background)	Contributing Partner	BG identifier	Short description of BG	Type of protection (e.g., patent, copyright, TM, Utility model)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Conditions to use outside INNOAQUA E.g. Is it confidential? Can it be shared with externals? Is it currently shared with externals? If yes on what conditions?	Interest in further exploitation through INNOAQUAS's results (Yes/ No)
	processes related to Porphyra species.					accessible royalty-free strictly on a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	for exploitation of Results, Access Rights have to be requested to be granted by A4F on Fair and Reasonable Conditions.	
9	Formulations of culture media for algae cultivation	A4F	BG9	TBC	TBC	This background will be accessible royalty-free strictly on a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	If this background is needed for exploitation of Results, Access Rights have to be requested to be granted by A4F on Fair and Reasonable Conditions.	TBC
10	Isolates of algae strains to be used in the project	A4F	BG10	TBC	TBC	This background will be accessible royalty-free strictly on a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	If this background is needed for exploitation of Results, Access Rights have to be requested to be granted by A4F on Fair and Reasonable Conditions and upon prior signature of a specific material transfer agreement.	TBC
11	Knowledge on seaweed culture systems outdoors (including, but without limitation, Integrated Multitrophic Aquaculture systems), including Biological and Engineering	A4F	BG11	TBC	TBC	This background will be accessible royalty-free strictly on a need-to know-basis and in the context of the work plan as	If this background is needed for exploitation of Results, Access Rights have to be requested to be granted by A4F on Fair and Reasonable Conditions.	TBC

No	Relevant Background (the name of the Background)	Contributing Partner	BG identifier	Short description of BG	Type of protection (e.g., patent, copyright, TM, Utility model)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Conditions to use outside INNOAQUA E.g. Is it confidential? Can it be shared with externals? Is it currently shared with externals? If yes on what conditions?	Interest in further exploitation through INNOAQUAS's results (Yes/ No)
	requirements, integration and optimisation					defined in Annex I of the Grant Agreement.		
12	Knowledge on seaweed processing techniques, namely drying and size reduction.	AF4	BG12	TBC	TBC	This background will be accessible royalty-free strictly on a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	If this background is needed for exploitation of Results, Access Rights have to be requested to be granted by A4F on Fair and Reasonable Conditions	TBC
13	Expertise in biorefinery of macroalgae and microalgae, including process development and upscale, namely, but without limitation: 1) extraction and fractionation of proteins; 2) extraction and purification of lipids; 3) extraction and purification of carbohydrates. Expertise in the integration of biorefinery processes for the full exploitation of the algal biomass.	AF4	BG13	TBC	TBC	This background will be accessible royalty-free strictly on a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	If this background is needed for exploitation of Results, Access Rights have to be requested to be granted by A4F on Fair and Reasonable Conditions.	TBC
14	Knowledge on the set-up, structure, operation, and husbandry of Solea	SEA8	BG14	TBC	TBC	This background will be accessible strictly on	Exploitation involving any of the stated background and	TBC

No	Relevant Background (the name of the Background)	Contributing Partner	BG identifier	Short description of BG	Type of protection (e.g., patent, copyright, TM, Utility model)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Conditions to use outside INNOAQUA E.g. Is it confidential? Can it be shared with externals? Is it currently shared with externals? If yes on what conditions?	Interest in further exploitation through INNOAQUAS's results (Yes/ No)
	senegalensis Recirculating Aquaculture Systems.					a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	results will be subject to contract, in all cases prior consent must be granted by SEA8 on Fair and Reasonable Conditions.	
15	Knowledge on best practices and integration of future seaweed culture systems outdoors (including, but without limitation, Integrated Multitrophic Aquaculture systems) in a commercial RAS, including engineering requirements.	SEA8	BG15	TBC	TBC	This background will be accessible strictly on a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	Exploitation involving any of the stated background and results will be subject to contract, in all cases prior consent must be granted by SEA8 on Fair and Reasonable Conditions.	TBC
16	Expertise in fish health, biosecurity and water treatment requirements that will need to be met by future seaweed culture systems outdoors (including, but without limitation, Integrated Multitrophic Aquaculture systems).	SEA8	BG16	TBC	TBC	This background will be accessible strictly on a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	Exploitation involving any of the stated background and results will be subject to contract, in all cases prior consent must be granted by SEA8 on Fair and Reasonable Conditions.	TBC
17	Data on environment, physico chemical parameters, and production, collected daily in the production of Solea senegalensis since 2012.	SEA8	BG17	TBC	TBC	This background will be accessible strictly on a need-to know-basis and in the context of the work plan as defined in Annex	Exploitation involving any of the stated background and results will be subject to contract, in all cases prior consent must be granted by SEA8 on Fair and	TBC



No	Relevant Background (the name of the Background)	Contributing Partner	BG identifier	Short description of BG	Type of protection (e.g., patent, copyright, TM, Utility model)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Conditions to use outside INNOAQUA E.g. Is it confidential? Can it be shared with externals? Is it currently shared with externals? If yes on what conditions?	Interest in further exploitation through INNOAQUAS's results (Yes/ No)
						I of the Grant Agreement.	Reasonable Conditions.	
18	Knowhow and patent on ULVA enrichment technology to increase the level of Polysaccharides	ERANOVA	BG18	The enrichment technology of Ulva in Polyssacharides is made in raceway ponds by eliminating the nutrients in the medium. This technology allows use to enhance the concentration of starch in the algae, and to improve the mechanical properties of our biomaterials. The concentration of starch can climb up from 5% to 20%w/w	Patent	This background will be accessible royalty-free strictly on a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	If this background is needed for exploitation of Results, Access Rights have to be requested to be granted by ERANOVA on Fair and Reasonable Conditions.	No
19	Knowhow and patent on Bleaching technology to remove color and odor for all kind of Macro algae.	ERANOVA	BG19	The whitening technology of algae is used to remove its odor and its color. It helps us create neutral plastics and reduce the browning of the biomaterials. The whitening of our biomass can be done in under 3 hours in an aqueous medium. It can also be done outside of water	Patent	This background will be accessible royalty-free strictly on a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	If this background is needed for exploitation of Results, Access Rights have to be requested to be granted by ERANOVA on Fair and Reasonable Conditions.	No
20	Know how on LCA (cycle life analysis) of bioplastics and Biocomposites based upon Algae	ERANOVA	BG20	The production of bioplastics or biocomposite at 25% of biobased material reduces 50% of the CO2 emission compared to 100% petrosourced polymers products (PP, PE, ...)	Patent	This background will be accessible royalty-free strictly on a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	If this background is needed for exploitation of Results, Access Rights have to be requested to be granted by ERANOVA on Fair and Reasonable Conditions and upon prior signature of a specific material transfer agreement.	Yes
21	Knowledge on formulation to make either Bioplastics or biocomposites for	ERANOVA	BG21	The plasticization of the starch extracted from the Ulva algae (bioplastics) or the compounding of the algae (biocomposites) with different polymers gives the	Patent	This background will be accessible royalty-free strictly on	If this background is needed for exploitation of Results, Access Rights have to be	Yes

No	Relevant Background (the name of the Background)	Contributing Partner	BG identifier	Short description of BG	Type of protection (e.g., patent, copyright, TM, Utility model)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Conditions to use outside INNOAQUA E.g. Is it confidential? Can it be shared with externals? Is it currently shared with externals? If yes on what conditions?	Interest in further exploitation through INNOAQUA's results (Yes/ No)
	Packaging applications for any kind of converting technology (Film and sheet Extrusion, Injection, Blow molding )			bioplastics a very good mechanical and chemical properties that allow them to be used as injection applications (with PP), blow molding applications (with HDPE), film extrusion applications (with LDPE), and many other application		a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	requested to be granted by ERANOVA on Fair and Reasonable Conditions.	
22	Knowledge on recycling Bioplastics and Biocomposites	ERANOVA	BG22	Our material could be recycled, just the one condition is that the biobased material (algae) should be less than 30% in the final product based on the European regulations, because ERANOVA produces biocomposites or bioplastics with 50 to 65% biobased material, so the compounds should be diluted at the client before their final application (film extrusion, injection, ...)	Patent	This background will be accessible royalty-free strictly on a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	If this background is needed for exploitation of Results, Access Rights have to be requested to be granted by ERANOVA on Fair and Reasonable Conditions	Yes
23	Knowledge on formulating Bioplastics and Biocomposites resins to be used for Food contact	ERANOVA	BG23	All components in our bioplastics or biocomposites formulations are FDA, so they can be used for food contact without any problem or risk to food. Heavy metals are measured in our water and in our algae and its concentrations are far below the concentrations limit.	Patent	This background will be accessible royalty-free strictly on a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	If this background is needed for exploitation of Results, Access Rights have to be requested to be granted by ERANOVA on Fair and Reasonable Conditions	Yes
24	Expertise in biorefinery of macroalgae, including process development and upscale, namely, but without limitation: 1) harvesting of macroalgae into raceways with high	ERANOVA	BG24	We collect green algae from green tide and we also produce ulva from our raceways ponds. To gather the biomass we can harvest it by pumping and separating the algae from the water with a curved grid. The extraction and fractionation of starch and fibers from green algae is done by lysing the cells. After micronisation, we obtain 2 types of powder : raw starch and green algae residue, these 2 types of	Patent	This background will be accessible royalty-free strictly on a need-to know-basis and in the context of the work plan as defined in Annex I of	If this background is needed for exploitation of Results, Access Rights have to be requested to be granted by ERANOVA on Fair and Reasonable Conditions.	Yes

No	Relevant Background (the name of the Background)	Contributing Partner	BG identifier	Short description of BG	Type of protection (e.g., patent, copyright, TM, Utility model)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Conditions to use outside INNOAQUA E.g. Is it confidential? Can it be shared with externals? Is it currently shared with externals? If yes on what conditions?	Interest in further exploitation through INNOAQUAS's results (Yes/ No)
	productivity 2) extraction and fractionation of polysaccharides /carbohydrates and fibers; 3) dedicated micronization versus Application in Packaging and plastics application Expertise in the integration of biorefinery processes for the full macroalgae biomass focused on Bioplastics and Biocomposites			powder can be used in 2 types of biomaterials : bioplastics and biocomposite		the Grant Agreement.		
25	Product development of vegan food products with algae	VIVA MARIS	BG25	TBC	TBC	This background will be accessible royalty-free strictly on a need-to know-basis and in the context of the work plan as defined in Annex I of the Grant Agreement.	Exploitation involving any of the stated background and results will be subject to contract, in all cases prior consent must be obtained from Viva Maris.	TBC
26	Know-how in nutrient extraction and recovery from sludge	LEITAT	BG26	LEITAT has previous knowledge on the recovery of nutrients from RAS sludge by using ultrasounds followed by enzymatic and chemical hydrolysis, methods developed in the iFishIENCi project. This know how will help to improve the characteristics of these nutrients to be used as medium ingredient to grow micro and macroalgae.	Trade secret	Background and results will be made accessible to project partners to the extent that these are needed for the implementation of the action	Exploitation involving any of the stated background and results will be subject to contract, in all cases prior consent must be obtained from LEITAT.	yes

No	Relevant Background (the name of the Background)	Contributing Partner	BG identifier	Short description of BG	Type of protection (e.g., patent, copyright, TM, Utility model)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Conditions to use outside INNOAQUA E.g. Is it confidential? Can it be shared with externals? Is it currently shared with externals? If yes on what conditions?	Interest in further exploitation through INNOAQUA's results (Yes/ No)
27	Know-how in protein extraction from fish by-products and characterization	LEITAT	BG27	LEITAT has previous knowledge on the extraction of protein and hydrolysis from fish processing side streams by using pre-treatments followed by enzymatic, methods developed in different projects (e.g. ReValue project). This know how will help to advance with improved bio and technofunctionalities.	Trade secret	Background and results will be made accessible to project partners to the extent that these are needed for the implementation of the action	Exploitation involving any of the stated background and results will be subject to contract, in all cases prior consent must be obtained from LEITAT.	yes
28	Know-how in bioactivity assessment, in vitro validation of antihypertensive, anti-inflammatory and antioxidant health claims	LEITAT	BG28	TBC	TBC	Background and results will be made accessible to project partners to the extent that these are needed for the implementation of the action	Exploitation involving any of the stated background and results will be subject to contract, in all cases prior consent must be obtained from LEITAT.	TBC
29	Know-how in formulation of food and beverage products	LEITAT	BG29	LEITAT has previous knowledge on the development of several food prototypes using alternative proteins such as microalgae proteins blended with other protein sources for e.g. pulses, soy or pea protein.	Trade secret	Background and results will be made accessible to project partners to the extent that these are needed for the implementation of the action	Exploitation involving any of the stated background and results will be subject to contract, in all cases prior consent must be obtained from LEITAT.	yes
30	INESC TEC IIoT Platform	INESC TEC	BG30	Data Capture, storage and process platform	TBC	Background and results will be made accessible to project partners to the extent that these are needed for the implementation of the action	Exploitation involving any of the stated background and results will be subject to contract, in all cases prior consent must be obtained from INESC TEC	TBC
31	Know how in formulation of fishery/aquaculture products	PESCANOVA		TBC	TBC	Background and results will be made accessible to	Exploitation involving any of the stated background and	TBC



No	Relevant Background (the name of the Background)	Contributing Partner	BG identifier	Short description of BG	Type of protection (e.g., patent, copyright, TM, Utility model)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Conditions to use outside INNOAQUA E.g. Is it confidential? Can it be shared with externals? Is it currently shared with externals? If yes on what conditions?	Interest in further exploitation through INNOAQUAS's results (Yes/ No)
						project partners to the extent that these are needed for the implementation of the action	results will be subject to contract, in all cases prior consent must be obtained from PESCANOVA	
32	Know how in scale up of aquaculture ingredients and fish protein hydrolysates manufacturing	LEITAT	BG32	LEITAT has expertise in scale up the production of medium ingredients rich in nutrients, mainly nitrogen and carbon. These nutrients have potential to be used as medium ingredient for the cultivation of micro and macroalgae while replacing commercial substrates. LEITAT has also experience in scale up the production of fish protein hydrolysates.	TBC	Background and results will be made accessible to project partners to the extent that these are needed for the implementation of the action	Exploitation involving any of the stated background and results will be subject to contract, in all cases prior consent must be obtained from LEITAT.	TBC

### 3.3 Foreground IP

The project partners were able to preliminarily identify the Foreground IP generated under the objectives of IINOAQUA. Preliminary identification of the Foreground IP can be found in Table 6. Additional updates or modifications are expected in the updated version of the report on INNOAQUA exploitation strategy and IP-related work, which will correspond to the progress of the project and the produced results and know-how. The table will be completed (TBC) later with the collected information from partners.



Table 6: INNOAQUA's Identified IP FG

WP	No	Project result (PR)/ Achievement	Specific project result	Main Partner(s)	Contributing partner(s)	Related BG number	Short description of FG	FG number	Type of protection (e.g., patent, copyright, TM, Utility model, CC licence)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Interest in Further Commercialisation of Project Results (Yes/ No)	Conditions to use after the end of project (free to use, licence fee, restrictions, NDA..)
WP3	1	Processing of residual algae fraction		ERANOVA	TBC	BG18, BG19, BG24	Process transformation of residual algae fraction to fine white powder of algae and rich in starch	FG1	Patent	NDA	Yes	NDA
WP3	2	Bioplastics and biocomposites production from residual algae fraction		ERANOVA	TBC	BG20, BG21, BG22, BG23	Bioplastics production with the use of fine white powder of residual algae fraction	FG2	Patent	NDA	Yes	NDA
WP1		Consumer attitudes report	Information regarding consumer attitudes towards innovative seafood products	ALGEMY/NORCE	PESCANOVA, VIVAMARIS		Report about the consumer preferences (cognitive and social motives for trying out inovative seafood products)	FG3	none	Free to use	Yes (it will indirectly affect the product development)	Free to use
WP3		Optimal extraction protocols	An optimal extraction protocol will be developed for each microalgae specie	ALGEMY	LEITAT	BG6	The process that maximizes the extraction of the desired compounds from each microalgae ( <i>Chlorella sorokiniana</i> , <i>Nanochloropsis oculata</i> and <i>Phaeodactylum tricornutum</i> ) will	FG4	Patent(s)/Trade secret(s)	Background and results will be made accessible to project partners to the extent that these are needed for the implementation of the action.	Yes	licence fee and NDA

WP	No	Project result (PR)/ Achievement	Specific project result	Main Partner(s)	Contributing partner(s)	Related BG number	Short description of FG	FG number	Type of protection (e.g., patent, copyright, TM, Utility model, CC licence)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Interest in Further Commercialisation of Project Results (Yes/ No)	Conditions to use after the end of project (free to use, licence fee, restrictions, NDA..)
							be developed and optimized.					
WP4		Micro algae based ingredients	Different stable ingredients obtained from the different microalgae extracts	ALGEMY	LEITAT	BG6	Modification, purification and stabilization of the extracts in order to obtain ingredients with the desired properties and that can be commercialized B2B	FG5	Trade secret(s)/Patent(s)	Background and results will be made accessible to project partners to the extent that these are needed for the implementation of the action.	Yes	licence fee and NDA
WP4		Microalgae based products	Vegan Snacks and powdered meals	ALGEMY	LEITAT	BG7	Formulated microalgae-based vegan snacks (cookies, energy balls, protein bars...) and powdered meals (including soup, protein shakes and breakfast bowls...)	FG6	Trade secret(s)/Patent(s)	Background and results will be made accessible to project partners to the extent that these are needed for the implementation of the action.	Yes	licence fee and NDA
WP2	4	Optimised process to valorise low - quality biomass to produce medium ingredients for algae growth		LEITAT	NORCE, A4F	BG26	Guidelines for the recovery of nutrients from sludge	FG7	Trade secret	NDA	No	NDA

WP	No	Project result (PR)/ Achievement	Specific project result	Main Partner(s)	Contributing partner(s)	Related BG number	Short description of FG	FG number	Type of protection (e.g., patent, copyright, TM, Utility model, CC licence)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Interest in Further Commercialisation of Project Results (Yes/ No)	Conditions to use after the end of project (free to use, licence fee, restrictions, NDA..)
WP3	5	Optimized process for the production of FPH from fish by-products, showing equivalent or better bioactivity to commercial fish protein hydrolysates obtained from whole fish or fish muscle		LEITAT	VIKING AQUA, PESCANOVA	BG27	Guidelines for the production of fish protein hydrolysates as techno and bio-functional ingredients (antioxidant, antihypertensive, antiinflammatory)	FG8	Trade secret	NDA	No	NDA
WP4	6	Optimized formulation for seafood products with plant-based ingredients		LEITAT	ALGEMY, PESCANOVA, VIVAMARIS	BG28	Formulation protocols for the production of seafood products with required nutritional composition and sensorial properties (smell, taste, color..)	FG9	Trade secret	NDA	No	NDA
WP2		Integrated RAS for salmon & microalgae production process	Optimised process	NORCE, RASLAB, Viking Aqua		BG 2, 3, 4, 5	Optimised processes for full integrated microalgae production from salmon cultivation water effluents.	FG7	Trade secret(s), CC licence	Free to use	yes	TBD



WP	No	Project result (PR)/ Achievement	Specific project result	Main Partner(s)	Contributing partner(s)	Related BG number	Short description of FG	FG number	Type of protection (e.g., patent, copyright, TM, Utility model, CC licence)	Conditions to use within INNOAQUA (free to use, licence fee, restrictions, NDA..)	Interest in Further Commercialisation of Project Results (Yes/ No)	Conditions to use after the end of project (free to use, licence fee, restrictions, NDA..)
WP2		Microbiome analyses + pest control strategies microalgae	Pest control strategies for microalgae production based on RAS water	NORCE, UFRJ	RASLAB, VIKING AQUA	BG 2, 3, 4	Understanding of microbiome in microalgae reactor, when grown on RAS water. How to control negative contamination.	FG8	Trade secret(s), CC licence	Free to use	yes	TBD

### 3.4 Key Exploitable Results

The project partners were able to preliminarily identify the key exploitable results generated under the objectives of INNOAQUA. This is presented in the following table. The table will be completed (TBC) later with the collected information from partners with the project progress.

Table 7: INNOAQUA’s Key Exploitable Results

No	Exploitable Result	Short description of ER	Main Partner	Contributing Partner(s)	Related FG	Related BG	ER Owner(s)	Potential IP protection	M	U	L	S	O	Most promising concerning M-U-L-S-O (which exploitation path is most promising by the proposed owner)
1	ABM of the market diffusion of innovative seafoods	The Agent Based Model and the resulting simulation software will allow to test in silico strategies increasing consumption of innovative seafood products and allow for stakeholder learning. End-users: Innovative seafood producers and social simulation scholars	NORCE	TBC	TBC	TBC	TBC	License, Copyright	TBC	TBC	TBC	TBC	TBC	TBC
2	Integrated production process of microalgae and RAS-based fish	Currently there is no commercial integrated production process of microalgae	NORCE, RASLAB, VA	TBC	TBC	TBC	TBC	Trade secret	TBC	TBC	TBC	TBC	TBC	TBC



No	Exploitable Result	Short description of ER	Main Partner	Contributing Partner(s)	Related FG	Related BG	ER Owner(s)	Potential IP protection	M	U	L	S	O	Most promising concerning M-U-L-S-O (which exploitation path is most promising by the proposed owner)
		cultivation on wastewater from RAS yet. DEMO# will demonstrate the integrated optimized production process at industrial scale tailored to VA's production system. End-users: Microalgae and fish producers												
3	SMART-IMTA system for seaweed and fish production	A System for Real Time Monitoring and Control of the seaweed production component of an IMTA operation does not exist presently. Better environmental performance of	A4F, SEA8	TBC	TBC	TBC	TBC	Trade secret	TBC	TBC	TBC	TBC	TBC	TBC

No	Exploitable Result	Short description of ER	Main Partner	Contributing Partner(s)	Related FG	Related BG	ER Owner(s)	Potential IP protection	M	U	L	S	O	Most promising concerning M-U-L-S-O (which exploitation path is most promising by the proposed owner)
		sole production process and additional marketable product (seaweeds) tailored to SEA8's production system. End-users: Seaweed and fish farmers												
4	Pest control strategies	No single established method for pest prevention control to maximise algae production. Moreover, the effect of land based IMTA on the microbiome and virome of both fish and algae is unknown, Knowledge is important for	UFRJ, NORCE, A4F	TBC	TBC	TBC	TBC	Copyright	TBC	TBC	TBC	TBC	TBC	TBC

No	Exploitable Result	Short description of ER	Main Partner	Contributing Partner(s)	Related FG	Related BG	ER Owner(s)	Potential IP protection	M	U	L	S	O	Most promising concerning M-U-L-S-O (which exploitation path is most promising by the proposed owner)
		avoiding decreases in productivity and product quality. End-users: algae and IMTA farmers.												
5	Digital Twin Backbone	The DTB will facilitate the ingestion, transformation and storage and availability in near-real time of data flows in the production plants. End-users: System Integrators and software developers aiming to integrate Operational Technology with Information Systems for data streaming,	INESC TEC	TBC	TBC	TBC	TBC	License, Copyright	TBC	TBC	TBC	TBC	TBC	TBC

No	Exploitable Result	Short description of ER	Main Partner	Contributing Partner(s)	Related FG	Related BG	ER Owner(s)	Potential IP protection	M	U	L	S	O	Most promising concerning M-U-L-S-O (which exploitation path is most promising by the proposed owner)
		monitoring and decision support.												
6	Multi-sensing Module	Innovative sensors in an integrated configuration with optical signal acquisition, analysis systems and communication with the control system will allow broad the wavelengths. End-users: (Algae) aquaculture producers, RAS technology developers, water treatment plants.	INESC TEC	TBC	TBC	TBC	TBC	Patent	TBC	TBC	TBC	TBC	TBC	TBC
7	N,P recovery from RAS sludge	Optimised process to valorise low - quality biomass to produce medium	LEITAT	NORCE, A4F	TBC	BG26	LEITAT	Trade secret	No	Yes	No	Yes	No	U2

No	Exploitable Result	Short description of ER	Main Partner	Contributing Partner(s)	Related FG	Related BG	ER Owner(s)	Potential IP protection	M	U	L	S	O	Most promising concerning M-U-L-S-O (which exploitation path is most promising by the proposed owner)
		ingredients for algae growth, improving circularity and reducing the need for commercial substrates. End-users: Algae producers												
8	Seaweed Biorefinery Processes and Ingredients	Development of adequate extracting procedures for seaweed biomass grown in IMTA system – a new biorefinery approach aiming at full exploitation of the biomass and zero waste. End-users: industries developing food and feed solutions based on algae, algae producers.	A4F	TBC	TBC	TBC	TBC	Trade secret	TBC	TBC	TBC	TBC	TBC	TBC

No	Exploitable Result	Short description of ER	Main Partner	Contributing Partner(s)	Related FG	Related BG	ER Owner(s)	Potential IP protection	M	U	L	S	O	Most promising concerning M-U-L-S-O (which exploitation path is most promising by the proposed owner)
9	Microalgae Biorefinery Processes and Ingredients	Scale up process to obtain ingredients from microalgae grown in RAS system that fit consumer demands for more sustainable and healthy food products that have good flavour, aroma and texture. End-users: Microalgae producers and processors	ALGEMY	LEITAT, NORCE	FG4, FG5	BG 6	ALGEMY	Patent, Trade secret	yes	yes	yes	no	no	M
10	Functional FPH from fish processing waste	Optimized process for the production of FPH from fish by-products, showing equivalent or better bioactivity to commercial	LEITAT	VIKING AQUA, PESCANOVA	TBC	BG27	LEITAT	Trade secret	No	Yes	No	Yes	No	U2



No	Exploitable Result	Short description of ER	Main Partner	Contributing Partner(s)	Related FG	Related BG	ER Owner(s)	Potential IP protection	M	U	L	S	O	Most promising concerning M-U-L-S-O (which exploitation path is most promising by the proposed owner)
		fish protein hydrolysates obtained from whole fish or fish muscle. End-users: Food (ingredient), beverage and feed companies, nutraceutical companies												
11	Formulated food products/ingredient blends	Formulated (vegan) products with improved sustainability and techno-functional properties with specific benefits as described in Table 1. Ingredient combinations may be commercialized as blends. For hybrid products	VIVA MARIS, PESCANOVA, ALGEMY, LEITAT	TBC	TBC	TBC	TBC	Patent, Secret-know how	TBC	TBC	TBC	TBC	TBC	TBC

No	Exploitable Result	Short description of ER	Main Partner	Contributing Partner(s)	Related FG	Related BG	ER Owner(s)	Potential IP protection	M	U	L	S	O	Most promising concerning M-U-L-S-O (which exploitation path is most promising by the proposed owner)
		(FPHs + algae) it is expected that the combination will create synergies that will further enhance end-product properties and increase the added value, application range and commercial uptake of the blend with respect to their individual use. End-users: Food/ingredient blend producers and retailers, Consumers												
12	Bio based packaging solutions	Bio based resins/packaging solutions with better sustainability performance (produced	ERANOVA	TBC	FG1, FG2	BG18, BG19, BG20, BG21, BG22, BG23, BG24	ERANOVA	Patent extension	M	U1, U2	TBC	TBC	TBC	U1



No	Exploitable Result	Short description of ER	Main Partner	Contributing Partner(s)	Related FG	Related BG	ER Owner(s)	Potential IP protection	M	U	L	S	O	Most promising concerning M-U-L-S-O (which exploitation path is most promising by the proposed owner)
		with algae leftovers) and better mechanical properties than conventional algae alternatives due to increased polysaccharide content.												

### 3.5 Exploitation Plans per KER

In this section the main KERs of the INNOAQUA project are described, along with the main contributors to their development. Information is also provided on who their potential users are, the benefits they stand to gain from exploiting that KER as well as on potential exploitation routes. Also, the main creator of each KER indicates any foreseeable action that may be needed to facilitate the potential exploitation route(s) of the KER, concisely outlining what needs to be done, when and by whom. The above information is presented in two tables for each KER:

- 1) The first table summarizing the exploitation plan of that KER;
- 2) The second table summarizing any actions needed for the exploitation of that KER.

Each KER is presented in a different sub-section of this section. The Exploitation Plans per Key Exploitable Result constitute preliminary plans developed according to the current stage of the INNOAQUA project and will be updated in the next versions during the project's lifetime. Thus, some of the tables will be completed (TBC) later with the collected information from partners with the project progress.

Table 8. Exploitation plan for the ABM of the market diffusion of innovative seafood

<b>Name of the KER №1</b>	<b>ABM of the market diffusion of innovative seafood</b>
<b>KER Description</b>	The Agent Based Model and the resulting simulation software will allow to test in silico strategies increasing consumption of innovative seafood products and allow for stakeholder learning. End-users: Innovative seafood producers and social simulation scholars
<b>Owners of the KER</b>	NORCE

Potential users and expected benefits from exploiting the KER	General, Public
Potential exploitation route	TBC

Actions needed for the exploitation of the ABM of the market diffusion of innovative seafood:

Table 9. Actions needed for the exploitation of the ABM of the market diffusion of innovative seafood

	What?	Who?	When?
IPR	License (the type will be decided later). Copyright (no further action is needed)	NORCE	During the project
Communication and dissemination	INNOAQUA consortium will make this exploitable result widely accessible according to its exploitation route	All Partners	TBC

Table 10. Exploitation plan for the Integrated production process of microalgae and RAS-based fish

Name of the KER №2	<b>The integrated production process of microalgae and RAS-based fish</b>
KER Description	Currently, there is no commercial integrated production process of microalgae cultivation on wastewater from RAS. DEMO# will demonstrate the

	integrated optimized production process at industrial scale tailored to VA's production system. End-users: Microalgae and fish producers
<b>Owners of the KER</b>	NORCE, RASLAB, VA
<b>Potential users and expected benefits from exploiting the KER</b>	Internal use
<b>Potential exploitation route</b>	Trade secret

Actions needed for the exploitation of the Integrated production process of microalgae and RAS-based fish:

Table 11. Actions needed for the exploitation of the Integrated production process of microalgae and RAS-based fish

	<b>What?</b>	<b>Who?</b>	<b>When?</b>
<b>IPR</b>	Trade secret	NORCE, RASLAB, VA	During the project
<b>Communication and dissemination</b>	INNOAQUA consortium will make this exploitable result widely accessible according to its exploitation route	All Partners	TBC

Table 12. Exploitation plan for the SMART-IMTA system for seaweed and fish production

<b>KER №3</b>	<b>A SMART-IMTA system for seaweed and fish production</b>
<b>KER Description</b>	A System for Real Time Monitoring and Control of the seaweed production component of an IMTA operation does not exist presently. Better environmental performance of sole production process and additional marketable product (seaweeds) tailored to SEA8's production system. End-users: Seaweed and fish farmers
<b>Owners of the KER</b>	A4F, SEA8
<b>Potential users and expected benefits from exploiting the KER</b>	Internal use
<b>Potential exploitation route</b>	Trade secret

Actions needed for the exploitation of the SMART-IMTA system for seaweed and fish production:

Table 13. Actions needed for the exploitation of the SMART-IMTA system for seaweed and fish production

	<b>What?</b>	<b>Who?</b>	<b>When?</b>
<b>IPR</b>	Trade secret	A4F, SEA8	During the project
<b>Communication and dissemination</b>	INNOAQUA consortium will make this exploitable result widely	All Partners	TBC

	accessible according to its exploitation route		
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Table 14. Exploitation plan for the Pest control strategies

The name of the KER №4	Pest control strategies
KER Description	<p>No single established method for pest prevention control to maximise algae production.</p> <p>Moreover, the effect of land based IMTA on the microbiome and virome of both fish and algae is unknown, Knowledge is important for avoiding decreases in productivity and product quality.</p> <p>End-users: algae and IMTA farmers.</p>
Owners of the KER	UFRJ, NORCE, A4F
Potential users and expected benefits from exploiting the KER	Copyright
Potential exploitation route	General, Public

Actions needed for the Pest control strategies:



Table 15. Actions needed for the Pest control strategies

	What?	Who?	When?
<b>IPR</b>	Copyright - no further action is needed	UFRJ, NORCE, A4F	During the project
<b>Communication and dissemination</b>	INNOAQUA consortium will make this exploitable result widely accessible according to its exploitation route	All Partners	TBC

Table 16. Exploitation plan for the Digital Twin Backbone

Name of the KER №5	The Digital Twin Backbone
<b>KER Description</b>	The DTB will facilitate the ingestion, transformation and storage and availability in near-real time of data flows in the production plants. End-users: System Integrators and software developers aiming to integrate Operational Technology with Information Systems for data streaming, monitoring and decision support.
<b>Owners of the KER</b>	INESC TEC
<b>Potential users and expected benefits from exploiting the KER</b>	License, Copyright
<b>Potential exploitation route</b>	TBC

Actions needed for the Digital Twin Backbone:

Table 17. Actions needed for the Digital Twin Backbone

	What?	Who?	When?
<b>IPR</b>	License Copyright - no further action is needed	INESC TEC	During the project, after the project
<b>Communication and dissemination</b>	TBC	All Partners	TBC

Table 18. Exploitation plan for the Multi-sensing Module

Name of the KER №6	Multi-sensing Module
<b>KER Description</b>	Innovative sensors in an integrated configuration with optical signal acquisition, analysis systems and communication with the control system will allow broad wavelengths. End-users: (Algae) aquaculture producers, RAS technology developers, and water treatment plants.
<b>Owners of the KER</b>	INESC TEC
<b>Potential users and expected benefits from exploiting the KER</b>	Patent
<b>Potential exploitation route</b>	TBC

Actions needed for the Multi-sensing Module:

Table 19. Actions needed for the Multi-sensing Module

	What?	Who?	When?
IPR	Patent	INESC TEC	During the project, after the project
Communication and dissemination	TBC	TBC	TBC

Table 20. Exploitation plan for the N,P recovery from RAS sludge

Name of the KER №7	<b>N,P recovery from RAS sludge:</b> Optimised process to valorise low -quality biomass to produce medium ingredient for algae growth, improving circularity and reducing the need for commercial substrates. End-users: Algae producers
Owners of the KER	LEITAT
Potential users and expected benefits from exploiting the KER	Trade secret
Potential exploitation route	Internal use

Actions needed for the Multi-sensing Module:

Table 21. Actions needed for the Multi-sensing Module

	What?	Who?	When?
IPR	Trade secret	LEITAT	During the project
Communication and dissemination	INNOAQUA consortium will make this exploitable result widely accessible according to its exploitation route.	All Partners	TBC

Table 22. Exploitation plan for the Seaweed Biorefinery Processes and Ingredients

Name of the KER №8	Seaweed Biorefinery Processes and Ingredients
KER Description	Development of adequate extracting procedures for seaweed biomass grown in IMTA system – a new biorefinery approach aiming at full exploitation of the biomass and zero waste. End-users: industries developing food and feed solutions based on algae, algae producers.
Owners of the KER	A4F
Potential users and expected benefits from exploiting the KER	Trade secret
Potential exploitation route	Internal use

Actions needed for the Multi-sensing Module:

Table 23. Actions needed for the Multi-sensing Module

	What?	By Who?	When?
IPR	Trade secret	AF4	During the project
Communication and dissemination	INNOAQUA consortium will make this exploitable result widely accessible according to its exploitation route.	All Partners	TBC

Table 24. Exploitation plan for the Microalgae Biorefinery Processes and Ingredients

<b>Name of the KER №9</b>	<b>Microalgae Biorefinery Processes and Ingredients</b>
<b>KER Description</b>	Scale up process to obtain ingredients from microalgae grown in RAS system that fit consumer demands for more sustainable and healthy food products that have good flavour, aroma and texture. End-users: Microalgae producers and processors
<b>Owners of the KER</b>	ALGEMY
<b>Potential users and expected benefits from exploiting the KER</b>	Trade secret, Patent
<b>Potential exploitation route</b>	Internal use, seafood formulation developers and product manufacturers

Actions needed for the Microalgae Biorefinery Processes and Ingredients:

Table 25. Actions needed for the Microalgae Biorefinery Processes and Ingredients

	What?	Who?	When?
IPR	Trade secret, Patent	ALGEMY	During the project
Communication and dissemination	INNOAQUA consortium will make this exploitable result widely accessible according to its exploitation route.	All Partners	TBC

Table 26. Exploitation plan for the Functional FPH from fish processing waste

Name of the KER №10	Functional FPH from fish processing waste
KER Description	Optimized process for the production of FPH from fish by-products, showing equivalent or better bioactivity to commercial fish protein hydrolysates obtained from whole fish or fish muscle. End-users: Food (ingredient), beverage and feed companies, nutraceutical companies
Owners of the KER	LEITAT
Potential users and expected benefits from exploiting the KER	Secret know-how
Potential exploitation route	Internal use

Actions needed for the Functional FPH from fish processing waste:

Table 27. Actions needed for the Functional FPH from fish processing waste

	What?	Who?	When?
IPR	Secret know-how	AF4	During the project
Communication and dissemination	INNOAQUA consortium will make this exploitable result widely accessible according to its exploitation route.	All Partners	TBC

Table 28. Exploitation plan for the Formulated food products/ingredient blends

Name of the KER №11	Formulated food products/ingredient blends
KER Description	Formulated (vegan) products with improved sustainability and techno-functional properties with specific benefits as described in Table 1. Ingredient combinations may be commercialized as blends. For hybrid products (FPHs + algae) it is expected that the combination will create synergies that will further enhance end-product properties and increase the added value, application range and commercial uptake of the blend with respect to their individual use. End-users: Food/ingredient blend producers and retailers, Consumers
Owners of the KER	VIVA MARIS, PESCANOVA, ALGEMY, LEITAT

Potential users and expected benefits from exploiting the KER	Patent, Secret-know how
Potential exploitation route	Internal use

Actions needed for the Functional FPH from fish processing waste:

Table 29. Actions needed for the Functional FPH from fish processing waste

	What?	Who?	When?
IPR	Patent, Secret-know how	VIVA MARIS, PESCANOVA,ALGEMY, LEITAT	During the project
Communication and dissemination	INNOAQUA consortium will make this exploitable result widely accessible according to its exploitation route.	All Partners	TBC

Table 30. Exploitation plan for the Bio based packaging solutions

Name of the KER №12	<b>Bio based packaging solutions</b>
KER Description	Bio based resins solutions with better sustainability performance (produced with algae leftovers) and better mechanical properties than conventional algae alternatives due to increased polysaccharide content.
Owners of the KER	ERANOVA



Potential users and expected benefits from exploiting the KER	Patent extension, Using coproducts of algae industry and the production of environmental friendly bioplastics
Potential exploitation route	Internal use, FDA approved, same mechanical properties of the produced biomaterials

Actions needed for the Bio based packaging solutions:

Table 31. Actions needed for the Bio based packaging solutions

	What?	Who?	When?
IPR	Patent, Secret-know how	ERANOVA	During the project
Communication and dissemination	INNOAQUA consortium will make this exploitable result widely accessible according to its exploitation route.	All Partners	TBC

## 4. Individual Exploitation Plans

This section summarises, in tabular format, the KERs of the **INNOAQUA** project that each partner is currently interested in exploiting the most, as well as how they intend to proceed to this end.

### 1. NORCE

Table 32. NORCE's individual exploitation plan

Results of major interest:	<ol style="list-style-type: none"> <li>1) ABM of the market diffusion of innovative seafoods;</li> <li>2) Integrated RAS and microalgae cultivation process (incl. microbiome data and pest control strategies);</li> <li>3) Production of microalgae on treated fish sludge.</li> </ol>
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<b>How do you intend to proceed?</b>	<p>25L photobioreactor for microalgae cultivation will be integrated with a salmon RAS, and the production process will be optimised (incl. microbiome analysis and pest control strategies). Once the process is optimised, we will test this at larger scale at VIKING AQUA;</p> <p>Fish sludge will be treated by LEITAT. The resulting soluble nutrient solution will be tested at lab-scale by NORCE as nutrient source for microalgae cultivation.</p>
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## 2. VIKINGAQUA

Table 33. VIKINGAQUA’s individual exploitation plan

<b>Results of major interest:</b>	TBC
<b>How do you intend to proceed?</b>	TBC

## 3. RASLAB

Table 34. RASLAB’s individual exploitation plan

<b>Results of major interest:</b>	TBC
<b>How do you intend to proceed?</b>	TBC

## 4. ALGEMY

Table 35. ALGEMY’s individual exploitation plan

<b>Results of major interest:</b>	Extraction protocols from microalgae (exploitable assets number 9). Ingredients from the extracted products (exploitable assets number 9). Formulated seafood products (snacks and powdered meals) (exploitable assets number 11).
<b>How do you intend to proceed?</b>	Different extraction methods will be tested for each microalgae cultivated in WP2 in order to produce different compound-rich extracts (WP3). Each extract will be later improved in terms of stability, texture... to produce the different ingredients (T4.2), and finally different seafood products prototypes will be formulated using the ingredients (and maybe some other obtained from seaweed and fish waste) and tested in terms of stability and consumer acceptance (T4.3). The best ingredients and formulations will be selected for commercialization.

5. A4F

Table 36. A4F's individual exploitation plan

<b>Results of major interest:</b>	TBC
<b>How do you intend to proceed?</b>	TBC

6. SEA8

Table 37. SEA8's individual exploitation plan

<b>Results of major interest:</b>	TBC
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How do you intend to proceed?	TBC
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## 7. INESC-TEC

Table 38. INESC-TEC’s individual exploitation plan

Results of major interest:	<p>Sensing platform prototype integrated in the demo site to provide real-time information about water parameters (key exploitable assets 6).</p> <p>Digital Twin Backbone prototype, integrated with the demo site to collect, process, and monitor information from different sensors (key exploitable assets 5).</p>
How do you intend to proceed?	<p>A set of optical sensors, developed within INNOAQUA, will be integrated in an intelligent module capable of measuring dissolved carbon dioxide, nitrates level, spectral turbidity, light, and temperature. Different techniques will be studied and implemented depending on the sensing target and also preventing biofouling techniques will be tested. This module will be tested and implemented in Demo 2 in WP2 and the results will be used by the consortium to optimize the algae production process.</p> <p>The Digital Twin Backbone will also be developed, implemented, and tested in demo 2 in WP 2 and the results will be used by the consortium to optimize the algae production process.</p> <p>As part of the results exploration strategy, scientific publications, participation in conferences, and patent submissions are included. After the project, the developed</p>

	<p>prototype, considering the results obtained, will be implemented in other sectors of aquaculture activity and other industrial sectors, where it will be capable of personalized adaptations with the addition of sensors for other parameters.</p>
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## 8. LEITAT

Table 39. LEITAT’s individual exploitation plan

<p><b>Results of major interest:</b></p>	<p>Guidelines for the recovery of nutrients from sludge. Guidelines for the production of fish protein hydrolysates as techno and bio-functional ingredients (antioxidant, antihypertensive, antiinflammatory). Formulated seafood products.</p>
<p><b>How do you intend to proceed?</b></p>	<p>Different extraction methods will be tested for RAS sludge in WP2 in order to recover nutrients (N,P), which will be tested as medium ingredient for the algae cultivation. In WP3 different fish protein hydrolysates from fish by products will be produced and tested for their techno and bio-functionalities and finally, the most promising one will be scaled up (Task 3.4). In WP4, the fish protein hydrolysate will be dried to obtain the ingredient in powder form to be formulated in sea food products (WP4).</p>

## 9. ERANOVA

Table 40. ERANOVA’s individual exploitation plan

<b>Results of major interest:</b>	Research on the production of bio based resin solutions from residual algae fraction
<b>How do you intend to proceed?</b>	<p>The residual algae fraction will be characterised to compare it to our products at Eranova.</p> <p>The analysis of this feedstock will let us know if its concentration in Polysaccharides is better, a greater concentration means better mechanical properties.</p> <p>Furthermore by using residual algae fraction, we use a byproducts of the industry and upcycle it to reduce the carbon impact of plastic production. Enhancing its sustainability potential.</p> <p>Biobased material solutions will be produced with this feedstock and mechanical measurement will be done. Depending on the results, the applications of these biobased materials will be defined. Different formulations will be made and tested. Economic and carbon analysis will be made.</p> <p>If this solution is economically viable, work on the supply and steadiness of the feedstock will be made.</p>

## 10. PESCANOVA

Table 41. PESCANOVA's individual exploitation plan

<b>Results of major interest:</b>	TBC
<b>How do you intend to proceed?</b>	TBC

## 11. VIVA MARIS

Table 42. VIVA MARIS's individual exploitation plan

<b>Results of major interest:</b>	<p>Research on new vegan meat alternatives and breatspreads with improved sustainability and the techno-functional properties of algae.</p>
<b>How do you intend to proceed?</b>	<p>With the help of the algae substrates we will try to produce a vegan meat alternative as well as other vegan products. The increase in proteins and possible vitamins is crucial here and must be given special attention. We also have to pay attention to the color of the added raw algae mass in order to produce a tasty and attractive product for the consumer.</p> <p>If the result is economically viable, we then work on mass production.</p>

## 12. SUSTAINN

Table 43. SUSTAINN's individual exploitation plan

<b>Results of major interest:</b>	<p>Dissemination about the results of T5.2 (socio-economic assessment) and T5.3 (Life cycle Sustianability-Circularity Assessment)</p>
<b>How do you intend to proceed?</b>	<p>Organization of several webinars about results from socio-economic and LCCA-LCSA (LCA, LCC, S-LCA) assessments done within the project</p>

## 13. EAS

Table 44. EAS’s individual exploitation plan

<b>Results of major interest:</b>	<p>Report showcasing the DEMOs alignment with the EAA management, as well as regulatory bottlenecks hindering the deployment of IMTA in Europe.</p>
<b>How do you intend to proceed?</b>	<ul style="list-style-type: none"> <li>• Webinars (at dates to be agreed, on subjects to be agreed and with presenters from within the consortium)</li> <li>• One feature article describing main deliverables for our magazine</li> <li>• Short news items/items from the project newsletter in our bi-monthly newsletter</li> <li>• SM posts whenever we have content from you/partners or we can make content when key documents are published online.</li> <li>• We can also see how best to integrate the project science in our events - AQUA2024 in August in Copenhagen and AE2025 in Valencia in September.</li> </ul>

#### 14. PERSEUS BVBA

Table 45. PERSEUS BVBA’s individual exploitation plan

<b>Results of major interest:</b>	<p>Report on deliverable D5.3</p>
<b>How do you intend to proceed?</b>	<p>The report will be of importance to the consotium. It will summarise the applicable legislation in general and focus on specific issues to clarify.</p>



15. UFRJ

Table 46. UFRJ’s individual exploitation plan

Results of major interest:	TBC
How do you intend to proceed?	TBC

## 5. Conclusion and way forward

This initial version of the INNOAQUA Exploitation Strategy and IP Management Plan has described the strategy and methodology employed in this respect within the framework of INNOAQUA, while also provided an overview of its Background and Foreground as well its Key Exploitable Results (KERs).

The IPR Matrix serves as a tool, has been elaborated in order to facilitate the identification and management of INNOAQUA’s KERs by project partners under the supervision of the Exploitation Manager (PEDAL) throughout the project.

Accordingly, the Exploitation Strategy and IP Management Plan of INNOAQUA will be updated to reflect the final project results along with their protection, ownership, access rights with the support of all partners. The interim and final version of the report will provide a more accurate outline of the main exploitable results of the project, the main target groups of external stakeholders and the potential benefits to them from INNOAQUA’s outcomes, the exploitation plans per KER, individual exploitation plan per partner and per groups of partners.

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