



D10.8– Intellectual Property Report v1

WP10 – WP Impact Creation,
Dissemination and Exploitation

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ABSTRACT	In the current deliverable, the activities performed in the project for the purpose of managing the knowledge and protecting the intellectual property of the results generated within aqua3S are reported. A comprehensive list of the assets generated during the project time span is provided and all ownership rights are specified.		

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ABBREVIATIONS/ACRONYMS

3D	3-Dimensional
CA	Consortium Agreement
CEN	European Committee for Standardization
DoA	Description of Actions
EPO	European Patent Office
EU	European Union
EUIPO	European Union Intellectual Property Office
GA	Grant Agreement
IP	Intellectual Property
IPR	Intellectual Property Rights
NH ₃	Ammonia
SEP	Standard Essential Patent
TC	Technical Committee
WP	Work Package

1. Executive summary

Deliverable D10.8 serves as aqua3S' IPR plan. The aim of the deliverable is to establish the Intellectual Property (IP) protection of the proposed solutions. More specifically, the goal is to record all assets that could potentially lead to valuable IP with commercial prospects and, on the other hand, to establish the rules of ownership, protection and management of the generated results to balance the need to disseminate the project results without discarding the opportunity to commercially exploit valuable knowledge.

Deliverable D10.8 starts by specifying the IPR strategy adopted in aqua3S. The strategy describes the adopted methodology and the knowledge management framework. The latter identifies the project's Grant Agreement and Consortium Agreement as the main document sources regulating the management of knowledge and intellectual property.

Next the deliverable provides aqua3S's IPR Plan, which starts with a summary of the IP assets that have been identified by all consortium members categorized on the bases of WP and ownership. Additionally, the deliverable describes the most widely used instruments for protecting IP.

Finally, aqua3S' framework for knowledge management provides a review of all IPR-related clauses that are included in aqua3S' Grant Agreement and Consortium Agreement. By going through these clauses, the goal is to translate them into clear and comprehensible rules for all consortium members to follow. In establishing these rules, the main concern has been to balance the trade-off between the need to adequately disseminate the project results, without discarding the opportunity to timely protect and commercially exploit valuable IP.

2. Introduction

The purpose of Deliverable D10.8 is to report activities that focus on management of knowledge and intellectual properties' protection of assets generated by the aqua3S consortium. It also aims to certify rules and processes that will be put into practice for protecting, accessing and transferring the produced assets. The goal of D10.8 is twofold:

- a. Describe the methodology that will be employed for collecting and analysing the key IP assets generated by aqua3S consortium; and
- b. Determine the rules and processes for protecting, accessing and transferring the project results that falls under IPR protection.

Even though the project is ongoing and the respective technologies are still being developed, it is useful to foresee the expected IP assets, in order to form a protection plan. The identification of assets does not entail specific actions to be taken within a specific timeframe. Instead, prospects of IP generation are examined with a view of setting up appropriate processes that would allow translation of the IP into concrete benefits. Therefore, deliverable D10.8 provides an initial record of aqua3S IP opportunities and highlights promising areas for IP protection. The aim is to alert aqua3S partners on the need to take steps and avoid early disclosure of valuable intellectual property, before it has been properly protected.

The intention of the deliverable is also to translate the IPR-related terms and conditions as they appear in aqua3S Grant Agreement (GA) and Consortium Agreement (CA), into a comprehensive framework for protecting, accessing, transferring and exploiting the IP assets generated within the project. For this reason, the deliverable discusses issues related to access rights, results ownership (i.e. joint ownership, transfer of results, granting licenses), protection of results (patents, trademarks) and the notification procedure for publications.

Deliverable D10.8 follows the subsequent structure:

Section 3 describes the IPR strategy by providing an overview of the methodology followed for compiling the IPR plan, as well as the approach taken for establishing the aqua3S framework for knowledge management. It also presents all the assets identified by the consortium and the various methods for protecting their ownership rights.

Section 4 outlines the clauses constituting the aqua3S framework for protecting and managing the project results.

Section 5 concludes the deliverable.

3. IPR Strategy

aqua3S has been designed specifically to foster the exploitation of its results, which requires clear IPR agreements and flexible ownership schemes. Furthermore, aqua3S requires mixing knowledge and competences across the entire spectrum of consortium partners. In order to succeed in exploiting the project results, therefore, the consortium needs to answer the following questions:

- What kind of results is expected in aqua3S?
- How will the results be managed?
- How will the joint ownership be treated?
- How will the results of the project be protected?
- How will the results be made public and disseminated?
- How will the results be exploited?

The following sections provide answers to these questions.

The IPR strategy will be focused and concise to protect the innovations developed within the lifetime of the project with a set of agreements that are planned (D1.2) to clearly identify:

- IPR ownership;
- Exploitation rights (and royalties) by the different industrial partners;
- IPR protection (e.g. patenting, trademarks, etc.);
- IPR exploitation strategy at consortium and partner level.

This will help in maximizing the returns on the human, capital and intellectual investments. In addition to the approval procedures for documents, publications and standards contributions, the management of knowledge was described in the Grant Agreement, rules for participation and Consortium Agreement between the partners, specific IPR agreements will also be released later in the project, possibly before its end to ensure the exploitation strategy is identified.

The management of knowledge and intellectual property and other aspects of innovation described in the proposal are undertaken in specific activities within work packages. We foresee two types of activity:

- IPR applications for new systems and solutions that are being developed by consortium partners; and
- Information disseminated within the project and externally, such as publications, presentations and regulations and standards, only after the necessary steps for ensuring the protection of IPRs have been made.

This ensures that IP will be secured in the interest of project partners.

3.1 Intellectual property plan methodology

In assembling the list of potential IP assets the following steps were taken:

- Development of a supporting document to collect information from the aqua3S partners about IP rights;
- Collecting information from partners;
- Creating a matrix of ownership and exploitation rights to identify possible conflicts between partners;
- Resolving minor conflicts.

The supporting document that was created to identify IP rights was heavily based on the previous work done in the consortium agreement. Additionally, the purpose of the document was: (i) to become a reference tool for the partners; (ii) to validate that all components, solutions, tools were properly identified and written down; and to (iii) identify the owner(s) of the different components, solutions, tools.

The document that was shared with the partners listed all the components, solutions, and tools while requiring them to claim if they had an exploitation right or exploitation obligation (Supporting document found in the Appendix). Based on their input an IPR matrix was created. Issues that were raised during the process were resolved with one-to-one calls with partners, while a call with the participation of multiple partners was also arranged.

3.2 Knowledge management framework

Next to identification of the IP assets, the goal of the deliverable D10.8 is to define the framework for managing the knowledge. To achieve this, the deliverable defines a set of clear and comprehensive rules covering aspects such as:

- a. access rights (to background and results);
- b. results ownership (i.e. joint ownership, transfer of results); and
- c. protection of results.

The defined rules are based on the information included in three different documents: (a) The model Grant Agreement H2020 (GA), which gives general principles and rules for a number of IPR-related issues by establishing the rights and obligations of beneficiaries towards the European Commission regarding IPR management; (b) the Consortium Agreement (CA) that was agreed among the partners and defines (among others) the background knowledge that was brought to the project by each partner; and (c) the Description of Actions that has already made a set of strategic decisions with respect to knowledge management and IPR.

For all three documents the IPR-related sections were analysed and discussed to clarify their implications in the context of aqua3S.

3.3 Types of knowledge

Background knowledge is knowledge that is relevant to a collaborative venture or open innovation project that is supplied by the partners at the start of the project while Foreground knowledge is produced during the project's tenure.²

3.3.1 Background

We define as Background any data, know-how or information – whatever its form or nature (tangible or intangible), including any rights such as intellectual property rights – that: (a) is held by the beneficiaries before they acceded to the Consortium Agreement; and (b) is needed to implement the action or exploit the results.

3.3.2 Foreground

The project results and their protection policies, related to copyright; design rights; patent rights; or similar forms of protection.

3.4 Record of intellectual property assets

The goal of this sub-section is to present the list of IP assets, as solicited by all consortium members.

All aqua3S partners involved in tasks that may result in the generation of IP are required to consider their own work within each WP, in order to fill-in the corresponding tables. The feedback received by all partners is summarized in the tables below and will be updated regularly during the project lifetime.

Commercially Exploitable Components
Refractive Index Sensor
NH3 Sensor
Visual Content Acquisition Module
Social Media Crawlers
aqua3S Ontology
Data Management Platform
Anomaly Detection Module
Developed Crisis Management Scenarios
Optimization And Parallelization Module
3D Visualization Module For The Network
Visual Analytics Module
Intervention Management Model
Crisis Classification And Decision Support Module
Real Time Computation Of The Water Demand Forecast
Real Time Management Of The Production And Distribution Network
Water Quality Monitoring And Early Warning Component
aqua3S Platform
Interactive User Interfaces

Table 1. aqua3S commercially exploitable components

Non-Commercially Exploitable Components
Pilot Data Of The Trieste Aqueduct
Pilot Data Of Drinking Water Treatment Plants Of Sofia
Pilot Data Of The Desalinated And Treated (Surface) Of Lemesos
Pilot Data Of Aliakmonas River And Thessaloniki Water Treatment Plant
Pilot Data Of The SEPG Water Supply System Of Paris
Pilot Data Of The Water Supply System In The City Of Brussels

Non-Commercially Exploitable Components
aqua3S Business Models
Guidelines For Utility Providers To Engage Communities
Production Of A Standardized Set Of Warning Messages
Emergency Response Plans For The Water Sector
Laser Optimized Design For NH3 Detection
aqua3S Logo
Definition Of New Water Security CEN/TC Standards
Policy Recommendations Regarding Water Security

Table 2. aqua3S non-commercially exploitable components

It should be noted that pilot data will not contain personal information. More information on data minimization, protection of the rights and freedoms of the data subject and preliminary ethics and legal framework can also be found in D11.5, D11.6 and D2.2 respectively.

3.5 Ownership schemas and IPR matrix

Based on the needs of the project, four types of ownership rights were identified:

1. **Single ownership of a component.** A single partner will own rights with regard to the aqua3S component. Should sharing of rights be required with individual partners for a given component, it will be the subject of a separate agreement.
2. **Joint ownership of a component.** Multiple partners will own joint rights with regard to the aqua3S component. The exact sharing of the rights of this foreground component is the subject of a separate agreement.
3. **Single ownership of a component for retailing/licensing.** A single partner will own the aqua3S exploitable component for producing and retailing, licensing and/or actively come to an agreement with a third-party company capable of producing and retailing the component.
4. **Joint ownership of a component for retailing/licensing.** Multiple partners will own the aqua3S exploitable component for producing and retailing, licensing and/or actively come to an agreement with a third-party company capable of producing and retailing the component.

The following table summarizes the ownership rights identified at this point in time of the project.

Technical Components	Ownership Schema	Owner
Refractive Index Sensor	Single Ownership	ICCS
NH3 Sensor	Joint ownership for retailing/licensing	MIRS and FZU
Visual Content Acquisition Module	Single Ownership	CERTH
Social Media Crawlers	Single Ownership	CERTH
aqua3S Ontology	Single Ownership	CERTH
Data Management Platform	Single Ownership	ICCS

Anomaly Detection Module	Single Ownership	UNEXE
Developed Crisis Management Scenarios	Single Ownership	DRAXIS
Optimization And Parallelization Module	Joint ownership for retailing/licensing	USTUTT and UNEXE
3D Visualization Module For The Network	Single Ownership	UNEXE
Visual Analytics Module	Single Ownership	CERTH
Intervention Management Model	Single Ownership	UNEXE
Crisis Classification And Decision Support Module	Single ownership	CERTH
Real Time Computation Of The Water Demand Forecast	Single Ownership	CERTH
Real Time Management Of The Production And Distribution Network	Single Ownership	CERTH
Water Quality Monitoring And Early Warning Component	Single Ownership	CERTH
aqua3S platform	Single Ownership	EVERIS
Interactive User Interfaces	Single ownership	DRAXIS

Table 3. Ownership rights

3.5.1 Assets classified by Partner

3.5.1.1 ALL PARTNERS

Asset	aqua3S Logo
Description	Logo adopted to identify aqua3S' products and services
Exploitation Rights	Joint ownership
Co-owner	All consortium partners

Table 4. aqua3S logo ownership

Asset	aqua3S Business Models
Description	Business models incorporated for the exploitation of aqua3S
Exploitation Rights	Joint ownership
Co-owner	All consortium partners

Table 5. aqua3S business models ownership

3.5.1.2 ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS (Centre for Research and Technology Hellas, CERTH)

Asset	Visual Content Acquisition Tool
Description	The main purpose of this component is to identify events threatening water safety and/or security based on collected data from satellites and drones.
Exploitation Rights	Single ownership
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 6. Visual content acquisition tool ownership

Asset	Social Media Crawler
Description	The social media crawler collects Twitter posts in a real-time manner from citizen observations that are relevant to the subject of water safety and security
Exploitation Rights	Single ownership
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 7. Social media crawler ownership

Asset	aqua3S ontology
Description	The aqua3S ontology semantically represents the knowledge produced within aqua3S. It includes data from sensors, social media, drones, satellites, call complaints which are the sources of the information and data produced from aqua3S modules such as alerts, and crisis representation.
Exploitation Rights	Single ownership
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 8. aqua3S ontology ownership

Asset	Visual Analytics Module
Description	The visual analytics module concerns the design and development of context specific interfaces to ensure the digestibility of data/information presented to the end-user. The visual analytics interface provides an environment that enables the operator to manipulate collected data in a real-time manner, whilst also providing a number of pre-determined visualizations and alerts
Exploitation Rights	Single ownership
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 9. Visual analytics module ownership

Asset	Crisis Classification And Decision Support Module
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Description	Crisis Classification module fuses heterogeneous data aiming to provide early warnings or real-time assessments for the crisis severity level, covering the pre-emergency and emergency phase
Exploitation Rights	Single ownership
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 10. Crisis classification and decision support module ownership

Asset	Real Time Computation Of The Water Demand Forecast
Description	IT application that automatically computes in real time the water demand forecast for each water consumption area from different information
Exploitation Rights	Single ownership
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 11. Real time computation of the water demand forecast ownership

Asset	Real Time Management Of The Production And Distribution Network
Description	IT application that automatically computes in real time optimal management scenarios for the water supply system
Exploitation Rights	Single ownership
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 12. Real time management of the production and distribution network ownership

Asset	Water Quality Monitoring And Early Warning Component
Description	Provides automatic early warnings via emails related to the overtopping of some predefined alert thresholds in the measurements by the sensors
Exploitation Rights	Single ownership
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 13. Water quality monitoring and early warning component ownership

3.5.1.3 VIVAQUA SCRL (VVQ)

Asset	Pilot Data Of The Water Supply System In The City Of Brussels
Description	Data collected during the operational phase of the pilot
Exploitation Rights	Single ownership

Table 14. Pilot data of the water supply system in the city of Brussels ownership

3.5.1.4 WATER BOARD OF LEMESOS (WBL)

Asset	Pilot Data Of The Desalinated And Treated (Surface) Of Lemesos
Description	Data collected during the operational phase of the pilot
Exploitation Rights	Single ownership

Table 15. Pilot data of the desalinated and treated (surface) of Lemesos ownership

3.5.1.5 DRAXIS ENVIRONMENTAL S.A.

Asset	Developed Crisis Management Scenarios
Description	Web application that visualizes the results of the crisis management tool. The module will allow the user to develop scenarios for certain crises and provide suggestions for managing the crises, based on the modeling of the pilot cases
Exploitation Rights	Single ownership for retailing/licensing
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 16. Developed crisis management scenarios ownership

Asset	Interactive User Interfaces
Description	Web application that will be used by the end users of aqua3S to interact with the overall system and have access to all the technical solutions of aqua3S
Exploitation Rights	Single ownership for retailing/licensing
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 17. Interactive user interfaces ownership

3.5.1.6 SHEFFIELD HALLAM UNIVERSITY'S CENTRE OF EXCELLENCE IN TERRORISM, RESILIENCE, INTELLIGENCE & ORGANISED CRIME RESEARCH (CENTRIC)

Asset	Guidelines For Utility Providers To Engage Communities
Description	Guidelines on how to effectively disseminate information to citizens in times of an emergent or ongoing emergency
Exploitation Rights	Single ownership

Table 18. Guidelines for utility providers to engage communities ownership

Asset	Production Of A Standardized Set Of Warning Messages
Description	Language agnostic warning messages to disseminate to citizens for a range of emergent or ongoing emergency
Exploitation Rights	Single ownership

Table 19. Production of a standardized set of warning messages ownership

3.5.1.7 FYZIKALNI USTAV AV CR V.V.I. (Institute of Physics of the Academy of Sciences, IP-ASCR)

Asset	NH3 Sensor
Description	This module provides the ammonia concentration of a water sample in real time.
Exploitation Rights	Joint ownership for retailing/licensing
Co-owner	MIRSENSE
Exploitation Responsibility	Joint responsibility for agreement with external distributor

Table 20. NH3 sensor ownership (FZU)

Asset	Laser Optimized Design For NH3 Detection
Description	Design optimized for NH3 detection
Exploitation Rights	Joint ownership
Co-owner	MIRSENSE

Table 21. Laser optimized design for NH3 detection ownership

3.5.1.8 MIRSENSE

Asset	NH3 Sensor
Description	This module provides the ammonia concentration of a water sample in real time.
Exploitation Rights	Joint ownership for retailing/licensing
Co-owner	FYZIKALNI USTAV AV CR V.V.I. (Institute of Physics of the Academy of Sciences, IP-ASCR)
Exploitation Responsibility	Joint responsibility for agreement with external distributor

Table 22. NH3 sensor ownership (MIRS)

Asset	Laser Optimized Design For NH3 Detection
Description	Design optimized for NH3 detection
Exploitation Rights	Joint ownership
Co-owner	FYZIKALNI USTAV AV CR V.V.I. (Institute of Physics of the Academy of Sciences, IP-ASCR)

Table 23. Laser optimized design for NH3 detection ownership

3.5.1.9 AUTORITA' DI BACINO DISTRETTUALE DELLE ALPI ORIENTALI (AAWA)

Asset	Pilot Data Of The Trieste Aqueduct
Description	Data collected during the operational phase of the pilot
Exploitation Rights	Single ownership

Table 24. Pilot data of the Trieste aqueduct ownership

Asset	Definition Of New Water Security CEN/TC Standards
Description	Report on standardization research and activities as well as strategy proposal for future work on water security standardization
Exploitation Rights	Single ownership

Table 25. Definition of new Water Security CEN/TC Standards ownership

Asset	Policy Recommendations Regarding Water Security
Description	Report on the current and proposed European legal framework, on the challenges within that framework and policy recommendations for the future of water security
Exploitation Rights	Single ownership

Table 26. Policy recommendations regarding Water Security ownership

3.5.1.10 ETAIRIA HYDREFSIS KAI APOCHETEFSIS THESSALONIKIS AE (Thessaloniki Water Supply and Sewerage Company SA, EYATH)

Asset	Pilot Data Of Aliakmonas River And Thessaloniki Water Treatment Plant
Description	Data collected during the operational phase of the pilot
Exploitation Rights	Single ownership

Table 27. Pilot data of Aliakmonas river and Thessaloniki Water Treatment Plant ownership

3.5.1.11 THE UNIVERSITY OF EXETER (UNEXE)

Asset	Anomaly Detection Module
Description	Data collected from sensors will be analyzed using machine learning or statistical models to detect and localize the anomaly
Exploitation Rights	Single ownership for retailing/licensing
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 28. Anomaly detection module ownership

Asset	Optimization And Parallelization Module
Description	The module's objective is to optimize the anomaly detection module developed by UNEXE in terms of serial, as well as parallel performance and efficiency
Exploitation Rights	Joint ownership for retailing/licensing
Co-owner	UNIVERSITY OF STUTTGART, HIGH PERFORMANCE COMPUTING CENTRE (USTUTT)
Exploitation Responsibility	Joint responsibility for retailing/licensing

Table 29. Optimization and parallelization module ownership

Asset	3D Visualisation Module For The Network
Description	Tool for interactive demonstration of spatial information, including the water distribution network with access to all of the modules included in a particular case
Exploitation Rights	Single ownership for retailing/licensing
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 30. 3D visualisation module for the network ownership

Asset	Intervention Management Model
Description	The intervention management model can be used to evaluate options for reducing the impact of anomalies within water distribution network
Exploitation Rights	Single ownership for retailing/licensing
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 31. Intervention management model ownership

3.5.1.12 SUEZ SMART SOLUTIONS (3S)

Asset	Pilot Data Of The SEPG Water Supply System Of Paris
Description	Data collected during the operational phase of the pilot
Exploitation Rights	Joint ownership

Table 32. Pilot data of the SEPG Water Supply System of Paris ownership

3.5.1.13 INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS (ICCS)

Asset	Refractive Index Sensor
Description	Data visualization module that visualizes sensors on the interactive map
Exploitation Rights	Single ownership for retailing/licensing
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 33. Refractive Index sensor ownership

Asset	Data Management Platform
Description	The data management platform, along with the offered OGC SWE services, is the aqua3S module that is responsible for the management and the storage of heterogeneous data collected
Exploitation Rights	Single ownership for retailing/licensing
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 34. Data Management Platform ownership

3.5.1.14 SOFIYSKA VODA AD

Asset	Pilot Data Of Drinking Water Treatment Plants Of Sofia
Description	Data collected during the operational phase of the pilot
Exploitation Rights	Single ownership

Table 35. Pilot data of drinking water treatment plants of Sofia ownership

3.5.1.15 EVERIS SPAIN SL

Asset	aqua3S Platform
Description	The platform that facilitates the combination of all aqua3S modules ready for deployment
Exploitation Rights	Single ownership for retailing/licensing
Exploitation Responsibility	Single responsibility for retailing/licensing

Table 36. aqua3S platform ownership

3.5.1.16 AZIENDA UNITA LOCALE SOCIO SANITARIA N 2 MARCA TREVIGIANA (LHA2)

Asset	Emergency Response Plans For The Water Sector
Description	Plans that address emergency situations related to the water sector
Exploitation Rights	Single ownership

Table 37. Emergency response plans for the water sector ownership

3.5.1.17 UNIVERSITY OF STUTTGART, HIGH PERFORMANCE COMPUTING CENTRE (USTUTT)

Asset	Optimization And Parallelization Module
Description	The module's objective is to optimize the anomaly detection module developed by UNEXE in terms of serial, as well as parallel performance and efficiency
Exploitation Rights	Joint ownership for retailing/licensing
Co-owner	THE UNIVERSITY OF EXETER (UNEXE)
Exploitation Responsibility	Joint responsibility for retailing/licensing

Table 38. Optimization and parallelization module ownership

3.6 Instruments for protecting results

The standard forms of protection relevant to aqua3S' assets are:

- Copyright;
- Patents;
- Trademarks;
- Trade-secrets.

Distinction is made between intellectual property rights (IPRs) such as copyright, patents and trademarks, and trade secrets, since trade secrets are not recognized as IPRs. Overall, IPRs are the

rights given to individuals over the creations of their minds. They give the creator an exclusive right over the use of his/her creation for a certain period of time based on imposed regulations. The following section provides a brief description of each form of protection.

3.6.1 Copyright

Copyright is a type of intellectual property that gives its owner the exclusive right to make copies of a creative work, usually for a limited time.³ The creative work may be in a literary, artistic, educational, or musical form. Copyright is intended to protect the original expression of an idea in the form of a creative work, but not the idea itself. The requirement of originality essentially means that a work must reflect the author's personality, i.e. whether he/she has been able to express his/her own creativity by making free choices. It also implies an intellectual effort from the author. Contrary to patents and trademarks, copyright protection is automatic and not granted by a particular governmental institution. It should be kept in mind that copyright law is not harmonized, which means that the principle of territoriality applies. As a result, protection in one region or country does not automatically extend to the rest of the world. In Europe, copyright protection lasts for the lifetime of the author of the work, plus an additional 70 years after the death of the author.

3.6.2 Patents

Patents are exclusive rights granted for a new technical invention. A patent holder can grant a licence to somebody wishing to produce copies of the invention against payment of a fee (or royalty), thus obtaining a return on the investment. Patents must be applied for and are granted by national or regional patent offices (e.g. the European Patent Office (EPO)).⁴ The application for a patent at a national or regional office means that the geographical scope of protection of the invention will differ. Application for a European Patent at the EPO still requires validation at national offices to benefit from the protection. A patent applicant must disclose the invention to the Office in a manner sufficient, clear and complete for the invention to be carried out by a person skilled in the art (in so-called "patent claims"). The term of a patent is of 20 years from the date of filing of the application. A standard essential patent (SEPs) is a patent essential to implement a specific industry standard or technical solution. The following steps are involved in the European patent granting procedure:

1. **Application.** A European patent application consists of: a request for grant, a description of the invention, claims, drawings (if any), an abstract.
2. **Filing and formalities examination.** This involves checking whether all the necessary information and documentation have been provided, so that the application can be accorded a filing date.
3. **Search.** While the formalities examination is being carried out, a European search report is drawn up, listing all the documents available to the Office that may be relevant to assessing novelty and inventive step. The search report is based on the patent claims but also takes into account the description and any drawings. Immediately after it has been drawn up, the search report is sent to the applicant together with a copy of any cited documents and an initial opinion as to whether the claimed invention and the application meet the requirements of the European Patent Convention.
4. **Publication of the application.** The application is published - normally together with the search report - 18 months after the date of filing or, if priority was claimed, the priority date. Applicants then have six months to decide whether or not to pursue their application by requesting substantive examination. Alternatively, an applicant who has requested

examination already will be invited to confirm whether the application should proceed. Within the same time limit the applicant must pay the appropriate designation fee and, if applicable, the extension fees. From the date of publication, a European patent application confers provisional protection on the invention in the states designated in the application. However, depending on the relevant national law, it may be necessary to file a translation of the claims with the patent office in question and have this translation published.

5. **Substantive examination.** After the request for examination has been made, the European Patent Office examines whether the European patent application and the invention meet the requirements of the European Patent Convention and whether a patent can be granted. An examining division normally consists of three examiners, one of whom maintains contact with the applicant or representative. The decision on the application is taken by the examining division as a whole in order to ensure maximum objectivity.
6. **The grant of a patent.** If the examining division decides that a patent can be granted, it issues a decision to that effect. A mention of the grant is published in the European Patent Bulletin once the translations of the claims have been filed and the fee for grant and publication have been paid. The decision to grant takes effect on the date of publication. The granted European patent is a "bundle" of individual national patents.
7. **Validation.** Once the mention of the grant is published, the patent has to be validated in each of the designated states within a specific time limit to retain its protective effect and be enforceable against infringers. In a number of contracting states, the patent owner may have to file a translation of the specification in an official language of the national patent office. Depending on the relevant national law, the applicant may also have to pay fees by a certain date.
8. **Opposition.** After the European patent has been granted, it may be opposed by third parties – usually the applicant's competitors – if they believe that it should not have been granted. This could be on the grounds, for example, that the invention lacks novelty or does not involve an inventive step. Notice of opposition can only be filed within nine months of the grant being mentioned in the European Patent Bulletin. Oppositions are dealt with by opposition divisions, which are normally made up of three examiners.
9. **Limitation / revocation.** This stage may also consist of revocation or limitation proceedings initiated by the patent proprietor himself. At any time after the grant of the patent, the patent proprietor may request the revocation or limitation of his patent. The decision to limit or to revoke the European patent takes effect on the date on which it is published in the European Patent Bulletin and applies *ab initio* to all contracting states in respect of which the patent was granted.
10. **Appeal.** Decisions of the European Patent Office – refusing an application or in opposition cases, for example – are open to appeal. Decisions on appeals are taken by the independent boards of appeal. In certain cases it may be possible to file a petition for review by the Enlarged Board of Appeal.

3.6.3 Trademarks

Trademarks are signs, which distinguish the goods and services of one company from those of another. As indicators of business origin, trademarks can be words, logos, devices or other distinctive features, or a combination of these. They can also be referred to as 'brands'. Trademark owners may prevent third parties not having their consent from using, in the course of trade, identical or similar signs for goods or services which are identical or similar to those registered for a trademark, when

such use would result in a likelihood of confusion. Similar to patents, trademarks must generally be registered at national or regional offices. The application for a trademark at a national or regional office means that the geographical scope of protection of the sign will differ. There are 6 steps to register a trademark in the EU.

1. The first step in this process is to conduct a comprehensive trademark search. The reason for this search is to determine whether a similar mark has already been registered in the EU before you begin the task of applying with the EUIPO.
2. Once a comprehensive trademark search has revealed no similar matches, you can proceed with filling your trademark application. You can do this either on paper or electronically through the EUIPO's website. The EUIPO also offers a Fast-Track option for trademark registration. On average, Fast-Track applications are approved 50% faster than those filed traditionally.
3. During the examination period, an EUIPO examiner will review your trademark application. Around one month after filing your application you will receive notice from the EUIPO, regarding any issues or questions that arose during the examination. This could be a concern regarding your class choice, wording, or the distinctiveness of the mark. Once you have received this notice, you will have two months to resolve any issues and respond accordingly. If needed, a two-month extension will be granted while you prepare your response.
4. Following the examination period, your trademark will be published in the EU Trademark Bulletin. During this three-month period, other trademark owners can review your publication. If they feel that your mark may infringe on their existing trademark, they may file an opposition. Once an opposition is filed, your application could be delayed or rejected completely. Opposition procedures may last two years or longer. The possibility of an opposition being filed against you reinforces the need to complete a trademark search before you file your application.
5. After the publication period, if no oppositions have been filed, the EUIPO will move to approve your trademark. Around six months after your mark is published in the EU Trademark Bulletin, you will be issued a certificate of registration. As a trademark owner in the EU, you now have legal rights to use your mark in any of its 28 member countries. You can also begin displaying the ® symbol wherever your trademark is visible, including packaging, signage, and websites.
6. The EUIPO grants trademarks, but they do not monitor or police their use. That responsibility is left to the trademark owner. In order to maintain exclusivity and control of your trademark, you must monitor its use within the EU, and take legal action as needed.

A trademark registered in the EU is valid for 10 years from the date it is issued. To maintain your trademark, you must renew the mark with the EUIPO every 10 years. It is important to note that the EUIPO will not issue a reminder as your renewal date approaches. The responsibility to begin the renewal process falls on the trademark owner. Failure to meet renewal deadlines could cause your trademark to be cancelled.

3.6.4 Trade secrets

Trade secrets can include a vast amount of information and know-how that is not protectable or cannot be protected properly through patents⁶, such as:

- Early-stage inventions;
- Manufacturing processes;
- Lists of suppliers and clients.

If you possess valuable information on technology or on any other aspect of your business, you can protect it as a trade secret if the following conditions are met:

- The information is not known either by the public at large or by the experts of the sector in question;
- The information has commercial value; and
- You have taken steps to keep the information secret: for example, you have signed non-disclosure agreements with anyone that has access to it or with whom you have shared the information.

The fact that you have a trade secret does not mean that you have exclusive rights over the information in question. If someone else develops the same information, he or she can use it freely. However, you are protected against dishonest behaviour: for example, if someone accesses the documents related to your secret information without your authorisation, copies them for their personal use or gives them to someone else. You are also protected if someone breaches a non-disclosure agreement and makes the information available to someone else. In situations of dishonest behaviour, you are entitled to damages and other remedies. For example, a court order can prohibit the use or further disclosure of the trade secret by the person who had acquired, used, or disclosed the trade secret unlawfully.

4. Management of knowledge and protection of results

The knowledge of the project will be encapsulated in a variety of forms, including project documents, publications, presentations and software. The overarching principle is to provide the widest possible access to this knowledge to maximise the positive impact of the project during and after its duration. The detailed strategy for the management of knowledge follows:

- **Project Documents:** The project will prepare a number of formal documents related to the project's deliverables and milestones. Most of these documents will be posted on the project's website and Associated with document Ref. Ares_(2019)_2424146 - 05/04/2019 48 systematically archived in an open-access document repository. After being finalised, they will be publicly available and released under a Creative Commons license (likely the "CC BY" license) to allow maximum reuse of the content. Due to the sensitive nature of the project some of the documents are characterized as "EU Restricted" and will remain confidential.
- **Project Reporting:** The project will prepare quarterly and periodic progress reports as required by the EC. for tracking its technical progress. As these documents may contain financial or other sensitive information, they as a whole will not be made public. However, the summaries will be available.
- **Open access:** aqua3S recognises the importance of making the research output of the project accessible as widely as possible. To this end, the consortium has taken an active approach to the open access policy in Horizon 2020 in order to promote diffusion of knowledge and dissemination. More specifically, Open Access i.e. free on-line access, such as the 'green' or 'gold' model will be provided for the peer-reviewed scientific publications that relate to the project scientific results.
- **Presentations:** When possible presentations by project participants will be made publicly available through the project's website or/and will be posted in a public service like SlideShare. These will all be licensed via a Creative Commons license, like the project documents.

4.1 Access Rights

The treatment of Access Rights is foreseen in: (a) Grant Agreement – Articles 25 and 31, and (b) Consortium agreement – Section 9.

Under the terms and conditions laid down in these articles, during the implementation of the project, all partners need to give access rights to their background or results being created in order for other partners to carry out their work on the project and/or exploit their results.

In the Consortium Agreement all beneficiaries are obliged to identify and agree upon the Background Knowledge that is available before entering the project, in order to be able to give access to it.

Following this mandate, all partners in aqua3S consortium have already identified their background knowledge in "Attachment 1" of the Consortium agreement. Thus, any other piece of knowledge or information that has not been included in Attachment 1 cannot be considered as background. Any Party may add further own Background on Attachment 1 during the project by written notice to the other Parties. However, approval of the Project Management Board is needed should a Party wish to modify or withdraw its Background in Attachment 1.

Access rights to background, based on Article 25 of the Grant agreement, are distinguished between access for implementing their own tasks under the action and access for exploiting their own results, as presented in the table below.

PURPOSE	ACCESS TO BACKGROUND
Implementation of own tasks	Royalty-free
Exploitation of owned results	Access shall be granted on Fair and reasonable conditions

Table 39. Access rights

Fair and reasonable conditions mean appropriate conditions, including possible financial terms or royalty-free conditions, taking into account the specific circumstances of the request for access, for example the actual or potential value of the results or background to which access is requested and/or the scope, duration or other characteristics of the exploitation envisaged.

4.2 Results ownership

The ownership of the generated Results is addressed in a) Grant Agreement – Article 26 “Ownership of results” and b) Consortium Agreement – Section 8: Results.

The general rule derived from the relevant excerpts is that results are owned by the beneficiary that generates them. All consortium members verified this principal as part of the Consortium Agreement. Nevertheless, it is important to clarify that “Results” means any tangible or intangible output of the action such as data, knowledge, or information – whatever its form or nature, whether it can be protected or not – that is generated in the action, as well as any rights attached to it, including intellectual property rights.

4.3 Joint ownership

In general, the results of the project belong to the beneficiary that generated them. Given the collaborative nature of aqua3S, however, some results can be jointly developed by several partners. In such cases the so -called “joint ownership” might arise.

As stated in the Grant Agreement – Article 26.2, two or more beneficiaries own results jointly if: (a) they have jointly generated them, and (b) it is not possible to: (i) establish the respective contribution of each beneficiary, or (ii) separate them for the purpose of applying for, obtaining, or maintaining their protection.

Article 26.2 of the Grant Agreement introduces a contractual obligation to agree in writing on the allocation and terms of execution for the joint ownership.

In the case of joint foreground, unless otherwise agreed, the following conditions apply: (a) each of the joint owners shall be entitled to use their jointly owned Results for non-commercial research activities on a royalty-free basis, and without requiring the prior consent of the other joint owner(s) and (b) each of the joint owners shall be entitled to otherwise Exploit the jointly owned Results and to grant non-exclusive licenses to third parties (without any right to sub-license), if the other joint owners are given: (i) at least 45 calendar days advance notice; and (ii) Fair and Reasonable compensation.

4.4 Transfer of results

The transfer of the project results is foreseen in: a) Grant Agreement – Article 30: Transfer and licensing of results, and b) Consortium Agreement – Section 8: Results.

Each aqua3S beneficiary may transfer ownership of its results. This rule is linked with the joint ownership rule, since any joint owner will have the chance to transfer the ownership of results to one of the joint owners or even third parties.

According to the Grant Agreement, a beneficiary that intends to transfer ownership of results must give at least 45 days advance notice to the other beneficiaries that still have access rights to the results. This notification must include sufficient information on the new owner to enable any beneficiary concerned to assess the effects on its access rights.

Any other beneficiary may object within 30 days of receiving notification if it can show that the transfer would adversely affect its access rights. In this case, the transfer may not take place until agreement has been reached between the beneficiaries concerned.

4.5 Granting licenses

Each beneficiary may grant licenses to its results. However, they must ensure that access rights can be exercised and that any additional exploitation obligations are complied with. Exclusive licenses for results may be granted only if all the other beneficiaries concerned have waived their access rights.

4.6 Exploitation of results

Provisions addressing the exploitation of the generated results are included in the Grant Agreement – Article 28 – “Exploitation of results”. The general rule that derives from these clauses is that the consortium must take measure aiming to ensure the exploitation of their results. All consortium partners must be proactive and take specific measures to ensure that the results are used to the extent possible and justified, up to four years after the beginning of the project. The exploitation of results in aqua3S is part of the activities foreseen in WP10 and described in deliverable D10.7 and D10.11

4.7 Publication notification procedure

aqua3S’ DoA explains that the consortium has taken an active approach to the open access policy in Horizon 2020 by establishing and promoting measures for open access publications. aqua3S partners are given the freedom to choose any of the two main open access publishing modalities: a) “Gold” model in either full or hybrid open access journals, or b) “Green” model through self-archiving journal articles in open access repositories.

Prior to any dissemination, however, all other partners should be consulted in order for them to exercise their right to object in the case where such publication could cause significant harm to their background or results. In order to satisfy both academic partners’ needs to publish and enterprise partners’ needs to protect IP before public disclosure, aqua3S follows the notification procedure specified in the Grant Agreement Article 29.1 – Obligation to disseminate results.

A beneficiary that intends to disseminate its results must give advance notice to the other beneficiaries of — unless agreed otherwise — at least 45 days, together with sufficient information on the results it will disseminate.

Any other beneficiary may object within — unless agreed otherwise — 30 days of receiving notification, if it can show that its legitimate interests in relation to the results or background would be significantly harmed. In such cases, the dissemination may not take place unless appropriate steps are taken to safeguard these legitimate interests.

5. Conclusion

Deliverable D10.8 does not constitute a plan in the management sense, since it does not incorporate a set of defined actions with specific dates and expected outcomes. Instead, its goal is to make a list of existing and predicted IP assets in order to activate the appropriate protections measures in time. All partners of aqua3S provided information about their IP assets.

The IPR plan of the project addresses the necessity to both protect the results produced and the importance of disseminating them to derive commercial benefits from the generated knowledge. For this purpose, specific clauses have been put in place that regulates the actions of the involved parties in the process of creating and disclosing the assets.

After the first version of the intellectual property report, the document will be updated until the end of the project, when the final version will be produced. As the project progresses and the components, solutions, tools mature changes may occur. For that purpose, the individual supporting documents will be sent to the partner for them to update them accordingly. Based on their input a new version will be created.

6. References

- [1] aqua3S Consortium Agreement, aqua3S Consortium, version 0.10, July 2019
- [2] Granstrand, Ove; Holgersson, Marcus (2014). "The challenge of closing open innovation: The intellectual property disassembly problem". *Research-Technology Management*. 57 (5): 19-25
- [3] "Definition of copyright", Oxford Dictionaries, April 2021
- [4] "What is a patent?", World Intellectual Property Organization, April 2021
- [5] "Trademark", United States Patent and Trademark Office, April 2021
- [6] "Trade secrets", Your Europe, April 2021

7. Appendix

7.1 Supporting document















aqua3S' ASSETS

FOLLOWING THE CONSORTIUM AGREEMENT OF AQUA3S, KEY COMPONENTS HAVE BEEN IDENTIFIED AMONG THE RESULTS PRODUCED.

These components have been broken down into 2 different groups:

- 🌀 **Commercially Exploitable Components:** components that have a direct exploitation in the market
- 🌀 **Exploitable Components:** components contributing to the development of the aqua3S project but do not have a direct market exploitation

Commercially Exploitable Components	🌀 Ammonia Sensor
	🌀 Refractive index sensor
	🌀 Visual content acquisition module
	🌀 Social media crawler
	🌀 aqua3S ontology
	🌀 Data management platform
	🌀 Anomaly detection module
	🌀 Developed crisis management scenarios
	🌀 Optimization and parallelization module
	🌀 3D visualization module for the network
	🌀 Visual analytics module
	🌀 Intervention management model
	🌀 Crisis classification and decision support module
	🌀 aqua3S platform
	🌀 Interactive user interfaces
	🌀 Real time computation of the water demand forecast (IT application)
	🌀 Real time management of the production and distribution network (IT application)
	🌀 Water quality monitoring and early warning component

Exploitable Components	 Pilot data of the Trieste Acqueduct
	 Pilot data of drinking water treatment plants of Sofia
	 Pilot data of the desalinated and treated (surface) of Lemesos
	 Pilot data of Aliakmonas River and Thessaloniki water treatment plant
	 Pilot data of the SEPG water supply system of Paris
	 Pilot data of the water supply system in the city of Brussels
	 aqua3S Business Models
	 Guidelines for utility providers to engage communities
	 Production of a standardized set of warning messages
	 Emergency response plans for the water sector
	 Laser optimized design for NH3 detection
	 aqua3S logo
	 Definition of new water security CEN/TC standards
	 Policy recommendations regarding water security

Please use the space below to give your comments and feedback on the above division (*e.g. if you think that an Exploitable Component could actually hold potential market exploitation OR an Exploitable Component has not been considered*):

POSSIBLE EXPLOITATION RIGHTS

THE PURPOSE OF THE FOLLOWING IS TO OUTLINE THE DIFFERENT OPTIONS AVAILABLE WITH REGARD TO EXPLOITATION RIGHTS. **FOR EACH COMPONENT, PLEASE SELECT THE MOST SUITABLE EXPLOITATION RIGHTS OPTION.** YOUR FEEDBACK WILL SERVE AS A BASIS TO FURTHER FINE-TUNE THE EXPLOITATION AGREEMENT IN ORDER TO BETTER REFLECT THE VIEW OF ALL PARTNERS ON AQUA3S' COMMERCIAL ROLLOUT.

Option 1 - No ownership of a component – The partner will own no rights with regard to the aqua3S component.

Option 2 - Joint ownership of a component – Multiple partners will own joint rights with regard to the aqua3S component. The exact sharing of the rights of this *Foreground* component is the subject of a separate agreement.

Option 3 - Single ownership of a component – A single partner will own rights with regard to the aqua3S component. Should sharing of rights be required with individual partners for a given component, it will be the subject of a separate agreement.

Option 4 - Joint ownership of a component for retailing/licensing – Multiple partners will own the aqua3S exploitable component for producing and retailing, licensing and/or actively come to an agreement with a third-party company capable of producing and retailing the component.

Option 5 - Single ownership of a component for retailing/licensing – A single partner will own the aqua3S exploitable component for producing and retailing, licensing and/or actively come to an agreement with a third-party company capable of producing and retailing the component.

POSSIBLE EXPLOITATION RESPONSIBILITIES

THE PURPOSE OF THE FOLLOWING IS TO OUTLINE THE DIFFERENT OPTIONS AVAILABLE WITH REGARD TO EXPLOITATION RESPONSIBILITIES. **FOR EACH COMPONENT, PLEASE SELECT THE MOST SUITABLE EXPLOITATION RESPONSIBILITY OPTION.** YOUR FEEDBACK WILL SERVE AS A BASIS TO FURTHER FINE-TUNE THE EXPLOITATION AGREEMENT IN ORDER TO BETTER REFLECT THE VIEW OF ALL PARTNERS ON AQUA3S' COMMERCIAL ROLLOUT.

Option 1 – No responsibility of the component – The partner will hold no exploitation responsibility of the component.

Option 2 - Joint responsibility for retailing/licensing the component – Multiple partners will produce and retail, license and/or actively come to an agreement with a third-party company capable of producing and retailing the “aqua3S component”, taking any reasonable provision that it is designed and produced in good quality, at competent cost and at the required by the Market volumes.

Option 3 - Single responsibility for retailing/licensing the component - A single partner will produce and retail, license and/or actively come to an agreement with a third-party company capable of producing and retailing the aqua3S exploitable component, taking any reasonable provision that it is designed and produced in good quality, at competent cost and at the required by the Market volumes.

Option 4 - Joint responsibility for an agreement with an external distributor - Multiple partners will use reasonable endeavours to license and/or actively come to an agreement with a distributor capable of producing and exploiting and licensing the “aqua3S component”, taking any reasonable provision that it is designed and produced in good quality and licensed against a reasonable license fee.

Option 5 - Single responsibility for an agreement with an external distributor - Partner A will use reasonable endeavours to license and/or actively come to an agreement with a distributor capable of

producing and exploiting and licensing the “aqua3S component”, taking any reasonable provision that it is designed and produced in good quality and licensed against a reasonable license fee.

THE PURPOSE OF THE FOLLOWING TABLE IS TO GATHER PARTNERS’ INPUT AND HAVE AN INITIAL IDEA ON THE TYPE OF EXPLOITATION RIGHTS FORESEEN FOR EACH COMPONENT, AS WELL AS THE TYPE OF EXPLOITATION RESPONSIBILITIES FORESEEN FOR THE COMMERCIALY EXPLOITABLE COMPONENTS.

FILL IN THE LAST TWO COLUMNS OF THE TABLE USING THE OPTIONS PROVIDED IN THE PAGES ABOVE (ONLY THE “EXPLOITATION RIGHTS” COLUMN IS RELEVANT FOR THE EXPLOITABLE COMPONENTS).

Component	Exploitation Right	Exploitation Responsibility
	(e.g. Option 1, Option 2, etc.)	(e.g. Option 1, Option 2, etc.)
Ammonia sensor		
Refractive index sensor		
Visual content acquisition module		
Social media crawler		
aqua3S ontology		
Data management platform		
Anomaly detection module		
Developed crisis management scenarios		
Optimization and parallelization module		
3D visualization module for the network		
Visual analytics module		

Intervention management model		
Crisis classification and decision support module		
aqua3S platform		
Interactive user interfaces		
Real time computation of the water demand forecast (IT application)		
Real time management of the production and distribution network (IT application)		
Water quality monitoring and early warning component		

Component	Exploitation Right	Exploitation Responsibility
Pilot data of the Trieste Acqueduct		N/A
Pilot data of drinking water treatment plants of Sofia		N/A
Pilot data of the desalinated and treated (surface) of Lemesos		N/A
Pilot data of Aliakmonas river and Thessaloniki water treatment plant		N/A
Pilot data of the SEPG water supply system of Paris		N/A
Pilot data of the water supply system in the city of Brussels		N/A

aqua3S Business Models		N/A
Guidelines for utility providers to engage communities		N/A
Production of a standardized set of warning messages		N/A
Emergency response plans for the water sector		N/A
Laser optimized design for NH3 detection		N/A
aqua3S logo		N/A
Definition of new water security CEN/TC standards		N/A
Policy recommendations regarding water security		N/A