



## Workshop Report

<b>Organizing partner:</b>	<b>BRGM</b>
<b>Workshop Place:</b>	<b>Visio-conference</b>
<b>Date:</b>	<b>2021-03-25</b>
<b>Number of invitess:</b>	<b>14</b>
<b>Number of registrations:</b>	<b>14</b>
<b>Number of guests attending:</b>	<b>14</b>

## Agenda for the workshop

### WORKSHOP - Infiltration of Agon-Coutainville Treated Wastewater

Development of digital solutions for the active management of natural coastal water retention and treatment solutions around the Agon-Coutainville treated wastewater infiltration site. These scientific activities have been financed by the European project H2020 AQUANES (Europe) over the period 2016-2019 and over the next three years by the European project JPI EviBan (ANR). The BRGM, Imageau and Geohyd-Antéa group teams involved in this research organize a day of exchanges with you on the Agon-Coutainville site.



### Thursday 25 March 2021

14:00-15:00 Scientific and technic progress of EVIBAN project:

- at the french case of Agon-Coutainville since last workshop in december 2019, *Géraldine Picot-Colbeaux (BRGM)*
- on NORRMAN tool, *Loïc Thomas (ANTEA Group)*
- in Quentin Guillemoto's thesis, *Quentin Guillemoto (BRGM, Sorbonne University PhD student)*

15:00-16:00 Discussions and proposals for further experimental studies, *Géraldine Picot-Colbeaux (BRGM) and Danièle Valdès-Lao (Sorbonne University)*

## Objectives

- ✓ Feedback from scientific activities EVIBAN
- ✓ Stakeholder feedback and interactions on the actual situation and future possibilities (2022-2024)

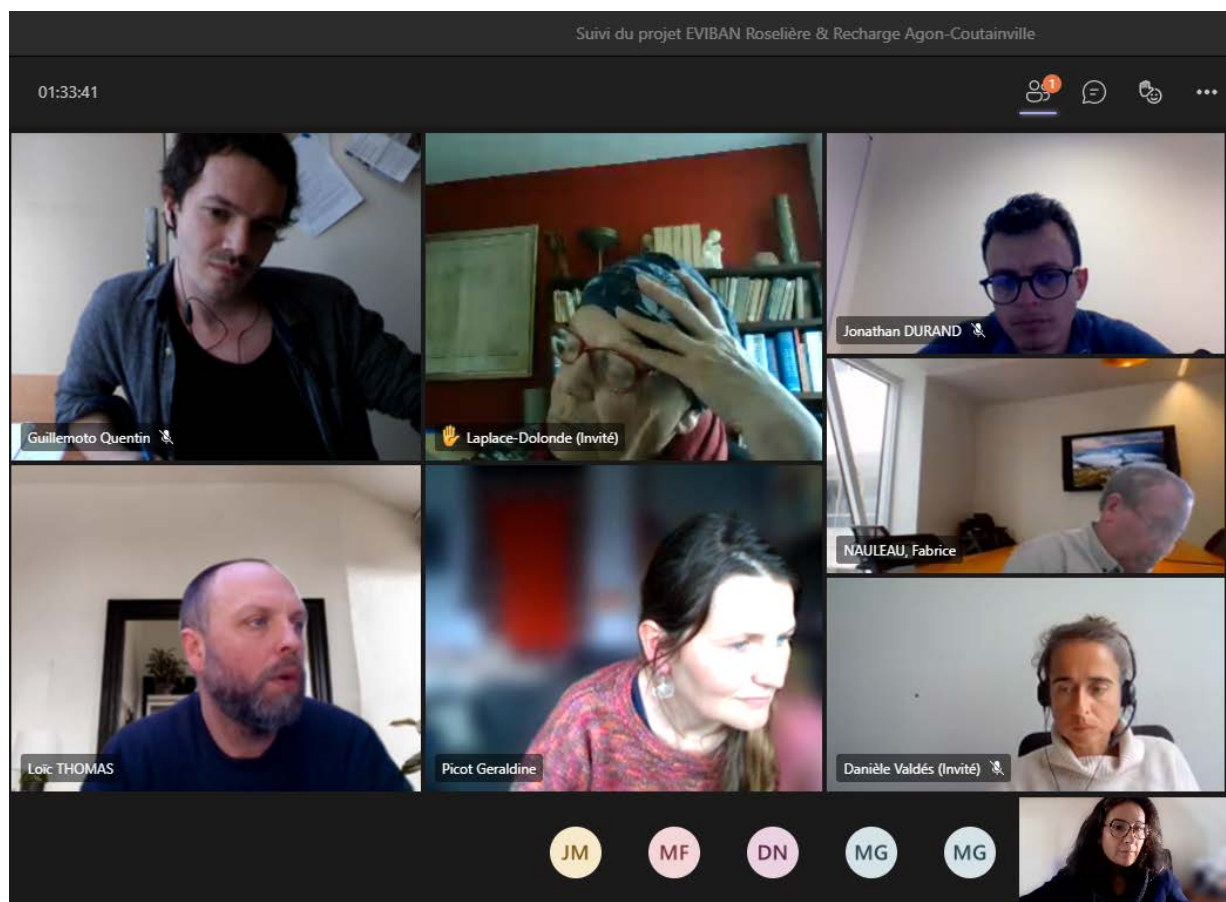


## Characterization of the participants

Table 1 shows the number of registrations in brackets and actual participants, the respective sector of activity and the level of governance each stakeholder is active in.

Table 1 Overview of stakeholders

Institution / sector	No. of participants (registrations)		
	In total	Male	Female
<b>Authorities</b>	<b>3 (3)</b>	<b>2 (2)</b>	<b>1 (1)</b>
Mairie D'Agon-Coutainville, Municipality	2 (2)	1 (1)	1 (1)
Communauté de communes Coutances Mer et Bocage (CMB), Public institution	1 (1)	1 (1)	- (-)
<b>Representatives of companies, other sectors</b>	<b>2 (2)</b>	<b>2 (2)</b>	<b>- (-)</b>
SAUR, Industrial (wastewater Treatment Plant operator)	2 (2)	2 (2)	- (-)
<b>Internal Stakeholders</b>	<b>9 (9)</b>	<b>6 (6)</b>	<b>3 (3)</b>
Imageau, Industrial	1 (1)	1 (1)	- (-)
AntéaGroup, Industrial	2 (2)	2 (2)	- (-)
BRGM, French Geological Survey	4 (4)	2 (2)	2 (2)
Sorbonne University	2 (2)	1 (1)	1 (1)





### Short summary of the workshop's activities

The current activities in the EviBAN project were outlined, the NORRMAN tool was detailed and the work done in France at the Agon-Coutainville site by the PhD student Quentin Guillemoto was presented.

37:44

Demander le contrôle

Qu'avons-nous fait sur le site d'étude d'Agon-Coutainville pour cette 1<sup>ère</sup> année du projet européen EVIBAN ?

- Atelier avec une majorité d'acteurs locaux
  - Municipalité Agon-Coutainville, Golf Agon-Coutainville
  - SAUR
  - Coutances Mer et Bocages, (SMEL)
  - ARS Normandie, DREAL, DDTM, (AESN)
- Visite du site : station & roselière

Atelier « objectifs développement durable »  
(Herman Helness & Sigrid Damman)

Echanges sur la gestion active des aquifères basée sur les solutions fondées sur la nature

SINTEF

Picot Geraldine

+5 DN FN

GOSSELIN, Mickael

Laplace-Dolonde (Invi...

Maxime GONY - CMB ...

Danièle Valdés (Invité)

Picot Geraldine

PM

Qu'avons-nous fait sur le site d'étude d'Agon-Coutainville pour cette 1<sup>ère</sup> année du projet européen EVIBAN ?

- Participation à la publication du volume UNESCO  
*Zheng, Y., Ross, A., Villholth, K.G. and Dillon, P. (eds.)*  
Récents travaux sur les indicateurs de durabilité et économique dédiés au MAR qui ont été notamment appliqués au système d'Agon-Coutainville  
→ durabilité: Good  
→ Cout normalisé par m<sup>3</sup> rechargé: 1.10\$US (0.93€)

**Case Study 16: Soil Aquifer Treatment system to protect coastal ecosystem in Agon-Coutainville (Normandy), France**

Picot-Colbeaux Géraldine, Mathurin Frédéric, Pettenati Marie, Nakache-Danglot Frédérique, Guillemoto Quentin, Mainguy Jean Michel, Baisset Matthieu, Devau Nicolas, Gosselin Mickaël, Allain Didier, Neyens Denis, Lartigaut Claire, Dufour Eric, Bouzanquet Richard, Togola Anne, Depraz Olivier, Nauleau Fabrice

<sup>1</sup>BRGM, French Geological Survey, Water Resource Management (GDR), 3 av. Claude-Guillemain - BP 36009, 45060 Orléans Cedex 2 - France.  
<sup>2</sup>SAUR, Pôle technologique du groupe Saur, 2 rue de la Bresle, 78310 Maurepas, France.  
<sup>3</sup>SAUR, Services de distribution des eaux, 8 allée du Château de la Mare, 50200 Coutances, France.  
<sup>4</sup>ImaGéau, Cap Alpha, 9 Avenue de l'Europe, 34830 Clapiers, France.  
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**MANAGING AQUIFER RECHARGE**  
A Showcase for Resilience and Sustainability

World Water Day Special Webinar :  
<https://wrrc.arizona.edu/world-water-day-special-webinar>

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# EviBAN

Evidence Based Assessment of NWRM  
for sustainable water management

Suivi du projet EVIBAN Roselière & Recharge Agon-Coutainville

38:59

Demander le contrôle

Qu'avons-nous fait sur le site d'étude d'Agon-Coutainville pour cette 1<sup>ère</sup> année du projet européen EVIBAN ?

- Campagnes de terrain: mesures et analyses → Thèse Quentin Guillemoto (août 2020; octobre 2020 et février 2021)
- Partage de données actualisées à fin 2020

Picot Geraldine

Logos: brgm, Sorbonne Université

+5 DN FN

GOSSELIN, Mickael

Laplace-Dolonde (Invité)

MG Maxime GONY - CMB ...

Danièle Valdés (Invité)

Picot Geraldine

Suivi du projet EVIBAN Roselière & Recharge Agon-Coutainville

52:58

Demander le contrôle

Adaptation des cinétiques

Par paramètre

Selon le rapport de flux

Facteur	Distance	Qualité init	Qualité max	Concentration limit	Entrée active
Facteur A	0	5	20	35 mg/l	2
Facteur B	1	15	25	35 mg/l	1
Facteur C	0	0	0	15 mg/l	1

Loïc THOMAS

+6 MG L MG

Danièle Valdés (Invité)

Picot Geraldine

Loïc THOMAS



Suivi du projet EVIBAN Roselière & Recharge Agon-Coutainville

59:08 Demander le contrôle 👤 🗨️ 🔍 ⋮

## Remise en contexte des travaux de thèse

« Compréhension du transfert des molécules organiques traces dans les systèmes SAT pour identifier et prévoir leurs effets sur les hydrosystèmes concernés »  
Approche in-situ et expérimentale  
Modélisation couplée hydrogéologie-biogéochimie

Approche méthodologique de la thèse

- Etude bibliographique
- Site opérationnel long terme SAT
- Expérimentations
- Modélisation

Modèle conceptuel du transfert des molécules organiques traces dans un site SAT (cas de Agon-Coutainville)

Picot Geraldine 12

+7 MG LT Danièle Valdés (Invité) Picot Geraldine Guillemoto Quentin PM

The main points of progress that are discussed concerned:

- Participation to the UNESCO book (in press) “Managed Aquifer Recharge: A showcase for resilience and sustainability” Zheng, Y., Ross, A., Villholth, K.G. and Dillon, P. (eds.); with Agon-Coutainville as case study n°16 “Soil Aquifer Treatment system to protect coastal ecosystem in Agon-Coutainville (Normandy), France” Picot-Colbeaux Géraldine, Mathurin Frédéric, Pettenati Marie, Nakache-Danglot Frédérique, Guillemoto Quentin, Mainguy Jean Michel, Baïssat Matthieu, Devau Nicolas, Gosselin Mickaël, Allain Didier, Neyens Denis, Lartigaut Claire, Dufour Eric, Bouzanquet Richard, Togola Anne, Depraz Olivier, Nauleau Fabrice (BRGM, SAUR, ImaGeau)
- 3 Field campaigns: measurements and analyses Thesis Quentin Guillemoto (August 2020; October 2020 and February 2021)
- Sharing of updated data at the end of 2020 with the SAUR operator and other project partners (Aquanès data 2016-2019; WWTP data 2006-2020; public external data 20006-2020; EVIBAN thesis’s data 2020-2021)
- Description of the NORRMAN tool and adaptation in progress to the watershed of the sector (Seine-Normandy)
- Questions addressed by the thesis work related to the understanding of the transfer of organic trace molecules in SAT systems in order to identify and predict their effects on the hydrosystems concerned: interpretation of experimental results acquired in the Aquanès project (transient time and fate of trace organic elements), Additional



# EviBAN

## Evidence Based Assessment of NWRM for sustainable water management

- characterizations and installation of new instruments (new observation wells and sensors (T°, pressure and electric conductivity); water measures (pH, Eh, O2) and analyses (majors, traces elements and organics))
- Future field campaigns included in EVIBAN thesis (march, june, august) and filed campaign in collaboration with Sorbonne University for training undergraduate students (march).
  - Discussion about difficulties to constrain flooding of the three infiltration pond:
    - o during winter with the amount of water coming from rain and sea (very high groundwater level (overflow) in the infiltration bassins and difficulty in flushing water away)
    - o since january 2020 there is no more regulation in the alternation of the infiltrations between the three basins (problem of valves (maintenance) and lack of knowledge of the infiltrated flows for each discharge point)
  - Discussion of future experimental studies to go further in the understanding of water purification via the NBS (reedbeds and aquifer) according to the discharge dynamics of the 2<sup>ndary</sup> effluent.

### Short summary of outcomes and future experimental studies

The EVIBAN project provides at local scale:

- an active participation of the territory's stakeholders with research actors that allows for an improved evaluation of the influence of nature-based solutions (dune infiltration & reed bed) and water resource management
- a continuation of the characterization, understanding, management work initiated in partnership since 2016
- a training of young scientific generation through research (university internship, thesis,...)
- a national and international dissemination of the experience conducted on the management of treated wastewater in Agon-Coutainville

Questions to be investigated in future projects at local scale:

- 1) Control and management of discharge dynamics and alternation between zones (valves and flow distribution and measurements)
- 2) Understanding of winter flooding periods (parasitic water, rainwater, tides, storms, ...)
- 3) Identification and optimization of water purification via the NBS (reedbeds and aquifer) according to the discharge dynamics
- 4) Assessment of environmental impacts/benefits extended to other elements
- 5) Maintenance of the reed bed areas (eutrophication, access, risks, ...)
- 6) Control and optimization of treated wastewater reused by the Golf (or more broadly water resource management)
- 7) Understanding of the saline intrusion according to the discharge dynamics, rainfall events and tidal range

Decisions:



# EviBAN

## Evidence Based Assessment of NWRM for sustainable water management

SAUR and municipality have worked on the point 1) Control and management of discharge dynamics and alternation between zones (valves and flow distribution and measurements): maintenance work will start in May 2021 and new sensors measuring the flows between basins will be installed by SAUR

Municipality and the CMB public institution are favourable to carry and find the financing of the experimental proposals discussed and concerning the point 3) Identification and optimization of water purification via the NBS (reedbeds and aquifer) according to the discharge dynamics