

THE OCEANS AT RISK : WHAT PROTECTION FROM DEEP SEA TO COASTAL AREAS ?

The development of Environmental Services to mitigate the urban and industrial impact on the quality of the Marine Resource



**Calédonienne
des Eaux**

Fabrice POLIZZI
Plant Operations Manager

I. CONTEXT: our company as an environmental stakeholder

The Caledonienne des Eaux Company assists the protection of marine ecosystems

Construction of 3 wastewater treatment plants
using Membrane Bio-Reactor (MBR) technology Ultrafor:

Boulari



The City Center: « James Cook » STP



Sainte-Marie Bay



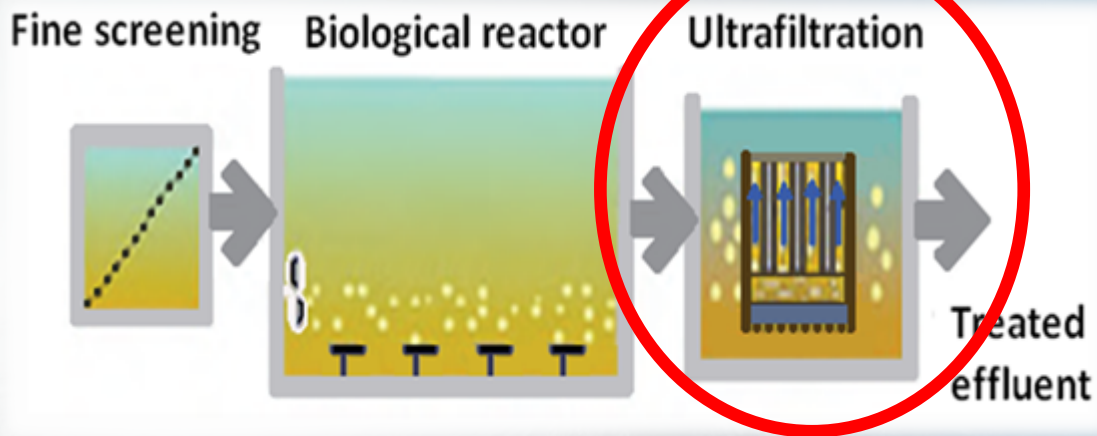
Improvement and protection of our lagoons, World Heritage UNESCO (July 2008)



II. ULTRAFOR™ : membrane technology for treatment of urban wastewater beyond the highest standards

Ultrafor™ is a process of wastewater treatment

which combines both a **biological treatment** using activated sludge and a clarification by immersion of **ultrafiltration membranes**.



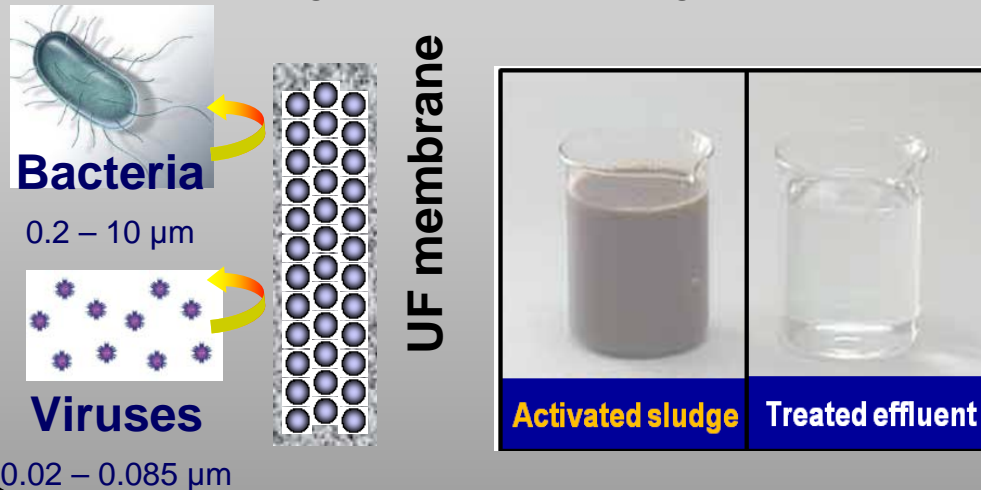
**INNOVATION
USING MEMBRANE TECHNOLOGY
TO BETTER CONTROL THE
SEPARATION
BETWEEN WATER AND SLUDGE.**



II. ULTRAFOR™ : MEMBRANE TECHNOLOGY FOR TREATMENT OF URBAN WASTEWATER BEYOND THE HIGHEST STANDARDS

★ PERFORMANCE:

KEY FIGURE: 0.035 μm nominal pore size creating a physical barrier against bacteria.



Protects nature with an effluent quality that **ALLOWS DISCHARGES INTO PROTECTED ZONES.**

Protection of people with a guarantee of **sanitation safety,**

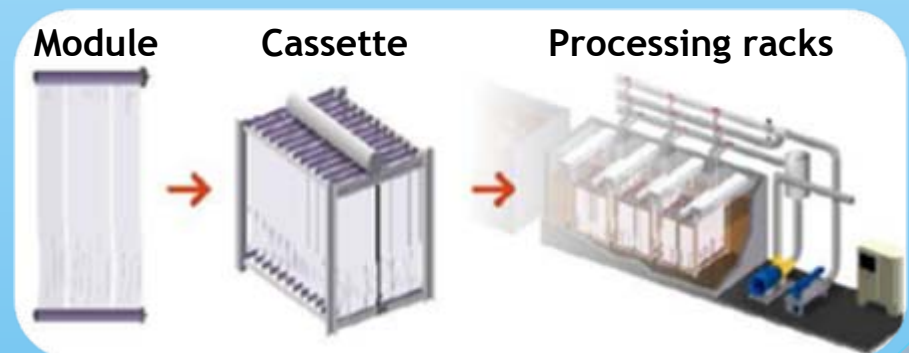
Protection of resources through the ability to **REUSE THE EFFLUENT**

★ COMPACT SIZE :

- Reduction of the environmental footprint of the stations.

★ SAFETY AND SIMPLICITY:

- The fully automatic
- Easily expandable



III. EXAMPLE: 3 new treatment plants to protect the New Caledonian lagoon

Waters treatment plant : City center “James Cook” STP

- Works started July 2010 - **Commisionning mid-2012**
- Part of the **sustainable development policy of the City of Noumea**

Developed under the concept of HEQ (High Environmental Quality) :

- **LANDSCAPING**
- **REDUCTION OF RISK & NUISANCES**



III. EXAMPLE: 3 new treatment plants to protect the New Caledonian lagoon

Waters treatment plant : City center “James Cook” STP

• ENVIRONMENTAL NUISANCE:

- Treatment of the waste water of 4 areas of Noumea
- Total capacity of 30,000 pE
- A treatment quality beyond the standards



- Low ground area
- Reuse of treated water
- High quality effluent

Parameters	Limit values of the characteristics of the discharge (ICPE permit)	Ultrafor treated water guarantee
TSS	20 mg/l	5 mg/l
BDO5	20 mg/l	10 mg/l
CDO	90 mg/L	70 mg/l
Total-N	20 mg/l	15 mg/l
Total-P	2 mg/l	2 mg/l
E. coli	250 E. coli /100ml	250 E. coli /100ml
Enterococci	100 enterococci /100ml	100 enterococci /100ml



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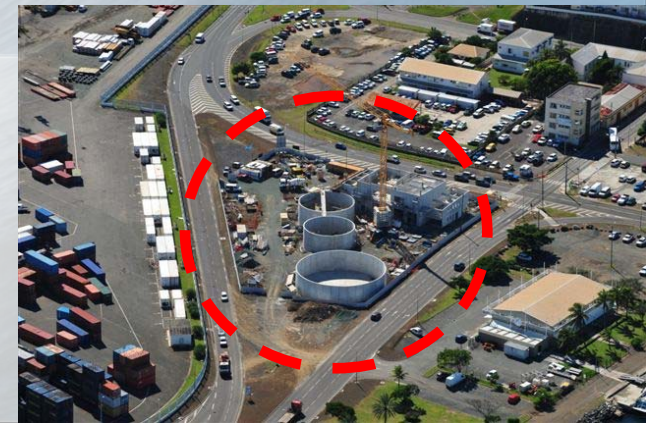
- **LANDSCAPE NUISANCE:**

- ➔ Harmonious relationship between buildings and their immediate environment.
- ➔ Architectural approach coupled with a **study of landscaping**
- ➔ Creation of **green spaces** around the station with and a **pedestrian trail**, planted with trees.



- **ODOR NUISANCE AND NOISE**

- ➔ Enclosed and ventilated rooms
- ➔ Unit of deodorization for the collected air
- ➔ Limitation of noise impact from the plant



III. EXAMPLE: 3 new treatment plants to protect the New Caledonian lagoon

Waters treatment plant : The St Marie bay

- **CONSTRUCTION 2011- 2014**

Will treat wastewater from the **3 major watersheds in Noumea**

= 1/3 of the population of the city

- **OBJECTIVE:**

- **TREAT domestic sewages** currently rejected into the Bay of St. Marie, or through the mangrove of Ouemo.

- **IMPROVE water quality** in the St Marie Bay



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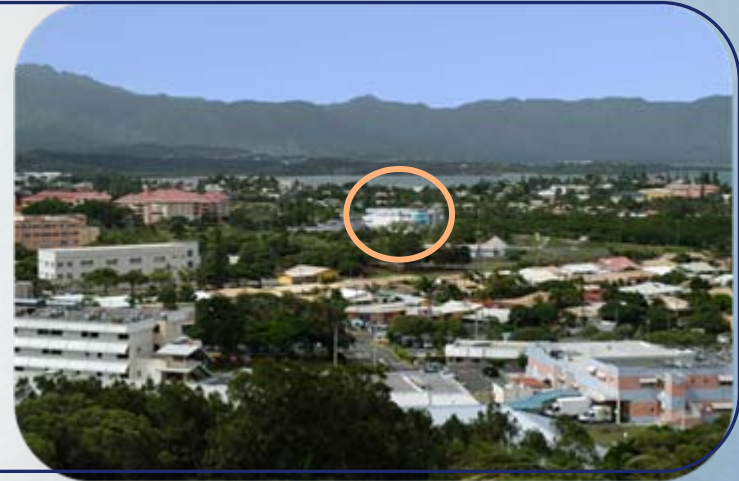
Waters treatment plant : The St. Marie bay

AN AREA OF GREAT IMPORTANCE = IMPACT STUDY

URBAN AREA: close to residences, schools, public places,...



Control and minimize pollutions and nuisances



CLOSE TO REMARKABLE MARINE ECOSYSTEMS:

-The bay of St Marie

-The mangrove of Ouemo



ECOLOGICAL IMPORTANCE



III. EXAMPLE: 3 new treatment plants to protect the New Caledonian lagoon

Waters treatment plant : The St. Marie bay

AN AREA OF GREAT ENVIRONMENTAL IMPORTANCE



THE BAY OF SAINTE MARIE :

associated with marine ecosystems such as reefs or sea grass beds.



THE MANGROVE OF OUEMO:

- habitat, spawning ground and nursery for many marine species.
- natural filter for sediments and pollutions.



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Waters treatment plant : The St. Marie bay

MARINE ECOSYSTEMS THREATENED BY URBANIZATION AND POLLUTIONS

The bay of St. Marie and the Mangrove of Ouemo receive **non treated water of more than 30 000 pE**

EVERY DAY...

- 900 kg of TSS,
- 1 ton of BOD₅
- 200kg of NGL
- microorganisms and fecal pathogens

... DISCHARGED INTO THE ST MARIE BAY



IN THE ABSENCE OF TREATMENT PLANT,
the impact on the marine environment will be
significant and not environmentally acceptable.

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Waters treatment plant : The St. Marie bay

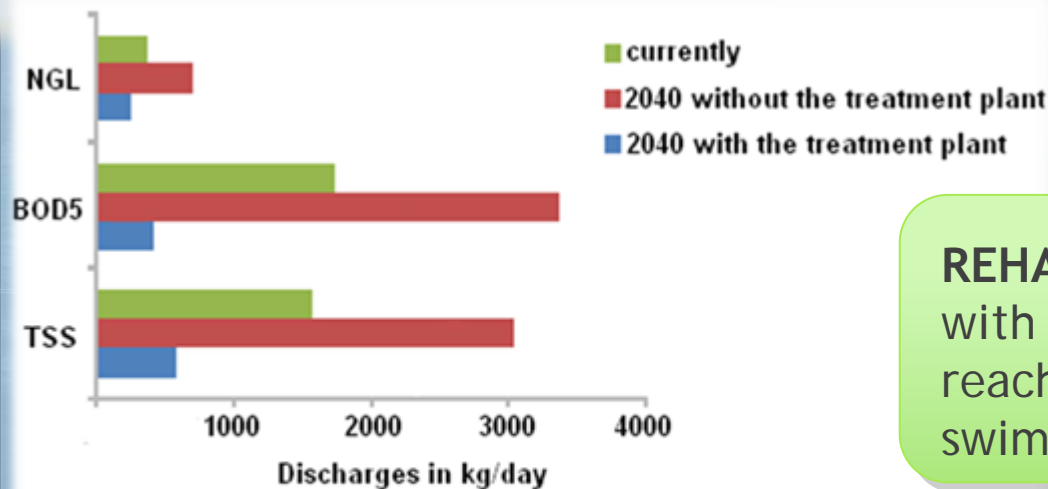
THE TREATMENT PLANT OF ST. MARIE: A SUITABLE ENVIRONMENTAL SOLUTION



Treatment by membrane bioreactor = a real change in the quality of discharges

The treatment plant will lead to decreases of:

- more than 64% for BOD₅
- more than 76% for TSS
- more than 32% for NGL



REHABILITATION OF THE ST MARIE BAY
with a quality improvement of the waters reaching the standards for fishing and swimming

Comparison of theoretical stream in NGL, TSS and BOD5 discharged into the St. Marie Bay, currently (≈ 30 000 pe) and in 2040 (≈ 60 000 pe) with and without the new treatment plant.

CONCLUSION

We act for the environment minimizing as much as we can secondary impacts of our activities.

We also allow a direct improvement and protection of our prestine lagoon, part of the World Heritage UNESCO since 2008, **using state of the art technology such as MBR.**



**Calédonienne
des Eaux**



**THANK YOU
FOR YOUR ATTENTION**



*" The oceans are in trouble;
the coasts are in trouble;
our marine resources are in trouble.
These are not challenges we can sweep aside."*

(James Watkins)



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