

Constructed Wetlands: solutions for wastewater pollution

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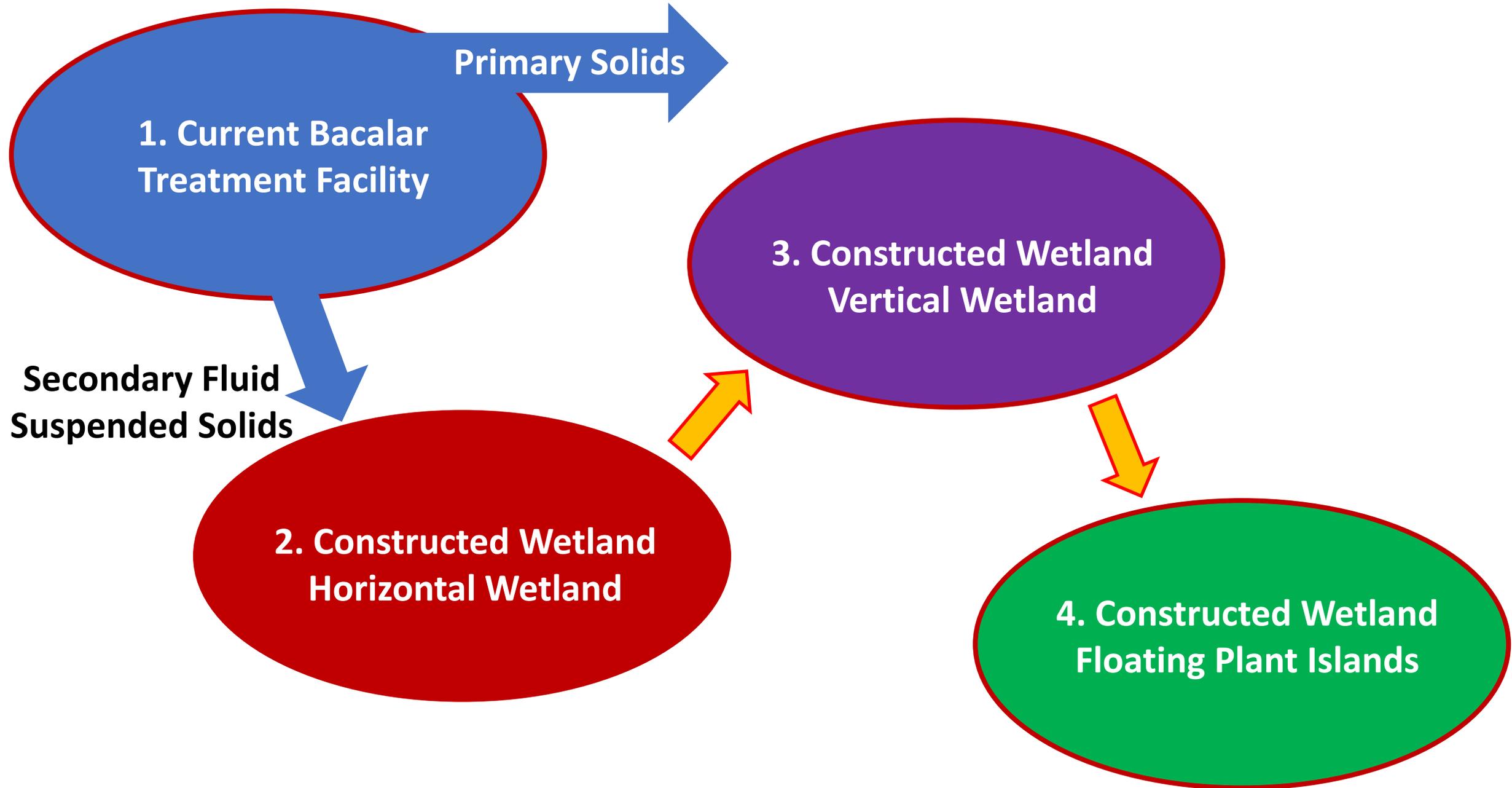


How can Constructed Wetlands be used in the Bacalar region?

Constructed wetlands are an engineering solution designed to mitigate wastewater pollution such as sewage, greywater, stormwater runoff, and other water pollutants.

Wetlands provide a contained area where wastewater can be processed by microorganisms and the natural uptake by wetland vegetation primarily through the roots.

Proposed Bacalar Wetland Treatment Sequence



1. Current Bacalar Treatment Facility

Primary Solids

Primary Solids
Manufactured
Fertilizer

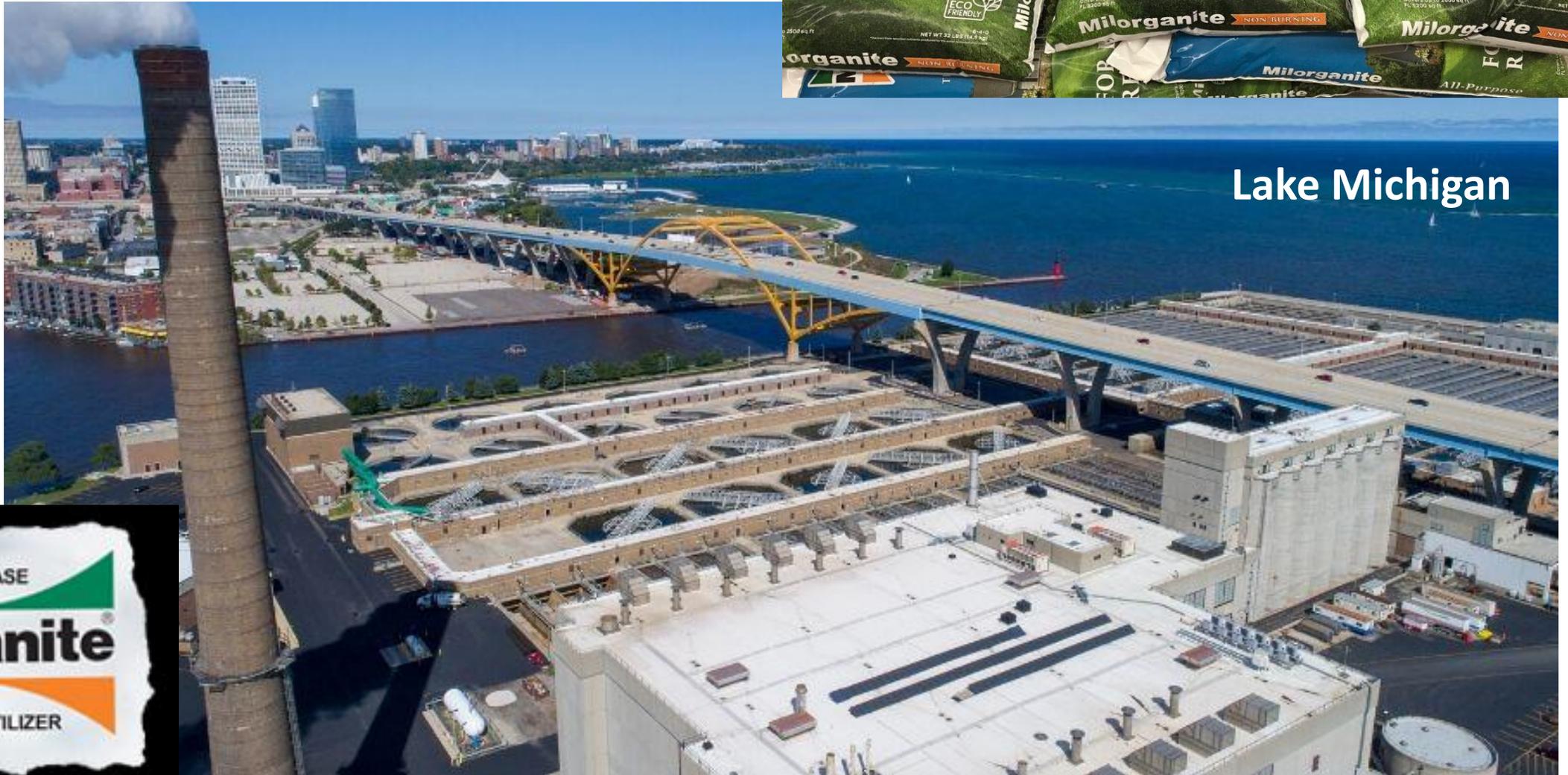
Fertilizer

Agriculture
Fertilizer
Application



Milwaukee Metropolitan Sewerage District

45,000 metric tons of Milorganite Fertilizer produced in 2020



Lake Michigan





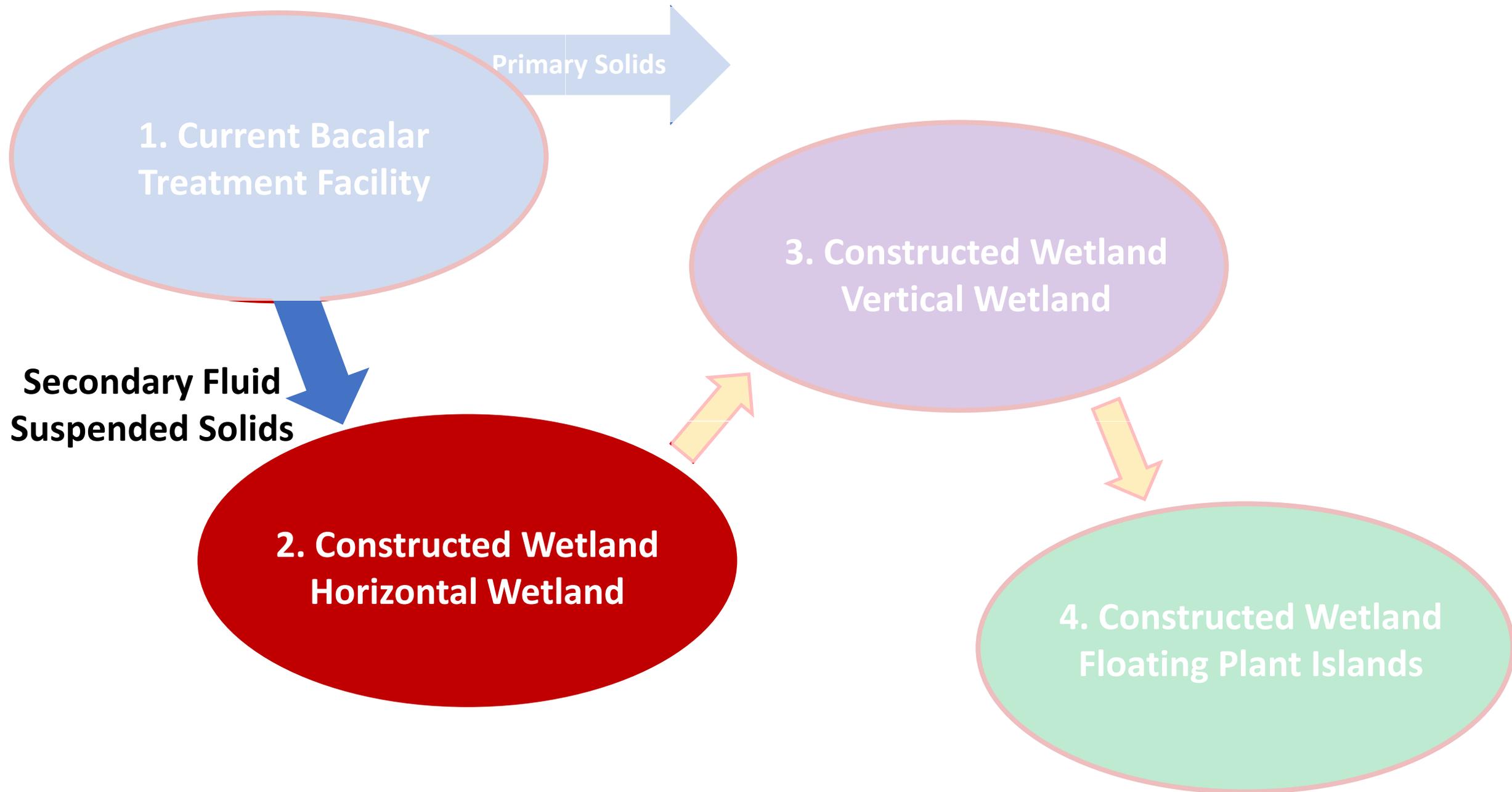
The Milwaukee Metropolitan Sewerage District (MMSD) creates Milorganite as a byproduct.

Environmental goals:

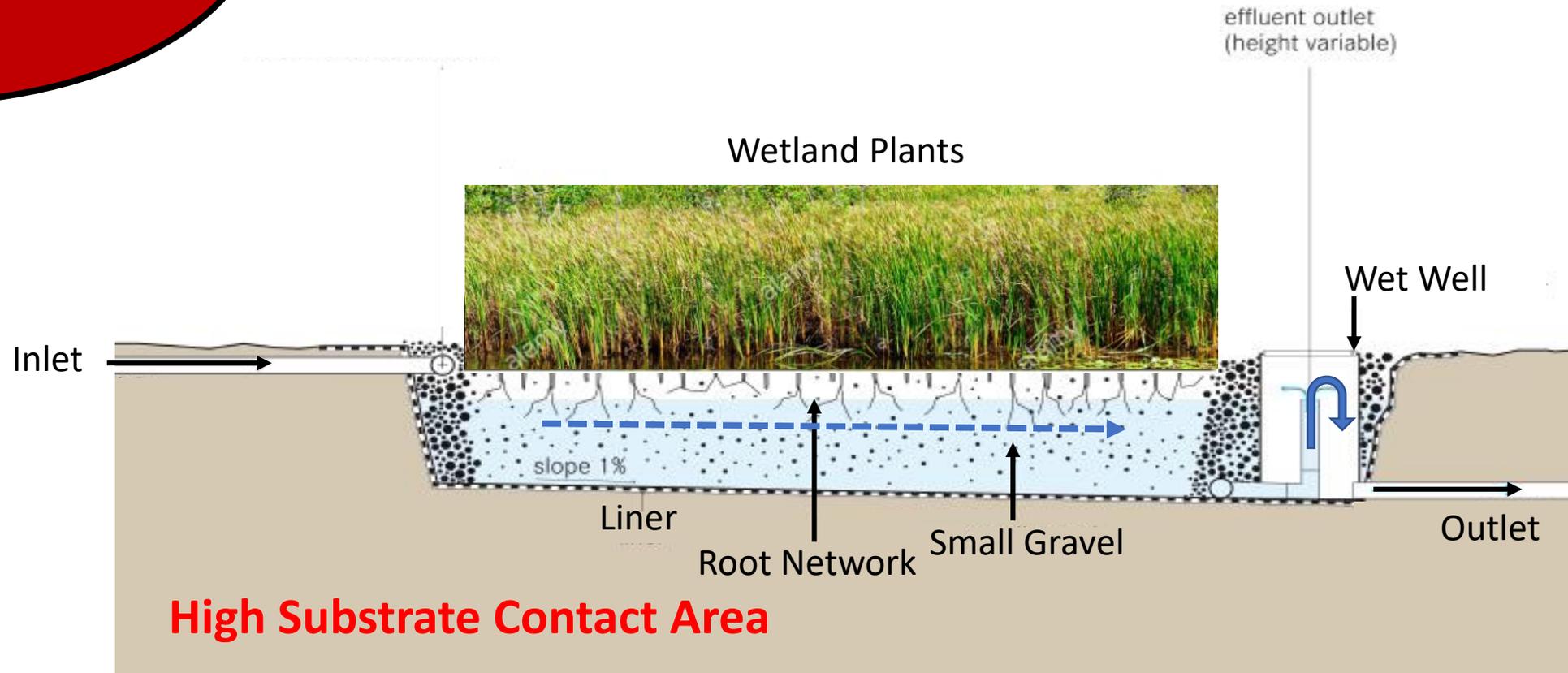
- maintain the health of our waterways, environment, and citizens by returning clean water to Lake Michigan;
- divert material from landfills;
- find the most cost-effective methods to do both.

Since 1926, for example, more than 4.5 billion Kg of waste has been diverted from landfills. Why throw away such a great product?

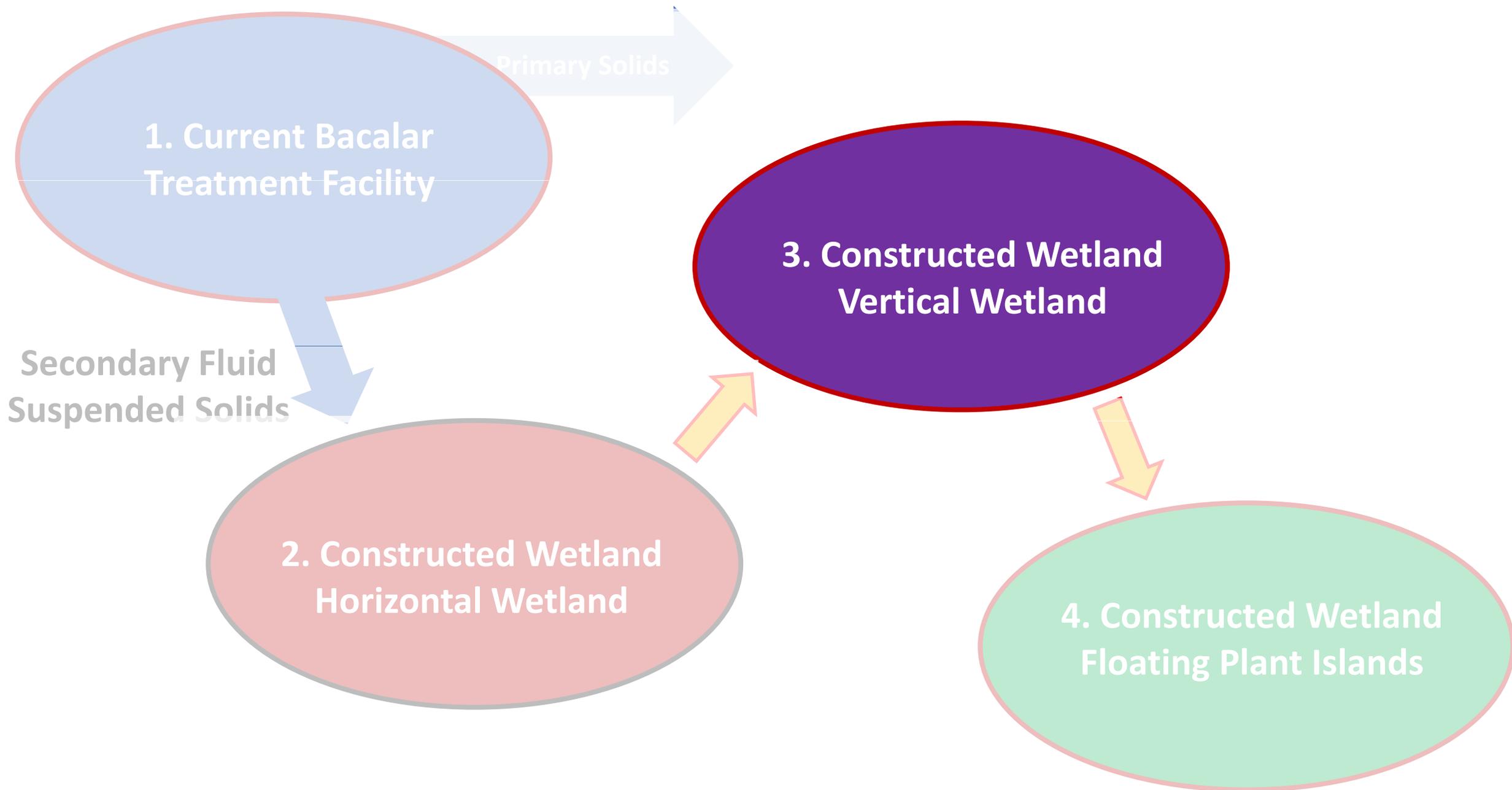
Proposed Bacalar Wetland Treatment Sequence



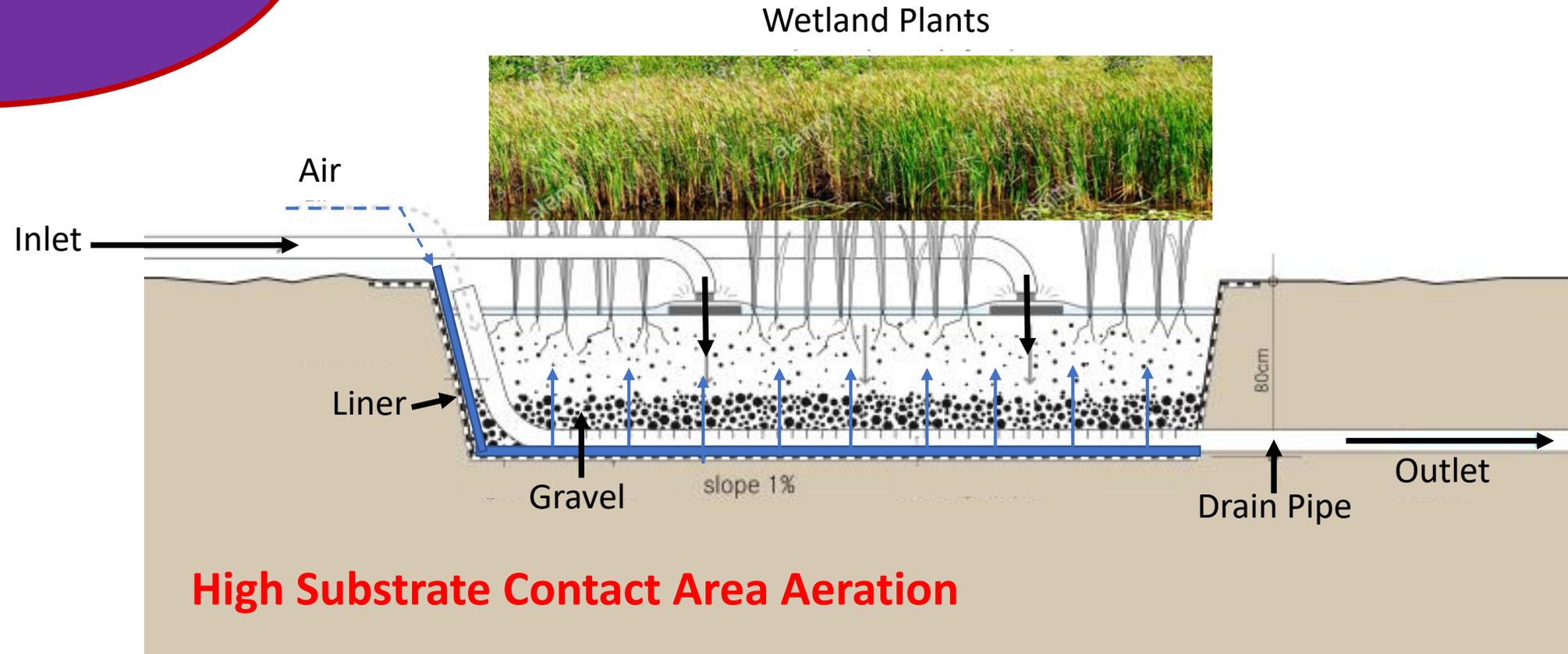
2. Constructed Wetland Horizontal Wetland



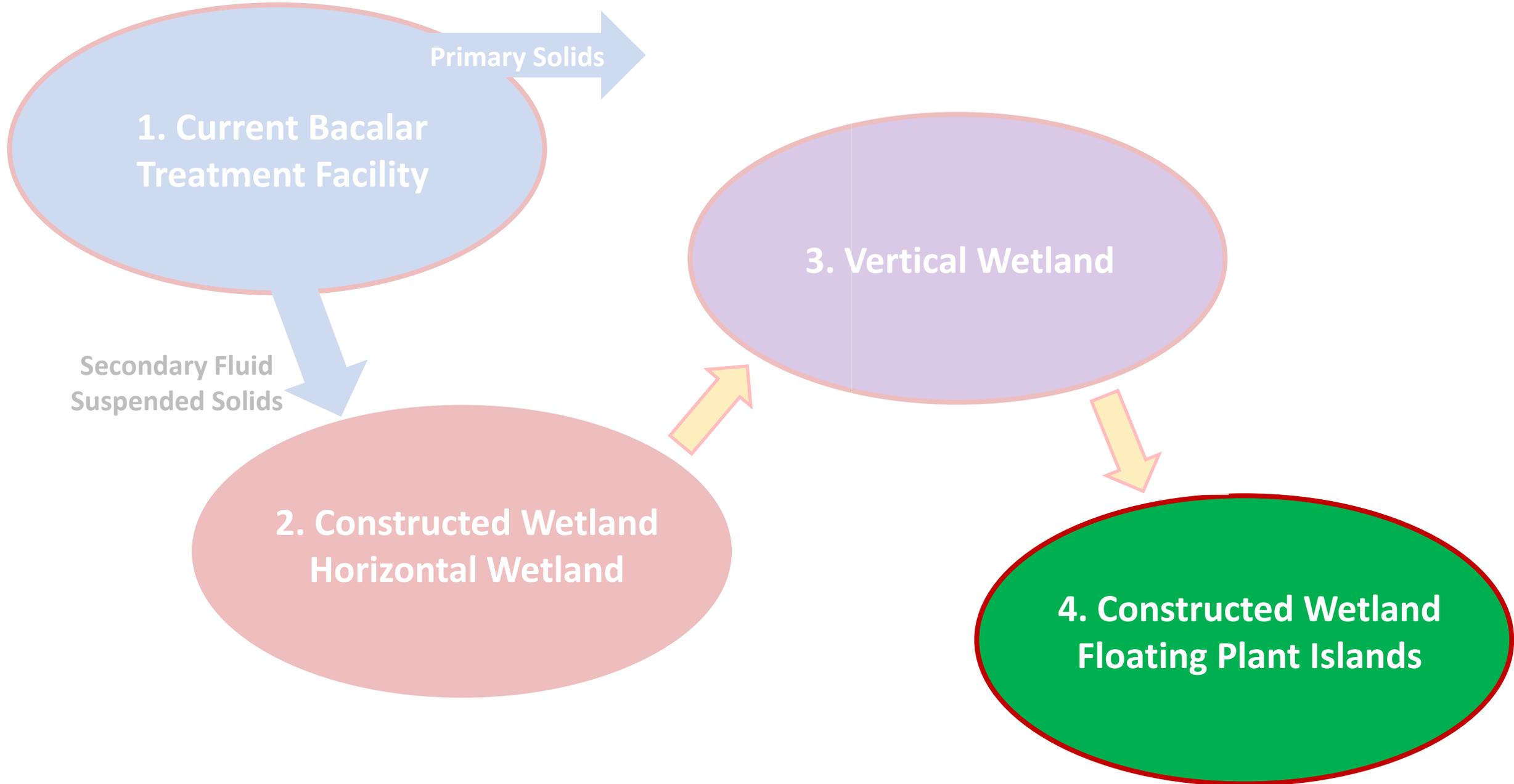
Proposed Bacalar Wetland Treatment Sequence



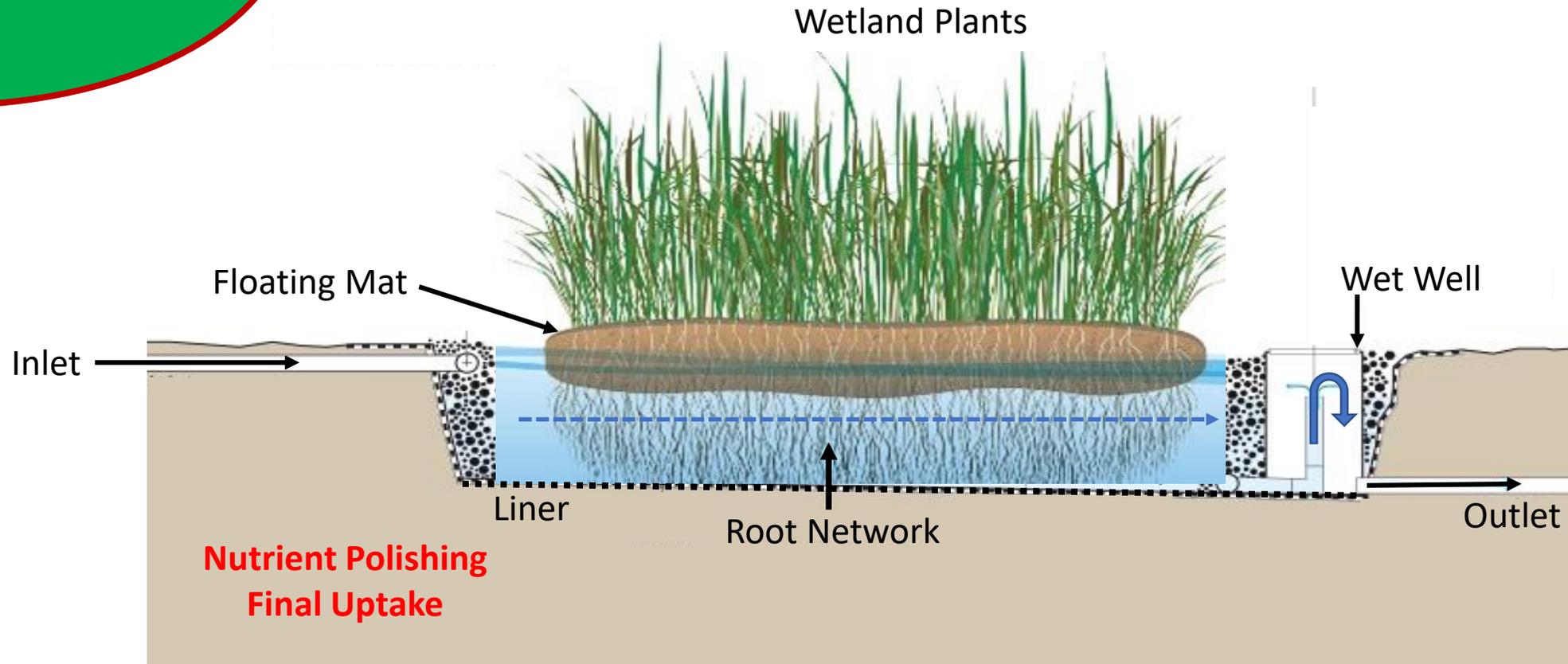
3. Constructed Wetland Vertical Wetland



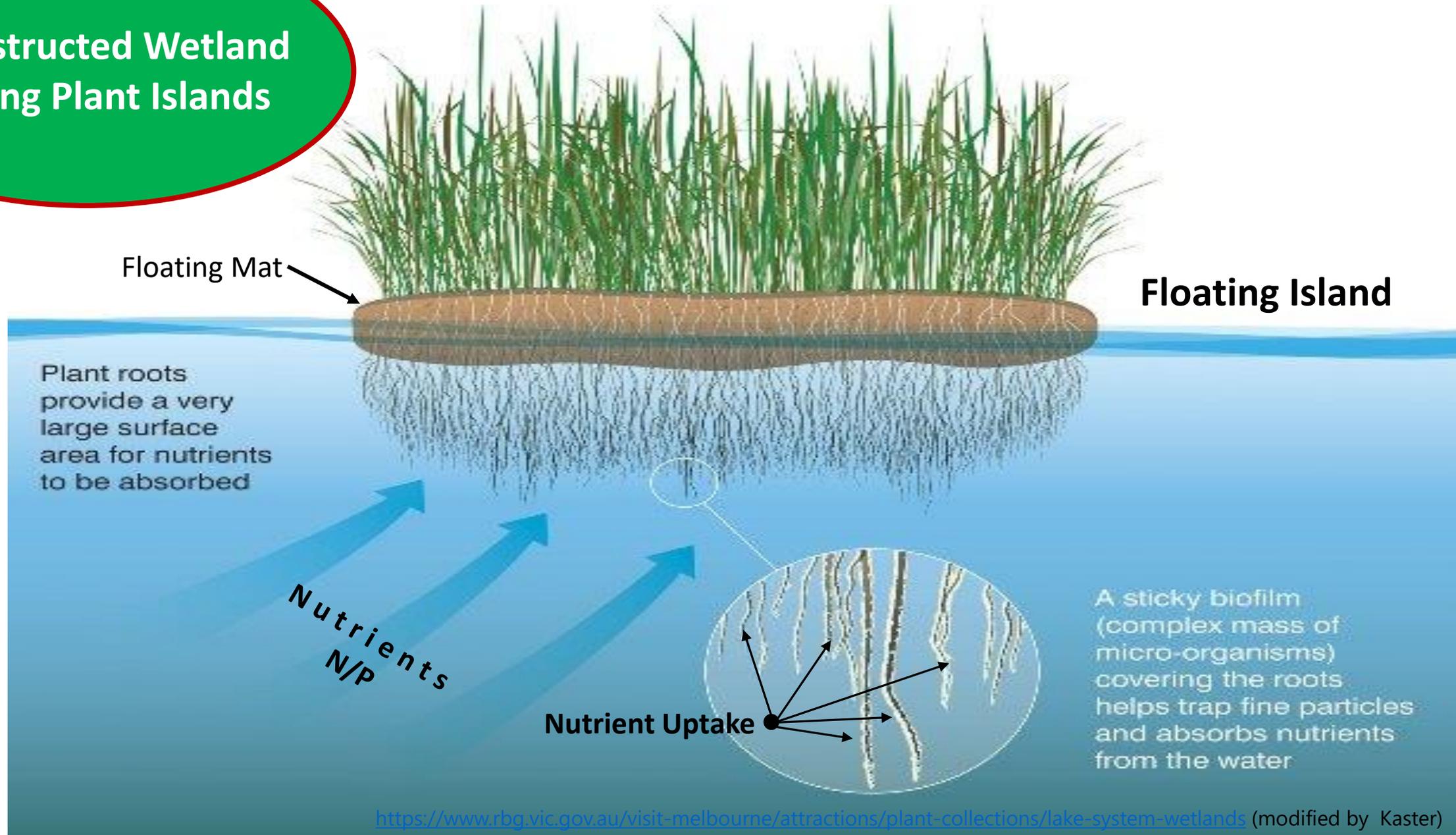
Preliminary Bacalar Wetland Treatment Sequence

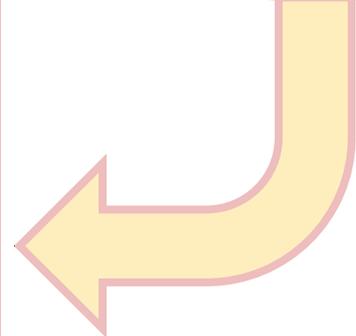
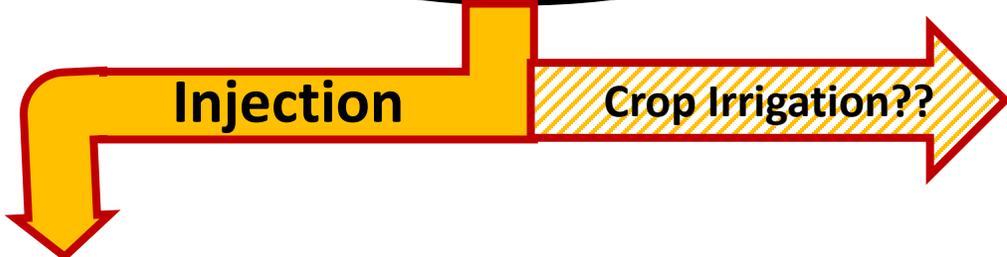
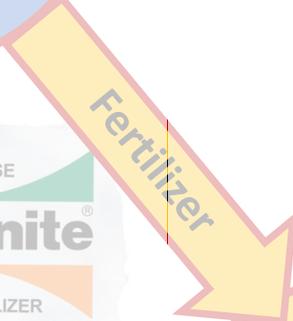


4. Constructed Wetland Floating Plant Islands



4. Constructed Wetland Floating Plant Islands





Constructed wetlands: a solution to water quality issues in Mexico?

P. L. García-García; L. Ruelas-Monjardín; J. L. Marín-Muñiz

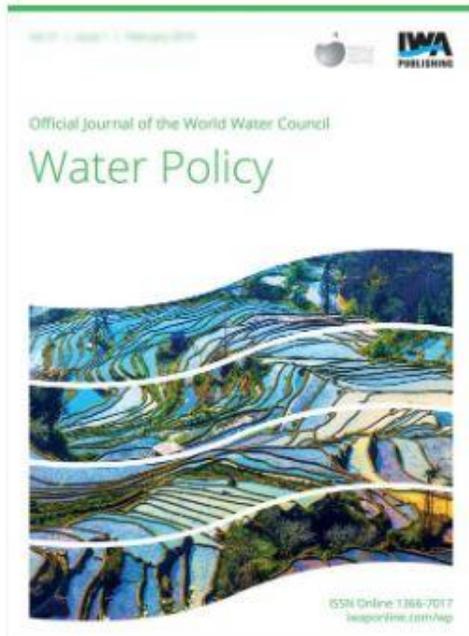


Water Policy (2016) 18 (3): 654–669.

<https://doi.org/10.2166/wp.2015.172> **Article history** 

Volume 18, Issue 3

June 2016



There is a large literature on the use of constructed wetlands for wastewater treatment.

Historically, water sanitation has not been a priority for any sector of society in Mexico, and substantial technical and ecological problems exist in this country's wastewater treatment systems. Constructed wetlands (CWs) have proven to be an exceptional alternative, particularly for rural areas in developing countries. This paper identifies the status of research on CWs in Mexico, and discusses the possibilities for their use. Our review showed that interest in CWs in Mexico is growing exponentially, particularly in academic institutions. Consequently, published documents are mostly on experimental wetlands, although there are a few experienced groups devoted to producing technology and providing training needed to apply CWs. CWs are generally used for domestic wastewater treatment, disregarding other pollution sources such as agriculture and industry. Rural communities have the most potential to obtain and apply this technology, but unfortunately their degree of use of these systems is still very low. The current status of research and application of CWs leads to a few options discussed in this paper to promote their use in Mexico, taking into account that the success of these alternatives can only be achieved by partnering with governments, water treatment companies, non-governmental organizations, academic institutions and rural communities.



Short communication

Investigation of *Escherichia coli* removal in various designs of subsurface flow wetlands used for wastewater treatment

O Decamp  , A Warren

Department of Zoology, The Natural History Museum, Cromwell Road, London SW7 5BD, UK

The average *E. coli* removal rates were ... **96.6–98.9%** for pilot-scale systems.



Original Article | Published: 14 September 2014

An environmental investigation of the mineralogical, geotechnical, hydrogeologic and botanical properties of subsurface flow constructed wetlands in **Akumal Mexico**

[Sheela Varma Sinha](#), [Erin P. Argyilan](#) & [Mark P. S. Krekeler](#) 

[Environmental Earth Sciences](#) **73**, 2299–2317(2015) | [Cite this article](#)

201 Accesses | 1 Citations | [Metrics](#)

The systems in **Akumal Mexico** are a classic example of a technological solution to an environmental problem caused by human development that has outpaced the designed capacity for wastewater treatment.

Treatment of swine wastewater with subsurface-flow constructed wetlands in Yucatán, Mexico: Influence of plant species and contact time

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Horizontal SSF CWs are a suitable technology for treating swine wastewater under the local conditions of Yucatán.

1263

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Pathogen removal from domestic and swine wastewater by experimental constructed wetlands

G. Giacomán-Vallejos, C. Ponce-Caballero and P. Champagne

ABSTRACT

This study examined the performance of subsurface flow horizontal wetlands in total coliforms, faecal coliforms, enterococci and *Salmonella* removal from swine and domestic wastewaters. The effects of organic loading rate, contact time (CT) and the presence of aquatic macrophytes, *Typha dominguensis* and *Typha latifolia*, on treatment performance were evaluated. In general, chemical oxygen demand (COD) and total suspended solids (TSS) were reduced by 66 and 72% after 24 h and 75 and 84% after 48 h in domestic wastewaters, and 73 and 71% after 24 h and 72 and 78% after 48 h in swine wastewater. Total coliform and faecal coliform reductions of 70–83% and 65–78% were observed in the vegetated systems after 24 h of CT, while after 48 h, total coliform and faecal coliform reductions of 80–82% and 86–91% were noted.

Key words | domestic wastewater treatment, hydraulic retention time, macrophyte type, pathogens removal, subsurface flow constructed wetlands, swine wastewater treatment

...after 48 hr, total coliform and fecal coliform reductions of 80-91% were noted.

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Balance



Mucho Gracias