



**Conceptual Design to Recycle Water
in Post-Panamax Locks
Electromechanical Equipment of the
Pumping Station**

**Diseño Conceptual para el Reciclaje
de Agua en las Esclusas
Pospanamax
Sección Electromecánica**

CONSORCIO POST PANAMAX

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**Introducción
(No existe Resumen Ejecutivo)**

1. GENERAL

The recycling study is a conceptual design of a recycling system by pumping water from a lower to a higher reservoir on the Pacific side for the future Post-Panamax locks, in order to save a maximum of spilled water during periods of insufficient water resources.

This document is related to phase II of the recycling study and is including the study, conceptual design of the main electromechanical components of the pumping station as well as a brief technical description of:

- the pumping units,
- the discharge valves,
- the mechanical auxiliaries of the pumping station,,
- the electrical auxiliaries of the pumping station,
- the water intake,

This design will allow at the end of this report to make a cost estimation covering the electrical and power equipment including local substation..

Basic design assumptions

According to the TOR:

- Water levels

The upstream water level of lake Gatun is supposed to be constant at + 26.00m PLD. It is obvious indeed that the recycling system should be used when the water levels are low, as there is no need to save 100% of the spilled water when there is sufficient water in the lake.

The average downstream level of the Pacific Ocean is 0.04 PLD. In fact, the level is fluctuating according to the tides. The average value is based on a sinusoidal curve with maximum and minimum levels corresponding to mean low water spring and mean high water spring (-2.32m PLD and +2.40m PLD), as the extreme values do seldom occur.

- Recycling scenarios:.

As required by the TOR, three different operating scenarios will be studied:

- a baseline scenario will assume recycling water directly from the Pacific Ocean directly into Gatun Lake (see location 1 of the pumping station on the general layout hereunder),
- a second scenario will include water storage ponds at lower (ocean) end and upper (lake) end, tied into Post-Panamax locks intake and discharge system (see location 2 of the pumping station on the general layout hereunder),
- a third scenario will recycle water from a lower storage pond directly into Gatun Lake (see same location 2 of the pumping station as for the second scenario near the lower pond).

