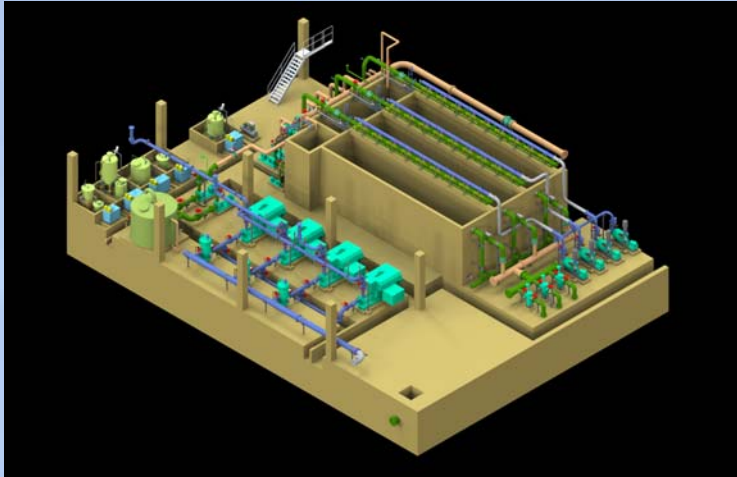


Ecopetrol

Power Plant Boiler Feed Water Make-up



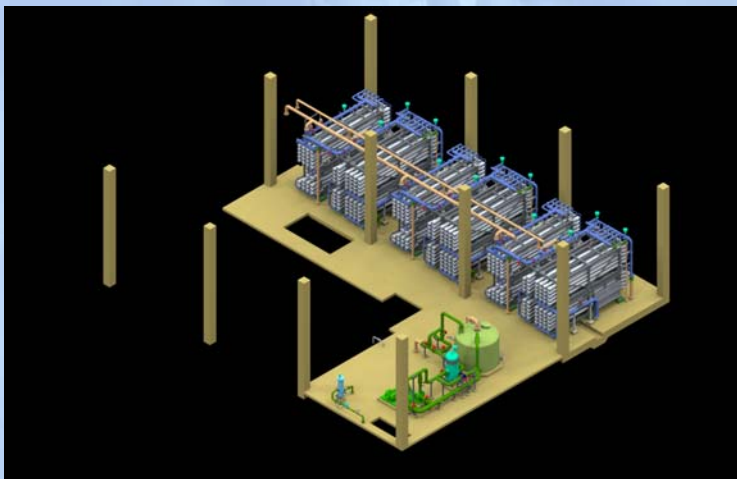
Year: 2009 - Present

Start-Up Date: Expected 12/2011

Client/Owner: Ecopetrol

Engineer: DHT

Location: Barrancabermeja,
Columbia



Application: Power Plant Boiler Feed Water

Scope of Work: Design, manufacture, supervise
(3 UF Trains + 3 BWRO Trains)

Operation Data: Feed water TDS: 237 ppm after UF
Permeate TDS: 0.15 ppm
Permeate flow: (1,579 GPM: 1st Pass,
1,374 GPM: 2nd Pass)
Recovery: RO - 77.5% / 87% (644
Total Membranes)
Other: UF-100 Modules/skid x 8
skid/train = 2333 GPM/train (3-UF
Train supplied)
40/19/22/11: 2 Stage-2 Pass RO
System, 3 Trains, Feed pH = 7.8,
Hydranautics Membranes, Clarified
Waste Treatment Effluent Source.

Capacity: 10 MGD Total UF + 5.9 MGD Total
BWRO

Project Summary: This is a Design-build on-site project
for 3 trains (Double
stack/Stage/Pass per train)
configuration and work in tandem
with DHT design build UF filtration of
3 UF Membrane systems. All UF/RO
frames/CIP were fabricated in the
U.S. and shipped directly to the site.
All equipments, instrumentation and
controls were included and
assembled/built on-site. Design,
procure, manufacture and install all
equipment. The contract required
support for installation
supervision, start up,
commissioning and personnel
training.