



Flexible water treatment plant for use with river water and well water

On the request of a beverage company producing soft drinks and bottled water, CHRIWA built a water treatment plant for river and well water in Colombia in 2012.

The plant was initially designed to treat river water. Due to a high level of turbidity, a high TSS (total suspended solids) content and an iron content, the demands placed upon the water treatment plant were very high. Thus it required a full pre-treatment cycle to condition the raw water for the actual treatment downstream with gravel filtration, activated carbon filtration and membrane filtration.

Towards the end phase of the project the client found out that the river water would not be available at the time production was set to commence. Well water was to be used instead in the first operating phase. Contrary to the river water, the well water had low turbidity and a low TSS content. Nevertheless, it was highly mineralised with a particularly high chloride content.

After checking the new conditions and considering the equipment already manufactured, CHRIWA made the necessary adaptations.

The outcome was a flexible to operate water treatment plant that is able to treat two very different raw water qualities and obtain comparable product water parameters. For tasks of this kind CHRIWA develops treatment con-

cepts that take the project-specific conditions into consideration and thus make a reliable production process possible.

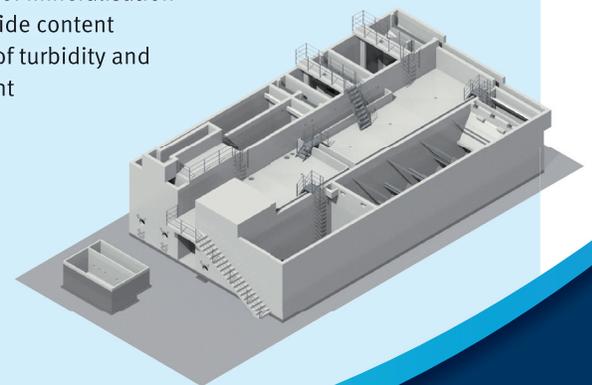
Raw water quality

River water

- High level of turbidity (approx. 500 NTU)
- High sediment content
- Iron

Well water

- High level of mineralisation
- High chloride content
- Low level of turbidity and
- TSS content



The project included the design, manufacture, installation and commissioning of the water treatment plant, which produces drinking water for bottling beverages as well as for general use and for boilers. As built, the water treatment plant currently produces an average of 188 m³/h. The modular design of the plant provides for future expansion where additional modules and components can be added without difficulties.

Process steps

- Mechanical separation through grit separator
- Flocculation/sedimentation
- Disinfection
- Gravel filtration
- Activated carbon filtration
- Membrane filtration in reverse osmosis plants
- Ozonation
- Remineralisation

In the pre-treatment process, turbidity and iron are removed from the river water through flocculation and sedimentation. The process commences by feeding the water into the grit separator and from there into a flocculation chamber and a lamella separator.

The sludge that is generated in the pre-treatment is dehydrated to facilitate its disposal.

To disinfect the water, sodium hypochlorite is added, which is produced on site by a chlorine electrolysis plant.

The required product water quality is achieved through additional process steps such as gravel filtration and activated carbon filtration as well as membrane filtration. Suspended solids and fine particles that remained from the pre-treatment are removed through gravel filtration. The activated carbon filtration removes not only the oxidising agents added for disinfection but also removes substances that impair flavour.

Any further undesirable substances are retained in the reverse osmosis plants downstream.

The clean water destined for beverage production is first subjected to ozone treatment and then UV treatment. It is then remineralised for the production of particular beverage products.

As a result of the particular combination and construction of the water treatment plant it is possible to react flexibly to the quality and quantity of the available raw water as well as to the production and service water required.



Customer benefits

- Flexible reaction to varying raw water qualities
- High level of process stability to achieve best product water quality
- Simple and low-maintenance water treatment technology
- Precise control of water treatment process



Figures, data, facts

Location:	Colombia
Plant performance:	234 m ³ /h in the pre-treatment plant 125 m ³ /h product water with increase to 140 m ³ /h in the second construction phase 63 m ³ /h service and boiler water
Task:	Water treatment of river and well water
Performance scope:	Concept development, design, manufacture, installation and commissioning
Time:	2012

