

ARA Radet cost allocation

Outflow measurement for just cost allocation

An association of twelve municipalities in Wallis was looking for a just cost allocation solution to account for the high foreign water content in the waste water entering the treatment plant. The measuring system installed now records the different outflows and thereby rewards those municipalities that already have installed a separation system.



The control cabinet of the Erschmatt (Leuk municipality) storm-water basin is located prominently high above the main valley.

The Radet waste water treatment plant on the municipal territory of Leuk in Wallis' main valley treats waste water from about 18,000 connected population equivalent in a widely branched catchment area. Totally twelve municipalities located very differently and of different size discharge their waste water in the Radet treatment plant that started operation in 1994. «According to the Articles of the Association, we split the cost among the municipalities into one third based on the construction volume and two thirds according to the population equivalent», sewage treatment plant foreman Reinhard Bregy explains the procedure practiced so far. «We did install measuring stations in our inflow system at the municipal borders at the beginning, but the measuring instruments twenty years ago lacked the necessary accuracy so that – with the exception of a few cases - we did not carry on with the measurements.»

Cost-efficient solution wanted

Since that time, some of the connected municipalities have set up separation systems and now felt they were treated unjustly by the current accounting system in view of the high foreign water content of 60 to 65 per cent from

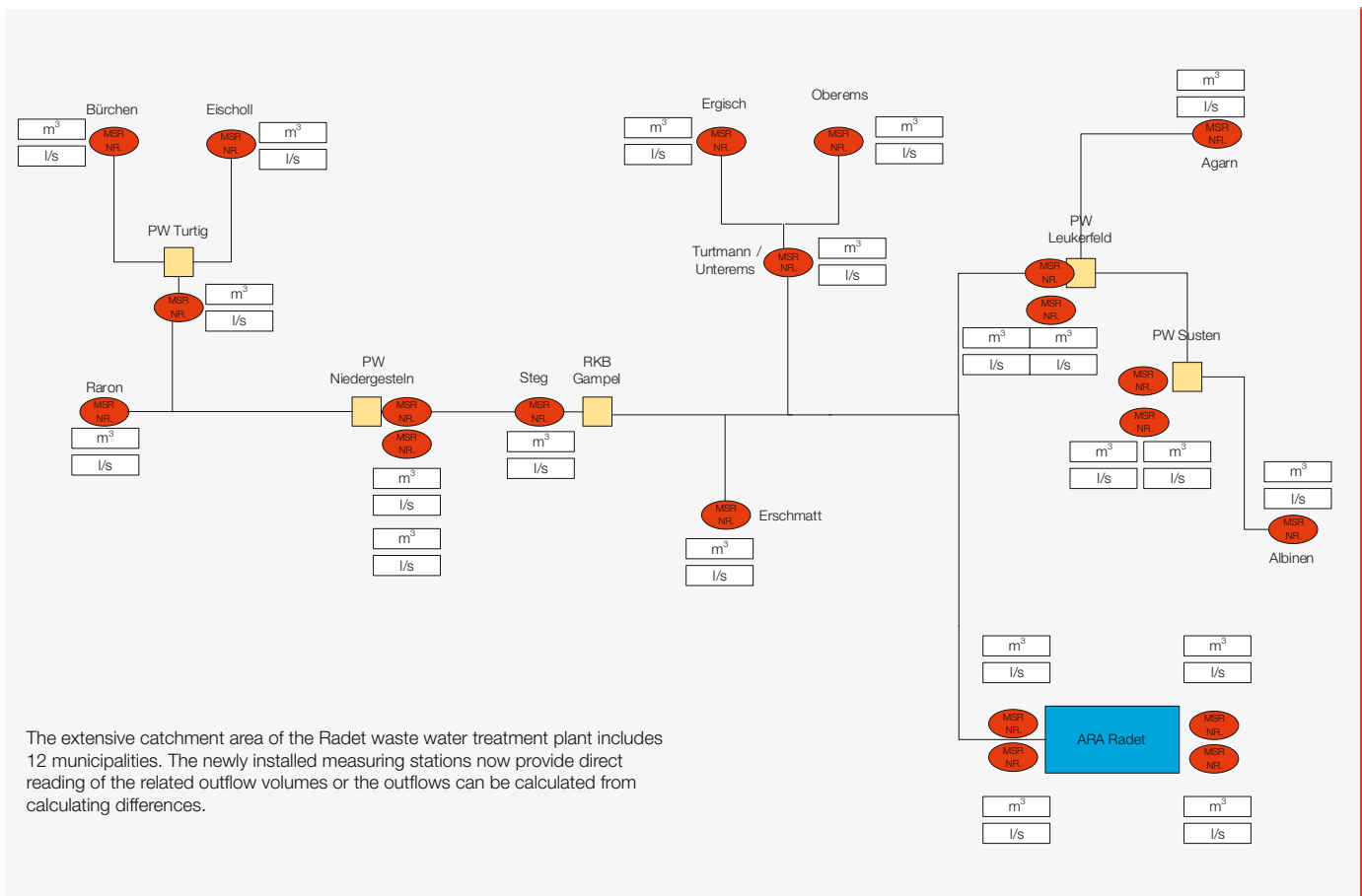
wells, drainage systems, surface water or irrigation. So the Association had to find a solution that would allocate the operating cost on a just basis. The body of measuring data available was meager and insufficient for deriving reliable information because due to the small number of measuring stations the cumulated measuring error would have been anything up to 35 per cent. «Our search for a potential partner for the development of a measuring concept and the installation of the required measuring stations led us to STEBATEC, whose measuring systems impressed us », Reinhard Bregy continues. Instantly, the experts from Brügge started defining the required measuring stations in the available inflow system in such a way that the lowest investment ensured a cost distribution as just as possible. «The purpose was not that of attaining maximum accuracy but clearly the attempt to develop an optimum solution within a financially reasonable framework», Heinrich Hesse, responsible for the project, says. The different measuring stations all provide flow data deviating not more than one per cent from the real flow value, but such a high level of accuracy would have necessitated much too many additional measuring stations.



Oberems measuring station with part-filled stationary flow measurement.



Eischoll measuring station: MID-controlled pneumatic outflow control.



Optimized measuring concept

A measuring concept was proposed to the Association which with totally twelve new measuring stations to be built would provide data with a cumulative measuring error between 1 and maximum 9.59 per cent. The cases in which the error was only 1 per cent are the municipalities located on the outskirts of the catchment area and those for which only one measuring station was included in the error calculation.

The error rates are necessarily higher for the municipalities located in-between different measuring stations because their cumulative error from the differences of several measuring values is integrated. «If the number of measuring stations was higher, more exact values would be obtained but the required investment would bear no relation with the potential savings of operating cost», Heinrich Hesse explains. The Association followed this view and requested the STEBATEC to install the proposed twelve

measuring stations with magnetic inductive flow meters or part-filled stationary outflow measurements, depending on which version proved to be more suitable.

In addition, the storm-water basins in the municipalities of Bürchen and Leuk were equipped with a pneumatic outflow throttle and outflow measurement. These two outlying structures can also be controlled by the newly installed web-based process control system ARAbella and are managed from the waste water treatment plant in the Radet ARA. And finally, a last measuring station is located in the waste water treatment plant: Here the outflow is measured anew so that the plausibility of the inflow measurement data can be validated, the sewage treatment share determined and overflow events registered.

Just solution rewards and motivates

The newly installed as well as the pre-existing measuring stations were all integrated in the available process control system of the Radet waste water treatment plant via the mobile phone network and have been available there at any time since the fall of 2015. Besides, every municipality receives an e-mail at the end of a month with a tabulated and a graphical account of the outflows relating to it and the precipitation measured. Municipalities that still operate a mixed system can see the correlation between peak outflows and rain events, which should be an extra stimulus for them to install a separated system. Peak outflows that cannot be explained by rain events can be caused, for example, by leaks or a burst pipe so the locations can be defined and the damage repaired systematically.

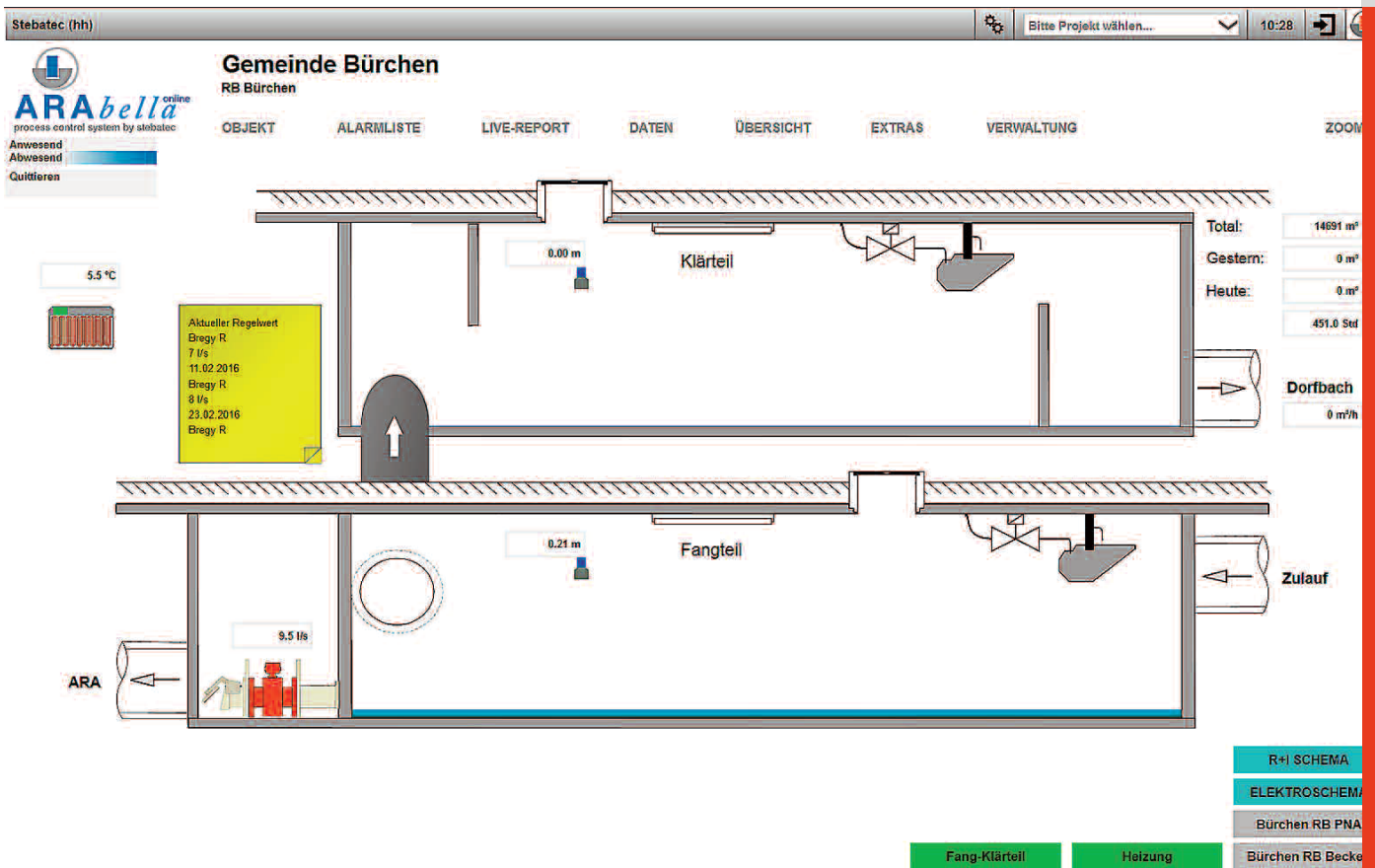
«It is clear already now that the future accounts will look different from those in the past», Reinhard Bregy states. This means that the new measuring concept exactly serves the purpose. Because it rewards the municipalities that have invested in a separated system and it places the burden of higher operating cost on others. This transparent and efficient polluter-pays principle should motivate eve municipalities so far reluctant to invest into a separation system.



Waste water treatment expert Reinhard Bregy in front of the premises of the Radet ARA.



The outflow from the Radet ARA is now measured by a part-filled stationary flow measurement system.



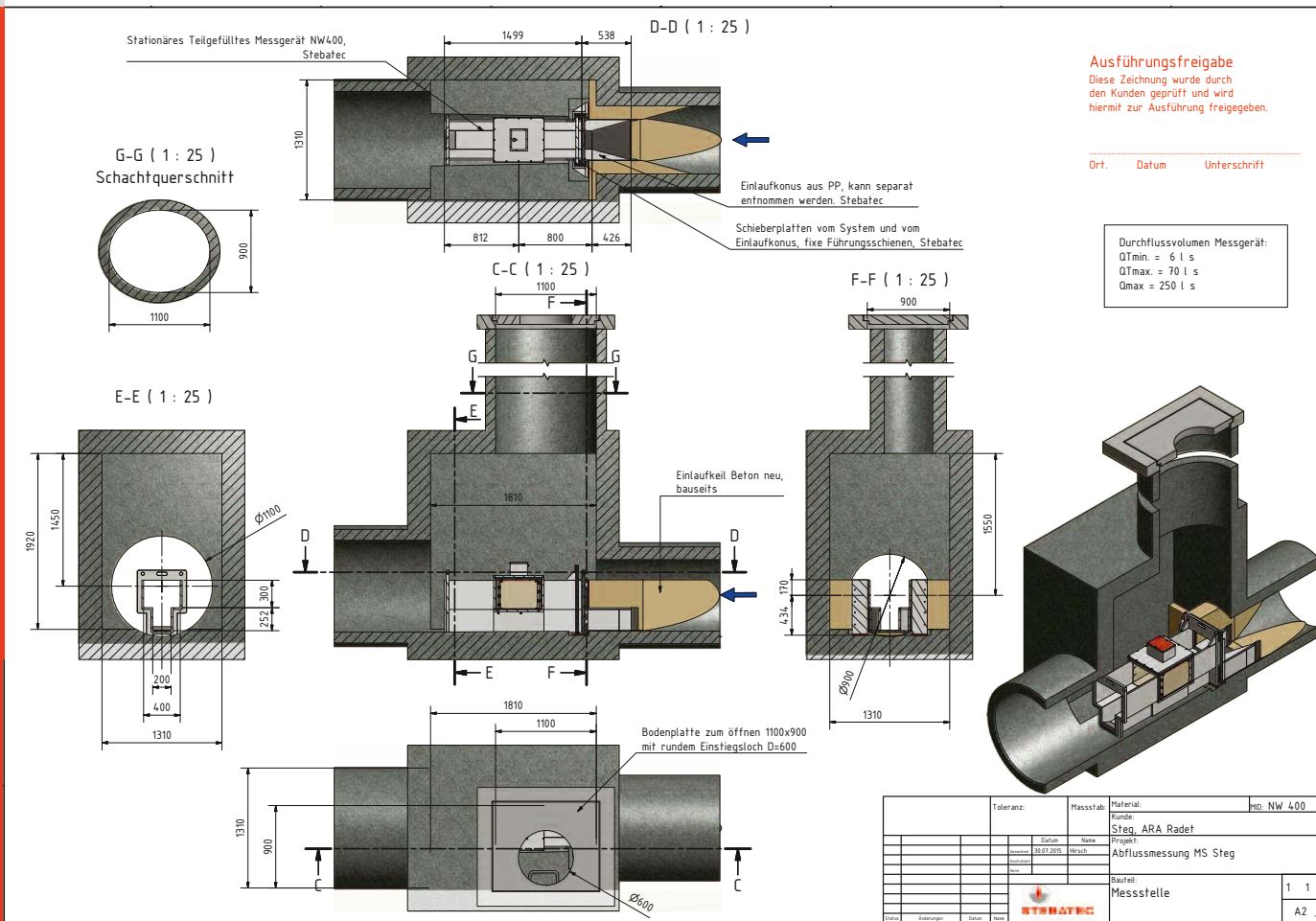
The storm-water basins in Bürchen and Erschmatt (Leuk) can be controlled online by ARAbella online from the waste water treatment plant in Radet.



View of the control cabinet of the measuring station in Raron.



Installation of the part-filled stationary flow measurement in the outlet canal of the Radet waste water treatment plant.



Execution plans of the Steg measuring station.



The part-filled stationary flow measurement of the Steg measuring station at low flow rate (dry bed only).



The measuring transducer from STEBATEC.