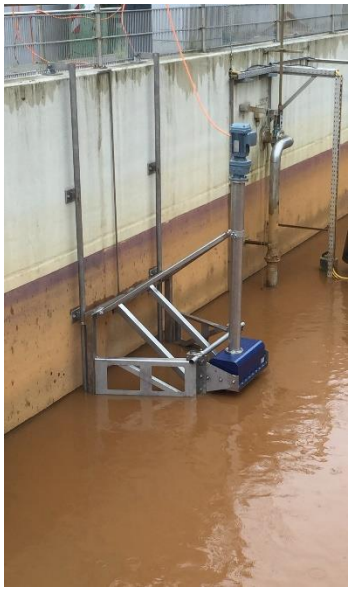
OLOID Solution GmbH

Iron and manganese removal

Sludge water treatment, Hamburg, Germany



HAMBURG WASSER
Hamburg
http://www.hamburgwasser.de

Operation:
1 Backwash water basin max. 880 m³ with 1 OLOID Type 600 I with cardan-shaft drive and wall guide

Period:
Since 2015 (2 OLOID Type 600)
Since 09/2017 1 OLOID Type 600 I

Success:
Homogenisation of the basin

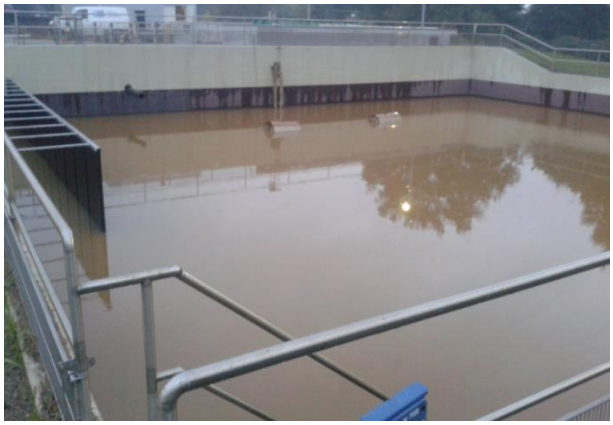
Preventing settling of the solid iron

Description of the plant

When drinking water is produced in a waterworks in the south of Hamburg, iron and manganese removal is necessary to treat groundwater into drinking water. The sludge-containing backwashing water resulting from the filter rinsing contains the removed iron and manganese. The separation of the sludge is no longer carried out in the basin by gravity, but in a special treatment plant. The clear water should be brought back into drinking water treatment prospectively. The rinsing water is collected in a settling tank (20 x 22 m). The sludge-containing water must be homogenised for subsequent treatment in order to ensure a constant concentration. Particularly difficult is the strongly fluctuating water level from 0 to 2 m.

OLOID operation

In 2015 2 OLOIDS with floats were originally used and the flow measurements shown on the following pages were carried out. In a further step, a customer-specific solution was developed and implemented. An OLOID Type 600 I with a cardan-shaft drive and a specially developed wall holder with guide were used.
Due to the fixed mounting by means of the wall holder, a better flow is achieved since the energy is transferred directly from the OLOID to the water.
The wall holder allows maintenance without draining the basin. The motor is protected against flooding via the cardan-shaft drive.
The OLOID Type 600 I ensures the necessary homogenization in the basin, so that no solids (especially iron) settle.



Before OLOID installation

OLOID Solution GmbH
Motzener Straße 25 | D-12277 Berlin | mail@oloid.de | www.oloid.de

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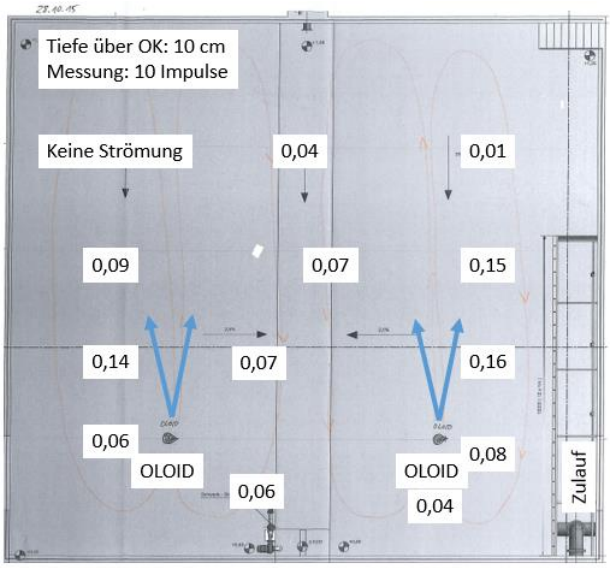
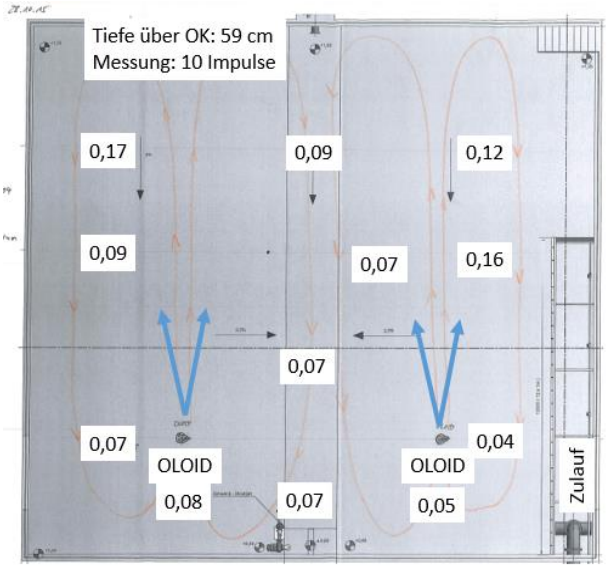
Test results from the flow rate measurement 10/28/15

With two OLOID Type 600 devices the entire basin was transferred to an oscillation and the sludge was stirred up and kept in suspension. Clearly visible in the colour change. To verify this observation speed measurements were carried out by the operating personnel (respectively the rate of 10 pulses originating from the OLOID delivered a reading). The measurements were carried out in 10 cm and 59 cm in depth.

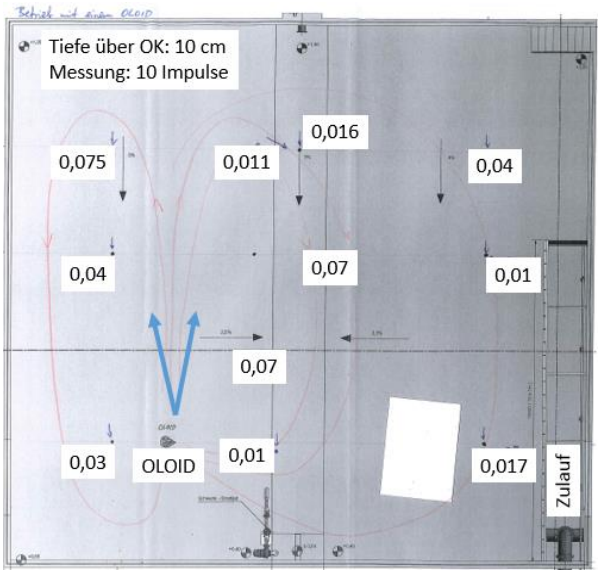
The results of the measurements are shown in the following pictures. The flow measurements showed for both depths and the different measurement points continuous flows which prevents the settling. The positioning could be improved to more optimally exploit the flow, due to the present drain device, however this was not possible. In further measurements, an OLOID type 600 has been turned off, to verify the possibility of using only one device. From a technical perspective repositioning the OLOID Type 600 would have been recommended to keep the relative square basin by a diagonal formation with a heart-shaped flow in motion. The results without repositioning then showed only very low speeds, particularly in the lower right corner of below 0.02 m/s.

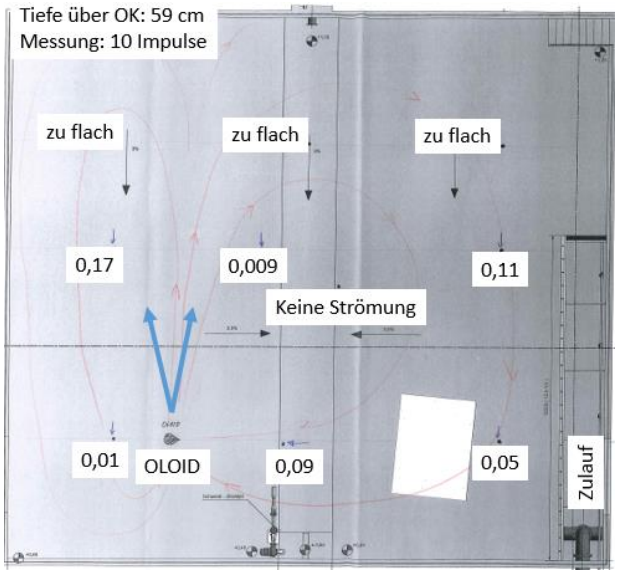
Measurement results with 2 OLOID Type 600 in 10 und 59 cm depth [m/s]





Result with 1 OLOID Type 600 in 10 und 59 cm depth [m/s]





Conclusion

A more energy efficient homogenisation and levitation of the iron sludge is possible with the help of the innovative OLOID technology. The pivoting stream jet in planning consumes 11 kW and thus a multiple of the two OLOID Type 600 devices (approx. 800 W each). Thus, in a continuous operation of the two systems, cost savings result solely from the energy costs through the use of the OLOID technology.

The fixed installation via a wall holder and the resulting lower position of the OLOID immediately brought a clear improvement of the flow velocity in the basin compared to the original installation with floats. A repetition of the flow measurements is not provided, but the difference is clearly visible.