

The smart solution: **ADAPT 2.0**

Increased performance
for your secondary
clarifiers.

Further developed for
even higher phosphorus
elimination.



hydro|grav

hydraulics • gravity separation

ADAPT 2.0 – The smart solution.

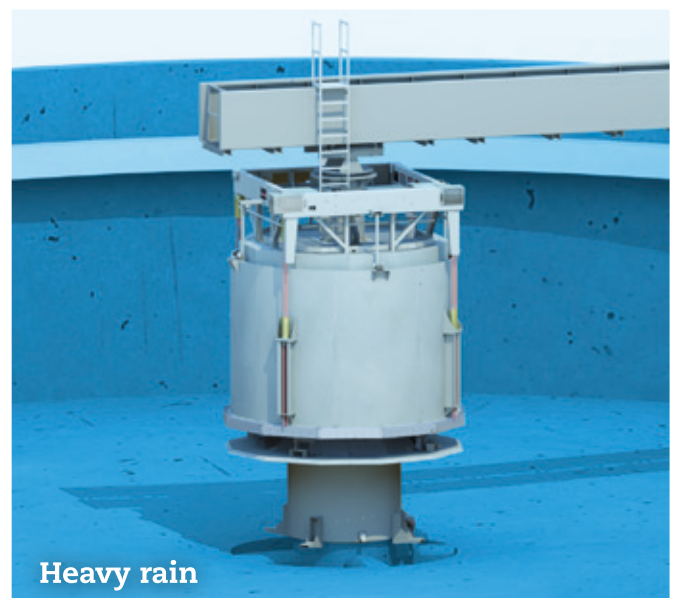
0.2 mg/l P_{ges} in the effluent of wastewater treatment plants now also without filter

Time and again, secondary clarifiers cause problems due to high effluent turbidity and reduced load capacity of the wastewater treatment plant. They are therefore often the problem children of the plant. If the turbidity problem is cured by filtration the second problem is exacerbated: backwashing further reduces the load capacity of the wastewater treatment plant.

The cause of both are rigid inlet structures - and also their horizontal discharge at low load. No matter how streamlined they are shaped, rigid and fixed the inlet is at the wrong place. At low loads, the discharge is too high and thus causes unnecessary turbidity; at high loads, the discharge is too low, stirring up the settled sludge. The rigid inlet design is therefore an outdated technology and is detrimental to the environment and efficiency.

To achieve state of the art effluent and maximum operational reliability, the inlet must be variable and change the direction of flow in the event of low load. Therefore, our adapt 2.0 can do even more than its predecessor: the patent-pending adapt with phosphorus elimination ring – PER – ensures that the inflow changes its direction load-dependent.

The result: even clearer water flows out of the tank, which can be proved by measurement. The total phosphorus could be reduced with adapt 2.0 and PER on several plants to average values of 0.2 mg/l P_{tot} – without filtration. Conclusion: TSS problems and overloading solves adapt 2.0 with PER at its source – the inlet of the secondary clarification – instead of curing the symptom with filtration, which is both energy-intensive and high-maintenance.



ADAPT 2.0 in video:
Scan QR code or visit:
<https://www.hydrograv.com/de/adapt-2-0>



Installation of the variable-height inlet system in the last of six secondary clarifiers at a large wastewater treatment plant.

ADAPT 2.0 at a glance

The most important advantages of the height-variable inlet system:

- Avoids swirling of the settled sludge and thus increases the tank capacity
- Lower sludge level and a stable sludge bed lead to increased operational safety
- Energy savings compared to filtration
- Floc filter in the secondary clarification instead of downstream filtration
- No hydraulic load of the biological purification due to backwashing
- Low maintenance, durable, successful.

ADAPT 2.0 thus defines the state of the art for the equipment of secondary clarifiers – a patented technology of hydrograv GmbH.

ADAPT 2.0: Sustainable water protection.

hydrograv adapt with effluent values like a sand filter

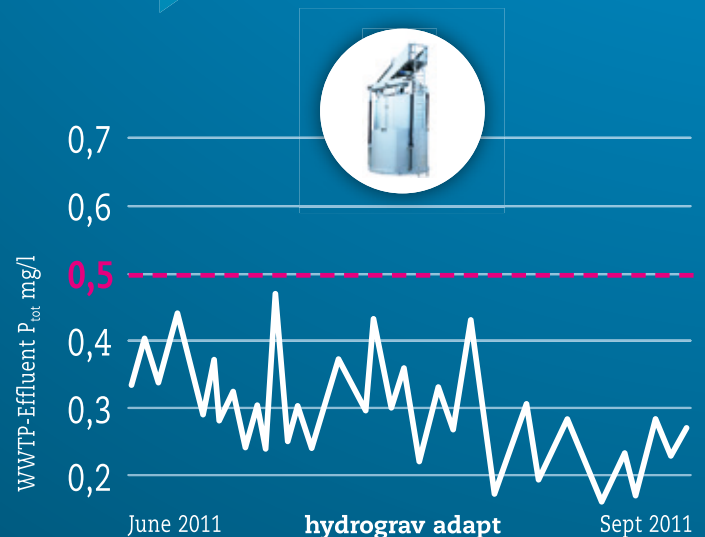
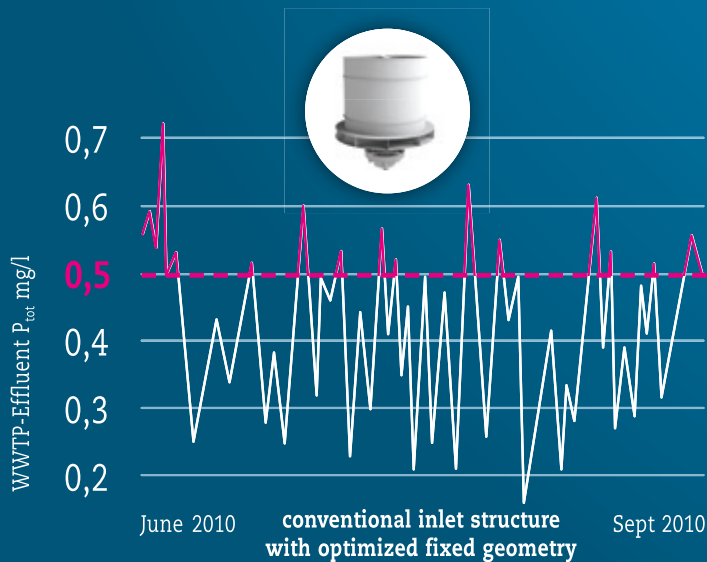
- without pumping costs
- with negligible energy demand
- with minimal operating expenses
- no additional space required

Minimization of the phosphorus discharge by actively securing the flock filter with hydrograv adapt, this is efficient water protection!

Peter Birken

Head of department Wastewater, LINEG:

“After installing the adapt inlet systems on the WWTP Moers-Gerdt we could verify discharge reductions of P_{tot} of almost 30 % and of COD of 25 %. Thus we are allowed to set off the investment costs against waste water levies.”



The consistent complement to activated carbon treatment

hydrograv adapt optimally complements
tertiary wastewater treatment.

Organic matter, nitrogen and phosphorus are the objectives of wastewater treatment nowadays. But micropollutants are becoming an increasing priority. They partially can be eliminated by activated carbon.

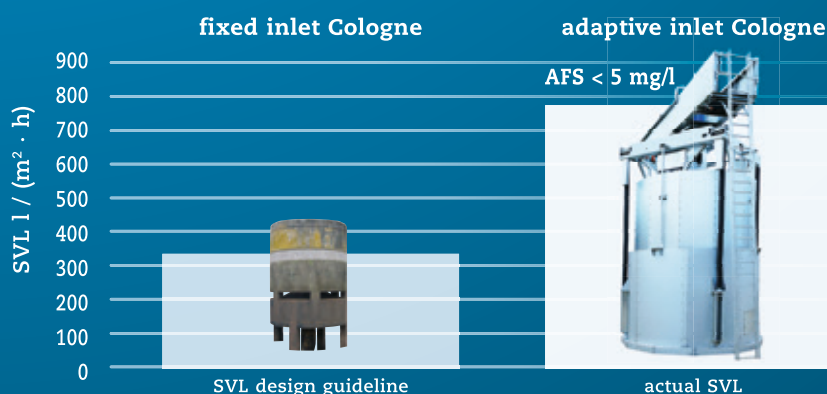
Mainly by three variants: activated carbon within the aerated tank, suspended in a tertiary treatment with subsequent settling tanks, or in a downstream filter.

Treat more combined wastewater – without additional secondary clarifiers

The hydraulic bottleneck secondary clarification prevents that more combined wastewater may be treated on WWTPs.

Less discharge of combined wastewater within an urban catchment, this is active water protection, too. For example we operated our plant in a comparatively shallow secondary clarifier with a surface loading of 2 m/h. Reliable and with reserves. At an actual sludge volume loading (SVL) of app. 775 l / (m² · h). With 230 %, i. e. more than twice the load that recent design guidelines permit for this tank.

- Connect additional urban catchments, without constructing a new secondary clarifier at once.
- Treat more combined wastewater in your WWTP – discharge less wastewater unpurified.
- Avoid a bypass around the activated sludge tanks – or apply it only at much higher loadings.
- Reuse of freed-up secondary clarifiers for additional treatment steps, for instance elimination of trace contaminants.



230%
OF THE DESIGN GUIDELINE

All three variants rely on efficient settling.

hydrograv adapt provides the variants in the following way:

Activated carbon in the recirculation within the aerated tank increases the MLSS that have to be removed and hence the loading of the secondary settling tanks. The suspended solids have to be strongly minimized, because they contain carbon loaded with micropollutants.

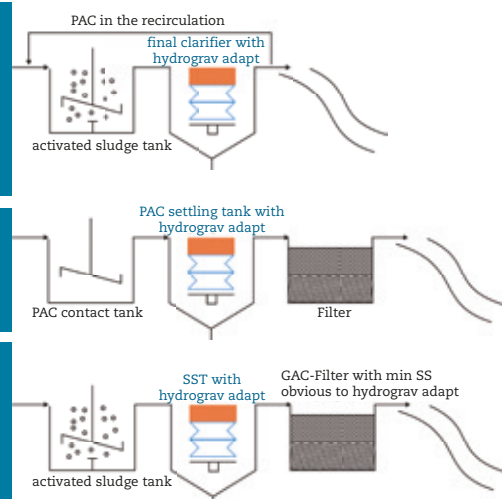
Maximum performance of secondary clarifiers for the activated sludge process (MLSS) and at the same time maximum retention of the suspended solids through hydrograv adapt.

Activated carbon suspended in a tertiary treatment requires for itself a settling that is as efficient as possible.

Extremely efficient activated carbon settling tank with hydrograv adapt.

The lower the amount of filterable substances in the effluent of the secondary clarification, the more stable the operation of activated carbon in a filter with even less time-consuming backwashing intervals.

Secondary clarifiers upgraded with hydrograv adapt already minimize the solids quantity at the inflow of the activated carbon filter as good as technically possible.



ADAPT 2.0: More than a structure - an innovative system!

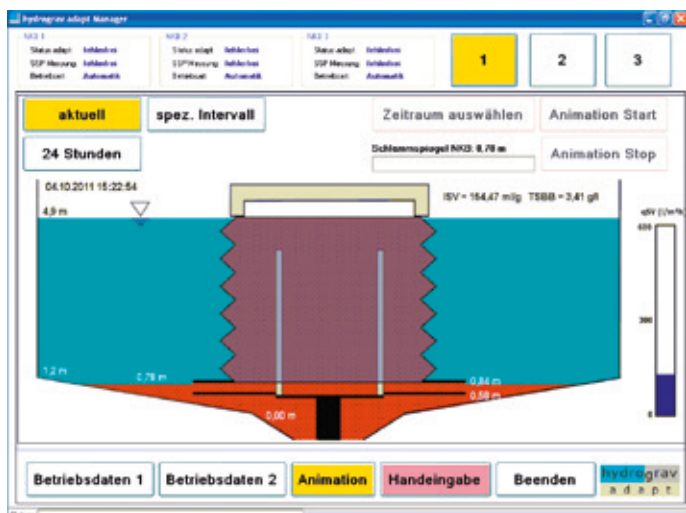
The hydrograv adapt system gives intelligence to secondary clarification. Finally secondary clarifiers become controllable.

The adapt system offers:

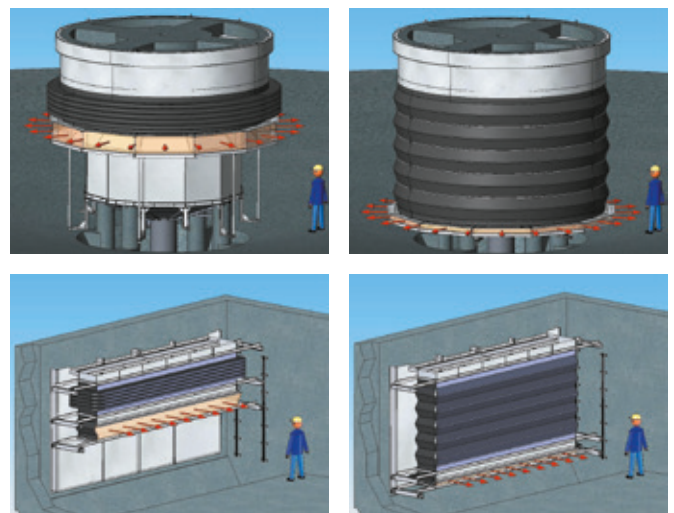
- A computer-based individual adjustment to the sewage plant of the customer
- Technology based on the know-how of the international leading experts for setting tanks
- Full controllability of the complex sedimentation process

The adapt system includes:

- Our robust and durable construction.
- Most reliable hardware, manufactured consistently from stainless steel.
- A complex process measuring and control technology based on leading know-how, customized to every individual WWTP, and therefore optimally controllable.
- Numerous monitoring tools for the operator, warnings and alerts based on most recent methods.
- A highly developed computerized sludge management system that retains a maximum of sludge in the aerated tanks – especially at stormwater, when it is most urgently needed there.



Fully automatic hydrograv adapt
sludge management system:
It checks, informs, and warns.
That's how you get your sludge balance under control!



hydrograv adapt
for circular tanks (above)
and rectangular tanks (below)

ADAPT 2.0: Impressive successes in practice

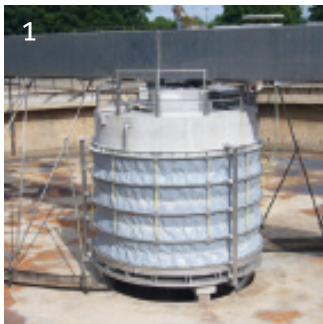
Finally a carefree operation of secondary clarifiers is possible!

- Low inlet with narrow opening width at low loadings.
- High inlet with wide opening width at high loadings.
- Horizontal inflow to prevent swirling up of settled sludge.

And concurrently always located below the sludge blanket level.

These are the patented key elements to the best effluent quality that secondary settling tanks may achieve. And to the highest hydraulic capacity. So good, that our inlet system hydrograv adapt convinces WWTP operators with impressive results meanwhile for many years! Those, who have got it, absolutely want to keep it. And recommend it to others.

Install it and switch it on. It just works! – A story of success since 2007.



1 Wastewater treatment plant Großostheim (2009).
There were considerable capacity problems here. The construction of a projected third secondary clarifier could be avoided. In addition, clearer water runs off.

2 Refitting with hydrograv adapt in a tank with suction collector system (2010)



3 Wastewater treatment plant Moers-Gerdt.
Operational problems eliminated with equipment of three hydrograv adapt. Offsetting against the wastewater levy.

4 Wastewater treatment plant Bad Berleburg-Aue.
In 2012, the second wastewater treatment plant was equipped.



5 Wastewater treatment plant Dresden Kaditz (2015-2016).
Capacity problems in the secondary clarification eliminated. At the same time, turbidity and phosphorus in the effluent decreased significantly.

6 Wastewater treatment plant Schlüchtern (2018-2019).
Installation to minimize the total phosphorus of the wastewater treatment plant.

What operators say about hydrograv adapt for secondary clarifiers:



A real success!

The equipment of the new secondary clarifier in Aue with the hydrograv adapt system was a real success! – When we rebuilt our main wastewater treatment plant in 2012, it was absolutely clear to us that we would not do without the adapt system here as well.

Jörg Sonneborn – Wastewater treatment plant manager
Bad Berleburg (21.000 PE) · Bad Berleburg Aue (5.800 PE)
Operates adapt since 2010 and 2013.



Problems solved!

hydrograv adapt solved the major problem of overloading of our secondary clarifiers.

Heiko Kümpel - Wastewater treatment plant manager
Großostheim Bachgau (35.000 PE) · Operates adapt since 2009.



The best invention of the last 30 years!

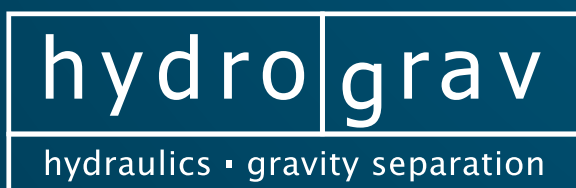
I follow technological developments for wastewater treatment plants attentively. And for me, the hydrograv adapt height-variable inlet system is the best invention of the last 30 years!

Guido Hammer - Wastewater treatment plant manager
Moers-Gerdt (250.000 PE) · Operates adapt since 2010.

hydrograv GmbH – with internationally leading expertise for secondary clarifiers and for the optimization of flows in the wastewater treatment technology.

Our core competencies:

- Flow simulations (CFD)
- Secondary clarifier optimization
- ADAPT 2.0



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UMWELTPREIS
2017

**Awarded with the Saxon
Environmental Award.**