reststoffenunie

25 years

aqua minerals

Annual Report 2020 AquaMinerals

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Reststoffenunie is established by 24 drinking water companies

reststoffenunie

1996

First deliveries: ferrous sludge to the brick industry, calcite pellets in cattle fodder

1997

30% of residuals in useful applications

1998

1998

Applications for 18,000 tonnes ferrous residuals and 30,500 tonnes calcite pellets

- Applications
- Network
- Sustainability
- Volumes
- Earnings
- Recognition
- Regulations

Three directors look back and ahead

25 years of opportunities and challenges

AquaMinerals, formerly Reststoffenunie, has turned 25. Three managers succeeded each other in setting the course. Each with his own focus and in a different spirit of the day. We look both back and ahead with Jan Geu ten Wolde, his successor Hay Koppers and the current managing director Olaf van der Kolk.

From left to right: Jan Geu ten Wolde, Hay Koppers, Olaf van der Kolk

Dumped as waste, everywhere in the country and of indeterminate quality. Until 1995, such was the lot of the drinking water sector's residuals. The collective of water companies thought there had to be an alternative. Jan Geu ten Wolde was asked,
to take charge, with the Reststoffenunie, of the valorisation of the streams, ensure continuity and keep a grip on costs. 'The pressure from the environmental legislation was great, and waste processing was definitely under heavy political pressure,' begins Jan Geu. 'The orientation report of (the then) KIWA, containing potential destinations for the materials, provided a good guide. Reststoffenunie got to work on the task in a structured manner; this was unprecedented in the Netherlands and was followed with interest. Our greatest obstacle was – and still is – the definition used in the legislation: *"all materials disposed of by an owner, are waste materials"*.'
Olaf van der Kolk agrees: 'That's right. The government calls for recycling, environmental protection and own responsibility, but the legislation still does not back this up enough. And today's decentralised administration doesn't make things easier; we are obligated to find our way between the visions and policies of multiple public authorities.'
Jan Geu: 'Even so, we managed to achieve a great deal at that time. And I look back to it with immense pleasure – in fact, it was the best job of my life. We fulfilled an important task for the water companies, with links throughout the society.'

Tailor-made

In 2009 Hay Koppers took over the baton; up until then he was responsible in Reststoffenunie for market development and technology. Jan Geu: 'The position was tailor-made for Hay: a tough technology job, requiring knowledge of the network and the background.'

Hay: 'And yet, in practice, my activities didn't have so much to do my technical expertise. The task assigned to me by the supervisors was to formalise and professionalise the organisation. This encompassed governance, updating the company's statutes and participation agreements, its position regarding the procurement and competition law, and a new earning's model. It represented a next stage: to demonstrate our *raison d'être*, show that we operated in conformity with the market, were accountable and entirely transparent. Complex, but challenging.'

Diamond in the rough

When Olaf joined the staff as commercial operational manager in 2011, he discovered, as he puts it, a diamond in the rough; a well organised company with plenty of commercial prospects. Four years later he became the new managing director. 'A beautiful opportunity which fit me like a glove.
This role has everything that energises me: societal relevance, the commercial game and a constant focus on innovation. Well covered by everything my predecessors accomplished, and with a solid foundation of trust, I could stick my neck out. Reststoffenunie became AquaMinerals, and we increased the visibility of who we are and what we do. We then began collaborating with the Water Authorities, which was something the sector had long wished for. And, an important step, we strongly committed ourselves to circularity: returning materials to, or keeping them in, the chain. Primarily with a view to sustainability; but it also provides for focus: there are fewer links in the chain because suppliers also become buyers. That eliminates lots of uncertainties.'

Jumping high

Hay: 'It's great to see how the organisation is flourishing and, particularly, how you have embraced the Water Authority world. In my period that was talked about cautiously, but it still came up against all kinds of objections. Nonetheless, the market for recovered raw materials and residuals from the water sector remains relatively small. Where do you see further growth prospects, Olaf, do you want to start looking across the borders for instance?'
Olaf, laughing: 'We already have a Belgian shareholder of course. But, yes, we are in fact also looking elsewhere abroad, but it has to remain manageable for the organisation, and be in line with the interests of our existing participants. One can imagine possible forms of collaboration. But, when it comes to any future plans, the following must apply: you can take a run-up and jump as high up the ladder as possible. If you succeed, then you've done well; but if you badly miss your jump, then it will be a very long time before you'll be able to set a foot on the ladder again. That's why I say: be very ambitious, but also be patient, and climb each rung at the appropriate pace. Also, economic growth is

not all there is; as far as I'm concerned, it is also a matter of market segmentation and circularity.'

Increasingly higher value

Olaf mostly sees opportunities in the reprocessing of the materials. 'Right from the very beginning we disposed of residuals as quickly as possible, preferably directly at the client's. But since we want to direct the streams to increasingly higher-value and circular applications, we cannot avoid the reprocessing. Take for instance the pure calcite from the drinking water companies which, after being processed, can be used in the highest possible segments in the animal feed, ceramics and cosmetic industries, or even in the drinking water sector itself.
I also see plenty of possibilities for other materials, but they call for reprocessing sites. The question is: Who is going to set up such a site? All the parties would benefit, but who has the know-how, who will make the investment and who will run it? This represents a great opportunity for the sector and I will be happy, working from AquaMinerals, to put in the energy to bring it about. In any event, this constitutes our initiating and connecting role for the stakeholders in the chain. Together with the participants, we examine, case by case, what the development of new chains requires from the sector. What we have seen is that a focus on a specific and high-value application is key to getting such a reprocessing step off the ground. Thus, the immediate driver behind building The Calcite Factory pilot plant in Amsterdam was the production of a high-end circular product: seeding material for centralised drinking water softening, made from the companies' own calcite. By developing this product with and for the drinking water sector, we demonstrated that we could meet stringent quality requirements, which opened the doors to many other market segments. Even the very demanding cosmetics branch was a "breeze". The snowball started rolling and that was wonderful! As Hannibal Smith in the "A Team" says: "I love it when a plan comes together".'

Trend

'The drinking water companies should actually look at the production process and the residual streams as extensions of each other,' suggests Hay. 'By making the materials, right up-front in the process, better, cheaper or more easily disposable, for instance by using iron or pellet reactors.'
Olaf: 'You're right about that, but another trend has also emerged. A worrying one, which confronts us with a big dilemma as raw materials people. The water is expected to become increasingly polluted – think of PFAS, pharmaceutical residues, GenX and other hazardous compounds that we still don't even know about. These of course are, and will continue in the future to be, removed by the drinking water companies, by means of membrane processes for example. But they also accumulate in the residual steams, which become more and more polluted as a result, interfering with sustainable applications.' Jan Geu: 'A new form of pollution, and exactly the opposite of what we want.' Olaf: 'Yes, and probably irreversible. But I do also see possibilities, which I would like to discuss. Think of the removal of these annoying compounds using activated carbon, made from woody biomass from the land areas managed by the drinking water companies and the Water Authorities. In short, I still see sufficient challenges *and* opportunities.'

1998 **1999** 1999 **2000**

New definition of the European Court of waste versus raw materials has a big impact on our work (read how we have been dealing with this issue for 25 years at www.aquaminerals.nl/regelgeving)

Goal achieved: all drinking water companies are part of the collective

2000

2000 **2001** 2001

For the first time no drinking water residuals are disposed of as landfill; all find useful destinations

EURAL publication: drinking water residuals no longer count as hazardous waste

This is who we are

AquaMinerals seeks destinations for the material streams that are generated in water treatment processes. In doing so, we develop suitable chains, which are then supplied and/or operated in a qualitatively high-value manner. The organisation was initially established for all drinking water companies in the Netherlands, but we have since also become active for a Belgian drinking water company and for a number of Dutch Water Authorities.

Although we were set up in 1995 to solve the 'waste problem', we have long ceased seeing the generated residual streams as waste, and certainly not as a problem. The current situation is that we have developed functional applications for most of the streams. So we have made great progress, both in the financial sense and in terms of sustainability.
A considerable number of materials are even bringing in money. Circular working is our ultimate objective; we can increasingly reuse the materials in processes in the water chain, or we can supply them to other circular chains.

We do not do this on our own. We work closely with our participants in research and development projects, and frequently brainstorm possible new, preferably circular, chains. Research institutes share their knowledge and thinking with us. Our service providers operate as links between supply and demand. And we examine with the clients how we can best meet their desires, and how we can organise the right, sustainable chains for them.

This is what we do

For and in the name of our participants we:

- ✓ direct the chain
- ✓ procure logistical services
- ✓ sell the residuals and raw materials
- ✓ innovate and valorise through joint research with participants, clients and knowledge institutes
- ✓ carry out quality management
- ✓ arrange and maintain the required certificates and declarations
- ✓ monitor, lobby and advise in areas of policy, and legal and regulatory frameworks
- ✓ provide transparency in financial and product flows

Staff members

Number of staff members in service 17
Number of FTEs 13.6

Age 26–35 4
Age 36–45 6
Age 46–55 5
Age 56–65 2

Number of men 9
Number men in FTSs 8.1

Number of women 8
Number of women in FTEs 5.5

0–2 years in service 8
2–5 years in service 3
5–10 years in service 5
> 10 years in service 1

University (+) 4
Higher Vocational Education (HBO) 9
Vocational Education (MBO) 4

Our core values

- **Joint pursuit of shared interest**
- **Social entrepreneurship**
- **Innovation**
- **Reliability**

2001

Greater demand for clean materials: drinking water companies build water flushing installations, storage silos and covered drying beds

2002

New government policy: all raw material declarations are revoked. Major effort by RU members leads to five new declarations.

2003

Clients demand more quality stability. RU translates their wishes into clear internal standards and procedures

2001

51,000 tonnes calcite pellets usefully applied

Our participants

At the end of 2020, AquaMinerals had fifteen shareholders: all ten Dutch drinking water companies, the Flemish drinking water company De Watergroep, and four Water Authorities*. On 1 October 2020, the Hoogheemraadschap De Stichtse Rijnlanden (HDSR) Water Authority was the latest participant to join our collective. *

We have two types of shares: 'WS' shares (Water Authorities) and 'DWB' shares (drinking water companies), so that specific decisions, proposed by the SB, concerning specific streams generated by the drinking water companies or by the Water Authorities, can be made by the shareholders concerned.

DRINKING WATER COMPANIES

Vitens: shares 2.808, interest 22.8%	brabant water: shares 1.968, interest 16%	Evides waterbedrijf: shares 1.242, interest 10.1%	De Watergroep: shares 1.028, interest 8.4%
PWN: shares 802, interest 6.5%	wml Limburgs drinkwater: shares 614, interest 5.0%	dunea DUIN & WATER: shares 574, interest 4.7%	waternet: shares 527, interest 4.3%
Waterbedrijf Groningen: shares 354, interest 2.9%	oasen drinkwater: shares 275, interest 2.2%	WMD water: shares 252, interest 2.0%	**Total Drinking water companies (DWC)** shares 10.444, interest 84.9%

WATER AUTHORITIES

waterschap amstel gooi en vecht: shares 773, interest 6.3%	Waterschap Aa en Maas: shares 546, interest 4.4%	hoogheemraadschap Hollands Noorderkwartier: shares 537, interest 4.4%	**Total Water Authorities (WA)** shares 1.856, interest 15.1%

Total DWB + WS	**shares 12.300, interest 100%**

* The HDSR share transfer (479 WS shares) was accounted for at the beginning of 2021, and is therefore not reflected in the table.

Highlights 2020

Growth in an unusual year:

- In 2020, the material streams that AquaMinerals delivered to the market increased to over 298,000 tonnes, which is 28,000 tonnes, or 14.5%, more than in 2019. Most of the growth occurred in the Water Authority streams.
- The (sale) value also posted a record high of over € 3.7 million, almost 9% more than in 2019.
- The acceptance expenses were more than double the figure for 2019. This was primarily a consequence of the Water Authority streams and, to a lesser degree, of cost increases resulting from the PFAS problem.
- The increase in tonnage, combined with the higher acceptance expenses, explains the record turnover of € 15.8 million.
- A portion of the additional Water Authority streams was thermally processed, which lowered the recycle percentage.

Key figures

	2020	2019	2018	2017	2016
Results					
Turnover residuals and consulting	€ 15,792,924	€ 11,134,219	€ 8,670,780	€ 7,216,400	€ 5,105,800
Turnover non-shareholders in %	10.8	7.4	7.2	4.0	4.1
Total disposal expenses	€ 12,064,083	€ 7,715,865	€ 5,588,800	€ 4,563,500	€ 3,245,100
Sales value (pos.-value materials)	3,745,849	3,446,367	3,002,328	2,666,025	1,944,375
Acceptance expenses (neg.-value materials)	€ 5,991,862	€ 2,137,179	€ 819,567	€ 593,454	€ 522,753
Operating result (before taxes)	18,910	158,650	203,800	74,800	1,200
Shareholders' contribution in €/t[1]	€ 5.59	€ 5.63	€ 5.82	€ 5.23	€ 5.24
Assets					
Balance sheet total	€ 5,718,834	€ 4,773,586	€ 3,354,400	€ 2,864,400	€ 2,431,100
Shareholders' equity	€ 1,315,587	€ 1,298,711	€ 1,117,300	€ 847,400	€ 787,500
Liquidity (quick ratio)	1.3	1.4	1.4	1.4	1.5
Materials' figures					
Supply in tonnes[3]	298,634	260,792	247,800	246,650	208,500
Recycle percentage	75	81	87	83	87
Transport kilometres per residual tonne	3.0	3.1	2.9	2.8	3.1
Personnel					
Number of employees FTE at report-year end	13.6	10.0	8.6	8.5	7.7
Absenteeism in % [2]	6.0	7.0	5.4	1.4	1.8
Average turnover per FTE	€ 1,161,244	€ 1,117,103	€ 1,008,230	€ 848,988	€ 633,091

[1] for '16-'18 incl. retention of 10% sales value [2] re. 2019: incl. long-term sick leave of 2 employees
[3] tonnage from ADH, incl. tonnage of third parties in 2020 312,886 tonnes transported

2003

2004

Turnover increases by 70%, mainly due to use of liquid aquafer in household-waste digesting plants and water treatment

2004

Contract for application of aquafer in German biogas plant

Fourth Water Authority joins AquaMinerals

The formal decision concerning the accession of Hoogheemraadschap De Stichtse Rijnlanden (HDSR) as the fourth Water Authority in the AquaMinerals collective was taken in 2020. This was formalised in 2021 through the issue of shares.
HDSR believes that its wastewater contains potentially valuable raw materials, such as phosphorus, cellulose, bioplastics, fatty acids, biomass and CO_2. As we are, HDSR is convinced that these raw materials are (re) usable, but that the Water Authorities need to work together with a view to organising these chains so that they are as sustainable as possible. HDSR has thus installed finescreens in its renovated Leidsche Rijn treatment plant; in due course, this installation will make it possible to make use of the recovered cellulose. Through its participation in AquaMinerals, HDSR aims to strengthen its market presence within a collective, while also gaining access to an organisation that has the in-house expertise to act as a reliable supplier.

HOOGHEEMRAADSCHAP DE STICHTSE RIJNLANDEN

25-year anniversary: symposium postponed

In 2020 AquaMinerals turned 25. Naturally, we wanted to celebrate this milestone with our participants, associates and friends. In late 2019 we began preparing a symposium and a 'feel-good' market. COVID-19 threw a spanner in the works however, and the event, planned for 1 July, had to be postponed. But on the day of the anniversary we did enjoy an ice-cream with our Waterhuis building-mates – outdoors and with social distancing. But, as the Dutch saying goes, 'what is well preserved, loses no value': so the event has been rescheduled and will be held on 28 September 2021!

The impact COVID-19

Like many other organisations AquaMinerals experienced the concerns associated with the COVID-19 pandemic. First and foremost, of course, with regard to the health of our colleagues, families, associates and friends. We acted on these concerns in the only area where we could have a direct impact, namely: our behaviour. Following the guidelines of Dutch National Institute for Public Health and the Environment (RIVM), we almost entirely worked from home during both lockdowns. Although this was initially very awkward and generally far from optimal, we managed to pursue our work effectively. It helped that we were already pretty well organised for distance working. We also noticed that the water companies, service providers and clients adjusted remarkably quickly to the new situation, and that the logistical operation continued to run well. While demand dropped in specific market segments – exports to the United Kingdom for example – demand in other segments actually increased. In spite of the serious concern at the beginning of the pandemic, we may conclude that AquaMinerals, together with the stakeholders, have managed to pull through well. Thanks to great flexibility and, quite simply, by putting our shoulders to the wheel.

2005

Reststoffenunie is ISO 9001 certified!

2005

2005

10-year anniversary: symposium on 'Tensions between regulation and recycling' attracts international interest

Assessment and review of Drinking Water Company Roadmap 2030

In 2016 the AquaMinerals participants drew up the Roadmap 2030, which expressed their ambitions in the areas or finance, sustainability, image and disposal. These were divided into three timeframes, and the first of these concluded at the beginning of 2020. An analysis of this first planning period shows that the image and disposal ambitions were realised. The sustainability ambitions, expressed in the CO_2 footprint, were amply exceeded, while the financial ambitions were not attained. The sustainability gains are thanks to the increasing tonnage directed to useful, and particularly to higher-value, applications. This avoids the use of more highly environmentally harmful materials, and thereby the associated higher CO_2 emissions. The failure to attain the financial objectives has to do with the sharp increase in the negative-value tonnage, and therefore also in costs. Moreover, the 'new' material stream tonnes now also cost money (processing expenses). Of course, the addition of these new materials is a positive development, and a sign of trust in AquaMinerals, but they do result in a lower net sales value. There were also numerous extra expenses for additional AquaMinerals services (dredging, dewatering) and also as a consequence of the PFAS problem.
In area of sustainability, as of 2021, we have begun taking internal carbon pricing into account, and we will be looking further into incorporating residual streams into circular chains. The financial ambitions have been outlined in greater detail and directed at specific material streams and markets.

Coalition seeks application for aluminium sludge: Alu Circles

Worldwide, drinking water production processes generate aluminium sludge. By far the largest portion of this sludge ends up as landfill. This is harmful for the environment and the disposal costs are high: time for new solutions. Using a unique procurement process, we set out to find entrepreneurs with whom to jointly engage in a new innovation process. The technology involved in the next research phase comes from NETICS. The challenge is to convert the one-off use of this aluminium sludge into a sustainable solution, such as through upcycling or recycling, at a lower cost. In their search for the right technique to achieve this, three partners (supported by Allied Waters and Corvers Procurement Services) set up an international Public Buyers Group. AquaMinerals (partly acting on behalf of the Dutch drinking water companies), De Watergroep (Belgium) and Scottish Water operate under the name of Alu Circles in this initiative. Read more about the outcome of the collaboration on page 20.

2005

First issue of 'Stof tot Nadenken' newsletter

2006

2006

Demand for dewatered iron sludge for biogas digester plants exceeds supply

Supply chain management for Amstel, Gooi and Vecht Water Authority

The 2019 sludge crisis created a big WWTP sludge disposal problem. The Amstel, Gooi and Vecht (AGV) Water Authority decided to send its sludge to multiple processors, since this offered more disposal security. A number of these channels were developed and contracted by AquaMinerals. However, while this multiplicity provided for disposal security, the logistical challenge became much greater. AGV and AquaMinerals each looked after the logistics for the buyers each had contracted, which also meant that the rights, obligations and quality requirements varied depending on the buyer. For this reason it was decided that, starting in the summer of 2020, the supply chain management would be made the responsibility of AquaMinerals for a period of time. The experience proved to be very positive for both parties.


Picture Waternet

New chains developed

In 2020 we noticed a striking acceleration of initiatives for the development of new chains. Who knows, perhaps the relative tranquillity of working from home stimulated new sustainability ideas... Whatever the case, the results are there! We now supply the ceramic tile producer Mosa, aquaculture via Green XL, mushroom growers via Avecom, and we contribute to nature development via phosphorus control, in the Groote Meer lake for instance. Several of these new applications are presented in more detail in this annual report.

2006

Corporate Social Responsibility increasingly important, interest in secondary raw materials grows

2007

2007

Client satisfaction survey: water companies, intermediaries and buyers are very happy with RU

2008

RU is active in the 'review of the Implementing Order of the Fertiliser Law' to assure the disposal of lime sludge in agriculture

High-value application of calcite pellets in the glass industry; contract with Ardagh Glass

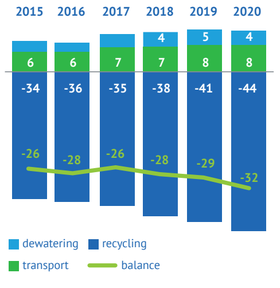
Sustainability results

Well on course for climate objective

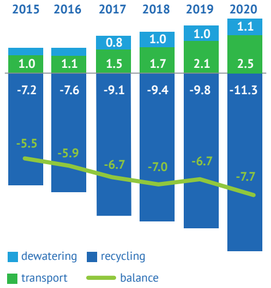
We are well on course to achieving our 2030 climate objective. Along with our shareholders we strive to achieve a 50% greater climate benefit compared to 2015. We speak of climate benefit, because the residuals chain footprint is negative – from the production process through to the applications by the buyers. The CO_2 emissions avoided because of recycling are far greater than the impact of the transport and dewatering.
We calculate the footprint every year by means of a lifecycle analysis (LCA). In 2020 the climate benefit again grew to more than 7.7 million kg CO_2 equivalent*, an increase of 15% over 2019. This was partly due to a dry summer, during which lots of drinking water was produced, resulting in lots of calcite pellets and aquafer for sale. But the environmental benefit per tonne of drinking water residual also increased because calcite pellets and filter gravel found higher-value applications. The materials from the Water Authorities are (still) mostly waste materials with a negative environmental impact. The positive exceptions are struvite and fat, which is processed into biofuel.

*) *Every year we update the emission factors for this calculation. But to make comparisons possible with the past, we recalculated the results for the years 2015-2019 using the new emission factors; excepting, of course, cases of physical changes, for example, a decreased energy consumption in the grinding of calcite pellets.*

Footprint per tonne, only drinking water shareholders (kg CO_2-eq)



Total footprint (mln kg CO_2-equivalent)



Circular applications

We strive to maximise the return of residuals into a biological or technical resource loop. Examples include recycling the calcite pellets contained in glass or carpeting, aquafer in biodigesters that return the digestate to the land, and struvite in agricultural applications. In 2020 a great new circular destination was added: Mosa began using calcite pellets instead of chalk in its cradle-to-cradle certified tiles.

2008

RU develops Safety Data Sheets for aquafer, softening lime and calcite pellets

2009

Hay Koppers new managing director

Earnings on calcite pellets double, though supply remains unchanged

2010

REACH registration for calcite pellets, lime sludge and aquafer

Aquafer and liquid softening lime included in Implementing Order of the Fertiliser Law

2010

Reuse of boxes

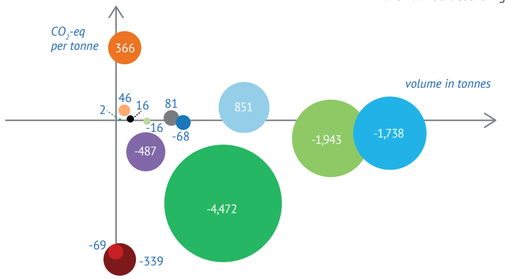
AquaMinerals very regularly sends (test) samples to potential buyers, and usually uses cardboard boxes. On an annual basis, this amounts to quite a pile of cardboard. To cut back on this, we now only use boxes taken from the waste-paper container. Why use new ones, when the old ones can perfectly well be posted again? Sustainability down to the smallest detail.

More and more climate-positive materials

Calcite pellets, aquafer, filter gravel, struvite and fat have a negative footprint and therefore produce a climate benefit. Dewatered aquafer in particular generates a benefit, amounting to a considerable tonnage, which moreover contains a large concentration of the active material ferric (hydr)oxide. The use of this material as a sulphur-binding agent in digesters saves on the use of the more environmentally harmful ferrous chloride. For the other residuals, the impact of transport and processing outweighs that of the savings on primary raw materials at the clients'.

We strive to render all material streams climate-positive. The bubble graph shows how far we have come. The size of the bubble indicates the climate impact or benefit for each material. On the vertical axis, the materials are ranked according to their climate impact per tonne. All those below the horizontal axis are climate-positive. The transport and incineration of screenings has the biggest environmental impact per tonne. While the processing of fat into biofuel and the use of struvite as a fertiliser produce the greatest climate benefit. Biofuels produce fewer fossil CO2 emissions than fossil diesel fuel, while struvite saves on the use of phosphate ore or artificial fertiliser. On the horizontal axis the materials are ranked according to volume.

Climate benefit per material (negative = climate benefit) (tonnes CO_2-eq)

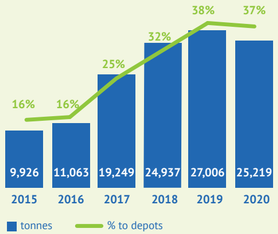


- Lime pellets
- Liquid aquafer
- Fat
- Struvite
- Dredge spoil
- Iron-lime sludge
- River sediment
- Aluminium sludge
- Screenings
- Sewage sludge
- Dewatered aquafer
- Filter gravel
- Carbon sludge
- Sand (WWTP)
- Lagoon-bed

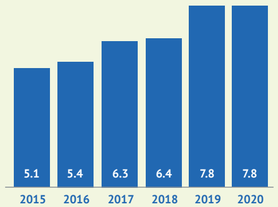
On the road to lower transport impact

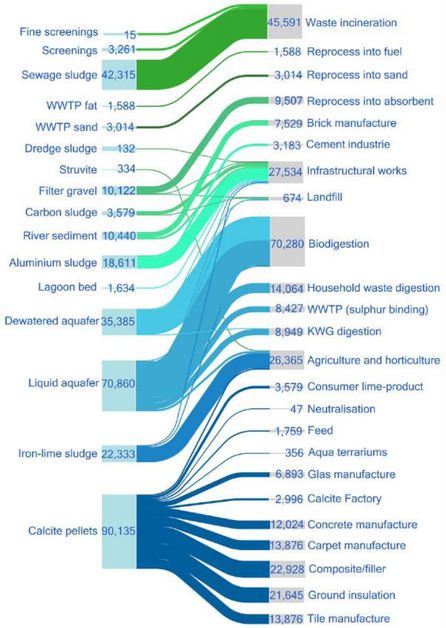
With more than 10,000 transports by truck and by ship, our environmental impact is considerable. Over the last few years, the total number of kilometres increased steadily because we often need to travel farther for higher-value destinations. A second reason has been the increased use of interim storage depots for the thickening of liquid aquafer, so that it can meet client specifications. In 2020 we managed to contain this increase. Transports via depots remained about the same, while the average transport distance for the drinking water residuals dropped a little. On the other hand, we had to cover great distances to transport treatment sludge to the processors. The net climate impact per tonne remained the same. To meet our own objectives, transport kilometres over the next three years need to be reduced by 10% – a huge challenge. A second objective is to reduce the climate impact through cleaner transport. When procuring transport, we will apply an internal CO_2 price of 100 euros per tonne of CO_2 equivalent, as a means of determining the value of cleaner transport.

Use of LIQ aquafer storage



Transport climate footprint
(kg CO_2-eq per residuals tonne)



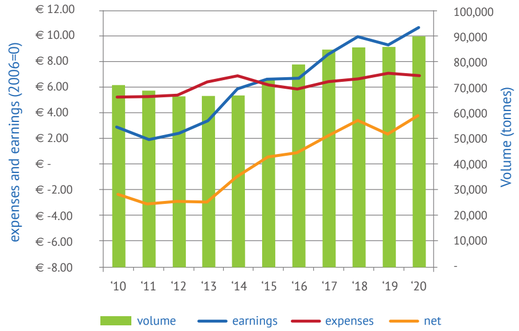


This Sankey diagram shows where the different material streams are applied (in tonnes). The width of the line indicates the volume of the relevant stream.

Calcite pellets

Volume and disposal

In 2020 a total of 90,034 tonnes of calcite pellets were supplied by the drinking water companies and placed on the market by AquaMinerals. That is almost 5% more than in 2019. This rise is partly the result of the increased production of drinking water in 2020. Because of the hot spring, but mostly because the drinking water companies began to soften water at more of their sites. This trend towards more softening sites, and also towards deeper softening at existing sites, has been going on for some time.



Circular calcite: more users of Dutch seeding material

In The Calcite Factory in Amsterdam calcite pellets from the softening process are dried, sanitised, ground and custom-sieved. This product is now being taken up by multiple buyers. But what makes this factory so special, is that it produces new seeding material for the water companies' own softening processes. In other words, total circularity. More and more water companies are switching over to this 'Dutch Calcite'. Following Waternet and WML, Brabant Water (all sites), Evides and Dunea (partially) have now turned to this circular raw material. And it does not stop there: after doing some testing, a French water production location in the vicinity of Paris has also decided to switch over completely to this Dutch product.

2010 — 2011 — 2012

RU introduces new earnings model

Recycle percentage materials reaches 75%

Distribution to shareholders trebles

Recycle percentage rises to 90%

First exploration of collaboration with Water Authorities

Calcite pellets recognised as cradle-to-cradle raw material

Pellets in Mosa ceramic tiles

The Maastricht company Mosa has been fully operating according to the cradle-to-cradle principle since 2011. A few years ago, AquaMinerals and Mosa struck up a conversation during a cradle-to-cradle café meeting, which was organised by a number of pioneering companies in this field (including Mosa and Desso/Tarkett). We pretty quickly came up with the idea of using the lovely white pellets from the Limburg water company WML in ceramic tiles. Mosa thus found a sustainable and local raw material source and WML a high-value regional application.

Calcite pellets by ship

In 2019 a relatively large amount of material (11,006 tonnes) was transported by ship, principally because British buyers built up reserves in anticipation of Brexit. Although Brexit remained very much in the news in 2020, the built-up reserves, combined with the reduced production associated with COVID-19, meant that fewer shipments were made to the country. In 2020, 5,831 tonnes were transported in four ships, representing 7% of the total calcite pellet volume.

New drying trailer

In 2013 an ingeniously designed 'drying trailer' began being used for shipments to the glass manufacturer Ardagh. Glass production requires that the pellets be as dry as possible upon delivery. In this trailer, which belongs to the Van Lijssel transport company, the moisture adhering to the pellets is blown away using the residual heat drawn from the truck's engine. However, the 2013 truck could no longer pass vehicle inspection, so, in 2020, a brand new and, of course, more efficient one was ordered.

New storage and transhipment site

AquaMinerals also of course markets the pellets of the Flemish participant De Watergroep. A portion of these pellets is disposed of via a depot. In 2020 AquaMinerals found a new site for storage and transhipment, the Meers company in Lanaken. The pellets can also be transported by ship from this location.

2012

2013

1,000,000 euros net income from sales

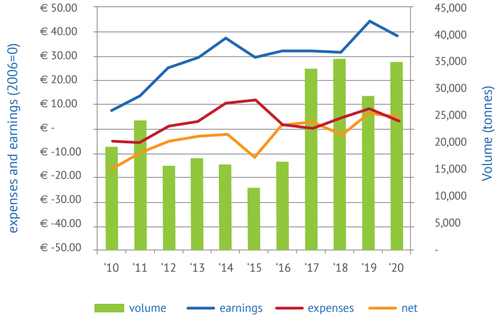
2013

FD Gazelle Award for fast-growing organisation

Dewatered and liquid aquafer

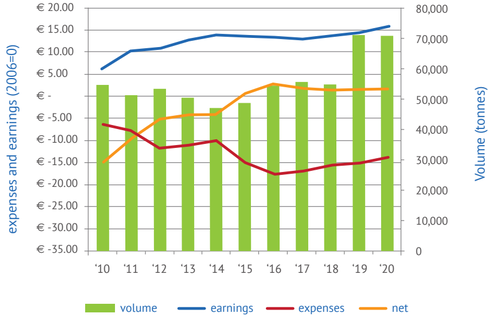
Volume and disposal of dewatered aquafer

In 2020 a total of 34,801 tonnes of dewatered aquafer was disposed of from the drinking water companies. Practically all of this aquafer is used to control sulphur in digesters. Nine ships transported a total of 10,467 tonnes, which represents 30% of the total volume of dewatered aquafer. The supply tonnage grew by 21% compared to 2019.



Volume and disposal of liquid aquafer

In 2020 a total of 70,860 tonnes of liquid aquafer was sold, a volume comparable to that of 2019. The liquid aquafer was used for sulphur control in agro-digesters, domestic waste digesters and digesters in wastewater treatment processes. The liquid aquafer was entirely transported by tanker truck.



New depot in Markegen

AquaMinerals has added a new depot for the storage and quality improvement of dewatered aquafer in Markegen (Belgium). This further extended and consolidated our logistics network. Among others, we are now in a position to serve our French clients more efficiently.

2014

2014

Drinking Water Materials Roadmap 2030 established

Move to Waterhuis Nieuwegein

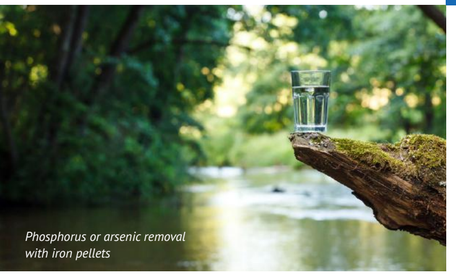
Over 10 million kg CO_2 emissions saved

HerCauWer project

The objective of the HerCauWer project is to research the possibility of producing new coagulant from aquafer. The theoretical component was completed in 2019. The production of coagulant has already been successfully tested on a small scale in manure processing. This also involved investigating whether coagulant can be produced that is suitable for wastewater treatment and/or drinking water production. This project is being carried out in collaboration with a number of drinking water companies and Water Authorities. In 2020 we were going to build a pilot plant at a WWTP, but corona and other circumstances made this impossible. In 2021 we will be processing the aquafer off-site and then deliver it to the WWTP, where the tests will then be carried out.

New: aquafer in mushroom cultivation

A few years ago Avecom, a Ghent University spin-off, started research on the impact of aquafer in mushroom cultivation. Iron plays an important role in this cultivation. When iron is not available and/or not available in the right concentration, it is possible that harmful bacteria might occur which cause spots to appear on the mushrooms (brown blotch mushroom disease). This research demonstrated that the aquafer, in combination with a number of additives, had a very positive effect when it is mixed into the casing soil. Avecom has applied for a patent for the application. In the meantime, the first full-scale deliveries have been made to one of the largest producers of casing soil in Belgium. Once the blending and delivery to the first buyer are smoothly accomplished, Avecom will make the product available to other producers.



Phosphorus or arsenic removal with iron pellets

Polishing pellets

Over the last few years AquaMinerals has successfully researched the production of iron pellets from drinking water sludge. The objective is to use them to remove phosphorus or arsenic from water, or H_2S from (bio)gas; the pellets have more than sufficient adsorption capacity for these purposes. However, a couple of problems came to light during the investigations. First, the pellets were often too fragile for the task. And, second, for use in drinking water production, the pellets still had too many problems associated with manganese and organic material leaching.

At the moment we are studying whether we can produce robust pellets that are also suitable for drinking water production. Exploratory experiments show that the leaching can be controlled. A more robust pellet will increase the material's usability, since it means that it would not break during transport or filter construction. The ultimate objective of this research is therefore a circular application: the reuse of aquafer in a company's own drinking water process.

2014 — Ground calcite pellets in Desso carpet tiles: cradle to cradle

2014 — Exploration valorisation struvite as first non-drinking-water stream, jointly with Waternet

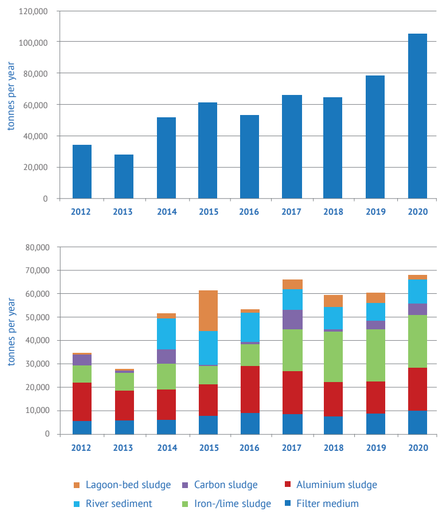
2015 — Olaf van der Kolk new managing director Reststoffenunie becomes AquaMinerals

2015 — Calcite pellet and liquid aquafer earnings exceed costs

2015 — IWA/KWR Resource Recovery Award

Other material streams from drinking water companies

Total other residuals



Ferrous filter gravel

Ferrous sand (sand with an iron coating) is generated during the removal of dissolved iron in groundwater. This ferrous sand is custom-sieved, a process that requires great care so as to preserve the iron coating.

In March 2020 an unprecedented volume of 1100 m^3 was used in the Groote Meer lake at Ossendrecht. Acting as a natural filter, the sand purifies the water which is full of fertilisers from agricultural activities, and thus provides opportunities for rare plants that actually grow well in poorer soils. The sand was supplied by Evides and Brabant Water, among others.

We also supply Green XL Pond Products on an ongoing basis. Their clients use the ferrous sand for aquaculture, ponds and aquaria. The material binds the phosphorus in the water, thus preventing the growth of algae and keeping the water nice and clear. Moreover, the phosphorus becomes more available for the water plants, which therefore grow faster and bigger.

Iron-lime sludge circular application

About 20,000 tonnes of lime sludge is disposed of annually. Because of its good quality, a portion of this sludge can be directly used in agriculture. This direct route is interesting for the drinking water companies since it means less transport and lower costs.
The mixed streams (iron and lime) are not suitable for direct application in agriculture because of their high iron concentrations. These streams are reprocessed by other companies into higher-value lime fertiliser.

Most of the lime sludges and iron-lime sludges generated by drinking water production thus find their way back to agriculture, thereby closing the loop. Drinking water companies abstract the water containing the lime from the soil, and the lime is then returned to the soil following the water softening.

New solution for aluminium sludge

Surface water typically contains considerable amounts of suspended solids. Drinking water companies remove them from the water by adding coagulants to the water. Based on the polarity of these coagulants, the equally polar suspended particles attach themselves as it were to each other and settle in the bottom as flocs. Throughout the world this is perhaps the most common technique for the removal of suspended solids. Moreover, the most commonly used coagulant internationally are aluminium salts, while in the Netherlands ferric salts are the most used. The resulting coagulation sludge contains inert particles ('clay'), organic matter and aluminium. To date, no satisfactory application has been found for aluminium-containing coagulation sludge.

In 2019, Allied Waters and Covers Procurement Services started working with several drinking water companies on finding a solution for this sludge. AquaMinerals joined the initiative in the name of its participants. The project has produced a very innovative tendering procedure, which wagered on co-creation with technology providers. At the end of 2020, a decision was made to move ahead with NETICS, a company that makes stable, moulded building material from the aluminium sludge.

Developments in carbon sludge

Carbon sludge is perhaps the most difficult stream to dispose of. In the past, and in 2020 for the last time, the material was used as construction material. Thanks to modifications implemented by Dunea at its production sites, the carbon sludge generated in its processes is much cleaner, containing fewer mineral pollutants. This opens up possibilities for the future. The sludge is used in the production process as a polishing step, in which the last pollutants are removed and the water decolourised. But the material's binding capacity is not 100% used. AquaMinerals is now studying the possibilities of making use of the remaining binding capacity in other processes.

In 2020 research was also carried out on the possibility of using an innovative technique to regenerate the powdered carbon. The tests were successful and will lead to a pilot in 2021. The approach also offers a solution to the PFAS problem. This technique can completely break down the powdered carbon at the atomic level and then rebuild it again (this also happens to the PFAS). All carbon atoms return to their primary form, that is, elemental carbon (i.e., powdered carbon). Theoretically, PFAS will break down into two elements: fluorine and carbon. If this follow-up research is successful, the carbon sludge could be reused in the on-site drinking water process.

River sediment

Drinking water is produced from a variety of sources, including river water. During the first treatment step the suspended solids are removed, which creates river sediment. Iron coagulant is used for the process to run effectively, so that the river sediment that is generated from drinking water production is ultimately a ferrous clay. AquaMinerals disposes of this ferrous river sediment in the brick industry, where it is used to give bricks their red colour. AquaMinerals will continue sending this residual stream to the brick industry in the years ahead.
One of the big sites where river sediment is generated is Waternet's intake point in Nieuwegein. A few years ago a new sluice was built nearby, which led to an increase in the amount of suspended solids in the river. It is anticipated that the amount will decrease over the next year, which will also result in somewhat less river sediment.

2015

2016

2016

2017

First Belgian participant: De Watergroep

For the first time a drinking water company earns money below-the-line from its residuals

AquaMinerals participates in various Green Deals

First application of calcite pellets in the poultry sector and as soil improver

Calcite pellets used circularly in remineralisation of drinking water

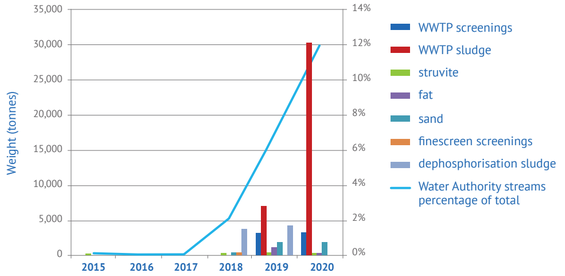
First Water Authority joins: Waterschap Aa and Maas

Water Authority material streams

Volume and disposal

As shown in the figure below, the disposal of Water Authority streams in 2020 was double that of the preceding year in absolute terms: 18,000 tonnes in 2019 and 36,000 tonnes in 2020. In terms of total volumes, the residual streams of the Water Authorities represented 12% of the total in 2020, while in 2019 it was 7%. It is expected that these volumes will continue to grow in 2021. AquaMinerals also disposed of a quantity of WWTP sludge as a result of a national shortfall of processing capacity.
This tonnage came from non-participants and is therefore not included in the table; in reality, the contribution to Water Authority streams is therefore somewhat larger.

Water Authority streams



Energy and Raw Materials Factory

The group of Dutch Water Authorities work actively on enhancing the sustainability of their activities by increasingly generating energy themselves, recovering as many raw materials as possible, and usefully reusing treated water. The Water Authorities combine their forces by working together in the Energy and Raw Materials Factory (EFGF). Over the last few years, this collaboration has provided the means for active efforts to accelerate initiatives for the disposal of raw materials. With a particular view to strengthening the business development activities surrounding the disposal of raw materials, energy and water, the EFGF granted AquaMinerals a three-year commission to further professionalise these activities. In 2020, AquaMinerals produced an inventory which highlighted the interests of individual Water Authorities in the different raw materials. On the basis of this inventory, we will proceed further with the development of chains for the Water Authorities. In the process, we will focus both on the creating volumes for raw materials that can be highly developed, and also on those raw materials for which the technology is still under development. Those chains that are being further developed, and for which we see good market prospects, include those for cellulose, struvite, bioplastics, nitrogen and fatty acids.

Screenings

Screenings are a continuous stream generated from the influent at a treatment plant. Two Water Authorities supply us with this stream: Aa and Maas, and Amstel, Gooi and Vecht. At the moment, the screenings are sent to the waste-to-energy plant. In 2018 AquaMinerals came into contact with BlueRoof, an initiative which uses screenings, following a number of processing steps, as a substrate for green roofs. The tests carried out were very promising but, because of the termination of the subsidy and the corona crisis, the company was not able to continue with the research. In 2020 AquaMinerals purchased the know-how from the BlueRoof proprietors, with the aim of further working on this development in 2021.

Fat

At this time, the Amstel, Gooi and Vecht Water Authority is the only Water Authority in our collective that supplies fat. This fat is ultimately used for the production of biofuel.

WWTP sludge

In 2020 AquaMinerals also disposed of a large portion of the wastewater treatment sludge of the Amstel, Gooi and Vecht Water Authority at a variety of clients. In addition, we sent more than 12,000 tonnes of treatment sludge to third-parties, for a total of almost 45,000 tonnes. WWTP sludge thus represented the fourth largest residual stream in our portfolio.
Furthermore, the Amstel, Gooi and Vecht Water Authority granted AquaMinerals management responsibility for the disposal of their total sludge volume (100,000 tonnes). This means not only the sludge that we dispose of for the Water Authority, but also the sludge that the Water Authority itself sends to other clients. The Water Authority's staff recognise that this new working set-up gives them peace of mind when it comes to the disposal of this material stream.

Struvite

Last year the disposal of struvite dropped below the 2018 level, even though new production locations were added. Struvite production is lagging behind expectations: less than a third of the budgeted level is being produced, and these levels were themselves below the production capacity. We assume that the levels will increase over the next (normal) year. It is clear that struvite recovery is still experiencing some growth pains, particularly in the technical area.

WWTP sand

WWTP sand has been used in an appealing recycle route for a long time. The sand from the sand traps at the wastewater treatment plants is cleaned and separated from the pollutants. It is then returned to the soil.

2017

Opening of The Calcite Factory in Amsterdam

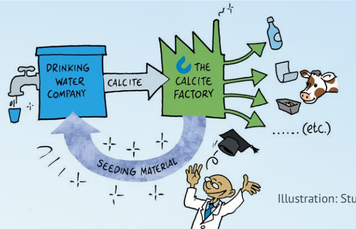


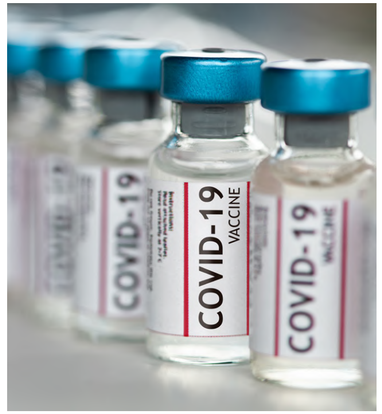
Illustration: Studio Bajo

2018

Expectations for 2021

AquaMinerals after COVID-19

From March 2020, our organisation continuously complied with the existing RIVM rules. Among other things, this meant that our staff practically only worked from home. Although this was sub-optimal for many processes, it also made for some new revelations. For instance, some departments were more productive than they were before the outbreak, travel dropped considerably and facilities were introduced to render working from home efficient. Because of the vaccination programme and the change of season, a number of people should be able to return to work in the office around about the summer of 2021. This is indeed preferable for many activities; given the rapidly evolving circumstances, which frequently affect AquaMinerals, the coordination of the different departments is important. Nevertheless, we expect that our staff will continue working from home on average 1-2 days a week. Moreover, international consultations will be conducted more frequently online, and travel – which was quite limited at AquaMinerals anyway – will be reduced.



The market after COVID-19

Quite soon after the pandemic's outbreak in early 2020, we noticed a strong and growing market interest in reliable, local and sustainable/circular raw materials. Perhaps it was because there was more time available, or simply because many other facilities were closed. But, maybe of greater importance, was the fact that the pandemic offered us a number of new insights, all pointing to the realisation that the current linear, internationalised and tightly organised material-stream chains have disturbing downsides. Thus, for instance, we saw countries, even within Europe, close their borders to important material streams. And that these were also no longer available locally or nationally. We realised how long the supply chains had become, with huge transport distances as a result. Consumers, too, began appreciating local entrepreneurs/producers more, and demonstrated it in their buying behaviour. This trend is beneficial for AquaMinerals, and produced a number of new contacts and developments. Although it is not unthinkable that many things will go back to 'normal' after the pandemic, many of the new developments are future-proof, and should produce positive results in 2021 and beyond.

2018

More and more materials climate-positive

Calcite pellets used in cosmetics

Amstel, Gooi and Vecht Water Authority joins

waterschap amstel gooi en vecht

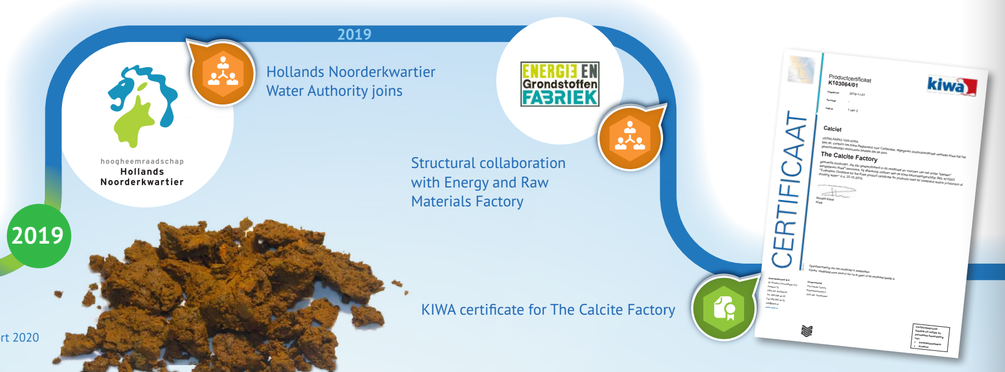
Roadmap 2030 for the Water Authorities also

International collaboration

AquaMinerals is actively involved in a number of European (research) programmes and network organisations. Based on this experience, we can confidently say that the Netherlands and Belgium are at the forefront when it comes to the recovery and application of water treatment residuals. In recent times we have noticed that international interest in these sustainable chains has not only increased, but that people have also actually begun taking action. There are a number of reasons for this, but in general it reflects a combination of technological developments, the market demand for materials, good examples in other countries, and government policy – think, for instance, of rising landfill taxes, CO_2 pricing, landspreading prohibitions and subsidies. A number of these (targeted) new technologies and chains are also new for AquaMinerals. We stay abreast of the developments through our networks and European activities. Whenever possible and sensible, we implement these for the benefit of our participants. In 2021 this collaboration will grow further.

Establishing chains: What have recent years and the existing chains taught us?

AquaMinerals directs a significant portion of its organisational resources to research for the development of new material stream chains. We have done this ever since the beginning and, as is recognised, with compelling results. Unfortunately, this does not apply to all projects, of which a significant number do not achieve their ultimate objective or take much longer than expected. To keep such cases to a minimum, in the future we would like, before any decision is made on an innovation process, to (1) assess its probability of success and (2) know how we can best design the process to maximise this probability of success. With this in mind, at the end of 2020, we began a study into our innovation projects over the last ten years. The reasons for success or of failure provide a source of important information for recommendations concerning future projects. In the case of successful material stream chains, we examine how these arose and what manner of organisation led to their success. This gives AquaMinerals an understanding of which parties we should best consider bringing together when developing new chains. This research will also contribute to raising the success rate of the innovation processes.



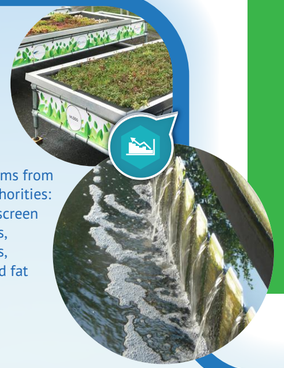
The power of certification

The water sector supplies raw materials to a wide variety of economic sectors. AquaMinerals of course ensures that this is always done in compliance with the legal frameworks, such as the Fertiliser Law, the Soil Quality Decree or the European Waste Framework Directive. However, this is frequently not sufficient to enable the supply to a particular sector. For example, materials to be used in the drinking water chain must comply with the guidelines of the KIWA Water Mark. Together with our partners, we have therefore made sure that the calcite seeding material that is returned to the drinking water sector meets this requirement. For deliveries to the feed and food sector (respectively, animal and human consumption), all parties in the chain must hold a GMP+ certificate for the feed sector and an FSSC 22000 certificate for the food sector. It is expected that AquaMinerals will acquire these in the first quarter of 2021. There is also strong demand in the market for the substantiation of the (sustainable) origin of the material streams. In the second quarter of 2021, we expect that the calcite pellets will be receive Cradle to Cradle certification from the EPEA at the Gold or Platinum level.

More applications of filter gravel as phosphorus-binder

2019

New streams from Water Authorities: sand, finescreen screenings, screenings, sludge and fat



2019

New dynamic based on CO_2 pricing and charges

Although the water sector has high ambitions when it comes to the development of alternative sustainable chains, at a given point the choices here, too, are constrained by their financial implications. This matter should evolve favourably in the near future, in particular because one sees that circular and CO_2 objectives (European, national, sectoral) are increasingly being translated, for example, into blending obligations, fictive pricing and officially imposed charges. We thus see large industries actively seeking alternative fuels (such as dewatered WWTP sludge), because of the anticipated rise in CO_2 pricing. In the water sector itself we can see initiatives to incorporate a fictive price for CO_2 saving, thereby giving alternatives a chance. And we see sharp increases in the charges/taxes on waste processing, such as incineration or landfill, which could render investments in high-value alternatives profitable. Where this will lead exactly will depend greatly on the specific formulation of these plans. We also realise that this will result – certainly in the short term – in higher costs for society, and thus for the water sector as well. We therefore call for a balanced implementation, in consultation with the sector and relevant stakeholders.

Governance, financial policy and risk management

Governance

According to the statutes of the AquaMinerals company, the most important powers are vested in the managing director and the Supervisory Board (SB). The General Meeting of Shareholders (GMS) appoints the SB members upon the recommendation of the SB; the SB appoints the managing director.

The managing director leads the company, is responsible for achieving its objectives, the strategy and associated risk profile, the financial results and societal aspects. In this regard, he is accountable to the SB in its role as supervisor, and to the GMS as the economic proprietors of the company. He provides both entities, in a timely manner, with all information they need to exercise their tasks.

AquaMinerals is not obligated to implement the principles and best practice provisions of the Dutch Corporate Governance Code. Nonetheless, the levels of transparency and responsibility established by the Code fit seamlessly with our objectives and operational management. To reflect in more detail the principles of the Governance Code, in 2011 various regulations and statutes were implemented or adjusted and, in 2012, the treasury statute was added.

Financial policy

Treasury

In accordance with the treasury statute, the final dividend test has been instituted. On this basis, the management will assess whether the company, following a distribution made to the shareholders, is able to continue paying its due debts. This assessment indicated that no dividend distribution can be made, because one of the conditions, a solvency of more than 30%, cannot be satisfied. The positive cash flow from business operations was added to savings. In 2020 AquaMinerals had no deposits or investments, nor did it lend any funds to third parties.

Liquidity risk

The quick ratio per 31 December 2020 was 1.3, compared to 1.4 in 2019, and thus remains above the standard target of 1.2. The solvency at the reporting date was 23%, that is, 4.2% below year-end 2019. The solvency ratio therefore remains under the standard target of 30%. The average settlement period by clients increased from 50 days in 2019 to 52 days in 2020. The average settlement period of AquaMinerals in 2020 was 43 days, a 3-day increase compared to 2019.

Shareholders' Equity Lower Limit

The Shareholders' Equity Lower Limit of AquaMinerals is set at one annual salary of full-time employees, with a minimum of € 100,000. Per 31 December 2020, this amounted to € 1,167,000. At the same time, shareholders' equity amounted to € 1,315,588.

Use of struvite as 100% natural fertiliser for water plants

Risk management

Risk management forms part of the AquaMinerals management model, and is discussed on a regular basis with the SB. We apply a risk-inventory system aimed at providing a clear, transparent and reproducible picture of priority risks. The following have been identified as the key risks for 2020:

Risk 1: Keeping up organisationally with the (strategic) growth
As in previous years, keeping up organisationally with the growth remains an important area of risk. The volume of work, the range of the activities (sales, legal, quality assurance, etc.), as well as activities in both directions of the chain, are all increasing. The level of expectation regarding AquaMinerals is high; growth should never be at the cost of the service level. In 2019 and 2020, we hired staff in fields of work where we anticipate most growth and demand. The organisational structure was also adjusted, including the consultation structures. We also reorganised the administrative processing of the thousands of shipments, in part by the reallocation of internal tasks and responsibilities, and in part through new ICT solutions. We believe that with these adjustments we will be able to effectively accommodate the (expected) growth.

Risk 2: New residual streams for which AquaMinerals is not yet adapted
AquaMinerals was initially set up to focus on the mineral residual streams from the drinking water sector and, in the meantime, the Water Authorities' streams have also become an intrinsic part of our work. We are however encountering a growing number of streams that are not yet part of our model and field of knowledge. Take for instance the material streams that are still being researched and cost money, but that as yet produce no earnings. Or streams like green gas, whose nature or scale are so different, that they do not as yet fit into the earnings model or measurement protocols. All the same, these streams might be of great strategic importance for participants (and therefore for AquaMinerals), and that is why we must adapt to them in good time. We are in regular contact with participants about these streams, and involve them more than before in the development of new chains. We also seek coordination at a sectoral level, for example, in the Roadmap 2030 working group. For specific, new streams that need to be imbedded in the governance structure, we present concrete proposals to the SB and GMS. A proposal for green gas was approved in December 2020.

Risk 3: Streams for which no good destination has (yet) been found
AquaMinerals receives a multiplicity of materials, and we have already found satisfactory solutions for most of them. But this is not the case for all of the streams. There are various reasons for this, related for instance to financing, image and/or sustainability, but it can over time result in the supplier losing patience or interest. We have placed these material streams higher on our priority list, which, in concrete terms, means investing more research money and time in them. Aluminium sludge and carbon sludge are good examples of this. We also work on the expectations management for these streams. By actively involving the participant in the process and keeping it informed of developments, and by indicating at an early stage what is realistic. In certain instances, we work with a small group of participants that have the same material stream and/or challenge, and actively seek a solution jointly with them.

Risk 4: Own declaration of end-of-waste or by-product status is not accepted*
An increasing number of streams are brought to the market on the basis of an own declaration. Although this is as good as a license to operate, the enforcing body can still refuse it. This risk can be expected to be much smaller for by-products, since these have never been waste. One option is to request a legal ruling in order to reduce the risk, but in the case of struvite for instance this process has already taken five (!) years, despite the water sector's great effort and investment. AquaMinerals wants to reduce the risk that an own declaration is not accepted to a minimum. Although we paid a lot of attention to the matter in 2020, we unfortunately made little progress with the competent authority. We have brought these problems to the attention of the public authorities in all sorts of ways and try to contribute to solutions; we have even had direct contact with a member of the European Parliament about the question. The Dutch government has now announced that companies can themselves judge whether something is waste material or not; but this own assessment offers no legal assurance. AquaMinerals has a good handle on the files upon which the own declarations are based. Naturally, we will deal with this matter with caution.

***Waste material or not? We've been dealing with this for 25 years already**
We outline the impact this has had, and continues to have, on our work on our website: **www.aquaminerals.com/regulations**.

Supervisory Board

The Supervisory Board (SB) oversees the policy of the managing director and provides him with advice. Its supervision mostly concerns the financial performance and developments, regulatory compliance and risk management

Roelof Kruize was chairperson of our SB until 31 December 2020. Per 1 January 2021 he was succeeded by Guïljo van Nuland.

Roelof Kruize: *'It was a great pleasure for me to have been chairperson of the SB of AquaMinerals over the last six years. A period in which the company experienced strong growth under the inspiring leadership of Olaf van der Kolk. More and more Water Authorities are deciding to become shareholders, because they see AquaMinerals as an important partner in helping them achieve their ambition to become more circular. The number of circular processes and products that AquaMinerals staff are working on has sharply increased. AquaMinerals sees new opportunities for its shareholders and will work with them in the upcoming year on refining its strategy. AquaMinerals offers the Dutch public water sector a unique concept to assist it in becoming more sustainable and unite its forces in the effort. A concept that is attracting increased international interest. In short, a fantastic company facing a challenging future.'*

Olaf van der Kolk: *'Five years ago Roelof dared to appoint me as a relatively inexperienced managing director. I am grateful to him for that trust. We have worked extremely well together over the last few years. Roelof was always constructively critical, but mostly also driven by a desire to advance AquaMinerals and the creation of new and high-value chains. He says goodbye at a time when things are going well for AquaMinerals, and I hope to show him in the years ahead the results of the developments he was partly responsible for setting in motion. I wish Roelof all the best in the future, and look forward confidently to working with our new chairperson Guïljo van Nuland.'*

Activities of the SB in 2020

The Supervisory Board met on four occasions in 2020 and addressed the following items:

- monitoring the results of the company in light of the 2020 budget and the Business Plan 2019-2021;
- accession of Hoogheemraadschap De Stichtse Rijnlanden to AquaMinerals;
- determination and monitoring of actions related to priority risks;
- determination of the 2019 Financial Statements and profit appropriation for that year;
- budget and annual plan for 2021;
- transfer of 'WS shares' from the Waternet Foundation to the Amstel, Gooi and Vecht Water Authority;
- assessment of the first planning period of the Drinking Water Company Roadmap 2030;
- adjustment of Drinking Water Company Roadmap 2030;
- nomination for reappointment of SB member Ms M. Demmers;
- the recruitment, selection and ultimate nomination of a new SB chairperson, Mr G.J. van Nuland;
- establish frameworks within which AquaMinerals can offer and provide services for participants in the area of green gas;
- follow developments of concrete cases raising possible investment or participation issues;
- the organisational development in relation to the (anticipated) growth in volume, turnover and activities.

2020

Circular: aquafer pellets remove arsenic from drinking water and phosphorus from surface water

2020

Aluminium sludge, following innovation initiative, used in building materials

Activities of the GMS in 2020

The General Meeting of Shareholders was held twice in 2020, and took the following decisions:

- approval of the Annual Report and Financial Statements for 2019;
- discharge of the managing director and his management and members of the SB for their supervision during fiscal year 2020;
- the profit appropriation for 2020;
- approval of the accession of Hoogheemraadschap De Stichtse Rijnlanden to AquaMinerals, and the issuance of new shares in the name of this new participant;
- reappointment of Ms M. Demmers as member of the SB;
- appointment of Mr G.J. van Nuland as chairperson of the SB;
- approval of assessment of the first planning period of the Drinking Water Company Roadmap 2030;
- adjustment of Drinking Water Company Roadmap 2030;
- approval of annual plan and budget for 2021.

From left to right: Marjolein Demmers, Roelof Kruize, Olaf van der Kolk, Jan Erik Janssen, Jacqueline Spoeltman

Samenstelling RvC op 31/12/2020

Name	Profile	Appointed	Reappointed	Resigned	Functions and other positions
Mr R. Kruize (1956), Chairperson	Managerial	1 January 2015	1 January 2018	1 January 2021	General Director, Waternet Foundation; Chairperson/Member SB, De Balie; Member of the Board, International Water Association; Chairperson, AquaTech Advisory Committee; Member of the Management Board, Amsterdam International Water Week; Member SB, Leading Utilities of the World; member Foundation Board, World Waternet; Member of the Board, Vewin.
Mr J.E. Janssen (1969), Vice-Chairperson	Legal	1 July 2016	1 July 2019	1 July 2023	Lawyer/Partner Stek Advocaten.
Ms M. Demmers (1967), member	Business and innovation	1 January 2017	1 January 2020	1 January 2024	Director-administrator, Natuur & Milieu; Supervisor, Rli; Member SB, Drift; Manager SKAO; Member of Strategic Advisory Council, TNO SA&P.
Ms J. Spoeltman (1969), member	Financial	15 March 2019	(possible) 15 March 2023		Director, Grootzakelijk. Rabobank kring, Middle Brabant; Member SB, Stichting De Nieuwe Arbeid Noord Oost Brabant.

COVID-19 creates worries and challenges, but also insights and opportunities

Heading enthusiastically into the next 25 years

Explanatory notes on the Financial Statements

Principles of evaluation

General

AquaMinerals B.V. (with its registered office in Rijswijk ZH, Chamber of Commerce number 30130247) is domiciled at Nieuwegein, Groningenhaven 7, 3433 PE.
The company's most important activity is relieving the drinking water companies and the Water Authorities of the residuals generated by the production of drinking water and the treatment of domestic wastewater.
The company has prepared its financial statements in accordance with the legal provisions of Title 9, Book 2 of the Dutch Civil Code.

Comparative figures

The comparative figures are only restated for comparative purposes.

Intangible fixed assets

The intangible fixed assets are valued at acquisition prices minus depreciation.
The depreciation period is five years.
A legal reserve equivalent to the research and development capitalised expenses is included.

Tangible fixed assets

The tangible fixed assets are valued at acquisition prices and depreciated straight-line on the basis of the expected operating life of the asset concerned.
The rate of depreciation applied is 20%.

Cash and cash equivalents

The cash and cash equivalents are valued at nominal value.
Unless otherwise indicated, these are freely available.

Other assets and liabilities

These are valued at nominal value.

Receivables

Receivables are stated initially at real value, including transaction expenses, and subsequently stated at the amortised cost price, less provisions for uncollectable debts.

The initially stated real value and the amortised cost price are equal to the nominal value, unless there is a question, in the initially stated value, of transaction expenses, premiums, or discounts, and other disparities between the real value and the nominal value.

Principles for the determination of the result

Earnings, expenses and interest are attributed to the period with which they are associated.
The earnings concern the passed-on disposal expenses plus the realised earnings (positive and negative) from clients and consulting services provided.
The direct disposal expenses concern outlays for extraction, transport, storage and analysis.

Pension expenses

The pension obligations towards employees fall under an industry pension fund. Payable pension contributions are incorporated into the profit and loss account in the year with which they are associated. Furthermore, an assessment is made as to whether, besides the premium, the employer has any other obligations related to the performance or insurance agreements, or to commitments to employees. In the event, a provision will be created. If the term of these obligations stretches over several years, the provision will be valued at cash value, calculated using an interest rate based on the average interest earned on high-grade corporate bonds.
Liabilities (other than premium settlements) related to the performance or insurance agreement, such as profit sharing and restitutions following a decision of the pension fund, will be included in the balance sheet only if their receipt is irrevocably established.
The coverage ratio of the pension fund (ABP), per 31 December 2020, was 93.2% (2019 97.8%). The recovery plan aims to achieve a coverage ratio of 126.6 % at the end of 2029. This will not require taking any drastic recovery measures.

Corporate tax

Taxes are calculated based on prevailing rates on the pre-tax result, according to the profit and loss account, taking into consideration the permanent differences between the fiscal profit calculation and the profit calculation according to the annual financial statements.

Balance sheet per 31 December 2020

(after profit appropriations following recommendations)

	31-dec-2020	31-dec-2019
	€	€
ASSETS		
Fixed assets		
Intangible fixed assets	21,528	37,152
Tangible fixed assets	65,808	39,153
Current assets		
Receivables and accrued income	4,305,239	3,768,010
Cash and cash equivalents	1,326,261	929,271
	5,718,835	4,773,586
LIABILITIES		
Shareholders' equity		
Issued and paid-up capital	559,649	559,649
Share discount	11,923-	11,923-
Share premium	108,258	108,258
Legal reserves	-	10,000
Other reserves	659,604	632,727
	1,315,588	1,298,711
Current liabilities		
Current liabilities and accrued liabilities	4,403,247	3,474,875
	5,718,835	4,773,586

Explanatory notes on the balance sheet

	31-dec-2020	31-dec-2019
	€	€
ASSETS		
Fixed assets		
Intangible fixed assets		
Book value per 1 January	37,152	20,000
Plus/minus investment/divestment	242-	27,152
	36,910	47,152
Minus: depreciation fiscal year	15,382	10,000
Book value per 31 December	21,528	37,152
Tangible fixed assets		
Inventory		
Book value per 1 January	39,153	8,767
Plus: investments	40,329	34,324
	79,482	43,092
Minus: depreciation fiscal year	13,675	3,939
Book value per 31 December	65,808	39,153
Total depreciation	30,388	16,713
Decommissioned assets	0	0
Cumulative depreciation	30,388	16,713

Current assets	31-dec-2020 €	31-dec-2019 €
Receivables and accrued income		
Receivables	4,099,916	3,640,907
Accrued income	205,323	127,103
	4,305,239	3,768,010
Receivables		
Nominal value	4,099,916	3,640,907

The receivables are due in less than one year.
Under the receivables position per 31-12 2020, there are receivables from other legal entities and companies that participate in the legal entity or within which the legal entity has a participation of € 2,816,430.

Accrued income		
Earnings yet to be received	50,244	9,057
Pre-paid contract costs	8,055	4,715
Pre-netted earnings on stocks	147,023	113,331
	205,323	127,103

Per 31 December 2020, several storage depots held stocks of lime pellets and aquafer.
The stock value is equal to the pre-calculated earnings on the stocks.

Cash and cash equivalent		
Deutsche Bank, current account	0	22,447
Deutsche Bank, savings account	0	0
Rabobank, current account	723,669	284,014
ING payment account	355,349	20,557
ING savings account	247,243	602,243
	1,326,261	929,261

In August 2020 the Deutsche Bank accounts were closed.

LIABILITIES	31-dec-2020 €	31-dec-2019 €
Shareholders' equity		
Issued and paid-up capital		
Status per 1 January (issued)	559,649	535,217
Share issue *	0	24,432
Status per 31 December (issued)	559,649	559,649

The authorised share capital amounts to € 910,000 divided into 20,000 shares of a nominal value of € 45.50.
Of this amount, € 559,650,50 is paid-up.

Share premium		
Status per 1 January	108,258	82,063
Change during fiscal year	0	26,195
Status per 31 December	108,258	108,258
Share discount	11,923	

This item arose through the sale of 568 shares with a discount of € 21.00 per share.

Legal reserves		
Research and development reserve		
Acquisition value	50,000	50,000
Addition to the reserve	0	0
Withdrawal from the reserve	50,000-	40,000-
Status per 31 December	0	10,000
Other reserves		
Status per 1 January	632,727	491,905
Sale of own shares	0	0
Change in allocation of legal reserve R&D	10,000	10,000
Plus: profit allocation	16,877	130,822
Status per 31 December	659,604	632,727

Current liabilities	31-dec-2020 €	31-dec-2019 €
Current liabilities and accrued liabilities		
Payables	2,937,223	2,937,585
Taxes and national insurance contributions	603,087	148,813
Other debt and accrued liabilities	862,938	388,477
	4,403,247	3,474,875

Under the payables position per 31-12-2020, there are payables to other legal entities and companies that have a participation in the legal entity of € 773,294.

Taxes and national insurance contributions		
Value added tax	536,857	25,542
Corporate tax	17,643-	61,290
Pension contributions	-	14,378
Payroll tax and national insurance contributions	83,873	47,603
	603,087	148,813
Other debt and accrued liabilities		
Accrued expenses	142,667	89,573
Earnings yet to be settled	391,315	0
Revenues received in advance on depots	39,228	50,452
Received in advance in connection with future REACH registration	19,751	15,858
Received in advance for red projects	152,817	156,536
Holidays	33,558	18,803
Holiday pay reserve	20,219	14,546
Collective Labour Agreement obligations	63,383	42,709
	862,938	388,477

Off-balance-sheet items
AquaMinerals has signed a rental contract for its premises up until 30 June 2022, and a contract for lease cars.
Obligations of < 1 year € 7,731
Obligations of 1-5 years € 135,412

Profit and loss account for 2020

	2020	2019
	€	€
Earnings		
Turnover residuals	15,518,897	10,953,098
Consulting	274,027	181,121
	15,792,924	11,134,219
Shareholders' annual contribution	1,670,361	1,467,904
Total earnings	17,463,285	12,602,123
Operating expenses		
Direct disposal expenses	6,072,222	5,578,686
Acceptance expenses	5,991,862	2,137,179
Earnings distributed to shareholders	3,192,830	2,940,303
	15,256,914	10,656,168
Gross turnover result	2,206,372	1,945,955
Operating expenses		
Personnel	1,461,964	1,197,124
Depreciation	29,057	13,939
Cost of sales and PR	153,880	107,509
Research and consulting costs	219,633	211,038
Premises	75,759	59,220
Supervisory Board	35,363	30,002
Other operating expenses	208,507	168,595
	2,184,162	1,787,427
Total expenses	17,441,076	12,443,595
Operating result	22,210	158,528
Interest income/expenses	3,300-	122
Pre-tax result	18,910	158,650
Corporate tax	2,033	27,828
Result	16,877	130,822

Explanatory notes on the profit and loss account

	2020	2019
	€	€
Earnings		
Turnover residuals		
Settled disposal/acceptance expenses shareholders	10,532,669	7,095,181
Settled disposal/acceptance expenses non-shareholders	1,240,379	411,550
Earning (post)sale residuals shareholders	3,510,064	3,190,121
Earnings (post)sale residuals non-shareholders	235,785	256,246
	15,518,897	10,953,098
Consulting		
Consulting for shareholders	50,931	30,062
Consulting for non-shareholders	223,096	151,059
	274,027	181,121
Total earnings	15,792,924	11,134,219
Direct disposal and acceptance expenses	12,064,083	7,715,865
Turnover of non-shareholders of AquaMinerals B.V.	1,699,260	818,855
Idem in percentage	10.8%	7.4%

	2020	2019
	€	€
Operating expenses		
Personnel		
Direct salary expenses	935,339	746,547
National insurance contributions	175,831	145,544
Pension contributions	137,872	117,257
Indirect salary expenses	45,643	32,895
Short-term staff	197,769	179,724
Sick-leave allowance	30,490-	24,843-
	1,461,964	1,197,124

Staff

In 2020 there was an average of 17 staff members, 14 of whom were permanent staff and the remainder short-term.

Cost of sales		
Travel and accommodation costs	72,485	76,925
Contributions	5,208	4,808
PR	76,186	25,776
	153,880	107,509
Research and Consulting costs		
Perspective: Financial	0	46,786
Perspective: Client	0	77,567
Perspective: Internal Processes	17,645	17,200
Perspective: Innovation/Learning	93,798	69,485
Marketing	3,856	0
Roadmap projects	104,334	0
	219,633	211,038

Other information

Statutory profit appropriation

Article 27 of the company statutes establishes the following provisions regarding the profit appropriation:

1 The profit shall be at the free disposal of the General Meeting of Shareholders. The General Meeting of Shareholders may reserve an amount from the profit established in the financial statements that it has approved.
2 The company may only make distributions to the extent that its shareholders' equity exceeds the amount of the issued and called-up part of the paid-up capital, plus the reserves to be maintained in accordance with the law.
3 Profit distribution shall only be made after the adoption of the financial statements from which it appears that such distribution is allowed.
4 Shares or certificates held by the company, or shares and certificates in which the company has right of usufruct, shall not be included in the profit appropriation calculation.
5 The General Meeting of Shareholders may decide to make interim distributions. The decision to pay an interim dividend from profits during the fiscal year in course can also be taken by management. Distributions referred to in this item may only be made if the provisions of item 2 of this article are met.
6 Unless the General Meeting of Shareholders establishes otherwise, the dividends shall be paid within 30 days after being approved.
7 The General Meeting of Shareholders may decide to pay dividends, in part or in whole, in a form other than cash.
8 A shortfall may only be settled through the reserves established by law inasmuch and to the extent that the law permits.
9 In the event that the total amount of the issued and called-up part of the capital, plus the reserves to be maintained in accordance with the law, is less than the most recently established legal minimum capital level, the company must maintain a reserve equal to the difference between the amounts.

Appropriation of 2020 result

In anticipation of the decision to be taken in this regard by the General Meeting of Shareholders, the 2020 result has been added to other reserves. This decision, which has yet to be taken, has already been incorporated into the 2020 financial statements.

Events after reporting date:

On 15 March 2020, the Hoogheemraadschap De Stichtse Rijnlanden Water Authority acceded to membership; 479 shares were issued, with a nominal value of € 45.50.
Premium: € 48.75 per share.

As a result of a dispute with a client, a lawsuit was filed which AquaMinerals has provisionally lost. We have consequently had to make a periodic penalty payment of € 250,000. An appeal is currently underway.

In 2021 a Flemish digesting company gave AquaMinerals a notice of default for the delivery of aquafer that did not comply with the current legal requirements. The Flemish government, after the conduct of multiple sampling and analyses, then declared that the aquafer does comply with the requirements and may be delivered. To date, the digesting company has not withdrawn its notice of default, nor has it made known what damage it has incurred as a result.

AUDITOR'S REPORT

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INDEPENDENT AUDITOR'S REPORT

To the shareholders of AquaMinerals B.V.

A. Report on the audit of the financial statements 2020 included in the annual report

Our opinion
We have audited the financial statements 2020 of AquaMinerals B.V. based in Nieuwegein.

In our opinion, the accompanying financial statements give a true and fair view of the financial position of AquaMinerals B.V. as at 31 December 2020 and of its result for 2020 in accordance with Part 9 of Book 2 of the Dutch Civil Code.

The financial statements comprise:
1. the balance sheet as at 31 December 2020;
2. the profit and loss account for 2020; and
3. the notes comprising a summary of the accounting policies and other explanatory information.

Basis for our opinion
We conducted our audit in accordance with Dutch law, including the Dutch Standards on Auditing. Our responsibilities under those standards are further described in the 'Our responsibilities for the audit of the financial statements' section of our report.

We are independent of AquaMinerals B.V.in accordance with the Verordening inzake de onafhankelijkheid van accountants bij assurance-opdrachten (ViO, Code of Ethics for Professional Accountants, a regulation with respect to independence) and other relevant independence regulations in the Netherlands. Furthermore we have complied with the Verordening gedrags- en beroepsregels accountants (VGBA, Dutch Code of Ethics).

We believe the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

B. Report on the other information included in the annual report
In addition to the financial statements and our auditor's report thereon, the annual report contains other information that consists of:
- the management report;
- other information as required by Part 9 of Book 2 of the Dutch Civil Code.

Based on the following procedures performed, we conclude that the other information:
- is consistent with the financial statements and does not contain material misstatements;
- contains the information as required by Part 9 of Book 2 of the Dutch Civil Code.

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We have read the other information. Based on our knowledge and understanding obtained through our audit of the financial statements or otherwise, we have considered whether the other information contains material misstatements.

By performing these procedures, we comply with the requirements of Part 9 of Book 2 of the Dutch Civil Code and the Dutch Standard 720. The scope of the procedures performed is substantially less than the scope of those performed in our audit of the financial statements.

Management is responsible for the preparation of the management report in accordance with Part 9 of Book 2 of the Dutch Civil Code and other information as required by Part 9 of Book 2 of the Dutch Civil Code.

C. Description of responsibilities regarding the financial statements

Responsibilities of management for the financial statements
Management is responsible for the preparation and fair presentation of the financial statements in accordance with the accounting policies selected and disclosed by the entity, as set out in note Principles of financial reporting to the financial statements. Furthermore, management is responsible for such internal control as management determines is necessary to enable the preparation of the financial statements that are free from material misstatement, whether due to fraud or error.

As part of the preparation of the financial statements, management is responsible for assessing the company's ability to continue as a going concern. Based on the financial reporting framework mentioned, management should prepare the financial statements using the going concern basis of accounting, unless management either intends to liquidate the company or to cease operations, or has no realistic alternative but to do so.

Management should disclose events and circumstances that may cast significant doubt on the company's ability to continue as a going concern in the financial statements.

The supervisory board is responsible for overseeing the company's financial reporting process.

Our responsibilities for the audit of the financial statements
Our objective is to plan and perform the audit engagement in a manner that allows us to obtain sufficient and appropriate audit evidence for our opinion.

Our audit has been performed with a high, but not absolute, level of assurance, which means we may not detect all material errors and fraud during our audit.

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Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements. The materiality affects the nature, timing and extent of our audit procedures and the evaluation of the effect of identified misstatements on our opinion.

We have exercised professional judgement and have maintained professional scepticism throughout the audit, in accordance with Dutch Standards on Auditing, ethical requirements and independence requirements. Our audit included among others:

- identifying and assessing the risks of material misstatement of the financial statements, whether due to fraud or error, designing and performing audit procedures responsive to those risks, and obtaining audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control;
- obtaining an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the company's internal control;
- evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management;
- concluding on the appropriateness of management's use of the going concern basis of accounting, and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause a company to cease to continue as a going concern.
- evaluating the overall presentation, structure and content of the financial statements, including the disclosures; and
- evaluating whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with the supervisory board the planned scope and timing of the audit and significant audit findings, including any significant findings in internal control that we identify during our audit.

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We provide the supervisory board with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

Lelystad, June 9 2021
mth accountants & adviseurs b.v.

Was signed

drs. B.M. Tinge RA

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aqua minerals

Colophon

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