



ENVIRO-PURE FOUNDATION

CORPORATE PROFILE

WATER AND WASTEWATER TREATMENT



DEVELOPMENT / CONCEPTUAL DESIGN / INTEGRATION / CONSULTANCY

“SAFE WATER IN ONE STEP FROM RIVER TO TAP™ AND BACK”

COMPANY HISTORY

ENVIRO-PURE FOUNDATION was founded in 1989 by Eng. Dick van Dijk, in The Hague-Netherlands in continuation of his Private Enterprise founded in 1977, named **ENVIRO-PURE ENVIRONMENTAL TECHNOLOGIES**.



Dick started his career as ships-engineer on board large ocean-going vessels, such as passenger-liners and cargo-ships in the Far-East, Australia and Africa, after his graduation with honors from the Royal Maritime Superior Engineering College at Flushing-Netherlands, and obtained a License as Chief Engineer on ocean-going vessels up to 3,000 BRT.

After this he managed a company for design and installation of central heating and air conditioning systems for condominiums, villa's, offices, schools, food-industry etc. followed by a position as Area Sales Manager Europe for a division of a large US-group, Dover Corp. with products for the oil-industry (distribution-stocking) and specialty pumps and valves for industry and product-tankers. His clients were oil companies, shipyards, fuel-and chemical tanker-truck manufacturers, airplane refueling-stations at civil and military airports, all over Europe and North-Africa. The following career step was as Marketing Manager at a shipyard in the Rotterdam area, responsible for bringing in orders for a workforce of 600 steelworkers and engineers. In 1977 he created his own company, ENVIRO-PURE ENVIRONMENTAL TECHNOLOGIES, specializing in treatment of industrial wastewater and disinfection of potable and industrial water, a new concept in the markets in Western-Europe, serving large companies such as Philips, Siemens, Thyssen-Krupp, Usinor, 3M, IBM, Kodak, Beiersdorf(NIVEA), Texas Instruments, DAF Trucks, Dutch Railways and Army, incl. NATO, Polaroid and many more, specializing in Ultra Filtration and introducing Ultraviolet technology to municipalities, shipping and food-industry.



Booth at Aquatech-Amsterdam Water Expo-and Congress 1982 until 1992

In 1990 Dick took on management for Trojan Technologies Inc. of Canada as Managing Director Europe, building a substantial market for UV applications in Europe, Africa and Middle East, with 6 offices in Europe and a staff of approx. 40, contributing to the growth of the parent company to become the world leader in UV with now 500 employees. Projects for cities like Rotterdam/ Antwerp/ Paris/ Madrid/ Milan/ Lisbon/ Oporto/ Tunis/ Stockholm/ Athens, Heraklion (Crete), Bergen(Norway), Rome, Pretoria, Bloemfontein (SA), King Abdullah City near Jeddah were realized as well as cooling-water disinfection (Legionella) for a large nuclear power plant in France with a capacity of 1 m³/sec.



Trojan Technologies Europe staff and representatives 1995: sales meeting The Hague-NL

Dick was an active member for IWA (Mediterranean Basin Reuse Committee), IUVA (International Ultra Violet Association), Austrian Standardization Institute (Ö-Norm), FIGAWA (Federation of German Gas-and Water Installers) and more, gave guest-lectures at Universities such as Polytechnical University of Marmara/Istanbul (Turkey) and UNICEF-IHE Institute in Delft-Netherlands and presentations at seminars and trade-shows, participated with Royals and Ministers of The Netherlands in trade-visits to the Middle East and India, later South East Asia and Australia.



Sheik Mohd. Al Maktoum- VP UAE- Ruler of Dubai Chamber of Commerce Riyadh – Saudi Arabia. Front row left Lute Broens, Boardmember, Dick and HE Nicolaas Beets, Ambassador

After his retirement from Trojan, Dick developed compact, efficient and easy to operate drinking water treatment systems for rural areas and disaster struck situations, opened a branch office in Thailand. and started introducing these systems in ASEAN, after successfully selling them in Africa, Brazil, India and Pakistan. He co-produced a documentary called “Blue Gold” for Dutch television network NCRV with guest now HM King Alexander of The Netherlands, about innovations for rural water stress situations. He was nominated for the European Environmental Award and for a Royal Decoration.



ENVIRO-PURE FOUNDATION has teamed-up with **Australian companies** active in rural water and wastewater facilities and emergency-housing and created **ENVIRO-PURE (ASIA) LP** and **Thailand Water Treatment Group**.



GreenCo folding tanks



BIPU Lego style wastewater treatment

OUR SOLUTIONS

smartUF

Starting in 1977 we were European Pioneers in Ultrafiltration (UF) Applications for Industrial effluents, gaining a wealth of know-how and experience in the following years supported by and working with UF-Membrane specialists from Universities.

Ultrafiltration(UF) is a Separation-Technology, using mostly Polymeric Membranes to remove particles and micro-organisms. Today, > 40 years later, UF is the choice of municipalities and industries to treat large volumes of water and effluents to the most stringent standards.

In association with **Akvoregia** in The Netherlands, *smartUF-series* were designed: compact, fully automatic back-washing systems, affordable, robust, maintenance-free* systems for purification of fresh water to WHO-standards** from virtually any source, in rural and sub-urban areas.

The heart of a *smartUF-system* is a set of membrane cartridges containing thousands of double walled PolyAcrylNitrile(PAN) hollow fibers, with a diameter of 1 mm and pores of roughly 25 nanometer.



Raw water is pumped through these hollow fibers at low pressure and only clean, safe water can pass through, making the water fit for consumption. This inside-out process has proved to be the strongest and most efficient configuration for complete removal of particles and bacteria, viruses etc. Trapped on the inner-walls of the fibers during the filtration step, they can, by simply back-flushing with clean water in the opposite direction, restore full capacity.

Backwash steps are fully automatic and micro-processor controlled. Absence of dead-pockets in the cartridges prevents sedimentation, with full cleaning as a result, and no regular chemical treatment is required, ensuring the longest possible service-life. Fully **Symmetrical** configuration allows the filters to be reversed during their service life of 5 to 7 years. Depending on the local situation, pumps may be self-priming, submersible, deep-well or booster type.

Electrical power can be supplied by solar-panels, micro-hydro-, wind-, motor-generator or grid, or hybrids thereof. Total power requirements are very modest and typically do not exceed 0.5 kW for systems with 3,000 L/h capacity. Raw water may come from river, creek, pond, dam-lake, irrigation canal, dug-wells, bore-holes and deep-wells, and rainwater collected from roofs of buildings.

Total Suspended Solids(TSS) such as mud, clay, silt, and other particles will be removed to < 0.1 mg/l. Total Dissolved Solids(TDS) such as salts, calcium, iron and manganese will typically not, or only partially, be removed by UF. NTU levels will become < 0.1. Bacteria counts are reduced by 6 Log (99.9999%), Viruses by 4 Log (99.99%) and the results are well below WHO requirements for potable water.



Newly developed sUF-MMU-SDE with capacity of 12 m³/h in Cambodia

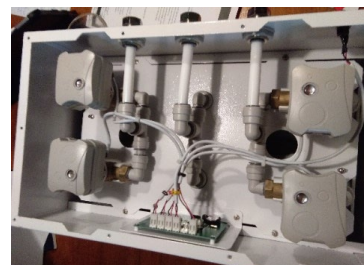
Rural drinking water production

Both plants use surface water directly from ponds, no chemicals, disinfection with **Aquatabs** InLine TCCA tablets.

Capacities up to 15 m³/h per skid, modular systems for hotels, hospitals, resorts, villages, cities with capacity up to 300 m³/h or 60,000 people, directly from pond or river to your taps. No chemicals.

SMALL SCALE UF SYSTEM

Water specialists and designers from The Netherlands with > 43 years of **experience** with UF technology have come-up with innovative solutions by **thinking “out-of-the box”**, creating compact, easy to transport and install units that take a minimum of maintenance, use very little power and produce **crystal clear, safe*** drinking water from almost any fresh water source!



smartUF-Box 2, a compact unit for homes, café's, restaurants, bars, schools

MULTICYCLONE

Except for rainwater or city-water, pre-filters need to be installed between pump and UF, for which we have the perfect answer:

MultiCyclone by one of our partners

- Raw water at low pressure enters the **MultiCyclone** tangentially, generating a strong centrifugal effect.
- Particles are spun out to the wall and then spiral down to the sediment chamber.
- The filtered water migrates to the centre and reverses to the top outlet and further to the **smartUF-system**.
- Accumulation of the sediment can be monitored through the transparent bowl of the sediment chamber.
- Purging of sediment in 15 seconds, manually or automatic with timer
- Capacities from 2.5 – 90 m³/h per unit
- NSF tested and Certified
- Tandem arrangements for large flows



Left MC 12, right MC XL- no moving parts, works on low water pressure only, 2.5 -90 m³/h

AQUATABS InLine

Disinfection:

Water only pre-treated with our **MultiCyclone** and used as tap water needs to be disinfected so people, in particular children, do not get in contact with harmful micro-organisms, and especially not ingest them. Water treated with UF and destined for drinking and food preparation should have a residual disinfectant during distribution and storage.

New: on-site production and dosing of chlorine, easy to manage, safe, no electricity based on 40 years of experience with slow dissolving tablets or granulates

- dry product, TCCA, produced under EU pharmaceutical protocol, safe to handle and no loss of strength
- already in 2001 approved by U.S.EPA for use in water treatment, NSF Certified
- WHO states: no risk for health from by-products
- flow-through dispenser with easily replaceable cartridge or granulate dissolving for bulk applications
- no skills required, no electricity, dynamic-hydraulic mixing * (granulate-unit only 40 W)
- field-adjustable between 0.1 and 5 ppm free chlorine
- ground- and rain-water disinfection and residual protection
- surface water purification in combination with our **smartUF systems**
- used by NGO's worldwide: treating 25 billion l/yr equals 800.000 l/sec or 12.7 Million GPM, serving safe water to over 7 million people daily



Automatic feeder with dissolving

AQUATABS™ IN-LINE HOCl production, dosing and mixing systems were developed in Thailand by our qualified engineers with 50+ years of experience in water treatment, in close cooperation with specialists of the manufacturers in Ireland, and are available from stock. Unique, automated, adjustable Cl dosing solution (see pictures above) with capacities to 150 m³/day (40,000 USGD) per cartridge. Multiple Aquatabs Dispensers can be arranged In parallel for larger demand at low cost. Dosing Between 0.1 – 5 ppm. Cartridges last up to 10,000 m³ = 2.6 Million USG, depending on required Cl concentration and presence of organics! Residual HOCl (hydrochlorousacid) is stable for 72 hours in water.

AQUATABS In-Line Systems are used in villages, resorts, schools, hospitals, clinics, refugee camps, restaurants, farms and industry.

ENVIRO-PURE H₂O Technology

The **ENVIRO-PURE H₂O Technology** has been developed by combining decades of Dutch water treatment experience and advanced research to meet the need for reliable and affordable drinking water in emerging markets. Compared to most existing, old and new, designs for surface water treatments, the Technology offers unique features:

- Excellent, safe water drinking water quality exceeding WHO requirements
- Lowest investment costs
- Lower operational and maintenance costs due to a minimum of mechanical components
- Operators with limited experience and education can be adequately trained in less than a week
- Robust and stable operation, even during strong and rapid seasonal fluctuations of raw water quality
- 70% of total investment may be locally tendered, main components manufactured in ASEAN
- Independently validated compared to classic systems: 50 % investment, 25% footprint, <70% concrete
- 25 systems > 18 years operational in ASEAN

MODULAR DESIGN / DECENTRALISED WATER SOLUTIONS:

ENVIRO-PURE H₂O Technology models can be combined to meet a wide range of required water production. The **ENVIRO-PURE H₂O Technology** models, with a capacities from 10 L/s to 200 L/sec per can be applied to meet the potable water demand of communities of 8,500 to 175,000 people.

CHOICE OF CONSTRUCTION MATERIALS:

The **ENVIRO-PURE H₂O Technology Model P** is constructed entirely out of epoxy-coated steel-sections welded in-situ for short delivery-time and start-up to answer quickly to rapid growth of population or industry. Pre-fabricated in ASEAN and installed by our experienced factory-staff.

In case of concrete construction, the **ENVIRO-PURE H₂O Technology** offer a great advantage over conventional designs due to their 70% lesser concrete requirement and compact dimensions, using only 25 % of the footprint of traditional systems. The absence of mechanical- mixers and -clarifiers reduces total building time considerably.



Efficient Mixing weir, 1 second only

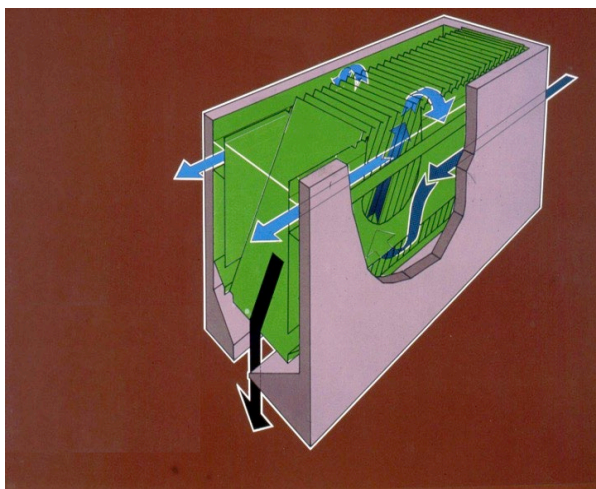


Reduced flocculation 12 minutes only

OPERATIONAL ADVANTAGES:

The unique dynamic hydraulic mixing of the polyelectrolyte takes place in 1 second, flocculation in 12 minutes only, versus 20-30 minutes in conventional systems, saving 30% of PAC, electricity, space and concrete, while optimizing floc formation.

The specially designed **Flat Sheet Lamella Separator** outperforms any plate or tubular separator on the market, thanks to its' unique hydraulics, warranting even load distribution and 3-4 times higher load factor, resulting in lower NTU, 150% higher capacity and greater flexibility compared to similar sized systems. Substantially reduced maintenance.



ENVIRO-PURE H₂O Technology Modular Surface Water Treatment Plant at Bekasi (Jakarta)-Java-Indonesia 850 m³/h
50% lower footprint, 50% concrete, 70% chemicals and power, 50% NTU, 150% capacity

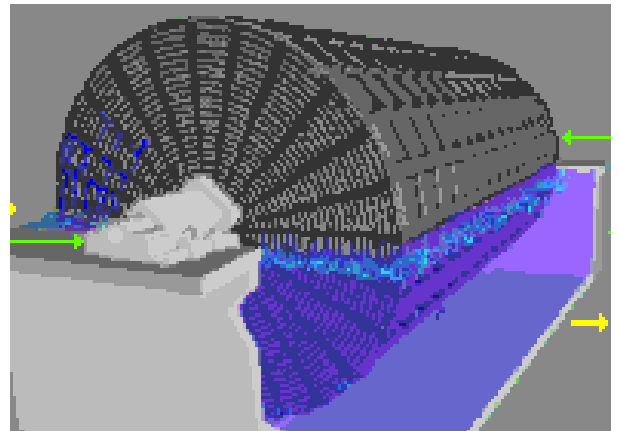
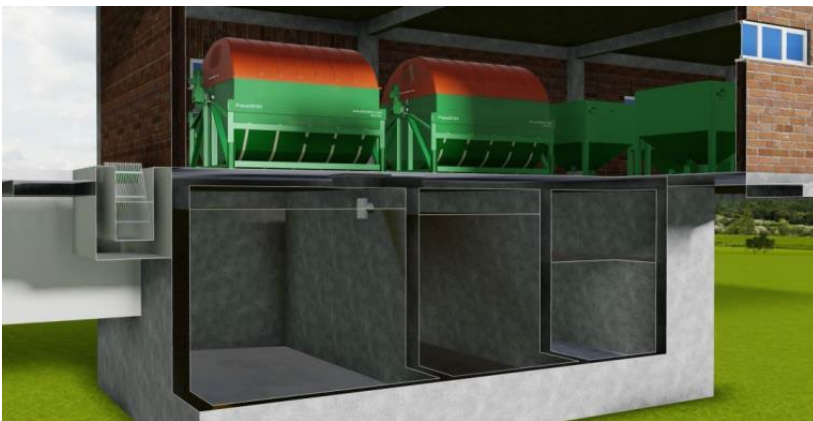


Compact design includes filter with in-filter backwashing, no pumps required

PlanetDISK RBC

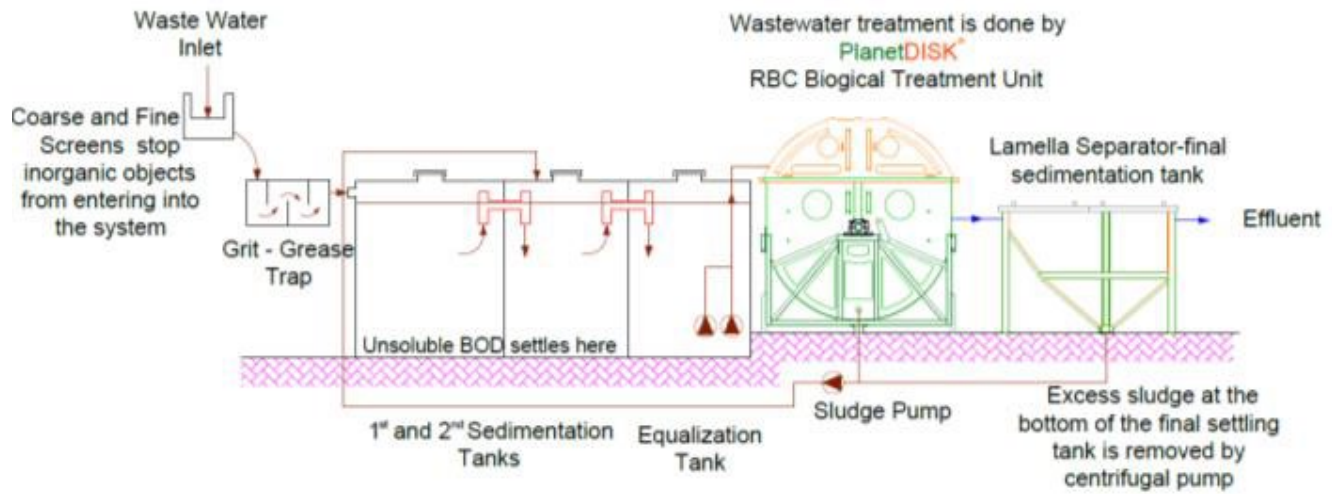
Wastewater Treatment:

The PlanetDisk Rotary Biological Contactor (RBC's) is manufactured in Türkiye and has been installed worldwide since 2003. It originally is a German invention of the 1960-ies, perfected in the 1980-ies.



PlanetDISK® RBC Unit is a fixed film biological Sewage Water Treatment system consisting of circular disks made of non-corrosive, Polypropylene (PP), mounted on a solid steel shaft rotating at a speed of less than 4 rpm.

During the rotation, 40% of the disks are immersed in wastewater and the rest are in contact with air. RBC process is widely used in the world since 1980s. Due to its simplicity in operation and energy saving mechanism, its popularity is continuously growing due to its low CAPEX and OPEX and proven long life-span (> 20 years)



The units are made of:

- GRP (fiberglass) body that will protect the system from corrosion; (Concrete body optional)
- Virgin Polypropylene 1-piece Discs (PP) which will last for years without any degradation; 2050 mm diameter, at least 1.5 mm thickness. 85 mm diameter Solid Steel shaft - chromium coated and/or epoxy painted- AISI 1045
- All deep galvanized metal parts to last for years against corrosion. Stainless Steel is optional.
- To disinfect the efficiently biologically treated effluent of RBC's to be used for irrigation and general cleaning for remote housing estates and small industry, AQUATABS InLine or UV (Ultraviolet) system of German design are supplied by us.

OUR STAFF



Seminar in Bandung-Indonesia February 2020

The **Thailand Water Treatment Group** resides under **ENVIRO-PURE FOUNDATION** and has the following active board-members, consultants and collaborators:

- **Eng. Dick van Dijk**, Chairman and travelling Board Member, Netherlands and Thailand, UF and UV technologies specialist, innovator and integrator
- **Mr. Gary Wyeth**, MSc Civil Engineering, Board member, Owner/Director Wyeth Water Consultants – Thailand/Malaysia
- **Mr. Lute Broens**, MSc Chemical Engineering, Netherlands, Resident Board member, co-founder and former Business Development Manager of leading UF-membrane manufacturers Norit-X-Flow now part of Pentair
- **Dr. Agustin Mariscal**, Medical Doctor, Spain, Advisor to the Board, disinfection specialist and Business Development Manager for the world largest manufacturer/supplier of TCSA, hypochlorous (HOCl) producing products
- **Mr. Peer Kamp**, MSc in Water Technology from University of Delft, former Chief Technology Officer of Provincial Water Authority North-Holland, inventor of the Perfector and Advisor to the Board
- **Process Engineer**, T.B.A. presently working in Australia, returning to Thailand after Covid-19 restrictions

Independent partners:

Akvoregia: Netherlands, UF-NF-RO membrane specialists

Aquatabs: Ireland- disinfection systems

Asxban – Singapore: Innovative Arsenic and Fluor removal developed with NUS and approved by TUV-SUD

GreenCo- Melbourne*: folding water tanks for remote locations and emergencies

ENVORINEX- Hobart-Tasmania*: compact LEGO-style wastewater collection and treatment

MADDEL- Melbourne, Emergency housing for disaster mitigation, field hospitals, temporary camps

MOOR Filtration Ltd , Netherlands: specialized brackish RO-systems with > 90 % recovery

PlanetTEK-Istanbul-Turkiye: PlanetDISK RBC's

Ueberall – Hamburg-Germany: UV systems

WaterCo-Australia: filter systems

*ENVORINEX, GreenC, and MADDEL form together with ENVIRO-PURE FOUNDATION an informal association to supply packaged emergency potable water treatment and wastewater collection and primary treatment systems and emergency accommodations for disaster mitigation

GARY WYETH – BOARD MEMBER



Gary graduated from Portsmouth University in 1991 with a Master of Engineering Degree in Civil Engineering. He has 29 years' experience in the water industry, specifically in the Non-Revenue Management field, with 26 of those years spent working in Asia. During this period Mr Wyeth has gained member status of CIWEM (UK), is a Chartered Engineer (CEng) and has gained a Graduate Diploma in International Operational Management.

Gary graduated from Portsmouth University in 1991 with a Master of Engineering Degree in Civil Engineering. He has 29 years' experience in the water industry, specifically in the Non-Revenue Management field, with 26 of those years spent working in Asia. During this period Mr Wyeth has gained member status of CIWEM (UK), is a Chartered Engineer (CEng) and has gained a Graduate Diploma in International Operational Management.

Gary started his career as a Hydraulic Modeller and has been responsible for the construction of over 40 network models, which has enabled him to gain a comprehensive understanding of water supply system operating regimes. Using this experience of water supply systems he has moved into the operation and management of supply systems, involving asset Water reduction techniques.

He has project managed a number of performance based NRW Reduction projects in Thailand, Malaysia, Indonesia and Saudi Arabia. As part of these projects Mr. Wyeth has had to conduct numerous NRW Awareness programmes as well as technical workshops and seminars. He has subsequently utilized the skills gained from these project management experiences in developing new projects worldwide and in establishing two new international businesses, which are still operating as successful entities to this day.

Gary is also the current Secretary of the IWA Water Loss Specialist Group and was the founder of the Water Loss Asia series of Conference and Exhibitions.



LUTE BROENS – RESIDENT BOARD MEMBER



Lute is a well-known serial entrepreneur of The Netherlands who has successfully built, established and initiated a long list of businesses, networks and initiatives. He has served as a Director Business Development for a large multinational and he took on the role of start-up CEO in various high-tech innovation efforts. He was a board member of European Desalination Society and former President. He is an internationally renowned water technology expert.

EDUCATION & DISTINCTIONS

Mr. Broens holds a Master of Science degree in Chemical Engineering of University of Twente - Netherlands. He co-operated with Professor Smolders on the field of membrane technology and membrane formation during the period of '71 to '80.

“Officer in the Order of the House of Oranje-Nassau” (Royal Dutch Chivalry Order Award)

The Queen of the Netherlands has awarded Mr. Broens in the rank of Officer for his impact in science and industry in the Netherlands on the topic of water technology. Especially for the impact through initiating new developments in technology like membrane technology and impulses in the innovation eco-structure for technology.

1968-1970- Chemical company Hülsch Project leader; *Working field Organic Chemistry*

1970-1979- University of Twente; *Working field Membrane Technology*

1979-1985- Polymer Corporation USA Director of Global R&D; *Working field high tech engineering plastics*

1985-1993- X-Flow BV Co-founder and shareholder of *Membrane development & manufacturing*

1993-2001- Norit Membrane Technology Founder, shareholder and Managing Director; *Supply of membrane Technology (sales volume 20 M€)*

2001-2011- Norit /Pentair Business Development Director *Membrane Technology reporting to CEO*

2001-2011- Netherlands Water Partnership (NWP) Member of the Board of Directors

Business delegation leader *Trade missions*

2003-2007- NWP Working Group Chairman 'Water and the Water cycle'

2004-2008- European Desalination Society (EDS) Member of the Board of Directors

2008-2011- International Water Association (IWA) Member Specialist Working Group; 'Cities of the Future'

2004-2011- Wetsus Institute Co- Founder & Director of Strategy *Top-institute Sustainable Water technology*

2008-2011- European Desalination Society (EDS) President of the Board of Directors

2001-present- Keynote speaker-Worldwide Water technology, Technological Innovation and development, Sustainable Water treatment, Water re-use, Water-recycling

2011-present- Capra Ibex B.V. CEO & Owner; *Fast Track Business Development*

2011-2017- OICAM (Open Innovation Centre Advanced Materials) Business Development Director

2012-present- ASTM Member; Working Group 'SDI'

2013-present- Akvoregia B.V. CEO and Owner *Smart Membrane technology*

2013-2019- Triple-H Water B.V. . Director *Water Technology provider, Strategic Water Treatment Advisory*



Large Ultrafiltration membrane-systems for industry, WTP and WWTP

Representatives In ASEAN:

Cambodia: Eng. Lo Chay, 3i Company, Chairman of Cambodian Water Association

Indonesia: TWA- Jakarta

Malaysia: Wyeth Water Consultants

Pacific – New Caledonia/Vanuatu: Philippe de Grésan

Philippines: ProWater Tech

Thailand: ENVIRO-PURE (ASIA)

Singapore: Energy-Renewed

ENVIRO-PURE FOUNDATION

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