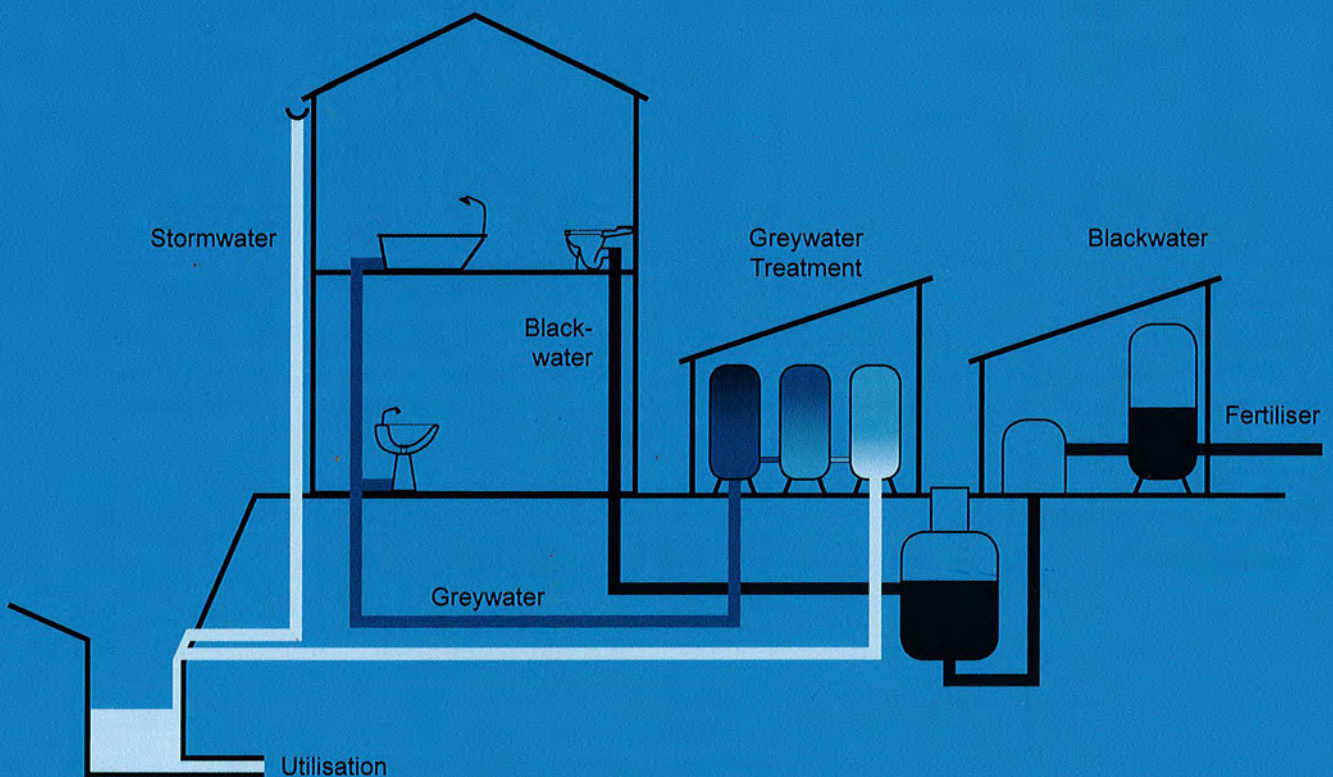


New Alternative Sanitation Systems - NASS

Terminology, Material Flows,
Treatment of Partial Flows, Utilisation



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Weiterbildendes Studium »Wasser und Umwelt«
Bauhaus-Universität Weimar
Coudraystr. 7
99421 Weimar
fon: +49 (0) 3643-584627, fax: +49 (0) 3643-584637
info@bauing.uni-weimar.de
www.uni-weimar.de/wbbau

DWA
fon: +49 (0) 2242-872333, fax: +49 (0) 2242-872100
kundenzentrum@dwa.de
www.dwa.de

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Preface

The impact and consequences of changes to the context in which it operates are the subject of heated debate within the German water industry, the main topics being climate change, demographic trends, and a shortage of resources. Further challenges are presented by the need to renew the sewage system, together with ongoing requirements such as sanitation and the removal of micropollutants.

Some initial thoughts about how the system could be radically redesigned – primarily from an academic perspective – were published in the 1990s, and some pilot projects were conducted. The new concepts focussed on material flows and their utilisation, and were given names such as ‘alternative sanitation concepts’, ‘ecological sanitation concepts (ecosan)’, ‘decentralised sanitation and reuse (desar)’, and finally ‘new alternative sanitation systems (NASS)’.

The German Association for Water Management, Wastewater and Waste (*Deutsche Vereinigung für Wasserwirtschaft, Abwasser und Abfall e.V. / DWA*) – which at that time was still called the ATV-DVWK – came up with an initial working report in 2002 which examined the topic of alternative sanitation concepts. A new Technical Committee (KA 1) was founded in 2004, its objective being to systematically present and evaluate ideas and experiences in relation to NASS. The outcome of this has been available since 2008 in the form of a DWA publication which was compiled by a large number of very committed volunteer members of six working groups and the Technical Committee itself. A crucial milestone in the work of the DWA Technical Committee appeared in 2014: Worksheet A272 ‘Principles for the Planning and Implementation of New Alternative Sanitation Systems – NASS’ (*Grundsätze für die Planung und Implementierung Neuartiger Sanitär-systeme – NASS*) was developed in Working Group KA 1.4 under the leadership of Dr.-Ing. Thomas Hillenbrand.

Even though this is a new and controversial topic, many universities and other higher education establishments were joined by engineering companies and well-known service providers who enabled their employees to contribute to this DWA publication. I would like to take this opportunity to thank all those who were involved for their outstanding personal commitment.

NASS have already been briefly outlined within the context of the post-graduate course entitled ‘Water and the Environment’, with some aspects being dealt with by Course WW59 (‘Sanitary Engineering in Rural Areas – Wastewater Disposal Module’). Thanks to the good and intensive collaboration with the DWA in the areas of sanitary and hydraulic engineering, the fruits of the work carried out by the above-mentioned Technical Committee could henceforth be used to create Course WW92 (‘New Alternative Sanitation Systems’).

We would like to offer our sincere thanks to everyone who has been involved in the development of this publication: Dipl.-Ing. Sonja Sauer (inawa Weimar), Dr.-Ing. Christian Springer and his colleagues who teach the ‘Water and the Environment’ Master’s course at the Bauhaus-Universität Weimar, particularly Simone Conrad M.Sc. for the restructuring and updating of individual sections together with Dipl.-Ing. R. Holzhey who was responsible for the layout and design. A special thanks goes to Dipl.-Ing. Ulf Raesfeld for organizing and editing the English translation of the publication. We are also grateful to the members of the Technical Committee’s working groups who are listed in Section 1, and who have contributed to this book.

We are particularly grateful to the Thuringian Ministry of Culture, which has enabled the development and publication of the first edition within the context of project funding over a number of years.

Last but not least, thanks go to Federal Ministry of Education and research, whose ‘Open Universities’ initiative provided the impetus to revise, translate and publish this first English edition via completion ‘Open Universities’ within the scope of the Professional Bauhaus project.

I hope this new course will help people to seize the opportunities that are offered by this period of change.

Weimar, Mai 2016

Prof. Dr.-Ing. Jörg Londong

Bauhaus-Universität Weimar, bauhaus institute for infrastructure solutions (b.is), Professor of Sanitary Engineering and Chairperson of DWA Technical Committee KA 1

1 Introduction

Demographic trends, climate change, the rising cost of raw materials such as petrol, together with drought and hunger in many parts of the world, are topical issues which also preoccupy sanitary engineers in Germany. Our solution to urban drainage has hitherto been based on centralised systems that use water-borne sewage removal and joint centralised treatment of domestic effluent, commercial / industrial wastewater and precipitation water prior to discharge into water bodies. The issues outlined above have increasingly made people wonder whether this solution is still fit for purpose: although the original priorities (hygiene and water drainage) have largely been resolved in Germany, this is nonetheless achieved by means of a somewhat inflexible system which ties up a great deal of capital. Furthermore, these systems face issues (pharmaceutical residues, micropollutants, etc.) to which there is still no prospect of a satisfactory solution.

Nevertheless, human beings' ability to adapt has enabled us to survive and make steady progress. We are living in a constantly changing world: the precise nature and extent of these changes are hard to foresee, although the trends in relation to climate change and demographics are all too obvious.

Engineers in particular are expected to come up with solutions that will help us to adapt. This is where we need to draw on the ideas formulated by those people who are addressing the paradigm shift towards resource-oriented systems in sanitary engineering.

Some initial thoughts about this – primarily from an academic perspective – were published in the 1990s, and some pilot projects were conducted. The DWA (German Association for Water, Wastewater and Waste) – which at that time was still called the ATV-DVWK – came up with an initial working report in 2002 which examined the topic of alternative sanitation concepts. The issue was the subject of some heated (and occasionally emotional) debates within the association. In order to place these discussions on a sound footing, it was decided in 2004 to found a new Technical Committee (KA-1 'New Alternative Sanitation Systems') as a joint committee of the main Wastewater Treatment (KA) and Drainage Systems (ES) committees. The results of this work over a period of four years [DWA, 2008c] underlie Course WW92 ('New Alternative Sanitation Systems').

Members of the Technical Committee and its working groups when the DWA publication entitled 'New Alternative Sanitation Systems' was developed were as follows:

Technical Committee KA 1: New Alternative Sanitation Systems

PD Dr. Joachim Clemens, Bonn, Universität Bonn, Institut für Pflanzenernährung

Dr. sc. techn. Helge Daebel, Zürich, CH, Emerald Technology Ventures AG

Dr.-Ing. Heinrich Herbst, Aachen, RWTH Aachen, now Grontmij, Cologne

Dipl.-Ing. Thomas Hillenbrand, Karlsruhe, Fraunhofer Institut für System- und Innovationsforschung, Karlsruhe

Prof. Dr.-Ing. Jörg Londong, Weimar, Bauhaus-Universität Weimar, Professor of Sanitary Engineering (Chairperson of Technical Committee)

Dr.-Ing. Martin Oldenburg, Lübeck, OtterWasser GmbH

Prof. Dr.-Ing. Ralf Otterpohl, Hamburg, Technische Universität Hamburg-Harburg, Institut für Abwasserwirtschaft und Gewässerschutz

Dr.-Ing. Anton Peter-Fröhlich, Berlin, Berliner Wasserbetriebe, Organisationseinheit Abwasserentsorgung

Dipl.-Ing. Arno Schäfer, Hamburg, HAMBURG WASSER (until 2007)

Prof. Dr.-Ing. Heidrun Steinmetz, Stuttgart, Universität Stuttgart, Institut für Siedlungswasserbau, Wassergüte und Abfallwirtschaft (Deputy Chairperson of Technical Committee)

Dr.-Ing. Thomas Werner, Hamburg, HAMBURG WASSER (from 2007)

Working Group 1.1 'Options for the capture, transport and treatment of blackwater, yellowwater and brownwater' (until February 2013)

Prof. Dr. Franz Bischof, Amberg, Fachhochschule Amberg and Hans Huber AG

Peter-Nils Grönwall, Hamburg, Behörde für Stadtentwicklung und Umwelt

Dipl.-Ing. Kay Joswig, Berlin, Berliner Wasserbetriebe, Abt. Netz- und Anlagenbau

Dr. sc. techn. Max Maurer, Dübendorf, CH, Eawag: Das Wasserforschungsinstitut des ETH-Bereichs

Dr.-Ing. Stefania Paris, Berching, Hans Huber AG

Dr.-Ing. Anton Peter-Fröhlich, Berlin, Berliner Wasserbetriebe, Organisationseinheit Abwasserentsorgung (spokesperson for working group)

Dipl.-Ing. (FH), Dipl. Biol. Nicola Räth, Frankfurt Sören Rüd B.Sc., Eschborn, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH (until 2010, since then Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH)