

Proposals for NORMAN Joint Programme of Activities 2024

Title	NORMAN WG-5 Water reuse risk assessment and policy support
Type of activity	Working Group activities
Leader	LTU and DERAC
Topic / activities	<p>Background / Justification for the proposed activity:</p> <p>In response to the escalating problem of water scarcity and waste management, treated wastewater, sewage sludge and other solid matrices are increasingly identified as reliable alternative sources for a range of applications. Although the reuse practice is accompanied by a number of benefits, a number of questions are still open regarding the release of contaminants of emerging concern. Current open challenges include the spread of chemicals and biological contaminants (e.g. viral genetic material including SARS-CoV-2, antibiotic resistance genes and bacteria), the effects that these contaminants may induce on receiving ecosystems and humans exposed via the environment, the identification of technologies that are able to remove such contaminants and means and solutions to overcome these challenges and promote safe reuse practices further.</p> <p>Description of the proposed activity and expected outcomes for 2024:</p> <p>A growing interest for data on biological and chemical contaminants of emerging concern (CECs) linked to reuse practices (i.e., the use of wastewater and associated sludge for different purposes e.g. agriculture, aquifer recharge, support public health decision-making, urban and recreational activities, construction, land restoration) has emerged with the Circular Economy Action Plan, the recent adoption of the new EU regulation on water reuse for agricultural irrigation and revision of the EU Directives related to urban wastewater treatment and the use of sewage sludge in agriculture. In line with the proposed activities built on the WG5 mandate, three projects, all related to databases, are planned to continue in 2024.</p> <p>Task 1: The Antibiotic Resistance Bacteria and Genes Database</p> <p>NORMAN ARB&ARG was first launched in 2021 as an open platform for the exchange of ARB&ARG occurrence data and analytical methods following the FAIR (Findable, Accessible, Interoperable, Reusable) principles. The database has been enriched with 2622 data points from 11 countries (795 soil, 595 surface water, 705 groundwater, 484 wastewater, 43 sewage sludge). An overview of the database functionalities, data extraction, and the contribution of data to the database has been presented in a manuscript currently under peer-review evaluation. The ambition to collect enough data to establish baseline ARB&ARG concentration levels in soil, wastewater, sludge, groundwater, and surface water still remains a primary goal. The goals for 2024 are as follows: 1) Intensify efforts to collect, harmonize, and upload ARB&ARG data from key scientific publications, 2) Improve the visualization capabilities of the database, 3) Attempt to initialize a monitoring campaign for ARB&ARGs and A&TPs to enrich the database with new data, and 4) Investigate the incorporation of NGS data into the database.</p> <p>Task 2: the SARS-CoV-2 in sewage (SC2S) Database</p> <p>Whilst several countries launched national SARS-CoV-2 in wastewater databases to share information on viral concentrations during the pandemic, the NORMAN SARS-CoV-2 database is the only online, open access database sharing data from multiple countries and hence remains a useful research resource currently hosting over 1000 data sets from 11 countries.</p> <p><u>Results obtained in 2023</u></p> <p>A joint meeting was held with the SCORE network to brainstorm ideas for the future of the database. The decision was made to undertake a survey of NORMAN and SCORE members with a view to understanding current wastewater-based epidemiology activities linked to infectious diseases. Survey results will be used to extend the remit of the SARS-CoV-2 database to additionally host data on other infectious diseases.</p> <p><u>Activities planned for 2024</u></p> <ul style="list-style-type: none"> Undertake survey to explore expanding database to include e.g. influenza and RSV and rebrand the database at the 'infectious diseases database' Another push to upload historic SARS-CoV-2 WW data into database – link to publication opportunity <p>Task 3: Databases for CEC risk characterisation in reused environmental matrices</p> <p>The risks linked to chemicals in reused matrices like water and sewage sludge are mostly unknown and occurrence data as well as quality targets (or threshold values) are needed to characterise and prioritise those risks. Therefore, the WG5 have identified as a new priority the collection and the dissemination of such data to support research projects, policy makers and environmental managers. This initiative is supported by the Water Europe Zero Pollution Working Group.</p> <p>The opportunity to upgrade the NORMAN existing databases, EMPODAT for occurrence data and Ecotoxicology for quality targets (hazards data), was identified in 2021 as the most relevant approach to collecting data related to chemical contaminants in reused matrices and to characterise their risk according to the WG1 prioritisation framework. In 2023, the following tasks has been performed to reach this objective:</p> <ul style="list-style-type: none"> Upload of six new EMPODAT DCTs (WWTP, surface water, groundwater, sediment, soil, biota) on the NORMAN website with new matrices (e.g. reclaimed water, stormwater, stormwater pond sediment,

	<p>dredged sediment, excavated soil) and reuse categories (e.g. agriculture, aquifer recharge, recreational and urban activities...).</p> <ul style="list-style-type: none"> - Compilation of Canadian regulatory quality targets for water reused in agriculture in DCT for Ecotoxicology database and upload in the WG5 private area on the NORMAN website. - Collection of quality targets in soil and the conversion of quality targets for sewage sludge reused in soil fertilisation. - Risk characterisation of pesticides and metals in different water types reused in agriculture. - Risk characterisation of CECs in stormwater, WWTP effluents and reclaimed water reused in agriculture and surface water recharge (on-going). <p>The activities planned for 2024 are the following:</p> <ul style="list-style-type: none"> - Collection and publication of new occurrence data on stormwater, reclaimed water and sewage sludge in EMPODAT based on literature reviews. - Collection and publication of new quality targets on soil and conversion in quality targets on sewage sludge for agricultural fertilisation in the Ecotoxicology database. - Perform the risk characterisation and prioritisation of CECs in sewage sludge for agricultural fertilisation. - Publish the risk characterisation and prioritisation of CECs in reused waters including stormwater and reclaimed water in a peer-review journal. <p>Added value / Link with other NORMAN activities and / or other projects</p> <ul style="list-style-type: none"> • Support the WG1 Prioritisation activities: identification of priority contaminants in environmental matrices intended for reuse in different practices and processes. • Identification of the contribution of WWTPs to the environmental spreading of biological hazards • Support the implementation of the EU Regulation on minimum requirements for water reuse (2020/741), Sewage sludge Directive (86/278/EEC) and Circular Economy Action Plan. • Contribute to the PARC partnership, the European Green Deal's Zero Pollution Action Plan and the Chemicals Strategy for Sustainability.
Participants	WG5 members and partners from SCORE and Water Europe networks
Proposed in-kind contribution	<p>LTU: Co-leading WG5, further development of the SC2S database and lead on the analysis of submitted datasets.</p> <p>DERAC: Activity transferred to WG-1 on Prioritisation. Contribution to Tasks 2, 3 and 5.</p> <p>LTU, DERAC, EAWAG, SLU, IDAEA, UFZ: Manuscript preparation for the risk characterisation of chemical contaminants in reused waters i.e. stormwater, reclaimed water, WWTP effluents reused for surface water recharge and agricultural practices.</p> <p>EI: Improve the visualization capabilities of the ARB&ARG database, attempt to initialize a monitoring campaign for ARB&ARGs and A&TPs to enrich the database with new data, and investigate the incorporation of NGS data into the database</p>
Contribution needed from NORMAN Association¹	<p>DERAC (4,500 €) Co-leading of WG5</p> <p>DERAC (4,000 €) Collection of occurrence data and quality targets for the NORMAN databases and risk characterisation of reused matrices. Activity transferred to WG-1 on Prioritisation.</p> <p>EI (4,000 €) Person time to collect, harmonize, and upload ARB&ARG data from key scientific publications.</p>

¹ Please, provide here a transparent justification of the requested resources and of the in-kind contribution, thereby distinguishing between the costs associated with "person-months" for the organisation, the "travelling costs" for invited speakers and the costs for the logistics (e.g. meals, room rental etc.)