



HAL
open science

Sedimentology, stratigraphy and chronology of a decantation tank in the sewer network of Orléans (France).

Jérémy Jacob, Alexandre Thibault, Anaëlle Simonneau, Claude Le Milbeau, Christian Digiovanni, Pierre Sabatier, Jean-Louis Reyss, Luigi Ardito, Cédric Morio

► To cite this version:

Jérémy Jacob, Alexandre Thibault, Anaëlle Simonneau, Claude Le Milbeau, Christian Digiovanni, et al.. Sedimentology, stratigraphy and chronology of a decantation tank in the sewer network of Orléans (France).. 19th EGU General Assembly, 2017, Vienne, Austria. pp.19077. hal-03552728

HAL Id: hal-03552728

<https://hal.science/hal-03552728v1>

Submitted on 3 Feb 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

Sedimentology, stratigraphy and chronology of a decantation tank in the sewer network of Orléans (France).

Jérémy Jacob (1), Alexandre Thibault (1), Anaëlle Simonneau (1), Claude Le Milbeau (1), Christian DiGiovanni (1), Pierre Sabatier (2), Jean-Louis Reyss (3), Luigi Ardito (4), and Cédric Morio (5)

(1) ISTO, UMR 7327 du CNRS/INSU, Université d'Orléans, BRGM, Orléans, France., (2) EDYTEM, Université Savoie Mont Blanc, CNRS, Le Bourget du Lac, France., (3) LSCE, Université de Versailles Saint-Quentin, CEA-CNRS, Gif-sur-Yvette, France., (4) Bureau de Recherches Géologiques et Minières (BRGM), (5) Aggl'O, Direction du Cycle de l'Eau et des Réseaux d'Energie, 1, rue Jacques Dufrasnes, 45 380 La Chapelle Saint Mesmin, France.

Current debates on the status of the Anthropocene convey geologists and palaeoenvironmentalists toward new spatial and temporal targets. One of the most emblematic socio-ecosystem of the Anthropocene is urban areas in which the dynamics of materials are mainly controlled by human activities. This brings unprecedented elemental, molecular and isotopic concentrations and distributions that lead Norra (2009) to propose a new geological sphere: the Astysphere. Here we propose that sediments accumulated in sewer networks can provide original, integrated, and multi-thematic archives for the recent history of cities by considering urban systems as any catchment where materials are produced, transported and sedimented.

The study site is a decantation tank that collects stormwater and wastewater from the north of Orléans city, upstream wastewater plants in Orléans. Sediments accumulated since 1942 over 17 m depth and were never cleaned out until 2015. Two sedimentary cores of 70 (A) and 250 cm long (B) were collected before clean out and then a third of 150 cm (C) after.

Sediments are organized into layers constituted by sands and gravels alternating with silts and organic layers. Sharp contacts between those layers indicate evenemential sedimentation, as expected in sewer networks. We formulate the hypothesis that organic/mineral alternations result from a seasonal dynamic.

^7Be presence in topmost sample from core A confirms it was deposited within the last 6 months. In core C, only the upper half core, mostly mineral, displays significant ^7Be levels whereas ^7Be is absent from the lower half, which is mostly organic. This would confirm that our hypothesis of a seasonal alternation, with organic facies deposited during spring- summer and mineral facies deposited during fall-winter. 30 ^{14}C dates measured on cores A and B by postbomb method are logically distributed with depth, the most ancient (beginning of the eighties) being recorder at 2.5m depth.

This study shows that sediments accumulated in a decantation tank constitute sedimentary archives comparable to more natural ones, thus allowing palaeoenvironmental reconstructions for the Anthropocene. We are currently examining the mineral and organic content of this archive to provide a detailed chronology of the history of man-made materials (drugs, plastics, pesticides...) in urban contexts.