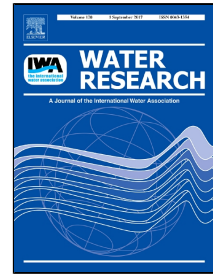


Accepted Manuscript

Detection and quantification of lateral, illicit connections and infiltration in sewers with Infra-Red camera: conclusions after a wide experimental plan

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PII: S0043-1354(17)30506-7
DOI: 10.1016/j.watres.2017.06.030
Reference: WR 12985
To appear in: *Water Research*
Received Date: 20 December 2016
Revised Date: 28 April 2017
Accepted Date: 11 June 2017

Please cite this article as: Mathieu Lepot, Konstantinos.F. Makris, François.H.L.R. Clemens, Detection and quantification of lateral, illicit connections and infiltration in sewers with Infra-Red camera: conclusions after a wide experimental plan, *Water Research* (2017), doi: 10.1016/j.watres.2017.06.030

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1 **Detection and quantification of lateral, illicit connections and**
2 **infiltration in sewers with Infra-Red camera: conclusions after a wide**
3 **experimental plan**

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11
12 **Abstract**

13 Separate sewer systems are sensitive to illegal or mis-connections. Several techniques
14 (including the Distributed Temperature Sensor) are now available to identify and locate
15 those connections. Based on thermal fingerprints, DTS allows the localization of each
16 lateral connection along a reach. The use of Infra-Red camera has been investigated
17 with 748 laboratory experiments (artificial connections along a flume). The tested
18 connections vary in diameters (from 75 to 200 mm), lengths of intrusion (from 0 to 200
19 m), shapes (circular or linear *i.e.* cracks), depths, discharge rates between the lateral
20 connection and the main flume, and temperatures. IR frame analysis (for detection) and
21 2D temperature mapping (at the free water surface, for quantification) demonstrate that:
22 *i)* the detection limit is very low (ratio between lateral and main discharges: 0.025) and
23 *ii)* the quantification of the lateral discharge is impossible. Application of an IR camera
24 seems to be a promising technique to detect lateral connections.

25

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