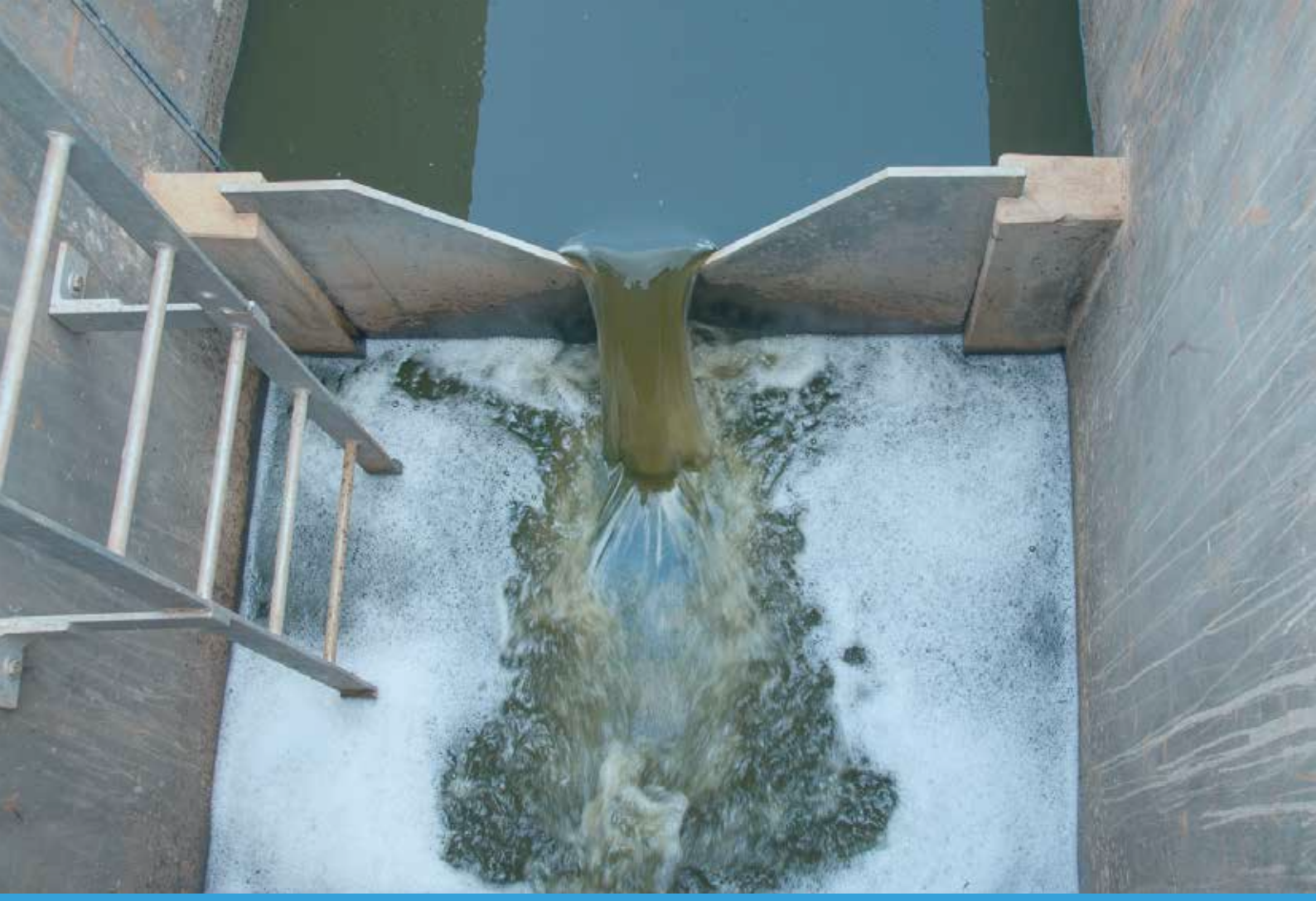

Results of faecal sludge analyses in Kampala, Uganda

Pictures, characteristics and qualitative observations for 76 samples

Schoebitz, L., Bischoff, F., Ddiba, D., Okello, F.,
Nakazibwe, R., Niwagaba, C.B., Lohri, C.R., Strande, L.

Sandec
Sanitation, Water and
Solid Waste for Development

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1. Introduction

As part of a collaborative research project conducted by Eawag/Sandec and Makerere University, 180 faecal sludge samples were collected and analyzed in Kampala, Uganda from November 2013 to April 2014. Presented in this report are quantitative and qualitative results, alongside pictures of 76 samples taken in the laboratory and from the onsite location where samples were collected. This information is expected to be helpful to further understand the characteristics and variability of different sources of faecal sludge, and also to develop qualitative knowledge regarding the visual appearance of faecal sludge with different characteristics. Some of this data has been used in the preparation of a journal article (Schoebitz et al. submitted). We are also sharing it here, because to our knowledge it is the first time that such extensive knowledge of faecal sludge characteristics has been made openly available in one document. By the end of the sampling campaign, the research assistant who processed all of these samples was able to reliably predict the range of COD in the sample based on a qualitative visual analysis of foam, color and viscosity (but on odor). We are hoping that some of this laboratory experience can be transferred by sharing these results. Potentially this could lead to inexpensive field methods for estimated characterization of faecal sludge in the field or at treatment plant inlets in low-income countries. Viscosity and odor can be qualitative predictors of COD and total solids with long-term experience, and to a certain extent color.

For samples where COD results were available, the results are presented by the following ranges of COD concentration: <5000 mg/L COD; 5,001–10,000; 10,001–20,000; 20,001–30,000; 30,001–40,000; 40,001–50,000; >50,001. In addition, presented in the last section are samples where COD values were not measured to due a lack of laboratory supplies. It is felt that they also include useful information as all other parameters are reported.

For each of the samples, a research assistant followed a collection and transport truck to the customer location and observed the emptying operation. The questionnaire information presented on page 4 was used to collect data on sludge origin from the crew operating the truck and from the customer receiving emptying services. The truck was then followed back to Bugolobi Treatment Plant where samples were collected from the truck during discharge. Samples were collected in a ratio of 1:2:1 during the initial discharge, middle discharge, and final discharge. An example of the sampling and questionnaire procedure is presented in photo 1. They were then placed in a cooler on ice for transport to the laboratory and stored at 4°C until the following day for analyses. Qualitative assessments of foam, smell, viscosity and color were made based on observation from a ranking of 1 (weak) to 3 (strong).

All methods for quantitative analyses of chemical and physical characteristics are available on the Sandec website: www.sandec.ch/fsm_tools. For a more detailed analysis of the reported samples, please refer to: Schoebitz, L., Bischoff, F., Ddiba, D., Okello, F., Niwagaba, C.B., Lohri, C.R., Strande, L. *Working Towards Reliable Methods for Estimating Faecal Sludge Quantities and Characteristics on a City-Wide Scale*. In preparation.

Photo 1. Collecting questionnaire information from customer of emptying service

Photo 2. Samples being collected during discharge at Bugolobi Treatment Plant.

Analyzed parameters

Chemical Parameters

pH	
COD	(chemical oxygen demand)
CODsol	(chemical oxygen demand of soluble compounds)
TN	(total nitrogen)
NH_3-N	(ammonia nitrogen)
NO_3-N	(nitrate nitrogen)
TP	(total phosphorus)
PO_4-P	(phosphate phosphorus)

Physical parameters

TSS	(total suspended solids)
VSS	(volatile suspended solids)
TS	(total solids)
VS	(volatile solids)

Qualitative parameters

Foam
Smell
Viscosity
Color

Questionnaire information

Questions to driver

- What is the volume of your truck?
- Who does the truck belong to?
- Is your truck completely full (following the emptying event)?
- Was the customers onsite faecal sludge containment fully emptied?
- Did you add any water to the onsite faecal sludge containment?
- What is the source/origin of sludge (i.e. household, multiple household, institution/industry, hotel/restaurant, school, public toilet, other)
- Was the faecal sludge containment a lined pit latrine, or Septic Tank?

Questions to customers

- If a household, number of inhabitants?
- Types of wastewater entering system (i.e. toilet, bathing/washing, kitchen, other)?
- Does solid waste enter the faecal sludge containment, yes or no? If yes, what types (e.g. hygenic products, food waste, other)?
- Age of faecal sludge containment (i.e. <5 years, 5-10 years, 10-20 years, exact age if known)?
- Do you have a water connection?
- Volume of containment?
- Have you ever had the faecal sludge containment emptied? If yes, when?
- Do you add bio-additives? If yes, how often?
- Is the faecal sludge containment watertight?
- If Septic Tank, how many chambers?

2. Tables

2.1 Chemical Oxygen Demand (COD): 5,000 mg/L

Sample 1

Laboratory sample

Chemical parameters (mg/L)

pH	7.0
COD	742
CODsol	267
TN	113
NH_4-N	84
NO_3-N	0.6
TP	14
PO_4-P	13

Physical parameters (mg/L)

TSS	393
VSS	395
TS	833
VS	826

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	1

System information

Containment system	Septic Tank
Percentage emptied	50 %
Containment volume	20 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	15
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	4 months ago

Sample 2

Laboratory sample

Chemical parameters (mg/L)

pH	7.0
COD	1,047
CODsol	186
TN	126
NH_4-N	73
NO_3-N	0.6
TP	16
PO_4-P	14

Physical parameters (mg/L)

TSS	965
VSS	541
TS	1,359
VS	885

Qualitative parameters
(1: weak – 3: strong)

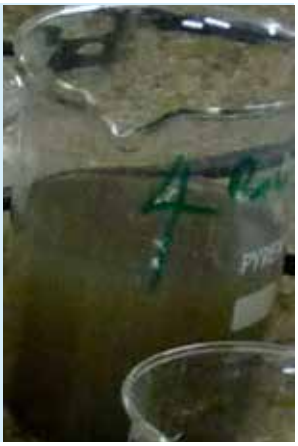
Foam	1
Smell	1
Viscosity	2
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	33 %
Containment volume	20 m³
Truck full	Yes
Origin	Institutional/Commercial/ Industrial
Number of system users	70
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	No
Last desludging	Monthly

Sample 3

Laboratory sample



Chemical parameters (mg/L)

pH	7.5
COD	1,388
CODsol	187
TN	87
NH_4-N	50
NO_3-N	0.5
TP	29
PO_4-P	19

Physical parameters (mg/L)

TSS	668
VSS	465
TS	1,244
VS	833

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	1

System information

Containment system	Septic Tank
Percentage emptied	5 %
Containment volume	120 m³
Truck full	Yes
Origin	Multiple Household
Number of system users	35
Source of inputs	Toilet, Bathing, Washing, Kitchen
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	Nov 12

Sample 4

Laboratory sample

Chemical parameters (mg/L)

pH	7.6
COD	1,999
CODsol	321
TN	131
NH_4-N	87
NO_3-N	1
TP	23
PO_4-P	11

Physical parameters (mg/L)

TSS	1,450
VSS	739
TS	2,073
VS	1,051

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	1

System information

Containment system	Septic Tank
Percentage emptied	57 %
Containment volume	7 m^3
Truck full	Yes
Origin	Household
Number of system users	8
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	No
Last desludging	No

Sample 5

Laboratory sample

Chemical parameters (mg/L)

pH	7.6
COD	2,060
CODsol	159
TN	566
NH_4-N	97
NO_3-N	0.7
TP	67
PO_4-P	25

Physical parameters (mg/L)

TSS	2,494
VSS	1,367
TS	2,262
VS	1,052

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	1

System information

Containment system	Septic Tank
Percentage emptied	44 %
Containment volume	9 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	5
Source of inputs	Toilet, Bathing, Washing, Kitchen
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	1 year ago

Sample 6

Laboratory sample

Chemical parameters (mg/L)

pH	7.2
COD	2,192
CODsol	174
TN	148
NH_4-N	74
NO_3-N	0.6
TP	16
PO_4-P	11

Physical parameters (mg/L)

TSS	1,274
VSS	963
TS	1,762
VS	1,381

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	2
Viscosity	1
Colour	1

System information

Containment system	Septic Tank
Percentage emptied	100 %
Containment volume	2 m^3
Truck full	Yes
Origin	Household
Number of system users	14
Source of inputs	Toilet, Bathing, Washing, Kitchen
Water Connection	Yes
Solid Waste	Hygienic Products, Food waste, Clothes, Plastic etc.
Last desludging	No

Sample 7

Laboratory sample

Chemical parameters (mg/L)

pH	7.9
COD	2,433
CODsol	1,580
TN	627
NH_4-N	—
NO_3-N	6.4
TP	74
PO_4-P	67

Physical parameters (mg/L)

TSS	—
VSS	—
TS	3,023
VS	1,563

Qualitative parameters
(1: weak – 3: strong)

Foam	—
Smell	—
Viscosity	—
Colour	—

System information

Containment system	Septic Tank
Percentage emptied	21 %
Containment volume	24 m^3
Truck full	Yes
Origin	Institutional/Commercia/ Industrial
Number of system users	—
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	Twice per week

Sample 8

Laboratory sample

Chemical parameters (mg/L)

pH	7.2
COD	2,695
CODsol	57
TN	190
NH_4-N	90
NO_3-N	0.6
TP	32
PO_4-P	20

Physical parameters (mg/L)

TSS	2,156
VSS	1,476
TS	1,916
VS	1,117

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	25 %
Containment volume	40 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	45
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	5 months ago

Sample 9

Laboratory sample

Chemical parameters (mg/L)

pH	7.8
COD	2,906
CODsol	702
TN	429
NH_4-N	326
NO_3-N	2.8
TP	97
PO_4-P	70

Physical parameters (mg/L)

TSS	2,139
VSS	1,281
TS	—
VS	—

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	1

System information

Containment system	Septic Tank
Percentage emptied	50 %
Containment volume	8 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	14
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	First time

Sample 10

Laboratory sample

Chemical parameters (mg/L)

pH	8.0
COD	3,694
CODsol	1,660
TN	1,293
NH_4-N	1,010
NO_3-N	6.0
TP	105
PO_4-P	54

Physical parameters (mg/L)

TSS	2,067
VSS	1,364
TS	5,789
VS	2,649

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	2
Viscosity	1
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	31 %
Containment volume	12 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	35
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products, Food Waste
Last desludging	2 months ago

Sample 11

Laboratory sample

Chemical parameters (mg/L)

pH	8.3
COD	3,933
CODsol	2,137
TN	—
NH_4-N	—
NO_3-N	16.9
TP	170
PO_4-P	155

Physical parameters (mg/L)

TSS	—
VSS	—
TS	11,496
VS	2,637

Qualitative parameters
(1: weak – 3: strong)

Foam	—
Smell	—
Viscosity	—
Colour	—

System information

Containment system	Latrine Pit
Percentage emptied	—
Containment volume	—
Truck full	No
Origin	School
Number of system users	40
Source of inputs	Toilet
Water Connection	No
Solid Waste	Domestic waste
Last desludging	May 2013

Sample 12

Laboratory sample

Chemical parameters (mg/L)

pH	8.2
COD	4,602
CODsol	2,415
TN	1,713
NH_4-N	978
NO_3-N	6.8
TP	178
PO_4-P	69

Physical parameters (mg/L)

TSS	3,131
VSS	1,776
TS	—
VS	—

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	30 %
Containment volume	6 m³
Truck full	Yes
Origin	Multiple Household
Number of system users	12
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	First time

Sample 13

Laboratory sample

Chemical parameters (mg/L)

pH	7.8
COD	4,655
CODsol	1,023
TN	738
NH_4-N	471
NO_3-N	2.8
TP	101
PO_4-P	80

Physical parameters (mg/L)

TSS	3,350
VSS	2,754
TS	—
VS	—

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	23 %
Containment volume	20 m³
Truck full	Yes
Origin	Public Toilet
Number of system users	1000
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	No
Last desludging	Daily

2. Tables

2.2 Chemical Oxygen Demand (COD): 5,000–10,000 mg/L

Sample 14

Laboratory sample

Chemical parameters (mg/L)

pH	7.5
COD	6,740
CODsol	1,489
TN	495
NH_4-N	224
NO_3-N	2
TP	65
PO_4-P	140

Physical parameters (mg/L)

TSS	4,692
VSS	3,392
TS	0
VS	0

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	3

System information

Containment system	Latrine Pit
Percentage emptied	100 %
Containment volume	10 m^3
Truck full	Yes
Origin	Restaurant/Hotel
Number of system users	250
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	No
Last desludging	1.5 months ago

Sample 15

Laboratory sample

Chemical parameters (mg/L)

pH	8.51
COD	6,770
CODsol	3,324
TN	2,410
NH_4-N	1,865
NO_3-N	13.4
TP	202
PO_4-P	78

Physical parameters (mg/L)

TSS	6,513
VSS	3,464
TS	—
VS	—

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	1
Viscosity	1
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	46 %
Containment volume	8 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	25
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	No

Sample 16

Laboratory sample

Chemical parameters (mg/L)

pH	6.9
COD	6,903
CODsol	568
TN	257
NH_4-N	82
NO_3-N	0.9
TP	39
PO_4-P	18

Physical parameters (mg/L)

TSS	4,508
VSS	3,123
TS	4,518
VS	2,883

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	1

System information

Containment system	Septic Tank
Percentage emptied	50 %
Containment volume	20 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	30
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	1 month ago

Sample 17

Laboratory sample

Chemical parameters (mg/L)

pH	7.1
COD	8,829
CODsol	416
TN	426
NH_4-N	151
NO_3-N	1.2
TP	59
PO_4-P	22

Physical parameters (mg/L)

TSS	5,785
VSS	4,181
TS	5,732
VS	4,090

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	2
Viscosity	2
Colour	3

System information

Containment system	Septic Tank
Percentage emptied	100 %
Containment volume	10 m^3
Truck full	Yes
Origin	Institutional/Commercia/ Industrial
Number of system users	170
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	9 months ago

Sample 18

Laboratory sample

Chemical parameters (mg/L)

pH	7.2
COD	9,068
CODsol	589
TN	440
NH_4-N	266
NO_3-N	2.9
TP	60
PO_4-P	18

Physical parameters (mg/L)

TSS	6,423
VSS	4,722
TS	6,796
VS	5,052

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	100 %
Containment volume	7 m^3
Truck full	Yes
Origin	Institutional/Commercial/ Industrial
Number of system users	30
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	No
Last desludging	2 months ago

Sample 19

Laboratory sample

Chemical parameters (mg/L)

pH	8.3
COD	9,648
CODsol	—
TN	1,968
NH_4-N	1,613
NO_3-N	9.5
TP	132
PO_4-P	69

Physical parameters (mg/L)

TSS	5,823
VSS	3,317
TS	9,831
VS	4,304

Qualitative parameters

(1: weak – 3: strong)

Foam	1
Smell	2
Viscosity	1
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	50 %
Containment volume	8 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	18
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	8 months ago

2.3 Chemical Oxygen Demand (COD): 10,000–20,000 mg/L

Sample 20

Laboratory sample

Chemical parameters (mg/L)

pH	8.2
COD	10,754
CODsol	4,054
TN	2,610
NH_4-N	1,518
NO_3-N	9.4
TP	212
PO_4-P	55

Physical parameters (mg/L)

TSS	9,175
VSS	6,199
TS	15,030
VS	8,473

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	2
Viscosity	1
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	40 %
Containment volume	5 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	25
Source of inputs	Toilet, Bathing, Washing, Kitchen
Water Connection	No
Solid Waste	Hygienic Products, Food waste
Last desludging	3 months ago

Sample 21

Laboratory sample

Chemical parameters (mg/L)

pH	8.0
COD	10,952
CODsol	1,907
TN	1,367
NH_4-N	688
NO_3-N	7.2
TP	168
PO_4-P	32

Physical parameters (mg/L)

TSS	9,440
VSS	6,143
TS	11,059
VS	6,032

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	1

System information

Containment system	Latrine Pit
Percentage emptied	50 %
Containment volume	20 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	50
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	4 months ago

Sample 22

Laboratory sample

Chemical parameters (mg/L)

pH	7.8
COD	11,322
CODsol	
TN	1,303
NH_4-N	486
NO_3-N	4.7
TP	283
PO_4-P	24

Physical parameters (mg/L)

TSS	14,466
VSS	8,302
TS	16,175
VS	8,852

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	2
Viscosity	1
Colour	3

System information

Containment system	Latrine Pit
Percentage emptied	100 %
Containment volume	2 m^3
Truck full	No
Origin	Multiple Household
Number of system users	100
Source of inputs	Toilet
Water Connection	No
Solid Waste	No
Last desludging	2.5 months ago

Sample 23

Laboratory sample

Chemical parameters (mg/L)

pH	8.0
COD	11,948
CODsol	1,970
TN	512
NH_4-N	261
NO_3-N	4.0
TP	122
PO_4-P	48

Physical parameters (mg/L)

TSS	6,263
VSS	4,193
TS	7,843
VS	4,719

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	1

System information

Containment system	Septic Tank
Percentage emptied	100 %
Containment volume	5 m^3
Truck full	No
Origin	Household
Number of system users	10
Source of inputs	Toilet, Bathing, Washing, Kitchen
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	10 years

Sample 24

Laboratory sample

Chemical parameters (mg/L)

pH	8.4
COD	12,663
CODsol	3,674
TN	1,350
NH_4-N	1,110
NO_3-N	20.4
TP	355
PO_4-P	159

Physical parameters (mg/L)

TSS	8,625
VSS	4,945
TS	20,675
VS	6,435

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	2
Viscosity	2
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	57 %
Containment volume	7 m^3
Truck full	Yes
Origin	Household
Number of system users	5
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	1.5 years ago

Sample 25

Laboratory sample

Chemical parameters (mg/L)

pH	7.9
COD	12,877
CODsol	2,428
TN	990
NH_4-N	661
NO_3-N	6.2
TP	194
PO_4-P	37

Physical parameters (mg/L)

TSS	8,564
VSS	5,782
TS	10,074
VS	6,179

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	2
Viscosity	2
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	—
Containment volume	—
Truck full	Yes
Origin	Multiple Household
Number of system users	31
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	3 months ago

Sample 26

Laboratory sample

Chemical parameters (mg/L)

pH	8.3
COD	13,393
CODsol	3,607
TN	3,060
NH_4-N	1,731
NO_3-N	10.9
TP	210
PO_4-P	61

Physical parameters (mg/L)

TSS	11,237
VSS	5,738
TS	14,977
VS	7,087

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	2
Viscosity	2
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	50 %
Containment volume	8 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	10
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	No

Sample 27

Laboratory sample

Chemical parameters (mg/L)

pH	8.4
COD	14,033
CODsol	5,220
TN	444
NH_4-N	1,330
NO_3-N	17.1
TP	250
PO_4-P	74

Physical parameters (mg/L)

TSS	9,678
VSS	6,324
TS	17,577
VS	7,902

Qualitative parameters
(1: weak – 3: strong)

Foam	3
Smell	3
Viscosity	2
Colour	3

System information

Containment system	Latrine Pit
Percentage emptied	50 %
Containment volume	8 m³
Truck full	Yes
Origin	Multiple Household
Number of system users	14
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	No

Sample 28

Laboratory sample

Chemical parameters (mg/L)

pH	8.4
COD	16,747
CODsol	5,525
TN	3,910
NH_4-N	2,133
NO_3-N	16.8
TP	390
PO_4-P	112

Physical parameters (mg/L)

TSS	15,547
VSS	8,442
TS	20,548
VS	9,927

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	2
Viscosity	2
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	33 %
Containment volume	12 m³
Truck full	Yes
Origin	Multiple Household
Number of system users	45
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	1 year ago

Sample 29

Laboratory sample

Chemical parameters (mg/L)

pH	8.9
COD	18,313
CODsol	3,314
TN	2,543
NH_4-N	1,260
NO_3-N	7
TP	231
PO_4-P	141

Physical parameters (mg/L)

TSS	10,362
VSS	7,876
TS	11,436
VS	6,952

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	1
Viscosity	2
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	10 %
Containment volume	50 m^3
Truck full	Yes
Origin	School
Number of system users	—
Source of inputs	Toilet, Bathing, Washing, Kitchen
Water Connection	Yes
Solid Waste	Hygienic Products, Food waste, Clothes, Plastic etc
Last desludging	Monthly

Sample 30

Laboratory sample

Chemical parameters (mg/L)

pH	8.7
COD	18,468
CODsol	3,668
TN	6,347
NH_4-N	1,924
NO_3-N	13.1
TP	258
PO_4-P	82

Physical parameters (mg/L)

TSS	7,514
VSS	4,172
TS	12,288
VS	6,376

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	1
Viscosity	1
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	100 %
Containment volume	5 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	45
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	3 months ago

Sample 31

Laboratory sample

Chemical parameters (mg/L)

pH	7.63
COD	18,655
CODsol	5,496
TN	895
NH_4-N	270
NO_3-N	2.9
TP	124
PO_4-P	32

Physical parameters (mg/L)

TSS	5,997
VSS	4,483
TS	0
VS	0

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	1
Viscosity	1
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	100 %
Containment volume	6 m^3
Truck full	No
Origin	Household
Number of system users	10
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	No
Last desludging	No

2. Tables

2.4 Chemical Oxygen Demand (COD): 20,000–30,000 mg/L

Sample 32

Laboratory sample

Chemical parameters (mg/L)

pH	8.08
COD	20,918
CODsol	1,458
TN	1,322
NH_4-N	682
NO_3-N	6.1
TP	338
PO_4-P	51

Physical parameters (mg/L)

TSS	13,270
VSS	10,372
TS	0
VS	0

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	1
Viscosity	2
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	20 %
Containment volume	23 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	60
Source of inputs	Toilet, Bathing, Washing
Water Connection	No
Solid Waste	No
Last desludging	7 months ago

Sample 33

Laboratory sample

Chemical parameters (mg/L)

pH	7.1
COD	22,007
CODsol	1,410
TN	704
NH_4-N	106
NO_3-N	2.4
TP	140
PO_4-P	10

Physical parameters (mg/L)

TSS	29,643
VSS	12,504
TS	24,154
VS	10,646

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	2
Colour	1

System information

Containment system	Septic Tank
Percentage emptied	50 %
Containment volume	20 m^3
Truck full	Yes
Origin	Restaurant/Hotel
Number of system users	30
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	2 years ago

Sample 34

Laboratory sample

Chemical parameters (mg/L)

pH	8.2
COD	22,563
CODsol	5,445
TN	3,970
NH_4-N	2,407
NO_3-N	19.6
TP	484
PO_4-P	174

Physical parameters (mg/L)

TSS	28,361
VSS	17,008
TS	24,732
VS	14,289

Qualitative parameters
(1: weak – 3: strong)

Foam	3
Smell	2
Viscosity	2
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	100 %
Containment volume	4 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	15
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	8 months ago

Sample 35

Laboratory sample

Chemical parameters (mg/L)

pH	8.4
COD	22,660
CODsol	—
TN	4,205
NH_4-N	2,888
NO_3-N	16.9
TP	777
PO_4-P	236

Physical parameters (mg/L)

TSS	23,419
VSS	14,788
TS	23,858
VS	13,371

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	2
Viscosity	2
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	100 %
Containment volume	8 m³
Truck full	No
Origin	Institutional/Commercial/ Industrial
Number of system users	80
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	5 months ago

Sample 36

Laboratory sample

Chemical parameters (mg/L)

pH	8.53
COD	23,922
CODsol	3,976
TN	3,850
NH_4-N	2,120
NO_3-N	14.3
TP	301
PO_4-P	100

Physical parameters (mg/L)

TSS	20,298
VSS	12,817
TS	0
VS	0

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	2
Viscosity	2
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	93 %
Containment volume	4 m³
Truck full	Yes
Origin	Multiple Household
Number of system users	27
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	1 year 4 months ago

Sample 37

Laboratory sample

Chemical parameters (mg/L)

pH	7.29
COD	25,852
CODsol	522
TN	1,273
NH_4-N	182
NO_3-N	2.5
TP	108
PO_4-P	20

Physical parameters (mg/L)

TSS	19,508
VSS	4,750
TS	0
VS	0

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	2
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	13 %
Containment volume	80 m^3
Truck full	Yes
Origin	School
Number of system users	450
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	No
Last desludging	2 weeks ago

Sample 38

Laboratory sample

Chemical parameters (mg/L)

pH	8.4
COD	26,453
CODsol	5,227
TN	2,370
NH_4-N	2,160
NO_3-N	25.7
TP	768
PO_4-P	124

Physical parameters (mg/L)

TSS	22,775
VSS	13,964
TS	30,449
VS	19,058

Qualitative parameters
(1: weak – 3: strong)

Foam	3
Smell	2
Viscosity	3
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	54 %
Containment volume	12 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	20
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products, Food waste
Last desludging	10 months ago

Sample 39

Laboratory sample

Chemical parameters (mg/L)

pH	8.1
COD	26,992
CODsol	4,270
TN	1,817
NH_4-N	897
NO_3-N	6.8
TP	234
PO_4-P	44

Physical parameters (mg/L)

TSS	19,529
VSS	12,483
TS	22,959
VS	13,417

Qualitative parameters
(1: weak – 3: strong)

Foam	3
Smell	1
Viscosity	1
Colour	3

System information

Containment system	Septic Tank
Percentage emptied	50 %
Containment volume	6 m^3
Truck full	Yes
Origin	Household
Number of system users	5
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	5 years ago

Sample 40

Laboratory sample

Chemical parameters (mg/L)

pH	7.8
COD	27,533
CODsol	1,946
TN	1,799
NH_4-N	685
NO_3-N	7.1
TP	430
PO_4-P	113

Physical parameters (mg/L)

TSS	21,713
VSS	14,814
TS	23,006
VS	16,827

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	1
Viscosity	2
Colour	3

System information

Containment system	Latrine Pit
Percentage emptied	65 %
Containment volume	10 m^3
Truck full	Yes
Origin	Household
Number of system users	7
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	1.5 years ago

Sample 41

Laboratory sample

Chemical parameters (mg/L)

pH	8.5
COD	28,020
CODsol	6,227
TN	3,620
NH_4-N	1,579
NO_3-N	21
TP	681
PO_4-P	125

Physical parameters (mg/L)

TSS	23,858
VSS	14,473
TS	25,728
VS	15,655

Qualitative parameters

(1: weak – 3: strong)

Foam	3
Smell	1
Viscosity	2
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	100 %
Containment volume	3 m^3
Truck full	No
Origin	Household
Number of system users	10
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	1 year ago

2.5 Chemical Oxygen Demand (COD): 30,000–40,000 mg/L

Sample 42

Laboratory sample

Chemical parameters (mg/L)

pH	8.4
COD	35,197
CODsol	5,041
TN	4,880
NH_4-N	1,345
NO_3-N	18.7
TP	1,070
PO_4-P	71

Physical parameters (mg/L)

TSS	27,150
VSS	11,940
TS	28,159
VS	16,716

Qualitative parameters
(1: weak – 3: strong)

Foam	3
Smell	2
Viscosity	2
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	25 %
Containment volume	12 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	30
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products, Food waste, Clothes, Plastic etc.
Last desludging	6 months ago

Sample 43

Laboratory sample

Chemical parameters (mg/L)

pH	8.2
COD	36,597
CODsol	5,534
TN	2,887
NH_4-N	1,297
NO_3-N	10.7
TP	582
PO_4-P	65

Physical parameters (mg/L)

TSS	35,949
VSS	22,811
TS	24,655
VS	15,845

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	2
Viscosity	2
Colour	1

System information

Containment system	Latrine Pit
Percentage emptied	100 %
Containment volume	2 m³
Truck full	No
Origin	Multiple Household
Number of system users	20
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	1.5 months ago

Sample 44

Laboratory sample

Chemical parameters (mg/L)

pH	8.3
COD	38,450
CODsol	4,360
TN	3,657
NH_4-N	704
NO_3-N	11
TP	940
PO_4-P	61

Physical parameters (mg/L)

TSS	29,192
VSS	20,132
TS	0
VS	0

Qualitative parameters
(1: weak – 3: strong)

Foam	3
Smell	3
Viscosity	3
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	57 %
Containment volume	7 m³
Truck full	Yes
Origin	Multiple Household
Number of system users	70
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	8 months ago

2.6 Chemical Oxygen Demand (COD): 40,000–50,000 mg/L

Sample 45

Laboratory sample

Chemical parameters (mg/L)

pH	7.8
COD	41,300
CODsol	3,720
TN	2,460
NH_4-N	783
NO_3-N	41.5
TP	394
PO_4-P	66

Physical parameters (mg/L)

TSS	29,761
VSS	22,004
TS	32,427
VS	25,246

Qualitative parameters
(1: weak – 3: strong)

Foam	3
Smell	2
Viscosity	3
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	65 %
Containment volume	10 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	20
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	No

Sample 46

Laboratory sample

Chemical parameters (mg/L)

pH	8.3
COD	43,020
CODsol	9,672
TN	2,860
NH_4-N	1,397
NO_3-N	25.1
TP	662
PO_4-P	75

Physical parameters (mg/L)

TSS	25,867
VSS	20,446
TS	31,771
VS	22,507

Qualitative parameters
(1: weak – 3: strong)

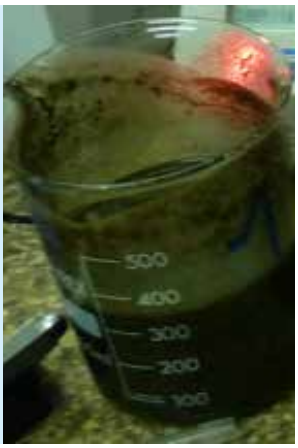
Foam	3
Smell	3
Viscosity	3
Colour	3

System information

Containment system	Latrine Pit
Percentage emptied	100 %
Containment volume	5 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	30
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	4 months ago

Sample 47

Laboratory sample



Chemical parameters (mg/L)

pH	7.7
COD	43,322
CODsol	2,158
TN	2,807
NH_4-N	764
NO_3-N	9
TP	474
PO_4-P	92

Physical parameters (mg/L)

TSS	37,064
VSS	27,326
TS	38,088
VS	27,826

Qualitative parameters
(1: weak – 3: strong)

Foam	3
Smell	2
Viscosity	3
Colour	3

System information

Containment system	Septic Tank
Percentage emptied	32 %
Containment volume	13 m^3
Truck full	Yes
Origin	Institutional/Commercial/ Industrial
Number of system users	75
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	1 year ago

2.7 Chemical Oxygen Demand (COD): >50,000 mg/L

Sample 48

Laboratory sample

Chemical parameters (mg/L)

pH	7.5
COD	52,013
CODsol	6,093
TN	1,767
NH_4-N	1,190
NO_3-N	11.9
TP	238
PO_4-P	83

Physical parameters (mg/L)

TSS	24,034
VSS	16,501
TS	43,566
VS	31,556

Qualitative parameters
(1: weak – 3: strong)

Foam	3
Smell	1
Viscosity	3
Colour	1

System information

Containment system	Septic Tank
Percentage emptied	—
Containment volume	—
Truck full	Yes
Origin	Multiple Household
Number of system users	9
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	3 years ago

Sample 49

Laboratory sample

Chemical parameters (mg/L)

pH	8.4
COD	52,167
CODsol	8,327
TN	3,420
NH_4-N	1,257
NO_3-N	21.1
TP	663
PO_4-P	153

Physical parameters (mg/L)

TSS	45,469
VSS	30,487
TS	47,509
VS	32,194

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	2
Viscosity	2
Colour	3

System information

Containment system	Latrine Pit
Percentage emptied	100 %
Containment volume	2 m^3
Truck full	No
Origin	Multiple Household
Number of system users	18
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	No

Sample 50

Laboratory sample

Chemical parameters (mg/L)

pH	8.3
COD	63,050
CODsol	6,084
TN	3,410
NH_4-N	1,154
NO_3-N	23.5
TP	2,040
PO_4-P	170

Physical parameters (mg/L)

TSS	62,041
VSS	36,279
TS	70,092
VS	42,567

Qualitative parameters
(1: weak – 3: strong)

Foam	3
Smell	1
Viscosity	3
Colour	1

System information

Containment system	Latrine Pit
Percentage emptied	100 %
Containment volume	3 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	5
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	5 years ago

Sample 51

Laboratory sample

Chemical parameters (mg/L)

pH	7.2
COD	66,690
CODsol	4,794
TN	1,913
NH_4-N	243
NO_3-N	9.2
TP	262
PO_4-P	21

Physical parameters (mg/L)

TSS	64,633
VSS	44,994
TS	66,078
VS	37,231

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	1
Viscosity	3
Colour	3

System information

Containment system	Septic Tank
Percentage emptied	17 %
Containment volume	60 m^3
Truck full	Yes
Origin	Institutional/Commercial/ Industrial
Number of system users	7000
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	No
Last desludging	3 years ago

Sample 52

Laboratory sample

Chemical parameters (mg/L)

pH	5.7
COD	67,617
CODsol	11,207
TN	983
NH_4-N	330
NO_3-N	270.4
TP	106
PO_4-P	39

Physical parameters (mg/L)

TSS	60,021
VSS	46,812
TS	52,732
VS	44,044

Qualitative parameters
(1: weak – 3: strong)

Foam	3
Smell	2
Viscosity	3
Colour	3

System information

Containment system	Septic Tank
Percentage emptied	50 %
Containment volume	8 m^3
Truck full	Yes
Origin	Institutional/Commercial/ Industrial
Number of system users	—
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	3 weeks ago

Sample 53

Laboratory sample

Chemical parameters (mg/L)

pH	8.3
COD	71,283
CODsol	5,498
TN	5,507
NH_4-N	1,538
NO_3-N	26.7
TP	1,078
PO_4-P	272

Physical parameters (mg/L)

TSS	4,768
VSS	3,301
TS	69,617
VS	41,713

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	1
Viscosity	3
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	100 %
Containment volume	2 m³
Truck full	No
Origin	Household
Number of system users	7
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	8 months ago

Sample 54

Laboratory sample

Chemical parameters (mg/L)

pH	7.1
COD	91,850
CODsol	8,358
TN	2,633
NH_4-N	331
NO_3-N	491.7
TP	—
PO_4-P	274

Physical parameters (mg/L)

TSS	0
VSS	0
TS	121,601
VS	54,919

Qualitative parameters
(1: weak – 3: strong)

Foam	—
Smell	—
Viscosity	—
Colour	—

System information

Containment system	Septic Tank
Percentage emptied	100 %
Containment volume	3 m³
Truck full	Yes
Origin	Household
Number of system users	2
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	No
Last desludging	Last 2006

Sample 55

Laboratory sample

Chemical parameters (mg/L)

pH	8.51
COD	95,947
CODsol	1,408
TN	2,235
NH_4-N	111
NO_3-N	4.2
TP	1,730
PO_4-P	23

Physical parameters (mg/L)

TSS	12,635
VSS	9,585
TS	0
VS	0

Qualitative parameters
(1: weak – 3: strong)

Foam	3
Smell	1
Viscosity	3
Colour	3

System information

Containment system	Latrine Pit
Percentage emptied	100 %
Containment volume	1 m^3
Truck full	No
Origin	Multiple Household
Number of system users	12
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	1.5 years ago

Sample 56

Laboratory sample

Chemical parameters (mg/L)

pH	8.3
COD	100,017
CODsol	6,505
TN	5,000
NH_4-N	1,310
NO_3-N	20.7
TP	825
PO_4-P	75

Physical parameters (mg/L)

TSS	59,289
VSS	41,900
TS	60,561
VS	41,064

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	2
Viscosity	2
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	67 %
Containment volume	9 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	20
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products, Food waste
Last desludging	10 months ago

2. Tables

2.8 Chemical Oxygen Demand (COD): No information

Sample 57

Laboratory sample

Chemical parameters (mg/L)

pH	7.7
COD	—
CODsol	—
TN	553
NH_4-N	420
NO_3-N	1.8
TP	75
PO_4-P	53

Physical parameters (mg/L)

TSS	2,163
VSS	1,481
TS	3,058
VS	1,675

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	49 %
Containment volume	21 m^3
Truck full	Yes
Origin	School
Number of system users	500
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	No
Last desludging	3 months ago

Sample 58

Laboratory sample

Chemical parameters (mg/L)

pH	7.7
COD	—
CODsol	—
TN	553
NH_4-N	420
NO_3-N	1.8
TP	75
PO_4-P	53

Physical parameters (mg/L)

TSS	2,163
VSS	1,481
TS	3,058
VS	1,675

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	1
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	49 %
Containment volume	21 m^3
Truck full	Yes
Origin	School
Number of system users	500
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	No
Last desludging	3 months ago

Sample 59

Laboratory sample

Chemical parameters (mg/L)

pH	8.2
COD	—
CODsol	—
TN	4,753
NH_4-N	1,771
NO_3-N	53.7
TP	2,040
PO_4-P	367

Physical parameters (mg/L)

TSS	120,863
VSS	63,997
TS	122,581
VS	60,631

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	2
Viscosity	3
Colour	3

System information

Containment system	Latrine Pit
Percentage emptied	83 %
Containment volume	4 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	10
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products, Food waste
Last desludging	First time

Sample 60

Laboratory sample

Chemical parameters (mg/L)

pH	8.0
COD	—
CODsol	—
TN	835
NH_4-N	593
NO_3-N	6.5
TP	107
PO_4-P	49

Physical parameters (mg/L)

TSS	5,733
VSS	3,849
TS	7,156
VS	4,262

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	3
Viscosity	—
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	100 %
Containment volume	4 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	7
Source of inputs	Toilet, Bathing, Washing
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	2 years ago

Sample 61

Laboratory sample

Chemical parameters (mg/L)

pH	6.9
COD	—
CODsol	—
TN	51
NH_4-N	35
NO_3-N	0.4
TP	6
PO_4-P	4

Physical parameters (mg/L)

TSS	108
VSS	136
TS	493
VS	381

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	—
Colour	1

System information

Containment system	Septic Tank
Percentage emptied	33 %
Containment volume	30 m^3
Truck full	Yes
Origin	Institutional/Commercial/ Industrial
Number of system users	150
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	No
Last desludging	1 week ago

Sample 62

Laboratory sample

Chemical parameters (mg/L)

pH	8.4
COD	—
CODsol	—
TN	3,705
NH_4-N	2,607
NO_3-N	37.2
TP	655
PO_4-P	85

Physical parameters (mg/L)

TSS	35,692
VSS	23,481
TS	39,646
VS	25,104

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	3
Viscosity	—
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	—
Containment volume	—
Truck full	Yes
Origin	Multiple Household
Number of system users	10
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	1 year ago

Sample 63

Laboratory sample

Chemical parameters (mg/L)

pH	7.1
COD	—
CODsol	—
TN	593
NH_4-N	190
NO_3-N	1.8
TP	174
PO_4-P	22

Physical parameters (mg/L)

TSS	29,221
VSS	17,456
TS	31,571
VS	18,851

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	—
Colour	3

System information

Containment system	Septic Tank
Percentage emptied	100 %
Containment volume	5 m^3
Truck full	No
Origin	Household
Number of system users	15
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	5 years ago

Sample 64

Laboratory sample

Chemical parameters (mg/L)

pH	6.8
COD	—
CODsol	—
TN	384
NH_4-N	66
NO_3-N	1
TP	47
PO_4-P	17

Physical parameters (mg/L)

TSS	7,619
VSS	5,858
TS	8,635
VS	6,713

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	2
Viscosity	—
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	50 %
Containment volume	9 m^3
Truck full	Yes
Origin	Institutional/Commercial/ Industrial
Number of system users	35
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	No
Last desludging	5 months ago

Sample 65

Laboratory sample

Chemical parameters (mg/L)

pH	8.4
COD	—
CODsol	—
TN	3,493
NH_4-N	2,620
NO_3-N	15.9
TP	130
PO_4-P	119

Physical parameters (mg/L)

TSS	3,139
VSS	1,613
TS	11,110
VS	3,811

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	2
Viscosity	—
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	33 %
Containment volume	20 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	40
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products, Food waste
Last desludging	2 months ago

Sample 66

Laboratory sample

Chemical parameters (mg/L)

pH	7.2
COD	—
CODsol	—
TN	2,600
NH_4-N	575
NO_3-N	20.2
TP	357
PO_4-P	74

Physical parameters (mg/L)

TSS	50,217
VSS	35,535
TS	53,145
VS	43,394

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	2
Viscosity	—
Colour	3

System information

Containment system	Septic Tank
Percentage emptied	36 %
Containment volume	25 m^3
Truck full	Yes
Origin	Public Toilet
Number of system users	—
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	Hygienic Products, Food waste
Last desludging	every 2 weeks

Sample 67

Laboratory sample

Chemical parameters (mg/L)

pH	8.0
COD	—
CODsol	—
TN	3,693
NH_4-N	2,153
NO_3-N	9.8
TP	232
PO_4-P	133

Physical parameters (mg/L)

TSS	8,357
VSS	5,060
TS	18,172
VS	8,589

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	3
Viscosity	—
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	56 %
Containment volume	8 m^3
Truck full	Yes
Origin	School
Number of system users	600
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	No
Last desludging	1 month ago

Sample 68

Laboratory sample

Chemical parameters (mg/L)

pH	8.1
COD	—
CODsol	—
TN	1,940
NH_4-N	1,250
NO_3-N	8.1
TP	209
PO_4-P	71

Physical parameters (mg/L)

TSS	11,861
VSS	7,947
TS	13,995
VS	8,649

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	3
Viscosity	—
Colour	3

System information

Containment system	Septic Tank
Percentage emptied	15 %
Containment volume	30 m^3
Truck full	—
Origin	Public Toilet
Number of system users	500
Source of inputs	Toilet
Water Connection	No
Solid Waste	No
Last desludging	—

Sample 69

Laboratory sample

Chemical parameters (mg/L)

pH	8.0
COD	—
CODsol	—
TN	1,570
NH_4-N	897
NO_3-N	9.4
TP	263
PO_4-P	72

Physical parameters (mg/L)

TSS	10,101
VSS	7,209
TS	14,088
VS	8,951

Qualitative parameters
(1: weak – 3: strong)

Foam	2
Smell	1
Viscosity	—
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	100 %
Containment volume	5 m^3
Truck full	No
Origin	Multiple Household
Number of system users	25
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	2.5 months ago

Sample 70

Laboratory sample

Chemical parameters (mg/L)

pH	7.4
COD	—
CODsol	—
TN	2,103
NH_4-N	494
NO_3-N	5.5
TP	200
PO_4-P	58

Physical parameters (mg/L)

TSS	20,136
VSS	15,867
TS	23,515
VS	17,992

Qualitative parameters
(1: weak – 3: strong)

Foam	3
Smell	1
Viscosity	—
Colour	3

System information

Containment system	Septic Tank
Percentage emptied	30 %
Containment volume	15 m^3
Truck full	Yes
Origin	School
Number of system users	1000
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	1 month ago

Sample 71

Laboratory sample

Chemical parameters (mg/L)

pH	8.4
COD	—
CODsol	—
TN	2,000
NH_4-N	2,160
NO_3-N	18.7
TP	105
PO_4-P	186

Physical parameters (mg/L)

TSS	3,290
VSS	1,831
TS	7,919
VS	2,660

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	2
Viscosity	—
Colour	3

System information

Containment system	Latrine Pit
Percentage emptied	50 %
Containment volume	13 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	20
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	3 months ago

Sample 72

Laboratory sample

Chemical parameters (mg/L)

pH	8.3
COD	—
CODsol	—
TN	2,063
NH_4-N	1,695
NO_3-N	12.2
TP	96
PO_4-P	104

Physical parameters (mg/L)

TSS	2,341
VSS	1,400
TS	8,291
VS	2,699

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	—
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	65 %
Containment volume	10 m^3
Truck full	Yes
Origin	Institutional/Commercial/ Industrial
Number of system users	—
Source of inputs	Toilet, Bathing, Washing
Water Connection	No
Solid Waste	Hygienic Products, Food waste
Last desludging	10 months ago

Sample 73

Laboratory sample

Chemical parameters (mg/L)

pH	7
COD	—
CODsol	—
TN	3,360
NH_4-N	386
NO_3-N	5.8
TP	570
PO_4-P	60

Physical parameters (mg/L)

TSS	68,234
VSS	51,730
TS	60,793
VS	43,520

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	—
Colour	3

System information

Containment system	Latrine Pit
Percentage emptied	33 %
Containment volume	12 m^3
Truck full	Yes
Origin	School
Number of system users	280
Source of inputs	Toilet
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	1 year

Sample 74

Laboratory sample

Chemical parameters (mg/L)

pH	7.3
COD	—
CODsol	—
TN	517
NH_4-N	160
NO_3-N	2.8
TP	137
PO_4-P	42

Physical parameters (mg/L)

TSS	28,289
VSS	13,656
TS	21,122
VS	11,288

Qualitative parameters
(1: weak – 3: strong)

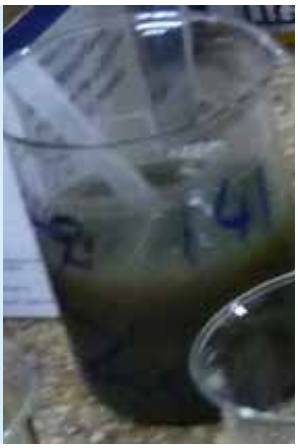
Foam	2
Smell	2
Viscosity	—
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	100 %
Containment volume	4 m^3
Truck full	Yes
Origin	Household
Number of system users	8
Source of inputs	Toilet, Bathing, Washing, Kitchen
Water Connection	Yes
Solid Waste	No
Last desludging	2 years ago

Sample 75

Laboratory sample



Chemical parameters (mg/L)

pH	7.4
COD	—
CODsol	—
TN	286
NH_4-N	—
NO_3-N	1.3
TP	33
PO_4-P	38

Physical parameters (mg/L)

TSS	9,823
VSS	7,446
TS	2,447
VS	1,690

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	—
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	100 %
Containment volume	5 m^3
Truck full	No
Origin	Institutional/Commercial/Industrial
Number of system users	40
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	No
Last desludging	2 weeks ago

Sample 76

Laboratory sample

Chemical parameters (mg/L)

pH	8
COD	—
CODsol	—
TN	1,673
NH_4-N	1,020
NO_3-N	5.7
TP	443
PO_4-P	60

Physical parameters (mg/L)

TSS	7,421
VSS	4,900
TS	10,225
VS	5,875

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	2
Viscosity	—
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	100 %
Containment volume	3 m³
Truck full	No
Origin	Household
Number of system users	6
Source of inputs	Toilet
Water Connection	Yes
Solid Waste	No
Last desludging	3 months ago

Sample 77

Laboratory sample

Chemical parameters (mg/L)

pH	7.3
COD	—
CODsol	—
TN	605
NH_4-N	346
NO_3-N	1.2
TP	102
PO_4-P	26

Physical parameters (mg/L)

TSS	1,550
VSS	1,267
TS	8,819
VS	6,452

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	2
Viscosity	—
Colour	3

System information

Containment system	Septic Tank
Percentage emptied	77 %
Containment volume	4 m³
Truck full	Yes
Origin	School
Number of system users	25
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	No
Last desludging	1 year

Sample 81

Laboratory sample

Chemical parameters (mg/L)

pH	7.9
COD	—
CODsol	—
TN	609
NH_4-N	445
NO_3-N	2.5
TP	72
PO_4-P	54

Physical parameters (mg/L)

TSS	1,602
VSS	1,164
TS	3,246
VS	1,687

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	2
Viscosity	—
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	100 %
Containment volume	4 m³
Truck full	Yes
Origin	Public Toilet
Number of system users	—
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	four times daily

Sample 82

Laboratory sample

Chemical parameters (mg/L)

pH	8.3
COD	—
CODsol	—
TN	754
NH_4-N	545
NO_3-N	2.7
TP	72
PO_4-P	33

Physical parameters (mg/L)

TSS	1,619
VSS	919
TS	3,433
VS	1,602

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	2
Viscosity	—
Colour	1

System information

Containment system	Septic Tank
Percentage emptied	100 %
Containment volume	5 m³
Truck full	Yes
Origin	Public Toilet
Number of system users	—
Source of inputs	Toilet, Bathing, Washing
Water Connection	Yes
Solid Waste	Hygienic Products
Last desludging	3–4 times daily

Sample 6

Laboratory sample

Chemical parameters (mg/L)

pH	8.0
COD	—
CODsol	—
TN	825
NH_4-N	797
NO_3-N	4.7
TP	76
PO_4-P	66

Physical parameters (mg/L)

TSS	1,270
VSS	570
TS	3,515
VS	1,130

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	1
Viscosity	—
Colour	2

System information

Containment system	Latrine Pit
Percentage emptied	40 %
Containment volume	25 m^3
Truck full	Yes
Origin	Multiple Household
Number of system users	40
Source of inputs	Toilet, Bathing, Washing
Water Connection	No
Solid Waste	Hygienic Products
Last desludging	6 months ago

Sample 84

Laboratory sample

Chemical parameters (mg/L)

pH	8.0
COD	—
CODsol	—
TN	1,047
NH_4-N	590
NO_3-N	3.1
TP	246
PO_4-P	30

Physical parameters (mg/L)

TSS	14,749
VSS	9,065
TS	14,886
VS	8,790

Qualitative parameters
(1: weak – 3: strong)

Foam	1
Smell	2
Viscosity	—
Colour	2

System information

Containment system	Septic Tank
Percentage emptied	100 %
Containment volume	3 m^3
Truck full	No
Origin	Institutional/Commercial/ Industrial
Number of system users	—
Source of inputs	Toilet, Bathing, Washing, Kitchen
Water Connection	Yes
Solid Waste	No
Last desludging	Every 2 weeks

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Alessandro Holler & Sandro Lochau, www.quaint.ch, Zurich

Text Editing:
Paul Donahue

All Photos:
Eawag (Sandec)

Eawag
Department Sandec

Überlandstrasse 133
P. O. Box 611
8600 Dübendorf
Switzerland

+41 (0)44 823 52 86
info@sandec.ch
www.eawag.ch
www.sandec.ch