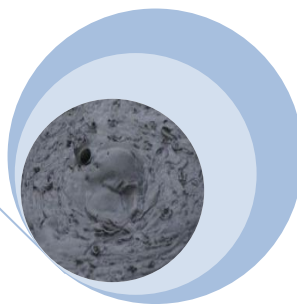


Tracing report Silale

15/05/14, Silale



„Euroslam (Beneficial use of sewage sludge in small and medium-sized municipalities)“ consulting and administration services

Contract 18th October 2012 No. B6-229(b)

Customer: Silale district municipality
administration

Provider: CJSC “Lyderio grupe”

Experts: CJSC “Senasis ezerelis”



Heavy metals tracing in Silale sewage network Report 15/05/2014



Part-financed by the European Union
(European Regional Development Fund)



euroslam

Silale district municipality administration is participating as a partner in an international "EUROSLAM" (Beneficial use of sewage sludge in small to medium size municipalities) project. One of the main project activities implemented in Silale is sewage sludge usage in agriculture as fertilizer.

According to Lithuanian legal situation, actually there are no practical possibilities to use raw sewage sludge as fertilizing material, because of the its hygiene and pollution can cause environmental protection problems. Sewage sludge contains quite high concentration of heavy metals, which fall into the sludge along with the effluent. So, to improve the quality of the sludge (reduction of heavy metal concentration), it is necessary to control the quality of the effluent and identify main sources of heavy metals.

This report contains assessment of heavy metals concentrations in Silale WWTP sewage sludge and a preliminary empirical assessment of pollutions sources. For this reason the heavy metals control sampling was performed in the main sewage collector of Silale industrial area.

Content

HEAVY METALS TRACING DATA ASSESSMENT	4
ANNEX 1. HEAVY METALS CONCENTRATIONS, BOD₇ AND COD₇ IN EFFLUENT OF SILALE INDUSTRY AREA COLLECTOR. CONTROL TEST. SEPTEMBER, 2013	6

Heavy metals tracing data assessment

Goal

The purpose of these investigations is to identify sources of heavy metals in the Silale, i.e. to assess industry influence on sewage sludge quality.

Method

In order to identify the preliminary sources of heavy metals in Silale, there was compared the total quantity of heavy metals Silales wastewater treatment plant sludge, and heavy metal quantity, which can be accumulated from effluent of Silale industrial area collector. There was accepted, that all heavy metals from effluent settles into sewage sludge.

Heavy metals, effluent and sewage sludge data and their assessment

Effluent and sewage sludge parameters of Silale WWTP

Parameters of effluent in 2013	Average of year	28-May	24-Jul	13-Sep	11-Nov
Effluent flow (inlet), m ³ /d	832	998	738	870	1341
Preliminary quantity of sludge (dry matter), kg/d	316	379	280	330	509

Heavy metals concentrations in Silale WWTP sludge, 2013 (data of sludge and sludge compost researches)

Date of sampling	Heavy metals, mg/kg of dry matter							
	As	Cd	Cr	Cu	Ni	Pb	Zn	Hg
28-May	<0,5	0,99	30	94	19	4	630	0,49
24-Jul	<0,5	0,21	21	54	10	2	220	0,06
13-Sep	<0,5	0,35	27	98	17	3	630	0,14
11-Nov	<0,5	0,39	16	72	18	3	480	0,3
Average	<0,5	0,485	23,5	79,5	16	3	490	0,2475

Accumulated heavy metals quantity in sludge, 2013

Date of sampling	Heavy metals, mg/d							
	As	Cd	Cr	Cu	Ni	Pb	Zn	Hg
28-May	189,5	375,21	11370	35626	7201	1516	238770	185,71
24-Jul	140	58,8	5880	15120	2800	560	61600	16,8
13-Sep	165	115,5	8910	32340	5610	990	207900	46,2
11-Nov	254,5	198,51	8144	36648	9162	1527	244320	152,7
Average	187	187	8576	29934	6193	1148	188148	100

Effluent flow in the main sewage network collector of industry area in Silale, 2013

	Average of year	28-May	24-Jul	13-Sep	11-Nov
Effluent flow, m ³ /d (preliminary data)	110	132	98	115	177

Heavy metals concentrations in effluent of industry area in Silale, 2013 (Annex. 1)

Date of sampling	Heavy metals, µg/l							
	As	Cd	Cr	Cu	Ni	Pb	Zn	Hg
13-Sep	0	0,3	11	39	4	3	110	0,1


Accumulated heavy metals quantity from effluent of industry area of Silale, 2013

Date of sampling	Heavy metals, mg/d							
	As	Cd	Cr	Cu	Ni	Pb	Zn	Hg
13-Sep	0	34,5	1265	4485	460	345	12650	11,5
Compare to total quantity in sewage sludge	0,00%	29,87%	14,20%	13,87%	8,20%	34,85%	6,08%	24,89%

Conclusions

The industry is not main pollution source of heavy metals in Silale. The heavy metals flow from industry to Silale WWTP represent up to 10-35 % of total heavy metals quantity in WWTP and also in the sewage sludge. So, the main pollution source in Silale is households. This confirms the earlier hypothesis of other scientists, that households are the main sources of heavy metal pollution in small municipalities. Previously on national level was observed that in small municipalities, after losing industry the pollution of effluent was not decreased, and in many cases increased.

Annex 1. Heavy metals concentrations, BOD₇ and COD₇ in effluent of Silale industry area collector. Control test. September, 2013

 Vandens tyrimai
 Žirmūnų g. 106, Vilnius ■ 8(5)2325287

UŽSAKOVAS: UAB "Ekorama"


Sunkiųjų metalų analizės vandenyje rezultatai

Data	Bandinio pavadinimas	Punktas	μg/l						
			Cd	Cr	Cu	Ni	Pb	Zn	Hg
13 09 13	Šilalės m. pramoninio kvartalo nuotekų kolektorius		<0.3	11	39	4	3	110	<0.1

Sunkiųjų metalų analizė atlikta atominės absorbcijos spektrometrija, naudojant grafinę krosnį (ISO 15586:2003)
 Gyvsidabrio analizė atlikta pagal ISO 12846:2012.



Rimantas Akstinas

 Vandens tyrimai	Žirmūnų g. 106, Vilnius ■ 8(5)2325287
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UŽSAKOVAS: UAB "Ekorama"

Vandens sutrumpintos cheminės analizės rezultatai

Objektas	Gręžinys (punktas)	Paėmimo data
Šilalės m. pramoninio kvartalo nuotekų kolektorius		2013 09 13

Analitė	Vertė	Analizės metodas
ChDS	179 mg O/l	ISO 15705
BDS ₇	84.0 mg O ₂ /l	LST EN 1899

Chemikė analitikė



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