Ūkio subjektų aplinkos
monitoringo nuostatų
3 priedas

ŪKIO SUBJEKTŲ TECHNOLOGINIŲ PROCESŲ MONITORINGO IR TARŠOS ŠALTINIŲ IŠMETAMŲ IR (AR) IŠLEIDŽIAMŲ TERŠALŲ MONITORINGO NENUOLATINIŲ MATAVIMŲ DUOMENYS

I SKYRIUS
BENDROJI DALIS

1. Informacija apie ūkio subjektą:

1.1. teisinis statusas:

juridinis asmuo	X
juridinio asmens struktūrinis padalinys (filialas, atstovybė)	
fizinis asmuo, vykdantis ūkinę veiklą	

(tinkamą langelį pažymėti X)

1.2. juridinio asmens ar jo struktūrinio padalinio pavadinimas ar fizinio asmens vardas, pavardė	1.3. juridinio asmens ar jo struktūrinio padalinio kodas Juridinių asmenų registre arba fizinio asmens kodas
UAB Vilniaus kogeneracinė jėgainė	303782367

1.4. juridinio asmens ar jo struktūrinio padalinio buveinės ar fizinio asmens nuolatinės gyvenamosios vietos adresas

savivaldybė	gyvenamoji vietovė (miestas, kaimo gyvenamoji vietovė)	gatvės pavadinimas	pastato ar pastatų komplekso Nr.	Korpu-sas	buto ar negyvena-mosios patalpos Nr.
Vilniaus m.	Vilnius	Jočionių g.	13	-	-

1.5. ryšio informacija

telefono Nr.	fakso Nr.	el. paštas
+370 620 65856		vkj@ignitis.lt

2. Ūkinės veiklos vieta:

Ūkinės veiklos objekto pavadinimas					
UAB Vilniaus kogeneracinė jėgainė					
adresas					
savivaldybė	gyvenamoji vietovė (miestas, kaimo gyvenamoji vietovė)	gatvės pavadinimas	namo pastato ar pastatų komplekso Nr.	Korpu-sas	buto ar negyvena-mosios patalpos Nr.
Vilniaus m.	Vilnius	Jočionių g.	13	-	-

3. Informaciją parengusio asmens ryšio informacija:

telefono Nr.	fakso Nr.	el. paštas
+370 616 09182		jurgita.aleknaite@ignitis.lt

4. Laikotarpis, kurio duomenys pateikiami: 2021 m. I ketv.

II SKYRIUS
ŪKIO SUBJEKTŲ TECHNOLOGINIŲ PROCESŲ MONITORINGAS

Technologinių procesų monitoringo duomenys

1 lentelė

Eil. Nr.	Technologinio proceso pavadinimas	Matavimų atlikimo vieta	Nustatomi parametrai	Matavimų dažnumas	Matavimų rezultatai, neatitinkantys nustatytų standartinių sąlygų	
					išmatuota reikšmė[1], matavimo vienetai	matavimo atlikimo data ir laikas
1	2	3	4	5	6	7
1	Nepavojingų atliekų deginimas	Katilas	Degimo produktų temperatūra prie degimo kameros vidinės sienelės	Nuolatinis nepertraukiamas	atitinka	Nuolatinis nepertraukiamas
		Degimo produktų išmetimo kaminas	Deguonies koncentracija išmetamose dujose	Nuolatinis nepertraukiamas	atitinka	Nuolatinis nepertraukiamas
			Išmetamųjų dujų slėgis		atitinka	Nuolatinis nepertraukiamas
			Išmetamųjų dujų temperatūra kamine		atitinka	Nuolatinis nepertraukiamas
			Vandens garų kiekis išmetamosiose dujose		atitinka	Nuolatinis nepertraukiamas

Pastabos:
[1]Jei per parą buvo užregistruota daugiau kaip 20 matavimo rezultatų, kurie neatitiko parametrams nustatytų standartinių sąlygų, nurodomas matavimo rezultatų intervalas ir neatitikimų per parą skaičius.

III SKYRIUS

ŪKIO SUBJEKTŲ TARŠOS ŠALTINIŲ IŠMETAMŲ TERŠALŲ MONITORINGAS

Stacionarių aplinkos oro taršos šaltinių duomenys

2 lentelė

Taršos šaltinis						Išmetamųjų dujų rodikliai pavyzdžio paėmimo (matavimo) vietoje			Matavimo atlikimo data (metai, mėnuo, diena, val.)
Nr.	kodas[1]	pavadinimas	koordinatės	aukštis, m	angos skersmuo, m	srauto greitis, m/s	temperatūra, °C	tūrio debitas, Nm^3/s	
1	2	3	4	5	6	7	8	9	10
001	-	Atliekų deginimo jėgainės kaminas	6059612,94 574331,65	80,0	2,10	10,59	33,3	36,68	2021-03-25 / 2021-03-27
004	-	Atliekų kuro bunkeris	6059618,28 574203,67	36,0	1,49x0,98	2,2	-	2,33	2021-01-17
005	-	Atliekų kuro bunkeris	6059616,44 574203,67	36,0	1,49x0,98	3,0	-	3,17	2021-01-17
011	-	Dugno pelenų patalpa	6059648,02 574245,122	12,5	1,48x1,0	6,0	-	8,75	2021-01-18
006	-	Dyzelinis elektros generatorius	6059616,44 574258,45	-	0,5	8,5	-	1,66	2021-01-18
007	-	Lakiųjų pelenų silosas	6059644,64 574303,6	32,0	0,3x0,3	-	-	-	2021-03-02
008	-	Lakiųjų pelenų silosas	6059644,64 574308,55	32,0	0,3x0,3	-	-	-	2021-03-02
009	-	Aktyvuotos anglies silosas	6059638,59 574304,05	14,0	0,3x0,3	-	-	-	2021-03-02
010	-	Gesintų kalkių silosas	6062087,94 574293,2	26,0	0,3x0,3	-	-	-	2021-03-02

Pastabos:
[1]Kol nenustatytas taršos šaltinio unikalusis kodas, skiltis nepildoma. Pildyti skiltį „Taršos šaltinio Nr.“

Teršalų, išmetamų iš stacionarių aplinkos oro taršos šaltinių, monitoringo duomenys

Taršos šaltinis		Teršalai		Matavimų rezultatai[2]	Technologinio proceso sąlygos ėminių ėmimo ar matavimo metu[3]	Matavimo metodas[4]	Laboratorijos, atlikusios matavimus, pavadinimas ir leidimo ar akreditacijos pažymėjimo Nr.
Nr.	kodas[1]	kodas	pavadinimas				
1	2	3	4	5	6	7	8
001	-	4112	Stibis ir jo junginiai (kaip stibis)	0,018 mg/Nm^3	Standartinės	PN-EN 14385:2005	TUV Rheinland Energy GmbH (Air pollution control). Accreditation Nr. D-PL-11120-02-00
		217	Arsenas ir jo junginiai (kaip arsenas)				
		2721	Chromas šešiavalentis (kaip chromo trioksidas)				
		3401	Kobaltas				
		3516	Manganas, mangano oksidai ir kiti junginiai (kaip mangano dioksidas)				
		4424	Varis ir jo junginiai (kaip varis)				
		1589	Nikelis ir jo junginiai (kaip nikelis)				
		2094	Švino organiniai ir neorganiniai junginiai (kaip švinas)				
		2023	Vanadžio pentoksidas				
		7866	PCDD	0,007 ng TEQ/Nm^3	Standartinės	PN-EN 1948:2006	TUV Rheinland Energy GmbH (Air pollution control). Accreditation Nr. D-PL-11120-02-00
		7875	PCDF				
		3211	Kadmis ir jo junginiai (kaip kadmis)	<0,001 mg/Nm^3	Standartinės	PN-EN 14385:2005	TUV Rheinland Energy GmbH (Air pollution control). Accreditation Nr. D-PL-11120-02-00
		7911	Talis ir jo junginiai (kaip talis)				
		1024	Gyvsidabris ir jo junginiai	<0,0001 mg/Nm^3	Standartinės	PN-EN 13211 + AC:2006	TUV Rheinland Energy GmbH (Air pollution control). Accreditation Nr. D-PL-11120-02-00
004	-	134	Amoniakas	0,4 mg/Nm3	Standartinės	VDI 3878	TUV Rheinland Energy GmbH (Air pollution control). Accreditation Nr. D-PL-11120-02-00
		4281	Kietosios dalelės (C)	<0,3 mg/Nm3	Standartinės	EN 13284 (part 1)	
005	-	134	Amoniakas	1,0 mg/Nm3	Standartinės	VDI 3878	
		4281	Kietosios dalelės (C)	<0,3 mg/Nm3	Standartinės	EN 13284 (part 1)	
011	-	4281	Kietosios dalelės (C)	0,2 mg/Nm3	Standartinės	EN 13284 (part 1)	TUV Rheinland Energy GmbH (Air pollution control). Accreditation Nr. D-PL-11120-02-00

006	-	5872	Azoto oksidai (B)	326 mg/Nm3	Standartinės	EN 13284 (part 1)	TUV Rheinland Energy GmbH (Air pollution control). Accreditation Nr. D-PL-11120-02-00
007		4281	Kietosios dalelės (C)	<1,0 mg/Nm3	Standartinės	EN 13284 (part 1)	TUV Rheinland Energy GmbH (Air pollution control). Accreditation Nr. D-PL-11120-02-00
008		4281	Kietosios dalelės (C)	<1,0 mg/Nm3	Standartinės	EN 13284 (part 1)	
009		4281	Kietosios dalelės (C)	<1,0 mg/Nm3	Standartinės	EN 13284 (part 1)	
010		4281	Kietosios dalelės (C)	<1,0 mg/Nm3	Standartinės	EN 13284 (part 1)	

Pastabos:
[1]Kol nenustatytas taršos šaltinio unikalusis kodas, skiltis nepildoma. Pildyti skiltį „Taršos šaltinio Nr.“
[2]Išmetamų į aplinkos orą atskirų teršalų kiekis gali būti pateikiamas mg/Nm^3 arba g/s. Jeigu išmatuota teršalo koncentracija mažesnė už taikomu metodu išmatuojamą mažiausią koncentraciją, pateikiant monitoringo duomenis, turi būti įrašoma, už kokią konkrečią taikomu metodu išmatuojamos mažiausios koncentracijos vertę matuotos teršalo koncentracijos vertė yra mažesnė.
[3]Detalus aprašymas bet kokių nestandartinių sąlygų, galėjusių paveikti matavimų rezultatus (pvz., dujų degimo temperatūra, įrangos paleidimas, apkrova, kt.).
[4]Galiojantis teisės aktas, kuriuo nustatytas matavimo metodas, galiojančio standarto žymuo ar kitas metodas.

IV SKYRIUS
ŪKIO SUBJEKTŲ TARŠOS ŠALTINIŲ IŠLEIDŽIAMŲ TERŠALŲ MONITORINGAS

Taršos šaltinių su gamybinėmis – komunalinėmis nuotekomis išleidžiamų teršalų monitoringo duomenys[1] - nuotekos išleidžiamos į UAB „Vilniaus vandenys“ nuotekų tinklus.

4 lentelė

Išleistuvo kodas[2]		Nuotekų valymo įrenginio kodas[3]				Nuotekų valymo įrenginio pavadinimas								
2130079		3130133				Naftos gaudyklė								
Ėminio ėmimo data, MMMM. mm.dd	Ėminio ėmimo laikas, hh.min	Ėminio ėmimo vieta[4]	Laiko-tarpis[5], d.	Nuotekų debitas, m^3/d	Nuotekų kiekis[6], m^3	Labai smarkus lietus[7], Taip / Ne	Tempera-tūra, °C	Teršalai / parametrai [8]		Matavimo rezultatas[9]	Matavimo metodas[10]	Laboratorija, atlikusi matavimą		Tyrimų protokolo Nr.
								kodas	pavadinimas, matavimo vnt.			leidimo ar akreditacijos pažymėjimo Nr.	pavadi-nimas	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2021-01-26	11:23	Nr. 1-2	26	-	6157	Ne	18,4	1001	pH	8,0	LST EN ISO 10523:2012	Leidimo Nr. 1AT-231	UAB „Ekom etrija“	298
								1003	BDS_7, mg/l	1,10	LST EN 1899-2:2000			
								1004	Suspenduotos medžiagos, mg/l	<2,5	LST EN 872:2005			

								1204	Naftos produktai, mg/l	<0,60	LAND 90-2010			
								1005	ChDS, mg/l	8,7	LST ISO 6060:2003			
								1201	Bendras azotas, mg/l	3,52	LST EN ISO 11905-1:2000			
								1203	Bendras fosforas, mg/l	0,321	LST EN ISO 6878:2004			
								1102	Chloridai, mg/l	22,5	LST ISO 9297:2008			
								4004	Chromas, mg/l	0,0031	CSN EN ISO 17294-2			
								4016	Varis, mg/l	0,0015				
								4012	Nikelis, mg/l	<0,003				
								4006	Cinkas, mg/l	<0,002				
								4003	Arsenas, µg/l	<1,0				
								4014	Švinas, µg/l	<1,0				
								4009	Kadmis, µg/l	<0,20				
								4018	Talis, µg/l	<0,50				
								4008	Gyvsidabris, µg/l	0,326	CSN EN ISO 17852			
2021-02-24	14:42	Nr. 1-2	29	-	16750	Ne	18,1	1001	pH	8,5	LST EN ISO 10523:2012	Leidimo Nr. 1AT-231	UAB „Ekometrija“	850
								1003	BDS_7, mg/l	30,0	LST EN 1899-2:2000			
								1004	Suspenduotos medžiagos, mg/l	1140	LST EN 872:2005			
								1204	Naftos produktai, mg/l	6,19	LAND 90-2010			
								1005	ChDS, mg/l	241	LST ISO 6060:2003			
								1201	Bendras azotas, mg/l	0,466	LST EN ISO 11905-1:2000			
								1203	Bendras fosforas, mg/l	0,587	LST EN ISO 6878:2004			
								1102	Chloridai, mg/l	391	LST ISO 9297:2008			
								4004	Chromas, mg/l	0,089	Unif. NT ir PV kokybės tyrimo met. 1d.			
								4016	Varis, mg/l	0,760				
								4012	Nikelis, mg/l	0,079				
								4006	Cinkas, mg/l	0,456				
								4003	Arsenas, µg/l	1,6				

								4014	Švinas, µg/l	10,7	CSN EN ISO 17294-2				
								4009	Kadmis, µg/l	0,22					
								4018	Talis, µg/l	<0,50					
								4008	Gyvsidabris, µg/l	0,224	CSN EN ISO 17852				
2021-03-22	10:00	Nr. 1-2	26	-	17172	Ne	22,4	1001	pH	8,9	LST EN ISO 10523:2012	Leidimo Nr. 1AT-231	UAB „Ekometrija“	2577	
								1003	BDS_7, mg/l	37,8	LST EN 1899-2:2000				
								1004	Suspenduotos medžiagos, mg/l	26,0	LST EN 872:2005				
								1204	Naftos produktai, mg/l	4,36	LAND 90-2010				
								1005	ChDS, mg/l	78,0	LST ISO 6060:2003				
								1201	Bendras azotas, mg/l	12,2	LST EN ISO 11905-1:2000				
								1203	Bendras fosforas, mg/l	1,18	LST EN ISO 6878:2004				
								1102	Chloridai, mg/l	50,6	LST ISO 9297:2008				
								4004	Chromas, mg/l	<0,004	Unif. NT ir PV kokybės tyrimo met. 1d.				
								4016	Varis, mg/l	0,035					
								4012	Nikelis, mg/l	<0,052					
								4006	Cinkas, mg/l	0,123					
								4003	Arsenas, µg/l	<1,0	CSN EN ISO 17294-2				
								4014	Švinas, µg/l	9,9					
								4009	Kadmis, µg/l	<0,20					
								4018	Talis, µg/l	<0,50					
								4008	Gyvsidabris, µg/l	3,00	CSN EN ISO 17852				

Pastabos:

[1]Kiekvienam išleistuvui pildoma atskira lentelė. Žuvininkystės tvenkinių vandens, paviršinių nuotekų išleistuvams, kuriuose nėra debito matavimo prietaisų, lentelės 4, 5, 6 skiltys nepildomos.

[2]Išleistuvo identifikavimo kodas įrašomas iš informacinės sistemos „Aplinkos informacijos valdymo integruota kompiuterinė sistema“ (toliau – IS „AIVIKS“). Jei pildomi duomenys apie naują išleistuvą, įrašomas jo pavadinimas.

[3]Nuotekų valymo įrenginio identifikavimo kodas įrašomas iš informacinės sistemos IS „AIVIKS“. Jei pildomi duomenys apie naują nuotekų valymo įrenginį, jo identifikavimo kodas nerašomas.

[4]Kai ėminio ėmimo vieta nurodoma „paimtame vandenyje“, lentelės 4, 5, 6, 7, 8 skiltys nepildomos.

[5]Dienų skaičius nuo paskutinio iki aprašomo ėminio ėmimo. Pirmojo kalendoriniais metais ėminio atveju nurodomas laikotarpis nuo kalendorinių metų pradžios iki pirmojo metų ėminio

ėmimo, paskutinio kalendoriniais metais ėminio atveju nurodomi du laikotarpiai – nuo priešpaskutinio iki paskutinio kalendorinių metų ėminio ėmimo ir nuo paskutinio kalendorinių metų ėminio ėmimo iki metų pabaigos.

[6]Nuotekų kiekis per nurodytąjį laikotarpį. Pirmojo kalendoriniais metais ėminio atveju nuotekų kiekis rašomas laikotarpiui nuo kalendorinių metų pradžios iki pirmojo metų ėminio ėmimo, paskutiniojo kalendoriniais metais ėminio atveju – dviem atskiriems laikotarpiams (nuo priešpaskutinio iki paskutinio kalendorinių metų ėminio ėmimo ir nuo paskutinio kalendorinių metų ėminio ėmimo iki metų pabaigos).

[7]Nepildoma žuvininkystės tvenkinių vandens, paviršinių nuotekų išleistuvams. Labai smarkus lietus nustatomas pagal Stichinių, katastrofinių meteorologinių ir hidrologinių reiškinių rodiklius, patvirtintus Lietuvos Respublikos aplinkos ministro 2011 m. lapkričio 11 d. įsakymu Nr. D1-870 „Dėl stichinių, katastrofinių meteorologinių ir hidrologinių reiškinių rodiklių patvirtinimo“.

[8]Teršalų ir (ar) parametrų kodai, pavadinimai ir matavimo vienetai įrašomi iš Vandens išteklių naudojimo valstybinės statistinės apskaitos ir duomenų teikimo tvarkos, patvirtintos Lietuvos Respublikos aplinkos ministro 1999 m. gruodžio 20 d. įsakymu Nr. 408 „Dėl Teršalų išmetimo į aplinką apskaitos tvarkos patvirtinimo“ (su vėlesniais pakeitimais) 1 priedėlyje pateikto Teršiančių medžiagų ir kitų parametrų kodų sąrašo.

[9]Jei išmatuota atskiro nuotekų ėminio teršalo koncentracija mažesnė už taikomu metodu išmatuojamą mažiausią koncentraciją, pateikiant matavimo rezultatą įrašoma, už kokią konkrečią taikomu metodu išmatuojamos mažiausios koncentracijos vertę matuotos teršalo koncentracijos vertė yra mažesnė, prieš skaičių rašant ženklą „<“.

[10]Galiojantis teisės aktas, kuriuo nustatytas matavimo metodas, galiojančio standarto žymuo ar kitas metodas.

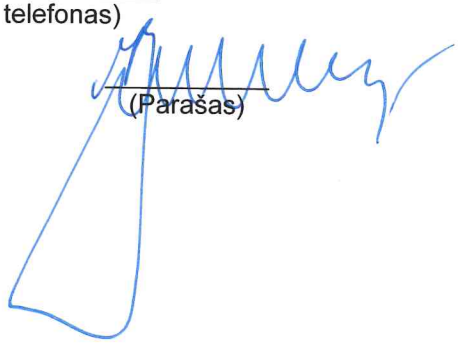
Taršos šaltinių su paviršinėmis nuotekomis išleidžiamų teršalų monitoringo duomenys[1] – nuotekos išleidžiamos į UAB „Grinda“ nuotekų tinklus“.

4 lentelė

Išleistuvo kodas[2]		Nuotekų valymo įrenginio kodas[3]				Nuotekų valymo įrenginio pavadinimas								
UAB „Grinda“ priimtuvas“ Nr. E-162		-				Naftos gaudyklė								
Ėminio ėmimo data, MMMM. mm.dd	Ėminio ėmimo laikas, hh.min	Ėminio ėmimo vieta[4]	Laiko-tarpis[5], d.	Nuotekų debitas, m^3/d	Nuotekų kiekis[6], m^3	Labai smarkus lietus[7], Taip / Ne	Tempera-tūra, °C	Teršalai / parametrai [8]		Matavimo rezultatas[9]	Matavimo metodas[10]	Laboratorija, atlikusi matavimą		Tyrimų protokolo Nr.
								kodas	pavadinimas, matavimo vnt.			leidimo ar akreditacijos pažymėjimo Nr.	pavadi-nimas	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2021-02-24	14:51	Nr. 2-2	-	-	-	Ne	5,8	1003	BDS_7, mg/l	2,84	LST EN 1899-2:2000	Leidimo Nr. 1AT-231	UAB „Ekometrija“	851
								1004	Suspenduotos medžiagos, mg/l	2,8	LST EN 872:2005			
								1204	Naftos produktai, mg/l	<0,60	LAND 90-2010			
2021-03-22	10:10	Nr. 2-2	-	-	-	Ne	12,4	1003	BDS_7, mg/l	2,07	LST EN 1899-2:2000	Leidimo Nr. 1AT-231	UAB „Ekometrija“	2578
								1004	Suspenduotos medžiagos, mg/l	<2,5	LST EN 872:2005			
								1204	Naftos produktai, mg/l	<0,60	LAND 90-2010			

Ataskaitą parengė Jurgita Aleknaitė, +37061609182
(Vardas ir pavardė, telefonas)

Generalinis direktorius
(Ūkio subjekto vadovo ar jo įgalioto asmens pareigos)



(Parašas)

Mantas Burokas
(Vardas ir pavardė)

2021-04-15
(Data)

TÜV RHEINLAND ENERGY GMBH

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-11120-02-00

Report on the implementation of emission measurements on the waste incineration plant in Vilnius of the company AB Ignitis grupė for the measuring objects PCDD/PCDF, WHO PCB, Benzo(a)pyrene and heavy metals

TÜV Report No.: 936/ 21252753/A1
Cologne, 17.06.2021

www.umwelt-tuv.de

tre-service@de.tuv.com

The department of Environmental Protection of TÜV Rheinland Energy GmbH
is accredited for the following work areas:

- Determination of air quality and emissions of air pollution and emissions of odour substances;
- Inspection of correct installation, function and calibration of continuously operating emission measuring instruments, including data evaluation and remote emission monitoring systems;
- Combustion chamber measurements;
- Performance testing of measuring systems for continuous monitoring of emissions and ambient air, and of electronic data evaluation and remote emission monitoring systems;
- Determination of stack height and air quality projections for hazardous and odour substances;
- Determination of emission and ambient air quality of noise and vibration, determination of sound power levels and execution of sound measurements at wind energy plants

according to EN ISO/IEC 17025.

The accreditation is registered under DAkkS-register number: D-PL-11120-02-00.

TÜV Rheinland Energy GmbH
D-51105 Cologne, Am Grauen Stein, Tel: +49 221 806-5200, Fax: +49 221 806-1349

blank page

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-11120-02-00

Report on the implementation of emission measurements on the waste incineration plant in Vilnius of the company AB Ignitis grupė for the measuring objects PCDD/PCDF, WHO PCB, Benzo(a)pyrene and heavy metals

Name of the notified body (§ 29b BImSchG)	TÜV Rheinland Energy GmbH
Reportnumber / Date	936/21252753/A1 17.06.2021 This report reclaces the report-No. : 936/21252753/A from 2021-05-17.
plant operator:	AB Ignitis grupė UAB Vilniaus kogeneracine jegaine Kodas 303782367 Zveju g.14 LT-09310 Vilnius Lithuania
Audited site:	Jocioniu g. 13 LT-02300 Vilnius Lithuania
Type of measurement:	Emission measurement
Order number: (of the customer)	4200081049
Order date:	24.03.2021
Customer ID:	1033976
Measurement date:	25.03. – 27.03.2021
Scope of report:	38 pages in total Annex starts on page 30
object / according to:	PCDD/PCDF EN 1948:2006-06 WHO-PCB EN 1948:2014-03 Benzo(a)pyrene EN 15549:2008-06 Mercury EN 13211:2005-06 Heavy metals EN 14385:2004-05
Installation arrangement:	Directive 2010/75/EU on industrial emissions

Leerseite

Summary

Type of plant: Waste incineration plant

Emission source Chimney

Measurement objects: PCDD/PCDF, WHO PCB, Benzo(a)pyrene and heavy metalsand emission boundary conditions

Measurement results: Three single measurements were carried out for every components on three days. The measurement results are listed in the table below. The individual evaluations are listed in chapter 6.2 and in the appendix.

measurement object	unit	maximum measured value minus expanded measurement uncertainty	maximum measured value plus expanded measurement uncertainty	value guaranteed	operation condition
PCDD/PCDF	ng TEQ/m³	< 0,015	0,01	0,1	90%/100%/100%
Sum concentration: Cd/Tl	mg/m³	< 0,01	< 0,01	0,05	90%/100%/100%
Sum concentration: Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Sn	mg/m³	0,01	0,03	0,5	90%/100%/100%
Sum concentration: As, Cd, Co, Cr, BaP	mg/m³	< 0,01	< 0,01	-	90%/100%/100%
Hg	mg/m³	< 0,001	< 0,001	0,05	90%/100%/100%
O_2 reference value	Vol.-%	-	-	11	90%/100%/100%

All concentration values are in dry norm state.

The table above shows the validated values for all components according to rounding rules. For components with very low emission level the value shows the significant decimal place. Chapter 6 shows the unrounded values.

blank page

TABLE OF CONTENTS **PAGE**

blank page

1 Objectives

1.1	**Client:**	Steinmüller Babcock Environment GmbH Fabrikstr. 1 51643 Gummersbach
1.2	**Plant operator:**	AB Ignitis grupė UAB Vilniaus kogeneracine jegaine Kodas 303782367 Zveju g.14 LT-09310 Vilnius Lithuania
	Contact person:	Mr Matas Mizera
	Telephone number:	+370 620 65856
	Work place number:	-
1.3	**Location:**	Jocioniu g. 13 LT-02300 Vilnius Lithuania
1.4	**Plant:**	Waste incineration plant according RL 2010/75/EU,
	Plant number:	-
1.5	**Date / Duration of the measurements:**	25.03. – 27.03.2021
1.6	**Reason:**	Measurements to verify compliance with the guaranteed emission limits
	Approving authority:	not known
	Licence:	not known
1.7	**Task:**	Determination of emissions
1.8	**Measurement objects:**	PCDD/PCDF, WHO PCB, Benzo(a)pyrene and heavy metalsand emission boundary conditions
1.9	**Site inspection before measurement:**	Yes
1.10	**Measurement plan coordination:**	The measurement planning was consulted with the plant builder Steinmüller Babcock Environment GmbH.
1.11	**Personnel involved in the measurements:**	Mr M. Sc. Jan Rettig. (project manager), Mr Ralf Ritter
1.12	**Participation of further institutes:**	mas münster analytical solutions, PCDD/PCDF, WHO PCB, BaP
1.13	**Technical supervisor:**	Mr. Steffen Klötzer
	Telephone number:	0221 806-2382
	E-mail address:	steffen.kloetzer@de.tuv.com
	Technical supervisor:	Mr. Ferdinand Lehmann
	Telephone number:	0221 806-1899
	E-mail address:	ferdinand.lehmann@de.tuv.com

2 Description of the plants and the materials handled

2.1 Type of plant: Waste incineration plant

2.2 Description of the plant

The waste incineration plant includes a downstream flue gas cleaning system, described in 2.6.2.

Brand:	Steinmüller Babcock, Gummersbach (boiler, grate)
Type:	Forward moving grate
Year of manufacture:	2020
Boiler No.:	8496
Steam mass flow	23,2 kg/s
Max. allow. operating pressure:	83 bar
Operating pressure at superheater outlet:	76,5 bar
Superheater outlet temperature:	451 °C
Max. allow. steam temperature at superheater outlet:	466 °C
Fuel:	Domestic waste
Max. furnace thermal rating:	70,00 MW

2.3 Description of the emission sources

Emission source:	Stack
Height above ground:	80 m
Cross-sectional area of outlet:	3,5 m²
Building design:	steel

2.4 Statement of raw materials possible according to the permit: Domestic waste

2.5 Operating times: Not applicable

2.6 Device for collecting and reducing the emissions

2.6.1 Device collecting the emissions

Apparatus for emission collection:	Closed plant with directed emission source
Collection element:	suction draught ventilator

2.6.2 Device reducing the emissions

The flue gas cleaning system consists of the following parts:

- Evaporative cooler
- Reactor
- Fabric filter
- Flue gas quench
- Flue gas tube condenser
- Combustion air humidifier

3 Description of the sampling site

3.1 Location of the measurement cross-section

Measuring point is located

- Outdoor	☒
- Indoor	☐
- In front of draft fan	☐
- Behind draft fan	☒
- In waste gas duct	☐
- In chimney	☒
Sampling point is located	23,3 m above ground level.
Exhaust gas is	Vertical
Access is provided via	ladder with climbing protection rail
Inlet section in m:	17,3
Outlet section in m:	62,7

In compliance with the sampling site and the requirements according to EN 15259 as well as EN 14181

Inlet section ≥ 5 D_h:	Yes
Outlet section ≥ 2 D_h:	Yes
Outlet section ≥ 5 D_h till the outlet:	Yes
Angle between gas flow/ central axis Waste gas duct < 15°:	Yes
No negative local flow:	Yes
Minimum velocity is available (differential pressure > 5 Pa):	Yes
Relation max. to min. velocity < 3:1:	Yes
Distance sampling point / sampling site < 3 x $D_{hydr.}$:	Yes

Notice :

Regarding to the inflow and outflow ratios the sampling site fulfils the requirements according to gaseous and particulate substances written in EN 15259.

3.2	**Dimensions of the measurement cross-section:**	∅ 2100 mm	≙ 3,46 m²
3.3	**Number of measurement axes and position of the measurement points in the measurement cross-section**		
	Angles:	2	
	Sampling point per angle:	8	
	Distance of sampling points from duct site in cm:	7 / 22 / 41 / 68 / 142 / 169 / 188 / 203	
3.4	**Number and dimension oft he measurement points:**		
	Numbers of measurement ports:	4	
	Location of measurement ports:	in one plane, 90° rotated	
	Measurement of measurement ports		
	Clear diameter:	84 mm	
	Socket length:	340 mm	
3.5	**Working platform:**	available	
3.6	**Weather protection:**	not available	

4 Methods of measurement

4.1 Standard reference methods and measurement methods for waste gas conditions

4.1.1	**Flow velocity:**	Prandtl's pitot tube with a micromanometer
	Manufacturer / T ype / measuring range / detection limit:	SI GmbH / LPU 3 / 0 - 500 / 0 - 5000 Pa / 1,5 m/s
	Last check/calibration:	Before measuring 08 / 2020
	Continuous determination:	Net measurement at the beginning of each measuring day. Continuous measuring at a point in the cross-section and recording during the measurements.
4.1.2	**Static pressure in the waste gas duct:**	Manometer according to 5.1.1
4.1.3	**Air pressure at the height of the sampling location**	
	Measuring system:	Barometer
	Manufacturer / type / measuring range:	GPB / 300 - 1100 hPa
	Last check/calibration:	Before measuring 04 2020
4.1.4	**Waste gas temperature:**	Ni-Cr-Ni-thermocouple
	Manufacturer / type:	Thermocouple: MTB/ type K
	Temperature measuring device, manufacturer / type / measuring range:	Measurement data acquisition according to 5.3.8
	Continuous determination and recording:	Continuous measuring at a point in measurement cross-section
4.1.5	**Water vapour content in the waste gas (waste gas moisture):**	Adsorption at silicia gel/ gravimetry
	Manufacturer (balance) / type / measuring range:	Kern / 572-39 / 5-4200 g/
	Last check/calibration:	Before measuring 07 2020
4.1.6	**Waste gas density:**	Calculated taking into account the waste gas content of oxygen (O_2), carbon dioxide (CO_2), carbon monoxide (CO if relevant), atmospheric nitrogen (N_2 with 0,933 % Ar), waste gas moisture (water vapour content in the waste gas) as well as waste gas temperature and pressure conditions in the duct.

4.2	**Automated measurement methods for gaseous measured objects**			
4.2.1	**Measured object:**		Oxygen (O_2)	
4.2.1.1	**Measuring system / guideline:**		Paramagnetism / EN 14789	
4.2.1.2	**Analyzer:**		TÜV measuring system	
	Manufacturer / type:		Horiba / PG 250 SRM	
4.2.1.3	**Measuring range set:**		0 – 25 Vol.-%	
4.2.1.4	**Declaration of suitability:**		Yes	
4.2.1	**Measured object**		Carbon dioxide (CO_2)	
4.2.1.1	**Measuring system / guideline:**		NDIR / analogue EN 15058	
4.2.1.2	**Analyzer:**		TÜV measuring system	
	Manufacturer / type:		Horiba / PG 250 SRM	
4.2.1.3	**Measuring range set:**		0 - 20 Vol.-%	
4.2.1.4	**Declaration of suitability:**		Yes	
4.2.1.5	**Sampling system**		**O_2, CO_2**	
	Sampling probe/ suction tube:		Heated to °C	180
	Particle filter:		Heated by waste gas	
	Sample gas line before gas treatment:		Heated to °C	180
	Sample gas line before gas treatment:		Length, in m	3
	Sample gas line after gas treatment:		Unheated	
	Sample gas line after gas treatment:		Length, in m	30
	Material of gas-bearing parts:		Quartz filter, stainless steel, PTFE	
	Measuring gas processing:		Sample gas cooler	
	Manufacturer / type:		M. & C. / PSS-5	
	Temperature, controlled to dew point temperature:		3 °C ± 1 K	
4.2.1.6	**Check of the instrument characteristic with the following test gases**			
	Zero gas:		N_2	N_2
	Test gas:		O_2, dehumidified external air	CO_2 in N_2
	Concentration:	Vol.-%	20.94	14.98 Vol-%
	Uncertainty::	%	-	2
	Cylinder number:		-	16834
	Manufacturer:		-	Nippon Gases
	Production date:		-	31.07.2020
	Guarantee of stability:	Months	-	60
	Certified:		No	ja
	Check of the certificate by:		-	TÜV Rheinland
	Check of the certificate on:		-	18.09.2020

4.2.1.7	**90% - Response time of the entire measuring system in s (feeding of test gases via the probe):**	< 90 s	< 60 s

4.2.1.8 Recording of measured values

With a data acquisition system (data processor), manufacturer / type:	Yokogawa / DX2048-3-4-2
Data collection programme (software):	Yokogawa / Excel

4.3 Discontinuous standard reference measurement method

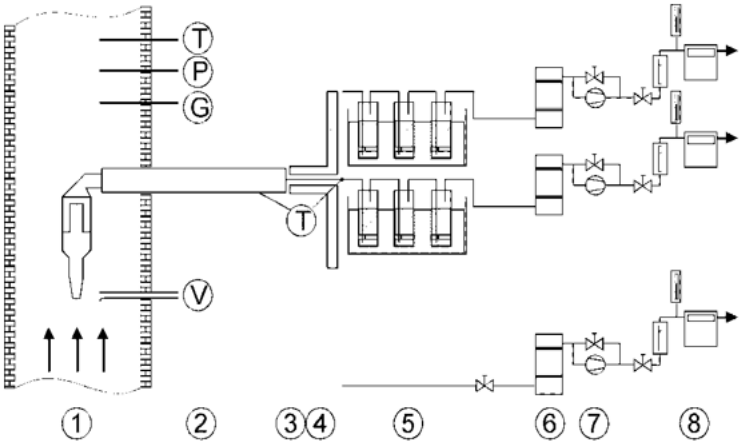
4.3.1 Gaseous and vaporous emissions

Not applicable

4.3.2 Particulate emissions

4.3.2.1	**Measured object:**	dust ingredients and adsorbed chemical bonds (metals, semi-metals and their compounds) including not filterable fractions
4.3.2.2.	**Measuring system / guideline:**	sampling dust and not filterable fractions for determination of the total emission according to DIN EN 14385, mai 2004 and DIN EN 13211, june 2001 (Correction June 2005)
	Analytical procedures:	ICP-MS / ICP-OES and AAS for Hg
4.3.2.3	**Measuring setup:**	
	Retention system for particulate materials	
	Filter unit	Flat filter head device
	Arrangement:	Instack, heated by waste gas
	Material:	Titan
	Sampling Probe / Tube	Titan / Quartz, heated to 150 °C
	Filter:	Quarzfaser Whatman, 1851
	Filter diameter	50 mm
	Separation efficiency	> 99 %
	Absorption system not filterable substances:	
	Absorption devices:	100-ml-wash-bottles with filter (double for Hg and triple for the other metals)
	Sorbent (metals but Hg)	HNO_3,5% + H_2O_2, 1,5% in H_2O, each 35 ml
	Sorbent (Hg)	Lösung aus 22 g KMnO4, 2 ml HCl (1 mol/l) in 1 l 10% H_2SO_4, each 35 ml
	Distance probe / absorber:	1,7 m
	Duration until analysis	13 days
4.3.2.4	**Treatment of the filter and the deposits**	
	Samples treatment (Hg)	Addition of 10% aqueous $(NH_3OH)Cl$-solution
	Transport and storage (filter):	Polystyrene containers
	Transport and storage (solutions):	in PP-beaker with PE-lid, cooled
	Rinse of filter unit	After each series of measurements with sorbent
	Treatment of Rinsing solution:	Collecting in PP beakers with PE lids, for metal analysis
	Drying temperature/time before exposure: after exposure:	 180 °C / >. 1 h without drying

Design of the sampling



1 Sampling probe with filter
2 Sampling tube, heated
3 Temperature measurement with controller
4 Adapter, insulated, heated
5 Absorption system
6 Condensate seperator
7 Pump system with bypass control
8 Gas meter

T Temperature measurement
P Pressure measurement
G Gas analysis
V Speed measurement

4.3.2.5 Preparation and evaluation of the measuring filters and the absorption solutions

Filter

Preparation of the sample material and analysis procedure:	microwave digestion , aliquote oft he eluat to analysis (parameters in table) Addition of 5 ml 65% HNO_3, 1 ml 40% H_2F_2, 1 ml 30% H_2O_2 and 1 ml distilled water, microwave digestion at 215-240 °C, at full digestion, filled up to 50 ml (parameters in table)

Absorption solutions

Preparation of the sample material:	Aliquote oft he solution directly to the analysis
Hg-absorption solution:	Aliquote (7ml) with 28µl Br^-/BrO_3-solution, 5ml directly to the analysis

Analyzers

Metals:	Agilent ICP-MS Typ 7800 / Perkin Elmer ICP_OES Typ Optima 7300 DV
Hg, particulate:	Perkin Elmer, Hydrid-AAS FIMS FIAS 400
Hg, not filterable:	MWS DMA-80L
Standards:	Standards solutions by Baker, Merck, Johnson Matthey, Alfa Products

Calibration procedure: standard addition (Hg)

Standard calibration procedure, additional standard addition (metals)

Element	Comment	Guideline
Hg, particulate		EN 13211
Hg, gaseous	Reducing agent $SnCl_2$	EN 13211
As		EN 14385
Cd		EN 14385
Co		EN 14385
Cr		EN 14385
Cu		EN 14385
Mn		EN 14385
Ni		EN 14385
Pb		EN 14385
Sb		EN 14385
Sn	in style of	EN 14385
Tl		EN 14385
V		EN 14385

4.3.2.6 Process parameters

Determination limit

Hg	0,02 µg/Filter:	0,00003 mg/l Absorption solution
Cd	0,05 µg/Filter:	0,001 mg/l Absorption solution
other elements	0,5 µg/Filter:	0,01 mg/l Absorption solution

4.3.2.7 Quality assurance measures

- leak test
- marked wash bottles for the absorption of Hg and the other elements
- Cleaning of the used washing bottles and distributors in a dishwasher as well as by intensive treatment with concentrated acid solutions and highly pure water.
- Replacement of the inner pipe or cleaning by treatment with acid solutions and high-purity water

Determination of blank value

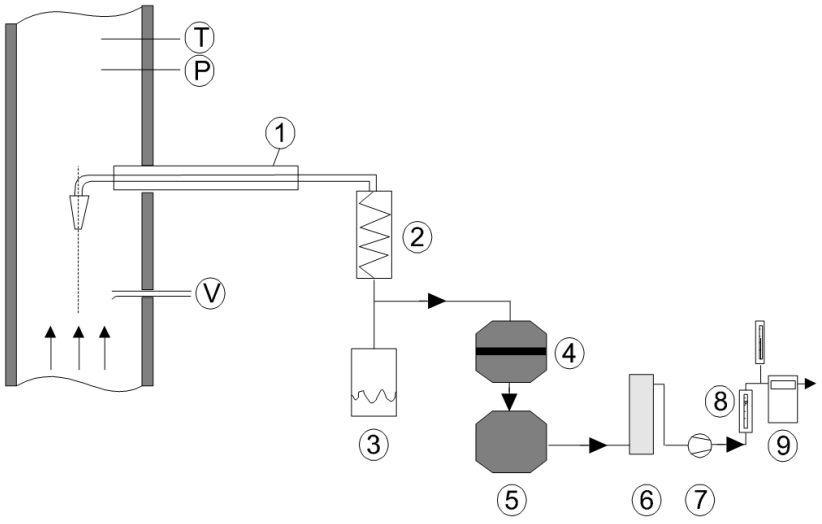
Field blank value

Date of sampling (Hg):	25.03.2021	14:00 Solution
Date of sampling (other metals and Hg particulate):	25.03.2021	14:00 Filter 14:30 Solution

4.3.3 Special highly toxic exhaust gas ingredients

4.3.3.1	**Measured object:**	PCDD/PCDF, PCB (WHO); BaP
4.3.3.2	**Measuring system / guideline::**	Chilled probe method according to DIN EN 1948-1, June 2006
	Analytical procedures:	DIN EN 1948-2, June 2006 (PCDD/PCDF) DIN EN 1948-3, June 2006 (PCDD/PCDF) DIN EN 1948-4, March 2014 (PCB) VDI 3874, December 2006 (B(a)P)
4.3.3.3	**Measuring setup:**	
	Sampling Probe / Tube	Glass, Ø = compare appendix 1 / Glass, Ø = 10 mm gekühlt
	Filter unit:	Flat filter, fiberglass filter GF 10 HY, Whatman® Schleicher & Schüll Ø = 47 mm v < 0,3 m/s
	Condensate separation:	Water cooled heat exchanger Lenght: 250 mm, Ø = 100 mm
	Cooling medium:	Cooled water
	Adsorption device /Sorbent:	Glass cartridge, Length: 100 mm, Ø = 45 mm/XAD-2, 120 ml, v < 0,3 m/s
	Design of the sampling device:	see illustration
	Material of all parts coming into contact with the sample:	Glass

Image: Design of the used sampling apparatus



1	Water cooled tube	7	Suction pump
2	Water cooled Heat exchanger	8	Flow meter
3	Condensate collecting vessel	9	Gas meter with thermocouple
4	Quartz filter / flat filter	T	Temperature measurement
5	XAD-2 catridge	P	Pressure measurement
6	Drying tower	V	Speed measurement

Design of the used sampling apparatus

Light protection:	Filter- and XAD-catridge and collecting vessel consist of amber glass.
Cleaning of the sampling vessels:	Sampling vessels for condensate and rinsing solution are used anew in each case, the cleaning of the other parts is described in 4.3.3.4.

Before sampling / extraction / analysis the following ^{13}C-marked dioxins / furans were added to check the individual steps of the process (sampling, processing and analysis).

	sampling[1)]	extraction	analysis
PCDD			
$^{13}C_{12}$-1,2,3,4-TetraCDD			X
$^{13}C_{12}$-2,3,7,8-TetraCDD		X	
$^{13}C_{12}$-1,2,3,7,8-PentaCDD		X	
$^{13}C_{12}$-1,2,3,4,7,8-HexaCDD		X	
$^{13}C_{12}$-1,2,3,6,7,8- HexaCDD		X	
$^{13}C_{12}$-1,2,3,7,8,9- HexaCDD			X
$^{13}C_{12}$-1,2,3,4,6,7,8-HeptaCDD		X	
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OctaCDD		X	
PCDF			
$^{13}C_{12}$-2,3,7,8-TetraCDF		X	
$^{13}C_{12}$-1,2,3,7,8- PentaCDF	X		
$^{13}C_{12}$-2,3,4,7,8- PentaCDF		X	
$^{13}C_{12}$-1,2,3,4,7,8- HexaCDF		X	
$^{13}C_{12}$-1,2,3,6,7,8- HexaCDF		X	
$^{13}C_{12}$-1,2,3,7,8,9- HexaCDF	X		
$^{13}C_{12}$-2,3,4,6,7,8- HexaCDF		X	
$^{13}C_{12}$-1,2,3,4,6,7,8-HeptaCDF		X	
$^{13}C_{12}$-1,2,3,4,7,8,9-HeptaCDF	X		
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OctaCDF		X	

1) Doping in the quartz filter

Distance between end of probe and cooler inlet or sorbent:	1,7 m plus 0,3 m

4.3.3.4 Sampling and post-treatment:

Leak test:	The probe is closed with the pump switched on and the apparatus is checked for gas flow.
max. allowed gas flow in m³/h:	< 0,02

Post-treatment

New glass parts or glass parts cleaned in the laboratory are used for each series of measurements. After each individual measurement, the probe, the sampling tube, the connecting parts and the cooler are rinsed with acetone and toluene. The resulting rinsing solution is collected in a collection bottle and sent to the laboratory for analysis. In the case of visible deposits, the probe and the cut sampling tube are also sent to the laboratory in a glass bottle for analysis.
The dust filter and XAD cartridge are removed, sealed and stored in a darkened place protected from high heat until analysis.

Exchange of an doped part:	No
Sample storage:	Darkened and cool
Sample transfer (Period between sampling and shipment):	max. 7 days

4.3.3.5	**Analytical determination:**	PCDD/PCDF, PCB (WHO); BaP
	Involvement of an external laboratory:	mas münster analytical solutions gmbh, Münster
	Analytical Method:	EN 1948, part 2 and 3, June 2006

Reconditioning of the sample material:

The accumulated samples (flat filter/quartz filter, condensate, XAD-2 cartridge and rinsing solution, were processed and analysed externally according to the following instructions:

Quartz filter / Flat filter:

Extraction of the fitlers with toluene after wetting with 1ml HCl and drying, extraction together with XAD-2 (min. 20 hours)

Condensate:

Liquid/liquid extraction (at least 3 times) with toluene, in case of solid content previous filtration and separate Soxhlet extraction of the dried filter residue with toluene/acetone

Rinsing solution:

addition of toluene, concentration, recovery with toluene, drying over sodium sulfate

XAD-2

Drying, extraction in Soxhlet with toluene/acetone (min. 20 hours)

The partial extracts were combined and analyzed as described below.

Method of analysis

The total extract was purified several times by column chromatography and concentrated to 20 µl (with n-nonane as keeper) before GC/MS analysis.

Analyzers:	Trace GC Ultra / DFS or MAT 95 XP, Thermo Scientific
HRGC-Conditions:	
Injection type:	PTV in cold feed mode
Injection volume, solvent:	1 µl, n-Nonan
GC-column:	RTX-2330, 60 m, 0,25 mm ID, 0,1 µm film, DB-5 MS, 60 m, 0,25 mm ID, 0,25 µm film
Carrier gas:	Helium, 0,9 ml/min (RTX-2330) Helium, 0,9 ml/min (DB-5 MS)

Temperature program:	RTX-2330 120 °C, 4 min isothermal with 30 °C/min to 210 °C with 2 °C/ min tto 240 °C, with 30 °C/min to 260 °C, 25 min isothermal DB-5 MS 120 °C, 4,45 min isothermal, with 40 °C/min to 210 °C, 0,5 min isothermal, with 2,5 °C/min to 270 °C, with 20 °C/min to 320 °C, 7,8 min isothermal
Temperature of the transfer line:	260 °C
HRMS- Conditions:	
Source temperature:	250 °C
Resolution / EI:	approx. 10.000 / 40 eV
Reference substance:	PFTBA, FC 43
MID mode, up to 3 masses per homologue group	
Setting time windows	

4.3.3.6 Process parameters

Detection limit (2378-TetraCDD): PCCD/F 0,001 ng/sample ≙ 0,0002 ng/m³ in 5 m³

4.3.3.7 Quality assurance measures

Compliance with isokinetic conditions ,
determination of the tightness of the sampling device,
cleaning of the glass parts used
Field blank value:

Date of sampling:	25.03.2021	16:00	Solution

Data on mass, concentration and comparison of results: Annex A1

The **field blank value** is sampled for each measurement series. An analysis is performed if the analysis values determined in the current series exceed WHO-TEQ2005 0,02 ng ≙ 0,004 ng/m or if analysis abnormalities are detected.

All dioxin analyses carried out are kept in a summary list and checked for the specified criteria. The quartz-filter and XAD-Datriges are checked in batches by the analysis laboratory (mas gmbh).

The last field blank determination was 21.03.2021 with 0,006337 ng WHO-TEQ2005 (including detection limit).

4.3.3.5 Analytical determination: PCB (WHO)

Before sampling / extraction / analysis the following ^{13}C-marked PCB were added to check the individual steps of the process (sampling, processing and analysis).

	sampling[1)]	extraction	analysis
$^{13}C_{12}$-2,3,4,4‘-TeCB (60)	X		
$^{13}C_{12}$-3,3‘,4,5,5‘-PeCB (127)	X		
$^{13}C_{12}$-2,3,3‘,4,5,5‘-HxCB (159)	X		
$^{13}C_{12}$-3,3‘,4,4‘-TeCB (77)		X	
$^{13}C_{12}$-3,4,4‘,5-TeCB (81)		X	
$^{13}C_{12}$-2,3,3‘,4,4‘-PeCB (105)		X	
$^{13}C_{12}$-2,3,4,4‘,5-PeCB (114)		X	
$^{13}C_{12}$-2,3‘,4,4‘,5-PeCB (118)		X	
$^{13}C_{12}$-2‘,3,4,4‘,5-PeCB (123)		X	
$^{13}C_{12}$-3,3,4,4‘,5-PeCB (126)		X	
$^{13}C_{12}$-2,3,3‘,4,4‘,5-HxCB (156)		X	
$^{13}C_{12}$-2,3,3‘,4,4‘,5‘-HxCB (157)		X	
$^{13}C_{12}$-2,3‘,4,4‘,5,5‘-HxCB (167)		X	
$^{13}C_{12}$-3,3‘,4,4‘,5,5‘-HxCB (169)		X	
$^{13}C_{12}$-2,3,3‘,4,4‘,5,5‘-HpCB (189)		X	
$^{13}C_{12}$-2,3‘,4‘,5-TeCB (70)			X
$^{13}C_{12}$-2,3,3‘,5,5‘-PeCB (111)			X
$^{13}C_{12}$-2,2‘,3,3‘,4,4‘,5-HpCB (170)			X

1) Doping in the quartz filter

Involvement of an external laboratory:	mas münster analytical solutions gmbh, Münster
Analytical Method:	DIN EN 1948, part 4, march 2014
Standard (preparation and analysis):	^{13}C-marked PCB
Reconditioning of the sample material:	same as 4.3.3.5 dioxine
Method of analysis:	GC-analysis with mass detector (GC/MS)
Analyzers:	Trace GC Ultra / DFS or MAT 95 XP, Thermo Scientific
Injection type:	PTV in cold feed mode
Injection volume, solvent:	1 µl, n-Nonan
GC-column:	DB-5 MS
Carrier gas:	Helium, 0,9 ml / min
Temperature program:	120 °C, 4 min isothermal, with 15 °C/min to 185 °C, with 1,5 °C/min to 205 °C, with 2,3 °C/min to 245 °C, with 6 °C/min to 290 °C, 13,44 min isothermal
Temperature of the transfer line:	260 °C
HRMS- Conditions:	
Source temperature:	250 °C
Resolution / EI:	approx. 10.000 / 40 eV
Reference substance:	PFTBA, FC 43

MID mode, up to 3 masses per homologue group

Setting time windows

4.3.3.6 Process parameters

detection limit (sum WHO-PCB):	2,33 ng / Probe ≙ 0,0041 ng TEQ or 0,0008 ng TEQ / m³ in 5 m³ sample volume

4.3.3.7 Quality assurance measures

Compliance with isokinetic conditions ,
determination of the tightness of the sampling device,
cleaning of the glass parts used
Field blank value (sampling in 4.3.3.7 PCDD/PCDF)

The **field blank value** is sampled for each measurement series.

An analysis shall be performed if the current analytical value for the sum of WHO PCBs in TEQ exceeds 0,01 ng. or if analysis abnormalities are detected.

oder The last field blank determination was 26.02.2021 mit < 0,01 ng ≙ < 0,0041 ng TEQ.

All PCB-analyses carried out are kept in a summary list and checked for the specified criteria. The quartz-filter and XAD-Datriges are checked in batches by the analysis laboratory (mas gmbh).

The TEQ values have been calculated using the WHO-TEF 2005.

4.3.3.5 Analytical determination: Benzo(a)pyrene (BaP)

Method of analysis:	Measurement of polycyclic aromatic hydrocarbons (PAH), GC/MS-procedure according to VDI 3874, december 2006
Reconditioning of the sample material:	same as 4.3.3.5 dioxine

10 % of the dioxin extraction solution is analysed as described below.

Preparation: SiOH-short columns (Baker-Bond SPE) and – if required - liquid-liquid distribution in the system dimethylformamide/water

Method of analysis	GC-analysis with mass detector (GC/MS)
Analyzers:	Trace GC Ultra / DSQ MS, Thermo Scientific
Column / carrier gas:	60 m DB-5 MS / Helium 0,9 ml/min
Temperature of transfer-line:	320 °C
MS-conditions:	MID mode: 2 masses per substance, setting time windows
Standards (preparation and analysis):	D12-Benzo(a)pyrene
Standard (Recovery):	D12-Perylen

4.3.3.6 Process parameters

detection limit:	0,02 µg ≙ 0,004 µg/m³ in 5 m³ sample volume

4.3.3.7 Quality assurance measures

Compliance with isokinetic conditions ,
determination of the tightness of the sampling device,
cleaning of the glass parts used
Field blank value (sampling in 4.3.3.7 PCDD/PCDF)

The **field blank value** is sampled for each measurement series. An analysis is performed if the analysis values determined in the current series exceed 0,02 ng ≙ 0,004 ng/m or if analysis abnormalities are detected.

All BaP-analyses carried out are kept in a summary list and checked for the specified criteria. The quartz-filter and XAD-Datriges are checked in batches by the analysis laboratory (mas gmbh).

The last field blank determination was 03.03.2020 with <0,02 µg BaP (<detection limit).

5 Operating state of the plant during the measurements

The operating data of the production plant can be obtained by the recording of measuring values of the operating measuring system in control station.

5.1 Production plant

The operating data of the plant during the measurements are indicated hereinafter.

Date	Steam mass flow	Operation condition
	kg/s	%
25.03.2021:	20,9	90
26.03.2021:	23,4	100
27.03.2021:	23,3	100

6 Summary of the results

6.1 Evaluation of the operating conditions during the measurements

During the measurements, the plant was operated in the intended mode at a capacity of 90 - 100 %, based on the steam quantity (see Section 5.1).

The operating conditions during the measurements corresponded to the condition of the highest emissions.

6.2 Measurement results

The measurement results and the guaranteed values are summarised in tables 6.1 to 6.4. Table 6.5 to 6.18 shows the single results.

Table 6.1: Results of the emission measurements (heavy metals, Sum concentration: Cd/Tl)

Standard	**EN 14385:2004-05**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty $U_{0,95}$	mass flow	operation condition
			from	to	Vol.-%	mg/m³	11 Vol.-% O_2 mg/Nm³	mg/m³	g/h	
Waste incineration boiler stack/ Stationary Pollution source number 001	25.03.2021	1	18:45	20:51	8,5	< 0,001	**< 0,001**	0,001	< 0,17	90%
	26.03.2021	2	13:07	15:13	8,8	< 0,001	**< 0,001**	0,001	< 0,22	100%
	27.03.2021	3	12:16	14:22	8,7	< 0,001	**< 0,001**	0,001	< 0,21	100%
minimum						< 0,001	**< 0,001**			
maximum						< 0,001	**< 0,001**			
average						< 0,001	**< 0,001**			
value guaranteed							**0,05**			

Table 6.2: Results of the emission measurements (Hg)

Standard	**DIN EN 13211:2001-06/2005-06**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty $U_{0,95}$	mass flow	operation condition
			from	to	Vol.-%	mg/m³	11 Vol.-% O_2 mg/Nm³	mg/m³	g/h	
Waste incineration boiler stack/ Stationary Pollution source number 001	25.03.2021	1	18:45	19:15	8,7	< 0,00018	**< 0,00018**	0,00	< 0,016	90%
	26.03.2021	2	13:07	13:37	8,8	< 0,00018	**< 0,00018**	0,00	< 0,022	100%
	27.03.2021	3	12:16	12:46	8,7	< 0,000027	**< 0,000027**	0,00	< 0,0031	100%
minimum						< 0,00003	**< 0,00003**			
maximum						< 0,0002	**< 0,0002**			
average						< 0,0001	**< 0,0001**			
value guaranteed							**0,05**			

Table 6.3: Results of the emission measurements (heavy metals, Sum concentration: Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Sn))

Standard	**EN 14385:2004-05**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty $U_{0,95}$	mass flow	operation condition
			from	to	Vol.-%	mg/m³	11 Vol.-% O_2 mg/Nm³	mg/m³	g/h	
Waste incineration boiler stack/ Stationary Pollution source number 001	25.03.2021	1	18:45	20:51	8,5	< 0,016	**< 0,016**	0,010	< 1,5	90%
	26.03.2021	2	13:07	15:13	8,8	< 0,016	**< 0,016**	0,010	< 2,0	100%
	27.03.2021	3	12:16	14:22	8,7	0,021	**0,021**	0,010	2,6	100%
minimum						<0,02	**< 0,016**			
maximum						0,02	**0,021**			
average						0,01	**0,018**			
value guaranteed							**0,5**			

Table 6.4: Results of the emission measurements (PCDD/PCDF)

Standard	**EN 1948:2006-06**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty $U_{0,95}$	mass flow	operation condition
			from	to	Vol.-%	ng TEQ/m³	11 Vol.-% O_2 ng TEQ/Nm³	ng TEQ/m³	µg TEQ/h	
Waste incineration boiler stack/ Stationary Pollution source number 001	25.03.2021	1	16:55	23:01	8,6	0,005	**0,005**	0,001	0,46	90%
	26.03.2021	2	11:17	17:23	8,8	0,006	**0,006**	0,001	0,79	100%
	27.03.2021	3	10:26	16:32	8,7	0,008	**0,008**	0,002	0,98	100%
minimum						0,005	**0,005**			
maximum						0,008	**0,008**			
average						0,007	**0,007**			
value guaranteed							**0,1**			

Table 6.5: Results of the emission measurements (Cd)

Standard	**EN 14385:2004-05**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty $U_{0,95}$	mass flow	operation condition
			from	to	Vol.-%	mg/m³	11 Vol.-% O_2 mg/Nm³	mg/m³	g/h	
Waste incineration boiler	25.03.2021	1	18:45	20:51	8,5	< 0,00016	**< 0,00016**	0,00013	< 0,015	90%
stack/ Stationary Pollution	26.03.2021	2	13:07	15:13	8,8	< 0,00017	**< 0,00017**	0,00013	< 0,020	100%
source number 001	27.03.2021	3	12:16	14:22	8,7	< 0,00016	**< 0,00016**	0,00012	< 0,019	100%
minimum						< 0,00016	**< 0,00016**			
maximum						< 0,00017	**< 0,00017**			
average						< 0,00016	**< 0,00016**			

Table 6.6: Results of the emission measurements (Tl)

Standard	**EN 14385:2004-05**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty $U_{0,95}$	mass flow	operation condition
			from	to	Vol.-%	mg/m³	11 Vol.-% O_2 mg/Nm³	mg/m³	g/h	
Waste incineration boiler	25.03.2021	1	18:45	20:51	8,5	< 0,0016	**< 0,0016**	0,0017	< 0,15	90%
stack/ Stationary Pollution	26.03.2021	2	13:07	15:13	8,8	< 0,0017	**< 0,0017**	0,0017	< 0,20	100%
source number 001	27.03.2021	3	12:16	14:22	8,7	< 0,0016	**< 0,0016**	0,0016	< 0,19	100%
minimum						< 0,0016	**< 0,0016**			
maximum						< 0,0017	**< 0,0017**			
average						< 0,0016	**< 0,0016**			

Table 6.7: Results of the emission measurements (Sb)

Standard	**EN 14385:2004-05**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty $U_{0,95}$	mass flow	operation condition
			from	to	Vol.-%	mg/m³	11 Vol.-% O_2 mg/Nm³	mg/m³	g/h	
Waste incineration boiler	25.03.2021	1	18:45	20:51	8,5	< 0,0016	**< 0,0016**	0,0012	< 0,15	90%
stack/ Stationary Pollution	26.03.2021	2	13:07	15:13	8,8	< 0,0017	**< 0,0017**	0,0013	< 0,20	100%
source number 001	27.03.2021	3	12:16	14:22	8,7	< 0,0016	**< 0,0016**	0,0012	< 0,19	100%
minimum						< 0,0016	**< 0,0016**			
maximum						< 0,0017	**< 0,0017**			
average						< 0,0016	**< 0,0016**			

Table 6.8: Results of the emission measurements (As)

Standard	**EN 14385:2004-05**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty $U_{0,95}$	mass flow	operation condition
			from	to	Vol.-%	mg/m³	11 Vol.-% O_2 mg/Nm³	mg/m³	g/h	
Waste incineration boiler	25.03.2021	1	18:45	20:51	8,5	< 0,0016	**< 0,0016**	0,0016	< 0,15	90%
stack/ Stationary Pollution	26.03.2021	2	13:07	15:13	8,8	< 0,0017	**< 0,0017**	0,0016	< 0,20	100%
source number 001	27.03.2021	3	12:16	14:22	8,7	< 0,0016	**< 0,0016**	0,0016	< 0,19	100%
minimum						< 0,0016	**< 0,0016**			
maximum						< 0,0017	**< 0,0017**			
average						< 0,0016	**< 0,0016**			

Table 6.9: Results of the emission measurements (Pb)

Standard	**EN 14385:2004-05**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty $U_{0,95}$	mass flow	operation condition
			from	to	Vol.-%	mg/m³	11 Vol.-% O_2 mg/Nm³	mg/m³	g/h	
Waste incineration boiler	25.03.2021	1	18:45	20:51	8,5	< 0,0016	**< 0,0016**	0,0014	< 0,15	90%
stack/ Stationary Pollution	26.03.2021	2	13:07	15:13	8,8	< 0,0017	**< 0,0017**	0,0015	< 0,20	100%
source number 001	27.03.2021	3	12:16	14:22	8,7	< 0,0016	**< 0,0016**	0,0014	< 0,19	100%
minimum						< 0,0016	**< 0,0016**			
maximum						< 0,0017	**< 0,0017**			
average						< 0,0016	**< 0,0016**			

Table 6.10: Results of the emission measurements (Cr)

Standard	**EN 14385:2004-05**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty	mass flow	operation condition
							11 Vol.-% O_2	$U_{0,95}$		
			from	to	Vol.-%	mg/m³	mg/Nm³	mg/m³	g/h	
Waste incineration boiler stack/ Stationary Pollution source number 001	25.03.2021	1	18:45	20:51	8,5	< 0,0016	**< 0,0016**	0,0014	< 0,15	90%
	26.03.2021	2	13:07	15:13	8,8	< 0,0017	**< 0,0017**	0,0014	< 0,20	100%
	27.03.2021	3	12:16	14:22	8,7	< 0,0016	**< 0,0016**	0,0014	< 0,19	100%
minimum						< 0,0016	**< 0,0016**			
maximum						< 0,0017	**< 0,0017**			
average						< 0,0016	**< 0,0016**			

Table 6.11: Results of the emission measurements (Co)

Standard	**EN 14385:2004-05**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty	mass flow	operation condition
							11 Vol.-% O_2	$U_{0,95}$		
			from	to	Vol.-%	mg/m³	mg/Nm³	mg/m³	g/h	
Waste incineration boiler stack/ Stationary Pollution source number 001	25.03.2021	1	18:45	20:51	8,5	< 0,0016	**< 0,0016**	0,0015	< 0,15	90%
	26.03.2021	2	13:07	15:13	8,8	< 0,0017	**< 0,0017**	0,0016	< 0,20	100%
	27.03.2021	3	12:16	14:22	8,7	< 0,0016	**< 0,0016**	0,0015	< 0,19	100%
minimum						< 0,0016	**< 0,0016**			
maximum						< 0,0017	**< 0,0017**			
average						< 0,0016	**< 0,0016**			

Table 6.12: Results of the emission measurements (Cu)

Standard	**EN 14385:2004-05**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty	mass flow	operation condition
							11 Vol.-% O_2	$U_{0,95}$		
			from	to	Vol.-%	mg/m³	mg/Nm³	mg/m³	g/h	
Waste incineration boiler stack/ Stationary Pollution source number 001	25.03.2021	1	18:45	20:51	8,5	< 0,0016	**< 0,0016**	0,0017	< 0,15	90%
	26.03.2021	2	13:07	15:13	8,8	< 0,0017	**< 0,0017**	0,0017	< 0,20	100%
	27.03.2021	3	12:16	14:22	8,7	< 0,0016	**< 0,0016**	0,0017	< 0,19	100%
minimum						< 0,0016	**< 0,0016**			
maximum						< 0,0017	**< 0,0017**			
average						< 0,0016	**< 0,0016**			

Table 6.13: Results of the emission measurements (Mn)

Standard	**EN 14385:2004-05**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty	mass flow	operation condition
							11 Vol.-% O_2	$U_{0,95}$		
			from	to	Vol.-%	mg/m³	mg/Nm³	mg/m³	g/h	
Waste incineration boiler stack/ Stationary Pollution source number 001	25.03.2021	1	18:45	20:51	8,5	< 0,0016	**< 0,0016**	0,0013	< 0,15	90%
	26.03.2021	2	13:07	15:13	8,8	< 0,0017	**< 0,0017**	0,0013	< 0,20	100%
	27.03.2021	3	12:16	14:22	8,7	0,0071	**0,0071**	0,0020	0,83	100%
minimum						< 0,0016	**< 0,0016**			
maximum						0,0071	**0,0071**			
average						0,0035	**0,0035**			

Table 6.14: Results of the emission measurements (Ni)

Standard	**EN 14385:2004-05**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty	mass flow	operation condition
							11 Vol.-% O_2	$U_{0,95}$		
			from	to	Vol.-%	mg/m³	mg/Nm³	mg/m³	g/h	
Waste incineration boiler stack/ Stationary Pollution source number 001	25.03.2021	1	18:45	20:51	8,5	< 0,0016	**< 0,0016**	0,0014	< 0,15	90%
	26.03.2021	2	13:07	15:13	8,8	< 0,0017	**< 0,0017**	0,0014	< 0,20	100%
	27.03.2021	3	12:16	14:22	8,7	< 0,0016	**< 0,0016**	0,0014	< 0,19	100%
minimum						< 0,0016	**< 0,0016**			
maximum						< 0,0017	**< 0,0017**			
average						< 0,0016	**< 0,0016**			

Table 6.15: Results of the emission measurements (V)

Standard	**EN 14385:2004-05**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty $U_{0,95}$	mass flow	operation condition
			from	to	Vol.-%	mg/m³	11 Vol.-% O_2 mg/Nm³	mg/m³	g/h	
Waste incineration boiler stack/ Stationary Pollution source number 001	25.03.2021	1	18:45	20:51	8,5	< 0,0016	**< 0,0016**	0,0017	< 0,15	90%
	26.03.2021	2	13:07	15:13	8,8	< 0,0017	**< 0,0017**	0,0017	< 0,20	100%
	27.03.2021	3	12:16	14:22	8,7	< 0,0016	**< 0,0016**	0,0017	< 0,19	100%
minimum						< 0,0016	**< 0,0016**			
maximum						< 0,0017	**< 0,0017**			
average						< 0,0016	**< 0,0016**			

Table 6.16: Results of the emission measurements (Sn)

Standard	**EN 14385:2004-05**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty $U_{0,95}$	mass flow	operation condition
			from	to	Vol.-%	mg/m³	11 Vol.-% O_2 mg/Nm³	mg/m³	g/h	
Waste incineration boiler stack/ Stationary Pollution source number 001	25.03.2021	1	18:45	20:51	8,5	< 0,0016	**< 0,0016**	0,0017	< 0,15	90%
	26.03.2021	2	13:07	15:13	8,8	< 0,0017	**< 0,0017**	0,0017	< 0,20	100%
	27.03.2021	3	12:16	14:22	8,7	< 0,0016	**< 0,0016**	0,0016	< 0,19	100%
minimum						< 0,0016	**< 0,0016**			
maximum						< 0,0017	**< 0,0017**			
average						< 0,0016	**< 0,0016**			

Table 6.17: Results of the emission measurements (Benzo(a)pyren)

Standard	**EN 15549:2008-06**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty $U_{0,95}$	mass flow	operation condition
			from	to	Vol.-%	µg/m³	11 Vol.-% O_2 µg/Nm³	µg/m³	mg/h	
Waste incineration boiler stack/ Stationary Pollution source number 001	25.03.2021	1	16:55	23:01	8,6	< 0,002	**< 0,002**	0,002	< 0,28	90%
	26.03.2021	2	11:17	17:23	8,8	< 0,003	**< 0,003**	0,002	< 0,40	100%
	27.03.2021	3	10:26	16:32	8,7	< 0,003	**< 0,003**	0,002	< 0,40	100%
minimum						< 0,002	**< 0,002**			
maximum						< 0,003	**< 0,003**			
average						< 0,003	**< 0,003**			

Table 6.18: Results of the emission measurements (heavy metals, Sum concentration: AS, Cd, Co, Cr, BaP)

Standard	**EN 14385:2004-05 / EN 15549:2008-06**									
Stationary pollution source name and number	date	measurement No.	time		O_2	concentration		expected measurement uncertainty $U_{0,95}$	mass flow	operation condition
			from	to	Vol.-%	mg/m³	11 Vol.-% O_2 mg/Nm³	mg/m³	g/h	
Waste incineration boiler stack/ Stationary Pollution source number 001	25.03.2021	1	18:45	20:51	8,5	< 0,005	**< 0,005**	0,004	< 0,47	90%
	26.03.2021	2	13:07	15:13	8,8	< 0,005	**< 0,005**	0,004	< 0,63	100%
	27.03.2021	3	12:16	14:22	8,7	< 0,005	**< 0,005**	0,004	< 0,60	100%
minimum						<0,005	**<0,005**			
maximum						<0,005	**<0,005**			
average						<0,005	**<0,005**			

6.3 Uncertainty of measurement

Table 6.19: Uncertainty of measurement

measurement object y	unit	mean measured value y_{mean} referred to reference value	maximum measured value y_{max} referred to reference value	expanded measurement uncertainty ($Up_{0,95}$)	$y_{max} - U_p$	$y_{max} + U_p$	value guaranteed	determination method
PCDD/PCDF	ng TEQ/m³	0,007	0,008	0,002	< 0,015	0,01	0,1	indirect
Sum concentration Cd/Tl	mg/m³	<0,001	<0,001	0,001	< 0,01	< 0,01	0,05	indirect
Sum concentration: Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V,	mg/m³	0,018	0,021	0,010	0,01	0,03	0,5	indirect
Hg	mg/m³	< 0,0001	< 0,0002	0,0001	< 0,001	< 0,001	0,05	indirect
O_2 reference value	Vol.-%	-	-	-	-	-	11	-

All concentration values are in dry norm state.

6.4 Plausibility check

The plant utilisation can be understood from the steam quantity of 20,9 kg/s – 23,4 kg/s (100 % load ≙ 23,2 kg/s normal full load).

The individual results and measurement protocols can be found in the appendix.

Taking into account the measurement accuracy of the applied measurement methods and the found operation mode of the plant, the results are plausible.

The measurement results are typical for a fully functioning exhaust gas cleaning system and all guaranteed limit values were complied with.

Environmental protection / Air pollution control Dept. (936)

Editor: Representative of the person responsible :

M.Sc. Jan Rettig Dipl.-Ing. Ferdinand Lehmann

Cologne, 17.06.2021

936/21252753/A1

7 Appendix

A1 Individual evaluations of the measurements

Annex A1: Individual evaluations of the measurements

Table 1: Determination of the volume flows

Plant		Waste incineration plant		
Measuring point		Chimney		
Date		25.3.2021	26.3.2021	27.3.2021
Measurement	no.	1	2	3
Start of measurement	time	16:00	10:00	09:20
Measuring time	min	16	16	16
Main volume flow (mean values)				
Temperature	°C	34	33	33
Temperature absolute	K	307	306	306
Air pressure	hPa	1007	1005	1005
Static pressure difference	hPa	-0,3	-0,4	-0,4
absolute pressure in the line	hPa	1007	1005	1005
Oxygen concentration	Vol.-%	6,1	7,7	7,3
Reference oxygen concentration	Vol.-%	11,0	11,0	11,0
Carbon dioxide concentration	Vol.-%	12,0	11,3	11,7
Humidity (ww)	Vol.-%	5,4	5,6	5,2
Density (t,p,h)	kg/m³	1,168	1,167	1,171
Average gas velocity	m/s	8,84	11,68	11,25
Ratio vmax:vmin		1,2 : 1	1,4 : 1	1,5 : 1
Line area	m²	3,46	3,46	3,46
Unnormalized flow qV,w (t,p,h)	m³/h (t,p,h)	110.270	145.600	140.270
expanded uncertainty	m³/h	11.641	10.004	10.301
relative expanded uncertainty	%	10,6	6,9	7,3
Volume flow, standardised, humid (norm h)	m³/h (n,h)	97.430	128.800	124.080
Volume flow, standardised qV,0d (horm dry)	m³/h (n,dr)	92.170	121.590	117.630
Volume flow, standardised in relation to 11 Vol.-% Reference oxygen concentration	m³/h (n,dr,O2)	137.330	161.710	161.150

Table 2: Determination of PCDD/PCDF emissions

Plant		Waste incineration plant		
Measuring point		Chimney		
Date		25.3.2021	26.3.2021	27.3.2021
Measurement	no.	1	2	3
Start of measurement	time	16:55	11:17	10:26
Measuring time		23:01	17:23	16:32
Main volume flow (mean values)				
Volume flow measurement	Nr.	1	2	3
Volume flow, standardised (horm dry)	m³/h	92.170	121.590	117.630
SAMPLING				
Duration of suction	min	360	360	360
Temperature at the gas meter	°C	18	16	15
Temperatur des Adsorbens	°C	7	7	7
Mean oxygen content	Vol.-%	8,6	8,8	8,7
Probe diameter	mm	7	6	6
Maximum suction rate	m³/h	1,3		
Partial gas volume (t,p,dr)	m³	6,980	6,321	6,112
Correction factor of the gas meter		1,026	1,026	1,026
Related to standard condition, dry (norm dr)	m³	6,678	6,078	5,897
Isokinetic ratio	%	109	102	102
Recovery rate, 13C12-12378-Penta-CDF	%	93,0	95,0	93,0
Recovery rate, 13C12-123789-Hexa-CDF	%	107,0	114,0	106,0
Recovery rate, 13C12-1234789-HeptaCDF	%	118,0	120,0	120,0
Recovery rate,12C12-PCB 60	%	107,0	120,0	100,0
Recovery rate,13C12-PCB 127	%	92,0	99,0	81,0
Recovery rate,13C12-PCB 159	%	98,0	112,0	105,0
MASS CONCENTRATION- AND FLOW				
PCDD/PCDF-mass (TEQ) in the partial flow	ng TEQ	0,03369	0,03970	0,04943
PCDD/PCDF-mass (TEQ), field blank value	ng TEQ	< 0,00634		
as concentration at partial gas volume (norm dr)	ng TEQ/m³	< 0,00095	< 0,00104	< 0,00108
in relation to the limit	%	< 0,9	< 1,0	< 1,1
in relation to the measured value	%	< 18,8	< 16,0	< 12,8
PCDD/PCDF-concentration in TEQ (norm dr)	ng TEQ/m³	0,005	0,006	0,008
PCDD/PCDF-concentration in TEQ (norm dr) with 11 Vol.-% Reference oxygen concentration	**ng TEQ/m³**	**0,005**	**0,006**	**0,008**
PCDD/PCDF-(TEQ)-mass flow	µg TEQ/h	0,46	0,79	0,98
Benzo(a)pyrene-mass, in partial gas volume	µg	< 0,02	< 0,02	< 0,02
BaP-mass, field blank value	µg	< 0,02		
as concentration at partial gas volume (norm dr)	µg/m³	< 0,0030	< 0,0033	< 0,0034
in relation to the limit	%	-	-	-
in relation to the measured value	%	< 100,0	< 100,0	< 100,0
Benzo(a)pyrene-conzentration (norm dr)	µg/m³	< 0,002	< 0,003	< 0,003
Benzo(a)pyrene-concentration with 11 Vol.-% Reference oxygen concentration	**µg/m³**	**< 0,002**	**< 0,003**	**< 0,003**
Benzo(a)pyrene-mass flow	mg/h	< 0,28	< 0,40	< 0,40

Table 3: Determination of PCDD/PCDF mass

Plant		Waste incineration plant					
Measuring point		Chimney					
Date		25.03.2021		26.03.2021		27.03.2021	
Measurement		1		2		3	
Start of measurement		16:55 Uhr		11:17 Uhr		10:26 Uhr	
Measuring time		23:01 Uhr		17:23 Uhr		16:32 Uhr	
PCDD/PCDF	TEF	ng/Sample	ng(TEF) Sample	ng/Sample	ng(TEF) Sample	ng/Sample	ng(TEF) Sample
PCDD 2378-Congeners							
2378-TetraCDD	1	0,001	0,00128	0,002	0,00167	0,001	0,00115
12378-PentaCDD	1	0,008	0,00798	0,009	0,00861	0,010	0,01046
123478-HexaCDD	0,1	0,004	0,00039	0,004	0,00041	0,005	0,00053
123678-HexaCDD	0,1	0,012	0,00116	0,013	0,00126	0,017	0,00169
123789-HexaCDD	0,1	0,005	0,00053	0,007	0,00074	0,009	0,00086
1234678-HeptaCDD	0,01	0,020	0,00020	0,020	0,00020	0,026	0,00026
12346789-OctaCDD	0,0003	< 0,045	< 0,00001	< 0,045	< 0,00001	< 0,045	< 0,00001
PCDF 2378-Congeners							
2378-TetraCDF	0,1	0,010	0,00096	0,012	0,00117	0,013	0,00134
12378-PentaCDF	0,03	0,017	0,00052	0,018	0,00054	0,025	0,00076
23478-PentaCDF	0,3	0,029	0,00872	0,036	0,01089	0,047	0,01403
123478-HexaCDF	0,1	0,014	0,00143	0,016	0,00164	0,019	0,00193
123678-HexaCDF	0,1	0,019	0,00190	0,018	0,00181	0,022	0,00225
123789-HexaCDF	0,1	< 0,003	< 0,00030	< 0,003	< 0,00030	< 0,003	< 0,00030
234678-HexaCDF	0,1	0,020	0,00200	0,021	0,00209	0,027	0,00266
1234678-HeptaCDF	0,01	0,022	0,00022	0,021	0,00021	0,025	0,00025
1234789-HeptaCDF	0,01	< 0,015	< 0,00015	< 0,015	< 0,00015	< 0,015	< 0,00015
12346789-OctaCDF	0,0003	< 0,045	< 0,00001	< 0,045	< 0,00001	< 0,045	< 0,00001
Polychlorierte Biphenyle							
Non ortho PCB							
PCB 77	0,0001	0,135	0,00001	0,118	0,00001	0,147	0,00001
PCB 81	0,0003	< 0,050	< 0,00002	< 0,050	< 0,00002	< 0,050	< 0,00002
PCB 126	0,1	0,064	0,00638	0,084	0,00844	0,112	0,01124
PCB 169	0,03	< 0,050	< 0,00150	< 0,050	< 0,00150	< 0,050	< 0,00150
Mono ortho PCB							
PCB 105	0,00003	< 0,500	< 0,000015	< 0,500	< 0,000015	< 0,500	< 0,000015
PCB 114	0,00003	< 0,100	< 0,000003	< 0,100	< 0,000003	< 0,100	< 0,000003
PCB 118	0,00003	< 1,000	< 0,000030	< 1,000	< 0,000030	< 1,000	< 0,000030
PCB 123	0,00003	< 0,100	< 0,000003	< 0,100	< 0,000003	< 0,100	< 0,000003
PCB 156	0,00003	0,125	0,000004	0,124	0,000004	0,146	0,000004
PCB 157	0,00003	< 0,100	< 0,000003	< 0,100	< 0,000003	< 0,100	< 0,000003
PCB 167	0,00003	< 0,100	< 0,000003	< 0,100	< 0,000003	< 0,100	< 0,000003
PCB 189	0,00003	< 0,100	< 0,000003	< 0,100	< 0,000003	< 0,100	< 0,000003
PCDD/PCDF-mass (TEQ) in the partial gas volume			0,03369		0,03970		0,04943

Table 4: Determination of heavy metal emissions No. 1

Plant:		Waste incineration plant					
Measuring point		Chimney					
Date		25.03.2021					
Messung-Nr.		1					
		particulate portion		**non-filterable portion**			
Start	hh:mm	18:45		18:45			
End	hh:mm	20:51		20:51			
	Vol.-%	8,5		8,5			
Reference oxygen concentration	Vol.-%	11,0					
main volume flow (Norm dr)	m³/h	92.170					
Extracted partial gas volume							
Duration of suction	min	120		120			
Probe diameter	mm	7					
partial gas volume (t,p,dr)	m³	1,737		0,382			
Correction factor of the gas meter		1,007		1,004			
average temperature at the gas meter	°C	23,0		22,0			
average temperature absolute	K	296,2		295,2			
pressure	hPa	1007		1007			
partial gas volume (norm dr)	m³	2,183	(with non-filterable portion)	0,353			
Isokinetic ratio	%	107					

Information on individual components	**particulate portion**		**non-filterable portion**		**sum**	**detection limit**
	concentration µg/sample	concentration mg/m³ (n,dr)	concentration µg/sample	concentration mg/m³ (n,dr)	concentration mg/m³ (n,dr)	concentration mg/m³ (n,dr)
Cadmium	< 0,1	< 0,00002	< 0,1	< 0,00014	< 0,00016	< 0,00016
Thallium	< 0,5	< 0,00023	< 0,5	< 0,00142	< 0,00165	< 0,00165
Antimony	< 0,5	< 0,00023	< 0,5	< 0,00142	< 0,00165	< 0,00165
Arsenic	< 0,5	< 0,00023	< 0,5	< 0,00142	< 0,00165	< 0,00165
Lead	< 0,5	< 0,00023	< 0,5	< 0,00142	< 0,00165	< 0,00165
Chromium	< 0,5	< 0,00023	< 0,5	< 0,00142	< 0,00165	< 0,00165
Cobalt	< 0,5	< 0,00023	< 0,5	< 0,00142	< 0,00165	< 0,00165
Copper	< 0,5	< 0,00023	< 0,5	< 0,00142	< 0,00165	< 0,00165
Manganese	< 0,5	< 0,00023	< 0,5	< 0,00142	< 0,00165	< 0,00165
Nickel	< 0,5	< 0,00023	< 0,5	< 0,00142	< 0,00165	< 0,00165
Vanadium	< 0,5	< 0,00023	< 0,5	< 0,00142	< 0,00165	< 0,00165
Tin	< 0,5	< 0,00023	< 0,5	< 0,00142	< 0,00165	< 0,00165
Benzo(a)pyrene					< 0,000003	< 0,000003

components/summations relevant to the limit value	concentration mg/m³ (n,dr)	concentration mg/m³ (n,dr, O2)	expanded measurement uncertainty mg/m³ (n,dr, O2)	mass flow g/h
Summe Cd/Tl	< 0,001	< 0,001	0,001	< 0,17
Summe Sb-Sn	< 0,01	< 0,01	0,01	< 1,5
Summe As-Cr, BaP	< 0,005	< 0,005	0,004	< 0,47

For the sum values, non-detected individual components with the specified detection limit were taken into account.

Table 5: Determination of heavy metal emissions No. 2

Plant:		Waste incineration plant					
Measuring point		Chimney					
Date		26.03.2021					
Messung-Nr.		2					
		particulate portion		**non-filterable portion**			
Start	hh:mm	13:07		13:07			
End	hh:mm	15:13		15:13			
	Vol.-%	8,8		8,8			
Reference oxygen concentration	Vol.-%	11,0					
main volume flow (Norm dr)	m³/h	121.590					
Extracted partial gas volume							
Duration of suction	min	120		120			
Probe diameter	mm	6					
partial gas volume (t,p,dr)	m³	1,6727		0,376			
Correction factor of the gas meter		1,007		1,004			
average temperature at the gas meter	°C	22,0		21,0			
average temperature absolute	K	295,2		294,2			
pressure	hPa	1005		1005			
partial gas volume (norm dr)	m³	2,183	(with non-filterable portion)	0,348			
Isokinetic ratio	%	110					

Information on individual components	**particulate portion**		**non-filterable portion**		**sum**	**detection limit**
	concentration µg/sample	concentration mg/m³ (n,dr)	concentration µg/sample	concentration mg/m³ (n,dr)	concentration mg/m³ (n,dr)	concentration mg/m³ (n,dr)
Cadmium	< 0,1	< 0,00002	< 0,1	< 0,00014	< 0,00017	< 0,00017
Thallium	< 0,5	< 0,00023	< 0,5	< 0,00144	< 0,00167	< 0,00167
Antimony	< 0,5	< 0,00023	< 0,5	< 0,00144	< 0,00167	< 0,00167
Arsenic	< 0,5	< 0,00023	< 0,5	< 0,00144	< 0,00167	< 0,00167
Lead	< 0,5	< 0,00023	< 0,5	< 0,00144	< 0,00167	< 0,00167
Chromium	< 0,5	< 0,00023	< 0,5	< 0,00144	< 0,00167	< 0,00167
Cobalt	< 0,5	< 0,00023	< 0,5	< 0,00144	< 0,00167	< 0,00167
Copper	< 0,5	< 0,00023	< 0,5	< 0,00144	< 0,00167	< 0,00167
Manganese	1,2	0,00055	< 0,5	< 0,00144	0,00055	< 0,00167
Nickel	< 0,5	< 0,00023	< 0,5	< 0,00144	< 0,00167	< 0,00167
Vanadium	< 0,5	< 0,00023	< 0,5	< 0,00144	< 0,00167	< 0,00167
Tin	< 0,5	< 0,00023	< 0,5	< 0,00144	< 0,00167	< 0,00167
Benzo(a)pyrene					< 0,000003	< 0,000003

components/summations relevant to the limit value	concentration mg/m³ (n,dr)	concentration mg/m³ (n,dr, O2)	expanded measurement uncertainty mg/m³ (n,dr, O2)	mass flow g/h
Summe Cd/Tl	< 0,002	< 0,002	0,001	< 0,22
Summe Sb-Sn	< 0,02	< 0,02	0,01	< 2,0
Summe As-Cr, BaP	< 0,005	< 0,005	0,004	< 0,63

For the sum values, non-detected individual components with the specified detection limit were taken into account.

Table 6: Determination of heavy metal emissions No. 3

Plant:		Waste incineration plant					
Measuring point		Chimney					
Date		27.03.2021					
Messung-Nr.		3					
		particulate portion		**non-filterable portion**			
Start	hh:mm	12:16		12:16			
End	hh:mm	14:22		14:22			
	Vol.-%	8,7		8,7			
Reference oxygen concentration	Vol.-%	11,0					
main volume flow (Norm dr)	m³/h	117.630					
Extracted partial gas volume							
Duration of suction	min	120		120			
Probe diameter	mm	6					
partial gas volume (t,p,dr)	m³	1,5968		0,39			
Correction factor of the gas meter		1,007		1,004			
average temperature at the gas meter	°C	19,0		23,0			
average temperature absolute	K	292,2		296,2			
pressure	hPa	1005		1005			
partial gas volume (norm dr)	m³	2,111	(with non-filterable portion)	0,358			
Isokinetic ratio	%	110					

Information on individual components	**particulate portion**		**non-filterable portion**		**sum**	**detection limit**
	concentration µg/sample	concentration mg/m³ (n,dr)	concentration µg/sample	concentration mg/m³ (n,dr)	concentration mg/m³ (n,dr)	concentration mg/m³ (n,dr)
Cadmium	0,1	0,00003	< 0,1	< 0,00014	0,00003	< 0,00016
Thallium	< 0,5	< 0,00024	< 0,5	< 0,00140	< 0,00163	< 0,00163
Antimony	< 0,5	< 0,00024	< 0,5	< 0,00140	< 0,00163	< 0,00163
Arsenic	< 0,5	< 0,00024	< 0,5	< 0,00140	< 0,00163	< 0,00163
Lead	0,6	0,00028	< 0,5	< 0,00140	0,00028	< 0,00163
Chromium	1,8	0,00085	< 0,5	< 0,00140	0,00085	< 0,00163
Cobalt	< 0,5	< 0,00024	< 0,5	< 0,00140	< 0,00163	< 0,00163
Copper	1,5	0,00071	< 0,5	< 0,00140	0,00071	< 0,00163
Manganese	15,0	0,00710	< 0,5	< 0,00140	0,00710	< 0,00163
Nickel	2,0	0,00095	< 0,5	< 0,00140	0,00095	< 0,00163
Vanadium	1,2	0,00057	< 0,5	< 0,00140	0,00057	< 0,00163
Tin	< 0,5	< 0,00024	< 0,5	< 0,00140	< 0,00163	< 0,00163
Benzo(a)pyrene					< 0,000003	< 0,000003

components/summations relevant to the limit value	concentration mg/m³ (n,dr)	concentration mg/m³ (n,dr, O2)	expanded measurement uncertainty mg/m³ (n,dr, O2)	mass flow g/h
Summe Cd/Tl	< 0,002	< 0,002	0,001	< 0,21
Summe Sb-Sn	0,02	0,02	0,01	2,6
Summe As-Cr, BaP	< 0,005	< 0,005	0,004	< 0,60

For the sum values, non-detected individual components with the specified detection limit were taken into account.

Table 7: Determination emissions - Hg

Plant:	Waste incineration plant			
Measuring point	Chimney			
Date:		25.3.2021	26.3.2021	27.3.2021
Measurement No.		1	2	3
Start	time	18:45	13:07	12:16
End	time	19:15	13:37	12:46
Main volume flow				
Volume flow measurement	No.	1	2	3
Related to standard condition dryn (Norm tr)	m³/h	92.170	121.590	117.630
non-filterable portion				
partial gas volume		dry gas meter		
Duration of suction	min	30	30	30
partial gas volume (t,p,dr)	m³	0,0640	0,0627	0,6220
Correction factor of the gas meter		1,006	1,006	1,006
Average temperature at the gas meter	°C	18	18	18
Average temperature absolute	K	291	291	291
Pressure	hPa	1007	1005	1005
partial gas volume (norm dr)	m³	0,0600	0,0587	0,5824
mass found in the sample	µg	< 0,01	< 0,01	< 0,01
mass, field blank value	µg	< 0,01		
related to the partial gas volume (Norm dr)	mg/m³	< 0,00017	< 0,00017	< 0,00002
Blank value in relation to the limit value	%	< 0,3	0,3	< 0,1
Blank value in relation to the measured value	%	< 100,0	< 100,0	< 100,0
Mass concentration (norm dr)	mg/m³	< 0,00017	< 0,00017	< 0,00002
mass flow	g/h	< 0,015	< 0,020	< 0,002
average total oxygen	Vol.-%	8,7	8,8	8,7
Reference oxygen content	Vol.-%	11,0	11,0	11,0
Mass concentration (norm dr, 11 Vol.-% O2)	mg/m³	< 0,00017	< 0,00017	< 0,00002
Paricular fraction Hg (isokinetic sampling)				
Extracted partial gas volume		dry gas meter		
Duration of suction	min	120	120	120
partial gas volume (t,p,dr)	m³	1,737	1,673	1,597
Correction factor of the gas meter		1,007	1,007	1,007
Average temperature at the gas meter	°C	23	22	19
Average temperature absolute	K	296	295	292
Pressure	hPa	1007	1005	1005
partial gas volume (norm dr)	m³	2,1830	2,1830	2,1114
Isokinetic ratio	%	107	110	110
mass found in the sample	µg	0,06	0,08	0,07
Mass, field blank value	µg	< 0,06		
partial gas volume (t,p,dr)	mg/m³	< 0,00003	< 0,00003	< 0,00003
Blank value in relation to the limit value	%	< 0,1	< 0,1	< 0,1
Blank value in relation to the measured value	%	< 100,0	< 75,0	< 85,7
average total oxygen	Vol.-%	8,5	8,8	8,7
Reference oxygen content	Vol.-%	11,0	11,0	11,0
mass concentration (norm dr)	mg/m³	< 0,00003	0,00004	0,00003
mass concentration (norm dr, 11 Vol.-% O2)	mg/m³	< 0,00003	0,00004	0,00003
mass flow	g/h	< 0,00253	0,0045	0,0039
sum mass concentration (norm dr)	mg/m³	< 0,00019	0,00021	0,00005
sum mass concentration (norm dr, 11 Vol.-%	mg/m³	< 0,00019	0,00021	0,00005
Total mass flow	g/h	< 0,018	0,024	0,005

TÜV RHEINLAND ENERGY GMBH

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-11120-02-00

Report on the implementation of emission measurements downstream venting fuel bunker (dust, NH_3), bottom ash room (Dust) and exhaust diesel electric generator (NOx) in the waste incineration plant in Vilnius of the Company Lietuvos energija

TÜV Report No.: 936/21251811/B
Cologne, 26.02.2021

www.umwelt-tuv.de

tre-service@de.tuv.com

The department of Environmental Protection of TÜV Rheinland Energy GmbH
is accredited for the following work areas:

- Determination of air quality and emissions of air pollution and emissions of odour substances;
- Inspection of correct installation, function and calibration of continuously operating emission measuring instruments, including data evaluation and remote emission monitoring systems;
- Combustion chamber measurements;
- Performance testing of measuring systems for continuous monitoring of emissions and ambient air, and of electronic data evaluation and remote emission monitoring systems;
- Determination of stack height and air quality projections for hazardous and odour substances;
- Determination of emission and ambient air quality of noise and vibration, determination of sound power levels and execution of sound measurements at wind energy plants

according to EN ISO/IEC 17025.

The accreditation is valid since 30-08-2019. DAkkS-register number: D-PL-11120-02-00.

TÜV Rheinland Energy GmbH
D-51105 Cologne, Am Grauen Stein, Tel: +49 221 806-5200, Fax: +49 221 806-1349

blank page

DAkkS Deutsche Akkreditierungsstelle D-PL-11120-02-00

Report on the implementation of emission measurements downstream venting fuel bunker (dust, NH3), bottom ash room (Dust) and exhaust diesel electric generator (NOx) in the waste incineration plant in Vilnius of the Company Lietuvos energija

plant operator:	Lietuvos energija UAB Vilniaus kogeneracine jegaine Kodas 303782367 Zveju g.14 LT-09310 Vilnius Lithuania
Audited site:	Jocioniu g. 13 LT-02300 Vilnius Lithuania
Order number: **(of the customer)**	4200080705
Date of application:	05.01.2021
Customer ID:	1033976
Duration of the test:	17.-18.01.2021
Scope of report:	35 pages in total Annex starts on page 29
Objectives:	Determination of the emissions downstream waste incineration plant fuel bunker, bottom ash room and diesel electric generator
Installation arrangement:	Directive 2010/75/EU on industrial emissions

blank page

Summary

The dust measurements downstream venting of the waste incineration plant fuel bunker and the bottom ash room showed concentrations below the detection limit.

The NH_3 content downstream venting of the waste incineration plant fuel bunker was very low with a maximum of 1 mg/m³

The NOx content was a maximum of 322 mg/m³ with an O_2 content of 18.3 Vol.-%.

blank page

TABLE OF CONTENTS **PAGE**

blank page

1 Objectives

1.1	**Client:**	Steinmüller Babcock Environment GmbH Fabrikstr. 1 51643 Gummersbach
1.2	**Plant operator:**	Lietuvos energija UAB Vilniaus kogeneracine jegaine Kodas 303782367 Zveju g.14 LT-09310 Vilnius Lithuania
	Contact person:	Mr Matas Mizera
	Telephone number:	+370 620 65856
	Work place number:	-
1.3	**Location:**	Jocioniu g. 13 LT-02300 Vilnius Lithuania
1.4	**Plant:**	Waste incineration plant according RL 2010/75/EU,
	Plant number:	-
1.5	**Date / Duration of the test:**	17.-18.01.2021
	Previous measurement:	new installation
	Next measurement:	according to the license
1.6	**Reason:**	Initial measurement of emissions downstream waste incineration plant fuel bunker, bottom ash room and diesel electric generator.
	Approving authority:	not known
	Licence:	not known
	Listing of measured objects:	

Emission source	Measuring component
Waste incineration plant fuel bunker	NH_3, Dust
Bottom ash room	Dust
Diesel electric generator	NOx

1.6.1	**Deviation from EN 14181:**	none
1.7	**Measurement plan coordination:**	The measurement planning was consulted with the plant builder Steinmüller Babcock Environment GmbH.
1.8	**Personnel involved in the test:**	Mr Dipl.-Ing. Ferdinand Lehmann (project manager), Mr Jan Rettig M. Sc. Mr Ralf Ritter
1.9	**Participation of further institutes:**	No

2 Description of the plants and the materials handled

2.1 Type of plant: Designation according to letter of permit

2.2 Description of the plant

Waste incineration plant:

The waste incineration plant includes a downstream flue gas cleaning system.

Brand:	Steinmüller Babcock, Gummersbach (boiler, grate)
Type:	Forward moving grate
Year of manufacture:	2020
Boiler No.:	8496
Steam mass flow	23,2 kg/s
Max. allow. operating pressure:	83 bar
Operating pressure at superheater outlet:	76,5 bar
Superheater outlet temperature:	451 °C
Max. allow. steam temperature at superheater outlet:	466 °C
Fuel:	Domestic waste
Max. furnace thermal rating:	70,00 MW

Engine of diesel electric generator:

Brand:	MTU
Type:	20V 4000G23
Year of manufacture:	2020
No.:	528105301
Fuel:	Diesel
Power (mechanically) in kW:	2200
Power (electric) in kVA:	2500

Electric generator

Brand:	Marelli Motori
Type:	synchronous generator, MJH560 LA4 B24
No.:	1001098
Baujahr:	2020

2.3 Description of the emission sources

Waste incineration plant:

Emission source:	Stack
Height above ground:	80 m
Cross-sectional area of outlet:	3,5 m²
Building design:	steel

Diesel electric generator:

Emission source:	Exhaust pipe
Height above ground:	4,5 m
Cross-sectional area of outlet:	0,2 m²
Building design:	steel

2.4 Statement of raw materials possible according to the permit: Domestic waste, natural gas, diesel

2.5 Operating times: Not applicable

2.6 Device for collecting and reducing the emissions

2.6.1 Device collecting the emissions

Apparatus for emission collection:	Closed plant with directed emission source
Collection element:	suction draught ventilator

2.6.2 Device reducing the emissions

Not relevant

3 [measured objects] Sampling site for parallel measurements (waste incineration plant fuel bunker)

3.1 Location of the measurement cross-section

Measuring point is located on top of the waste incineration plant fuel bunker at the end of the 2 exhaust ducts.

- Outdoor	x
- Indoor	☐
- In front of draft fan	☐
- Behind draft fan	x
- In waste gas duct	x
- In stack	☐
Sampling point is located	ca. 38 m above ground level.
Exhaust gas is	Horizontal
Access is provided via	Elevator
Inlet section in m:	1
Outlet section in m:	0

In compliance with the sampling site and the requirements according to EN 15259 as well as EN 14181

Inlet section ≥ 5 D_h:	No
Outlet section ≥ 2 D_h:	No
Outlet section ≥ 5 D_h till the outlet:	No
Angle between gas flow/ central axis Waste gas duct < 15°:	Yes
No negative local flow:	Yes
Minimum velocity is available (differential pressure > 5 Pa):	Yes
Relation max. to min. velocity < 3:1:	Yes

Notice :

Requirements according to EN 15259 regarding The inlet section (< 5Dhydr.) are not fulfilled. Due to the construction, there is no better suited measuring point in the plant. Performance of the sampling site is proved by the grid measurement.

3.2	**Dimensions of the measurement cross-section:**	1,49 m x 0,74 m	≙ 1,1 m²

3.3 Number of measurement axes and position of the measurement points in the measurement cross-section

Angles:	2
Sampling point per angle:	4
Distance of sampling points from duct site:	0,19 m

3 [measured objects] Sampling site for parallel measurements (bottom ash room)

3.1 Location of the measurement cross-section

Measuring point is located on top of the bottom ash room at the end of the exhaust duct.

- Outdoor	x
- Indoor	☐
- In front of draft fan	☐
- Behind draft fan	x
- In waste gas duct	x
- In stack	☐
Sampling point is located	ca. 10 m above ground level.
Exhaust gas is	Horizontal
Access is provided via	Fixed ladder
Inlet section in m:	1
Outlet section in m:	0

In compliance with the sampling site and the requirements according to EN 15259 as well as EN 14181

Inlet section ≥ 5 D_h:	No
Outlet section ≥ 2 D_h:	No
Outlet section ≥ 5 D_h till the outlet:	No
Angle between gas flow/ central axis Waste gas duct < 15°:	Yes
No negative local flow:	Yes
Minimum velocity is available (differential pressure > 5 Pa):	Yes
Relation max. to min. velocity < 3:1:	Yes

Notice :

Requirements according to EN 15259 regarding The inlet section (< 5Dhydr.) are not fulfilled. Due to the construction, there is no better suited measuring point in the plant. Performance of the sampling site is proved by the grid measurement.

3.2	**Dimensions of the measurement cross-section:**	1,49 m x 0,98 m	≙ 1,46 m²

3.3 Number of measurement axes and position of the measurement points in the measurement cross-section

Angles:	2
Sampling point per angle:	3
Distance of sampling points from duct site:	0,25 m

3 [measured objects] Sampling site for parallel measurements (diesel electric generator)

3.1 Location of the measurement cross-section

Measuring point is located on the outside wall of the waste incineration plant at the end of the exhaust duct.

- Outdoor	x
- Indoor	☐
- In front of draft fan	☐
- Behind draft fan	x
- In waste gas duct	x
- In stack	☐
Sampling point is located	4,5 m above ground level.
Exhaust gas is	Horizontal
Access is provided via	Elevator
Inlet section in m:	4
Outlet section in m:	0

In compliance with the sampling site and the requirements according to EN 15259 as well as EN 14181

Inlet section ≥ 5 D_h:	Yes
Outlet section ≥ 2 D_h:	No
Outlet section ≥ 5 D_h till the outlet:	No
Angle between gas flow/ central axis Waste gas duct < 15°:	Yes
No negative local flow:	Yes
Minimum velocity is available (differential pressure > 5 Pa):	Yes
Relation max. to min. velocity < 3:1:	Yes

Notice :

Requirements according to EN 15259 regarding (outlet section < 2 D_h) are not fulfilled. Due to the construction, there is no better suited measuring point in the plant.

3.2	**Dimensions of the measurement cross-section:**	∅ 0,5 m	≙ 0,2 m²

3.3 Number of measurement axes and position of the measurement points in the measurement cross-section

Angles:	1
Sampling point per angle:	1
Distance of sampling points from duct site:	0,25 m

4 [measured objects] Methods of measurement for parallel measurements

4.1 Standard reference methods and measurement methods for waste gas conditions

4.1.1	**Flow velocity:**	Anemometer	
	Measuring system / guideline:	EN ISO 16911, June 2013	
	Manufacturer / T ype / measuring range / detection limit:	Höntzsch / MP-flowth./ 0 - 40 m/s / 0.3 m/s	
	Last check/calibration:	Before measuring	01 / 2020
	Continuous determination:	Not applicable	
4.1.2	**Static pressure in the waste gas duct:**	Prandtl's pitot tube with a micromanometer	
		SI GmbH / LPU 3 / 0 - 500 / 0 - 5000 Pa / 1,5 m/s	
		Not applicable	
4.1.3	**Air pressure at the height of the sampling location**		
	Measuring system:	Barometer	
	Manufacturer / type / measuring range:	GPB / 300 - 1100 hPa	
	Last check/calibration:	Before measuring	04 / 2020
4.1.4	**Waste gas temperature**		
	Manufacturer / type:	NiCr-/Ni thermo element, type K	
	Temperature measuring instrument, manufacturer / type / measuring range:	Kane May / KM 45	
	Last check/calibration:	Before measuring	09 / 2020
	Continuous determination and recording:	Not applicable	
4.1.5	**Water vapour content in the waste gas (waste gas moisture):**	Not required	
4.1.6	**Waste gas density:**	Not applicable	

4.2	**Discontinuous measurement methods for gaseous measured objects**		
	Not applicable		
4.3	**Automated parallel measurement methods for gaseous measured objects**		
	Measured object:	Oxygen (O_2)	
4.3.1	**Measuring system / guideline:**	Paramagnetism / EN 14789	
4.3.2	**Analyser:**	TÜV measuring system	
	Manufacturer / type:	Horiba / PG-350E	
4.3.3	**Measuring range set:**	0 – 25 Vol.-%	
4.3.4	**Declaration of suitability:**	Yes	
4.3	**Automated parallel measurement methods for gaseous measured objects**		
	Measured object	Carbon dioxide (CO_2)	
4.3.1	**Measuring system / guideline:**	NDIR / analogue EN 15058	
4.3.2	**Analyser:**	TÜV measuring system	
	Manufacturer / type:	Horiba / PG-350E	
4.3.3	**Measuring range set:**	0 - 20 Vol.-%	
4.3.4	**Declaration of suitability:**	Yes	
4.3.5	**Sampling system**		
	Sampling probe/ suction tube:	Heated to °C	160
	Particle filter:	Heated by waste gas	
	Sample gas line before gas treatment:	Heated to °C	150
	Sample gas line before gas treatment:	Length, in m	10
	Sample gas line after gas treatment:	Unheated	
	Sample gas line after gas treatment:	Length, in m	2
	Material of gas-bearing parts:	Stainless steel, PTFE	
	Measuring gas processing:	Sample gas cooler	
	Manufacturer / type:	M & C / PSS 5	
	Temperature, controlled to dew point temperature:	3 °C ± 1 K	

4.3.6 Check of the instrument characteristic with the following test gases

Zero gas:		N_2	N_2
Test gas:		O_2, dehumidified air	CO_2
Concentration:	Vol.-%	20.94	15,9
Uncertainty::	%	-	2
Cylinder number:		-	16860
Manufacturer:		-	Nippon Gases
Production date:		-	29.10.2020
Guarantee of stability:	Months	-	36
Certified:		No	yes
Check of the certificate by:		-	Own laboratory
Check of the certificate on:		-	10.12.2020

4.3.7 90% - Response time of the entire measuring system in s (feeding of test gases via the probe): < 60 | < 60

4.3.8 Recording of measured values

With a data acquisition system (data processor), manufacturer / type:	Yokogawa / DX 1012-3-4-2
Data collection programme (software):	Yokogawa / Excel

5.4 Discontinuous standard reference measurement method for particulate substances

Not applicable

4 [NO_X] Measurement methods for parallel measurements

4.1	**Determination of waste gas conditions:**	Not applicable	
4.2	**Discontinuous measurement methods for gaseous measured objects:**	Not applicable	
4.3	**Automated measurement methods for gaseous measured objects**		
4.3.1	**Measuring system / guideline:**	Chemiluminescence, EN 14792	
4.3.2	**Analyser:**	TÜV measuring system (NO_X)	
	Manufacturer/type:	Horiba / PG-350E	
	Converter (measuring of NO_2 as NO): coefficient:	Integrated converter > 95 % determined in laboratory	
4.3.3	**Measuring range set**	0 - 200 ppm	
4.3.4	**Declaration of suitability**	Yes	
4.3.5	**Sampling system**		
	Sampling probe:	Heated to °C	160
	Particle filter:	Heated by waste gas	
	Sample gas line before gas treatment:	Heated to °C	150
	Sample gas line before gas treatment:	Length, in m	10
	Sample gas line after gas treatment:	Unheated	
	Sample gas line after gas treatment:	Length, in m	2
	Material of gas-bearing parts:	Stainless steel, PTFE	
	Sample gas conditioning,:	Sample gas cooler	
	Manufacturer/ type:	M & C / PSS 5	
	Temperature, controlled to dew point temperature:	3 °C ± 1 K	

4.3.6	**Check of the instrument characteristic with test gases:**		**NO**
	Zero gas:		N_2
	Test gas:		NO
	Concentration:	mg/m³	227
	Uncertainty:	%	2
	Cylinder number:		16860
	Manufacturer:		Nippon Gases
	Production date:		29.10.2020
	Guarantee of stability:	Months	36
	Certified:		Yes
	Check of the certificate by:		Own laboratory
	Check of the certificate on:		10.12.2020
4.3.7	**90% - Response time of the entire measuring system in s** (feeding of test gases via the probe):		< 60

4.3.8 Recording of measured values

Please refer to section **4 [measured objects] Measurement methods for parallel measurements**

4.4 Discontinuous standard reference measurement method for particulate substances

Not applicable

4 [NH_3] Measurement methods for parallel measurements

4.1 Parallel measurements and measurement methods for waste gas conditions

Please refer to section **4 [measured objects] Measurement methods for parallel measurements**

4.2 Discontinuous measurement methods for gaseous measured objects

4.2.1	**Measurement methods:**	VDI 3878 (September 2017)
4.2.2	**Sampling system**	
	Volume measurement instruments:	Gasmeter
	Absorption system:	100 ml frit washing bottles D2 (twice)
	Sorption agent	0.05 mol/l sulphuric acid
	Stability time of the samples:	15 Days
	Transport and storage:	In brown PP bottles with PE cover
4.2.3	**Analytical determination**	
	Analytic device:	Dionex DX-120 with conductivity detector
	Columns / Flow:	CS16 0.9 ml/min
	Eluent:	Methane sulfonic acid
	Evaluation:	Surface calculation
	Standards:	Standard calibration procedure, standard solution Merck, 19812, 1000 mg NH_4^+/l
4.2.4	**Performance characteristics**	
	Detection limit:	0.01 mg NH_3 ≙ 0.2 mg/m³ bei 0.05 m³ gas volume sampled
4.2.5	**Measures for quality assurance:**	Determination of leaks and determination of blank sample

4.3 Automated measurement methods for gaseous measured objects

Not applicable

4.4 Discontinuous parallel measurement methods for particulate measured objects

Not applicable

4 [Dust] Measurement methods for parallel measurements

4.1 Parallel measurements and measurement procedures for waste gas conditions

Please refer to section **4 [measured objects] Measurement methods for parallel measurements**

4.2 Discontinuous measurement methods for gaseous measured objects

Not applicable

4.3 Automated measurement methods for gaseous measured objects

Please refer to section **4 [measured objects] Measurement methods for parallel measurements**

4.4 Discontinuous parallel measurement methods for particulate measured objects

4.4.1	**Measurement method:**	EN 13284, Part 1, November 2017
	Basis of procedure:	Gravimetric determination
4.4.2	Sampling system**:**	Planar filter device
	Arrangement:	Instack, heated by waste gas
	Spamling probe / sampling pipe:	Titanium/ stainless steel heated by waste gas
	Filtration medium (planar filter):	Quartz fibre Whatman, 1851
	Filter diameter:	50 mm
	Filtration efficiency:	> 99.9 %
	Effective diameter in mm:	18
	Adsorption systems for filter passing materials:	Not applicable
	Suction device:	Vacuum pump
4.4.3	**Conditioning of the filtration media**	
	Transport and storage of the filters:	In round tanks made of polystyrene
	Drying temperature/period of the filtration medium before and after sampling:	300 °C / at least 1 h 160 °C / 160 °C / at least 1 h
	Recovery of deposits upstream the filter:	After each measuring sequence (at least once a day)
	Treatment of rinsing solutions:	Vaporizing, drying
4.4.4	**Processing and evaluation of the measuring filters and the absorption solutions**	
4.4.4.1	**Weighing**	
	Balance / manufacturer / type / measuring range:	50 mm filter: MC 210P / Sartorius / 0 -210 g
	Detection limit / accuracy of reading:	0.01 mg / 0.01 mg
	Air-conditioned weighing room:	Yes
4.4.4.2	**Preparation and analysis**	
	Preparation:	Conditioning in weighing room
	Digestion method / analytical methods:	Not applicable
4.4.5	**Performance characteristics:**	No deviations according to EN 13284

4.4.6	**Measures for quality assurance:**	Annual maintenance (manufacturer), before each weighinhg sequence, testing with scale whights, testing of leak, keeping the isocinetic conditions, Field blank value determination
	Field blank value	
	Time of sampling:	17.01.2021 14:00 Clock
	Components:	Planar filter
	Detection limit::	0.3 mg ≙ 0.3 mg/m³ at 1 m³ gas volume sampled

5 Operating state of the plant during the parallel measurements

The operating data of the production plant can be obtained by the recording of measuring values of the operating measuring system in control station.

5.1 Production plant

The operating data of the plant during the measurement are indicated hereinafter.

Raw materials/fuels:	Domestic waste, Diesel
Operating condition waste incineration plant:	69 % load
Operating condition diesel electric generator:	part load

5.2 Waste gas purification units

Not applicable

6 Compilation of the measurement results and discussion

6.1 Evaluation of the operating conditions during the measurements

During the measurements, the waste incineration plant was operated at an output of 69 %.

The operating conditions during the measurements corresponded to the state of the highest emissions.

6.2 Measurement results

Waste incineration plant fuel bunker:

Table 6.1: Results of the determination of the concentrations of NH3, venting right (1)/left (2)

Measurement day	Measurement No.	Operating cond.	Time from	Time to	O_2 Vol.-%	NH3 - concentration mg/m³	Volume flow dry,std. m³/h	NH3- Mass flow g/h
17.01.2021	1	norm. operation	14:13	14:43	20,9	0,4	8.390	3,7
17.01.2021	2	norm. operation	14:55	15:25	20,9	1,0	11.400	11,1
Minimum					20,9	0,4	8.390	3,7
Maximum					20,9	1,0	11.400	11,1
Average					20,9	0,7	9.895	7,4

Table 6.2: Results of the determination of the concentrations of dust, venting right (1)/left (2)

Measurement day	Measurement No.	Operating cond.	Time from	Time to	O_2 Vol.-%	Dust - concentration mg/m³	Volume flow dry,std. m³/h	Dust- Mass flow g/h
17.01.2021	1	norm. operation	14:30	15:00	20,9	< 0,3	8.390	< 2,4
17.01.2021	2	norm. operation	15:06	15:36	20,9	< 0,3	11.400	< 3,6
Minimum					20,9	< 0,3	8.390	< 2,4
Maximum					20,9	< 0,3	11.400	< 3,6
Average					20,9	< 0,3	9.895	< 3,0

Bottom ash room:

Table 6.3: Results of the determination of the concentrations of dust

Measurement day	Measurement No.	Operating cond.	Time from	Time to	O_2 Vol.-%	Dust - concentration mg/m³	Volume flow dry,std. m³/h	Dust- Mass flow g/h
18.01.2021	1	norm. operation	11:13	11:43	20,9	< 0,3	31.500	< 8,0
18.01.2021	2	norm. operation	12:12	13:00	20,9	< 0,2	31.500	< 6,4
Minimum					20,9	< 0,2	31.500	< 6,4
Maximum					20,9	< 0,3	31.500	< 8,0
Average					20,9	< 0,2	31.500	< 7,2

Diesel electric generator:

Table 6.4: Results of the determination of the concentrations of NOx

Measurement day	Measurement No.	Operating cond.	Time from	Time to	O_2 Vol.-%	NOx - concentration mg/m³	Volume flow dry,std. m³/h	NOx- Mass flow g/h
18.01.2021	1	part load	12:30	13:00	18,3	332	5.990	1989
18.01.2021	2	part load	13:00	13:30	18,5	320	5.990	1917
Minimum					18,3	320	5.990	1917
Maximum					18,5	332	5.990	1989
Average					18,4	326	5.990	1953

6.3 Measurement uncertainties

Expanded measurement uncertainty NH_3: 0,1 mg/m³

Expanded measurement uncertainty dust: 0,4 mg/m³

Expanded measurement uncertainty NOx: 8 mg/m³

Methods of determination of all components: computational approach

6.4 Plausibility check

The individual results and measurement protocols can be found in the appendix.

The results are plausible, taking into account the measurement accuracy of the measurement methods used and the operating mode of the system.

The test results relate to the examined system in the described condition.

Environmental protection / Air pollution control Dept. (936)

Editor: Person technically responsible :

Jan Rettig M. Sc. Dipl.-Ing. Ferdinand Lehmann

Cologne, 26.02.2021
936/21251811/B

7 Appendices

A1: Measured values and calculated values, operating data

Annex A1: Measured values and calculated values, operating data

Calculation of the main volume flow within the duct:			
Company		Lietuvos energija	
Plant		fuel bunker	
Measuring Site		venting right	
Date of measurement		17.01.2021	
Measurement	No.	1	
Operating condition of the plant		norm. operation	
Start of measurement	time	14:20	
Waste gas temperature (average)	°C	3,5	
Waste gas temperature (absolute)	K	276,5	
Barometer reading (corrected)	hPa	1001	
Static pressure difference	Δ hPa	0	
Absolute pressure	hPa	1001	
O2 content	Vol.-%	20,9	
reference O2 content			
CO2 content	Vol.-%	0,0	
Waste gas humidity (ff)	m³/m³	0,010	
Water content with reference to dry waste gas	g/m³	8	
Density (wet, std.)	kg/m³	1,288	
Density channel state (t,p,f)	kg/m³	1,256	
Average root of dynamic pressure	√Pa	1,73	
Average flow rate	m/s	2,2	
Duct cross-section	m²	1,1	
Main volume flow (t,p,f)	m³/s	2,4	
Hourly volume flow (t,p,f)	m³/h	8.680	
Hourly volume flow (wet,std.)	m³/h	8.470	
Hourly volume flow (dry,std.)	m³/h	8.390	
Hourly volume flow (wet,std.), operation instr.			

t,p,f = Operating state
wet,std. = related to standard conditions (273 K, 1013 hPa) in wet waste gas
dry,std. = related to standard conditions (273 K, 1013 hPa) in dry waste gas

Calculation of the main volume flow within the duct:

Company		Lietuvos energija	
Plant		fuel bunker	
Measuring Site		venting left	
Date of measurement		17.01.2021	
Measurement	No.	1	
Operating condition of the plant		norm. operation	
Start of measurement	time	14:50	
Waste gas temperature (average)	°C	3,5	
Waste gas temperature (absolute)	K	276,5	
Barometer reading (corrected)	hPa	1001	
Static pressure difference	Δ hPa	0	
Absolute pressure	hPa	1001	
O2 content	Vol.-%	20,9	
reference O2 content			
CO2 content	Vol.-%	0,0	
Waste gas humidity (ff)	m³/m³	0,010	
Water content with reference to dry waste gas	g/m³	8	
Density (wet, std.)	kg/m³	1,288	
Density channel state (t,p,f)	kg/m³	1,256	
Average root of dynamic pressure	√Pa	2,35	
Average flow rate	m/s	3,0	
Duct cross-section	m²	1,1	
Main volume flow (t,p,f)	m³/s	3,3	
Hourly volume flow (t,p,f)	m³/h	11.800	
Hourly volume flow (wet,std.)	m³/h	11.500	
Hourly volume flow (dry,std.)	m³/h	11.400	
Hourly volume flow (wet,std.), operation instr.			

t,p,f = Operating state
wet,std. = related to standard conditions (273 K, 1013 hPa) in wet waste gas
dry,std. = related to standard conditions (273 K, 1013 hPa) in dry waste gas

Calculation of the main volume flow within the duct:

Company		Lietuvos energija	
Plant		bottom ash room	
Measuring Site		venting	
Date of measurement		18.01.2021	
Measurement	No.	1	
Operating condition of the plant		norm. operation	
Start of measurement	time	10:50	
Waste gas temperature (average)	°C	-5	
Waste gas temperature (absolute)	K	268	
Barometer reading (corrected)	hPa	1001	
Static pressure difference	Δ hPa	0	
Absolute pressure	hPa	1001	
O2 content	Vol.-%	20,9	
reference O2 content			
CO2 content	Vol.-%	0,0	
Waste gas humidity (ff)	m³/m³	0,010	
Water content with reference to dry waste gas	g/m³	8	
Density (wet, std.)	kg/m³	1,288	
Density channel state (t,p,f)	kg/m³	1,296	
Average root of dynamic pressure	√Pa	4,84	
Average flow rate	m/s	6,0	
Duct cross-section	m²	1,5	
Main volume flow (t,p,f)	m³/s	8,8	
Hourly volume flow (t,p,f)	m³/h	31.600	
Hourly volume flow (wet,std.)	m³/h	31.800	
Hourly volume flow (dry,std.)	m³/h	31.500	
Hourly volume flow (wet,std.), operation instr.			

t,p,f = Operating state
wet,std. = related to standard conditions (273 K, 1013 hPa) in wet waste gas
dry,std. = related to standard conditions (273 K, 1013 hPa) in dry waste gas

Calculation of the main volume flow within the duct:

Company		Lietuvos energija	
Plant		Diesel electric generator	
Measuring Site		Exhaust	
Date of measurement		18.01.2021	
Measurement	No.	1	
Operating condition of the plant		part load	
Start of measurement	time	13:45	
Waste gas temperature (average)	°C	-5	
Waste gas temperature (absolute)	K	268	
Barometer reading (corrected)	hPa	1002	
Static pressure difference	Δ hPa	0	
Absolute pressure	hPa	1002	
O2 content	Vol.-%	18,5	
reference O2 content	Vol.-%	5	
CO2 content	Vol.-%	1,9	
Waste gas humidity (ff)	m³/m³	0,010	
Water content with reference to dry waste gas	g/m³	8	
Density (wet, std.)	kg/m³	1,297	
Density channel state (t,p,f)	kg/m³	1,307	
Average root of dynamic pressure	√Pa	6,87	
Average flow rate	m/s	8,5	
Duct cross-section	m²	0,2	
Main volume flow (t,p,f)	m³/s	1,7	
Hourly volume flow (t,p,f)	m³/h	6.010	
Hourly volume flow (wet,std.)	m³/h	6.050	
Hourly volume flow (dry,std.)	m³/h	5.990	
Hourly volume flow (wet,std.), operation instr.	m³/h	940	

t,p,f = Operating state
wet,std. = related to standard conditions (273 K, 1013 hPa) in wet waste gas
dry,std. = related to standard conditions (273 K, 1013 hPa) in dry waste gas

Table Annex: Determination of emissions NH3

Plant		Waste incineration plant Vilnius	
Measuring Site		Fuel bunker venting right (1)/left (2)	
Date of measurement		17.01.2021	17.01.2021
Measurement No.		1	2
Operating condition of the plant		norm. operation	norm. operation
Start of measurement	time	14:13	14:55
End of measurement	time	14:43	15:25
Partial gas volume extracted		dry gas meter	
Duration of suction	min	30	30
Gas meter at the end	m³	9,8605	9,9374
Gas meter at the begin	m³	9,8029	9,8605
Partial gas volume dry	m³	0,0576	0,0769
Correction factor of the gas meter		0,988	0,988
Average temperature on the gas meter	°C	6	4
Same in abs. temperature degrees	K	279	277
Barometer reading	hPa	1001	1001
Stat. pressure difference at the gas meter	hPa	0	0
Corr. pressure on the gas meter	hPa	992	993
Partial gas volume dry, std.	m³	0,0546	0,0734
Mass concentration and flow			
mass found in the sample	µg	24,0	72,0
Mass, field blank	µg	21,0	21,0
based on the partial gas volume dry, std.	mg/m³	0,385	0,286
Blank value in relation to the measured value	%	87,5	29,2
Mass concentration dry, std.	mg/m³	0,44	0,98
Main volume flow dry, std.	m³/h	8.390	11.400
Mass flow	g/h	3,7	11,2
Oxygen content in the exhaust gas	Vol.-%	20,9	20,9

Table Annex: Determination of emissions Dust

Plant	Waste incineration plant Vilnius		
Measuring Site	Fuel bunker venting right (1)/left (2)		
Date of measurement		17.01.2021	17.01.2021
Measurement No.		1	2
Operating condition of the plant		norm. operation	norm. operation
Start of measurement	time	14:30	15:06
End of measurement	Uhr	15:00	15:36
Partial gas volume extracted		dry gas meter	
Duration of suction	min	30	30
Gas meter at the end	m³	20,6500	21,6030
Gas meter at the begin	m³	19,6172	20,6500
Partial gas volume dry	m³	1,0328	0,9530
Correction factor of the gas meter		1,031	1,031
Average temperature on the gas meter	°C	5	4
Same in abs. temperature degrees	K	278	277
Barometer reading	hPa	1001	1001
Stat. pressure difference at the gas meter	hPa	0	0
Corr. pressure on the gas meter	hPa	992	993
Partial gas volume dry, std.	m³	1,0243	0,9491
Mass concentration and flow			
mass found in the sample	mg	< 0,3	< 0,3
Mass, field blank	mg	< 0,3	< 0,3
based on the partial gas volume dry, std.	mg/m³	< 0,3	< 0,3
Blank value in relation to the measured value	%	< 100,0	< 100,0
Mass concentration dry, std.	mg/m³	< 0,3	< 0,3
Main volume flow dry, std.	m³/h	8.390	11.400
Mass flow	g/h	< 2,5	< 3,6
Oxygen content in the exhaust gas	Vol.-%	20,9	20,9

Table Annex: Determination of emissions Dust

Plant	Waste incineration plant Vilnius		
Measuring Site	Venting bottom ash room		
Date of measurement		18.01.2021	18.01.2021
Measurement No.		1	2
Operating condition of the plant		norm. operation	norm. operation
Start of measurement	time	11:13	12:12
End of measurement	Uhr	11:43	13:00
Partial gas volume extracted		dry gas meter	
Duration of suction	min	30	30
Gas meter at the end	m³	22,8230	24,3150
Gas meter at the begin	m³	21,6050	22,8230
Partial gas volume dry	m³	1,2180	1,4920
Correction factor of the gas meter		1,031	1,031
Average temperature on the gas meter	°C	13	9
Same in abs. temperature degrees	K	286	282
Barometer reading	hPa	1001	1001
Stat. pressure difference at the gas meter	hPa	0	0
Corr. pressure on the gas meter	hPa	986	990
Partial gas volume dry, std.	m³	1,1667	1,4546
Mass concentration and flow			
mass found in the sample	mg	< 0,3	< 0,3
Mass, field blank	mg	< 0,3	< 0,3
based on the partial gas volume dry, std.	mg/m³	< 0,3	< 0,2
Blank value in relation to the measured value	%	< 100,0	< 100,0
Mass concentration dry, std.	mg/m³	< 0,3	< 0,2
Main volume flow dry, std.	m³/h	31.500	31.500
Mass flow	g/h	< 8,1	< 6,5
Oxygen content in the exhaust gas	Vol.-%	20,9	20,9

TÜV RHEINLAND ENERGY GMBH

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-11120-02-00

Report on the testing of the dust emissions downstream rooftop filters of hydrated lime silos, activated carbon silo and of fly ash and residue silos in the waste incineration plant in Vilnius of the Company Lietuvos energija

TÜV Report No.: 936/21251811/C
Cologne, 08.03.2021

www.umwelt-tuv.de

tre-service@de.tuv.com

The department of Environmental Protection of TÜV Rheinland Energy GmbH
is accredited for the following work areas:

- Determination of air quality and emissions of air pollution and emissions of odour substances;
- Inspection of correct installation, function and calibration of continuously operating emission measuring instruments, including data evaluation and remote emission monitoring systems;
- Combustion chamber measurements;
- Performance testing of measuring systems for continuous monitoring of emissions and ambient air, and of electronic data evaluation and remote emission monitoring systems;
- Determination of stack height and air quality projections for hazardous and odour substances;
- Determination of emission and ambient air quality of noise and vibration, determination of sound power levels and execution of sound measurements at wind energy plants

according to EN ISO/IEC 17025.

The accreditation is valid since 30-08-2019. DAkkS-register number: D-PL-11120-02-00.

TÜV Rheinland Energy GmbH
D-51105 Cologne, Am Grauen Stein, Tel: +49 221 806-5200, Fax: +49 221 806-1349

blank page

Report on the testing of the dust emissions downstream rooftop filters of hydrated lime silos, activated carbon silo and of fly ash and residue silos in the waste incineration plant in Vilnius of the Company Lietuvos energija

plant operator:	Lietuvos energija UAB Vilniaus kogeneracine jegaine Kodas 303782367 Zveju g.14 LT-09310 Vilnius Lithuania
Audited site:	Jocioniu g. 13 LT-02300 Vilnius Lithuania
Order number: **(of the customer)**	4200080705
Date of application:	05.01.2021
Customer ID:	1033976
Duration of the test:	02.03.2021
Scope of report:	18 pages in total Annex starts on page 15
Objectives:	Determination of the dust emissions downstream rooftop filters of hydrated lime silos, activated carbon silo and of fly ash and residue silos
Installation arrangement:	Directive 2010/75/EU on industrial emissions

blank page

Summary

The task was the determination of the emissions downstream rooftop filters of hydrated lime silos, activated carbon silo and of fly ash and residue silos.

After the visual inspection at the outlet of the ventilation pipes downstream the bunker filters of all silos, dust contents well below 1 mg / m³ are to be expected.

blank page

TABLE OF CONTENTS **PAGE**

blank page

1 Objectives

1.1	**Client:**	Steinmüller Babcock Environment GmbH Fabrikstr. 1 51643 Gummersbach
1.2	**Plant operator:**	Lietuvos energija UAB Vilniaus kogeneracine jegaine Kodas 303782367 Zveju g.14 LT-09310 Vilnius Lithuania
	Contact person:	Mr Matas Mizera
	Telephone number:	+370 620 65856
	Work place number:	-
1.3	**Location:**	Jocioniu g. 13 LT-02300 Vilnius Lithuania
1.4	**Plant:**	Waste incineration plant according RL 2010/75/EU,
	Plant number:	-
1.5	**Date / Duration of the test:**	02.03.2021
	Previous measurement:	new installation
	Next measurement:	according to the license
1.6	**Reason:**	determination of dust emissions
	Approving authority:	not known
	Licence:	not known
	Listing of measured objects:	dust
1.6.1	**Deviation from EN 14181:**	none
1.7	**Measurement plan coordination:**	The measurement planning was consulted with the plant builder Steinmüller Babcock Environment GmbH.
1.8	**Personnel involved in the test:**	Mr Dipl.-Ing. Ferdinand Lehmann (project manager), Mr Jan Rettig M. Sc. Mr Ralf Ritter
1.9	**Participation of further institutes:**	No

2 Description of the plants and the materials handled (Hydrated lime storage silos)

2.1	**Plant:**	Hydrated lime storage silos
2.2	**Description of the plant**	
	3 Silos for storage of hydrated lime. Hydrated lime is supplied via silo truck and pneumatically discharged from the truck into the silos with pressurized air of approx. 2 bar.	
	The useful volume of each silo is approx. 200 m³ each.	
	The air for filling and discharge fluidisation in the bottom part is dedusted in an dedusting filter on top oft the silos and discharged to the ambient	
2.3	**Description of the emission source**	
2.3.1	**Emission source:**	outlet of the silo rooftop filter
	Height above ground:	approx. 26 m
	Material:	mild steel
2.4	**Medium**	hydrated lime (Ca(OH)2)
2.5	**Operation times**	
2.5.1	**Yearly operation time:**	approx 50 h/a filling time by silo trucks
2.5.2	**Estimated operation times**	
	Per day:	ca. 1 h
	Per week:	ca. 1 h
2.6	**Device for collecting and reducing the emissions**	
2.6.1	**Installation for Emission control:**	
2.6.1.1	**Installation for Emission control:**	Closed installation with directed emission source
2.6.1.2	**Component for Emission Control:**	Silo rooftop filter
2.6.1.3	**Fan data:**	Not applicable
2.6.1.4	**Suction area:**	Not applicable

2 Description of the plants and the materials handled (Activated carbon storage silo)

2.1	**Plant:**	Activated carbon storage silo
2.2	**Description of the plant**	
	A silo for storage of Activated Carbon (AC). AC is supplied via silo truck and pneumatically discharged from the truck into the silos with pressurized air of approx. 2 bar.	
	The useful volume of the silo is approx. 55 m³.	
	The air for filling and discharge fluidisation in the bottom part is dedusted in an dedusting filter on top of the silos and discharged to the ambient	
2.3	**Description of the emission source**	
2.3.1	**Emission source:**	outlet of the silo rooftop filter
	Height above ground:	approx. 14 m
	Material:	mild steel
2.4	**Medium**	Activated Carbon (AC)
2.5	**Operation times**	
2.5.1	**Yearly operation time:**	approx 20 h/a filling time by silo trucks
2.5.2	**Estimated Operation times**	
	Per day:	ca. 0,5 h
	Per week:	ca. 1 h
2.6	**Device for collecting and reducing the emissions**	
2.6.1	**Installation for Emission control:**	
2.6.1.1	**Installation for Emission control:**	Closed installation with directed emission source
2.6.1.2	**Component for Emission Control:**	Silo rooftop filter
2.6.1.3	**Fan data:**	Not applicable
2.6.1.4	**Suction area:**	Not applicable

2 Description of the plants and the materials handled (Fly ash and residue storage silos)

2.1	**Plant:**	Fly ash and residue storage silos
2.2	**Description of the plant**	

2 Silos for storage of fly ash and residues from Flue Gas Cleaning. A pneumatic conveying system is delivering the fly ash and FGT residue collected in the plant into the silos. The discharge cone of the silo is equipped with fluidization installations which supports the discharge of the silo content into discharge trucks.

The useful volume of each silo is approx. 200 m³ each.

The air for filling and discharge fluidisation in the bottom part is dedusted in an dedusting filter on top of t he silos and discharged to the ambient.

2.3	**Description of the emission source**	
2.3.1	**Emission source:**	outlet of the silo rooftop filter
	Height above ground:	approx. 32 m
	Material:	mild steel
2.4	**Medium**	fly ash and FGT-residue
2.5	**Operation times**	
2.5.1	**Yearly operation time:**	approx 50 h/a filling time by silo trucks
2.5.2	**Estimated Operation times**	
	Per day:	ca. 1 h
	Per week:	ca. 1 h
2.6	**Device for collecting and reducing the emissions**	
2.6.1	**Installation for Emission control:**	
2.6.1.1	**Installation for Emission control:**	Closed installation with directed emission source
2.6.1.2	**Component for Emission Control:**	Silo rooftop filter
2.6.1.3	**Fan data:**	Not applicable
2.6.1.4	**Suction area:**	Not applicable

3 Description of the sampling point

3.1 Location of the measurement cross-section

The measuring point is located at the outlet of the ventilation pipe downstream the bunker filter above the silos.

4 Measurement and analysis methods, devices

Not applicable

5 Operating state of the plant during the parallel measurements

Mode of operation:	Normal operation, discontinuous

6 Compilation of the measurement results and discussion

6.1 Results

After the visual inspection at the outlet of the ventilation pipes downstream the bunker filters of all silos, dust contents well below 1 mg / m³ are to be expected. See the photos in the appendix.

6.2 Plausibility check

The results are plausible for a new installation.

The test results relate to the examined system in the described condition.

Environmental protection / Air pollution control Dept. (936)

Editor: Person technically responsible :

Jan Rettig M. Sc. Dipl.-Ing. Ferdinand Lehmann

Cologne, 08.03.2021
936/21251811/C

7 Appendices

A1: Photos of the outlets of the ventilation pipes downstream the bunker filters of the silos

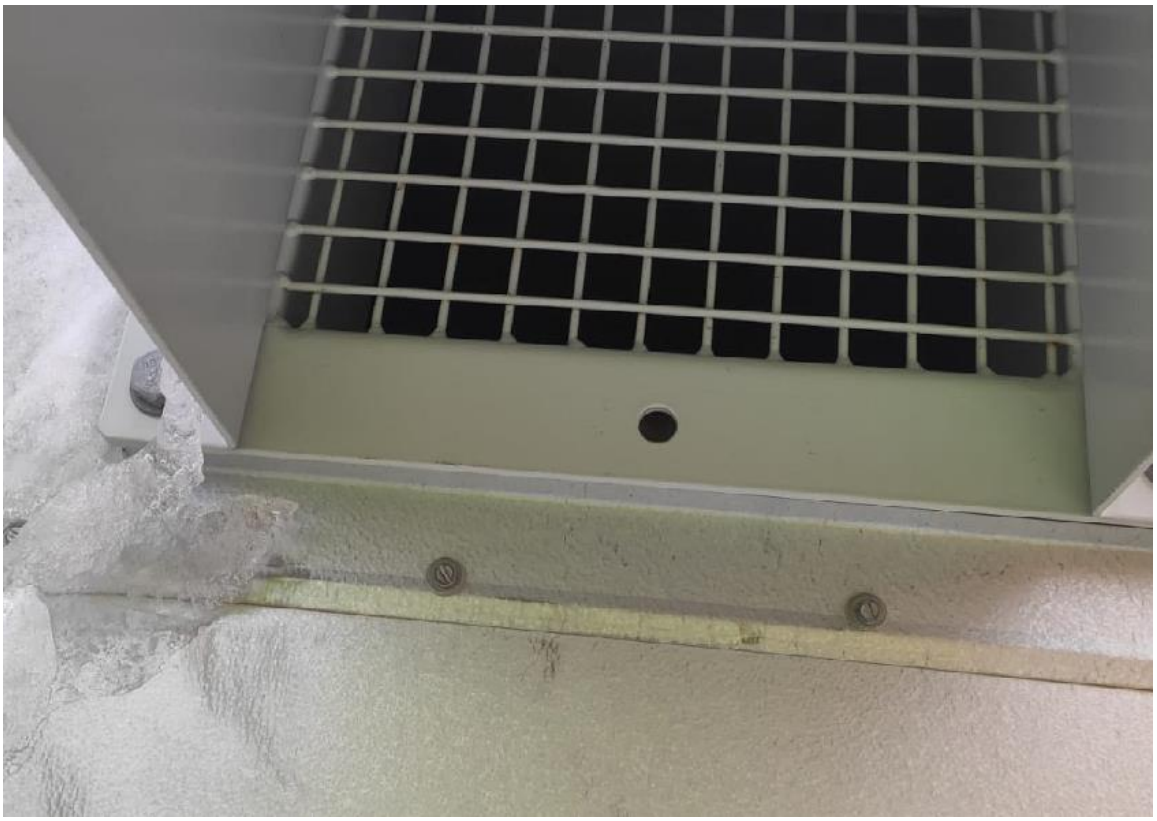
Annex A1: Photos of the outlets of the ventilation pipes downstream the bunker filters of the silos

Outlet of the ventilation pipe downstream the bunker filter of hydrated lime storage silos

Outlet of the ventilation pipe downstream the bunker filter of the activated carbon silo

Outlet of the ventilation pipe downstream the bunker filter of fly ash and residue storage silo 1

Outlet of the ventilation pipe downstream the bunker filter of fly ash and residue storage silo 2



EKOMETRIJA

UAB „EKOMETRIJA“

Geologų g. 11, Vilnius, tel. 8 5 213 67 30, faks. 8 5 230 85 53,
el. p. info@ekometrija.lt

2021-02-17

TYRIMŲ PROTOKOLAS Nr. 298

Užsakovas, adresas: Budimex S.A, 9 Siedmiogrodzka str., 01-204 Warsawa, Poland
Objektas, adresas: **UAB „Vilniaus kogeneracinė jėgainė“, Jočionių g. 13, Vilnius**
Ėminio paėmimo vieta: **nenurodyta**
Ėminys paimtas: 2021-01-26, 11.23 val. pristatytas: 2021-01-26
Ėminio rūšis: buitinės nuotekos
Tyrimas pradėtas: 2021-01-26 baigtas: 2021-02-17

Analitė	Matavimo vnt.	Tyrimo rezultatai	Tyrimo metodo ND*
Temperatūra	°C	18,4	*Unif. NT ir PV kokybės tyrimo met.d.Chem.analiz.met.Vilnius,1994*
pH	-	8,0	*LST EN ISO 10523:2012*
Biocheminis deguonies suvartojimas (BDS_7)	mg/l	1,10	*LST EN 1899-2:2000*
Cheminis deguonies suvartojimas (ChDS)	mg/l	8,7	*LST ISO 6060:2003*
Suspenduotos medžiagos	mg/l	<2,5	*LST EN 872:2005*
Bendras azotas	mg/l	3,52	*LST EN ISO 11905-1:2000*
Bendras fosforas	mg/l	0,321	*LST EN ISO 6878:2004*
Chloridas	mg/l	22,5	*LST ISO 9297:2008*
Cinkas	mg/l	<0,002	***CSN EN ISO 17294-2*
Nikelis	mg/l	<0,003	***CSN EN ISO 17294-2*
Varis	mg/l	0,0015	***CSN EN ISO 17294-2*
Chromas	mg/l	0,0031	***CSN EN ISO 17294-2*
Arsenas	µg/l	<1,0	***CSN EN ISO 17294-2*
Švinas	µg/l	<1,0	***CSN EN ISO 17294-2*
Kadmis	µg/l	<0,20	***CSN EN ISO 17294-2*
Talis	µg/l	<0,50	***CSN EN ISO 17294-2*
Gyvsidabris	µg/l	0,326	***CSN EN ISO 17852*
Naftos produktai	mg/l	<0,60	*LAND 90-2010*

*ND - normatyvinis dokumentas, SVP - standartinė veiklos procedūra
< - mažiau tyrimo metodo nustatymo ribos
Ėminio saugojimas šaldytuve +3 ± 2 °C

Papildomi duomenys, pastabos: ChDS/BDS = 7,91

Ėminį paėmė: P. Eiva (pareigos, vardas, pavardė) pristatė: P. Eiva (pareigos, vardas, pavardė)

Tyrimą(us) atliko: chemikė Angelija Garalytė, chemikas Adrian Guščo, chemikė Anželika Damaškaitė, chemikas Gintautas Švilpa, **ALS Czech Republic, s.r.o. (pareigos, vardas, pavardė/pavadinimas)

Tvirtinu: UAB „EKOMETRIJA“ Laboratorijos vedėja Vida Mazaliauskienė (pareigos, vardas, pavardė, parašas)

EKOMETRIJA
UAB „EKOMETRIJA“
Geologų g. 11, Vilnius, tel. 8 5 213 67 30, faks. 8 5 230 85 53,
el. p. info@ekometrija.lt

2021-03-12

TYRIMŲ PROTOKOLAS Nr. 850

Užsakovas, adresas: Budimex S.A, 9 Siedmiogrodzka str., 01-204 Warsawa, Poland
Objektas, adresas: **UAB „Vilniaus kogeneracinė jėgainė“, Jočionių g. 13, Vilnius**
Ėminio paėmimo vieta: **nenurodyta**
Ėminys paimtas: 2021-02-24, 14.42 val. pristatytas: 2021-02-24
Ėminio rūšis: buitinės nuotekos
Tyrimas pradėtas: 2021-02-24 baigtas: 2021-03-10

Analitė	Matavimo vnt.	Tyrimo rezultatai	Tyrimo metodo ND*
Temperatūra	°C	18,1	*Unif. NT ir PV kokybės tyrimo met.d.Chem.analiz.met.Vilnius,1994*
pH	-	8,5	*LST EN ISO 10523:2012*
Biocheminis deguonies suvartojimas (BDS_7)	mg/l	30,0	*LAND 47-1:2007*
Cheminis deguonies suvartojimas (ChDS)	mg/l	241	*LST ISO 6060:2003*
Suspenduotos medžiagos	mg/l	1140	*LST EN 872:2005*
Bendras azotas	mg/l	0,466	*LST EN ISO 11905-1:2000*
Bendras fosforas	mg/l	0,587	*LST EN ISO 6878:2004*
Chloridas	mg/l	391	*LST ISO 9297:2008*
Cinkas	mg/l	0,456	*Unif. NT ir PV kokybės tyrimo met.d.Chem.analiz.met.Vilnius,1994*
Nikelis	mg/l	0,079	
Varis	mg/l	0,760	
Chromas	mg/l	0,089	
Arsenas	µg/l	1,6	***CSN EN ISO 17294-2*
Švinas	µg/l	10,7	***CSN EN ISO 17294-2*
Kadmis	µg/l	0,22	***CSN EN ISO 17294-2*
Talis	µg/l	<0,50	***CSN EN ISO 17294-2*
Gyvsidabris	µg/l	0,224	***CSN EN ISO 17852*
Naftos produktai	mg/l	6,19	*LAND 90-2010*

*ND - normatyvinis dokumentas, SVP - standartinė veiklos procedūra
< - mažiau tyrimo metodo nustatymo ribos
Ėminio saugojimas šaldytuve +3 ± 2 °C

Papildomi duomenys, pastabos: ChDS/BDS = 8,03

Ėminį paėmė: P. Eiva (pareigos, vardas, pavardė) pristatė: P. Eiva (pareigos, vardas, pavardė)

Tyrimą(us) atliko: chemikė Angelija Garalytė, chemikas Adrian Guščo, chemikė Anželika Damaškaitė, (pareigos, vardas, pavardė/pavadinimas)
chemikas Gintautas Švilpa, chemikė Elena Mataytene, **ALS Czech Republic, s.r.o. (pareigos, vardas, pavardė/pavadinimas)

Tvirtinu: UAB „EKOMETRIJA“ Laboratorijos vedėjos pavaduotoja Roma Zupkaitė (pareigos, vardas, pavardė, parašas)

Tyrimų rezultatai susiję tik su šiais tiriamais objektais.
Be raštiško direktoriaus sutikimo tyrimų protokolą dalimis dauginti draudžiama.

EKOMETRIJA

UAB „EKOMETRIJA“

Geologų g. 11, Vilnius, tel. 8 5 213 67 30, faks. 8 5 230 85 53,
el. p. info@ekometrija.lt

2021-04-12

TYRIMŲ PROTOKOLAS Nr. 2577

Užsakovas, adresas: Budimex S.A, 9 Siedmiogrodzka str., 01-204 Warsawa, Poland

Objektas, adresas: **UAB „Vilniaus kogeneracinė jėgainė“, Jočionių g. 13, Vilnius**

Ėminio paėmimo vieta: **nenurodyta**

Ėminys paimtas: 2021-03-22, 10.00 val. pristatytas: 2021-03-22

Ėminio rūšis: buitinės nuotekos

Tyrimas pradėtas: 2021-03-22 baigtas: 2021-04-09

Analitė	Matavimo vnt.	Tyrimo rezultatai	Tyrimo metodo ND*
Temperatūra	°C	22,4	*Unif. NT ir PV kokybės tyrimo met.d.Chem.analiz.met.Vilnius,1994*
pH	-	8,9	*LST EN ISO 10523:2012*
Biocheminis deguonies suvartojimas (BDS_7)	mg/l	37,8	*LAND 47-1:2007*
Cheminis deguonies suvartojimas (ChDS)	mg/l	78	*LST ISO 6060:2003*
Suspenduotos medžiagos	mg/l	26	*LST EN 872:2005*
Bendras azotas	mg/l	12,2	*LST EN ISO 11905-1:2000*
Bendras fosforas	mg/l	1,18	*LST EN ISO 6878:2004*
Chloridas	mg/l	50,6	*LST ISO 9297:2008*
Cinkas	mg/l	0,123	*Unif. NT ir PV kokybės tyrimo met.d.Chem.analiz.met.Vilnius,1994*
Nikelis	mg/l	<0,052	
Varis	mg/l	0,035	
Chromas	mg/l	<0,004	
Arsenas	µg/l	<1,0	***CSN EN ISO 17294-2*
Švinas	µg/l	9,9	***CSN EN ISO 17294-2*
Kadmis	µg/l	<0,20	***CSN EN ISO 17294-2*
Talis	µg/l	<0,50	***CSN EN ISO 17294-2*
Gyvsidabris	µg/l	3,00	***CSN EN ISO 17852*
Naftos produktai	mg/l	4,36	*LAND 90-2010*

*ND - normatyvinis dokumentas, SVP - standartinė veiklos procedūra

< - mažiau tyrimo metodo nustatymo ribos

Ėminio saugojimas šaldytuve +3 ± 2 °C

Papildomi duomenys, pastabos: ChDS/BDS = 2,06

Ėminį paėmė: L. Jasiūnas (pareigos, vardas, pavardė) pristatė: L. Jasiūnas (pareigos, vardas, pavardė)

Tyrimą(us) atliko: chemikė Angelija Garalytė, chemikas Adrian Guščo, chemikė Anželika Damaškaitė, (pareigos, vardas, pavardė/pavadinimas)
chemikas Gintautas Švilpa, chemikė Elena Mataytene, **ALS Czech Republic, s.r.o. (pareigos, vardas, pavardė/pavadinimas)

Tvirtinu: *UAB „EKOMETRIJA“ Laboratorijos vedėja Vida Mazaliauskienė* (pareigos, vardas, pavardė, parašas)

Tyrimų rezultatai susiję tik su šiais tiriamais objektais.
Be raštiško direktoriaus sutikimo tyrimų protokolą dalimis dauginti draudžiama.

UAB „EKOMETRIJA“
Geologų g. 11, Vilnius, tel. 8 5 213 67 30, faks. 8 5 230 85 53,
el. p. info@ekometrija.lt

2021-03-04

TYRIMŲ PROTOKOLAS Nr. 851

Užsakovas, adresas: Budimex S.A, 9 Siedmiogrodzka str., 01-204 Warsawa, Poland
Objektas, adresas: **UAB „Vilniaus kogeneracinė jėgainė“, Jočionių g. 13, Vilnius**
Ėminio paėmimo vieta: **nenurodyta**
Ėminys paimtas: 2021-02-24, 14.51 val. pristatytas: 2021-02-24
Ėminio rūšis: paviršinis vanduo
Tyrimas pradėtas: 2021-02-24 baigtas: 2021-03-04

Analitė	Matavimo vnt.	Tyrimo rezultatai	Tyrimo metodo ND*
Temperatūra	°C	5,8	*Unif. NT ir PV kokybės tyrimo met.d.Chem.analiz.met.Vilnius,1994*
Biocheminis deguonies suvartojimas (BDS_7)	mg/l	2,84	*LST EN 1899-2:2000*
Suspenduotos medžiagos	mg/l	2,8	*LST EN 872:2005*
Naftos produktai	mg/l	<0,60	*LAND 90-2010*

*ND - normatyvinis dokumentas, SVP - standartinė veiklos procedūra
< - mažiau tyrimo metodo nustatymo ribos
Ėminio saugojimas šaldytuve +3 ± 2 °C

Papildomi duomenys, pastabos: nėra

Ėminį paėmė: P. Eiva (pareigos, vardas, pavardė) pristatė: P. Eiva (pareigos, vardas, pavardė)

Tyrimą(us) atliko: chemikė Angelija Garalytė, chemikas Adrian Guščo (pareigos, vardas, pavardė/pavadinimas)

Tvirtinu: UAB „EKOMETRIJA“ Laboratorijos vedėja Vida Mazaliauskienė (pareigos, vardas, pavardė, parašas)

UAB „EKOMETRIJA“
Geologų g. 11, Vilnius, tel. 8 5 213 67 30, faks. 8 5 230 85 53,
el. p. info@ekometrija.lt

2021-04-12

TYRIMŲ PROTOKOLAS Nr. 2578

Užsakovas, adresas: Budimex S.A, 9 Siedmiogrodzka str., 01-204 Warsawa, Poland
Objektas, adresas: **UAB „Vilniaus kogeneracinė jėgainė“, Jočionių g. 13, Vilnius**
Ėminio paėmimo vieta: **nenurodyta**
Ėminys paimtas: 2021-03-22, 10.10 val. pristatytas: 2021-03-22
Ėminio rūšis: paviršinis vanduo
Tyrimas pradėtas: 2021-03-22 baigtas: 2021-04-06

Analitė	Matavimo vnt.	Tyrimo rezultatai	Tyrimo metodo ND*
Temperatūra	°C	12,4	*Unif. NT ir PV kokybės tyrimo met.d.Chem.analiz.met.Vilnius,1994*
Biocheminis deguonies suvartojimas (BDS_7)	mg/l	2,07	*LST EN 1899-2:2000*
Suspenduotos medžiagos	mg/l	<2,5	*LST EN 872:2005*
Naftos produktai	mg/l	<0,60	*LAND 90-2010*

*ND - normatyvinis dokumentas, SVP - standartinė veiklos procedūra
< - mažiau tyrimo metodo nustatymo ribos
Ėminio saugojimas šaldytuve +3 ± 2 °C

Papildomi duomenys, pastabos: nėra

Ėminį paėmė: L. Jasiūnas (pareigos, vardas, pavardė) pristatė: L. Jasiūnas (pareigos, vardas, pavardė)

Tyrimą(us) atliko: chemikė Angelija Garalytė, chemikas Adrian Guščo

Tvirtinu: *UAB „EKOMETRIJA“ Laboratorijos vedėja Vida Mazaliauskienė* (pareigos, vardas, pavardė/pavadinimas)
(pareigos, vardas, pavardė, parašas)

Tyrimų rezultatai susiję tik su šiais tiriamais objektais.
Be raštiško direktoriaus sutikimo tyrimų protokolą dalimis dauginti draudžiama.