

ELABORATE on collective examination of laboratory samples: 2024-3112, 2024-3113, 2024-3114, 2025-0114, 2025-0115, 2025-0116, 2025-0117, 2025-0118, 2025-0119, 2025-0120

OPČINSKI SUD u Novom Zagrebu

Jakuševac landfill site

Poročilo št.:	P 1-1/2025
Datum poročila:	23.10.2025

Subject of analysis: Waste - Jakuševac landfill site

Contractor: IKEMA d.o.o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dravskem polju

Registration code: P 1-1/2025

Report offer No: P 153/2024

Customer or Obligor: OPČINSKI SUD u Novom Zagrebu , Sajmišna cesta 12 10010 Zagreb

Responsible person for the production of the report: Nataša Kante Flanjak dipl.ing kem.teh. 

Collaborators:

Sampling: Rene Ferk dipl. Ekolog naravovarstvenik, Andrej Vek teh., Matic Borštnar Lamprecht dipl. Ekolog naravovarstvenik (UN)

Measurements: mag. Matjaž Cenčič dipl.inž.
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Andreja Bezjak inž.kem. tehnol.
Andrej Cenčič dipl.inž.kem.tehnol.
Tjaša Cenčič univ. dipl.biol.
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Lilijana Milošič dipl.inž.kem.tehnol.
Laura Kovačec mag. kem.
Petra Bukovec dipl.kem.(UN)
Jožica Sitar dipl.inž.kem.tehnol.
Manca Bauman dipl.biol.(UN)

Lovrenc na Dravskem polju, 23.10.2025

IKEMA d.o.o.
Technical Manager
Andrej Cenčič dipl.ing.kem.teh.



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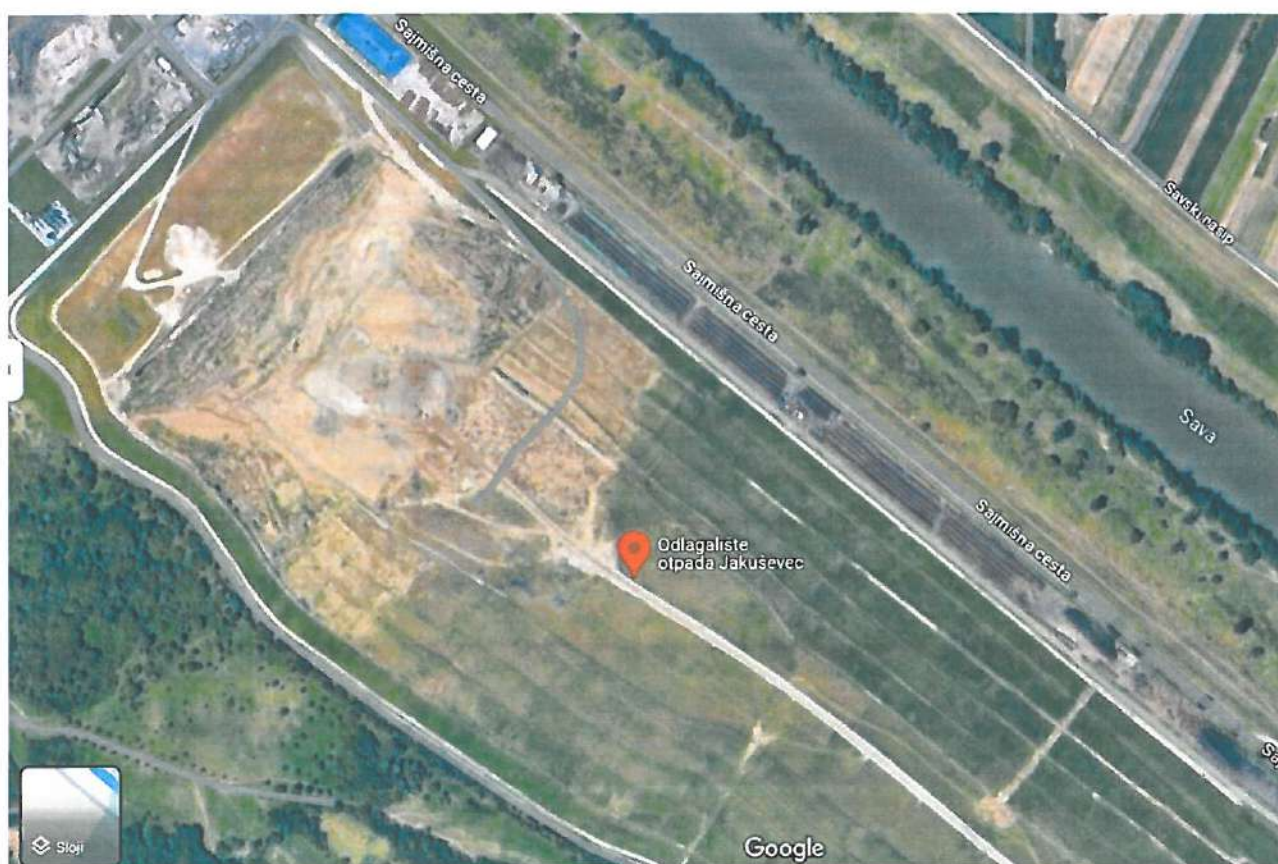
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1. Introduction

On behalf of the Općinski sud u Novom Zagrebu, we carried out sampling and analysis of waste at the inactive part of the Jakuševac landfill site. Core sampling was carried out using a core drill at two points on the landfill to a depth of 22m.

Landfill gases were also measured at two measurement sites (CPT1 and CPT2).

The sampling was carried out on two different days (12.12.2024 and 24.1.2024) due to a breakdown of the drilling machine.



Annexes:

- Sampling Plan No. 2024-3112, 2024-3113, 2024-3114, 2024-0114-2025-0115, 2025-0116-2025-0120
- Sampling report 2024-3112, 2024-3113, 2024-3114, 2025-0114, 2025-0115, 2025-0116, 2025-0117, 2025-0118, 2025-0119, 2025-0120
- Report of analysis: 2024-3112, 2024-3113, 2024-3114, 2025-0114, 2025-0115, 2025-0116, 2025-0117, 2025-0118, 2025-0119, 2025-0120, 2025-141/1 in 2025-141/2

ANNEXES

TEST REPORT

Report No: 2024-3112

General information:

Name: Waste analysis
 Client: OPĆINSKI SUD U NOVOM ZAGREBU , Turinina ulica 3, 10000 Zagreb
 Sampled by: Andrej Cenčič
 No. Offers: P 153/2024

Sample information:

Subscription code: Zagreb Landfill, 3,5 - 8m
 Description of the sample: Zagreb Landfill, 3,5 - 8m
 Sampling time: 12.12.2024
 Sample status: The sample meets the admission criteria
 Date of sample collection : 12.12.2024
 Date of report: 28.02.2025

Sample ID : Lab.No.: 2024 - 3112

Analysis :

MEASUREMENTS:

1. Parameter-Leachate	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Dissolved organic carbon-DOC (1.)	mg/kg d.m.		552	CEN/TR 16192:2020, SIST EN 12457-4,SIST EN 1484:1998	08.01.2025 08.01.2025
2. Parameter-WASTE	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Total organic carbon-TOC	% d.m.		8,9	SIST EN 15936:2022, Method B	30.01.2025 01.02.2025
Net Calorific value	kJ/kg d.m..	<6000	#	SIST-TS-CEN/TS 16023:2014	31.12.2024 31.12.2024
Gross Calorific value	kJ/kg d.m.	<6000	#	SIST-TS-CEN/TS 16023:2014	31.12.2024 31.12.2024
pH (2.)	/		9,0	EN ISO 10390:2022, SIST EN 16179:2013	28.01.2025 28.01.2025
Dry matter	%		77,35	EN 15934:2012, Method A	17.12.2024 17.12.2024
Loss on ignition	% d.m.		16,49	SIST EN 15935:2021	10.01.2025 10.01.2025
AT4 - Biological stability (3.)	mgO ₂ /g d.m.	<5		ONORM S 2027-4:2012	17.12.2024 27.12.2024
Volatile substances	% d.m.		16,9	ISO 22167:2021 mod.	25.02.2025 25.02.2025

Results marked with # refer to a non-accredited activity

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 0215 0001 7604 620 with NLB d.d.

Sampling	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Waste sampling	/		1	SIST EN 14899:2006	12.12.2024 12.12.2024

Results marked with # refer to a non-accredited activity

(1.) leachate filtered through a 0.45um membrane filter, sample preserved with H3PO4

(2.) Leaching of air-dry sample in water, T=21.3°C

(3.) The analysis is carried out on a previously frozen sample, thawed for 24 hours in a temperature chamber. The result is given taking into account the percentage of inerts removed before the analysis (ul%=29.27%).

Remark:

The test results refer to the sampled population as defined in Sampling Report No 2024-3112, which includes all sampling data and is an annex to the Test Report.

Any further information on the testing carried out is available from the laboratory.

The sample was properly stored from the time it was received in the laboratory until the analyses were completed.

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Written complaints are taken into account within eight days from the date of receipt of the test report.

Measurement uncertainty data are provided upon request.

Report by:

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

Approved by: Head of Lab.

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.



IKEMA d.o.o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dravskem polju.

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SAMPLING PLAN - WASTE
 In accordance with SIST EN 14899:2006, Annex A, Table A.1

GENERAL INFORMATION 2024-3112-2024-3114	
The sampling plan was made by: ing. Andrej Cenčič	For the purpose of: Analysis of waste in odlagalište Jakuševac
Waste holder/Company: Odlagalište otpada Jakuševac Sajmišna cesta 12, 10010, Zagreb, Hrvatska	The producer of the waste: Odlagalište otpada Jakuševac Sajmišna cesta 12, 10010, Zagreb, Hrvatska
Other involved parties: g. Gabrovšek	
The sampling will be carried out by IKEMA d. o. o.	Name of the sampler: mag. Matjaž Cenčič, Andrej Cenčič
THE PURPOSE OF THE SAMPLING/SAMPLING OBJECTIVE: sampling of predrilled core samples from the body of landfill in Jakuševac.	
SAMPLING APPROACH: probabilističen / probabilistic	
MATERIAL:	
Core samples from landfill.	Location: Odlagalište otpada Jakuševac Sajmišna cesta 12, 10010, Zagreb, Hrvatska
How the waste is produced: By disposing of waste material.	
Waste generation process/activity: compacting	
Specifies the properties and contents to be determined: parameters requested by client (OPĆINSKI SUD U NOVOM ZAGREBU)	
SAMPLING METHOD:	
Specify the detailed sampling location: sampling location determent by client	
Define sub-population: core sample from a pile	
Define the sampling location and points: location of core samples determent by client	
Specify the date and time of sampling: 12 dec. 2025	
Identify the people who will be present (note names and addresses): mag. Matjaž Cenčič, dr.sc. Željko Lebo, dipl.ing.grad.,	
Specify sampling techniques (CEN/TR 15210-2): collection of core samples	
Specify the equipment: pedološka sonda, lopatica / soil probe, hand shovel	
Use of rented equipment: YES ☒	NO ☐
Verification method : /	
Specifies the number of increments/samples to be taken (CEN/TR 15310-1): each	
Determine the increment/sample size (CEN/TR 1510-1): about. 45L	
Give the requirements for field determinations (measurements): determining GPS coordinates if sampling site, photo	
Determine how the samples are to be labelled: v skladu z postopki IKEMA d. o. o. / in accordance with the procedures IKEMA d. o. o.	
Set out instructions for safe working: general guidance, protection of hands and eyes with glasses, suitable footwear. High visibility jacket	
SUBSAMPLING: ne / no	
Detailed procedures (CEN/TR 15310-3): Core sample will be split in separate samples (about every 4m will be one sample).	

PACKAGING, PRESERVATION, STORAGE AND REQUIREMENTS DURING TRANSPORT (CEN/TR 15310-4) :
Packaging: PE bag,
Preservation: ni / no preservation
Storage: hladilnica laboratorija podjetja IKEMA d. o. o. / cold room of company IKEMA d. o. o.
Transport: prtljajnik osebnega avtomobila / the trunk of passenger car
ANALYTICAL LABORATORY accepting the sample: IKEMA d. o. o.
Date of sample acceptance: 12.12.2024

Handwritten signature

IKEMA d. o. o.
 INSTITUT ZA KEMIJO, FIZIKO-KEMIJO I
 Lovrenc na Dravskem polju 4
 1211 Lovrenc na Dravskem polju

Sampling location (source: Google earth)



WASTE SAMPLING RECORD

In accordance with SIST EN 14899:2006, Anex B, Table B.1

SAMPLING RECORD 2024-3112

BASIC DATA

Client Sample code: /

Sample ID: Lab no.: 2024-3112

Date and time of sampling: 12.12.2024 from 9:30 to 11:30

Persons present: dr.sc. Željko Lebo, dipl.ing.grad.

GENERAL INFORMATION

Client: OPĆINSKI SUD U NOVOM ZAGREBU, Turinina ulica 3, 10000 Zagreb

The waste producer: Odlagalište otpada Jakuševac, Sajmišna cesta 12, 10010, Zagreb, Hrvatska

Sampling location: Odlagalište otpada Jakuševac

Sampling sub-location: spot sampling at the core drilling site

Carried out by: IKEMA d. o. o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dr. polju

Sampler: ing. Andrej Cencic, mag. Matjaz Cencic

SAMPLING OBJECT - WASTE DATA

Sample population: core sample

Waste number: /

Type of waste: deposited waste on landfill

Description of the sample:

Colour:

Smell: ☐ strong ☒ weak ☐ without ☒ odourGrain size: ☐ Uniform size ☒ different sizes

Estimated moisture content: 20-30%

☐ liquid	☒ inhomogeneous	☐ in pieces	☐ suspension
☐ densely liquid/pasty	☒ multiple aggregate layers	☐ grainy	☐ emulsion
☐ sludgy	☒ moist	☐ in powder form	☐ dispersion
☒ solid	☐ dry	☐ hard	☐
☐ homogeneous	☐ dusting	☐ hygroscopic	☐

Additional description:

Different layers easily identified in the core samples.

Grain size range: 0,01-80mm

Density or bulk density: /

Amount of waste to be sampled: about 45L

Geometric similarity of waste:

☐ cone ($V=1/3\pi r^2 \cdot v$) ☒ cylinder ($V= \pi r^2 \cdot v$) ☐ half cylinder ($V= \pi r^2 \cdot v/2$) ☐ cuboid ($V=a \cdot b \cdot c$) ☐ other**SAMPLING METHODOLOGY**

Describe/define the sub-population or uniform sampling: core sample

Accessibility: ☒ Accessible ☐ inaccessible

(access problems affecting the area and quantity of waste sampled)

Location and sampling points:

Sampling coordinates: N: 5069428,1900 E:463103,5360

Sampling approach: ☒ Probabilistic ☐ Judgemental	
Describe the sampling procedure or technique: Core sample will be split in separate samples (about every 4m will be one sample). This sample is depth from 3,5 to 8m.	
Sampling equipment used: drilling rig, soil probe, hand shovel	
Use of rented equipment: YES ☒ NO ☐	
Verification method: /	
Number of increments: 1	
The amount of each increment: 45L	
Observations during sampling (gas evolution, reactions, heat development, etc.):	
Details of on-site determinations:	
Safety precautions: standard protective equipment (gloved hands, suitable footwear and clothing, safety vest, safety goggles, etc.).	
SUB-SAMPLE PREPARATION AND PRE-TREATMENT:	
Describe the location (field, workshop or lab, indoor or outdoor) Outdoor, top of landfill	
Procedure: sub-sample taken in the field for: ☐ BTEX ☐ VOC ☐ Total Hydrocarbons ☐ PAH ☐ ☐	
PACKAGING, PRESERVATION, STORAGE, TRANSPORT	
Packaging: ☐ Glass ☒ 50 L PE bag ☐ PE bottle ☐ metal packaging ☐ other	
Preservation: ☐ Preserved with ☐ refrigeration ☒ not preserved	
Storage/Storage: storage IKEMA d.o.o.	
Transport: ☒ car trunk ☐ Cooling bag ☐ Other	
T _{zac.} = 5,5 °C T _{konc.} = 6,8 °C	
Equipment ID: I-185D	
DEVIATION FROM THE SAMPLING PLAN: YES ☐ NO ☒	
Description of the deviation: /	
WEATHER CONDITIONS	
Air temperature: 4°C	
Weather: ☐ Sunny ☒ cloudy ☐ rainy ☐ snow ☐ other (dry and cold)	
DELIVERY TO THE ANALYTICAL LABORATORY	
Laboratory: IKEMA d.o.o.	
Date of delivery: 12.12.2024	

Report by: Andrej Cencic

Approved the report: Nataša Kante Flanjak



Date of report: 12.12.2024

Sample photographs





TEST REPORT

Report No: 2024-3113

General information:

Name: Waste analysis
 Client: OPĆINSKI SUD U NOVOM ZAGREBU , Turinina ulica 3, 10000 Zagreb
 Sampled by: Andrej Cenčič
 No. Offers: P 153/2024

Sample information:

Subscription code: Zagreb Lanfill, 8 - 12m
 Description of the sample: Zagreb Landfill, 8 - 12m
 Sampling time: 12.12.2024
 Sample status: The sample meets the admission criteria
 Date of sample collection : 12.12.2024
 Date of report: 28.02.2025

Sample ID : Lab.No.: 2024 - 3113

Analysis :

MEASUREMENTS:

1. Parameter-Leachate	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Dissolved organic carbon-DOC (1.)	mg/kg d.m.		754	CEN/TR 16192:2020, SIST EN 12457-4,SIST EN 1484:1998	30.01.2025 09.01.2025
2. Parameter-WASTE	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Total organic carbon-TOC	% d.m.		5,6	SIST EN 15936:2022, Method B	30.01.2025 01.02.2025
Net Calorific value	kJ/kg d.m.	<6000	#	SIST-TS-CEN/TS 18023:2014	31.12.2024 31.12.2024
Gross Calorific value	kJ/kg d.m.	<6000	#	SIST-TS-CEN/TS 18023:2014	31.12.2024 31.12.2024
pH (2.)	/		9,1	EN ISO 10390:2022, SIST EN 16179:2013	28.01.2025 28.01.2025
Dry matter	%		80,24	EN 15934:2012, Method A	17.12.2024 17.12.2024
Loss on ignition	% d.m.		12,76	SIST EN 15935:2021	10.01.2025 10.01.2025
AT4 - Biological stability (3.)	mgO ₂ /g d.m.	<5		ONORM S 2027-4:2012	17.12.2024 27.12.2024
Volatile substances	% d.m.		13,3	ISO 22167:2021 mod.	25.02.2025 25.02.2025

Sampling	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Waste sampling	/		1	SIST EN 14899:2006	12.12.2024 12.12.2024

Results marked with # refer to a non-accredited activity

(1.) leachate filtered through a 0.45µm membrane filter, sample preserved with H₃PO₄

(2.) Leaching of air-dry sample in water, T=21,5°C

(3.) The analysis is carried out on a previously frozen sample, thawed for 24 hours in a temperature chamber. The result is given taking into account the percentage of inerts removed before analysis (ut%=15.51%).

Remark:

The test results refer to the sampled population as defined in Sampling Report No. 2024-3113, which includes all sampling data and is an annex to the Test Report. Any additional information on the testing carried out is available from the laboratory.

The sample was properly stored from the time it was received in the laboratory until the analyses were completed.

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Written complaints are taken into account within eight days from the date of receipt of the test report.

Measurement uncertainty data are provided upon request.

Report by:

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

Approved by: Head of Lab.

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.



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WASTE SAMPLING RECORD

In accordance with SIST EN 14899:2006, Anex B, Table B.1

SAMPLING RECORD 2024-3113**BASIC DATA**

Client Sample code: /

Sample ID: Lab no.: 2024-3113

Date and time of sampling: 12.12.2024 from 9:30 to 11:30

Persons present: dr.sc. Željko Lebo, dipl.ing.građ.

GENERAL INFORMATION

Client: OPĆINSKI SUD U NOVOM ZAGREBU, Turinina ulica 3, 10000 Zagreb

The waste producer: Odlagalište otpada Jakuševac, Sajmišna cesta 12, 10010, Zagreb, Hrvatska

Sampling location: Odlagalište otpada Jakuševac

Sampling sub-location: spot sampling at the core drilling site

Carried out by: IKEMA d. o. o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dr. polju

Sampler: ing. Andrej Cencic, mag. Matjaz Cencic

SAMPLING OBJECT - WASTE DATA

Sample population: core sample

Waste number: /

Type of waste: deposited waste on landfill

Description of the sample:Colour:Smell: ☐ strong ☒ weak ☐ without ☒ odourGrain size: ☐ Uniform size ☒ different sizesEstimated moisture content: 20-30%

☐ liquid	☒ inhomogeneous	☐ in pieces	☐ suspension
☐ densely liquid/pasty	☒ multiple aggregate layers	☐ grainy	☐ emulsion
☐ sludgy	☒ moist	☐ in powder form	☐ dispersion
☒ solid	☐ dry	☐ hard	☐
☐ homogeneous	☐ dusting	☐ hygroscopic	☐

Additional description:Different layers easily identified in the core samples.Grain size range: 0,01-80mmDensity or bulk density: /Amount of waste to be sampled: about 45LGeometric similarity of waste:☐ cone ($V=1/3\pi r^2 \cdot v$) ☒ cylinder ($V= \pi r^2 \cdot v$) ☐ half cylinder ($V= \pi r^2 \cdot v/2$) ☐ cuboid ($V=a \cdot b \cdot c$) ☐ other**SAMPLING METHODOLOGY**Describe/define the sub-population or uniform sampling: core sampleAccessibility: ☒ Accessible ☐ inaccessible

(access problems affecting the area and quantity of waste sampled)

Location and sampling points:Sampling coordinates: N: 5069428,1900 E:463103,5360

Sampling approach: ☒ Probabilistic ☐ judgemental	
Describe the sampling procedure or technique: Core sample will be split in separate samples (about every 4m will be one sample). This sample is depth from 8 to 12m.	
Sampling equipment used: drilling rig, soil probe, hand shovel	
Use of rented equipment: YES ☒ NO ☐	
Verification method: /	
Number of increments: 1	
The amount of each increment: 45L	
Observations during sampling (gas evolution, reactions, heat development, etc.):	
Details of on-site determinations:	
Safety precautions: standard protective equipment (gloved hands, suitable footwear and clothing, safety vest, safety goggles, etc.).	
SUB-SAMPLE PREPARATION AND PRE-TREATMENT:	
Describe the location (field, workshop or lab, indoor or outdoor) Outdoor, top of landfill	
Procedure: sub-sample taken in the field for: ☐ BTEX ☐ VOC ☐ Total Hydrocarbons ☐ PAH ☐	
PACKAGING, PRESERVATION, STORAGE, TRANSPORT	
Packaging: ☐ Glass ☒ 50 L PE bag ☐ PE bottle ☐ metal packaging ☐ other	
Preservation: ☐ Preserved with ☐ refrigeration ☒ not preserved	
Storage/Storage: storage IKEMA d.o.o.	
Transport: ☒ car trunk ☐ Cooling bag ☐ Other	
T _{zab.} = 5,5 °C T _{konč.} = 6,8 °C	
Equipment ID: I-185D	
DEVIATION FROM THE SAMPLING PLAN: YES ☐ NO ☒	
Description of the deviation: /	
WEATHER CONDITIONS	
Air temperature: 4°C	
Weather: ☐ Sunny ☒ cloudy ☐ rainy ☐ snow ☐ other (dry and cold)	
DELIVERY TO THE ANALYTICAL LABORATORY	
Laboratory: IKEMA d.o.o.	
Date of delivery: 12.12.2024	

Report by: Andrej Cencic

Approved the report: Nataša Kante Flanjak



Date of report: 12.12.2024

Sample photographs





TEST REPORT

Report No: 2024-3114

General information:

Name: Waste analysis
 Client: OPĆINSKI SUD U NOVOM ZAGREBU , Turinina ulica 3, 10000 Zagreb
 Sampled by: Andrej Cenčič
 No. Offers: P 153/2024

Sample information:

Subscription code: Zagreb Landfill 12 - 16m
 Description of the sample: Zagreb Landfill, 12 - 16m
 Sampling time: 12.12.2024
 Sample status: The sample meets the admission criteria
 Date of sample collection : 12.12.2024
 Date of report: 28.02.2025

Sample ID : Lab.No.: 2024 - 3114

Analysis :

MEASUREMENTS:

1. Parameter-Leachate	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Dissolved organic carbon-DOC (1.)	mg/kg d.m.		919	CEN/TR 16192:2020, SIST EN 12457-4,SIST EN 1484:1998	09.01.2025 09.01.2025
2. Parameter-ODPADEK	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Total organic carbon-TOC	% d.m.		7,4	SIST EN 15936:2022, Method B	30.01.2025 01.02.2025
Net Calorific value	kJ/kg d.m.		<6000 #	SIST-TS-CEN/TS 16023:2014	31.12.2024 31.12.2024
Gross Calorific value	kJ/kg d.m.		<6000 #	SIST-TS-CEN/TS 16023:2014	31.12.2024 31.12.2024
pH (2.)	/		9,3	EN ISO 10390:2022, SIST EN 16179:2013	28.01.2025 28.01.2025
Dry matter	%		65,52	EN 15934:2012, Method A	17.12.2024 17.12.2024
Loss on ignition	% d.m.		18,93	SIST EN 15935:2021	10.01.2025 10.01.2025
AT4 - Biological stability (3.)	mgO ₂ /g d.m.		<5	ONORM S 2027-4:2012	17.12.2024 27.12.2024
Volatile substances	% d.m.		21,1	ISO 22167:2021 mod.	25.02.2025 25.02.2025

Results marked with # refer to a non-accredited activity

Sampling	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Waste sampling	/		1	SIST EN 14899:2006	12.12.2024 12.12.2024

Results marked with # refer to a non-accredited activity

(1.) leachate filtered through a 0.45um membrane filter, sample preserved with H₃PO₄

(2.) Leaching of air-dry sample in water, T=21.2°C

(3.) The analysis is carried out on a previously frozen sample, thawed for 24 hours in a temperature chamber. The result is given taking into account the percentage of Inerts removed before analysis (ut%=30.0%).

Remark:

The test results refer to the sampled population as defined in Sampling Report No. 2024-3114, which includes all sampling data and is an annex to the Test Report. Any additional information on the testing carried out is available from the laboratory.

The sample was properly stored from the time it was received in the laboratory until the analyses were completed.

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Written complaints are taken into account within eight days from the date of receipt of the test report.

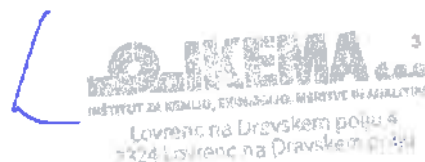
Measurement uncertainty data are provided upon request.

Report by:

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

Approved by: Head of Lab.

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.



IKEMA d.o.o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dravskem polju.

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WASTE SAMPLING RECORD

In accordance with SIST EN 14899:2006, Anex B, Table B.1

SAMPLING RECORD 2024-3114

BASIC DATA

Client Sample code: /

Sample ID: Lab no.: 2024-3114

Date and time of sampling: 12.12.2024 from 9:30 to 11:30

Persons present: dr.sc. Željko Lebo, dipl.ing.građ.

GENERAL INFORMATION

Client: OPĆINSKI SUD U NOVOM ZAGREBU , Turinina ulica 3, 10000 Zagreb

The waste producer: Odlagalište otpada Jakuševac, Sajmišna cesta 12, 10010, Zagreb, Hrvatska

Sampling location: Odlagalište otpada Jakuševac

Sampling sub-location: spot sampling at the core drilling site

Carried out by: IKEMA d. o. o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dr. polju

Sampler: ing. Andrej Cencic, mag. Matjaz Cencic

SAMPLING OBJECT - WASTE DATA

Sample population: core sample

Waste number: /

Type of waste: deposited waste on landfill

Description of the sample:Colour:Smell: ☐ strong ☒ weak ☐ without ☒ odourGrain size: ☐ Uniform size ☒ different sizesEstimated moisture content: 20-30%

☐ liquid	☒ inhomogeneous	☐ in pieces	☐ suspension
☐ densely liquid/pasty	☒ multiple aggregate layers	☐ grainy	☐ emulsion
☐ sludgy	☒ moist	☐ in powder form	☐ dispersion
☒ solid	☐ dry	☐ hard	☐
☐ homogeneous	☐ dusting	☐ hygroscopic	☐

Additional description:Different layers easily identified in the core samples.

Grain size range: 0,01-80mm

Density or bulk density: /

Amount of waste to be sampled: about 45L

Geometric similarity of waste:☐ cone ($V=1/3\pi r^2 \cdot v$) ☒ cylinder ($V=\pi r^2 \cdot v$) ☐ half cylinder ($V=\pi r^2 \cdot v/2$) ☐ cuboid ($V=a \cdot b \cdot c$) ☐ other**SAMPLING METHODOLOGY**

Describe/define the sub-population or uniform sampling: core sample

Accessibility: ☒ Accessible ☐ inaccessible

(access problems affecting the area and quantity of waste sampled)

Location and sampling points:

Sampling coordinates: N: 5069428,1900 E:463103,5360

Sampling approach:	
☒ Probabilistic	☐ judgemental
Describe the sampling procedure or technique:	
Core sample will be split in separate samples (about every 4m will be one sample).	
This sample is depth from 12 to 16m.	
Sampling equipment used: drilling rig, soil probe, hand shovel	
Use of rented equipment: YES ☒ NO ☐	
Verification method: /	
Number of increments: 1	
The amount of each increment: 45L	
Observations during sampling (gas evolution, reactions, heat development, etc.):	
Details of on-site determinations:	
Safety precautions: standard protective equipment (gloved hands, suitable footwear and clothing, safety vest, safety goggles, etc.).	
SUB-SAMPLE PREPARATION AND PRE-TREATMENT:	
Describe the location (field, workshop or lab, indoor or outdoor)	
Outdoor, top of landfill	
Procedure: sub-sample taken in the field for:	
☐ BTX	☐ VOC ☐ Total Hydrocarbons ☐ PAH ☐
PACKAGING, PRESERVATION, STORAGE, TRANSPORT	
Packaging: ☐ Glass ☒ 50 L PE bag ☐ PE bottle ☐ metal packaging ☐ other	
Preservation: ☐ Preserved with ☐ refrigeration ☒ not preserved	
Storage/Storage: storage IKEMA d.o.o.	
Transport: ☒ car trunk ☐ Cooling bag ☐ Other	
T _{zaf.} = 5,5 °C T _{konc.} = 6,8 °C	
Equipment ID: I-185D	
DEVIATION FROM THE SAMPLING PLAN: YES ☐ NO ☒	
Description of the deviation:	
/	
WEATHER CONDITIONS	
Air temperature: 4°C	
Weather: ☐ Sunny ☒ cloudy ☐ rainy ☐ snow ☐ other (dry and cold)	
DELIVERY TO THE ANALYTICAL LABORATORY	
Laboratory: IKEMA d.o.o.	
Date of delivery: 12.12.2024	

Report by: Andrej Cencic

Approved the report: Nataša Kante Flanjak

Date of report: 12.12.2024



Sample photographs





TEST REPORT

Report No: 2025-0114

General information:

Name: Waste analysis
 Client: OPĆINSKI SUD U NOVOM ZAGREBU , Turinina ulica 3, 10000 Zagreb
 Sampled by: mag. Matjaž Cenčič
 No. Offers: P 154/2024

Sample information:

Subscription code: Zagreb Landfill , 16m - 20m
 Description of the sample: Zagreb Landfill, 16m - 20m
 Sampling time: 24.1.2025
 Sample status: The sample meets the admission criteria
 Date of sample collection : 24.01.2025
 Date of report: 19.03.2025

Sample ID : Lab.No.: 2025 - 0114

Analysis :

MEASUREMENTS:

1.Parameter- Leachate	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Dissolved organic carbon-DOC (1.)	mg/kg d.m.		2080	CEN/TR 16192:2020, SIST EN 12457-4, SIST EN 1484:1998	17.02.2025 17.02.2025
2. Parameter -Waste					
2. Parameter -Waste	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Total organic carbon-TOC	% d.m..		8,9	SIST EN 15935:2022, Method B	17.02.2025 19.02.2025
Net Calorific value	kJ/kg d.m.	<6000	#	SIST-TS-CEN/TS 16023:2014	21.02.2025 21.02.2025
pH (2.)	/		8,8	EN ISO 10390:2022, SIST EN 16179:2013	03.03.2025 03.03.2025
Gross Calorific value	kJ/kg d.m.	<6000	#	SIST-TS-CEN/TS 16023:2014	21.02.2025 21.02.2025
Dry matter	%		60,56	EN 15934:2012, Method A	27.01.2025 27.01.2025
Loss on ignition	% d.m.		20,36	SIST EN 15935:2021	10.02.2025 10.02.2025
AT4 - Biological stability (3.)	mgO2/g d.m.	<5		ONORM S 2027-4:2012	25.02.2025 04.03.2025
Volatile substances	% d.m.		22,1	ISO 22167:2021 mod.	25.02.2025 25.02.2025

Results marked with # refer to a non-accredited activity

Sampling	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Waste sampling	/		1	SIST EN 14899:2006	24.01.2025 24.01.2025

Results marked with # refer to a non-accredited activity

(1.) leachate filtered through a 0.45um membrane filter, sample preserved with H₃PO₄

(2.) Leaching of air-dry sample in water, T=20.8°C

(3.) The analysis is carried out on a previously frozen sample, thawed for 24 hours in a temperature chamber. The result is given taking into account the percentage of inerts removed before analysis (ut%=27.51%).

Remark:

The test results refer to the sampled population as defined in Sampling Report No. 2025-0114, which includes all sampling data and is an annex to the Test Report. Any further information on the testing carried out is available from the laboratory.

The sample was properly stored from the time it was received in the laboratory until the analyses were completed.

The report may not be reproduced, except in full, without the written consent of the laboratory. It may not be used for advertising purposes.

Written complaints are taken into account within eight days from the date of receipt of the test report.

Measurement uncertainty data are provided upon request.

Report by:

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

Approved by:Head of Lab.

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.



IKEMA d.o.o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dravskem polju.

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SAMPLING PLAN - WASTE
 In accordance with SIST EN 14899:2006, Annex A, Table A.1

GENERAL INFORMATION 2025-0114, 2025-0115	
The sampling plan was made by: mag. Matjaž Cenčič	For the purpose of: Analysis of waste in odlagalište Jakuševac
Waste holder/Company: Odlagalište otpada Jakuševac Sajmišna cesta 12, 10010, Zagreb, Hrvatska	The producer of the waste: Odlagalište otpada Jakuševac Sajmišna cesta 12, 10010, Zagreb, Hrvatska
Other involved parties: g. Gabrovšek	
The sampling will be carried out by IKEMA d. o. o.	Name of the sampler: mag. Matjaž Cenčič, Matic Borštnar Lamprecht dipl. ekolog naravovarstvenik (UN).
THE PURPOSE OF THE SAMPLING/SAMPLING OBJECTIVE: sampling of predrilled core samples from the body of landfill in Jakuševac.	
SAMPLING APPROACH: probabilističen / probabilistic	
MATERIAL:	
Core samples from landfill.	Location: Odlagalište otpada Jakuševac Sajmišna cesta 12, 10010, Zagreb, Hrvatska
How the waste is produced: By disposing of waste material.	
Waste generation process/activity: compacting	
Specifies the properties and contents to be determined: parameters requested by client (OPĆINSKI SUD U NOVOM ZAGREBU)	
SAMPLING METHOD:	
Specify the detailed sampling location: sampling location determined by client	
Define sub-population: core sample from a pile	
Define the sampling location and points: location of core samples determined by client	
Specify the date and time of sampling: 24.1.2025	
Identify the people who will be present (note names and addresses): Matic Borštnar Lamprecht dipl. ekolog naravovarstvenik (UN) mag. Matjaž Cenčič, dr.sc. Željko Lebo, dipl.ing.grad.,	
Specify sampling techniques (CEN/TR 15210-2): collection of core samples	
Specify the equipment: pedološka sonda, lopatica / soil probe, hand shovel	
Use of rented equipment: YES ☒	NO ☐
Verification method : /	
Specifies the number of increments/samples to be taken (CEN/TR 15310-1): each	
Determine the increment/sample size (CEN/TR 1510-1): about. 40L	
Give the requirements for field determinations (measurements): determining GPS coordinates on sampling site, photo	
Determine how the samples are to be labelled: v skladu z postopki IKEMA d. o. o. / in accordance with the procedures IKEMA d. o. o.	
Set out instructions for safe working: general guidance, protection of hands and eyes with glasses, suitable footwear. High visibility jacket	
SUBSAMPLING: ne / no	
Detailed procedures (CEN/TR 15310-3): Core sample will be split in separate samples (about every 4m will be one sample).	

PACKAGING, PRESERVATION, STORAGE AND REQUIREMENTS DURING TRANSPORT (CEN/TR 15310-4) :

Packaging: PE bag,

Preservation: ni / no preservation

Storage: hladilnica laboratorija podjetja IKEMA d. o. o. / cold room of company IKEMA d. o. o.

Transport: prtljažnik osebnega avtomobila / the trunk of passenger car

ANALYTICAL LABORATORY accepting the sample: IKEMA d. o. o.

Date of sample acceptance: 24.1.2025

✓

IKEMA d.o.o.
INSTITUT ZA KOLEKTIVNO
LOKACIJSKO ANALIZIRANJE
LOKACIJSKO ANALIZIRANJE
LOKACIJSKO ANALIZIRANJE

Sampling location (source: Google earth)



WASTE SAMPLING RECORD

In accordance with SIST EN 14899:2006, Anex B, Table B.1

SAMPLING RECORD 2025-0114**BASIC DATA**

Client Sample code: /

Sample ID: Lab no.: 2025-0114

Date and time of sampling: 24.1.2025 from 10:00 to 10:30

Persons present: dr.sc. Željko Lebo, dipl.ing.građ.

GENERAL INFORMATION

Client: OPĆINSKI SUD U NOVOM ZAGREBU, Turinina ulica 3, 10000 Zagreb

The waste producer: Odlagalište otpada Jakuševac, Sajmišna cesta 12, 10010, Zagreb, Hrvatska

Sampling location: Odlagalište otpada Jakuševac

Sampling sub-location: spot sampling at the core drilling site

Carried out by: IKEMA d. o. o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dr. polju

Sampler: Matic Borštnar Lamprecht dipl. ekolog naravovarstvenik (UN), mag. Matjaz Cencic

SAMPLING OBJECT - WASTE DATA

Sample population: core sample

Waste number: /

Type of waste: deposited waste on landfill

Description of the sample:

Colour:

Smell: ☐ strong ☒ weak ☐ without ☒ odourGrain size: ☐ Uniform size ☒ different sizes

Estimated moisture content: 25-40%

☐ liquid	☒ inhomogeneous	☐ in pieces	☐ suspension
☐ densely liquid/pasty	☒ multiple aggregate layers	☐ grainy	☐ emulsion
☐ sludgy	☒ moist	☐ in powder form	☐ dispersion
☒ solid	☐ dry	☐ hard	☐
☐ homogeneous	☐ dusting	☐ hygroscopic	☐

Additional description:

Different layers easily identified in the core samples.

Grain size range: 0,01-80mm

Density or bulk density: /

Amount of waste to be sampled: about 40L

Geometric similarity of waste:

☐ cone ($V=1/3\pi r^2 \cdot v$) ☒ cylinder ($V= \pi r^2 \cdot v$) ☐ half cylinder ($V= \pi r^2 \cdot v/2$) ☐ cuboid ($V=a \cdot b \cdot c$) ☐ other**SAMPLING METHODOLOGY**

Describe/define the sub-population or uniform sampling: core sample

Accessibility: ☒ Accessible ☐ inaccessible

(access problems affecting the area and quantity of waste sampled)

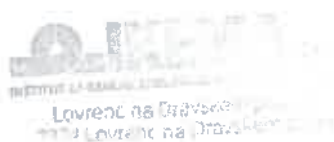
Location and sampling points:

Sampling coordinates: N: 5069428,1900 E:463103,5360

Sampling approach: ☒ Probabilistic ☐ judgemental	
Describe the sampling procedure or technique: Core sample will be split in separate samples (about every 4m will be one sample). This sample is depth from 16m to 20m.	
Sampling equipment used: drilling rig, soil probe, hand shovel	
Use of rented equipment: YES ☒ NO ☐	
Verification method: /	
Number of increments: 1	
The amount of each increment: 40L	
Observations during sampling (gas evolution, reactions, heat development, etc.):	
Details of on-site determinations:	
Safety precautions: standard protective equipment (gloved hands, suitable footwear and clothing, safety vest, safety goggles, etc.).	
SUB-SAMPLE PREPARATION AND PRE-TREATMENT:	
Describe the location (field, workshop or lab, indoor or outdoor) Outdoor, top of landfill	
Procedure: sub-sample taken in the field for: ☐ BTEX ☐ VOC ☐ Total Hydrocarbons ☐ PAH ☐	
PACKAGING, PRESERVATION, STORAGE, TRANSPORT	
Packaging: ☐ Glass ☒ 50 L PE bag ☐ PE bottle ☐ metal packaging ☐ other	
Preservation: ☐ Preserved with ☐ refrigeration ☒ not preserved	
Storage/Storage: storage IKEMA d.o.o.	
Transport: ☒ car trunk ☐ Cooling bag ☐ Other	
T _{zač} := 3,4 °C T _{konč} := 3,6 °C Equipment ID: I-185B	
DEVIATION FROM THE SAMPLING PLAN: YES ☐ NO ☒	
Description of the deviation: /	
WEATHER CONDITIONS	
Air temperature: 2°C	
Weather: ☐ Sunny ☒ cloudy ☐ rainy ☐ snow ☐ other (dry and cold)	
DELIVERY TO THE ANALYTICAL LABORATORY	
Laboratory: IKEMA d.o.o.	
Date of delivery: 24.1.2025	

Report by: Matjaž Cencič

Approved the report: Nataša Kante Flanjak



Date of report: 13.3.2025

Sample photographs



TEST REPORT

Report No: 2025-0115

General information:

Name: Waste analysis
 Client: OPČINSKI SUD U NOVOM ZAGREBU , Turinina ulica 3, 10000 Zagreb
 Sampled by: mag. Matjaž Cenčič
 No. Offers: P 153/2024

Sample information:

Subscription code: Zagreb Landfill, 20m - 22m
 Description of the sample: Zagreb Landfill, 20m - 22m
 Sampling time: 24.1.2025
 Sample status: The sample meets the admission criteria
 Date of sample collection : 24.01.2025
 Date of report: 19.03.2025

Sample ID : Lab.No.: 2025 - 0115

Analysis :

MEASUREMENTS:

1. Parameter-Leachate	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Dissolved organic carbon-DOC (1.)	mg/kg d.m.		5451	CEN/TR 16192:2020, SIST EN 12457-4, SIST EN 1484:1998	17.02.2025 17.02.2025
2. Parameter-WASTE	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Total organic carbon-TOC	% d.m.		14	SIST EN 15936:2022, Method B	17.02.2025 19.02.2025
Net Calorific value	kJ/kg d.m.	<6000	#	SIST-TS-CEN/TS 16023:2014	21.02.2025 21.02.2025
pH (2.)	/		7,9	EN ISO 10390:2022, SIST EN 16179:2013	03.03.2025 03.03.2025
Gross Calorific value	kJ/kg d.m.	<6000	#	SIST-TS-CEN/TS 16023:2014	21.02.2025 21.02.2025
Dry matter	%		67,65	EN 15934:2012, Method A	27.01.2025 27.01.2025
Loss of incandescence	% d.m.		30,43	SIST EN 15935:2021	10.02.2025 10.02.2025
AT4 - Biological stability (3.)	mgO ₂ /g d.m.		8,45	ONORM S 2027-4:2012	25.02.2025 04.03.2025
Volatile substances	% d.m.		27,2	ISO 22167:2021 mod.	25.02.2025 25.02.2025

Results marked with # refer to a non-accredited activity

Sampling	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Waste sampling	/		1	SIST EN 14899:2006	24.01.2025 21.01.2025

Results marked with # refer to a non-accredited activity

(1.) leachate filtered through a 0.45um membrane filter, sample preserved with H₃PO₄

(2.) Leaching of air-dry sample in water, T=20.8°C

(3.) The analysis is carried out on a previously frozen sample, thawed for 24 hours in a temperature chamber. The result is given taking into account the percentage of inerts that were removed before the analysis (ut%=41.60%).

Remark:

The test results refer to the sampled population as defined in Sampling Report No. 2025-0115, which includes all sampling data and is an annex to the Test Report. Any further information on the testing carried out is available from the laboratory.

The sample was properly stored from the time it was received in the laboratory until the analyses were completed.

The report may not be reproduced, except in full, without the written consent of the laboratory. It may not be used for advertising purposes.

Written complaints are taken into account within eight days from the date of receipt of the test report.

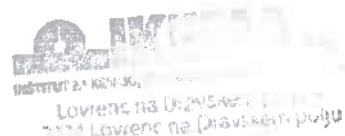
Measurement uncertainty data are provided upon request.

Report by:

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

Approved by: Head of Lab.

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.



IKEMA d.o.o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dravskem polju.

T:+386(0)2 790 0060, F:+386(0)2 7900061, E:info@ikema.si, VAT identification number: SI99144620, business account number: SI56 0215 0001 7604 620 with NLB d.d.

WASTE SAMPLING RECORD

In accordance with SIST EN 14899:2006, Anex B, Table B.1

SAMPLING RECORD 2025-0115

BASIC DATA

Client Sample code: /

Sample ID: Lab no.: 2025-0115

Date and time of sampling: 24.1.2025 from 10:30 to 11:00

Persons present: dr.sc. Željko Lebo, dipl.ing.građ.

GENERAL INFORMATION

Client: OPĆINSKI SUD U NOVOM ZAGREBU, Turinina ulica 3, 10000 Zagreb

The waste producer: Odlagalište otpada Jakuševac, Sajmišna cesta 12, 10010, Zagreb, Hrvatska

Sampling location: Odlagalište otpada Jakuševac

Sampling sub-location: spot sampling at the core drilling site

Carried out by: IKEMA d. o. o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dr. polju

Sampler: Matic Borštnar Lampreht dipl. ekolog naravovarstvenik (UN), mag. Matjaz Cencic

SAMPLING OBJECT - WASTE DATA

Sample population: core sample

Waste number: /

Type of waste: deposited waste on landfill

Description of the sample:

Colour:

Smell: ☐ strong ☒ weak ☐ without ☒ odour

Grain size: ☐ Uniform size ☒ different sizes

Estimated moisture content: 30%-40%

☐ liquid	☒ inhomogeneous	☐ in pieces	☐ suspension
☐ densely liquid/pasty	☒ multiple aggregate layers	☐ grainy	☐ emulsion
☐ sludgy	☒ moist	☐ in powder form	☐ dispersion
☒ solid	☐ dry	☐ hard	☐
☐ homogeneous	☐ dusting	☐ hygroscopic	☐

Additional description:

Different layers easily identified in the core samples.

Grain size range: 0,01-80mm

Density or bulk density: /

Amount of waste to be sampled: about 40L

Geometric similarity of waste:

☐ cone ($V=1/3\pi r^2 \cdot v$) ☒ cylinder ($V=\pi r^2 \cdot v$) ☐ half cylinder ($V=\pi r^2 \cdot v/2$) ☐ cuboid ($V=a \cdot b \cdot c$) ☐ other

SAMPLING METHODOLOGY

Describe/define the sub-population or uniform sampling: core sample.

Accessibility: ☒ Accessible ☐ inaccessible

(access problems affecting the area and quantity of waste sampled)

Location and sampling points:

Sampling coordinates: N: 5069428,1900 E:463103,5360

Sampling approach:	
☒ Probabilistic	☐ judgemental
Describe the sampling procedure or technique:	
Core sample will be split in separate samples (about every 4m will be one sample).	
This sample is depth from 20m to 22m.	
Sampling equipment used: drilling rig, soil probe, hand shovel	
Use of rented equipment: YES ☒ NO ☐	
Verification method: /	
Number of increments: 1	
The amount of each increment: 25L	
Observations during sampling (gas evolution, reactions, heat development, etc.):	
Details of on-site determinations:	
Safety precautions: standard protective equipment (gloved hands, suitable footwear and clothing, safety vest, safety goggles, etc.).	
SUB-SAMPLE PREPARATION AND PRE-TREATMENT:	
Describe the location (field, workshop or lab, indoor or outdoor)	
Outdoor, top of landfill	
Procedure: sub-sample taken in the field for:	
☐ BTEX	☐ VOC ☐ Total Hydrocarbons ☐ PAH ☐
PACKAGING, PRESERVATION, STORAGE, TRANSPORT	
Packaging: ☐ Glass ☒ 50 L PE bag ☐ PE bottle ☐ metal packaging ☐ other	
Preservation: ☐ Preserved with ☐ refrigeration ☒ not preserved	
Storage/Storage: storage IKEMA d.o.o.	
Transport: ☒ car trunk ☐ Cooling bag ☐ Other	
$T_{zag} = 3,4\text{ }^{\circ}\text{C}$	$T_{konj} = 3,6\text{ }^{\circ}\text{C}$
Equipment ID: I-185B	
DEVIATION FROM THE SAMPLING PLAN: YES ☐ NO ☒	
Description of the deviation:	
There are only 2m of core sample in this sample, because deposited waste is 22m deep. Because there was less sample we could not take 50l, so we took 25l of sample.	
WEATHER CONDITIONS	
Air temperature: 2°C	
Weather: ☐ Sunny ☒ cloudy ☐ rainy ☐ snow ☐ other (dry and cold)	
DELIVERY TO THE ANALYTICAL LABORATORY	
Laboratory: IKEMA d.o.o.	
Date of delivery: 24.1.2025	

Report by: Matjaž Cenčič

Approved the report: Nataša Kante Flanjak

Date of report: 13.3.2025



Sample photographs



TEST REPORT

Report No: 2025-0116

General information:

Name: Waste analysis
 Client: OPČINSKI SUD U NOVOM ZAGREBU, Turinina ulica 3, 10000 Zagreb
 Sampled by: mag. Matjaž Cenčič
 No. Offers: P 153/2024

Sample information:

Subscription code: Zagreb Landfill, 0m - 5m
 Description of the sample: Zagreb Landfill 0m - 5m
 Sampling time: 24.1.2025
 Sample status: The sample meets the admission criteria
 Date of sample collection : 24.01.2025
 Date of report: 20.03.2025

Sample ID : Lab.No.: 2025 - 0116

Analysis :

MEASUREMENTS:

1. Parameter-Leachate	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Dissolved organic carbon-DOC (1.)	mg/kg d.m.		1388	CEN/TR 16192:2020, SIST EN 12457-4, SIST EN 1484:1998	17.02.2025 17.02.2025
2. Parameter-Waste	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Total organic carbon-TOC	% d.m.		24	SIST EN 15936:2022, Method B	17.03.2025 19.03.2025
Net Calorific value	kJ/kg d.m.		<6000 #	SIST-TS-CEN/TS 16023:2014	21.02.2025 21.02.2025
pH (2.)	/		7,7	EN ISO 10390:2022, SIST EN 16179:2013	03.03.2025 03.03.2025
Gross Calorific value	kJ/kg d.m.		7600 #	SIST-TS-CEN/TS 16023:2014	21.02.2025 21.02.2025
Dry matter	%		66,61	EN 15934:2012, Method A	27.01.2025 27.01.2025
Loss on ignition	% d.m.		32,69	SIST EN 15935:2021	21.02.2025 21.02.2025
Volatile substances	% d.m.		30,6 #	EN ISO 22167:2021 mod.	25.02.2025 25.03.2025
AT4 - Biological stability (3.)	mgO ₂ /g d.m.		<5	ONORM S 2027-4:2012	05.03.2025 13.03.2025

Results marked with # refer to a non-accredited activity

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 0215 0001 7604 620 with NLB d.d.

Sampling	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Waste sampling	/		1	SIST EN 14899:2006	24.01.2025 24.01.2025

Results marked with # refer to a non-accredited activity

(1.) leachate filtered through a 0.45um membrane filter, sample preserved with H₃PO₄

(2.) Leaching of air-dry sample in water, T=20,9°C

(3.) The analysis is carried out on a previously frozen sample, thawed for 24 hours in a temperature chamber. The result is given taking into account the percentage of Inerts removed before analysis (ut%=40,3%).

Remark:

The test results refer to the sampled population as defined in Sampling Report No. 2025-0116, which includes all sampling data and is an annex to the Test Report. Any further information on the testing carried out is available from the laboratory.

The sample was properly stored from the time it was received in the laboratory until the analyses were completed.

The report may not be reproduced, except in full, without the written consent of the laboratory. It may not be used for advertising purposes.

Written complaints are taken into account within eight days from the date of receipt of the test report.

Measurement uncertainty data are provided upon request.

Report by:

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

Approved by: Head of Lab.

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.



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SAMPLING PLAN - WASTE

In accordance with SIST EN 14899:2006, Annex A, Table A.1

GENERAL INFORMATION 2025-0116-2025-0120

The sampling plan was made by: mag. Matjaž Cenčič For the purpose of: Analysis of waste in odlagalište Jakuševac

Waste holder/Company:
Odlagalište otpada Jakuševac
Sajmišna cesta 12,
10010, Zagreb,
Hrvatska

The producer of the waste:
Odlagalište otpada Jakuševac
Sajmišna cesta 12,
10010, Zagreb,
Hrvatska

Other involved parties: g. Gabrovšek

The sampling will be carried out by IKEMA d. o. o. Name of the sampler: mag. Matjaž Cenčič, Matic Borštnar Lampreht dipl. ekolog naravovarstvenik (UN).

THE PURPOSE OF THE SAMPLING/SAMPLING OBJECTIVE: sampling of predrilled core samples from the body of landfill in Jakuševac.

SAMPLING APPROACH: probabilističen / probabilistic

MATERIAL:

Core samples from landfill. Location:
Odlagalište otpada Jakuševac
Sajmišna cesta 12,
10010, Zagreb,
Hrvatska

How the waste is produced:
By disposing of waste material.

Waste generation process/activity: compacting

Specifies the properties and contents to be determined: parameters requested by client (OPĆINSKI SUD U NOVOM ZAGREBU)

SAMPLING METHOD:

Specify the detailed sampling location: sampling location determined by client

Define sub-population: core sample from a pile

Define the sampling location and points: location of core samples determined by client

Specify the date and time of sampling: 24.1.2025

Identify the people who will be present (note names and addresses): Matic Borštnar Lampreht dipl. ekolog naravovarstvenik (UN) mag. Matjaž Cenčič, dr.sc. Željko Lebo, dipl.ing.građ.,

Specify sampling techniques (CEN/TR 15210-2): collection of core samples

Specify the equipment: pedološka sonda, lopatica / soil probe, hand shovel

Use of rented equipment: YES ☒

NO ☐

Verification method: /

Specifies the number of increments/samples to be taken (CEN/TR 15310-1): each

Determine the increment/sample size (CEN/TR 15310-1): about. 40L

Give the requirements for field determinations (measurements): determining GPS coordinates on sampling site, photo

Determine how the samples are to be labelled: v skladu z postopki IKEMA d. o. o. / in accordance with the procedures IKEMA d. o. o.

Set out instructions for safe working: general guidance, protection of hands and eyes with glasses, suitable footwear. High visibility jacket

SUBSAMPLING: ne / no

Detailed procedures (CEN/TR 15310-3):

Core sample will be split in separate samples (about every 5m will be one sample).

PACKAGING, PRESERVATION, STORAGE AND REQUIREMENTS DURING TRANSPORT (CEN/TR 15310-4) :
Packaging: PE bag,
Preservation: ni / no preservation
Storage: hladilnica laboratorija podjetja IKEMA d. o. o. / cold room of company IKEMA d. o. o.
Transport: prtljažnik osebnega avtomobila / the trunk of passenger car
ANALYTICAL LABORATORY accepting the sample: IKEMA d. o. o.
Date of sample acceptance: 24.1.2025

Sampling location (source: Google earth)



WASTE SAMPLING RECORD

In accordance with SIST EN 14899:2006, Anex B, Table B.1

SAMPLING RECORD 2025-0116
BASIC DATA

Client Sample code: /

Sample ID: Lab no.: 2025-0116

Date and time of sampling: 24.1.2025 from 11:00 to 11:20

Persons present: dr.sc. Željko Lebo, dipl.ing.građ.

GENERAL INFORMATION

Client: OPĆINSKI SUD U NOVOM ZAGREBU , Turinina ulica 3, 10000 Zagreb

The waste producer: Odlagalište otpada Jakuševac, Sajmišna cesta 12, 10010, Zagreb, Hrvatska

Sampling location: Odlagalište otpada Jakuševac

Sampling sub-location: spot sampling at the core drilling site

Carried out by: IKEMA d. o. o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dr. polju

Sampler: Matic Borštnar Lampreht dipl. ekolog naravovarstvenik (UN), mag. Matjaz Cencic

SAMPLING OBJECT - WASTE DATA

Sample population: core sample

Waste number: /

Type of waste: deposited waste on landfill

Description of the sample:

Colour:

 Smell: ☐ strong ☒ weak ☐ without ☒ odour

 Grain size: ☐ Uniform size ☒ different sizes

Estimated moisture content: 30%-50%

☐ liquid	☒ inhomogeneous	☐ in pieces	☐ suspension
☐ densely liquid/pasty	☒ multiple aggregate layers	☐ grainy	☐ emulsion
☐ sludgy	☒ moist	☐ in powder form	☐ dispersion
☒ solid	☐ dry	☐ hard	☐
☐ homogeneous	☐ dusting	☐ hygroscopic	☐

Additional description:

Different layers easily identified in the core samples.

Grain size range: 0,01-80mm

Density or bulk density: /

Amount of waste to be sampled: about 40L

Geometric similarity of waste:

☐ cone ($V=1/3\pi r^2 \cdot v$) ☒ cylinder ($V= \pi r^2 \cdot v$) ☐ half cylinder ($V= \pi r^2 \cdot v/2$) ☐ cuboid ($V=a.b.c$) ☐ other

SAMPLING METHODOLOGY

Describe/define the sub-population or uniform sampling: core sample.

 Accessibility: ☒ Accessible ☐ inaccessible

(access problems affecting the area and quantity of waste sampled)

Location and sampling points:

Sampling coordinates: N: 45°45'50.6" E: 16°01'34.1"

Sampling approach: ☒ Probabilistic ☐ judgemental	
Describe the sampling procedure or technique: Core sample will be split in separate samples (about every 5m will be one sample). This sample is depth from 0m to 5m.	
Sampling equipment used: drilling rig, soil probe, hand shovel	
Use of rented equipment: YES ☒ NO ☐	
Verification method: /	
Number of increments: 1	
The amount of each increment: 40L	
Observations during sampling (gas evolution, reactions, heat development, etc.):	
Details of on-site determinations:	
Safety precautions: standard protective equipment (gloved hands, suitable footwear and clothing, safety vest, safety goggles, etc.).	
SUB-SAMPLE PREPARATION AND PRE-TREATMENT:	
Describe the location (field, workshop or lab, indoor or outdoor) Outdoor, top of landfill	
Procedure: sub-sample taken in the field for: ☐ BTEX ☐ VOC ☐ Total Hydrocarbons ☐ PAH ☐	
PACKAGING, PRESERVATION, STORAGE, TRANSPORT	
Packaging: ☐ Glass ☒ 50 L PE bag ☐ PE bottle ☐ metal packaging ☐ other	
Preservation: ☐ Preserved with ☐ refrigeration ☒ not preserved	
Storage/Storage: storage IKEMA d.o.o.	
Transport: ☒ car trunk ☐ Cooling bag ☐ Other	
$T_{\text{zač.}} = 3,4^{\circ}\text{C}$ $T_{\text{konč.}} = 3,6^{\circ}\text{C}$	Equipment ID: I-185B
DEVIATION FROM THE SAMPLING PLAN: YES ☐ NO ☒	
Description of the deviation: /	
WEATHER CONDITIONS	
Air temperature: $2,5^{\circ}\text{C}$	
Weather: ☐ Sunny ☒ cloudy ☐ rainy ☐ snow ☐ other (dry and cold)	
DELIVERY TO THE ANALYTICAL LABORATORY	
Laboratory: IKEMA d.o.o.	
Date of delivery: 24.1.2025	

Report by: Matjaž Cenčič

Approved the report: Nataša Kante Flanjak

Date of report: 13.3.2025

Sample photograph



TEST REPORT

Report No: 2025-0117

General information:

Name: Waste analysis
 Client: OPĆINSKI SUD U NOVOM ZAGREBU ,Turinina ulica 3, 10000 Zagreb
 Sampled by: mag.Matjaž Cenčič
 No. Offers: P 153/2024

Sample information:

Subscription code: Zagreb Landfill, 5m - 10m
 Description of the sample: Zagreb Landfill, 5m - 10m
 Sampling time: 24.1.2025
 Sample status: The sample meets the admission criteria
 Date of sample collection : 24.01.2025
 Date of report: 20.03.2025

Sample ID : Lab.No.: 2025 - 0117

Analysis :

MEASUREMENTS:

1. Parameter-Leachate	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Dissolved organic carbon-DOC (1.)	mg/kg d.m.		1782	CEN/TR 16192:2020, SIST EN 12457-4,SIST EN 1484:1998	17.02.2025 17.02.2025
2. Parameter-WASTE					
	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Volatile substances	% d.m.	21	#	EN ISO 22167:2021 mod	25.02.2025 25.02.2025
Total organic carbon-TOC	% d.m.	9,3		SIST EN 15936:2022, Method B	17.03.2025 19.03.2025
Net Calorific value	kJ/kg d.m.	<6000	#	SIST-TS-CEN/TS 16023:2014	21.02.2025 21.02.2025
pH (2.)	/	10,4		EN ISO 10390:2022, SIST EN 16179:2013	03.03.2025 03.03.2025
Gross Calorific value	kJ/kg d.m.	<6000	#	SIST-TS-CEN/TS 16023:2014	21.02.2025 21.02.2025
Dry matter	%	75,02		EN 15934:2012, Method A	27.01.2025 27.01.2025
Loss on ignition	% d.m.	17,51		SIST EN 15935:2021	21.02.2025 21.02.2025
AT4 - Biological stability (3.)	mgO2/g d.m.	<5		ONORM S 2027-4:2012	05.03.2025 13.03.2025

Results marked with # refer to a non-accredited activity

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 0215 0001 7804 620 with NLB d.d.

Sampling	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Waste sampling	/		1	SIST EN 14899:2006	24.01.2025 24.01.2025

Results marked with # refer to a non-accredited activity

(1.) leachate filtered through a 0.45um membrane filter, sample preserved with H₃PO₄

(2.) Leaching of air-dry sample in water, T=20.8°C

(3.) The analysis is carried out on a previously frozen sample, thawed for 24 hours in a temperature chamber. The result is given taking into account the percentage of Inerts that were removed before the analysis (wt%=38.61%).

Remark:

The test results refer to the sampled population as defined in Sampling Report No. 2025-0117, which includes all sampling data and is an annex to the Test Report. Any further information on the testing carried out is available from the laboratory.

The sample was properly stored from the time it was received in the laboratory until the analyses were completed.

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Written complaints are taken into account within eight days from the date of receipt of the test report.

Measurement uncertainty data are provided upon request.

Report by:

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

Approved by: Head of Lab.

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

L

IKEMA d.o.o.
POSREDOVANJE V PROMETU IN ANALITIKA
na Dravskem polju 4
Ljubeč na Dravskem polju

IKEMA d.o.o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dravskem polju.

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WASTE SAMPLING RECORD

In accordance with SIST EN 14899:2006, Anex B, Table B.1

SAMPLING RECORD 2025-0117

BASIC DATA

Client Sample code: /

Sample ID: Lab no.: 2025-0117

Date and time of sampling: 24.1.2025 from 11:20 to 11:40

Persons present: dr.sc. Željko Lebo, dipl.ing.grad.

GENERAL INFORMATION

Client: OPĆINSKI SUD U NOVOM ZAGREBU , Turinina ulica 3, 10000 Zagreb

The waste producer: Odlagalište otpada Jakuševac, Sajmišna cesta 12, 10010, Zagreb, Hrvatska

Sampling location: Odlagalište otpada Jakuševac

Sampling sub-location: spot sampling at the core drilling site

Carried out by: IKEMA d. o. o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dr. polju

Sampler: Matic Borštnar Lamprecht dipl. ekolog naravovarstvenik (UN), mag. Matjaz Cencic

SAMPLING OBJECT - WASTE DATA

Sample population: core sample

Waste number: /

Type of waste: deposited waste on landfill

Description of the sample:

Colour:

Smell: ☐ strong ☒ weak ☐ without ☒ odour

Grain size: ☐ Uniform size ☒ different sizes

Estimated moisture content: 30%-50%

☐ liquid	☒ inhomogeneous	☐ in pieces	☐ suspension
☐ densely liquid/pasty	☒ multiple aggregate layers	☐ grainy	☐ emulsion
☐ sludgy	☒ moist	☐ in powder form	☐ dispersion
☒ solid	☐ dry	☐ hard	☐
☐ homogeneous	☐ dusting	☐ hygroscopic	☐

Additional description:

Different layers easily identified in the core samples.

Grain size range: 0,01-80mm

Density or bulk density: /

Amount of waste to be sampled: about 40L

Geometric similarity of waste:

☐ cone ($V=1/3\pi r^2 \cdot v$) ☒ cylinder ($V= \pi r^2 \cdot v$) ☐ half cylinder ($V= \pi r^2 \cdot v/2$) ☐ cuboid ($V=a \cdot b \cdot c$) ☐ other

SAMPLING METHODOLOGY

Describe/define the sub-population or uniform sampling: core sample.

Accessibility: ☒ Accessible ☐ inaccessible

(access problems affecting the area and quantity of waste sampled)

Location and sampling points:

Sampling coordinates: N: 45°45'50.6" E: 16°01'34.1"

Sampling approach:	
☒ Probabilistic	☐ judgemental
Describe the sampling procedure or technique:	
Core sample will be split in separate samples (about every 5m will be one sample).	
This sample is depth from 5m to 10m.	
Sampling equipment used: drilling rig, soil probe, hand shovel	
Use of rented equipment: YES ☒ NO ☐	
Verification method: /	
Number of increments: 1	
The amount of each increment: 40L	
Observations during sampling (gas evolution, reactions, heat development, etc.):	
Details of on-site determinations:	
Safety precautions: standard protective equipment (gloved hands, suitable footwear and clothing, safety vest, safety goggles, etc.).	
SUB-SAMPLE PREPARATION AND PRE-TREATMENT:	
Describe the location (field, workshop or lab, indoor or outdoor)	
Outdoor, top of landfill	
Procedure: sub-sample taken in the field for:	
☐ BTEX	☐ VOC ☐ Total Hydrocarbons ☐ PAH ☐
PACKAGING, PRESERVATION, STORAGE, TRANSPORT	
Packaging: ☐ Glass ☒ 50 L PE bag ☐ PE bottle ☐ metal packaging ☐ other	
Preservation: ☐ Preserved with ☐ refrigeration ☒ not preserved	
Storage/Storage: storage IKEMA d.o.o.	
Transport: ☒ car trunk ☐ Cooling bag ☐ Other	
T _{zač.} = 3,4 °C	T _{konč.} = 3,6 °C
Equipment ID: I-185B	
DEVIATION FROM THE SAMPLING PLAN: YES ☐ NO ☒	
Description of the deviation:	
/	
WEATHER CONDITIONS	
Air temperature: 2,5°C	
Weather: ☐ Sunny ☒ cloudy ☐ rainy ☐ snow ☐ other (dry and cold)	
DELIVERY TO THE ANALYTICAL LABORATORY	
Laboratory: IKEMA d.o.o.	
Date of delivery: 24.1.2025	

Report by: Matjaž Cenčič



Approved the report: Nataša Kante Flanjak





Date of report: 13.3.2025

Sample photograph



TEST REPORT

Report No: 2025-0118

General information:

Name: Waste analysis
 Client: OPČINSKI SUD U NOVOM ZAGREBU , Turinina ulica 3, 10000 Zagreb
 Sampled by: Mag. Matjaž Cenčič
 No. Offers: P 153/2024

Sample information:

Subscription code: Zagreb Landfill 10m - 15m
 Description of the sample: Zagreb Landfill, 10m - 15m
 Sampling time: 24.1.2025
 Sample status: The sample meets the admission criteria
 Date of sample collection : 24.01.2025
 Date of report: 20.03.2025

Sample ID : Lab.No.: 2025 - 0118

Analysis :

MEASUREMENTS:

1. Parameter-Leachate	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Dissolved organic carbon-DOC (1.)	mg/kg d.m.		1428	CEN/TR 16192:2020, SIST EN 12457-4, SIST EN 1484:1998	17.02.2025 17.02.2025
2. Parameter-WASTE					
	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Volatile substances	% d.m.		23,4 #	EN ISO 22167:2021 mod.	25.02.2025 25.02.2025
Total organic carbon-TOC	% d.m.		10,5	SIST EN 15936:2022, Method B	17.03.2025 19.03.2025
Net Calorific value	kJ/kg d.m.	<6000	#	SIST-TS-CEN/TS 16023:2014	21.02.2025 21.02.2025
pH (2.)	/		9,2	EN ISO 10390:2022, SIST EN 16179:2013	03.03.2025 03.03.2025
Gross Calorific value	kJ/kg d.m.	<6000	#	SIST-TS-CEN/TS 16023:2014	21.02.2025 21.02.2025
Dry matter	%		76,64	EN 15934:2012, Method A	21.02.2025 27.01.2025
Loss on ignition	% d.m.		17,64	SIST EN 15935:2021	24.01.2025 21.02.2025
AT4 - Biological stability (3.)	mgO ₂ /g d.m.	<5		ONORM S 2027-4:2012	05.03.2025 13.03.2025

Results marked with # refer to a non-accredited activity

Sampling	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Waste sampling	/		1	SIST EN 14899:2006	24.01.2025 24.01.2025

Results marked with # refer to a non-accredited activity

(1.) leachate filtered through a 0.45um membrane filter, sample preserved with H₃PO₄

(2.) Leaching of air-dry sample in water, T=20,5°C

(3.) The analysis is carried out on a previously frozen sample, thawed for 24 hours in a temperature chamber. The result is given taking into account the percentage of inerts removed before analysis (ut%=36.0%).

Remark:

The test results refer to the sampled population as defined in Sampling Report No. 2025-0118, which includes all sampling data and is an annex to the Test Report. Any additional information on the testing carried out is available from the laboratory.

The sample was properly stored from the time it was received in the laboratory until the analyses were completed.

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Written complaints are taken into account within eight days from the date of receipt of the test report.

Measurement uncertainty data are provided upon request.

Report by:

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

Approved by: Head of Lab.

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

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WASTE SAMPLING RECORD

In accordance with SIST EN 14899:2006, Anex B, Table B.1

SAMPLING RECORD 2025-0118

BASIC DATA

Client Sample code: /

Sample ID: Lab no.: 2025-0118

Date and time of sampling: 24.1.2025 from 11:40 to 12:00

Persons present: dr.sc. Željko Lebo, dipl.ing.građ.

GENERAL INFORMATION

Client: OPĆINSKI SUD U NOVOM ZAGREBU , Turinina ulica 3, 10000 Zagreb

The waste producer: Odlagalište otpada Jakuševac, Sajmišna cesta 12, 10010, Zagreb, Hrvatska

Sampling location: Odlagalište otpada Jakuševac

Sampling sub-location: spot sampling at the core drilling site

Carried out by: IKEMA d. o. o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dr. polju

Sampler: Matic Borštnar Lamprecht dipl. ekolog naravovarstvenik (UN), mag. Matjaz Cencic

SAMPLING OBJECT - WASTE DATA

Sample population: core sample

Waste number: /

Type of waste: deposited waste on landfill

Description of the sample:

Colour:

Smell: ☐ strong ☒ weak ☐ without ☒ odour

Grain size: ☐ Uniform size ☒ different sizes

Estimated moisture content: 30%-50%

☐ liquid	☒ inhomogeneous	☐ in pieces	☐ suspension
☐ densely liquid/pasty	☒ multiple aggregate layers	☐ grainy	☐ emulsion
☐ sludgy	☒ moist	☐ in powder form	☐ dispersion
☒ solid	☐ dry	☐ hard	☐
☐ homogeneous	☐ dusting	☐ hygroscopic	☐

Additional description:

Different layers easily identified in the core samples.

Grain size range: 0,01-80mm

Density or bulk density: /

Amount of waste to be sampled: about 40L

Geometric similarity of waste:

☐ cone ($V=1/3\pi r^2 \cdot v$) ☒ cylinder ($V=\pi r^2 \cdot v$) ☐ half cylinder ($V=\pi r^2 \cdot v/2$) ☐ cuboid ($V=a \cdot b \cdot c$) ☐ other

SAMPLING METHODOLOGY

Describe/define the sub-population or uniform sampling: core sample.

Accessibility: ☒ Accessible ☐ inaccessible

(access problems affecting the area and quantity of waste sampled)

Location and sampling points:

Sampling coordinates: N: 45°45'50.6" E: 16°01'34.1"

Sampling approach:	
☒ Probabilistic	☐ Judgemental
Describe the sampling procedure or technique:	
Core sample will be split in separate samples (about every 5m will be one sample).	
This sample is depth from 10m to 15m.	
Sampling equipment used: drilling rig, soil probe, hand shovel	
Use of rented equipment: YES ☒ NO ☐	
Verification method: /	
Number of increments: 1	
The amount of each increment: 40L	
Observations during sampling (gas evolution, reactions, heat development, etc.):	
Details of on-site determinations:	
Safety precautions: standard protective equipment (gloved hands, suitable footwear and clothing, safety vest, safety goggles, etc.).	
SUB-SAMPLE PREPARATION AND PRE-TREATMENT:	
Describe the location (field, workshop or lab, indoor or outdoor)	
Outdoor, top of landfill	
Procedure: sub-sample taken in the field for:	
☐ BTEX ☐ VOC ☐ Total Hydrocarbons ☐ PAH ☐ ☐	
PACKAGING, PRESERVATION, STORAGE, TRANSPORT	
Packaging: ☐ Glass ☒ 50 L PE bag ☐ PE bottle ☐ metal packaging ☐ other	
Preservation: ☐ Preserved with ☐ refrigeration ☒ not preserved	
Storage/Storage: storage IKEMA d.o.o.	
Transport: ☒ car trunk ☐ Cooling bag ☐ Other	
T _{zrač.} = 3,4 °C T _{konč.} = 3,6 °C	
Equipment ID: I-185B	
DEVIATION FROM THE SAMPLING PLAN: YES ☐ NO ☒	
Description of the deviation:	
/	
WEATHER CONDITIONS	
Air temperature: 2,5°C	
Weather: ☐ Sunny ☒ cloudy ☐ rainy ☐ snow ☐ other (dry and cold)	
DELIVERY TO THE ANALYTICAL LABORATORY	
Laboratory: IKEMA d.o.o.	
Date of delivery: 24.1.2025	

Report by: Matjaž Cenčič

Approved the report: Nataša Kante Flanjak

Date of report: 13.3.2025

Sample photograph



TEST REPORT

Report No: 2025-0119

General information:

Name: Waste analysis
 Client: OPĆINSKI SUD U NOVOM ZAGREBU, Turinina ulica 3, 10000 Zagreb
 Sampled by: Mag. Matjaž Cenčič
 No. Offers: P 153/2024

Sample information:

Subscription code: Zagreb Landfill, 15m - 20m
 Description of the sample: Zagreb Landfill, 15m - 20m
 Sampling time: 24.1.2025
 Sample status: The sample meets the admission criteria
 Date of sample collection: 24.01.2025
 Date of report: 20.03.2025

Sample ID : Lab.No.: 2025 - 0119

Analysis :

MEASUREMENTS:

1.Parameter- Leachate	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Dissolved organic carbon-DOC (1.)	mg/kg d.m.		1583	CEN/TR 16192:2020, SIST EN 12457-4, SIST EN 1484:1998	17.02.2025 17.02.2025
2. Parameter-WASTE	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Volatile substances	% d.m.		20,1 #	EN ISO 22167:2021 mod.	25.02.2025 25.03.2025
Total organic carbon-TOC	% d.m.		10,2	SIST EN 15936:2022, Method B	17.02.2025 19.02.2025
Net Calorific value	kJ/kg d.m.		<6000 #	SIST-TS-CEN/TS 16023:2014	21.02.2025 21.02.2025
pH (2.)	/		9,2	EN ISO 10390:2022, SIST EN 16179:2013	06.03.2025 06.03.2025
Gross Calorific value	kJ/kg d.m.		<6000 #	SIST-TS-CEN/TS 16023:2014	21.02.2025 21.02.2025
Dry matter	%		75,35	EN 15934:2012, Method A	27.01.2025 27.01.2025
Loss on ignition	% d.m..		19,86	SIST EN 15935:2021	10.02.2025 10.02.2025
AT4 - Biological stability (3.)	mgO ₂ /g d.m..		<5	ONORM S 2027-4:2012	05.03.2025 13.03.2025

Results marked with # refer to a non-accredited activity

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 0215 0001 7604 620 with NLB d.d.

Sampling	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Waste sampling	/		1	SIST EN 14899:2006	24.01.2025 24.01.2025

Results marked with # refer to a non-accredited activity

(1.) leachate filtered through a 0.45um membrane filter, sample preserved with H₃PO₄

(2.) Leaching of air-dry sample in water, T=21.2°C

(3.) The analysis is carried out on a previously frozen sample, thawed for 24 hours in a temperature chamber. The result is given taking into account the percentage of inerts that were removed before the analysis (ut%=34.82%).

Remark:

The test results refer to the sampled population as defined in Sampling Report No. 2025-0119, which includes all sampling data and is an annex to the Test Report. Any further information on the testing carried out is available from the laboratory.

The sample was properly stored from the time it was received in the laboratory until the analyses were completed.

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Written complaints are taken into account within eight days from the date of receipt of the test report.

Measurement uncertainty data are provided upon request.

Report by:

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

Approved by: Head of Lab.

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

[Handwritten signature and stamp]
IKEMA
Ljubljana, Dravskem polju
Ljubljana, Dravskem polju

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WASTE SAMPLING RECORD

In accordance with SIST EN 14899:2006, Anex B, Table B.1

SAMPLING RECORD 2025-0119

BASIC DATA

Client Sample code: /

Sample ID: Lab no.: 2025-0119

Date and time of sampling: 24.1.2025 from 12:00 to 12:20

Persons present: dr.sc. Željko Lebo, dipl.ing.grač.

GENERAL INFORMATION

Client: OPĆINSKI SUD U NOVOM ZAGREBU, Turinina ulica 3, 10000 Zagreb

The waste producer: Odlagalište otpada Jakuševac, Sajmišna cesta 12, 10010, Zagreb, Hrvatska

Sampling location: Odlagalište otpada Jakuševac

Sampling sub-location: spot sampling at the core drilling site

Carried out by: IKEMA d. o. o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dr. polju

Sampler: Matic Borštnar Lampreht dipl. ekolog naravovarstvenik (UN), mag. Matjaz Cencic

SAMPLING OBJECT - WASTE DATA

Sample population: core sample

Waste number: /

Type of waste: deposited waste on landfill

Description of the sample:

Colour:

Smell: ☐ strong ☒ weak ☐ without ☒ odour

Grain size: ☐ Uniform size ☒ different sizes

Estimated moisture content: 30%-50%

☐ liquid	☒ inhomogeneous	☐ in pieces	☐ suspension
☐ densely liquid/pasty	☒ multiple aggregate layers	☐ grainy	☐ emulsion
☐ sludgy	☒ moist	☐ in powder form	☐ dispersion
☒ solid	☐ dry	☐ hard	☐
☐ homogeneous	☐ dusting	☐ hygroscopic	☐

Additional description:

Different layers easily identified in the core samples.

Grain size range: 0,01-80mm

Density or bulk density: /

Amount of waste to be sampled: about 40L

Geometric similarity of waste:

☐ cone ($V=1/3\pi r^2 \cdot v$) ☒ cylinder ($V= \pi r^2 \cdot v$) ☐ half cylinder ($V= \pi r^2 \cdot v/2$) ☐ cuboid ($V=a \cdot b \cdot c$) ☐ other

SAMPLING METHODOLOGY

Describe/define the sub-population or uniform sampling: core sample.

Accessibility: ☒ Accessible ☐ inaccessible

(access problems affecting the area and quantity of waste sampled)

Location and sampling points:

Sampling coordinates: N: 45°45'50.6" E: 16°01'34.1"

Sampling approach:	
☒ Probabilistic	☐ judgemental
Describe the sampling procedure or technique:	
Core sample will be split in separate samples (about every 5m will be one sample).	
This sample is depth from 15m to 20m.	
Sampling equipment used: drilling rig, soil probe, hand shovel	
Use of rented equipment: YES ☒ NO ☐	
Verification method: /	
Number of increments: 1	
The amount of each increment: 40L	
Observations during sampling (gas evolution, reactions, heat development, etc.):	
Details of on-site determinations:	
Safety precautions: standard protective equipment (gloved hands, suitable footwear and clothing, safety vest, safety goggles, etc.).	
SUB-SAMPLE PREPARATION AND PRE-TREATMENT:	
Describe the location (field, workshop or lab, indoor or outdoor)	
Outdoor, top of landfill	
Procedure: sub-sample taken in the field for:	
☐ BTEX ☐ VOC ☐ Total Hydrocarbons ☐ PAH ☐ ☐	
PACKAGING, PRESERVATION, STORAGE, TRANSPORT	
Packaging: ☐ Glass ☒ 50 L PE bag ☐ PE bottle ☐ metal packaging ☐ other	
Preservation: ☐ Preserved with ☐ refrigeration ☒ not preserved	
Storage/Storage: storage IKEMA d.o.o.	
Transport: ☒ car trunk ☐ Cooling bag ☐ Other	
T _{zač.} = 3,4 °C T _{konč.} = 3,6 °C	
Equipment ID: I-185B	
DEVIATION FROM THE SAMPLING PLAN: YES ☐ NO ☒	
Description of the deviation:	
/	
WEATHER CONDITIONS	
Air temperature: 3,0 °C	
Weather: ☐ Sunny ☒ cloudy ☐ rainy ☐ snow ☐ other (dry and cold)	
DELIVERY TO THE ANALYTICAL LABORATORY	
Laboratory: IKEMA d.o.o.	
Date of delivery: 24.1.2025	

Report by: Matjaž Cenčič

Approved the report: Nataša Kante Flanjak



Date of report: 13.3.2025

Sample photograph



TEST REPORT

Report No: 2025-0120

General information:

Name: Waste analysis
 Client: OPĆINSKI SUD U NOVOM ZAGREBU , Turinina ulica 3, 10000 Zagreb
 He sampled: mag. Matjaž Cencič
 No. Offers: P 153/2024

Sample Information:

Subscription code: Zagreb Landfill, 20m - 22m
 Description of the sample: Zagreb Landfill, 20m - 22m
 Sampling time: 24.1.2025
 Sample status: The sample meets the admission criteria
 Date of sample collection : 24.01.2025
 Date of report: 20.03.2025

Sample ID : Lab.No.: 2025 - 0120

Analysis :

MEASUREMENTS:

1. Parameter-Leachate	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Dissolved organic carbon-DOC (1.)	mg/kg d.m.		888	CEN/TR 16192:2020, SIST EN 12457-4, SIST EN 1484:1998	17.02.2025 17.02.2025
2. Parameter-Waste	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Volatile substances	% d.m.		21,9 #	EN ISO 22167:2021 mod.	25.02.2025 25.02.2025
Total organic carbon-TOC	% d.m.		10,6	SIST EN 15936:2022, Method B	17.02.2025 19.02.2025
Net Calorific value	kJ/kg d.m.		<6000 #	SIST-TS-CEN/TS 16023:2014	21.02.2025 21.02.2025
pH (2.)	/		9,3	EN ISO 10390:2022, SIST EN 16179:2013	06.03.2025 06.03.2025
Gross Calorific value	kJ/kg d.m.		<6000 #	SIST-TS-CEN/TS 16023:2014	21.02.2025 21.02.2025
Dry matter	%		79,59	EN 15934:2012, Method A	27.01.2025 27.01.2025
Loss on ignition	% d.m.		25,85	SIST EN 15935:2021	10.02.2025 10.02.2025
AT4 - Biological stability (3.)	mgO ₂ /g d.m.		<5	ONORM S 2027-4:2012	05.03.2025 13.03.2025

Results marked with # refer to a non-accredited activity

Sampling	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Waste sampling	/		1	SIST EN 14899:2006	24.01.2025 24.01.2025

Results marked with # refer to a non-accredited activity

(1.) leachate filtered through a 0.45um membrane filter, sample preserved with H₃PO₄

(2.) Leaching of air-dry sample in water, T=21,5°C

(3.) The analysis is carried out on a previously frozen sample, thawed for 24 hours in a temperature chamber. The result is given taking into account the percentage of inerts that were removed before the analysis (ut%=43,50%).

Remark:

The test results refer to the sampled population as defined in Sampling Report No 2025-0120, which includes all sampling data and is an annex to the Test Report. Any further information on the testing carried out is available from the laboratory.

The sample was properly stored from the time it was received in the laboratory until the analyses were completed.

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Written complaints are taken into account within eight days from the date of receipt of the test report.

Measurement uncertainty data are provided upon request.

Report by:

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

Approved by: Head of Lab.

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.



IKEMA d.o.o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dravskem polju.

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WASTE SAMPLING RECORD

In accordance with SIST EN 14899:2006, Annex B, Table B.1

SAMPLING RECORD 2025-0120

BASIC DATA

Client Sample code: /

Sample ID: Lab no.: 2025-0120

Date and time of sampling: 24.1.2025 from 12:20 to 12:40

Persons present: dr.sc. Željko Lebo, dipl.ing.građ.

GENERAL INFORMATION

Client: OPĆINSKI SUD U NOVOM ZAGREBU , Turinina ulica 3, 10000 Zagreb

The waste producer: Odlagalište otpada Jakuševac, Sajmišna cesta 12, 10010, Zagreb, Hrvatska

Sampling location: Odlagalište otpada Jakuševac

Sampling sub-location: spot sampling at the core drilling site

Carried out by: IKEMA d. o. o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dr. polju

Sampler: Matic Borštnar Lamprecht dipl. ekolog naravovarstvenik (UN), mag. Matjaz Cencic

SAMPLING OBJECT - WASTE DATA

Sample population: core sample

Waste number: /

Type of waste: deposited waste on landfill

Description of the sample:

Colour:

Smell: ☐ strong ☒ weak ☐ without ☒ odourGrain size: ☐ Uniform size ☒ different sizes

Estimated moisture content: 30%-50%

☐ liquid	☒ inhomogeneous	☐ in pieces	☐ suspension
☐ densely liquid/pasty	☒ multiple aggregate layers	☐ grainy	☐ emulsion
☐ sludgy	☒ moist	☐ in powder form	☐ dispersion
☒ solid	☐ dry	☐ hard	☐
☐ homogeneous	☐ dusting	☐ hygroscopic	☐

Additional description:

Different layers easily identified in the core samples.

Grain size range: 0,01-80mm

Density or bulk density: /

Amount of waste to be sampled: about 25L

Geometric similarity of waste:

☐ cone ($V=1/3\pi r^2 \cdot v$) ☒ cylinder ($V=\pi r^2 \cdot v$) ☐ half cylinder ($V=\pi r^2 \cdot v/2$) ☐ cuboid ($V=a \cdot b \cdot c$) ☐ other**SAMPLING METHODOLOGY**

Describe/define the sub-population or uniform sampling: core sample.

Accessibility: ☒ Accessible ☐ inaccessible

(access problems affecting the area and quantity of waste sampled)

Location and sampling points:

Sampling coordinates: N: 45°45'50.6" E: 16°01'34.1"

Sampling approach: ☒ Probabilistic ☐ judgemental	
Describe the sampling procedure or technique: Core sample will be split in separate samples (about every 5m will be one sample). This sample is depth from 20 m to 22m.	
Sampling equipment used: drilling rig, soil probe, hand shovel	
Use of rented equipment: YES ☒ NO ☐	
Verification method: /	
Number of increments: 1	
The amount of each increment: 25L	
Observations during sampling (gas evolution, reactions, heat development, etc.):	
Details of on-site determinations:	
Safety precautions: standard protective equipment (gloved hands, suitable footwear and clothing, safety vest, safety goggles, etc.).	
SUB-SAMPLE PREPARATION AND PRE-TREATMENT:	
Describe the location (field, workshop or lab, indoor or outdoor) Outdoor, top of landfill	
Procedure: sub-sample taken in the field for: ☐ BTEX ☐ VOC ☐ Total Hydrocarbons ☐ PAH ☐ ☐	
PACKAGING, PRESERVATION, STORAGE, TRANSPORT	
Packaging: ☐ Glass ☒ 50 L PE bag ☐ PE bottle ☐ metal packaging ☐ other	
Preservation: ☐ Preserved with ☐ refrigeration ☒ not preserved	
Storage/Storage: storage IKEMA d.o.o.	
Transport: ☒ car trunk ☐ Cooling bag ☐ Other	
T _{zab} = 3,4 °C T _{konč} = 3,6 °C Equipment ID: I-185B	
DEVIATION FROM THE SAMPLING PLAN: YES ☐ NO ☒	
Description of the deviation: There are only 2m of core sample in this sample, because deposited waste is 22m deep. Because there was less sample we could not take 50l, so we took 25l of sample	
WEATHER CONDITIONS	
Air temperature: 3,0°C	
Weather: ☐ Sunny ☒ cloudy ☐ rainy ☐ snow ☐ other (dry and cold)	
DELIVERY TO THE ANALYTICAL LABORATORY	
Laboratory: IKEMA d.o.o. Date of delivery: 24.1.2025	

Report by: Matjaž Cenčič

Approved the report: Nataša Kante Flanjak

Date of report: 13.3.2025

Sample photograph



TEST REPORT

Report No: 2025-0141/1

General information:

Name:

Technological analysis of landfill gases

Client :

OPĆINSKI SUD U NOVOM ZAGREBU , Turinina ulica 3, 10000 Zagreb

Sampled by:

IKEMA d.o.o. Lovrenc na Dravskem polju 4

2324 Lovrenc na Dravskem polju

Matjaž Cencič

MEASURING EQUIPMENT FOR GAS MEASUREMENT:

- Gas Analyser OPTIMA I-183

- AHLBORN ALMEMO 2590-4AS: -sensor for T, RH,p,FHAD 46-C2

-T sensor R2E4(PT 100)

-barometer FDA 612-SA

No. Offers:

P 153/2024

Sample information:

Subscription code:

Landfill gases CPT 2

Description of the sample:

Landfill gas CPT 2-customer information

Sampling time:

24.1.2025

Sample status:

/

Date of sample collection :

24.01.2025

Date of report:

20.03.2025

Sample ID :

Lab.No.: 2025 - 0141/1

Analysis :

Weather conditions: ambient temperature 6,9°C, air pressure 1002 mb,

gas pressure 990 mb, gas temperature 8.1°C, wind speed< 1 m/s

MEASUREMENTS:

1. Parameter-Plini	Unit	limit values	Result	measurement method uncertainty	beginning / end analyses
Oxygen-O ₂	%		8,63	HM Internal Method 101 Edition 11	24.01.2025 24.01.2025
Methane CH ₄	%		35,25	HM Internal Method 101 Edition 11	24.01.2025 24.01.2025
Carbon dioxide CO ₂	%		21,32	HM Internal Method 101 Edition 11	24.01.2025 24.01.2025
Hydrogen - H ₂	ppm		15	HM Internal Method 101 Edition 11	24.01.2025 24.01.2025
Hydrogen sulphide - H ₂ S	ppm		<5	HM Internal Method 101 Edition 11	24.01.2025 24.01.2025

Lat(WGS84): 45,764488

Lon(EGS84):160265562

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Remark:

Any further information on the testing carried out is available from the laboratory.

The sample was properly stored from the time it was received in the laboratory until the analyses were completed.

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Written complaints are taken into account within eight days from the date of receipt of the test report.

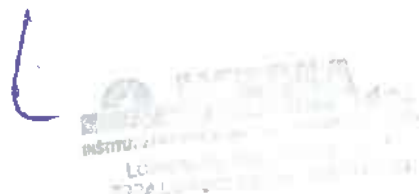
Measurement uncertainty data

Report by:

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

Approved by: Head of Lab.

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.



IKEMA d.o.o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dravskem polju.

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TEST REPORT

Report No: 2025-0141/2

General Information:

Name: Technological analysis of landfill gases
Client: OPĆINSKI SUD U NOVOM ZAGREBU, Turinina ulica 3, 10000 Zagreb
Sampled by: IKEMA d.o.o. Lovrenc na Dravskem polju 4
2324 Lovrenc na Dravskem polju
Matjaž Cenčič
MEASURING EQUIPMENT FOR GAS MEASUREMENT:
- Gas Analyser OPTIMA 1-163
- AHLBORN ALMEMO 2590-4AS: -sensor for T, RH,p,FHAD 46-C2
-T sensor R2E4(PT 100)
-barometer FDA 612-SA

No. Offers: P 153/2024

Sample Information:

Subscription code: Landfill gases CPT 1
Description of the sample: Landfill gas CPT 1-customer information
Sampling time: 24.1.2025
Sample status: /
Date of sample collection : 24.01.2025
Date of report: 20.03.2025

Sample ID : Lab.No.: 2025 – 0141/2

Analysis :

Weather conditions: ambient temperature 6,8°C, air pressure 1002 mb,
gas pressure 989 mb, gas temperature 8,5°C, wind speed< 1 m/s

MEASUREMENTS:

1. Parameter-Plini	Unit	limit values	result	measurement method uncertainty	beginning / end analyses
Oxygen O ₂	%		17,82	HM Internal Method 101 Edition 11	24.01.2025 24.01.2025
Methane CH ₄	%		7,19	HM Internal Method 101 Edition 11	24.01.2025 24.01.2025
Carbon dioxide CO ₂	%		5,62	HM Internal Method 101 Edition 11	24.01.2025 24.01.2025
Hydrogen - H ₂	ppm	<10		HM Internal Method 101 Edition 11	24.01.2025 24.01.2025
Hydrogen sulphide - H ₂ S	ppm	<5		HM Internal Method 101 Edition 11	24.01.2025 24.01.2025

Lat(WGS84): 45,764788

Lon(EGS84):16,0268480

IKEMA d.o.o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dravskem polju.
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0215 0001 7604 620 with NLB d.d.

Remark:

Any further information on the testing carried out is available from the laboratory.

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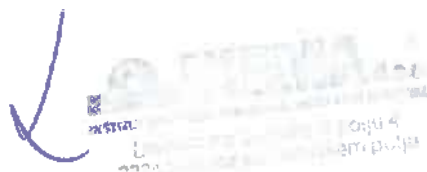
Measurement uncertainty data

Report by:

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.

Approved by: Head of Lab.

Nataša Kante Flanjak Dipl.Eng.Chem.Technol.



IKEMA d.o.o., Lovrenc na Dravskem polju 4, 2324 Lovrenc na Dravskem polju.

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