

*Translation from Bulgarian language*

**REPUBLIC OF BULGARIA [and National Coat of Arms]  
MINISTRY OF HEALTH**

5 "St. Nedelya" Square, Sofia 1000

www.mh.government.bg

**C E R T I F I C A T E**

**No. 5**

**Dated 14.06.2024**

This certificate certifies that the mineral water extracted from the water intake facility

***Borehole No. 4***

***"Sofia - Gorna Banya" mineral water deposit, "Gorna Banya" living quarters, "Ovcha Kupel" region, Sofia city, Sofia municipality, Sofia district, has the following:***

***A. Geological and Hydrogeological Characteristics:***

***Location***

Borehole No. 4 is located in the central part of "Gorna Banya" living quarters, "Ovcha Kupel" region, Sofia city.

***Mineral water forming environment***

The mineral water of the "Sofia-Gorna Banya" deposit is formed in a pressure water-exchange system of a fractured-vein type, developed in the south-eastern part of the Lyulin Mountains.

The Lyulin Mountain massif is composed of effusive rocks ( $9K_2^{avg}$ ) - represented by amphibole andesites, trachyandesites, andesite tuffs, tuff breccias and andesite-basalts.

***Recharge of the deposit***

The mineral water is of atmospheric-infiltration origin. The recharge area of the "Sofia-Gorna Banya" deposit is in the ridge parts and north-eastern slopes of the Lyulin Mountain. The recharge is carried out at the expense of atmospheric precipitation.

***Mineral water reservoir***

The effusive rocks lying in the drainage zone of the deposit, on the boundary between the Lyulin Mountain and the Sofia Valley, at a depth of more than 350 m below the ground surface are the mineral water reservoir.

***Operational mineral water sources in the deposit***

Operational mineral water sources in the "Sofia-Gorna Banya" deposit are: borehole No. 3, borehole No. 4, captured/natural spring "Domus Dere" and captured natural spring "Haznata".

Borehole No. 4 was drilled in 1961, it is located at an elevation of 689 m and has a depth of 492.5 m. Borehole No. 4 has the following structure:

- 0.00 to 75.20 m - piped using  $\varnothing$  220 mm steel pipes;
- 75.20 to 172.00 m - drilling using  $\varnothing$  146 mm;
- 172.00 to 303.00 m - drilling using  $\varnothing$  127 mm;
- 303.00 to 380.00 m - drilling using  $\varnothing$  108 mm;
- 380.00 to 492.50 m - drilling using  $\varnothing$  89 mm.

The geological section of borehole No. 4 is as follows:

- 0.00 to 11.80 m - Gorna Banya gravels and boulders with a clay filler;
- 11.80 to 16.00 m - sand, clays and clayey materials (Neogene);
- 16.00 to 71.70 m - sandy clays (Neogene);
- 71.70 to 492.50 m - andesite and andesite breccias.

### Operational resources

The following exploitation resources have been approved for the water intake facility of mineral water - borehole No. 4, "Sofia-Gorna Banya" mineral water deposit, "Gorna Banya" living quarters, "Ovcha Kupel" region, Sofia Municipality, Sofia district, by Order No. RD-638 of 29.06.2010 of the Minister of Environment and Waters:

Water body	Operational mineral water resources	
	OEP1 (l/s)	QEP2 (l/s)
"Sofia-Gorna Banya" mineral water deposit	5.124	3.416
	8.54	

and possible technical flow-rate:

Operational water intake facilities	Distribution of operational mineral water resources by water intake facilities		Permissible reduction (SADD.)	Temperature (°C)	Q (l/s)	AT (°C)	G <sup>2</sup> OP (kJ/s)
	QEP1 (l/s)	QEP2 (l/s)					
Borehole No. 4	3.444	2.296	Pumping SADD. = 4,5 m to elevation + 681.36 m	41	-	-	-
	5.74						

### Capture

The mouth of borehole No. 4 is located in a buried cylindrical capturing chamber measuring 3.2 X 2.0 X 5.0 m, with a pumping station measuring 3.2 X 3.7 m, the latter being constructed in the immediate vicinity. The borehole is equipped with the necessary instrumentation for mineral water monitoring and raw water sampling.

The borehole and the pumping station are surrounded by a wire fence and marked with a warning sign.

### Water protection zones

A Water protection zone was established by Order No. RD-248 dated 29.03.2021 of the Minister of Environment and Waters around the mineral water sources - "Sofia-Gorna Banya" mineral water deposit AD.

### **B. Composition:**

<b>1. Anions</b>	<b>mg/l</b>	<b>eq%</b>	<b>2. Cations</b>	<b>mg/l</b>	<b>eq%</b>
F <sup>-</sup>	0.11	0.337	NH <sub>4</sub> <sup>+</sup>	< 0.05	0.000
Cl <sup>-</sup>	3.55	5.830	Ca <sup>2+</sup>	2,00	6.322
SO <sub>4</sub> <sup>2-</sup>	17.28	20.944	Mg <sup>2+</sup>	< 0.12	0.000
CO <sub>3</sub> <sup>2-</sup>	28.80	55.891	Na <sup>+</sup>	33.65	92.717
HCO <sub>3</sub> <sup>-</sup>	11.59	11.062	K <sup>+</sup>	0.57	0.920
HSiO <sub>3</sub> <sup>-</sup>	7.86	5.937	Fe-total	0.04	0.041
NO <sub>2</sub> <sup>-</sup>	< 0.05	0.000	Li <sup>+</sup>	< 0.05	0.000
NO <sub>3</sub> <sup>-</sup>	< 1.00	0.000	Mn <sup>2+</sup>	< 0.02	0.000
<b>Total:</b>	<b>69.19</b>	<b>~100.00</b>	<b>Total:</b>	<b>36.25</b>	<b>~100.00</b>
Dry residue at 180°C	119.5	mg/l	H <sub>2</sub> SiO <sub>3</sub>	48.80	mg/l
Dry residue at 260°C	115.5	mg/l	Total mineralization	146	mg/l
Electric conductivity	153.2	µS/cm	Carbon dioxide	0.00	mg/l
pH	9.85		Hydrogen sulphide	0.43	mg/l
			Flow-rate		5.74 l/s
			Temperature		42°C

Appearance: The water is clear, colourless, tasteless and odourless.

### **3. Trace elements** (mg/l)

Aluminium	0.167	Nickel	< 0.005
Arsenic	< 0.010	Lead	< 0.010
Antimony	< 0.005	Selenium	< 0.010
Boron	0.142	Chromium	< 0.005
Barium	< 0.010	Zinc	0.035
Silver	< 0.050	Mercury	< 0.001
Cadmium	< 0.003	Cyanides	< 0.010
Copper	< 0.050		

Data are according to a Test protocol No. 37 dated 28.03.2024 of a Specialized Laboratory for Mineral Water Analysis within the "National Specialized Hospital for Physical Therapy and Rehabilitation" EAD, Sofia, and Test protocol No. 1240431-3 dated 23.02.2024 of the Laboratory test complex at the Sofia Regional Health Inspectorate (RHI).

### **4. Radiological parameters**

Total α-activity	0.024±0.010 Bq/l	Tritium	< 2 Bq/l
Total β-activity	0.075±0.010 Bq/l	Natural uranium	0.0057±0.0013 mg/l
Radium-226	0.094±0.038 Bq/l	Total inductive dosage	< 0.10 mSv/year
Radon-222	4.17±0.77 Bq/l		

Data are according to a Water radiological parameter control protocol No. W 031a and No. W 031b dated 16.04.2024 of a Type A Control Authority within the National Centre for Radiobiology and Radiation Protection, and Test protocol No. 01-0347 dated 02.04.2024 of the Accredited testing laboratory within "Laboratory and analytical activity" General Directorate of the Executive Environment Agency.

## **5. Microbiological parameters**

Total number of colonies of viable microorganisms at 20±22°C for 72 hours	< 20 CFU/cm <sup>3</sup>	Faecal streptococci (enterococci)	< 0/250 cm <sup>3</sup>
Total number of colonies of viable microorganisms at 37° for 24 hours	< 5 CFU/cm <sup>3</sup>	Escherichia coli	< 0/250 cm <sup>3</sup>
Coliforms	< 0/250 cm <sup>3</sup>	Sulphite-reducing clostridia	< 0/50 cm <sup>3</sup>
		Pseudomonas aeruginosa	< 0/250 cm <sup>3</sup>

Data are according to a Test protocol No. 1240431-3 dated 23.02.2024 of the Laboratory test complex at the Sofia RHI.

### **Conclusion:**

The total mineralization of the mineral water from borehole No. 4 of the "Sofia - Gorna Banya" mineral water deposit, "Gorna Banya" living quarters, "Ovcha Kupel" region, Sofia city, Sofia municipality, Sofia district is 146 mg/l. It is characterized as hyper-thermal, low mineralized, hydrocarbonate-sulphate-sodium water. The water contains no sanitary-chemical and microbiological signs of contamination. The content of the examined trace components and the values of the radiological indicators are within the limits of the mineral water standards. The water has a stable physical and chemical composition and properties and meets the requirements of the Ordinance on the Requirements for Bottled Natural Mineral, Spring and Table Waters Intended for Drinking Purposes (State Gazette, No. 68 dated 2004, subsequently amended and supplemented, No. 66 dated 2008).

### **C. Properties:**

The curative and preventive properties of the water have been determined by Balneological Assessment No. 142 dated 2024, issued by the Minister of Health.

*The mineral water from borehole No. 4 of the "Sofia - Gorna Banya" mineral water deposit, "Gorna Banya" living quarters, "Ovcha Kupel" region, Sofia city, Sofia municipality, Sofia district, may be used for bottling for drinking purposes.*

**The certificate is valid for 5 years as of the date of its issuance.**

**FOR THE MINISTER: [signature - ill.]**  
**DOBROMIRA KAREVA**  
**DEPUTY MINISTER**  
**(Pursuant to Order No. RD-01-293 / 23.04.2024)**  
Round seal of the Ministry of Health \* SOFIA

*The undersigned, Elena Konstantinova Vlahova-Ilieva, hereby certify the genuineness of the translation made by me of the enclosed document from Bulgarian into English language, consisting of 4 (four) pages.*

Translator: /Elena Konstantinova Vlahova-Ilieva/