



TESTING LABORATORY DIRECTORATE

EUROTEST CONTROL EAD

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Accredited Testing and Calibration Laboratory
certified by the Bulgarian Accreditation Service, reg. No. 3-LIK, valid by Oct 31, 2011

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PROTOCOL OF TESTING

No. 4148/29.04.2010

- 1** Surface waters and groundwaters.....
(product name, type, make, etc.)
- 2** Company which requested the testing: Balkan Mineral and Mining EAD - the samples are provided by a representative of.....
- Eurotest Control EAD through protocol no. 369/13.04.2010 in accordance with BNS ISO 5667.....
(name and address of the company, no. and date of the protocol for collection of samples)
- 3** Method of testing: BNS 3424/81; BNS EN 27888/00; BNS 3775/87; BNS 17.1.4.04/80; ISO 6060/89;
BNS ISO 7150-1/02; BNS EN ISO 10304-1/09; BNS EN ISO 6878/05; BNS 15398/81; BNS 15551/82;
BNS EN 1483/07; ISO 11083/94; BNS EN ISO 11885/09 – the parameters are specified in item 7.1 of the protocol
(name and no. of the standards or validated methods)
- 4** Date of receipt of the samples for testing in the laboratory, request ref. no. 519/15.04.2010
- 5** Number of tested samples: 5 water samples collected from groundwaters, Ada Tepe area, Krumovgrad Region.....
(production no., number, and mass of the samples, number of samples shipments, import invoice no., date of production)
- 6** Date/period of the testing: Apr 15, 2010 to Apr 29, 2010.....

DIRECTOR OF

TESTING LABORATORY DIRECTORATE:.....

Yu. Akrabova

7. TEST RESULTS

7.1. Testing/measurements within the scope of accreditation

#	Parameter	Unit of measurement	Standards/validated methods	Sample no. according to Sample Logbook	Test results (value, below detection)	Parameter value and tolerance	Test conditions
1	2	3	4	5	6	7	8
1	pH	pH units	BNS 3424/81	Water sample PV-001, lab no. 917, from surface waters - Ada Tepe area, Krumovgrad region	8.31 ± 0.10	-	Standard
2	Electrical conductivity	µS/cm	BNS EN 27888/00		206 ± 6	-	Standard
3	Total hardness	mgeqv/dm ³	BNS 3775/87		146 ± 0.15	-	Standard
4	Suspended solids	mg/dm ³	BNS 17.1.4.04/80		6	-	Standard
5	Dissolved solids	mg/dm ³	BNS 17.1.4.04/80		124 ± 4	-	Standard
6	COD (bichromatic)	mgO ₂ /dm ³	ISO 6060/89		11.0 ± 1.1	-	Standard
7	Ammonium (NH ₄ ⁺)	mg/dm ³	BNS ISO 7150-1/02		0.025 ± 0.003	-	Standard
8	Nitrites (NO ₂ ⁻)	mg/dm ³	BNS EN ISO 10304-		<0.05	-	Standard
9	Nitrites (NO ₃ ⁻)	mg/dm ³	BNS EN ISO 10304-		<0.10	-	Standard
10	Phosphates (PO ₄ ³⁻)	mg/dm ³	BNS EN ISO 6878/05		<0.10	-	Standard
11	Sulfates (SO ₄ ²⁻)	mg/dm ³	BNS EN ISO 10304-		15.5 ± 1.6	-	Standard
12	Chlorides (as Cl ⁻)	mg/dm ³	BNS EN ISO 10304-		78 ± 0.8	-	Standard
13	Sodium (Na)	mg/dm ³	BNS 15398/81		89 ± 0.9	-	Standard
14	Potassium (K)	mg/dm ³	BNS 15551/82		14 ± 0.1	-	Standard
15	Chromium (as Cr ⁶⁺)	mg/dm ³	ISO 11083/94		<0.010	-	Standard
16	Mercury (Hg)	mg/dm ³	BNS EN 1483/07		<0.0010	-	Standard
17	Cadmium (Cd)	mg/dm ³	BNS EN ISO 11885/09		<0.0010	-	Standard
18	Copper (Cu)	mg/dm ³	BNS EN ISO 11885/09		<0.0030	-	Standard
19	Cobalt (Co)	mg/dm ³	BNS EN ISO 11885/09		<0.0010	-	Standard
20	Lead (Pb)	mg/dm ³	BNS EN ISO 11885/09		<0.010	-	Standard
21	Aluminum (Al)	mg/dm ³	BNS EN ISO 11885/09		0.0503 ± 0.0050	-	Standard
22	Iron (Fe)	mg/dm ³	BNS EN ISO 11885/09		0.1344 ± 0.0134	-	Standard
23	Zinc (Zn)	mg/dm ³	BNS EN ISO 11885/09		0.0020 ± 0.0002	-	Standard
24	Manganese (Mn)	mg/dm ³	BNS EN ISO 11885/09		0.0067 ± 0.0007	-	Standard
25	Arsenic (As)	mg/dm ³	BNS EN ISO 11885/09		<0.010	-	Standard
26	Magnesium (Mg)	mg/dm ³	BNS EN ISO 11885/09		5.24 ± 0.52	-	Standard
27	Calcium (Ca)	mg/dm ³	BNS EN ISO 11885/09		20.58 ± 2.06	-	Standard
1	2	3	4	5	6	7	8
1	pH	pH units	BNS 3424/81	Water sample PV-002, lab no. 918, from surface waters - Ada Tepe area, Krumovgrad region	8.29 ± 0.10	-	Standard
2	Electrical conductivity	µS/cm	BNS EN 27888/00		603 ± 18	-	Standard
3	Total hardness	mgeqv/dm ³	BNS 3775/87		617 ± 0.62	-	Standard
4	Suspended solids	mg/dm ³	BNS 17.1.4.04/80		6 ± 1	-	Standard
5	Dissolved solids	mg/dm ³	BNS 17.1.4.04/80		362 ± 11	-	Standard
6	COD (bichromatic)	mgO ₂ /dm ³	ISO 6060/89		8.4 ± 0.8	-	Standard
7	Ammonium (NH ₄ ⁺)	mg/dm ³	BNS ISO 7150-1/02		0.117 ± 0.012	-	Standard
8	Nitrites (NO ₂ ⁻)	mg/dm ³	BNS EN ISO 10304-		<0.05	-	Standard
9	Nitrites (NO ₃ ⁻)	mg/dm ³	BNS EN ISO 10304-		<0.10	-	Standard
10	Phosphates (PO ₄ ³⁻)	mg/dm ³	BNS EN ISO 6878/05		<0.10	-	Standard
11	Sulfates (SO ₄ ²⁻)	mg/dm ³	BNS EN ISO 10304-		78.2 ± 7.8	-	Standard
12	Chlorides (as Cl ⁻)	mg/dm ³	BNS EN ISO 10304-		12.5 ± 1.3	-	Standard
13	Sodium (Na)	mg/dm ³	BNS 15398/81		16.0 ± 1.6	-	Standard
14	Potassium (K)	mg/dm ³	BNS 15551/82		1.9 ± 0.2	-	Standard
15	Chromium (as Cr ⁶⁺)	mg/dm ³	ISO 11083/94		<0.010	-	Standard
16	Mercury (Hg)	mg/dm ³	BNS EN 1483/07		<0.0010	-	Standard
17	Cadmium (Cd)	mg/dm ³	BNS EN ISO 11885/09		<0.0010	-	Standard
18	Copper (Cu)	mg/dm ³	BNS EN ISO 11885/09		0.0040 ± 0.0004	-	Standard
19	Cobalt (Co)	mg/dm ³	BNS EN ISO 11885/09		<0.0010	-	Standard
20	Lead (Pb)	mg/dm ³	BNS EN ISO 11885/09		<0.010	-	Standard
21	Aluminum (Al)	mg/dm ³	BNS EN ISO 11885/09		0.0537 ± 0.0054	-	Standard
22	Iron (Fe)	mg/dm ³	BNS EN ISO 11885/09		0.0747 ± 0.0075	-	Standard
23	Zinc (Zn)	mg/dm ³	BNS EN ISO 11885/09		<0.0010	-	Standard
24	Manganese (Mn)	mg/dm ³	BNS EN ISO 11885/09		0.0057 ± 0.0006	-	Standard
25	Arsenic (As)	mg/dm ³	BNS EN ISO 11885/09		<0.010	-	Standard
26	Magnesium (Mg)	mg/dm ³	BNS EN ISO 11885/09		22.09 ± 2.21	-	Standard
27	Calcium (Ca)	mg/dm ³	BNS EN ISO 11885/09		87.1 ± 8.7	-	Standard

#	Parameter	Unit of measurement	Standards/validated methods	Sample no. according to Sample Logbook	Test results (value, below detection)	Parameter value and tolerance	Test conditions
1	2	3	4	5	6	7	8
1	pH	pH units	BNS 3424/81	Water sample PV-003, lab no. 919, from surface waters - Ada Tepe area, Krumovgrad region	8.57 ± 0.10	-	Standard
2	Electrical conductivity	$\mu\text{S}/\text{cm}$	BNS EN 27888/00		284 ± 9	-	Standard
3	Total hardness	mg/dm^3	BNS 3775/87		250 ± 25	-	Standard
4	Suspended solids	mg/dm^3	BNS 17.1.4.04/80		<6	-	Standard
5	Dissolved solids	mg/dm^3	BNS 17.1.4.04/80		171 ± 5	-	Standard
6	COD (bichromatic)	mgO_2/dm^3	ISO 6060/89		7.0 ± 0.7	-	Standard
7	Ammonium (NH_4^+)	mg/dm^3	BNS ISO 7150-1/02		<0.013	-	Standard
8	Nitrites (NO_2^-)	mg/dm^3	BNS EN ISO 10304-		<0.05	-	Standard
9	Nitrites (NO_3^-)	mg/dm^3	BNS EN ISO 10304-		0.62 ± 0.06	-	Standard
10	Phosphates (PO_4^{3-})	mg/dm^3	BNS EN ISO 6878/05		<0.10	-	Standard
11	Sulfates (SO_4^{2-})	mg/dm^3	BNS EN ISO 10304-		23.7 ± 2.4	-	Standard
12	Chlorides (as Cl ⁻)	mg/dm^3	BNS EN ISO 10304-		82 ± 0.8	-	Standard
13	Sodium (Na)	mg/dm^3	BNS 15398/81		94 ± 0.9	-	Standard
14	Potassium (K)	mg/dm^3	BNS 15551/82		16 ± 0.2	-	Standard
15	Chromium (as Cr^{6+})	mg/dm^3	ISO 11083/94		<0.010	-	Standard
16	Mercury (Hg)	mg/dm^3	BNS EN 1483/07		<0.0010	-	Standard
17	Cadmium (Cd)	mg/dm^3	BNS EN ISO 11885/09		<0.0010	-	Standard
18	Copper (Cu)	mg/dm^3	BNS EN ISO 11885/09		0.0034 ± 0.0003	-	Standard
19	Cobalt (Co)	mg/dm^3	BNS EN ISO 11885/09		<0.0010	-	Standard
20	Lead (Pb)	mg/dm^3	BNS EN ISO 11885/09		<0.010	-	Standard
21	Aluminum (Al)	mg/dm^3	BNS EN ISO 11885/09		0.0182 ± 0.0018	-	Standard
22	Iron (Fe)	mg/dm^3	BNS EN ISO 11885/09		0.0168 ± 0.0017	-	Standard
23	Zinc (Zn)	mg/dm^3	BNS EN ISO 11885/09		<0.0010	-	Standard
24	Manganese (Mn)	mg/dm^3	BNS EN ISO 11885/09		0.0015 ± 0.0002	-	Standard
25	Arsenic (As)	mg/dm^3	BNS EN ISO 11885/09		<0.010	-	Standard
26	Magnesium (Mg)	mg/dm^3	BNS EN ISO 11885/09		9.75 ± 0.98	-	Standard
27	Calcium (Ca)	mg/dm^3	BNS EN ISO 11885/09		34.10 ± 3.41	-	Standard

1	2	3	4	5	6	7	8
1	pH	pH units	BNS 3424/81	Water sample PV-004, lab no. 920, from surface waters - Ada Tepe area, Krumovgrad region	8.36 ± 0.10	-	Standard
2	Electrical conductivity	$\mu\text{S}/\text{cm}$	BNS EN 27888/00		555 ± 17	-	Standard
3	Total hardness	mg/dm^3	BNS 3775/87		558 ± 56	-	Standard
4	Suspended solids	mg/dm^3	BNS 17.1.4.04/80		<6	-	Standard
5	Dissolved solids	mg/dm^3	BNS 17.1.4.04/80		333 ± 10	-	Standard
6	COD (bichromatic)	mgO_2/dm^3	ISO 6060/89		8.1 ± 0.8	-	Standard
7	Ammonium (NH_4^+)	mg/dm^3	BNS ISO 7150-1/02		<0.013	-	Standard
8	Nitrites (NO_2^-)	mg/dm^3	BNS EN ISO 10304-		<0.05	-	Standard
9	Nitrites (NO_3^-)	mg/dm^3	BNS EN ISO 10304-		1.1 ± 0.1	-	Standard
10	Phosphates (PO_4^{3-})	mg/dm^3	BNS EN ISO 6878/05		<0.10	-	Standard
11	Sulfates (SO_4^{2-})	mg/dm^3	BNS EN ISO 10304-		75.3 ± 7.5	-	Standard
12	Chlorides (as Cl ⁻)	mg/dm^3	BNS EN ISO 10304-		125 ± 1.3	-	Standard
13	Sodium (Na)	mg/dm^3	BNS 15398/81		172 ± 1.7	-	Standard
14	Potassium (K)	mg/dm^3	BNS 15551/82		24 ± 0.2	-	Standard
15	Chromium (as Cr^{6+})	mg/dm^3	ISO 11083/94		<0.010	-	Standard
16	Mercury (Hg)	mg/dm^3	BNS EN 1483/07		<0.0010	-	Standard
17	Cadmium (Cd)	mg/dm^3	BNS EN ISO 11885/09		<0.0010	-	Standard
18	Copper (Cu)	mg/dm^3	BNS EN ISO 11885/09		0.0033 ± 0.0003	-	Standard
19	Cobalt (Co)	mg/dm^3	BNS EN ISO 11885/09		<0.0010	-	Standard
20	Lead (Pb)	mg/dm^3	BNS EN ISO 11885/09		<0.010	-	Standard
21	Aluminum (Al)	mg/dm^3	BNS EN ISO 11885/09		0.0106 ± 0.0011	-	Standard
22	Iron (Fe)	mg/dm^3	BNS EN ISO 11885/09		0.0213 ± 0.0021	-	Standard
23	Zinc (Zn)	mg/dm^3	BNS EN ISO 11885/09		0.0425 ± 0.0043	-	Standard
24	Manganese (Mn)	mg/dm^3	BNS EN ISO 11885/09		0.0032 ± 0.0003	-	Standard
25	Arsenic (As)	mg/dm^3	BNS EN ISO 11885/09		<0.010	-	Standard
26	Magnesium (Mg)	mg/dm^3	BNS EN ISO 11885/09		20.92 ± 2.09	-	Standard
27	Calcium (Ca)	mg/dm^3	BNS EN ISO 11885/09		77.2 ± 7.7	-	Standard

#	Parameter	Unit of measurement	Standards/validated methods	Sample no. according to Sample Logbook	Test results (value, below detection)	Parameter value and tolerance	Test conditions
1	2	3	4	5	6	7	8
1	pH	pH units	BNS 3424/81	Water sample PV-005, lab no. 921, from surface waters - Ada Tepe area, Krumovgrad region	8.56 ± 0.10	-	Standard
2	Electrical conductivity	µS/cm	BNS EN 27888/00		333 ± 10	-	Standard
3	Total hardness	mgEqv/dm ³	BNS 3775/87		3.04 ± 0.30	-	Standard
4	Suspended solids	mg/dm ³	BNS 17.1.4.04/80		<6	-	Standard
5	Dissolved solids	mg/dm ³	BNS 17.1.4.04/80		200 ± 6	-	Standard
6	COD (bichromatic)	mgO ₂ /dm ³	ISO 6060/89		8.3 ± 0.8	-	Standard
7	Ammonium (NH ₄ ⁺)	mg/dm ³	BNS ISO 7150-1/02		<0.013	-	Standard
8	Nitrites (NO ₂ ⁻)	mg/dm ³	BNS EN ISO 10304-		<0.05	-	Standard
9	Nitrites (NO ₃ ⁻)	mg/dm ³	BNS EN ISO 10304-		0.91 ± 0.09	-	Standard
10	Phosphates (PO ₄ ³⁻)	mg/dm ³	BNS EN ISO 6878/05		<0.10	-	Standard
11	Sulfates (SO ₄ ²⁻)	mg/dm ³	BNS EN ISO 10304-		36.3 ± 3.6	-	Standard
12	Chlorides (as Cl ⁻)	mg/dm ³	BNS EN ISO 10304-		8.5 ± 0.9	-	Standard
13	Sodium (Na)	mg/dm ³	BNS 15398/81		11.0 ± 1.1	-	Standard
14	Potassium (K)	mg/dm ³	BNS 15551/82		1.6 ± 0.2	-	Standard
15	Chromium (as Cr ⁶⁺)	mg/dm ³	ISO 11083/94		<0.010	-	Standard
16	Mercury (Hg)	mg/dm ³	BNS EN 1483/07		<0.0010	-	Standard
17	Cadmium (Cd)	mg/dm ³	BNS EN ISO 11885/09		<0.0010	-	Standard
18	Copper (Cu)	mg/dm ³	BNS EN ISO 11885/09		0.0031 ± 0.0003	-	Standard
19	Cobalt (Co)	mg/dm ³	BNS EN ISO 11885/09		<0.0010	-	Standard
20	Lead (Pb)	mg/dm ³	BNS EN ISO 11885/09		<0.010	-	Standard
21	Aluminum (Al)	mg/dm ³	BNS EN ISO 11885/09		0.0115 ± 0.0012	-	Standard
22	Iron (Fe)	mg/dm ³	BNS EN ISO 11885/09		0.0193 ± 0.0019	-	Standard
23	Zinc (Zn)	mg/dm ³	BNS EN ISO 11885/09		0.0522 ± 0.0052	-	Standard
24	Manganese (Mn)	mg/dm ³	BNS EN ISO 11885/09		0.0070 ± 0.0007	-	Standard
25	Arsenic (As)	mg/dm ³	BNS EN ISO 11885/09		<0.010	-	Standard
26	Magnesium (Mg)	mg/dm ³	BNS EN ISO 11885/09		10.66 ± 1.07	-	Standard
27	Calcium (Ca)	mg/dm ³	BNS ISO 6058/02		43.26 ± 4.33	-	Standard

NOTE I: If required, the protocol of testing may include opinions and interpretations of the tests (conclusions are not allowed) only if compliant with the regulations in item 5.10.5 of BNS EN ISO/IEC 17025.

NOTE II: The test results refer only to the tested samples. Excerpts of the protocol of testing should not be copied without the written consent of the testing laboratory.

PERSONS WHO CARRIED OUT THE TESTING:
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.....
V. Nedelcheva
.....
S. Mihaylova, Eng.

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MANAGER:.....
Hr. Stanchev, Eng.

DIRECTOR OF
TESTING LABORATORY
DIRECTORATE:
Yu. AkraBova