

## **Appendix III**

**Chemistry of groundwater in MSB boreholes**

## Chemistry of groundwater from MSB-2 and 4

Groundwater sample		MSB-2			MSB-4		
Borehole							
Depth of interval	[mabh]	79.0–130.5	132.0–154.0	171.5–175.5	15.8–25.6	34.8–62.1	95.5–99.0
Elevation of interval	[masl]	68.0–119.5	44.5–66.5	23.0–27.0	188.8–198.6	152.3–179.6	115.4–118.9
<b>Physico-chemical parameters</b>							
pH	[-]	9.06	8.78	8.64	7.54	7.91	8.81
Electrical conductivity (EC)	[mScm <sup>-1</sup> ]	0.383	0.553	0.400	0.390	0.420	0.265
Eh <sub>Pt</sub>	[mV]	-118	-75	-140	Not measured	Not measured	-86
Eh <sub>Au</sub>	[mV]	-132	-84	-159	Not measured	Not measured	-99
Dissolved oxygen (DO)	[mg l <sup>-1</sup> ]	0.00	0.00	0.00	Not measured	Not measured	0.00
Temperature	[°C]	21.8	21.3	20.5	Not measured	Not measured	23.0
<b>Major components</b>							
Si	[mg l <sup>-1</sup> ]	4.9	5.7	5.5	33.7	30.9	6.1
Total Fe	[mg l <sup>-1</sup> ]	0.019	0.017	0.058	<0.01	0.07	0.042
Fe <sup>2+</sup>	[mg l <sup>-1</sup> ]	<0.05	<0.05	<0.05	Not measured	Not measured	<0.05
Al	[mg l <sup>-1</sup> ]	0.012	0.014	0.004	Not measured	Not measured	0.069
Mn <sup>2+</sup>	[mg l <sup>-1</sup> ]	0.0	0.0	0.0	0.5	0.2	0.0
Mg <sup>2+</sup>	[mg l <sup>-1</sup> ]	0.18	0.11	0.23	9.72	5.45	<0.10
Ca <sup>2+</sup>	[mg l <sup>-1</sup> ]	15	27	27	51	38	14
Str <sup>2+</sup>	[mg l <sup>-1</sup> ]	<0.3	<0.3	<0.3	Not measured	Not measured	<0.3
Na <sup>+</sup>	[mg l <sup>-1</sup> ]	107	130	110	25	47	74
K <sup>+</sup>	[mg l <sup>-1</sup> ]	0.2	1.9	1.1	2.4	2.6	0.2
NH <sub>4</sub> <sup>+</sup>	[mg l <sup>-1</sup> ]	<0.1	<0.1	<0.1	Not measured	Not measured	<0.1
F <sup>-</sup>	[mg l <sup>-1</sup> ]	11.0	8.3	8.0	0.2	0.3	12.0
Cl <sup>-</sup>	[mg l <sup>-1</sup> ]	155	223	189	1	1	96
Br	[mg l <sup>-1</sup> ]	0.29	0.42	0.25	<0.05	<0.05	0.18
NO <sub>3</sub> <sup>-</sup>	[mg l <sup>-1</sup> ]	<0.3	<0.3	<0.3	<0.05	<0.05	<0.3
NO <sub>2</sub> <sup>-</sup>	[mg l <sup>-1</sup> ]	<0.2	<0.2	<0.2	Not measured	Not measured	<0.2
I <sup>-</sup>	[mg l <sup>-1</sup> ]	<0.5	<0.5	<0.5	Not measured	Not measured	<0.5
SO <sub>4</sub> <sup>2-</sup>	[mg l <sup>-1</sup> ]	0.8	<0.4	1.6	19.7	52.4	<0.4
S <sup>2-</sup>	[mg l <sup>-1</sup> ]	0.08	0.04	0.05	Not measured	Not measured	0.50
Alkalinity	[meq l <sup>-1</sup> ]	0.68	0.45	0.56	Not measured	Not measured	0.77
Total carbon (TC)	[mg l <sup>-1</sup> ]	7.6	4.8	6.0	44.4	36.2	10.0
Total inorganic carbon (TIC)	[mg l <sup>-1</sup> ]	6.0	4.0	5.4	44.4	36.2	8.9
Total organic carbon (TOC)	[mg l <sup>-1</sup> ]	1.6	0.7	0.6	<2.0	<0.2	1.1
<b>Isotopes</b>							
Tritium	[TU]	<0.4	<0.4	<0.4	0.6	<0.6	0.5
δD	[‰]	-57.8	-57.0	-61.0	Not measured	Not measured	-61.8
δ <sup>18</sup> O	[‰]	-9.1	-9.1	-8.9	Not measured	Not measured	-8.9
δ <sup>13</sup> C	[‰]	-13.4	-12.4	-13.2	Not measured	Not measured	-14.3
<sup>14</sup> C/ <sup>12</sup> C	[pMC]	57.8	48.4	33.1	Not measured	Not measured	15.0
δ <sup>34</sup> S SO <sub>4</sub> <sup>2-</sup>	[‰]	2.5	13.6	15.8	Not measured	Not measured	17.9
δ <sup>34</sup> S HS <sup>-</sup>	[‰]	16.5	18.0	20.5	Not measured	Not measured	11.8
<b>Fluorescent dyes</b>							
Sodium-naphthionate	[mg l <sup>-1</sup> ]	0.17	0.18	–	0.02	<0.01	–
Uranine	[mg l <sup>-1</sup> ]	–	–	0.0045	–	–	0.0007