

## Trace elements in geothermal water (separated and condensate) from Hellisheidi and Nesjavellir power plants

Typical concentrations ( $\mu\text{g}/\text{kg}$ ) of several trace elements in geothermal water (separated and condensed water) from the Hellisheidi and Nesjavellir Geothermal Power Plants and their maximum permissible concentrations ( $\mu\text{g}/\text{kg}$ ) for potable water. When the chemical content of separated water is compared to potable water standards, one can see that in separated water from the Hellisheidi Geothermal Power Plant, the concentration of aluminium is about ten times higher, concentration of arsenic is about four times higher and the concentration of selenium is 50% higher than permissible levels for potable water. In separated water from the Nesjavellir Geothermal Power Plant, the concentration of aluminium is about ten times higher, the concentration of arsenic is about six times higher and the concentration of selenium around 10% higher than permissible levels for potable water. The concentration of other substances in separated water is lower than the given limits for potable water.

Element	Unit	Max. recommended value for potable water	Separated water		Condensate water	
			Hellisheidi	Nesjavellir	Hellisheidi	Nesjavellir
Aluminium (Al)	$\mu\text{g}/\text{kg}$	200	1800	1930	0.427	0.629
Arsenic (As)	$\mu\text{g}/\text{kg}$	10	37	60	<0.05	0.0879
Barium (Ba)	$\mu\text{g}/\text{kg}$	700	0.33	1.53	0.0269	0.0661
Cadmium (Cd)	$\mu\text{g}/\text{kg}$	5	<0.002	<0.002	<0.002	<0.002
Cobalt (Co)	$\mu\text{g}/\text{kg}$	-	0.027	0.026	0.007	0.054
Chrome (Cr)	$\mu\text{g}/\text{kg}$	50	0.071	0.36	0.087	3.87
Copper (Cu)	$\mu\text{g}/\text{kg}$	2,000	0.4	2.7	<0.1	<0.1
Mercury (Hg)	$\mu\text{g}/\text{kg}$	1	<0.002	<0.002	<0.002	0.0134
Manganese (Mn)	$\mu\text{g}/\text{kg}$	50	0.61	17	0.257	1.73
Molybdenum (Mo)	$\mu\text{g}/\text{kg}$	-	4.7	2.4	<0.05	<0.05
Nickel (Ni)	$\mu\text{g}/\text{kg}$	20	0.17	1.57	0.828	4.47
Phosphorus (P)	$\mu\text{g}/\text{kg}$	5,000	<1	11.3	<1	<1
Lead (Pb)	$\mu\text{g}/\text{kg}$	10	<0.01	0.062	0.027	0.0261
Selenium (Se)	$\mu\text{g}/\text{kg}$	10	15.3	10.9	<0.5	<0.5
Strontium (Sr)	$\mu\text{g}/\text{kg}$	-	4.3	<2	0.064	0.0966
Titan (Ti)	$\mu\text{g}/\text{kg}$	-	0.079	0.06	0.0223	0.0254
Vanadium (V)	$\mu\text{g}/\text{kg}$	-	4.2	2.5	0.0185	0.0475
Zink (Zn)	$\mu\text{g}/\text{kg}$	3,000	0.3	19.1	1.28	2.39