



Routine monitoring of trace elements I

Trace elements monitoring - Legal obligations

According to the operation licenses of “Orot Rabin” & “Rutenberg” PS follow – up of 16 trace elements, 3 radionuclides in coal, FA & BA

- ♣ Performed on representative semi-annual composite samples
- ♣ Analyses by GSI Laboratory (ICP, ICPMS ...) and by certified lab. of envir. radiation analyses (“System” – Gamma Spectroscopy)

Covers the periods 1986-2009 for Orot Rabin PS and 1991-2009 for Rutenberg PS : it is a very reliable data basis

- ♣ **According to the “envir. guidelines for the utilization & handling of coal ash” issued by the MEP in 1998, TCLP leachate analyses are performed by the GSI Lab. on the FA representative samples**



Routine monitoring of trace elements II

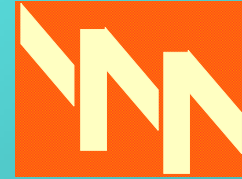
Ash quality monitoring – Different coal sources

During the last years, IEC prepared with NCAB another data basis with concentrations of trace elements & radionuclides for the different coals received, using “industrial fly ash” sampled at the PS (includes results of TCLP leaching tests)

Averages/ranges of trace element concentrations for industrial FA samples are similar with averages/ranges reported for the same elements when using the representative FA samples

Reasons for relatively uniform environmental quality

- ♣ Coal specifications – low S bituminous coal
- ♣ Limitations imposed on purchase of new coal sources include the environmental aspects (trace elements & radionuclides)



Coal ash environmental quality – in the future

Preservation of the ash quality

After installations of new Flue Gas Cleaning equipments (FGD & SCR) at “Orot Rabin” & “Rutenberg” PS, coal ash quality could change:

The imported coal basket will possibly include high S coals

Fly ash enriched in ammonia could be produced

Alternative fuels

♣ Presently IEC is not allowed to mix wastes, biomass or low-quality fuels (petcoke) with coal

♣ If this will be allowed after upgrading the coal-fired units, it will be necessary to check if the ash quality is modified

Trace elements composition in fly ash obtained from different coals burnt by IEC power stations in 2009

Concentrations given in ppm, dry weight basis

	South Africa	Austral.	Colombia	Indonesia	Russia	Follow up 7/91-6/09
As	12 - 14	8	26 - 44	26 - 29	50	9 - 60
Cd	0.4 - 0.8	0.4	1.8 - 2.3	0.3 - 0.6	0.7	0.2 - 1.5
Cr	138 - 200	85	103 - 125	130 - 138	90	80 - 205
Hg	0.05 - 0.19	0.05	0.11 - 0.18	0.05 - 0.19	0.07	<0.02 – 0.3
Pb	52 - 75	50	27 - 33	35 - 47	40	29 - 140
Se	3 - 9	2	27 - 35	4 - 6	3	0.8 - 24
% in ash	52	6	15	19	5	