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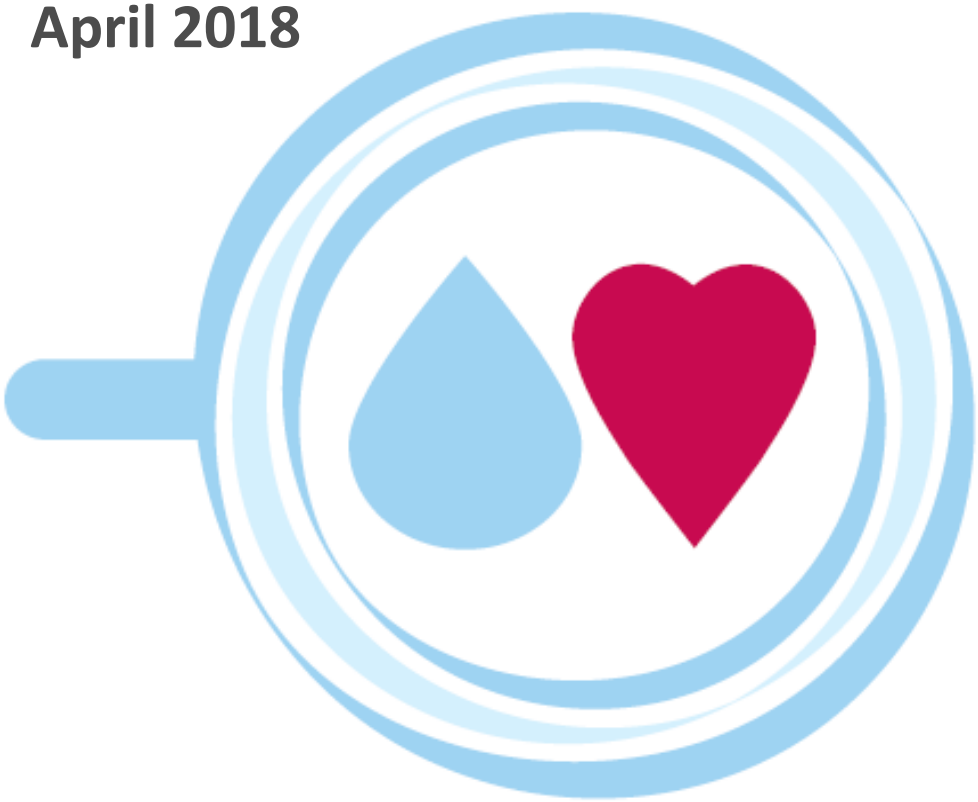
David King
April 2018



WATER FOR COFFEE LOVERS

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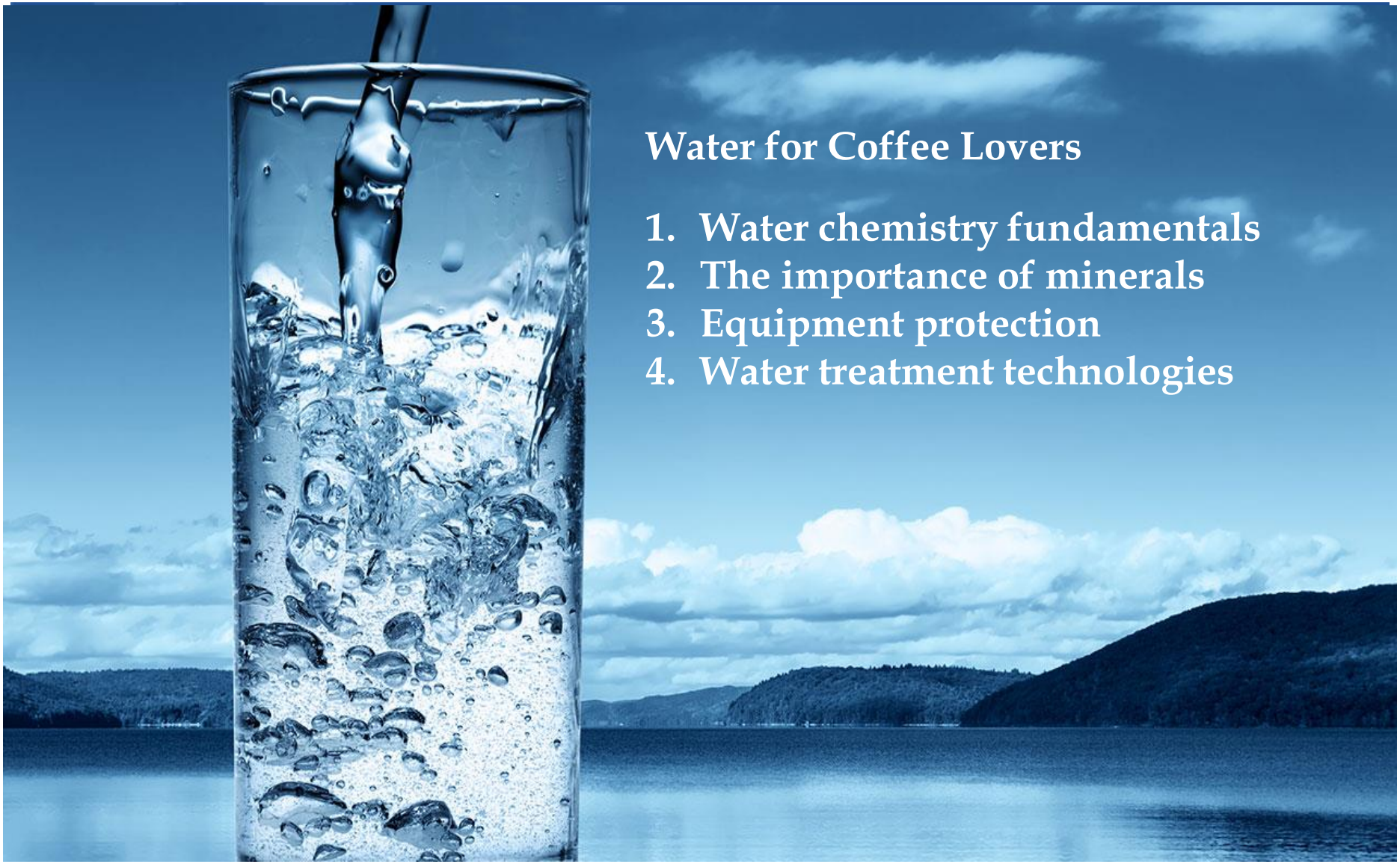


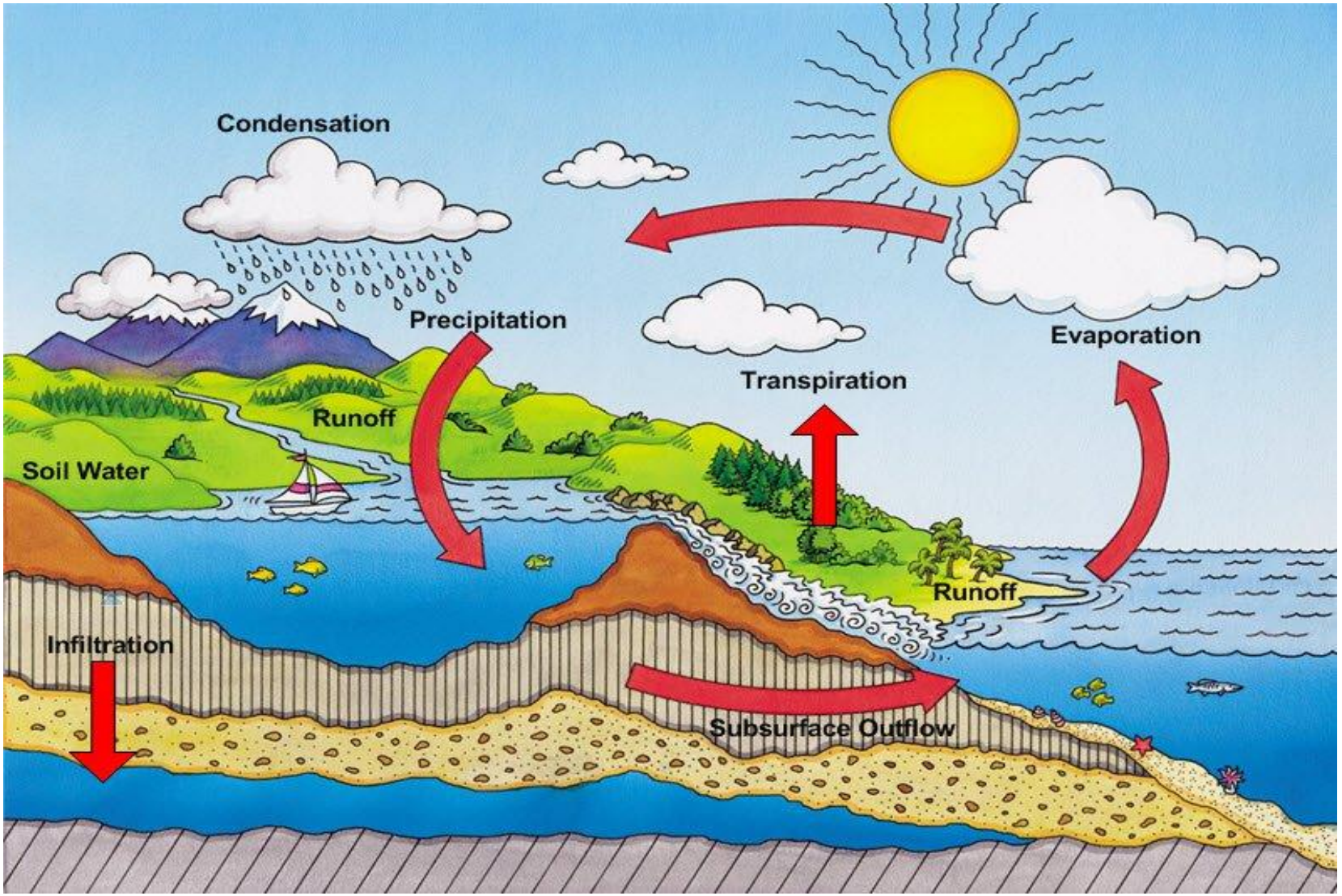
Water for Coffee Lovers

1. Water chemistry fundamentals
2. The importance of minerals
3. Equipment protection
4. Water treatment technologies

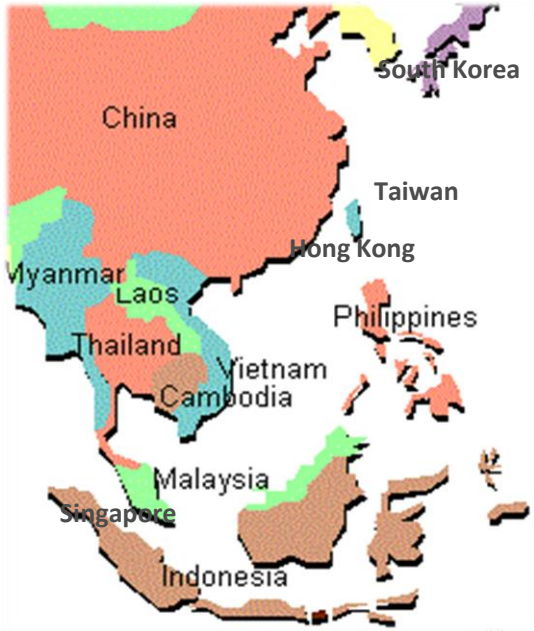
Water Chemistry – Fundamentals

1. Total dissolved solids (TDS) (ppm)
2. Total hardness (ppm)
3. Carbonate Hardness or Alkalinity (ppm)
4. pH

The Hydrological Cycle



Asia - Variable Water Conditions (TDS)



1. Australia - Melbourne 30 – 50 ppm
2. Australia - Perth 380 – 600 ppm
3. S. Korea - Seoul 100 - 480 ppm
4. Philippines - 70 – 400 ppm
5. Vietnam - 70 – 200 ppm
6. Indonesia – 100 -250 ppm

Australia

New Zealand

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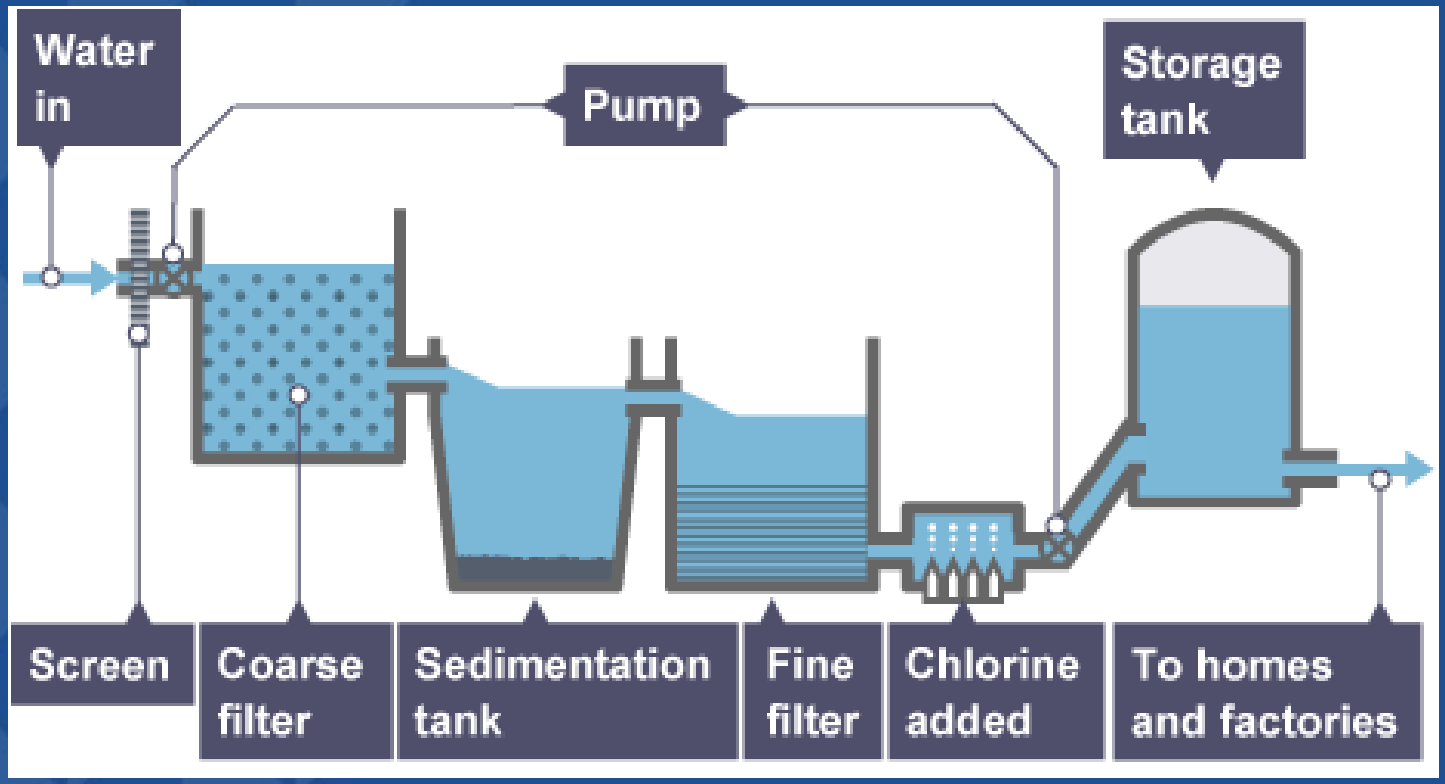
How much chlorine do you serve with your coffee ?



Filter demonstration

WBC 2016 Short Coffee Video.mp4

How does the chemistry of water affect coffee ?

Mineral Content of Water

	TDS (ppm)	Total Hardness (ppm)	Alkalinity (ppm)	pH
WBC Water Spec	**120 -150**	**60-85**	**40**	**7 - 8**
Australia (Melb)	30	30	10	7.7
Australia (Perth)	600	300	190	7.6
S. Korea (Seoul)	150	60	30	7.6
S. Korea (Seoul)	480	230	200	7.7
Vietnam	200	80	60	7.6
Indonesia	250	110	90	7.5

Protecting the coffee machine

Langelier Saturation Index (LSI)

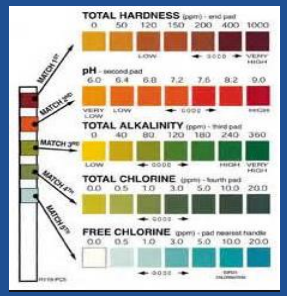
Scale

Corrosion

$$LSI = pH + \log\left(\frac{K_a \cdot \gamma_{Ca^{2+}} \cdot \left[Ca^{2+}\right] \cdot \gamma_{HCO_3^-} \cdot \left[HCO_3^-\right]}{\gamma_{H^+} \cdot K_{sp}}\right)$$

Water Quality – Testing

1. Litmus paper



2. Titration

3. Digital meters (spectrometer, photometer)

Water Treatment Technologies

1. Removal
   - Carbon block
   - Sub micron filters
   - Reverse Osmosis
2. Exchange
   - Softening
   - Partial Softening
3. Addition
   - Minerals
   - Scale Inhibitors

Everpure Conserv Reverse Osmosis System

Features and benefits:

1. Control of mineral content.
2. Balances water chemistry.
3. High efficiency membrane.

Summary

1. **Chemistry fundamentals** - *understand what can be in your water.*

2. **A solvent free from impurities taste and odour** – *Taste the water after the filter, is it good enough to drink*

3. **Water testing** – Test your water or have your water tested for the appropriate dissolved minerals.

4. **Solutions** – Select the appropriate solution based on the water testing