

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

رَبِّ اشْرَحْ لِي صَدْرِي 0 وَيَسِّرْ لِي أَمْرِي 0
وَاحْلُ عُقْدَةً مِّنْ لِّسَانِي 0 يَفْقَهُوا قَوْلِي 0

اے میرے رب! میرا سینہ کھول دے اور میرے لیے میرا کام آسان کر دے اور
میری زبان کی گرہ کھول دے تاکہ لوگ میری بات سمجھ سکیں

رَبِّ زِدْنِي عِلْمًا

MY LORD! INCREASE ME IN KNOWLEDGE.

FST-407. L # 36-37.

**NATIONAL AND INTERNATIONAL CRITERIA AND
STANDARDS ON WATER QUALITY**

CRITERIA AND STANDARDS

Criteria

- A rule or principle for evaluating or testing something

Standards

- Something used as a measure, norm, or model in comparative evaluations

WHO - DRINKING WATER STANDARDS

PHYSICO-CHEMICAL PARAMETER	UNIT	LIMIT
Aluminum	mg / L	0.2
Arsenic	mg / L	0.05
Barium	mg / L	0.05
Beryllium	µg / L	0.2
Cadmium	µg / L	5.0
Calcium	mg / L	200.0
Chromium	mg / L	0.05
Copper	mg / L	1.0
Iron Total	mg / L	0.3
Lead	mg / L	0.01

WHO - DRINKING WATER STANDARDS

PHYSICO-CHEMICAL PARAMETER	UNIT	LIMIT
Magnesium	mg / L	150.0
Manganese	mg / L	0.1
Mercury	µg / L	1.0
Selenium	mg / L	0.01
Sodium	mg / L	200.0
Zinc	mg / L	5.0
Chlorides	mg / L	250.0
Cyanide	mg / L	0.1
Fluorides	mg / L	1.5
Nitrates	mg / L	10.0
Nitrites	mg / L	-
Sulphates	mg / L	400.0

WHO - DRINKING WATER STANDARDS

PHYSICO-CHEMICAL PARAMETER	UNIT	LIMIT
Suphides	mg / L	0
Hydrocarbons	mg / L	0.1
Anionic Detergents	mg / L	0
pH		9.2
Total Dissolved Solids	mg / L	1500
Total Hardness	mg / L	500
Alkalinity	mg / L	500
MICROBIOLOGICAL PARAMETERS		
Total Bacteria	Count / mL	100
<i>Coliform</i>	Count / 100 mL	0
<i>E. Coli</i>	Count / 100 mL	0
<i>Salmonella</i>	Count / 100 mL	0
µg = microgram or ppb	mg = milligram or ppm	

CRITERIA AND STANDARDS FOR DRINKING WATER

Color

- The colour of drinking water may change due to **Tannins, Iron, Copper, Manganese**, natural **Deposits**. This decreases the acceptance of drinking water.
- It is measured in **Hazen (Hz) Unit**

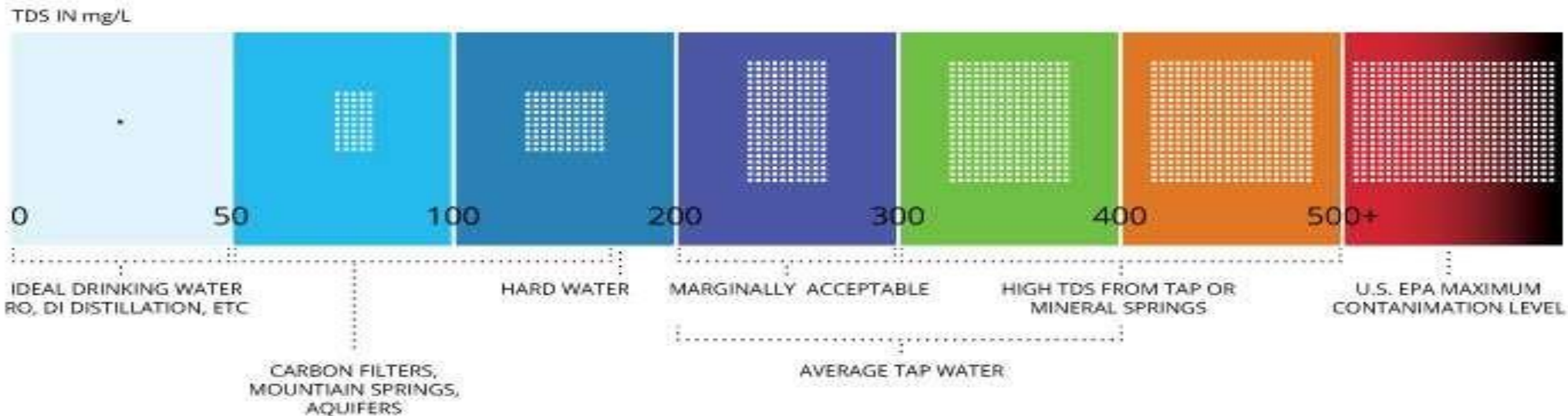
pH

- The desirable limit of pH is **6.5-8.5**
- The lower pH may cause **Corrosion** and metallic taste of water on the other hand higher pH cause bitter taste

CRITERIA AND STANDARDS FOR DRINKING WATER

TDS (Total dissolved solids)

- The **acceptable limit** of TDS is **500 mg/L**
- The higher concentration cause **hardness** of water, **corrosion** of pipes.
- The source of dissolve solids in water from **livestock waste**, **hazardous waste** landfills



CRITERIA AND STANDARDS FOR DRINKING WATER

Iron(Fe)

- The higher concentration of it makes the water **brackish** in color, **bitter** or **metallic in taste, brown-green stains**
- The permissible limit is **1.0 mg/L**

Arsenic (As)

- Some epidemiological studies have suggested that **arsenic** is **carcinogenic** but no real proof of the carcinogenicity to man of arsenic in drinking-water has been forthcoming.
- It causes a disease called **Black foot disease**



CRITERIA AND STANDARDS FOR DRINKING WATER QUALITY

Cadmium

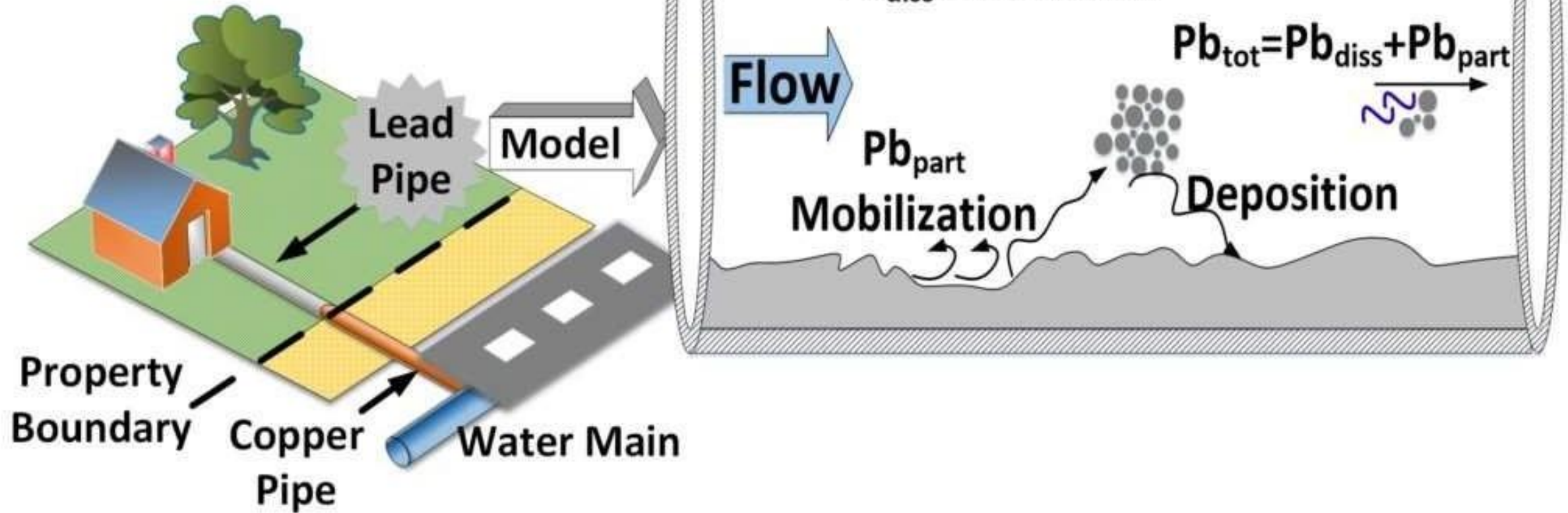
- The results of animal studies suggest that very small amounts of **cadmium** can produce **nephrotoxic** and **cardiovascular effects, Itai-Itai disease**
- Cadmium may be derived from **natural** or **industrial** sources, or from cadmium compounds used in the production of **plastic water pipes**

Lead (Pb)

- Lead compounds are used as **stabilizers** in some **plastic pipes** and may leach out.
- The total **body-load of lead** should be reduced to a level at which equilibrium between absorption and elimination can be maintained.
- The maximum acceptable load of lead from food and beverages has been tentatively placed at **0.05 mg /Kg/day**.

SOURCE OF LEAD IN DRINKING WATER

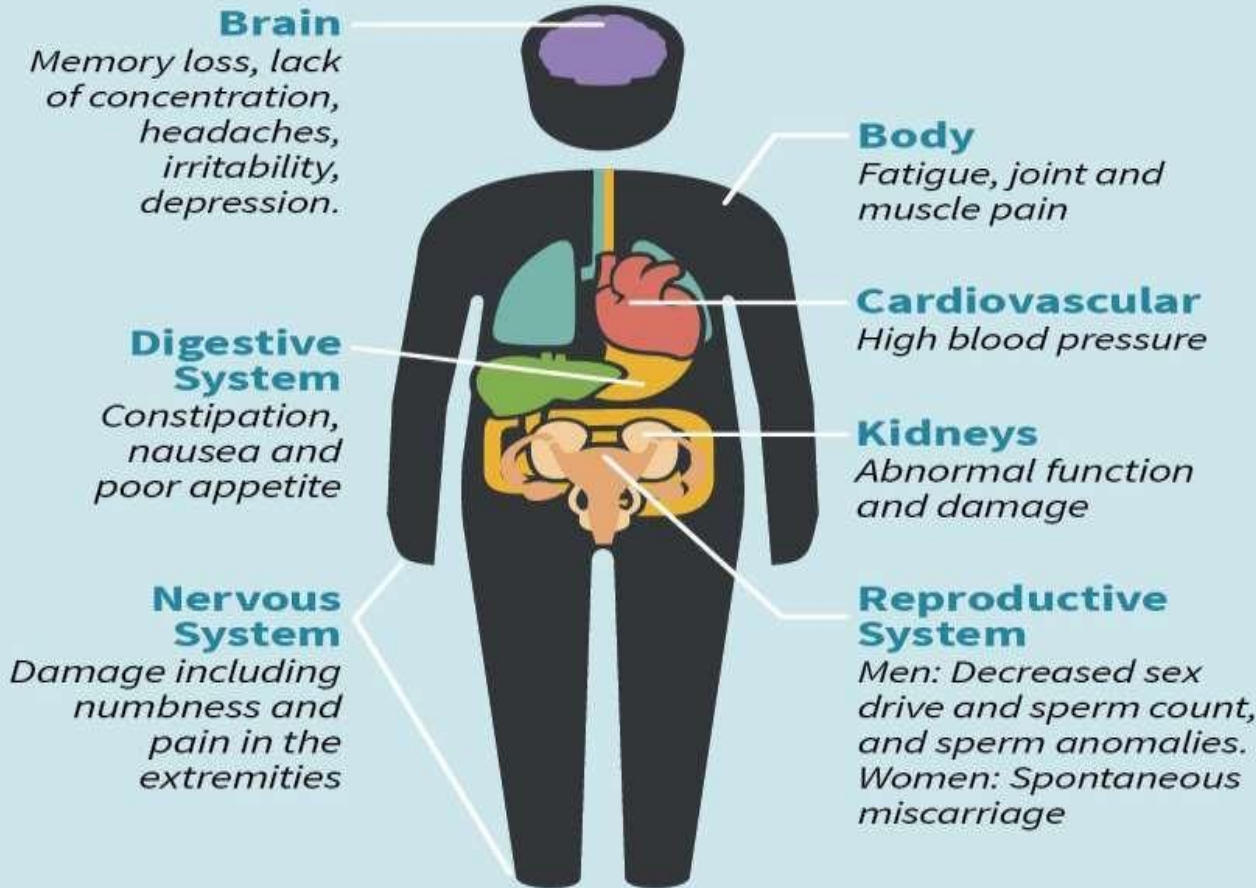
Partial LSL Replacement



Health Impacts of Lead

Exposure to high levels of lead can cause severe damage to the brain, blood and kidneys. Children under six are most at risk from lead poisoning. Even low levels of lead exposure have been found to permanently reduce cognitive ability and cause hyperactivity in children.

ADULTS



CHILDREN



CRITERIA AND STANDARDS FOR DRINKING WATER QUALITY

Fluorides (F)

- Fluorides presence in excessive may give rise to **dental fluorosis** in some children
- If the fluoride concentration in the drinking- water of a community is less than **0.5 mg/l** the incidence of dental caries is likely to be high

The enamel surfaces of the teeth show marked wear and brown stain is frequently a disfiguring feature.



Moderate

Nitrite

- In some circumstances, nitrates have been shown to present a health hazard to infants, and older children, if they are present in drinking-water at concentrations greater than **45 mg/l** (expressed as NO₃) because, after reduction to nitrite, they may give rise to **methaemoglobinaemia (Blue baby syndrome)**

SOURCES OF NITRATE IN DRINKING WATER

