wastewater reuse in Israel

Health related regulation and management

Czech–Israeli Seminar

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Ministry of health

Water shortage challenge

- Semi-arid, densely populated country

- Need for sanitary waste solutions and use as a water resource

  - Low quality effluent in rivers (60's – 90's)

Wastewater treatment in Israel

>500 Million m^3 /year

90 “Big” (1000 – 350,000 m^3 /day) and 300 “Small” WWTP.

>80% Sewage re-use (Agriculture, Public garden irrigation and Industry.)

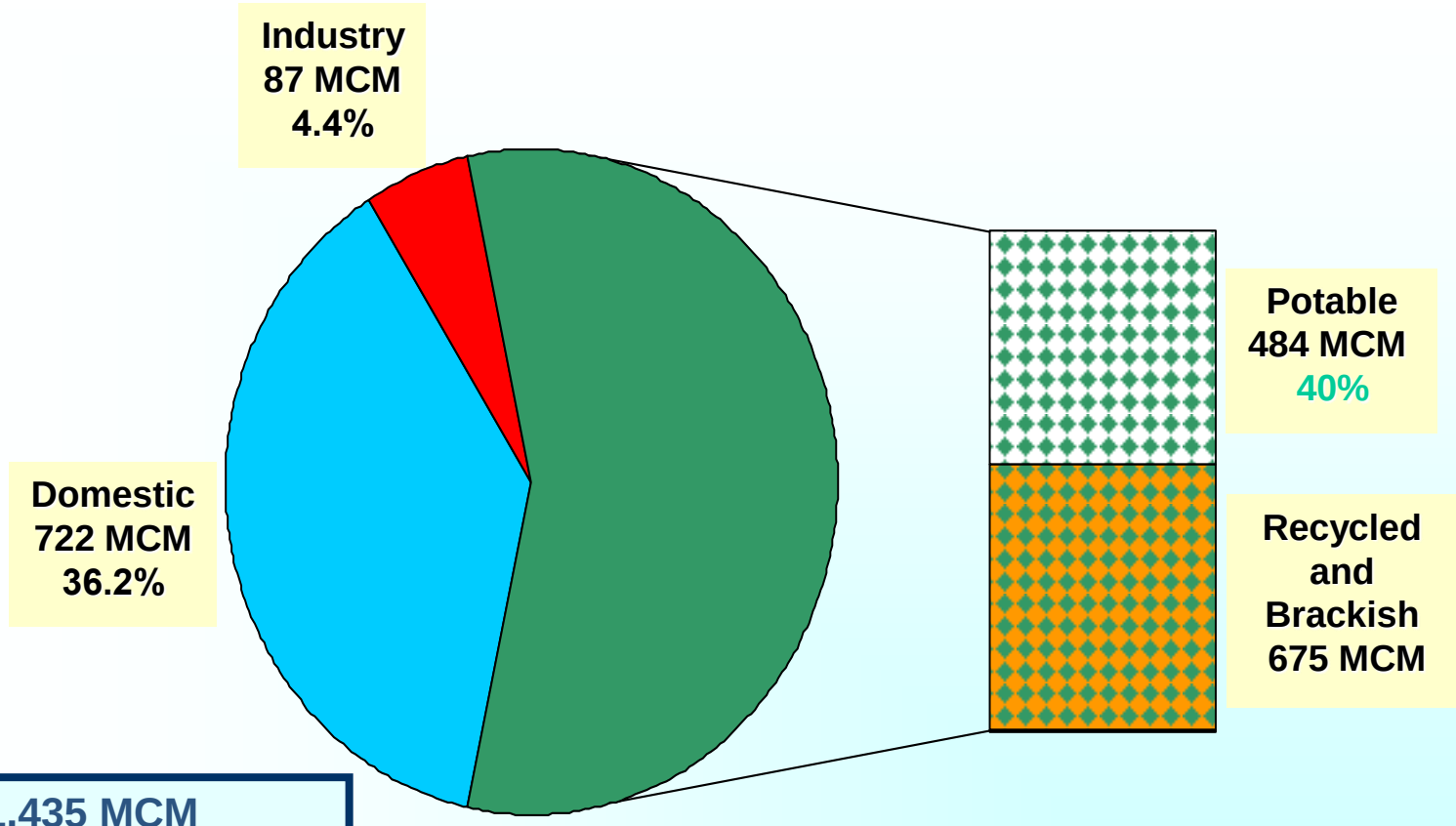
50% of sewage in Israel is tertiary treated (10/10/10/10).

WATER AUTHORITY

STATE OF ISRAEL

Water Consumption in Israel

According to sectors , 2014



Total Potable : 1,435 MCM

Total Water: 2,110 MCM

*Including 26 MCM for Nature

Regulations used:

- Managing sewage content (Industrial - Up stream)
- Municipal sewage treatment grade
- Managing the effluent use

Managing environmental influence

Sewage treatment regulations today:

Tertiary treatment (10/10/10/10):

1 Microbial (10 F.C) and 35 Chemical parameters (BOD,N, Cl-, heavy metals, SAR, etc.)

Technology: Secondary > Deep bed Filtration (<10m/hr.) with Flocculent + Chlorination (CT=30 min mg/l)

Small WWTP – only secondary (20/30 BOD/TSS)

60/90 can be used for industrial crops (cotton etc.)

Unrestricted use effluent quality (/100 ml)

- WHO – 1000 Thermo-tolerant Coliforms
- Spain – 100 F.C
- JRC (EU) – 10 E.C = 20-40 F.C
- Israel - 10 F.C
- California – 2.2 Coliforms (MPN)

Alternative technologies (UV etc.) are checked whether equivalent

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- Entero-Viruses
- Protozoa
- Helminthes

Flocculation aided hydro-cyclon

Up stream industry supervision

Regulations for industry sewage:

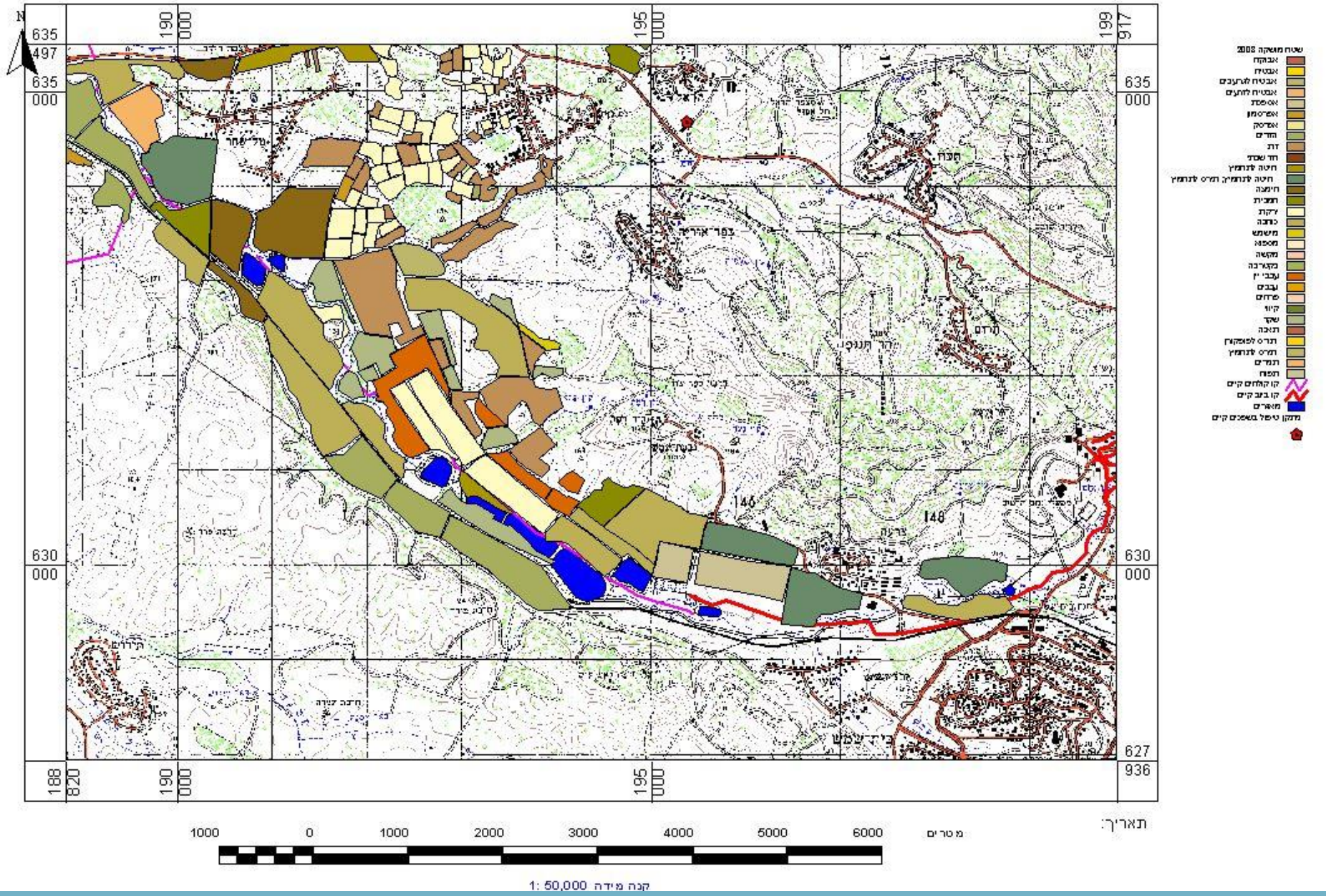
47 chemicals/parameters levels :

- **allowed / not allowed**
- **pay**

Effluent reuse regulation: Application regulations

Irrigation permits according to the Barrier system:

- Effluent quality
- Irrigation conditions
- Growing in the field conditions
- Product characteristics



Compulsory: Irrigation permit

Irrigation conditions

- Distance to fruit – from 50 cm. (spray irrigation droplets) to 0 cm.
- Using drip Irrigation/ underground drip Irrigation / plastic sheets

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Nature and Parks Authority

Growing in the field conditions

Product characteristics:

- Inedible peel / <u>Need for cooking or Heating</u>

- Non edible (Cotton)
- Grass , Fodder, Forests with no public entry

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NUMBER OF BARRIERS

NEED COOCKING	NON DIBLE PEEL	UNDER GROUND DRIP IRRIGATION	PLASTIC SHEET	DISTANCE TO DRIP IRRIGATION	DEEP SAND FILTRATION	CHLORINATION	SECONDARY	TERITIARY	AGRICULTURAL PRODUCT
		++		+	+	+Compulsory	2	0	Eaten Raw: Tomato Cucumber
+	+	++	+		+	+	2	0	Cooked: Eggplant Pumpkin
+				+	+		2	0	Cooked, Grown Underground: Potato

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2003 - Park irrigation

& Industrial use.

Growing bigger.

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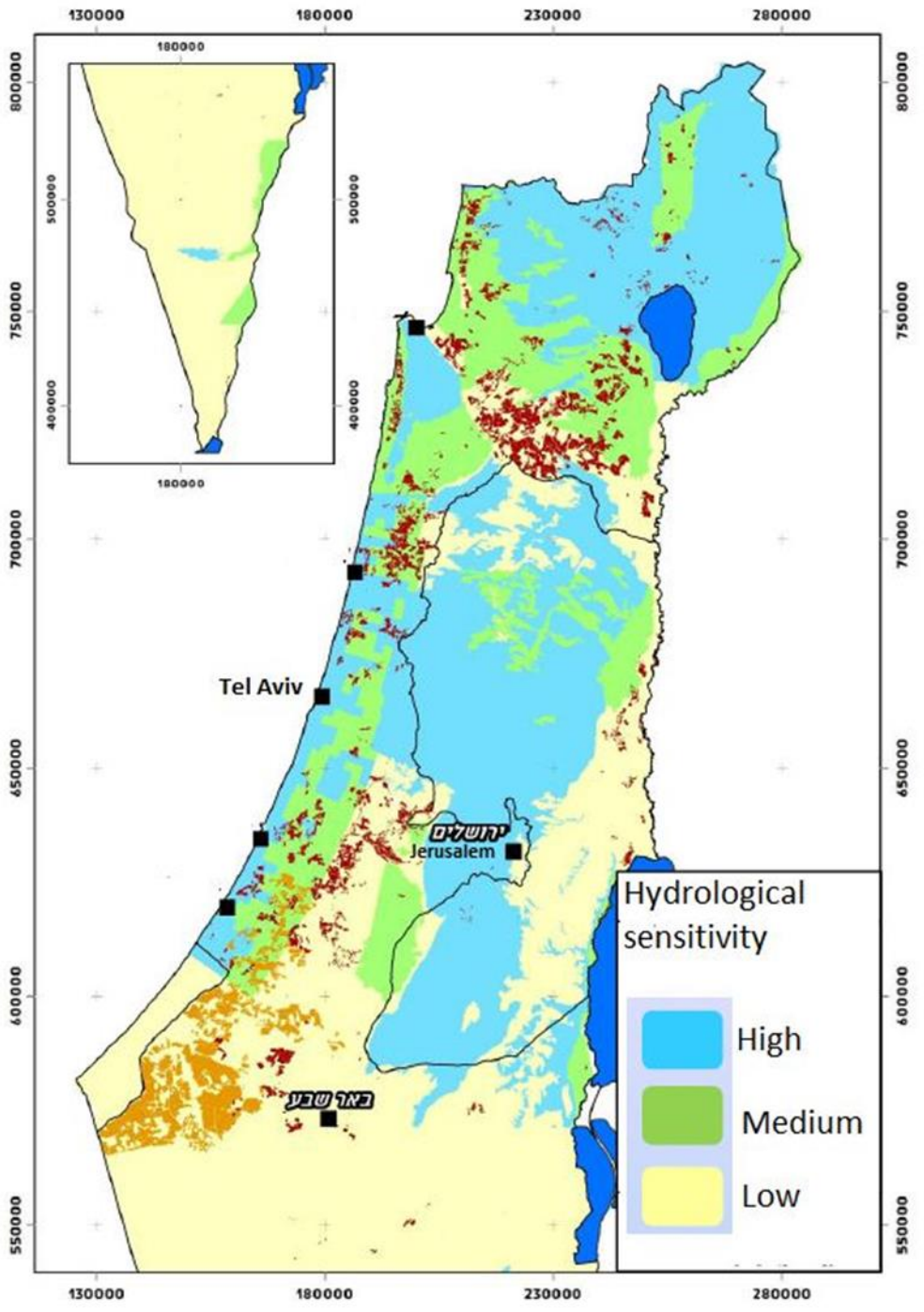
Aquifer preservation

Effluent irrigation by Hydrological Sensitivity

Soil salt flushing



Drinking Water Regulations: >100 Parameters.

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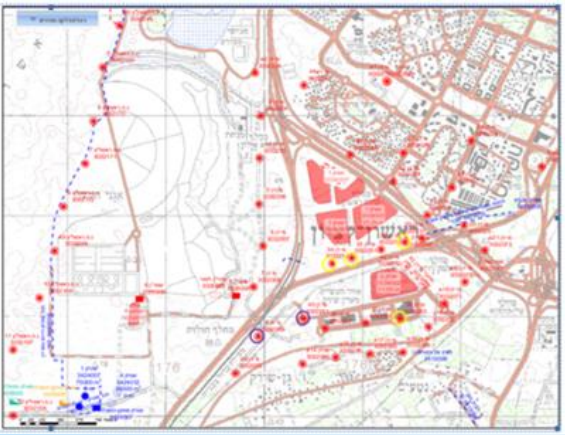
Environment changes and public health hazards

Advanced W.W treatment in Israel

- Secondary > SAT > Agriculture



- AOP: MBR > Ozone > BAC filtration > U.V

5000 m3/hr.

Micro-pollutant (CEC's) removal & 10 log virus reduction

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Thank You

Velocipede Recycling Shower