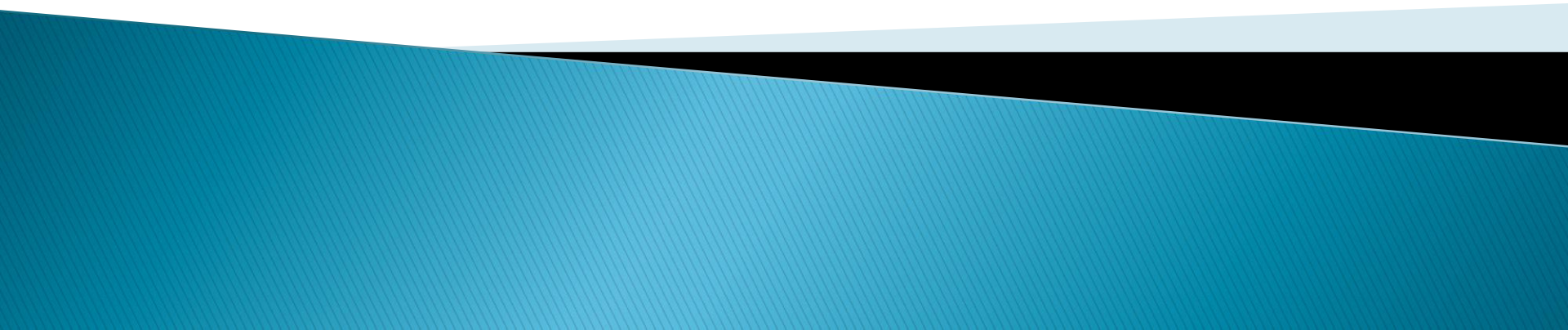


The Environmental Balance Improvement Device & Its Applicability



We treat Water !!

- Ground Water
- Surface Water
- Waste Water
- Grey Water
- Sewage

Core Competencies :

- Low Cost Solution
- Bio-augmentation
- Specialized Skid Mounted Equipment

Technologies we offer :

- Anaerobic (HRFD, UASB)
- ASP, FAB, SAFF & RBC
- RO, DM & Ultrafiltration

Services :

- FPC
- DBO
- Turnkey Project
- O&M

Executed more than hundred Projects of Water & Waste Water Treatment in the last five years with various Residential & Commercial Complex, Shopping Malls, Hotels, Resorts, Clubs & Spas, Hospitals, Industries, PSU, MoEF Govt. of India & West Bengal

We also design & supply packaged skid mounted units for waste water treatment

Unitech Water Technologies Pvt. Ltd

Regd. Office : KAILASH BHAWAN, 2nd Floor, 32/1, Gariahat Road (South)
Kolkata-700 031, W.B. (India), Fax : +91-33-2499-0411, E-mail : contact@unitechwater.net

UWT's

Knowledge management
& system well being division

Unitech Environmental Services Pvt. Ltd.

Laboratory Testing & Analysis
(PCB Approved)
Operation & Maintenance, Survey,
Consultancy & Feasibility

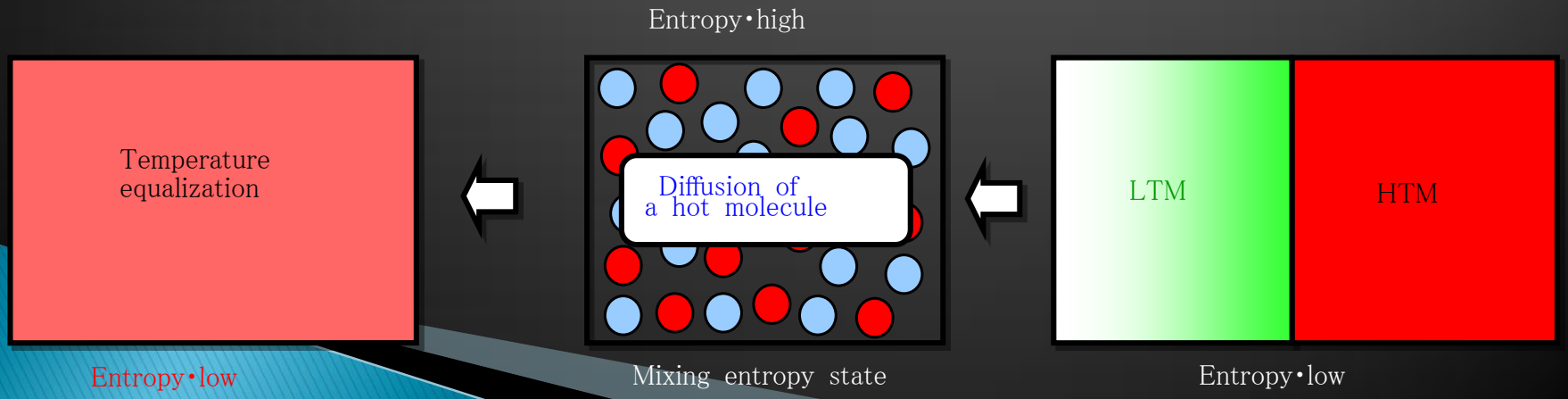
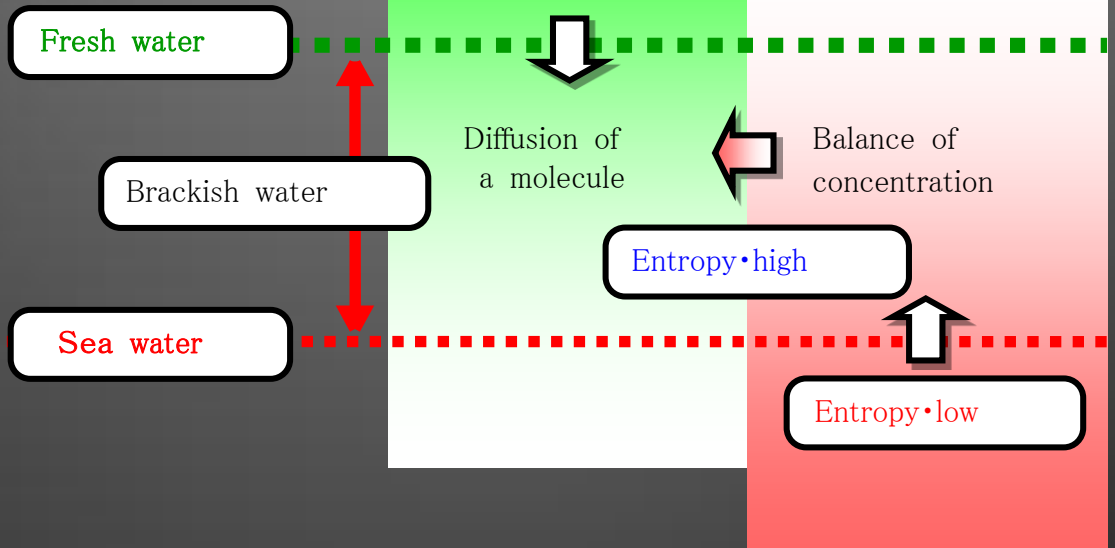
Phone : 3296 4771
4000 4624
4000 4625

www.unitechwater.net

Concept of Entropy

Entropy

It is the thermodynamic disorder when two systems at different temperatures or concentrations are mixed together. The system then tends to achieve a dynamic equilibrium and is said to be balanced

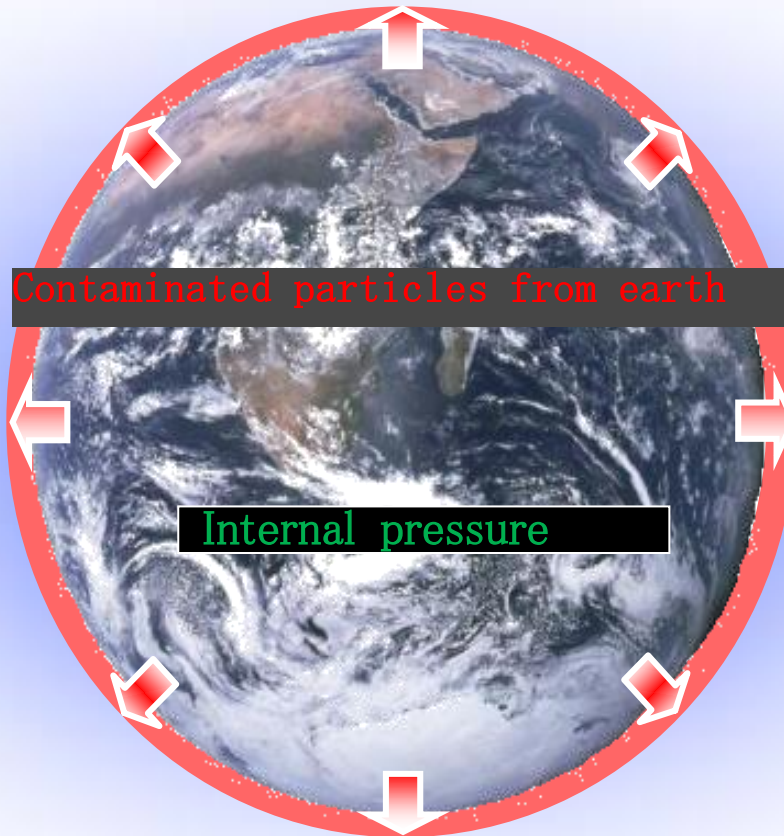


Factors & the Occurrence of Imbalance

Entropy • low

Generating factor

Population expansion
Resources development
Deforestation
Site work
Ocean development
Urbanization
Mass production
Mass consumption
Deforestation
Environmental pollution
Abandonment of chemical substances
Frequent occurrences of war
Nuclear power plant disasters
Infectious diseases



Contaminated particles from earth

Internal pressure

Present conditions

Global warming
Ozone layer depletion
Acid rain
Abnormal weather
Water contamination
Natural disasters
Air pollution
Exhaustion of resources
Soil pollution
Desertification
CO₂ increase

Unbalance of the substances & Nature

O·H·N·OH·NO·Cl·CH—Radical

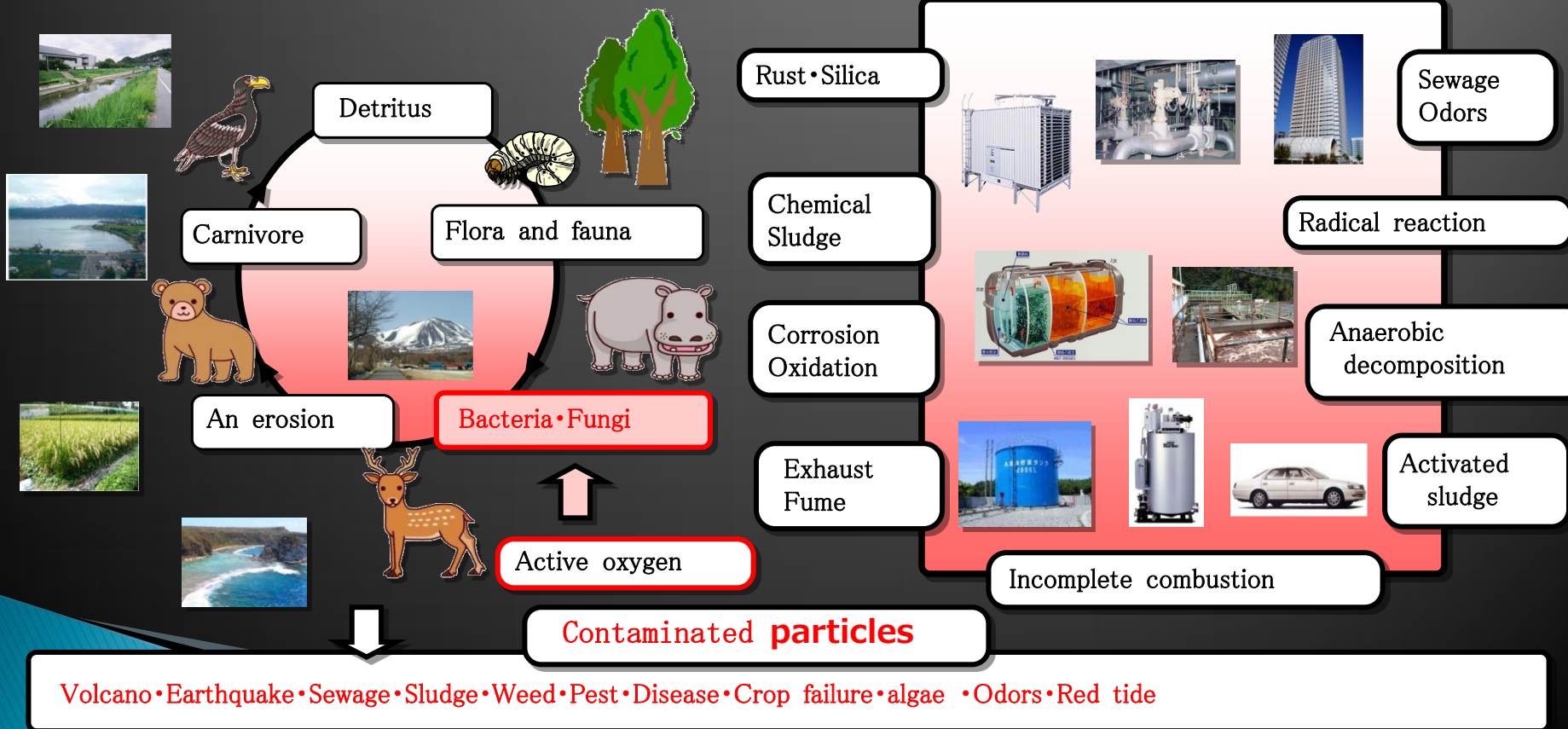
Unbalanced environment
Entropy • small

Generation of free radicals
Generation of active oxygen

Killing of microorganisms

Collapse of the food chain
Collapse of the detritus food chain

Resource depletion

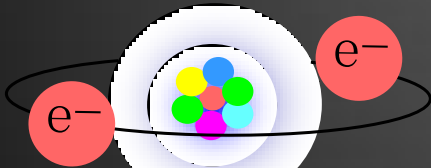


Atoms & radicals

Stability

Entropy • high

Outermost electrons



Electron pair

Cause of radical generation

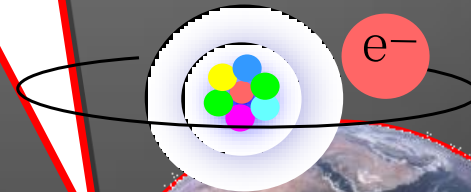
Electromagnetic waves
Electrical energy
High temperatures
Pesticides
Carcinogens
Herbicides
Insecticides
Radiation
Industrial waste
Ultraviolet rays
Animal Husbandry
Air pollution
Acid rain
Global warming
Drugs
Human sewage
Malnutrition
Tobacco
Crude oil pollution
Food additives

Internal pressure

Instability

Entropy • low

Radical atoms



Unpaired electron

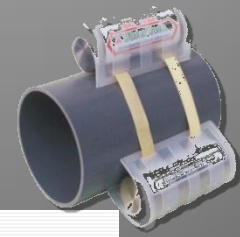
Radical reaction

Radical chain reaction

Environmental destruction



Nature & uses of the device



Line Series

- * Cooling towers
- * Heat exchangers
- * Water heaters
- * Air conditioners
- * Water supply facilities
- * Sewerage facilities
- * Housing
- * Mansions
- * High-rise buildings
- * Industrial wastewater
- * Schools
- * Hospitals
- * Restaurants
- * Spa facilities
- * Groundwater
- * Farms
- * Pools

Device developed from Transition Metal Powder & Plastic Molding

- * Suppression of rust
- * Adhesion prevention silica
- * Antioxidant
- * Water softener
- * Reduction action
- * Deterioration prevention
- * Wear prevention
- * Disappearance of smells
- * Disappearance of inorganics
- * Disappearance of blue-green algae
- * Disappearance of bulking phenomenon
- * Disappearance of E. coli
- * Disappearance of Legionella

Cooling towers



Heat exchangers



Water heaters



Schools



Restaurants



Buildings



Pools

Water supply facilities



Industrial wastewater



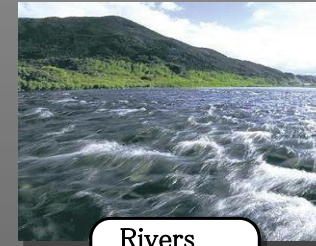
Hospitals

Uses of the device (contd.)

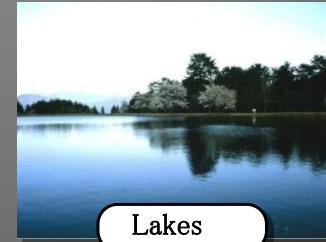
Pollution Series

- * Rivers
- * Lakes
- * Farms
- * Water supply facilities
- * Sewerage facilities
- * Wells
- * Mansions
- * High-rise building
- * Industrial wastewater
- * Hospital wastewater
- * Restaurant drainage
- * Septic tanks
- * Grease traps

- * Disappearance of blue-green algae
- * Decrease in eutrophication
- * Disappearance of sludge
- * Improvement of water quality
- * Antioxidant
- * Water softeners
- * Reduction action
- * Deterioration prevention
- * Wear prevention
- * Disappearance of sludge
- * Decomposition of inorganics
- * Disappearance of the bulking phenomenon
- * Water anti-corruption
- * Deodorant smells
- * Solubilization of garbage
- * Decomposition of heavy metals



Rivers



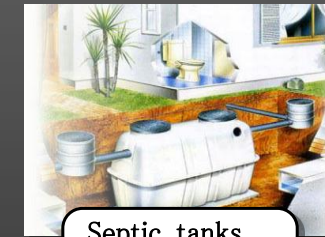
Lakes



Groundwater



Sewage treatment



Septic tanks



Sludge



Eutrophication



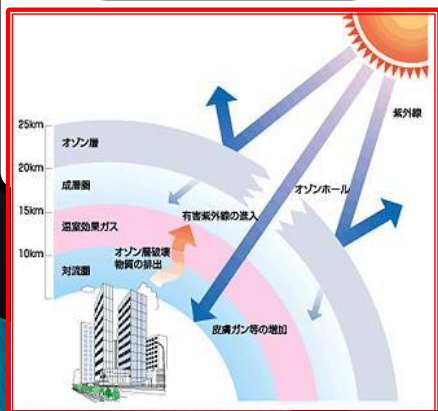
Grease traps

Uses of the device (contd.)

Natural Series

- * Large rivers
- * Large lakes
- * Oceans
- * Deserts
- * High groundwater depth
- * Weather
- * Crust
- * Airflow
- * Radiation

Ultraviolet



- * Elimination of air pollution
- * Elimination of soil contamination
- * Elimination of marine pollution
- * Elimination of desertification
- * Ballast water purification
- * Repair of the ozone layer
- * Large river purification
- * Large lake purification
- * Purification of chemical substances
- * Elimination of ship pollution
- * Elimination of aircraft pollution
- * Elimination of radioactive contamination
- * Repair of forests



Large rivers



Nuclear power plants



Ozone layer



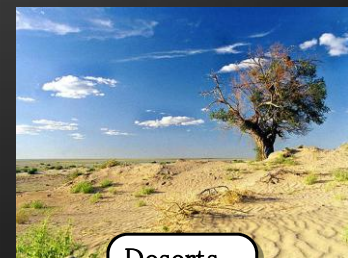
Large lakes



Ionosphere

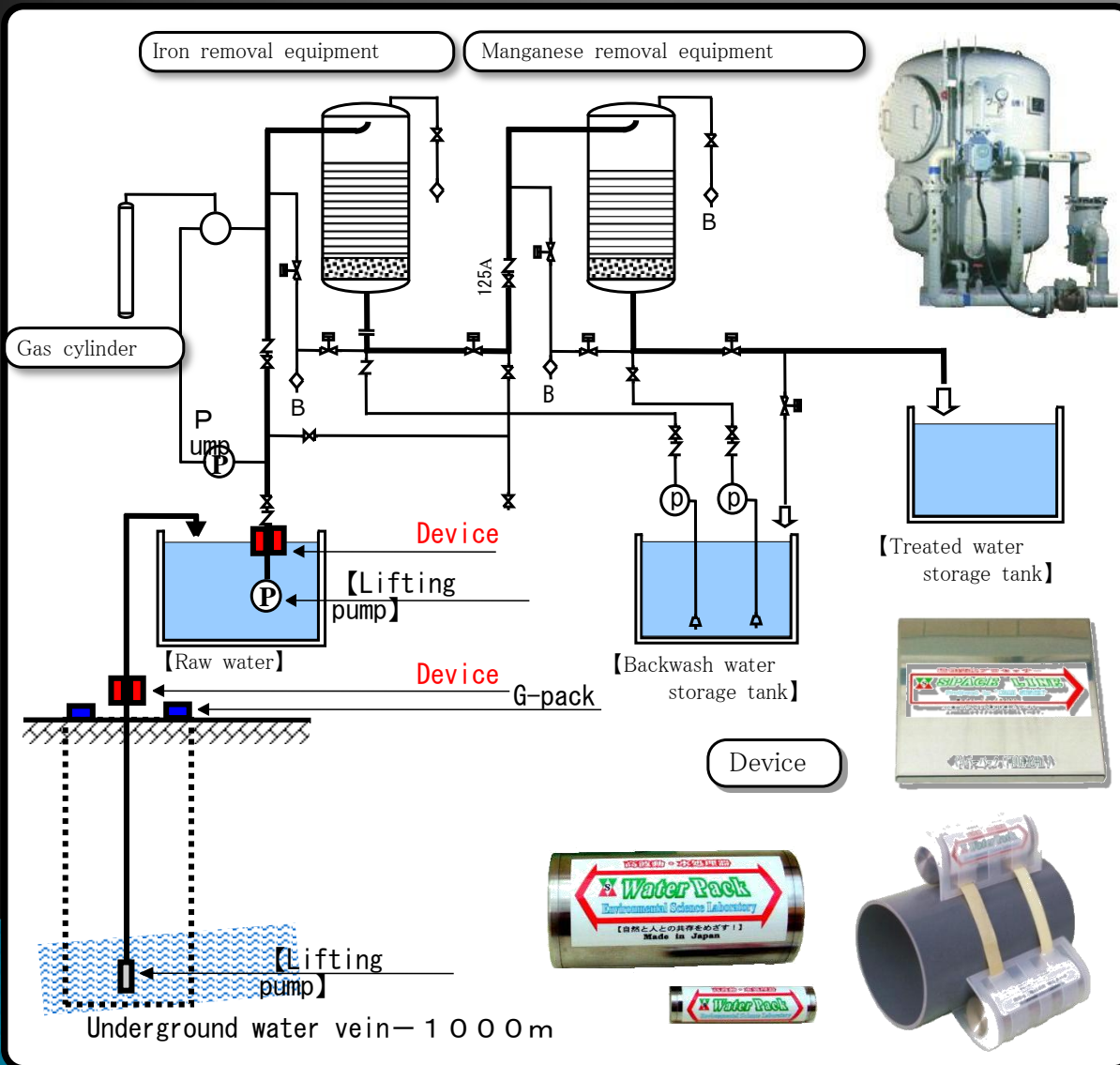


Oceans



Deserts

Effects on groundwater



■ Groundwater contamination ■

[Health item]

- ◆ Heavy metals
- ◆ Cyanide
- ◆ Volatile organic compound
- ◆ Pesticides
- ◆ Nitrate-nitrogen·Nitrite-nitrogen

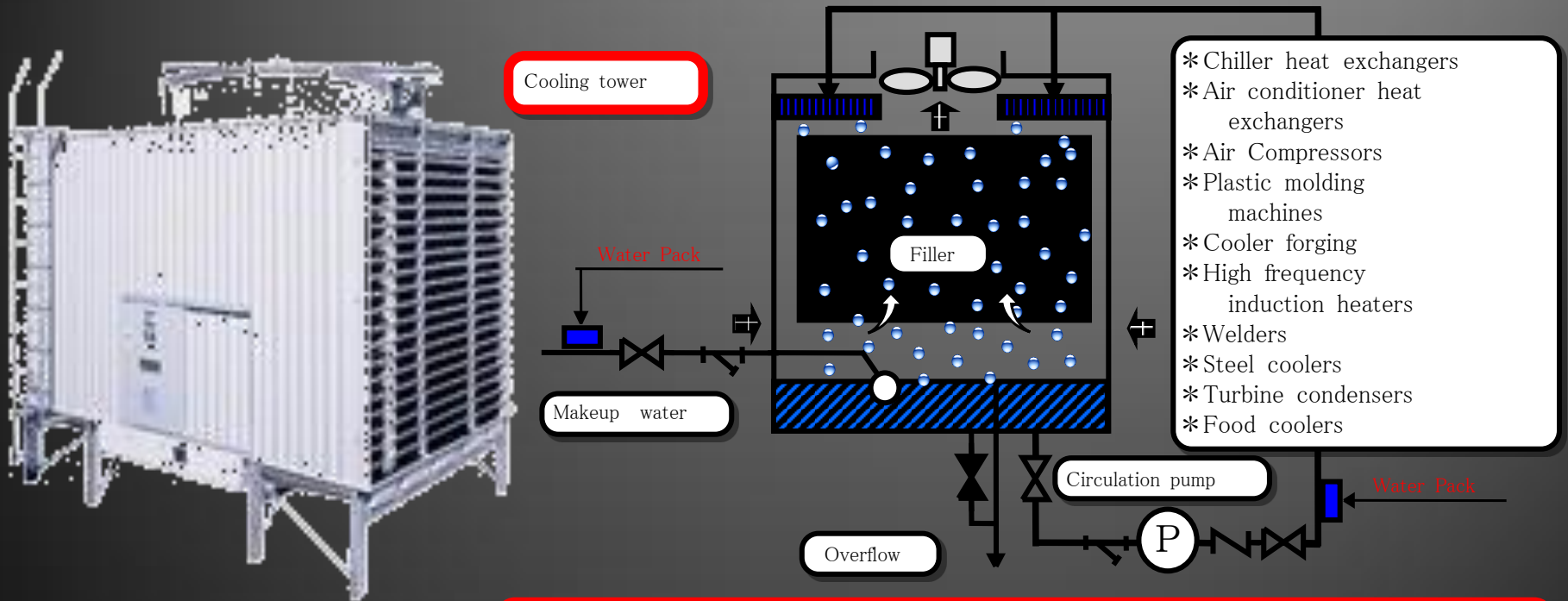
[Also living environment]

- ◆ Fluorine·Boron compound
- ◆ Colors·Smells
- ◆ Acids and alkalis
- ◆ Water turbidity
- ◆ Oil
- ◆ Microorganism
- ◆ Nutrient salts

■ The effects of balance improvement ■

- 1) Phenomenon of heavy metals, manganese and iron
- 2) Reduction of nitrate nitrogen
- 3) Disappearance of cyanide
- 4) Reduction of fluorine and boron compounds
- 5) Disappearance of odors
- 6) Disappearance of suspended solids
- 7) Disappearance of bacteria

Use in Cooling Towers



■ Effects of cooling towers and balance problems ■

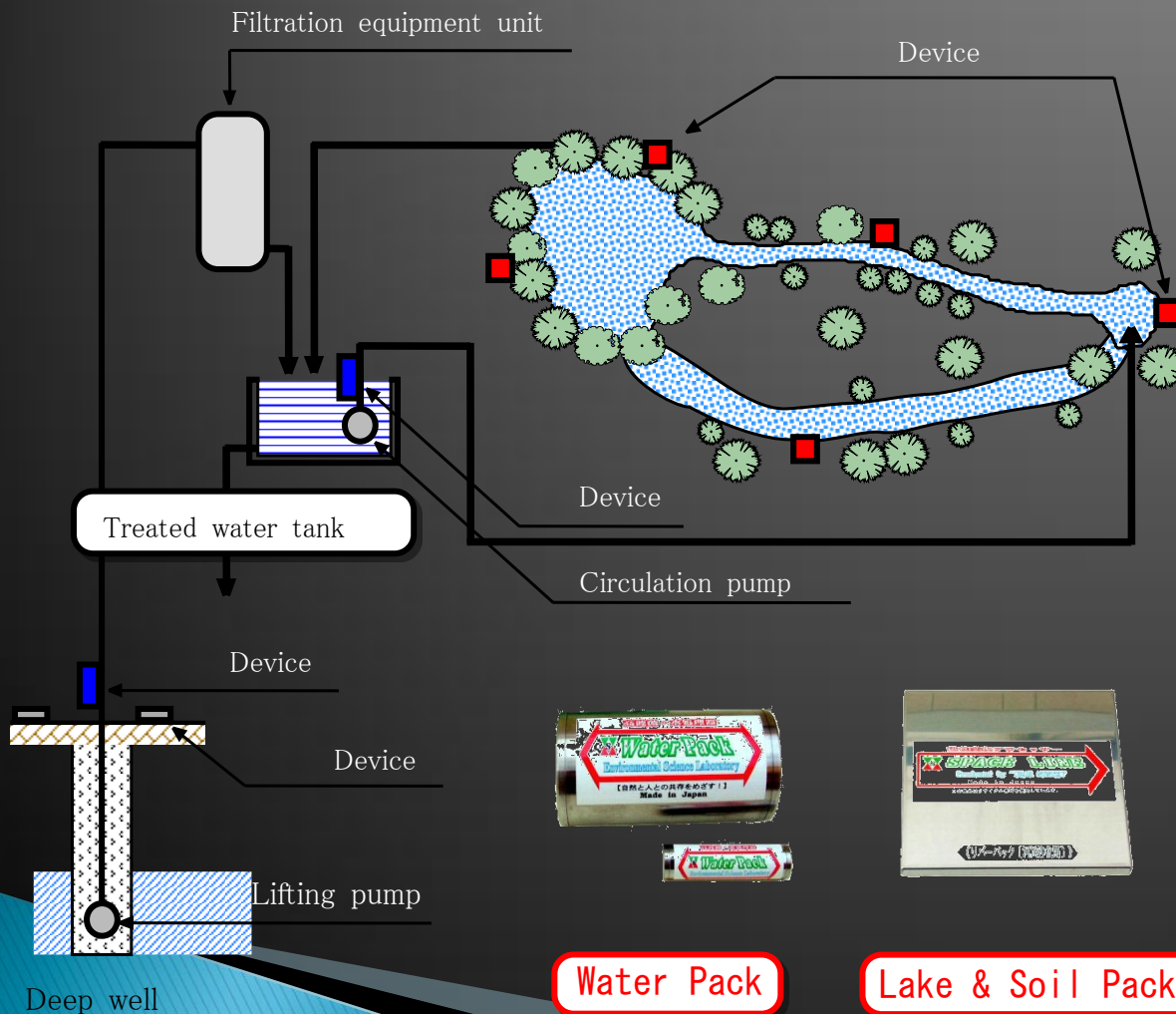
- 1) Clogging of pipes and fillers → Disappearance of silica, scale components
- 2) Rust → Elimination
- 3) Occurrence of algae and blue-green algae → Annihilation
- 4) Increase of COD values → Realization of non-chemicals
- 5) Occurrence of slime or biofilm → Annihilation
- 6) Growth of Legionella → Decrease
- 7) Increase in the cost of power due to temperature variation → Decrease
- 8) Cost burden of cleaning → Significantly reduce



Device

Effects on lakes & ponds

Biotope



■ The effect of balance improvement ■

- 1) Reduce blue-green algae in lakes
- 2) Disappearance of odors
- 3) Disappearance of sludge
- 5) Improvement of landscape
- 6) Improvement of living conditions
- 7) Improvement of water quality from water sources



Water Pack

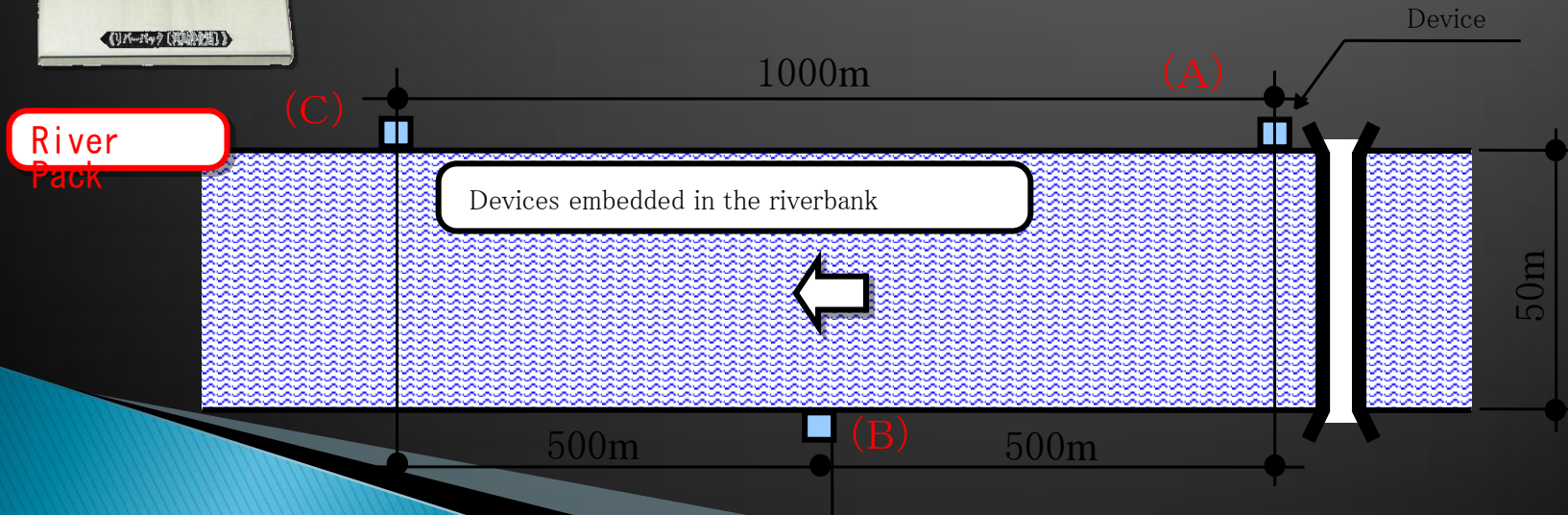
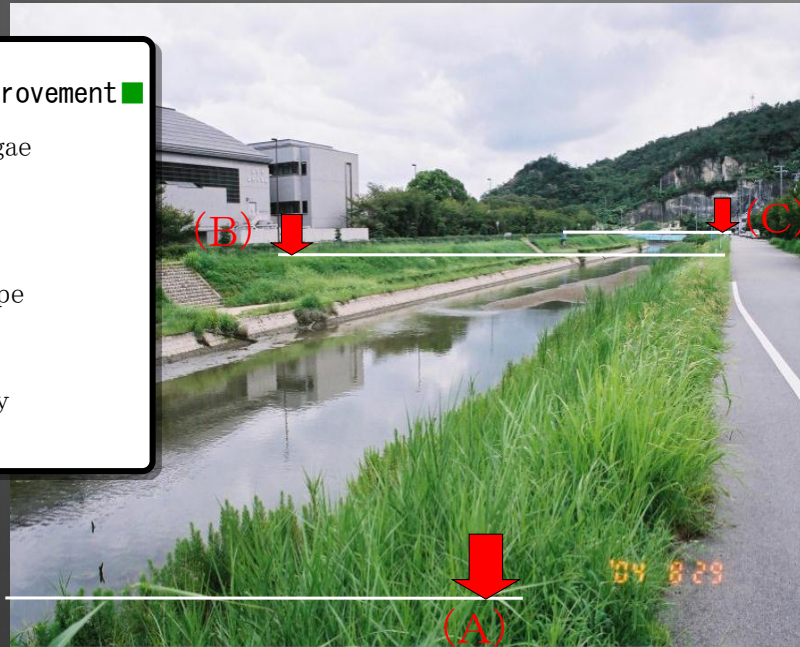


Lake & Soil Pack

Effects on rivers/ sludge

■ The effect of balance improvement ■

- 1) Reduction of blue-green algae in lakes
- 2) Disappearance of odors
- 3) Disappearance of sludge
- 5) Improvement of the landscape
- 6) Improvement of living conditions
- 7) Improvement of water quality from water sources



Results in Japan

BOD PRAMETER IN KAKOGAWA RIVER IN JAPAN

Month/Date	BOD in 1st year with out any Device (mg/l)	Month/Date	BOD in 2nd year with out any Device(mg/l)	Month/Date	BOD in 2nd year with Device (mg/l)	Month/Date	BOD in 2nd year with Device (mg/l)	Month/Date	BOD in 2nd year with Device (mg/l)	Month/Date	BOD in 2nd year with Device (mg/l)
7-Jul	1.2	5-Jul	1.5	4-Jul	1.9	3-Jul	1.8	9-Jul	0.9	7-Jul	1
4-Aug	2.8	2-Aug	1.8	1-Aug	2.1	7-Aug	1.7	6-Aug	1.1	4-Aug	1.4
20-Sep	0.9	6-Sep	3.9	5-Sep	1.6	4-Sep	1.9	3-Sep	1	3-Sep	0.6
13-Oct	1.4	11-Oct	1.2	3-Oct	1.6	2-Oct	1.2	1-Oct	0.8	6-Oct	0.5
10-Nov	1.2	8-Nov	1	7-Nov	1.4	6-Nov	1.2	5-Nov	1.5	4-Nov	0.4
8-Dec	1.6	6-Dec	1.5	5-Dec	1.4	4-Dec	1.9	3-Dec	0.8	1-Dec	1.7
12-Jan	3.2	15-Jan	2.5	9-Jan	1.1	8-Jan	1.2	7-Jan	0.8	5-Jan	0.8
2-Feb	1.3	7-Feb	1.8	6-Feb	1	5-Feb	1.1	4-Feb	1	2-Feb	1.8
1-Mar	2	8-Mar	1.6	11-Mar	1.7	5-Mar	1.1	3-Mar	1.1`	2-Mar	1.6
26-Apr	1.9	9-Apr	2.9	9-Apr	1.9	7-Apr	1.2	7-Apr	1.7	-	-
10-May	4.2	9-May	3.1	15-May	1.4	7-May	1.6	6-May	1.5	-	-
7-Jun	3.9	6-Jun	2.9	5-Jun	2.2	4-Jun	2.2	2-Jun	1.5	-	-
Avg.	2.13	Avg	2.14	Avg	1.61	Avg	1.51	Avg	1.05	Avg	1.08

PHOSPHORUS PRAMETER IN KAKOGAWA RIVER IN JAPAN

Month/Date	P in 1st year with out any Device (mg/l)	Month/Date	P in 2nd year with out any Device(mg/l)	Month/Date	P in 1st year with Device (mg/l)	Month/Date	P in 2nd year with Device(mg/l)	Month/Date	P in 1st year with Device (mg/l)	Month/Date	P in 2nd year with Device(mg/l)
7-Jul	0.08	5-Jul	0.1	4-Jul	0.09	3-Jul	0.16	9-Jul	0.1	7-Jul	0.08
4-Aug	0.12	2-Aug	0.12	1-Aug	0.1	7-Aug	0.11	6-Aug	0.07	4-Aug	0.13
20-Sep	0.05	6-Sep	0.15	5-Sep	0.08	4-Sep	0.1	3-Sep	0.06	3-Sep	0.06
13-Oct	0.07	11-Oct	0.07	3-Oct	0.09	2-Oct	0.07	1-Oct	0.06	6-Oct	0.05
10-Nov	0.06	8-Nov	0.06	7-Nov	0.11	6-Nov	0.08	5-Nov	0.09	4-Nov	0.03
8-Dec	0.07	6-Dec	0.07	5-Dec	0.05	4-Dec	0.09	3-Dec	0.04	1-Dec	0.04
12-Jan	0.13	15-Jan	0.07	9-Jan	0.05	8-Jan	0.04	7-Jan	0.03	5-Jan	0.04
2-Feb	0.06	7-Feb	0.07	6-Feb	0.06	5-Feb	0.04	4-Feb	0.05	2-Feb	0.07
1-Mar	0.06	8-Mar	0.07	11-Mar	0.06	5-Mar	0.08	3-Mar	0.05	2-Mar	0.06
26-Apr	0.08	9-Apr	0.1	9-Apr	0.1	7-Apr	0.08	7-Apr	0.07	-	-
10-May	0.18	9-May	0.16	15-May	0.13	7-May	0.12	6-May	0.15	-	-
7-Jun	0.23	6-Jun	0.23	5-Jun	0.12	4-Jun	0.14	2-Jun	0.13	-	-
Avg.	0.099	Avg.	0.105	Avg.	0.084	Avg.	0.0925	Avg.	0.077	Avg.	0.063

Results, using the device

- ❑ Results obtained from rivers in Japan show 51% BOD reduction and 40% phosphorus removal even in such low concentrations.
- ❑ BOD removal in STPs with inlet values > 200 mg/l – 90–95%
- ❑ By using the device, existing STPs can be overloaded with an additional 50–80 % of the flow, without compromising on the outlet parameters. Thus the capacity of a 1 MLD plant can be increased to treat a flow of 1.8 MLD, keeping the outlet parameters same.
- ❑ The device requires no usage of tertiary treatment units. Thus, no pressure sand filters or activated carbon filters are required. Hence, less usage of electro–mechanical equipments and much less power consumption.

Mode of application of the device

- ❑ These are small, portable, hand-held digital type
- ❑ Devices are embedded within the river bank or within the STP walls
- ❑ In STPs, the device is fixed in the aeration or anaerobic tank bottom and walls
- ❑ The device does not come in direct contact with water or sewage.
- ❑ Very long life – hence no need for replacement

Thank You!!

