IMPACT OF新兴 CONTAMINANTS IN OUR WATER SUPPLY

NEWLY DISCOVERED CHEMICALS IN THE WATER SUPPLY ARE BECOMING OF INCREASING IMPORTANCE DUE TO THEIR UNKNOWN EFFECTS ON THE ENVIRONMENT AND HUMAN HEALTH. IDENTIFICATION AND RISK ASSESSMENT IS REQUIRED TO MEASURE THE POTENTIAL DANGERS OF THESE CHEMICALS IN THE WATER.

WHAT ARE EMERGING CONTAMINANTS?

Any synthetic or naturally occurring chemical not commonly recognized as bioavailable. The presence of emerging contaminants in the environment may cause known or suspected adverse ecological and/or human health effects.

CHEMICAL CLASSES FOR POTENTIAL EMERGING CONTAMINANTS:

- Pharmaceuticals and Personal Care Products (PPCPs)
- Chemicals from Consumer Products
- Endocrine Disrupting Compounds (EDCs)
- Nanomaterials

WHAT ARE THOSE EMERGING CONTAMINANTS?

Sources include:
- Human and veterinary pharmaceuticals
- Personal care products
- Pesticides
- Industrial solvents
- Heavy metals
- Microplastics
- Nanomaterials

WHAT DO WE KNOW ABOUT THE IMPACT OF THESE CONTAMINANTS?

The full extent is unknown due to the vast waves currently removed. Are they dangerous/not dangerous?

WHAT HAPPENS TO CONTAMINANTS IN WASTEWATER TREATMENT FACILITIES?

- Wastewater treatment facilities may not have the technologies required to test and monitor removal of emerging contaminants.
- Understanding the chemistries and identifying unknowns allows wastewater treatment facilities to improve their processes to remove emerging efficiency.

- Some emerging contaminants, e.g., microplastics, are removed during sedimentation or filtration processes ending up in the sludge or sludge layer.
- Other unknowns may not be removed through conventional treatment processes and are released into the environment.

HOW DO THESE CONTAMINANTS ENTER THE WATER?

- Leachates from landfills
- Excretion from the body
- Industrial waste
- Agricultural runoff

HOW DO WE TEST FOR THESE CONTAMINANTS TODAY?

Gas Chromatography/Mass Spectrometry
Inductively Coupled Plasma/Mass Spectrometry
Liquid Chromatography/ Mass Spectrometry

WHAT NEW TECHNOLOGIES ARE BEING DEVELOPED TO IDENTIFY EMERGING CONTAMINANTS?

These tools help researchers discern new technologies and platforms to address emerging contaminants. Researchers use high-performance liquid chromatography or high-performance liquid chromatography coupled to high-performance liquid chromatography to identify emerging contaminants. These platforms deliver new or refine existing contaminant removal processes.