

# Institutional Biosafety Committee Guidance on Wastewater Research

**Effective Date: December 18, 2024**

This guidance is based on current recommendations from the CDC and the National Wastewater Surveillance System (<https://www.cdc.gov/nwss/wastewater-surveillance.html>) and will be updated as new information becomes available.

## Scope

The Institutional Biosafety Committee (IBC) will review all proposed work involving wastewater research. This includes work with all domestic, industrial, agricultural, or hospital wastewater samples as well as treated effluent. Proposals must be on standard registration or amendment forms located on the IBC website, which can be accessed at this address: <https://ehs.oregonstate.edu/resources/safety-committees/institutional-committee>

Investigators are encouraged to conduct their own risk assessments and incorporate best practices into their IBC registration documents.

## Work Permitted at BSL-2 Facilities and Work Practices

Work involving the concentration of environmental specimens, such as wastewater precipitation or membrane filtration, or handling concentrated environmental specimens that have not been chemically inactivated must be conducted in a BSL-2 laboratory with unidirectional (inward) airflow. The following additional work practices are required:

- Work with concentrated materials prior to chemical inactivation, as well as aerosol-generating activities, must be performed in a certified Class II BSC; **or**
- Respiratory protection (N95 equivalent or higher) worn by all room occupants during work with concentrated materials prior to chemical inactivation or aerosol-generating activities. See the OSU Respiratory Protection Program for information on the use of respiratory protection in research or other work at OSU.

## Treated Effluent Risks

Treated effluent, despite undergoing various treatment processes, can still pose risks due to the presence of residual contaminants. These may include:

- **Micropollutants:** Pharmaceuticals, pesticides, and nano-sized metals that are not fully removed during treatment<sup>1</sup>
- **Pathogens:** Treated effluent can still contain human pathogens such as bacteria, viruses, and protozoa, which can pose health risks if released into the environment<sup>2</sup>

- **Estrogenic Compounds:** Compounds that can disrupt endocrine systems, potentially affecting reproductive health<sup>1</sup>

## Human Pathogens in Wastewater

Wastewater can harbor a wide range of human pathogens, including:

- **Viruses:** Such as enteric viruses (e.g., norovirus, rotavirus) and respiratory viruses (e.g., SARS-CoV-2)<sup>2,3</sup>
- **Bacteria:** Including fecal coliforms, *E. coli*, *Salmonella*, and *Shigella*<sup>2</sup>
- **Protozoa:** Such as *Giardia* and *Cryptosporidium*<sup>2</sup>
- **Helminths:** Parasitic worms that can cause various diseases<sup>2</sup>

### Pathogens that Persist Through Treatment:

- **Viruses:** Some viruses, including enteric viruses, can persist through conventional treatment processes and may require advanced treatment methods like UV disinfection or membrane filtration to be effectively removed<sup>3</sup>
- **Protozoa:** Cysts of protozoa such as *Giardia* and *Cryptosporidium* are resistant to standard disinfection methods and may persist through treatment<sup>3</sup>
- **Bacteria:** Certain bacteria, including antibiotic-resistant strains, can survive treatment processes and pose a risk if not adequately managed<sup>3</sup>

## Updated Biosafety Guidelines for SARS-CoV-2

In May 2020, based on the data available at that time, the CDC issued Interim Laboratory Biosafety Guidelines for Handling and Processing Specimens Associated with Coronavirus Disease 2019 at Biosafety Level 3 (BSL3). Following CDC's issuance of its Interim Guidelines, the NIH Office of Science Policy (OSP) issued companion guidance aligned with CDC's assessment through its interim laboratory biosafety guidance stating that SARS-CoV-2 should be considered as a Risk Group 3 (RG3) agent.

After careful review of current pathogen characteristics and population impact, CDC is updating its biosafety guidance, now recommending that work with SARS-CoV-2 be conducted at BSL2 at a minimum, and NIH is aligning by rescinding the interim RG classification such that SARS-CoV-2 should be considered a RG2 agent. In the [NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules](#) (NIH Guidelines), other than SARS-CoV and Middle East Respiratory Syndrome (MERS-CoV), which are specifically listed as RG3 agents in Appendix B-III-D, all other coronaviruses, including SARS-CoV-2, are classified under the existing RG2 category for Coronaviruses in Appendix B-II-D.

## References

- [1] [Tertiary Treatment in Wastewater: Ensuring Water Quality and ...](#)
- [2] [Microbiology of industrial effluents and their treatment](#)
- [3] [A Comprehensive Review on Various Phases of Wastewater ... - MDPI](#)