Wastewater Management at NIST-Gaithersburg

NIST S 7301.07
Document Approval Date: 09/25/2023
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1. PURPOSE

This suborder delineates requirements and associated roles and responsibilities related to the discharge of wastewater at the NIST-Gaithersburg site.

2. BACKGROUND

At the NIST-Gaithersburg site, routine discharges to the sanitary sewer system, that primarily comprise the wastewater, originate from:

- Kitchen sinks;
- Bathroom sinks and toilets;
- Laboratory sinks;
- Janitorial sinks;
- Floor drains;
- Steam condensate drains;
- Cooling towers; and
- Boilers.

NIST produces over 100 million gallons of wastewater per year at the NIST-Gaithersburg site. All wastewater produced at NIST-Gaithersburg facilities is collected in an on-site system of sanitary sewer pipelines. The on-site sanitary sewer system eventually consolidates all wastewater into one sewer pipeline that discharges offsite into the regional sanitary sewer system maintained by the Washington Suburban Sanitary Commission (WSSC). The WSSC sanitary sewer subsequently discharges to the District of Columbia's Blue Plains Advanced Wastewater Treatment Plant (the Publicly Owned Treatment Works or POTW). Following treatment, wastewater is released into the Potomac River.

[1] For revision history, see Appendix A.

Wastewater discharged from the NIST-Gaithersburg site is regulated by WSSC through a Discharge Authorization Permit (DAP). The regulatory requirements of this permit are the basis for most of the requirements of this suborder.

3. APPLICABILITY

This suborder applies to all activities at the NIST-Gaithersburg site that discharge to the sanitary sewer system.

4. REFERENCES

a. Code of Federal Regulations (CFR), Title 40, Subchapter D

b. Code of Maryland Regulations (COMAR), Part 2, Subtitle 08, Water Pollution

c. WSSC Discharge Authorization Permit 05813

d. WSSC Plumbing and Fuel Gas Code (current version)

e. International Plumbing Code (current version)

f. Clean Water Act and Federal Facilities

g. NIST Toxic Organic Management Plan

5. APPLICABLE NIST PROGRAMS

a. NIST S 7101.15: *Document and Records Control Program*

b. NIST S 7101.23: *Safety Education and Training*

c. NIST S 7101.24: *Incident Reporting and Investigation*

d. NIST S 7101.51: *Bloodborne Pathogens Program*

e. NIST S 7101.60: *Chemical Management*

f. NIST S 7201.01: *Radioactive Materials at NIST-Gaithersburg*

g. NIST S 7301.01: *Environmental Management System*

h. NIST S 7301.06: *Chemical Waste Accumulation and Disposal at NIST-Gaithersburg*

i. NIST S 7301.08: *Oil Storage and Handling at NIST-Gaithersburg*

j. NIST S 7301.10: *Storm Water Management at NIST-Gaithersburg*

6. REQUIREMENTS

a. General

No chemicals shall be released to sanitary sewer drains without review and approval by the NIST Gaithersburg Safety, Health, and Environment Division, Environmental Management Group (GSHED-EMG). An approval shall remain in effect as long as the chemical(s) and concentration(s) do not change beyond the limits specified in the approval. Contact GSHED-EMG at x5375, option 3 with any questions. Chemical waste shall be collected and disposed of under the requirements of the Chemical Waste Accumulation and Disposal NIST Gaithersburg Program.

b. Discharge Restrictions

Discharge restrictions for the sanitary sewer are specified in section B.33 of the DAP. Please refer to the DAP for a complete description of all parameters and discharge limits. Key discharge restrictions applicable to NIST are listed below.

(1) High Temperature – Any liquids or vapors having a temperature greater than 140° F (60° C).

(2) Fire or Explosion Hazard – Any liquids, solids, or gases that by reason of their nature or quantity are, or may be, either alone or by interaction with other substances, sufficient to be a fire or explosion hazard.

(3) Public Nuisance or Hazard – Any malodorous or toxic gases, vapors, fumes, or other substances that, either singly or by interaction with other wastes, are capable of creating a public nuisance, a hazard to human health or the environment, or the prevention of entry by WSSC personnel into sewers for maintenance and repair.

(4) Interference and Pass-Through – Any liquids, solids, or gases not amenable to treatment or reduction by the sewage treatment processes.

(5) Excess Coloration – Any liquids, solids, or gases that, singly or by interaction with other material, cause excessive coloration.

(6) Obstruction to Flow – Any substances capable of causing obstruction to the flow in sewers.

(7) Discharge Limitations – Any water or wastewater containing substances in excess of the limitations contained in Appendix B, NIST-Gaithersburg Wastewater Discharge Limits.

(8) Radioactive Wastes – Any radioactive wastes or isotopes of such half-life or concentration as to exceed limits established by applicable local, State, or Federal regulations.

(9) Pathogenic Wastes – Any substance containing viable pathogenic or parasitic organisms that could pose a health hazard to the public or interfere with the proper operation of the wastewater collection or treatment systems.

(10) Storm or Ground Water – Any storm water, surface water, ground water, roof runoff, subsurface drainage.

(11) Viscous Substances – Any substances that may solidify or become highly viscous at temperatures between 40°F (4°C) and 140°F (60°C), or at any other temperature that could cause obstruction and/or interference with the conveyance system or the POTW processes.

(12) Dilution Prohibition – Any water added to a discharge as a partial or complete substitute for proper treatment to achieve compliance with applicable discharge limitations for any wastewater constituent.

(13) Hauled Pollutants – Any trucked or hauled pollutants.

(14) Oils – Any wastes containing petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin.

(15) Glycol – Any glycol compound or derivative added to or contained in internal combustion engine cooling systems or liquid conveyance systems for the purposes of altering liquid freezing and/or boiling points.

(16) Corrosive Substances – Substances causing corrosive damage, harm or endangerment to the collection system, pumps, or personnel.

(17) Bypass of Treatment Facilities - A bypass shall be defined as the intentional diversion of waste streams from any portion of an Industrial User's treatment facility. A bypass is

prohibited unless it is unavoidable to prevent loss of life, personal injury, or severe property damage, or no feasible alternative exists, such as the use of auxiliary treatment facilities. Bypasses must be reported to WSSC within 24 hours of occurrence and followed up with a written report within 30 days. Coordinate with GSHED-EMG if a bypass is ever required.

(18) Duty to Halt - Duty to Halt or Reduce Activity Upon reduction of efficiency of operation, or loss or failure of all or part of the pretreatment system. Activities with pretreatment systems shall, to the extent necessary to maintain compliance with its permit, control its production discharges until operation of the treatment facility is restored or an alternative method of treatment is provided (i.e., the primary source of power to the pretreatment system fails or is reduced).

c. Equipment Specific Requirements

(1) NIST-owned wastewater pretreatment systems are critical to maintaining compliance with discharge parameters. Each existing pretreatment systems is described below. Equipment specific requirements and responsible individuals are listed Appendix D.

(a) Building 313 Site-Wide pH Neutralization System and Flow Meter – This system is designed to correct fluctuations in the pH of the consolidated wastewater prior to off-site discharge. Procedures for maintaining the pH neutralization system are maintained within the Maximo asset management system managed by OFPM.

(b) Building 215 pH Neutralization System – This system designed to neutralize limited quantities of specific[2] acids and bases released from wet benches in the Building 215 Nanofabrication Laboratory. Neutralization procedures are included in the 215 pH Neutralization Operation and Maintenance Manual.

(c) Building 227 pH Neutralization System – This system is designed to neutralize accidental releases of acid or base from all lab drains in Building 227. Procedures for maintaining the pH neutralization system are maintained within the Maximo asset management system managed by OFPM.

(d) Building 235 pH Neutralization System – This system is designed for batch treatment of limited quantities of specific[2] acids or bases released from two wet benches in Building 235 laboratories. Neutralization procedures are included in NIST Center for Neutron Research (NCNR) standard operating procedures.

[2] Acids and bases released to the neutralization system shall be approved by GSHED-EMG.

(e) Lime Contact Basins at Buildings 202, 220, 221, 222, 223, 224, 225, 226, 231, and 245 – Lime Contact Basins were part of the original construction of the NIST-Gaithersburg site. The contact basins are large underground in-line containers filled with limestone. Wastewater from lab drains is routed to the Lime Contact Basins for neutralization of the wastewater prior to entering the sanitary sewer system. The Lime Contact Basins are only intended to assist with accidental discharges to lab drains. Procedures for maintaining the lime contact basins are maintained within the Maximo asset management system managed by OFPM.

(f) Building 101 Grease Trap – The grease trap is designed to capture oils and greases that are unavoidably released to the sink drains in the Building 101 cafeteria. As much as possible, oils and greases shall be collected and disposed/recycled separately and not sent directly to the grease trap. When in operation, the grease trap is maintained/pumped out quarterly by OFPM via a service contractor.

(g) Building 303 Oil Water Separator – The oil water separator is designed to capture oils and other fluids that are unavoidably released into the drains from vehicle maintenance activities in Building 303. Best management practices are used to collect oils and other vehicle maintenance fluids for disposal or recycling. Procedures for maintaining the oil water separator are maintained within the Maximo asset management system managed by OFPM.

(2) Low Level Radioactive Waste Holding Tanks located in Building 235 and 245
These systems are designed to contain wastewaters from specific locations and labs where radioactive materials are used. The wastewater contained in the holding tanks must be tested prior to discharge to the sewer system (see Section 6.d.(4) below).

d. Analytical Monitoring of Wastewater and Routine Reporting

(1) In accordance with the DAP, sampling and analysis of the NIST-Gaithersburg site wastewater shall be conducted quarterly. Samples shall be collected from NIST's consolidated wastewater flow at the manhole adjacent to Gate E. Monitoring parameters, sampling frequency, sample type, and responsibilities are summarized in Appendix C.

(2) NIST shall submit wastewater analysis reports quarterly to the WSSC to demonstrate compliance with the requirements of the DAP. The reports corresponding to the previous quarter are due each year on April 7, July 7, October 7, and January 7.

(3) The NIST GSHED-EMG shall coordinate the quarterly monitoring and submit the analysis reports.

(4) Discharges from the low-level radioactive waste holding tanks - Wastewater stored within the holding tanks must be tested for radionuclides present and their concentrations, and cleared prior to release to the sewer system by the following groups:

(a) Building 235 – NCNR Health Physics; and

(b) Building 245 – Radiation Safety Division (RSD).

Specific reporting requirements to WSSC must also be met prior to release. These reporting requirements are specified in Section II, Special Conditions, of the NIST DAP and Appendix D of this Suborder.

e. Design and Construction Requirements

(1) NIST Design and Construction Projects shall meet the requirements of the International Plumbing Code. This clause applies specifically to wastewater drains and conveyances, for the purposes of this document.

(2) NIST Design and Construction projects shall not allow the disposal of un-metered water such as stormwater, groundwater, or condensate from cooling coils or evaporators into the sanitary sewer.

f. Permit Non-Compliance Notification Requirements

(1) NIST shall notify WSSC both verbally and in writing if it is discovered that any requirements of the DAP are not being met. In addition, and depending on the non-compliance, notification of the District of Columbia Water and Sewer Authority, Maryland Department of the Environment and the U.S. Environmental Protection Agency may also be required. Non-compliance with permit requirements may be discovered through routine sampling and monitoring, WSSC conducted sampling, bypass of NIST pretreatment systems, or accidental discharges of prohibited materials (Section 6.b.) into the wastewater system.

(2) GSHED-EMG shall make any needed notifications due to non-compliance. All non-compliance notifications shall follow procedures listed here:

(a) Notify WSSC verbally within 24 hours of becoming aware of the non-compliance.

(b) Within 5 days of the notification, submit a written report to WSSC, which must include:

i. A description of the exceedance or discharge and the cause of noncompliance;

ii. The period of noncompliance with exact dates and times, or if not corrected, the anticipated time the noncompliance is expected to continue;

iii. Steps being taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance; and

iv. Results from additional sampling, if required by WSSC.

(c) Within 30 days of becoming aware of the noncompliance, repeat the sampling and analysis of the parameter in violation, and submit the results of the analysis, a copy of the chain of custody, and an original certification statement to the WSSC. Scheduled self-monitoring may not be substituted in place of resampling for a violation.

g. Training and Certification

(1) In accordance with the Code of Maryland Regulations (COMAR) 26.06.01, pretreatment system operators must obtain an Industrial Wastewater Works Certification from the Maryland Board of Waterworks and Waste Systems Operators. Representatives from the GSHED-EMG and OFPM shall maintain this certification.

(2) All staff that maintain NIST-owned wastewater pretreatment systems (Section 6.c.) shall receive training on the proper procedures and work area hazards.

(3) Training records shall be maintained in accordance with NIST S 7101.23.

h. Records

NIST shall maintain records as necessary to demonstrate compliance with the WSSC DAP and in accordance with NIST S 7101.15.

(1) General Records

(a) Any records, documents, memoranda, reports, correspondence, and summaries of these materials relating to testing, internal or external monitoring, calibrations, investigations, and chemical analyses made by or on behalf of NIST in connection with its discharge shall be maintained electronically by OSHE with a backup hard copy in the GSHED-EMG files.

(b) All records that pertain to matters that are the subjects of special orders or any other enforcement or litigation activities brought by the WSSC shall be retained by the GSHED-EMG and preserved until all enforcement activities have concluded and all periods of limitation with respect to any and all appeals have expired.

(2) Equipment Specific Records

Records to demonstrate compliance with equipment-specific requirements as specified in Appendix D (*i.e.*, inspections, calibrations) shall be maintained by the owners of the equipment.

(3) Retention of Records

All records required by this Suborder will be maintained for a minimum period of three (3) years.

i. WSSC DAP Compliance

NIST shall comply with all requirements of the DAP. This suborder addresses requirements of the DAP that are known to apply to NIST. However, should a NIST activity or situation occur that is not covered by this suborder, the requirements of the DAP shall apply.

7. DEFINITIONS

a. Best Management Practices (BMPs) – Methods, activities, prohibitions of practices, maintenance procedures, and other management practices designed to reduce the quantity of pollutants discharged to a pretreatment system or to the sanitary sewer. BMP's also include treatment requirements operating procedures, practices to control spillage or leaks, and waste disposal procedures.

b. Composite sample – A combination of individual samples collected at regular intervals over a time period not to exceed 24 hours in any given calendar day. The volume of each individual sample may be either proportional to the flow rate during the sample period (flow composite), or constant and collected at equal time intervals during the composite period (time composite). Composite sampling shall be representative of the process waste stream for that day.

c. Continuous pH monitoring – A pH reading taken automatically at a frequency of at least once/minute.

d. Daily maximum – The maximum allowable discharge concentration of a pollutant in a waste stream during a calendar day.

e. Estimated flow – A calculated volume or discharge rate which is based on a technical evaluation of the sources contributing to the discharge including, but not limited to, pump capabilities, water meters, and batch discharge volumes.

f. Grab sample – An individual sample collected over a time period not exceeding 15 minutes, without regard for flow or time. Grab samples specified in the DAP require two discrete samples taken during the same monitoring day and composited afterwards to create a representative sample for testing.

g. Parasitic Organisms – Viable disease-causing organisms of a parasitic nature.

h. Pathogenic – A bacterium, virus, or other microorganism capable of causing disease.

i. pH Calibration – The process of using standardized buffer solutions to match the pH meter to the current characteristics of the pH probe.

j. pH Calibration Check – A check on of pH equipment following a pH calibration and/or at the end of a monitoring day using calibration standardized buffer solutions. No adjustment is made to equipment.

k. Pretreatment – The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing to the WWTP.

l. POTW – A Publicly Owned Treatment Works, which includes any device and system used in storage, treatment, recycling, and reclamation of municipal sewage or industrial waste of a liquid nature. Also included are sewers, pipes, and other conveyances only if they convey wastewater to a POTW treatment plant. The term also means the municipality as defined in Section 502(4) of the Clean Water Act, which has jurisdiction over the indirect discharges to and the discharges from such a treatment works.

m. Quarter – For reporting purposes, a quarter shall consist of the months of January - March, April - June, July - September, and October - December.

n. Toxic Organic Management Plan – NIST plan submitted to WSSC detailing how internal chemical, chemical waste, and spill control policies and procedures are sufficient to prevent the release of toxic organics into the sanitary sewer system. WSSC approval of this plan reduces required testing during quarterly compliance sampling.

o. Viscous – Having a thick, sticky consistency between solid and liquid that may interfere with wastewater conveyance or treatment processes.

8. ACRONYMS

a. CFR – Code of Federal Regulations

b. COMAR – Code of Maryland

c. DAP – Discharge Authorization Permit

d. EMS – Environmental Management System

e. EMG – The Environmental Management Group which is part of the Gaithersburg Safety, Health, and Environment Division

f. GDCD – Gaithersburg Design and Construction Division

g. GFMD – Gaithersburg Facility Maintenance Division

h. GSHED – Gaithersburg Safety, Health, and Environment Division

i. IPC – International Plumbing Code

j. NPDES – National Pollutant Discharge Elimination System

k. OFPM – Office of Facilities and Property Management

l. OSHE – Office of Safety, Health, and Environment

m. OU – Organizational Unit

n. POTW – Publicly Owned Treatment Works

o. RSD – Radiation Safety Division

p. WSSC – Washington Suburban Sanitary Commission

9. RESPONSIBILITIES

The roles and responsibilities specific to this suborder are as follows:

a. EMG Leader, GSHED, OSHE is responsible for the following:

(1) Acting as the NIST point of contact with regulatory agencies for wastewater management issues;

(2) Applying for and obtaining mandatory wastewater discharge permits on required timetables;

(3) Coordinating routine wastewater sampling required by the DAP (Section 6.d.);

(4) Preparing and submitting routine compliance reports to the WSSC;

(5) Ensuring overall compliance with the requirements established in the DAP and all applicable federal, state, and local regulations;

(6) Performing an internal compliance evaluation once per calendar year at a minimum to verify ongoing compliance with this suborder;

(7) Coordinating regulatory agency inspections – as requested;

(8) Notifying the WSSC as specified in Section 6.f and any follow up reporting required;

(9) Ensuring applicable GSHED-EMG staff maintain the Industrial Wastewater Works Certification from the Maryland Board of Waterworks and Waste Systems Operators; and

(10) Maintaining the following records:

(a) Routine reports identified in Section 6.d;

(b) Emergency Notification reports;

(c) Regulatory Correspondence;

(d) Compliance Evaluation Reports;

(e) Permit applications;

(f) Permit related submittals requested by WSSC such as the Toxic Organic Management Plan, testing results, and plumbing plans; and

(g) Current and Historic Permits.

b. Pipe and Plumbing Group Leader, Gaithersburg Facility Maintenance Division (GFMD), OFPM is responsible for the following with respect to the wastewater pretreatment systems for which they are listed as the Responsible Individual in Appendix D;

(1) Inspecting and maintaining wastewater pretreatment systems at NIST as described for specific equipment in Appendix D;

(2) Maintaining operations and maintenance records for activities identified in Appendix D;

(3) Providing training to staff that maintain NIST wastewater pretreatment systems on the proper procedures and work area hazards;

(4) Promptly reporting any problems with wastewater pretreatment systems to GSHED-EMG (x5375, Option 3);

(5) Participating in annual compliance evaluations with GSHED-EMG and in regulatory inspections; and

(6) Identifying and ensuring staff that operate the **s**ite-wide pH neutralization system listed in Appendix D maintain an Industrial Wastewater Works Certification from the Maryland Board of Waterworks and Waste Systems Operators.

c. Transportation Group Leader, Facilities Services Division, OFPM is responsible for the following:

(1) Maintaining Building 303 floor drains, drum storage area, oil/water separator, waste oil tank; and

(2) Minimizing the amount of oil and vehicle fluids entering the Building 303 floor drains by properly cleaning up any oil spills or drips that occur in the building.

d. Operations Engineering Group Leader, GFMD, OFPM is responsible for the following:

(1) Coordinating the cleaning of the Building 101 Cafeteria grease trap every three (3) months at a minimum;

(2) Providing documentation of the grease trap cleaning to GSHED-EMG every three months for inclusion in compliance reports to WSSC;

(3) Coordinating the calibration of the outfall flow meter once per year;

(4) Coordinating the inspection of the Building 303 oil water separator every three (3) months at a minimum; and

(5) Participating in annual compliance evaluations with GSHED-EMG and in regulatory inspections.

e. Gaithersburg Design and Construction Division Chief (GDCD), OFPM is responsible for the following:

(1) Designing and constructing projects that adhere to the discharge requirements in WSSC's Plumbing & Fuel Gas Code and in accordance with the IPC. Designs and construction shall not allow un-metered water, such as stormwater, groundwater, roof runoff, subsurface drainage, and cooling coil condensate to be disposed of via the sanitary sewer;

(2) Communicating to GSHED-EMG any project planning that may result in a modification to the sanitary sewer system or result in new discharges to the system; and

(3) Ensuring that precautions are taken to control unauthorized wastewater discharges to the sanitary sewer system from construction and demolition projects.

f. NanoFab Operations Group Leader, Center for Nanoscale Science and Technology is responsible for the following:

(1) Training Nanofab Staff and Users on required procedures for discharging acidic/basic chemicals to the Building 215 neutralizer as shown in the CNST Nanofab Safety Manual;

(2) Ensuring the Building 215 neutralizer is being maintained per manufacturer recommendations and neutralization procedures are followed by Nanofab Staff and Users;

(3) Maintaining any calibration, repair, and service records for any work performed on the neutralization system;

(4) In accordance with Section 6.b.(18) of this suborder, halting activity causing pH discharges outside the pH range of 6 - 10 upon any reduction in the efficiency of operation, or loss or failure of all or part of the pH neutralization system until operation of the system is restored; and

(5) Notifying GSHED-EMG of any prohibited discharges to the sanitary sewer system.

g. Radiation Safety Division (RSD) Chief, OSHE is responsible for the following:

(1) Inspecting and maintaining low level radioactive wastewater holding tanks in Building 245;

(2) Conducting radioactivity testing on holding tank wastewater per WSSC DAP requirements; and

(3) Reporting wastewater radioactivity results as specified in the WSSC DAP prior to release (Appendix D).

(4) Notifying GSHED-EMG of any prohibited discharges to the sanitary sewer system.

h. Chief of NCNR Health Physics, NCNR is responsible for the following:

(1) Inspecting and maintaining low level radioactive wastewater holding tanks in Building 235.

(2) Conducting radioactivity testing on holding tank wastewater per WSSC DAP requirements.

(3) Reporting wastewater radioactivity results as specified in the WSSC DAP prior to release (Appendix D).

(4) Notifying GSHED-EMG of any prohibited discharges to the sanitary sewer system.

i. Research Facility Operations Group Leader, NCNR is responsible for the following:

(1) Ensuring NCNR Staff and Users are trained on required procedures for discharging acidic/basic chemicals to the Building 235 neutralizer;

(2) Ensuring the Building 235 neutralizer is being maintained per manufacturer recommendations and neutralization procedures are followed by NCNR Staff and Users;

(3) Maintaining any calibration, repair, and service records for any work performed on the neutralization system;

(4) In accordance with Section 6.b.(18) of this suborder, halting activity causing pH discharges outside the pH range of 6 - 10 upon any reduction in the efficiency of operation, or loss or failure of all or part of the pH neutralization system until operation of the system is restored; and

(5) Notifying GSHED-EMG of any prohibited discharges to the sanitary sewer system.

j. Emergency Services Office Director is responsible for the following:

(1) Receiving notifications of spills or other unauthorized discharges that enter the sanitary sewer system through the emergency notification system (x2222); and

(2) Ensuring that GSHED-EMG is notified immediately when any prohibited discharges to the sanitary sewer system are reported through the emergency notification system.

k. NIST Employees and Associates are responsible for the following:

(1) Only releasing authorized material to the sanitary sewer; and

(2) Reporting any observation of out-of-the-ordinary discharges to the sanitary sewer system to the GSHED-EMG (x5375, Option 3) or the emergency number (x2222).

10. AUTHORITIES

None

11. DIRECTIVE OWNER

Chief Safety Officer

12. APPENDICES

A - Revision History

B - NIST-Gaithersburg Wastewater Discharge Limits

C - NIST-Gaithersburg Wastewater Sampling and Analysis Parameters

D - Requirements for Subject Wastewater Equipment

637 **Appendix A. Revision History**

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Version #	Approval Date	Effective Date	Brief Description of Change
1	9/25/2023	4/1/2024	• Initial document

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641 **Appendix B: NIST-Gaithersburg Wastewater Discharge Limits**
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NIST-Gaithersburg Wastewater Discharge Limits	
Parameter	**WSSC Daily Maximum Discharge Limit[3]**
Flow	N/A (gal/day)
pH	6.0 – 10.0 (standard units)
Cadmium	0.07 mg/L
Copper	2.3 mg/L
Lead	1.0 mg/L
Molybdenum	0.89 mg/L
Nickel	2.2 mg/L
Silver	1.3 mg/L
Zinc	3.4 mg/L
Oil and Grease (Nonpolar, Petroleum)	100 mg/L
Fats, Oil and Grease (Polar, FOG)	200 mg/L
Mercury	<0.001 mg/L
Arsenic	0.23 mg/L
Cyanide	0.56 mg/L
Polychlorinated Biphenyls (PCBs)	<0.001 mg/L
Total Dissolved Solids (TDS)	Monitoring Only
Total Suspended Solids (TSS)	Monitoring Only
Biochemical Oxygen Demand (BOD)	Monitoring Only
Trichloroethylene (Trichloroethene)	0.026 mg/L
Tetrachloroethylene (Tetrachloroethene)	0.0945 mg/L
Ammonia (NH3)	Monitoring Only
Total Phosphorus (TP)	Monitoring Only
Temperature	140 °F

[3] Measurements of NIST wastewater characteristics performed to assess compliance with a discharge limit are conducted on the consolidated wastewater flow just prior to leaving the NIST-Gaithersburg site (Gate E manhole).

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644 **Appendix C: NIST-Gaithersburg Wastewater Sampling and Analysis Parameters**

WSSC Wastewater Sampling and Analysis Parameters		
Parameter	**Sampling Frequency**	**Sample Type**
NIST MONITORING[4]		
Flow (gallons/day)	2 days per quarter	Measured
pH (standard units)	2 days per quarter	Continuous Recorder
Cadmium, total	2 days per quarter	24-hour Composite
Copper, total	2 days per quarter	24-hour Composite
Lead, total	2 days per quarter	24-hour Composite
Molybdenum, total	2 days per quarter	24-hour Composite
Nickel, total	2 days per quarter	24-hour Composite
Silver, total	2 days per quarter	24-hour Composite
Zinc, total	2 days per quarter	24-hour Composite
Oil and Grease (Nonpolar, Petroleum)	2 days per quarter	Grab
Fats, Oil and Grease (Polar, FOG)	2 days per quarter	Grab
Radionuclides	Prior to release from radioactive holding tanks	Grab
WSSC MONITORING		
Arsenic, total	At WSSC's Discretion	Composite
Mercury, total		
Selenium, total	At WSSC's Discretion	Composite
Cyanide, total	At WSSC's Discretion	Grab
Tetrachloroethylene (tetrachloroethene)	At WSSC's Discretion	Grab
Trichloroethylene (trichloroethene)	At WSSC's Discretion	Grab
Polychlorinated Biphenyls (PCBs)	At WSSC's Discretion	Composite
Temperature	At WSSC's Discretion	Continuous Recorder
Chromium, total	At WSSC's Discretion	Composite
Ammonia (NH3)	At WSSC's Discretion	Composite
Total Dissolved Solids (TDS)	At WSSC's Discretion	Composite
Total Suspended Solids (TSS)	At WSSC's Discretion	Composite
Biochemical Oxygen Demand (BOD)	At WSSC's Discretion	Composite
Total Phosphorus	At WSSC's Discretion	Composite

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[4] Monitoring performed by NIST GSHED-EMG.

Appendix D: Requirements for Subject Wastewater Equipment

Requirements and Responsibilities for NIST Gaithersburg Wastewater Equipment			
Subject Equipment	**Building**	**Responsible Individual**	**Maintenance Requirements**
Site-wide pH Neutralization System and Flow Meter	**313**	Pipe and Plumbing Group Leader, GFMD, OFPM	1. Visually inspect the neutralization system and flow meter weekly; 2. Clean equipment as needed; 3. Calibrate the pH meter weekly and maintain calibration records for 3 years; 4. Calibrate the flow meter once per year and maintain calibration records for 3 years; 5. Replace the pH and flow recorder charts weekly; 6. Provide the previous week's pH and flow recorder charts to GSHED-EMG, which will maintain the charts; 7. Inspect the neutralization chemical storage and replenish chemical supply as needed. 8. Report any operational problems to the GSHED-EMG.
Chemical pH Neutralization Systems	**215 and 227**	Pipe and Plumbing Group Leader, GFMD, OFPM	1. Visually inspect the neutralization systems weekly; 2. Clean equipment as needed; 3. Calibrate the pH meters weekly and maintain calibration records for 3 years; 4. For 227, replace the pH recorder chart weekly and provide the previous week's chart to GSHED-EMG, which will maintain the pH charts; 5. Inspect the neutralization chemical storage and replenish chemical supply as needed;

Requirements and Responsibilities for NIST Gaithersburg Wastewater Equipment			
Subject Equipment	**Building**	**Responsible Individual**	**Maintenance Requirements**
			6. Provide copies of calibration, maintenance records, and service tickets to the equipment owners for recordkeeping.; and 7. Report any operational problems to the GSHED-EMG
Chemical pH Neutralization System	**235**	Research Facility Operations Group Leader, NCNR	1. Ensure NCNR Staff and Users are trained on required procedures for discharging acidic/basic chemicals to the Building 235 neutralizer; 2. Ensure neutralizer is maintained per manufacturer recommendations and neutralization procedures are followed by NCNR Staff and Users; 3. Maintain any calibration, repair, and service records for any work performed on the neutralization system; 4. In accordance with Section 6.b.(18) of this suborder, halting activity causing pH discharges outside the pH range of 6 - 10 upon any reduction in the efficiency of operation, or loss or failure of all or part of the pH neutralization system until operation of the system is restored; and 5. Notifying GSHED-EMG of any prohibited discharges to the sanitary sewer system.
Lime Contact Basins	**202, 220, 221, 222, 223, 224, 225, 226, 231, and 245**	Pipe and Plumbing Group Leader, GFMD, OFPM	1. Inspect contact basins annually; and 2. Replenish/replace limestone as needed.
Grease Trap	**101**	Operations Engineering Group Leader, GFMD, OFPM	1. Perform maintenance including pumping out of grease trap quarterly; and 2. Provide GSHED-EMG with grease trap waste disposal documentation.

Requirements and Responsibilities for NIST Gaithersburg Wastewater Equipment			
Subject Equipment	**Building**	**Responsible Individual**	**Maintenance Requirements**
Oil Water Separator	**303**	Pipe and Plumbing Group Leader, GFMD, OFPM	1. Inspect quarterly; and 2. Notify GSHED-EMG when oil/sediment must be removed.
		EMG Leader, GSHED, OSHE	1. GSHED-EMG shall arrange to have the oil/water separator pumped out as needed.
Radioactive Wastewater Holding Tanks	**235**	NCNR Health Physics	1. Inspect and maintain holding tanks according to manufacturer recommendations. 2. Conducting radioactivity testing and reporting per WSSC DAP and listed below: • NIST shall submit notification to WSSC by fax or email at least three (3) hours in advance of a scheduled discharge from the Low-Level Radioactive Waste (LLRW) tank(s). • This notification shall include the date and time(s) of the planned discharge; a general description of what is being discharged, including radionuclide(s) present; identification of the tank(s) to be discharged; estimated volume to be discharged (gallons); the analytical test results for radionuclides concentration (in μCi/ml); the fraction of the limit (monthly average in μCi/ml) for each radionuclide released into the sewer (limits are listed in 10 CFR part 20 Appendix B Table 3 and Code of Maryland Regulations (COMAR) 26.1201.01 Part D Appendix B Table III); and, a statement certifying that the planned release to the sewer is in compliance with all Federal, State, and local regulations.

Requirements and Responsibilities for NIST Gaithersburg Wastewater Equipment			
Subject Equipment	**Building**	**Responsible Individual**	**Maintenance Requirements**
			3. In addition, NCNR Health Physics shall maintain records of all tank analyses and these records shall be available for review during any site inspection and/or upon request by WSSC.
Radioactive Wastewater Holding Tanks	**245**	RSD	1. Inspect and maintain holding tanks according to manufacturer recommendations. 2. Conducting radioactivity testing and reporting per WSSC DAP and listed below: • NIST shall submit notification to WSSC by fax or email at least three (3) hours in advance of a scheduled discharge from the Low-Level Radioactive Waste (LLRW) tank(s). • This notification shall include the date and time(s) of the planned discharge; a general description of what is being discharged, including radionuclide(s) present; identification of the tank(s) to be discharged; estimated volume to be discharged (gallons); the analytical test results for radionuclides concentration (in μCi/ml); the fraction of the limit (monthly average in μCi/ml) for each radionuclide released into the sewer (limits are listed in 10 CFR part 20 Appendix B Table 3 and Code of Maryland Regulations (COMAR) 26.1201.01 Part D Appendix B Table III); and, a statement certifying that the planned release to the sewer is in compliance with all Federal, State, and local regulations. 3. In addition, Radiation Safety Division shall maintain records of all tank analyses and these records shall be available for review during any site inspection and/or upon request by WSSC.

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