UMass Chan
MEDICAL SCHOOL

University of Massachusetts Chan Medical School

Stormwater Management Program

For Coverage Under The

National Pollutant Discharge Elimination System (NPDES)
General Permit for Municipal Separate Storm Sewer Systems (MS4)

University of Massachusetts Chan Medical School
55 Lake Ave North, Worcester, MA 01655

EPA NPDES Permit Number MAR042049

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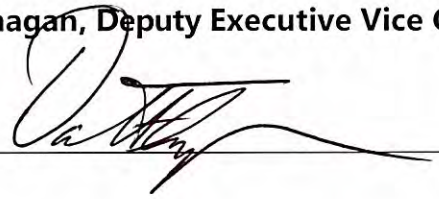
Certification

Authorized Representative: University of Massachusetts Chan Medical School has designated David Flanagan, Deputy Executive Vice Chancellor for Facilities, as an authorized representative to sign MS4 reports. David Flanagan is designated as an authorized person for signing all reports including but not limited to the stormwater management plan, stormwater pollution prevention plans, inspection reports, annual reports, monitoring reports, reports on training, and other information required by the MS4 Permit. The authorization letter is provided in Appendix A.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

David Flanagan, Deputy Executive Vice Chancellor for Facilities Management

Signature:  Date: 7/24/24

Background

The University of Massachusetts Chan Medical School (UMass Chan Medical School) is committed to sustainability throughout our operations, as well as by encouraging sustainable practices among students, faculty and staff. This commitment extends to protecting water resources through education, stewardship, and facility operations that prevent stormwater pollution. UMass Chan Medical School's Stormwater Management Program (SWMP) outlines UMass Chan Medical School's existing and planned measures to protect water resources and to comply with the National Pollutant Discharge Elimination System (NPDES) Phase II General Permit for Municipal Separate Storm Sewer Systems (MS4s).

Regulatory Context

Under the Clean Water Act, the Stormwater Phase II Final Rule was promulgated in 1999 and was the next step after the 1987 Phase I Rule in the Environmental Protection Agency's (EPA's) effort to preserve, protect, and improve the Nation's water resources from polluted stormwater runoff. The Phase II program expanded the Phase I program by requiring additional operators of MS4s in urbanized areas and operators of small construction sites, through the use of NPDES permits, to implement programs and practices to control polluted stormwater runoff. Under the Phase II rule, all MS4s with stormwater discharges from Census designated Urbanized Area are required to seek NPDES permit coverage for those stormwater discharges.

On May 1, 2003, EPA Region 1 issued its Final General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (2003 MS4 Permit) consistent with the Phase II rule. The 2003 small MS4 permit covered "traditional" (i.e., cities and towns) and "non-traditional" (i.e., Federal and state agencies) MS4 Operators located in the states of Massachusetts and New Hampshire. This permit expired on May 1, 2008 but remained in effect until operators were authorized under the 2016 MS4 Permit, which became effective on July 1, 2018. On May 16, 2022, EPA decided to administratively continue the coverage of the 2016 MS4 Permit to extend past its expiration date of June 30, 2022 until a new MS4 permit is issued.

UMass Chan Medical School is categorized as a non-traditional MS4 and a new permittee, since it was not covered under the 2003 MS4 Permit.

University of Massachusetts Chan Medical School MS4 Facilities

UMass Chan Medical School operates at four campuses located within the MS4 regulated area. This SWMP previously included facilities located at 333 South Street (Shrewsbury), 222 Maple Avenue (Shrewsbury) and 460 Walk Hill Street, Mattapan (MassBiologics) and their associated receiving waterbodies. After further review of facility ownership, these facilities were determined to be owned by Worcester City Campus Corporation and not UMass Chan Medical School. Therefore, these facilities are not part of UMass Chan Medical School's jurisdiction and were removed from this SWMP in June 2022.

Main Campus, Worcester
The UMass Chan Medical School main campus is located on more than 60 acres in Worcester,

Massachusetts, just north of Route 9 on the west side of Lake Quinsigamond, between Plantation Street and North Lake Avenue. The physical address of the main campus is 55 North Lake Avenue. The main campus includes the University of Massachusetts Chan Medical School and the UMass Memorial Medical Center University Campus and buildings that are either owned or leased, with spaces for academics, research, laboratories, offices, patient care, and ancillary support.

Stormwater Management Program (SWMP)

The SWMP describes the activities and measures, or Best Management Practices (BMPs), that UMass Chan Medical School will implement to meet the terms and conditions of the permit. The SWMP has been prepared to comply with the overall general permit, modified requirements for Non-Traditional MS4s, and timeline extensions for New Permittees. The SWMP is intended to be a "living document", which UMass Chan Medical School will update and/or modify during the permit term as new information is developed or UMass Chan Medical School's activities are modified, changed, or updated to meet permit conditions. UMass Chan Medical School will assess the need for SWMP updates as part of the Annual Evaluation to be completed, along with the Annual Report, by the end of September each year. Permit years referenced in the SWMP correspond to fiscal years, beginning with fiscal year 2019 (permit year 1).

The main elements of the SWMP are organized by minimum control measures (MCMs) and additional BMPs for discharges to water quality limited waterbodies.

MCM 1: A public education program aiming to affect public behavior causing stormwater pollution,

MCM 2: An opportunity for the public to participate and provide comments on the stormwater program,

MCM 3: A program to effectively find and eliminate illicit discharges within the MS4,

MCM 4: A program to effectively control construction site stormwater discharges to the MS4,

MCM 5: A program to ensure that stormwater from development projects entering the MS4 is adequately controlled by the construction of stormwater controls,

MCM 6: A good housekeeping program to ensure that stormwater pollution sources on municipal properties and from municipal operations are minimized, and

TMDLs and Water Quality Impairments: Enhanced and additional BMPs to reduce pollutants of concern discharging to waterbodies with water quality impairments and Total Maximum Daily Loads (TMDLs) related to urban stormwater runoff.

Small MS4 Authorization

UMass Chan Medical School submitted its Notice of Intent (NOI) on September 24, 2019. EPA granted Authorization to Discharge on February 14, 2019. The NOI and Authorization Letter can be found at the following links:

- NOI: https://www3.epa.gov/region1/npdes/stormwater/ma/ntms4noi/umass-medical-school.pdf
- Authorization Letter: https://www3.epa.gov/region1/npdes/stormwater/ma/ntms4noi/umass-medical-school-auth.pdf

Stormwater Management Program Team

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Receiving Waters

The following table lists UMass Chan Medical School's receiving waters, impairments, and the number of outfalls discharging to each waterbody segment.

Waterbody segment that receives flow from the MS4	Number of outfalls into receiving water segment	Chloride	Chlorophyll-a	Dissolved Oxygen/ DO Saturation	Nitrogen	Oil & Grease/PAH	Phosphorus	Solids/TSS/Turbidity	E. Coli	Enterococcus	Other pollutant(s) causing impairments
Lake Quinsigamond (MA51125)	0 (1 out-going interconnection)			X						X	Curly-leaf Pondweed*, Eurasian Water Milfoil / Myriophyllum Spicatum*, Fanwort*, Non-Native Aquatic Plants*, Water Chestnut*, Algae

*TMDL not required (non-pollutant)

Eligibility: Endangered Species and Historic Properties

Endangered Species Act (ESA) eligibility determination

UMass Chan Medical School has completed the ESA eligibility process outlined in MS4 Permit Appendix C. According to the U.S. Fish & Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool, UMass Chan Medical School campuses potentially contain habitat for Northern Long-eared Bat, which is listed as a threatened species.

UMass Chan Medical School has determined that the stormwater discharges and discharge related activities will have no effect on any federally threatened or endangered listed species or designated critical habitat under the jurisdiction of the USFWS. If, during the course of the permit term, UMass Chan Medical School plans to install a structural BMP not identified in the NOI, UMass Chan Medical School will conduct an endangered species screening for the proposed site and will contact the USFWS if UMass Chan Medical School determines that the new activity "may affect" or is "not likely to adversely affect" listed species or critical habitat under the jurisdiction of the USFWS.

In accordance with the ESA eligibility process outlined in MS4 Permit Appendix C, UMass Chan Medical School certifies permit eligibility with the ESA under **Criterion C.**

USFWS Criterion C: *Using the best scientific and commercial data available, the effect of the stormwater discharge and discharge related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by EPA, or by the applicant and affirmed by EPA, that the stormwater discharges and discharge related activities will have "no effect" on any federally threatened or endangered listed species or designated critical habitat under the jurisdiction of the USFWS.*

The following attachments are included in Appendix B:

- Lake Avenue North, Worcester campus IPaC resource list

National Historic Preservation Act (NHPA) eligibility determination

UMass Chan Medical School has completed the NHPA eligibility process outlined in MS4 Permit Appendix D. UMass Chan Medical School campuses do not have property listed or eligible for listing on the National Register of Historic Places. No prior surveys or disturbances have revealed the existence of historic properties or artifacts. Operation of UMass Chan Medical School MS4 does not have the potential to cause effects on historic properties.

In accordance with the NHPA eligibility process outlined in MS Permit Appendix D, UMass Chan Medical School certifies permit eligibility with the NHPA under **Criterion B.**

NHPA Criterion B: *A survey was conducted. The survey concluded that no historic properties are present. Discharges do not have the potential to cause effects on historic properties.*

MCM 1 Public Education and Outreach

Permit Part 2.3.2

Objective

The objective of UMass Chan Medical School's public education and outreach program is to increase awareness and influence behavior of the public so that stormwater pollutants are reduced.

Program Overview

UMass Chan Medical School's program is structured in accordance with the MS4 Permit at Part 2.3.2 and with specific requirements for impaired waterbodies in Appendix H and Appendix F of the MS4 Permit. As a non-traditional MS4, UMass Chan Medical School's target audiences differ slightly from those targeted by traditional (municipal) MS4s. UMass Chan Medical School's target audiences include the people who are most likely to affect pollution on UMass Chan Medical School properties, and those who are most likely to be reached through interaction with UMass Chan Medical School: visitors, students, staff, and contractors. The messages focus on stormwater pollutants that are most likely to be generated by the public on UMass Chan Medical School properties and to impact UMass Chan Medical School's receiving waterbodies:

- Trash,
- Sediment,
- Fertilizer,
- Leaf litter, and
- Grass clippings.

The educational messages will be distributed through a range of forums, selected to best reach each target audience. Each public education BMP has a measurable goal, which UMass Chan Medical School will assess annually to ensure that educational messages are reaching target audiences effectively.

The following table summarizes the educational messages, target audiences, and distribution schedule.

BMP	Target Audience	Schedule by Permit Year (Fiscal Year)						
		1 (FY19)	2 (FY20)	3 (FY21)	4 (FY22)	5 (FY23)	6 (FY24)	7 (FY25)
1-1: Think Blue Advertising Campaign	Visitors, Students, Staff	x						
1-2: Web Page	Visitors, Students, Staff	x	x	x	x	x	x	x
1-3: Growing Green Newsletter	Visitors, Students, Staff	x	x	x	x	x	x	x
1-4: Stormwater Fact Sheet	Visitors, Students, Staff			x	x	x	x	x
1-5: Contractor Education	Contractors			x	x	x	x	x
1-6: Facility Staff Education	Facility Staff				x	x	x	x

BMP 1-1: Think Blue Advertising Campaign

Description:

Think Blue Massachusetts (https://www.thinkbluemassachusetts.org/) ran an advertising campaign on behalf of MS4 communities from May 31 to June 25th, 2018. The "Fowl Water" advertisement, targeting MA urban residents, aimed to help viewers visualize stormwater pollution from motor oil, pet waste, and trash. Even though UMass Chan Medical School is not part of a municipal coalition, UMass Chan Medical School staff and visitors reside within those communities. Relevant to UMass Chan Medical School , Think Blue targeted outreach to the Charles River region (TOC-TBM-Charles-River-Regional-Campaign-Report-06252018) and the Central Massachusetts region (TOC-TBM-Central-Massachusetts-Campaign-Report-06252018). UMass Chan Medical School will amplify the "Fowl Water" message by adding links to UMass Chan Medical School's stormwater webpage (BMP 1-2).

Targeted Audience:

- Visitors, students, and staff

Responsible Department/Parties:

- Environmental Health & Safety, Sustainability

Measurable Goal(s):

- Views in Charles River and Central MA Regions

BMP 1-2: Web Page

Description:

UMass Chan Medical School will create and maintain a stormwater management page on the Growing Green website. The webpage will include stormwater pollution prevention tips, links to ThinkBlue Massachusetts videos and educational materials, and information about UMass Chan Medical School's stormwater management program.

Targeted Audience:

- Visitors, students, and staff

Responsible Department/Parties:

- Environmental Health & Safety, Sustainability

Measurable Goal(s):

- Website views

BMP 1-3: Growing Green Newsletter

Description:

UMass Chan Medical School will post on UMass Chan Medical School's Growing Green newsletter about stormwater pollution prevention and will provide a link to UMass Chan Medical School's

Growing Green stormwater webpage. This post will be repeated annually, potentially with slight variations in the content. The educational message will focus on general stormwater awareness and pollution prevention (such as ThinkBlue's stormwater 101 materials).

Targeted Audience:

- Visitors, students, and staff

Responsible Department/Parties:

- Environmental Health & Safety, Sustainability

Measurable Goal(s):

- Followers, likes, shares, and comments

BMP 1-4: Stormwater Fact Sheet

Description:

UMass Chan Medical School will set up a table with stormwater education materials, including a stormwater fact sheet, and other educational media (such as the Think Blue video) at its annual Earth Day event.

Targeted Audience:

- Visitors, students, and staff

Responsible Department/Parties:

- Environmental Health & Safety

Measurable Goal(s):

- Number of people engaged at Earth Day event

BMP 1-5: Contractor Education

Description:

UMass Chan Medical School will provide stormwater awareness and pollution prevention fact sheets to contractors with each purchase order to educate them on stormwater management.

Targeted Audience:

- Contractors

Responsible Department/Parties:

- Facilities Engineering, Facilities Maintenance, and Environmental Health and Safety

Measurable Goal(s):

- Number of Contractors reached

BMP 1-6: Facility Staff Education

Description:

UMass Chan Medical School will provide annual training to facility staff on UMass Chan Medical School's O&M Plan. O&M procedures will include measures such as landscape maintenance to reduce phosphorus loading.

Targeted Audience:

- Facility staff

Responsible Department/Parties:

- Facilities Engineering, Facilities Maintenance, and Environmental Health and Safety

Measurable Goal(s):

- Number of facility staff reached

MCM 2 Public Involvement and Participation

Permit Part 2.3.3

Objective

UMass Chan Medical School's objective for its Public Involvement and Participation program is to engage the public in review and implementation of the SWMP.

Program Overview

The following table summarizes the public involvement and participation BMPs and schedule.

BMP	Schedule by Permit Year (Fiscal Year)						
	1 (FY19)	2 (FY20)	3 (FY21)	4 (FY22)	5 (FY23)	6 (FY24)	7 (FY25)
2-1: Public Review of SWMP	x	x	x	x	x	x	x
2-2: Earth Day Event	x	x	x	x	x	x	x
2-3: E-Waste Recycling Events	x	x	x	x	x	x	x

BMP 2-1: Public Review of Stormwater Management Program (SWMP)

Description:

UMass Chan Medical School will post its SWMP online on its Growing Green-Stormwater Management webpage (BMP 1-2) to allow for ongoing public review of its SWMP. The webpage will provide an email address (stormwater@umassmed.edu) for the public to provide comments, ask questions, or report stormwater issues. UMass Chan Medical School will annually share the stormwater management website link in the Growing Green newsletter so the public can easily navigate to the page and review the SWMP. The SWMP will be located at: https://www.umassmed.edu/growinggreen/stormwater-management/.

Responsible Department/Parties:

- Environmental Health & Safety, Sustainability

Measurable Goal(s):

- Post stormwater management plan on website
- Track comments received and resolutions

BMP 2-2: Earth Day Event

Description:

UMass Chan Medical School hosts an annual Earth Day Event at its main campus in Worcester. At the Earth Day event, UMass Chan Medical School will display information about stormwater management and hand out brochures. Specific focus topics will vary by year and may include volunteer opportunities for pollution prevention. More information is available at https://www.umassmed.edu/growinggreen/earthday/.

Responsible Department/Parties:

- Environmental Health & Safety, Sustainability

Measurable Goal(s):

- Event and volunteer opportunities sponsored/supported annually

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BMP 2-3: E-Waste Recycling Events

Description:

UMass Chan Medical School will host E-waste recycling events on each campus for members of the UMass Chan Medical School community to dispose of electronic waste for recycling purposes.

Responsible Department/Parties:

- Environmental Health & Safety, Sustainability

Measurable Goal(s):

- Number of events hosted annually

MCM 3 Illicit Discharge Detection and Elimination (IDDE) Program

Permit Part 2.3.4

Objective

UMass Chan Medical School's objective for the IDDE program is to systematically find and eliminate illicit sources of non-stormwater discharges to its MS4 and to prevent such discharges.

Program Overview

The following table summarizes the IDDE BMPs and schedule.

BMP	Schedule by Permit Year (Fiscal Year)						
	1 (FY19)	2 (FY20)	3 (FY21)	4 (FY22)	5 (FY23)	6 (FY24)	7 (FY25)
3-1: Sanitary Sewer Overflow (SSO) Inventory				Initial Inventory	x	x	x
3-2: Storm Sewer System Mapping	x	x	x	x	Complete Phase 1 Map	x	x
3-3: Written IDDE Program				x	x	x	x
3-4: Employee Training	x	x	x	x	x	x	x
3-5: Dry Weather Screening					x		
3-6: Catchment Investigations (beyond permit term)							x
3-7: Wet Weather Screening (beyond permit term)							x
3-8: Ongoing Screening (beyond permit term)							

BMP 3-1: Sanitary Sewer Overflow (SSO) Inventory

Description:

UMass Chan Medical School will develop an inventory of sanitary sewer overflows (SSOs) that have occurred on UMass Chan Medical School campuses over the past 5 years and will update that list annually. An SSO is a discharge of untreated sanitary wastewater from a municipal sanitary sewer. While UMass Chan Medical School does not own sanitary sewer lines and is therefore not directly responsible for SSOs, UMass Chan Medical School will identify and report locations and maintain an inventory of SSOs that have occurred on UMass Chan Medical School properties, in coordination with those entities responsible for the sanitary sewer systems.

An overflow or bypass must be reported within 24 hours by phone to MassDEP, EPA, and other relevant parties. Follow up the verbal notification with a written report following MassDEP's Sanitary Sewer Overflow (SSO)/Bypass notification form within 5 calendar days of the time you become aware of the overflow, bypass, or backup.

DEP 24-hour Emergency Line: 1-888-304-1133		
DEP Northeast Region (978) 694-3215 205B Lowell Street Wilmington, MA 01887	DEP Central Region (508) 792-7650 8 New Bond Street Worcester, MA 01606	EPA New England (617) 918-1510 5 Post Office Square Boston, MA 02109

Responsible Department/Parties:

- Environmental Health & Safety, Facility Engineering & Construction, Facilities Maintenance Services

Measurable Goal(s):

- Complete within 4 years of permit effective date (by June 30, 2022) and update annually thereafter

BMP 3-2: Map of Storm Sewer System

Description:

UMass Chan Medical School will incrementally build a GIS map of its stormwater system, beginning in Permit Year 1. The Phase I map, scheduled to be completed by June 30, 2023, will include:

- Outfalls
- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems
- UMass Chan Medical School-owned stormwater treatment structures (e.g., detention and retention basins, infiltration systems, bioretention areas, water quality swales, particle separators, oil/water separators, or other proprietary systems)
- Waterbodies identified by name and indication of all use impairments as identified on the most recent EPA approved Massachusetts Integrated List of Waters report
- Initial catchment delineations. A catchment is the area that drains to an individual outfall or interconnection.

The Phase II map, scheduled to be completed by June 30, 2031, will include:

- Outfall spatial location (latitude and longitude with a minimum accuracy of +/-30 feet)
- Pipes
- Manholes
- Catch basins
- Refined catchment delineations. Catchment delineations will be updated to reflect information collected during catchment investigations.
- Municipal sanitary sewer system (if available)
- Municipal combined sewer system (if applicable).

Responsible Department/Parties:

- Environmental Health & Safety, Facility Engineering & Construction, Facilities Maintenance Services

Measurable Goal(s):

- Complete Phase 1 map within 5 years of permit effective date (by June 30, 2023) and complete full system map 13 years after permit effective date (by June 30, 2031)

BMP 3-3: Written IDDE Program

Description:

UMass Chan Medical School will develop a written IDDE program, which will include:

- Illicit discharge policy
- Roles and responsibilities
- SSO inventory
- Assessment and priority ranking of outfalls/interconnections
- Dry weather outfall screening and sampling procedures
- Catchment investigation procedures
- Wet weather sampling procedures
- Training
- Reporting

UMass Chan Medical School will complete initial outfall assessment and ranking in Permit Year 4 (FY2023), using available data. As new data become available through GIS mapping, outfall inspections, and catchment investigations, UMass Chan Medical School will annually update the outfall ranking. Outfalls will be categorized as Problem, High Priority, Low Priority, or Excluded, as defined in the MS4 Permit at Part 2.3.4.7. Outfalls discharging to waterbodies impaired for or with a TMDL for bacteria or pathogens will be categorized as Problem or High Priority.

UMass Chan Medical School will update the IDDE Program annually and will post the Program online on its stormwater management webpage.

Responsible Department/Parties:

- Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Complete the written IDDE Program within 4 years of permit effective date (by June 30, 2022) and update as required

BMP 3-4: Employee Training

Description:

UMass Chan Medical School will add IDDE Program training, including how to recognize and respond

to illicit discharges and SSOs, to its annual Spill Prevention, Control, and Countermeasure (SPCC) training. Environmental Health & Safety, Facility Engineering & Construction, Facilities On-Site Maintenance Services, and EH&S Safety Officer employees complete a SPCC training on the anniversary of their hire date.

Responsible Department/Parties:

- Environmental Health & Safety, Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Train annually

BMP 3-5: Dry Weather Screening

Description:

UMass Chan Medical School will conduct in dry weather screening in accordance with outfall screening procedures and permit conditions to identify illicit contributions to the system. Procedures for and findings from dry weather outfall screening will be documented in the written IDDE Program (BMP 3-3). UMass Chan Medical School will complete dry weather screening of all outfalls by June 30, 2024.

Responsible Department/Parties:

- Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Complete within 6 years of permit effective date (by June 30, 2024)

BMP 3-6: Catchment Investigations

Description:

UMass Chan Medical School will implement catchment investigations according to program and permit conditions. Procedures for and findings from catchment investigations will be documented in the written IDDE Program (BMP 3-3). UMass Chan Medical School will complete catchment investigations by June 30, 2031.

Responsible Department/Parties:

- Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Complete within 13 years of permit effective date (by June 30, 2031)

BMP 3-7: Wet Weather Screening

Description:

UMass Chan Medical School will conduct wet weather screening in accordance with outfall screening procedure to identify illicit discharges to its MS4. Procedures for and findings from wet weather screening will be documented in the written IDDE Program (BMP 3.3). UMass Chan Medical School will complete wet weather screening by June 30, 2031.

Responsible Department/Parties:

- Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Complete within 13 years of permit effective date (by June 30, 2031)

BMP 3-8: Ongoing Screening

Description:

After completion of BMPs 3-5, 3-6, and 3-7, UMass Chan Medical School will continue dry weather and wet weather screening as necessary to identify and eliminate illicit discharges.

Responsible Department/Parties:

- Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Complete ongoing outfall screening upon completion of IDDE program

MCM 4 Construction Site Stormwater Runoff Control

Permit Part 2.3.5

Objective

UMass Chan Medical School's objective for its construction stormwater runoff control program is to minimize or eliminate erosion and maintain sediment on site so that it is not transported in stormwater and allowed to discharge to a water of the U.S. through UMass Chan Medical School's MS4.

Program Overview

The following table summarizes Construction Site Stormwater Runoff Control BMPs and schedule.

BMP	Schedule by Permit Year (Fiscal Year)						
	1 (FY19)	2 (FY20)	3 (FY21)	4 (FY22)	5 (FY23)	6 (FY24)	7 (FY25)
4-1: Construction Site Stormwater Runoff Control	x	x	x	x	x	x	x
4-2: Project Design and SWPPP Review	x	x	x	x	x	x	x
4-3: Site Inspection	x	x	x	x	x	x	x

BMP 4-1: Construction Site Stormwater Runoff Control

Description:

As a non-traditional MS4, UMass Chan Medical School does not have the authority to enact an ordinance, bylaw, or other regulatory mechanism regarding construction site stormwater management. The MS4 Permit at Part 5.1.2 stipulates that MS4s without the authority to enact an ordinance should instead have written policies or procedures in place to ensure erosion and sediment control, and control of construction wastes, on projects that disturb one or more acres of land.

UMass Chan Medical School will ensure construction site stormwater management through compliance with the NPDES Construction General Permit. UMass Chan Medical School includes a bid item and special provisions on construction contracts to be advertised for bid which exceed the one-acre land disturbance threshold. The bid item and special provisions require preparation of a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the Construction General Permit.

UMass Chan Medical School will develop more detailed specifications and will continue to include contract bid items and special provisions for construction site stormwater management for projects that disturb one or more acres of land.

Responsible Department/Parties:

- Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Continue to include bid item and special provisions in applicable projects

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BMP 4-2: Project Design and SWPPP Review

Description:

UMass Chan Medical School will continue to perform internal reviews of project design work to ensure projects include appropriate erosion and sediment control practices. UMass Chan Medical School will also continue to review construction SWPPPs.

Responsible Department/Parties:

- Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Number of construction starts with Construction General Permit coverage

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BMP 4-3: Site Inspection

Description:

UMass Chan Medical School will require contractors to perform site inspections in accordance with NPDES Construction General Permit requirements. UMass Chan Medical School's Resident Engineer will also observe erosion and sediment controls on construction projects.

Responsible Department/Parties:

- Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Number of construction projects that start with SWPPPs

MCM 5 Post-Construction Stormwater Management in New Development and Redevelopment

Permit Part 2.3.6

Objective

UMass Chan Medical School's objective for its post-construction stormwater management program is to reduce the discharge of stormwater pollutants to its MS4 and receiving waterbodies. This is accomplished by retaining or treating stormwater runoff after construction on new or redeveloped sites, and by ensuring proper maintenance of installed stormwater controls.

Program Overview

The following table summarizes Post-Construction Stormwater Management BMPs and schedule.

BMP	Schedule by Permit Year (Fiscal Year)						
	1 (FY19)	2 (FY20)	3 (FY21)	4 (FY22)	5 (FY23)	6 (FY24)	7 (FY25)
5-1: Design Guidelines for New Development and Redevelopment (continued enforcement after implementation)			x				
5-2: As-Built Plans for On-Site Stormwater Control			x	x	x	x	x
5-3: Target Properties for Stormwater Retrofits (beyond permit term)						x	x
5-4: Street Design and Parking Lot Guidelines (beyond permit term)						x	x

BMP 5-1: Design Guidelines for New Development and Redevelopment

Description:

UMass Chan Medical School will adopt design guidelines for post-construction stormwater management to meet permit requirements to ensure any stormwater controls or management practices for new development and redevelopment meet the retention or treatment requirements of the MS4 Permit and all applicable requirements of the Massachusetts Stormwater Handbook.

Responsible Department/Parties:

- Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Complete within 3 years of permit effective date (by June 30, 2021).

BMP 5-2: As-Built Plans for On-Site Stormwater Control

Description:

UMass Chan Medical School will continue to require contractors to submit as-built plans. Procedures will require submission of as-built drawings no later than two (2) years after completion of applicable UMass Chan Medical School construction projects. The as-built drawings will depict all on-site controls, both structural and non-structural, designed to manage stormwater associated with the completed site.

Responsible Department/Parties:

- Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Require submission of as-built plans for completed projects.

BMP 5-3: Target Properties for Stormwater Retrofits

Description:

UMass Chan Medical School will identify at least five (5) campus sites that could be modified or retrofitted with stormwater BMPs to reduce the frequency, volume, and pollutant loads of stormwater discharges from its MS4. UMass Chan Medical School will prioritize properties with significant impervious cover that fall within areas discharging to waterbodies with phosphorus impairments. In determining the potential for modifying or retrofitting particular properties, UMass Chan Medical School will consider factors such as maintenance access; subsurface conditions; proximity to water supply, swimming beaches, and shellfish growing areas; and opportunities for public education. UMass Chan Medical School will compile the list of potential retrofits, with five (5) prioritized sites, by the end of Permit Year 6. Beginning with the seventh annual report and in each subsequent annual report, UMass Chan Medical School will identify additional sites that could be retrofitted, to maintain a minimum of five (5) sites in the inventory. UMass Chan Medical School will report on all properties that have been modified or retrofitted with BMPs in each annual report.

Responsible Department/Parties:

- Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Complete within 6 years of permit effective date (by June 30, 2024) and report annually on retrofitted properties.

BMP 5-4: Street Design and Parking Lot Guidelines

Description:

UMass Chan Medical School will review UMass Chan Medical School street and parking lot design standards and other design guidelines that affect the creation of impervious cover. The assessment will help determine if changes to design standards can be made to support low impact design options, such as permeable paving and minimizing impervious surface. If the assessment indicates that changes can be made, the report will include recommendations and proposed schedules to incorporate policies and standards into relevant documents and procedures to minimize impervious cover attributable to parking areas and street designs. UMass Chan Medical School will implement recommendations, in accordance with the schedules contained in the assessment.

Responsible Department/Parties:

- Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Complete within 6 years of permit effective date (by June 30, 2024) and implement recommendations of report.

MCM 6 Good Housekeeping and Pollution Prevention for Permittee Owned Operations

Permit Part 2.3.7

Objective

The objective of UMass Chan Medical School's Good Housekeeping program is to prevent or reduce pollutant runoff from Town facilities and operations.

Program Overview

The following table summarizes Good Housekeeping BMPs and schedule.

BMP	Schedule by Permit Year (Fiscal Year)						
	1 (FY19)	2 (FY20)	3 (FY21)	4 (FY22)	5 (FY23)	6 (FY24)	7 (FY25)
6-1: Facilities Inventory				x	x	x	x
6-2: Facility O&M Procedures				x	x	x	x
6-3: Facility SWPPPs				x	x	x	x
6-4: Written MS4 O&M Program				x	x	x	x
6-5: Catch Basin Inspection and Cleaning	x	x	x	x	x	x	x
6-6: Street and Parking Lot Sweeping	x	x	x	x	x	x	x
6-7: Winter Road Maintenance	x	x	x	x	x	x	x
6-8: Stormwater Treatment Facility Inspections	x	x	x	x	x	x	x

BMP 6-1: Facilities Inventory

Description:

UMass Chan Medical School will create an inventory of campus open spaces, buildings and facilities, and vehicles and equipment maintenance and storage areas.

Responsible Department/Parties:

- Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Complete within 4 years of permit effective date (by June 30, 2022) and implement annually.

BMP 6-2: Facility Operations and Maintenance (O&M) Procedures

Description:

UMass Chan Medical School will develop written O&M procedures including all requirements contained in 2.3.7.a.ii for open spaces, buildings and facilities, and vehicle and equipment storage and maintenance areas. The O&M Procedures will include pollution prevention practices specific to each category, as listed below. The O&M procedures will include measures such as landscape maintenance to reduce phosphorus loading to impaired waterbodies, as applicable.

1) Open Space:
    - Use, storage, and disposal of pesticides, herbicides, and fertilizers
    - Lawn maintenance and landscaping
    - Trash container placement and cleanings
    - Erosion control and vegetative cover
2) Buildings and facilities where pollutants are exposed to stormwater runoff:
    - Use, storage, and disposal of petroleum products and other potential stormwater pollutants
    - Employee training
    - Spill prevention plans, if applicable
    - Management of dumpsters and other waste management equipment
    - Sweeping and cleaning around facilities
3) Vehicles and equipment
    - Vehicle storage
    - Management of vehicles with fluid leaks
    - Fueling areas
    - Vehicle wash waters

Responsible Department/Parties:

- Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Complete and implement within 4 years of permit effective date (by June 30, 2022).

BMP 6-3: Stormwater Pollution Prevention Plan (SWPPP)

Description:

UMass Chan Medical School will annually evaluate campus facilities to determine whether any facilities have materials and waste storage or handling that may be exposed to stormwater. UMass Chan Medical School currently does not have any facilities that meet the criteria that would require implementation of facility SWPPPs.

UMass Chan Medical School will continue to implement existing Spill Prevention, Control, and Countermeasure (SPCC) plans.

Responsible Department/Parties:

- Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Annually evaluate applicability of facility SWPPP requirements.

BMP 6-4: MS4 Infrastructure O&M

Description:

UMass Chan Medical School will develop a written a program detailing the activities and procedures UMass Chan Medical School will implement so that the MS4 infrastructure is maintained in a timely manner to reduce the discharge of pollutant from the MS4. The written O&M program will include catch basin cleaning (BMP 6-5), street and parking lot sweeping (BMP 6-6), winter road maintenance (BMP 6-7), and stormwater treatment facility inspection (BMP 6-8).

Responsible Department/Parties:

- Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Complete within 4 years of permit effective date (by June 30, 2022).

BMP 6-5: Catch Basin Cleaning

Description:

UMass Chan Medical School will establish a catch basin cleaning program, including documenting annual catch basin cleaning and prioritized areas to be cleaned based on the sensitivity of the area and receiving waters.

During Permit Year 2, UMass Chan Medical School will start to track catch basin sediment depth during routine catch basin cleaning. Inspectors will record sediment depth within catch basin sumps as empty, less than half full, half full, and greater than half full. Catch basins found to have sediment depth greater than half full will be prioritized for cleaning during Permit Year 3. Following two years of data collection, UMass Chan Medical School will complete an optimization analysis to schedule routine inspections, cleaning, and maintenance of catch basins such that the following conditions are met:

- Prioritize inspection and maintenance for catch basins located near construction activities. Clean catch basins in such areas more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings.

- Establish a schedule with a goal that the frequency of routine cleaning will ensure that no catch basin at any time will be more than 50 percent full.
- If a catch basin sump is more than 50 percent full during two consecutive routine inspections/cleaning events, document that finding, investigate the contributing drainage area for sources of excessive sediment loading, and to the extent practicable, abate contributing sources. Describe any actions taken in annual report.

UMass Chan Medical School will report in each annual report the total number of catch basins, number inspected, number cleaned, and the total volume or mass of material removed from all catch basins.

Responsible Department/Parties:

- Facility Engineering & Construction, Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Clean catch basins on established schedule and report number of catch basins cleaned and volume of material removed annually.

BMP 6-6: Street and Parking Lot Sweeping

Description:

UMass Chan Medical School will sweep all UMass Chan Medical School roads and parking lots a minimum of twice per year (in the fall and spring). UMass Chan Medical School will also sweep more frequently in areas with land uses that generate higher sediment loading and/or where catch basin inspections indicate higher loading rates.

Responsible Department/Parties:

- Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Report on compliance with street sweeping schedule annually.

BMP 6-7: Winter Road Maintenance

Description:

UMass Chan Medical School will establish and implement written procedures for winter road maintenance, including the use and storage of salt and sand. UMass Chan Medical School will minimize the use of sodium chloride and other salts and will evaluate opportunities for use of alternative materials. UMass Chan Medical School will also ensure that snow disposal activities do not result in disposal of snow into waters of the United States.

Responsible Department/Parties:

- Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Report on compliance with winter road maintenance procedures annually.

BMP 6-8: Inspection and Maintenance of Stormwater Treatment Structures

Description:

UMass Chan Medical School will establish and implement inspection and maintenance procedures and frequencies of stormwater treatment structures such as water quality swales, detention basins, infiltration structures, and proprietary treatment devices. UMass Chan Medical School will inspect all UMass Chan Medical School-owned stormwater treatment structures (excluding catch basins) annually at a minimum.

Responsible Department/Parties:

- Facilities On-Site Maintenance Services, EH&S Safety Officer

Measurable Goal(s):

- Report on compliance with inspection and maintenance of treatment structures per established schedule.

TMDLs and Water Quality Limited Waters

The MS4 Permit at Part 2.2 describes additional requirements for MS4s that discharge to waters that are subject to Total Maximum Daily Loads (TMDLs) and/or that discharge to certain water quality limited waters. Specific requirements are detailed in the MS4 Permit Appendix F (for TMDLs) and Appendix H (for impaired waters).

This section identifies UMass Chan Medical School's receiving waterbodies that are impaired or are subject to TMDLs. This section also describes the BMPs that UMass Chan Medical School will implement to meet the MS4 Permit requirements at Part 2.2 and Appendices F and H.

The following table summarizes the additional BMPs that UMass Chan Medical School will implement to meet MS4 Permit Appendix F and Appendix H requirements.

BMP	Schedule by Permit Year (Fiscal Year)						
	1 (FY19)	**2 (FY20)**	**3 (FY21)**	**4 (FY22)**	**5 (FY23)**	**6 (FY24)**	**7 (FY25)**
7-1: Lake Phosphorus Control Plans				x	x	x	x

Bacteria/Pathogens

Applicable Waterbodies

The following receiving waters are water quality limited due to bacteria or pathogens, and/or have an approved TMDL for bacteria/pathogens. Discharges to these waterbodies are subject to the provisions of MS4 Permit Appendix H Part III and Appendix F at Part III.

UMass Chan Medical School Campus	Receiving Waterbody	Segment ID	TMDL Name
Main	Lake Quinsigamond via DCR interconnection	MA51125	N/A

Enhanced BMPs

The following table summarizes the Enhanced BMPs, as described under the MCMs above, that UMass Chan Medical School will implement to meet Appendix H and Appendix F requirements for discharge to bacteria/pathogen impaired waterbodies.

Requirements	Enhanced BMPs
Supplement public education program with an annual message encouraging the proper management of pet waste	This requirement is not applicable to UMass Chan Medical School, as dog walking is not allowed on UMass Chan Medical School campuses
Disseminate educational materials to dog owners at the time of issuance or renewal of a dog license, or other appropriate time	This requirement is not applicable to UMass Chan Medical School, as it does not have the authority to issue dog licenses
Provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria or pathogens	This requirement is not applicable to UMass Chan Medical School, as it does not own or operate septic systems
Designate catchments draining to any waterbody impaired for bacteria/pathogens as either Problem Catchments or High Priority in implementation of the IDDE Program.	BMP 3-3: Written IDDE Program • Outfalls discharging to waterbodies with a bacteria or pathogen impairment will be categorized as Problem or High Priority.

Nutrients (Phosphorus)

Applicable Waterbodies

The following receiving waters are water quality limited due to phosphorus. Discharges to these waterbodies are subject to the provisions of MS4 Permit Appendix H Part III and Appendix F at Part III.

UMass Chan Medical School Campus	Receiving Waterbody	Segment ID	TMDL Name
Main	Lake Quinsigamond	MA51125	Total Maximum Daily Load of Phosphorus for Lake Quinsigamond and Flint Pond

Enhanced BMPs – Nutrients (Phosphorus)

The following table summarizes the Enhanced BMPs, as described in the SWMP above, that UMass Chan Medical School will implement to meet MS4 Permit Appendix H requirements for discharge to phosphorus-impaired waterbodies and their tributaries.

Requirements	Enhanced BMPs
Distribute an annual message in the spring (April/May) that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release and phosphorus-free fertilizers	BMP 1-6: Annual facility staff training will include the topics of proper disposal of grass clippings and proper use of fertilizers.
Distribute an annual message in the summer (June/July) encouraging the proper management of pet waste	This requirement is not applicable to UMass Chan Medical School, as dog walking is not allowed on UMass Chan Medical School campuses.
Distribute an annual message in the fall (August/September/October) encouraging the proper disposal of leaf litter	BMP 1-6: Annual facility staff training will include the topics of proper disposal of leaf litter.
For post-development stormwater management, include a requirement that new development and redevelopment stormwater management BMPs be optimized for phosphorus removal	BMP 5-1: Design Guidelines for New Development and Redevelopment specify BMP designs must be optimized for phosphorus removal.
For retrofit inventory and priority ranking, include consideration of BMPs to reduce nutrient discharges	BMP 5-3: Target Properties for Stormwater Retrofits. UMass Chan Medical School will evaluate all properties identified as presenting retrofit opportunities or areas for structural BMP installation, identified in the Nutrient Source Identification Reports (BMP 6-9), that are within the drainage area of Lake Quinsigamond or its tributaries or tributaries to Blackstone River.

Requirements	Enhanced BMPs
Establish procedures to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces	BMP 6-2: Facility Operations and Maintenance (O&M) Procedures will cover this topic.
Increase street sweeping frequency of all municipal owned streets and parking lots subject to permit part 2.3.7.a.iii.(c) to a minimum of two times per year (spring and fall)	BMP 6-6: Street and Parking Lot Sweeping. UMass Chan Medical School will sweep all streets and parking lots two times per year (spring and fall).

Lake and Pond Phosphorus TMDLs

Between 1999 and 2010 EPA has approved 13 Lake TMDLs completed by MassDEP covering 78 lakes and ponds within the Commonwealth of Massachusetts[1]. Any permittee that discharges to a waterbody segment covered by the Lake TMDLs is subject to the requirements of MS4 Permit Appendix F at Part A.II. UMass Chan Medical School will meet these requirements as described under BMP 7-1 below.

The following receiving waters fall within watersheds covered by the Lakes and Ponds TMDLs.

UMass Chan Medical School Campus	Receiving Waterbody	Segment ID	TMDL Name
Worcester	Lake Quinsigamond	MA51125	Total Maximum Daily Load of Phosphorus for Lake Quinsigamond and Flint Pond (CN 115.0)

BMP 7-1 Lake Phosphorus Control Plans

Description:

UMass Chan Medical School will develop lake phosphorus control plans (LPCP) for each TMDL listed in the table above. A PCP is a plan to reduce the amount of phosphorus in stormwater discharges from the MS4 to impaired waters and their tributaries covered under those TMDLs. UMass Chan Medical School will complete the plans according to the phases and schedule outlined in the MS4 Permit Appendix F at Part A.II. Key milestones through Permit Year 8 are summarized below. EPA has specified a 2-year timeline extension for new permittees.

Phase 1 of the PCP Component and Milestones	Completion Date
Legal analysis	4 years after permit effective date
Funding source assessment	5 years after permit effective date
Define LPCP scope (LPCP area)	6 years after permit effective date
Calculate baseline phosphorus, allowable phosphorus load, and phosphorus reduction requirement	6 years after permit effective date
Description of planned nonstructural and structural controls	7 years after permit effective date
Description of operation and maintenance program	7 years after permit effective date
Implementation schedule	7 years after permit effective date
Cost and funding source assessment	7 years after permit effective date
Complete written LPCP	7 years after permit effective date
Full implementation of nonstructural controls	7 years after permit effective date

Responsible Department/Parties:

- Facilities Engineering & Construction, Facilities Maintenance Services

[1] Final TMDLs for lakes and ponds can be found at:
http://www.mass.gov/eea/agencies/massdep/water/watersheds/total-maximum-daily-loads-tmdls.html

Measurable Goal(s):

- Fully implement plans within 17 years of permit effective date.

Annual Evaluation

This section will be updated annually as annual reports are completed.

Year 1 Annual Report
https://www3.epa.gov/region1/npdes/stormwater/ma/reports/2019/umass-medical-school-ma-ar19.pdf

Year 2 Annual Report
https://www3.epa.gov/region1/npdes/stormwater/ma/reports/2020/umass-medical-school-ma-ar20.pdf

Year 3 Annual Report
https://www3.epa.gov/region1/npdes/stormwater/ma/reports/2021/UMASS_MEDICAL_SCHOOL_MA_AR21.pdf

Year 4 Annual Report
Web address will be posted when available from EPA.

Year 5 Annual Report
Web address will be posted when available from EPA.

Appendix A – Delegation of Authority

July 17, 2024

MEMO TO FILE

Re: Documentation for delegation of "Authorized Representative" for NPDES 2016 Massachusetts Small Municipal Separate Storm Sewer System (MS4) General Permit

This document serves to affirm that David Flanagan has responsibility for the operation of the MS4 and is hereby designated as an authorized person for signing all reports including but not limited to the Stormwater Management Plan (SWMP), Stormwater Pollution Prevention Plans (SWPPPs), inspection reports, annual reports, monitoring reports, reports on training, and other information required by the General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts for University of Massachusetts Medical School. This authorization cannot be used for signing a NPDES permit application (e.g., Notice of Intent (NOI)) in accordance with 40 CFR 122.22).

By signing this authorization, I confirm that I meet the following requirements to make such a designation as set forth in Part B.11 of Appendix B of the Small MS4 General Permit:

> *For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official.*

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

DocuSigned by:
63C9209EE6B442E...

7/23/2024

John Lindstedt
Executive Vice Chancellor, Administration and Finance

Date

Appendix B – IPaC Resource Lists

Worcester Main Campus

Includes pages 1 - 3 showing location and endangered species (excludes pages 4 – 9 listing of migratory birds, USFWS facilities, and NWI wetlands)

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Worcester County, Massachusetts

Local office

New England Ecological Services Field Office

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

http://www.fws.gov/newengland

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species

[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are

Appendix C – IDDE Plan

University of Massachusetts Chan Medical School

Illicit Discharge Detection and Elimination (IDDE) Plan

UMass Chan
MEDICAL SCHOOL

June 30, 2022
Updated April 2024

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University of Massachusetts Chan Medical School

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1 Introduction

1.1 MS4 Program

This Illicit Discharge Detection and Elimination (IDDE) Plan has been developed by the University of Massachusetts Chan Medical School (UMass Chan Medical School) to address the requirements of the United States Environmental Protection Agency's (USEPA's) 2016 National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts, hereafter referred to as the "2016 Massachusetts MS4 Permit" or "MS4 Permit."

The 2016 Massachusetts MS4 Permit requires that each permittee, or regulated community, address six Minimum Control Measures. These measures include the following:

1. Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination Program
4. Construction Site Stormwater Runoff Control
5. Stormwater Management in New Development and Redevelopment (Post Construction Stormwater Management); and
6. Good Housekeeping and Pollution Prevention for Permittee Owned Operations.

Under Minimum Control Measure 3, the permittee is required to implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges. The IDDE program must also be recorded in a written (hardcopy or electronic) document. This IDDE Plan has been prepared to address this requirement.

1.2 Illicit Discharges

An "illicit discharge" is any discharge to a drainage system that is not composed entirely of stormwater, with the exception of discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the MS4) and discharges resulting from fire-fighting activities.

Illicit discharges may take a variety of forms. Illicit discharges may enter the drainage system through direct or indirect connections. Direct connections may be relatively obvious, such as cross-connections of sewer services to the storm drain system. Indirect illicit discharges may be more difficult to detect or address, such as failing septic systems that discharge untreated sewage to a ditch within the MS4, or a sump pump that discharges contaminated water on an intermittent basis.

Some illicit discharges are intentional, such as dumping used oil (or other pollutant) into catch basins, a contractor illegally tapping a new sewer lateral into a storm drain pipe to avoid the costs of a sewer connection fee and service, and illegal dumping of yard wastes into surface waters.
Some illicit discharges are related to the unsuitability of original infrastructure to the modern regulatory environment. Examples of illicit discharges in this category include connected floor drains in old buildings, as well as sanitary sewer overflows that enter the drainage system. Sump pumps legally

connected to the storm drain system may be used inappropriately, such as for the disposal of floor washwater or old household products, in many cases due to a lack of understanding.

Elimination of some discharges may require substantial costs and efforts, such as funding and designing a project to reconnect sanitary sewer laterals. Others, such as improving self-policing of waste management, can be accomplished by outreach and training in conjunction with commitment to properly dispose of collected waste materials on a regular basis.

Regardless of the intention, when not addressed, illicit discharges can contribute high levels of pollutants, such as heavy metals, toxics, oil, grease, solvents, nutrients, and pathogens to surface waters.

1.3 Allowable Non-Stormwater Discharges

The following categories of non-storm water discharges are allowed under the MS4 Permit unless the permittee, USEPA or Massachusetts Department of Environmental Protection (MassDEP) identifies any category or individual discharge of non-stormwater discharge as a significant contributor of pollutants to the MS4:

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground water
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20))
- Uncontaminated pumped groundwater
- Discharge from potable water sources
- Foundation drains
- Air conditioning condensation
- Irrigation water, springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual car washing
- De-chlorinated swimming pool discharges
- Street wash waters
- Residential building wash waters without detergents

If these discharges are identified as significant contributors to the MS4, they must be considered an "illicit discharge" and addressed in the IDDE Plan (i.e., control these sources so they are no longer significant contributors of pollutants, and/or eliminate them entirely).

1.4 Receiving Waters and Impairments

Table 1-1 lists the "impaired waters" within the boundaries of UMass Chan Medical School's regulated area based on the 2022 Massachusetts Integrated List of Waters produced by MassDEP every two years. Impaired waters are water bodies that do not meet water quality standards for one or more designated use(s) such as recreation or aquatic habitat.

Table 1-1. Impaired Waters

University of Massachusetts Chan Medical School

Water Body Name	Segment ID	Category	Impairment(s)	Associated Approved TMDL
Lake Quinsigamond	MA51125	5	Dissolved Oxygen/DO Saturation, Enterococcus, Curly-leaf Pondweed*, Eurasian Water Milfoil / Myriophyllum Spicatum*, Fanwort*, Non-Native Aquatic Plants*, Water Chestnut*, Algae	*Total Maximum Daily Load of Phosphorus for Lake Quinsigamond and Flint Pond* (CN 115.0)

*TMDL not required (non-pollutant).
Category 4a Waters – impaired water bodies with a completed Total Maximum Daily Load (TMDL).
Category 4c Waters – impaired water bodies where the impairment is not caused by a pollutant. No TMDL required.
Category 5 Waters – impaired water bodies that require a TMDL.
"Approved TMDLs" are those that have been approved by EPA as of the date of issuance of the 2016 MS4 Permit.

1.5 IDDE Program Goals, Framework, and Timeline

The goals of the IDDE program are to find and eliminate illicit discharges to municipal separate storm sewer system and to prevent illicit discharges from happening in the future. The program consists of the following major components as outlined in the MS4 Permit:

- University policy to prohibit illicit discharges and enforce this prohibition,
- Storm system mapping,
- Inventory and ranking of outfalls,
- Dry weather outfall screening,
- Catchment investigations,
- Identification/confirmation of illicit sources,
- Illicit discharge removal,
- Follow-up screening, and
- Employee training.

The IDDE investigation procedure framework is shown in **Figure 1-1.** The required timeline for implementing the IDDE program is shown in **Table 1-2.**

Figure 1-1. IDDE Investigation Procedure Framework

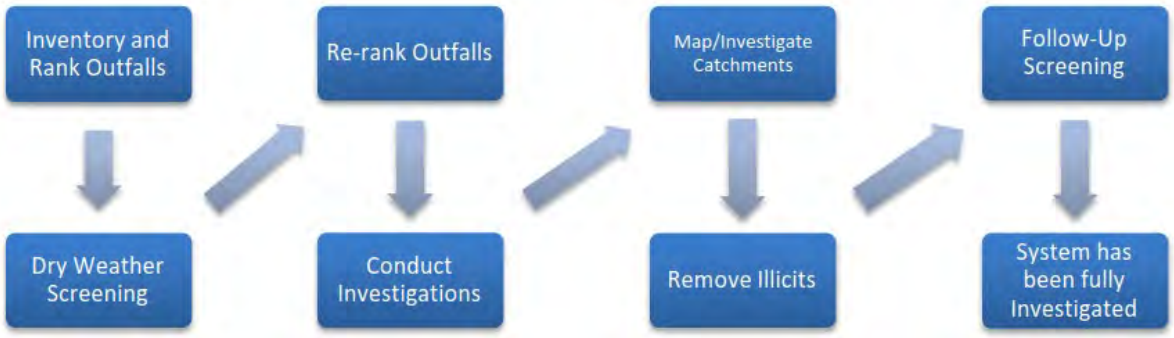

Table 1-2. IDDE Program Implementation Timeline[1]

IDDE Program Requirement	Completion Date from Effective Date of Permit						
	3 Years	4 Years	4.5 Years	5 Years	6 Years	10 Years	13 Years
Written IDDE Program Plan		X					
SSO Inventory		X					
Written Catchment Investigation Procedure			X				
Phase I Mapping				X			
Phase II Mapping							X
IDDE Regulatory Mechanism	X						
Dry Weather Outfall Screening					X		
Follow-up Ranking of Outfalls and Interconnections					X		
Catchment Investigations – Problem Outfalls						X	
Catchment Investigations – all Problem, High and Low Priority Outfalls							X

[1] UMass Chan Medical School is categorized as a new permittee since it was not covered under the 2003 MS4 Permit. Per Part 1.10.3 of the MS4 Permit, the IDDE regulatory mechanism or By-Law required by Part 2.3.6 shall be completed as soon as possible, but no later than three (3) years from the permit effective date for new permittees. All other IDDE deadlines required by Part 2.3.6 shall be extended by three (3) years.

1.6 Work Completed to Date

UMass Chan Medical School is categorized as a new permittee since it was not covered under the 2003 MS4 Permit. The following is a summary of the work completed to-date under UMass Chan Medical School's IDDE program.

In Permit Year 3, UMass Chan Medical School developed an Illicit Discharge Policy prohibiting discharges to the UMass Chan Medical School drainage system that are not stormwater. In Permit Year 4, the University conducted Phase I mapping and initial catchment delineations of outfall catchments, in addition to completing the written Illicit Discharge Detection and Elimination (IDDE) Plan.

In Permit Year 5, UMass Chan Medical School completed the following:

- The IDDE Plan was updated with current information based on progress and/or changes to the stormwater program in Permit Year 5, IDDE screening and sampling results, and changes in waterbody statuses (e.g., impairments).
- The Phase I Map that was developed during Permit Year 4 was advanced. The existing public facing web map was also maintained, which includes outfalls, receiving waters, open conveyances, interconnections, and stormwater best management practices (BMPs).
- Screening was conducted on UMass Chan Medical School's outgoing interconnections from the stormwater system for the presence of dry-weather flow and water quality sampling was completed where flow was present. During the inspections, observations were recorded on structure condition, visual and olfactory indications of illicit discharges, and presence of flow. All sampling records are stored in the University's MS4 database. Following the dry weather screening, the outgoing interconnections were ranked based on the screening and sampling results.

In Permit Year 6, UMass Chan Medical School completed the following:

- The IDDE Plan was updated with current information based on progress and/or changes to the stormwater program in Permit Year 6, IDDE screening and sampling results, and changes in waterbody statuses (e.g., impairments).
- The Phase I Map that was developed during Permit Year 4 was advanced. The existing public facing web map was also maintained, which includes outfalls, receiving waters, open conveyances, interconnections, and stormwater best management practices (BMPs).

UMass Chan Medical School has also prepared materials for an IDDE training for facility staff. This training is conducted annually and the training materials are continuously updated.

2 Authority and Statement of IDDE Responsibilities

2.1 Authority

UMass Chan Medical School is required to adopt a campus policy, to provide the University with adequate authority to prohibit illicit discharges and investigate suspected illicit discharges. In Permit Year 3 (Fiscal Year 2021), UMass Chan Medical School developed a IDDE policy in the form of a factsheet. The IDDE policy meets the requirements of the 2016 MS4 Permit, including the authorities listed above.

2.2 Statement of Responsibilities

The IDDE policy referenced above identifies the Environmental Health & Safety Department as responsible for implementing the IDDE program and enforcement.

3 Stormwater System Mapping

The 2016 MS4 Permit requires the storm system map to be updated in two phases as outlined below. The Environmental Health & Safety and Facilities, Engineering & Construction Departments are responsible for updating the stormwater system mapping pursuant to the 2016 MS4 Permit. UMass Chan Medical School will report on the progress towards completion of the storm system map in each annual report. Updates to the stormwater mapping will be included in the online map available at this link: https://umms.maps.arcgis.com/apps/webappviewer/index.html?id=b5a254d1ec284323a9dfd837acec62fc

3.1 Phase I Mapping

Phase I mapping must be completed within five (5) years of the effective date of the permit (July 1, 2023) and include the following information:

- Outfalls and receiving waters
- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems
- University owned stormwater treatment structures (i.e., Best Management Practices or BMPs)
- Water bodies identified by name and indication of all use impairments as identified on the most recent EPA approved Massachusetts Integrated List of Waters report
- Initial catchment delineations. Topographic contours and drainage system information may be used to produce initial catchment delineations.

UMass Chan Medical School has completed Phase I mapping and initial catchment delineations of outfall catchments.

3.2 Phase II Mapping

Phase II mapping must be completed within 13 years of the effective date of the permit (July 1, 2031) and include the following information:

- Outfall spatial location (latitude and longitude with a minimum accuracy of +/-30 feet)
- Pipes
- Manholes
- Catch basins
- Refined catchment delineations. Catchment delineations must be updated to reflect information collected during catchment investigations.

UMass Chan Medical School will update its stormwater mapping by July 1, 2031 to include the remaining Phase II information.

4 Sanitary Sewer Overflows (SSOs)

The 2016 MS4 Permit requires permittees to prohibit illicit discharges, including sanitary sewer overflows (SSOs), to the separate storm sewer system. SSOs are discharges of untreated sanitary wastewater from a municipal sanitary sewer that can contaminate surface waters, cause serious water quality problems and property damage, and threaten public health. SSOs can be caused by blockages, line breaks, sewer defects that allow stormwater and groundwater to overload the system, power failures, improper sewer design, and vandalism.

Upon detection of an SSO, UMass Chan Medical School will eliminate it as expeditiously as possible and take interim measures to minimize the discharge of pollutants to and from its MS4 until the SSO is eliminated. Upon becoming aware of an SSO to the MS4, UMass Chan Medical School will provide oral notice to EPA within 24 hours and written notice to EPA and MassDEP within five (5) days of becoming aware of the SSO occurrence.

Environmental Health & Safety will update the SSO inventory in this Plan when new SSOs are detected. The SSO inventory will be included in the annual report, including the status of mitigation and corrective measures to address each identified SSO.

5 Assessment and Priority Ranking of Outfalls

The 2016 MS4 Permit requires an assessment and priority ranking of outfalls in terms of their potential to have illicit discharges and SSOs and the related public health significance. The ranking helps determine the priority order for performing IDDE investigations and meeting permit milestones.

5.1 Outfall Catchment Delineations

A catchment is the area that drains to an individual outfall[2] or interconnection.[3] The catchments for each of the MS4 outfalls will be delineated to define contributing areas for investigation of potential sources of illicit discharges. Catchments are typically delineated based on topographic contours and mapped drainage infrastructure, where available. As described in **Section 3**, initial catchment delineations will be completed as part of the Phase I mapping, and refined catchment delineations will be completed as part of the Phase II mapping to reflect information collected during catchment investigations.

5.2 Outfall and Interconnection Inventory and Initial Ranking

The Environmental Health & Safety Department completed an initial outfall and interconnection inventory and priority ranking to assess illicit discharge potential based on existing information. The initial inventory and ranking was completed within four (4) years from the effective date of the permit.

The outfall and interconnection inventory identifies each outfall and interconnection discharging from the MS4, records its location and condition, and provides a framework for tracking inspections, screenings, and other IDDE program activities.

Outfalls and interconnections are classified into one of the following categories:

1. **Problem Outfalls**: Outfalls/interconnections with known or suspected contributions of illicit discharges based on existing information shall be designated as Problem Outfalls. This shall include any outfalls/interconnections where previous screening indicates likely sewer input. Likely sewer input indicators are any of the following:

    - Olfactory or visual evidence of sewage,

[2] **Outfall** means a point source as defined by 40 CFR § 122.2 as the point where the municipal separate storm sewer discharges to waters of the United States. An outfall does not include open conveyances connecting two municipal separate storm sewers or pipes, tunnels or other conveyances that connect segments of the same stream or other waters of the United States and that are used to convey waters of the United States. Culverts longer than a simple road crossing shall be included in the inventory unless the permittee can confirm that they are free of any connections and simply convey waters of the United States.

[3] **Interconnection** means the point (excluding sheet flow over impervious surfaces) where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is conveyed to waters of the United States or to another storm sewer system and eventually to a water of the United States.

- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine.

Dry weather screening and sampling, as described in **Section 6** of this IDDE Plan and Part 2.3.4.7.b of the MS4 Permit, is not required for Problem Outfalls.

2. **High Priority Outfalls**: Outfalls/interconnections that have not been classified as Problem Outfalls and that are:

    - Discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds
    - Determined by the permittee as high priority based on the characteristics listed below or other available information.

3. **Low Priority Outfalls**: Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed below or other available information.

4. **Excluded outfalls**: Outfalls/interconnections with no potential for illicit discharges may be excluded from the IDDE program. This category is limited to roadway drainage in undeveloped areas with no dwellings and no sanitary sewers; drainage for athletic fields, parks or undeveloped green space and associated parking without services; cross-country drainage alignments (that neither cross nor are in proximity to sanitary sewer alignments) through undeveloped land.

Outfalls will be ranked into the above priority categories (except for excluded outfalls, which may be excluded from the IDDE program) based on the following characteristics of the defined initial catchment areas, where information is available. Additional relevant characteristics, including location-specific characteristics, may be considered but must be documented in this IDDE Plan.

- **Past discharge complaints, reports, and screening results.**

- **Discharging to Area of Concern to Public Health** – outfalls or interconnections that discharge to public beaches, recreational areas, drinking water supplies and/or shellfish beds.

- **Impaired Waterbodies –** discharges to waters impaired for bacteria according to the most recent 303(d) list.

- **TMDL Watershed** – discharges to waters with an approved TMDL where illicit discharges may contribute to the pollutant of concern.

- **Density of generating sites within Catchment** – Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges, based on land use codes or local knowledge.

5.3 Follow-up Ranking of Outfalls and

Interconnections

An updated inventory and ranking will be provided in each annual report. The inventory will be updated annually to include data collected in connection with dry weather screening and other relevant inspections. Based on guidance in the permit, the outfalls identified as Problem Outfalls in Permit Year 4 prioritization remain problem outfalls for the permit requirements. Outfalls/interconnections where dry weather screening information was found indicating sewer input to the MS4, or sampling results indicated sewer input, will be considered likely to contain illicit discharges from sanitary sources and will be ranked at the top of the High Priority Outfalls (Highest) category for investigation.

Table 5-1 provides the most recent UMass Chan Medical School outfall inventory and priority ranking.

Table 5-1. Outfall and Interconnection Inventory and Priority Ranking Matrix

Worcester, Massachusetts
Revision Date: 6/30/2023
Total Outfalls/Interconnections in Urban Area: 7
Problem Outfalls/Interconnections: 0
Highest Priority Outfalls/Interconnections: 1
High Priority Outfalls/Interconnections: 6
Low Priority Outfalls/Interconnections: 0

Outfall ID	Receiving Water		Reports or Complaints of Potential Illicit Discharges?[1]	Discharging to Area of Concern to Public Health?[2]				Receiving Water Quality[3]	TMDL Watershed[4]	Density of Generating Sites within Catchment[5]	Outfalls with Screening Results that Indicate Likely Sewer Input[6]	Score	Priority Ranking
Information Source			UMass Chan Records	a	b	c	d	Impaired Waters List	Mass DEP	Land Use/GIS Maps,	Screening and Sampling Records		
Scoring Criteria			Yes = 40 (Problem outfall) No = 0	Yes = 6 No = 0				Bacteria = 6 Other = 2 None = 0	Yes = 2 No = 0	High = 3 Medium = 2 Low = 0	Yes = 30 No = 0		Problem => 50 Highest Priority => 30 High Priority => 6 Low Priority < 6
A	B	C	D	E	F	G	H	I	K	L		M	N
UMMS_IC_1	MA51125	Lake Quinsigamond via interconnection with City of Worcester MS4	0	0	6	0	0	6	2	3	0	17	High Priority
UMMS_IC_2	MA51125	Lake Quinsigamond via interconnection with City of Worcester MS4	0	0	6	0	0	6	2	3	0	17	High Priority
UMMS_IC_3	MA51125	Lake Quinsigamond via interconnection with City of Worcester MS4	0	0	6	0	0	6	2	3	30	47	Highest Priority
UMMS_IC_4	MA51125	Lake Quinsigamond via interconnection with City of Worcester MS4	0	0	6	0	0	6	2	3	0	17	High Priority
UMMS_IC_5	MA51125	Lake Quinsigamond via interconnection with City of Worcester MS4	0	0	6	0	0	6	2	3	0	17	High Priority
UMMS_IC_6	MA51125	Lake Quinsigamond via interconnection with City of Worcester MS4	0	0	6	0	0	6	2	3	0	17	High Priority
UMMS_IC_7	MA51125	Lake Quinsigamond via interconnection with City of Worcester MS4	0	0	6	0	0	6	2	3	0	17	High Priority

Table 5-1 Scoring Criteria:

[1] Previous reports of dumping, failing septic systems, odors, or other indications of potential illicit discharges.

[2] Outfalls/interconnections that discharge to or in the vicinity of any of the following areas, as determined via GIS evaluation of the following datalayers. Note: Discharges to an area of concern to public health will automatically be considered High Priority.

a. Public Beaches: https://www.mass.gov/info-details/massgis-data-state-designated-barrier-beaches
b. Recreational Areas (note: query layer for only PRIM_PURP = "R" to only review areas protected for recreation primarily): https://www.mass.gov/info-details/massgis-data-protected-and-recreational-openspace
c. Drinking Water Supplies: https://www.mass.gov/info-details/massgis-data-surface-water-supply-watersheds
d. Shellfish Beds: https://www.mass.gov/info-details/massgis-data-designated-shellfish-growing-areas

[3] Receiving water quality based on latest version of MassDEP Integrated List of Waters: https://www.mass.gov/lists/integrated-lists-of-waters-related-reports

- Bacteria: Discharges to waters or their tributaries listed as impaired for bacteria (Category 4a or 5 Waters). This may include waters impaired for Fecal Coliform or Escherichia coli.
  - Note: Discharges to bacteria impaired waters will automatically be considered High Priority, based on guidance provided in Appendix H of the 2016 Permit
- Other: Discharges to waters or their tributaries listed as impaired for pollutants other than bacteria (Category 4a or 5 Waters). This does not include waters impaired for non-pollutants.
- None: Discharges to waters or their tributaries with no water quality impairments (Category 2 or 3 Waters)

[4]Discharges to waters with an approved TMDL where illicit discharges have the potential to contain the pollutant identified as the cause of the impairment. Listing of approved TMDLs can be found here: https://www.mass.gov/lists/total-maximum-daily-loads-by-watershed

[5] Density of generating sites based on MassGIS Land Use layer: https://gisprpxy.itd.state.ma.us/arcgisserver/rest/services/AGOL/LandUse_2005/MapServer

- High Density: Catchment area contains any of the following Land Use Codes = 10, Multi-Family Residential; 11, High Density Residential; 15, Commercial; 16, Industrial; 17, Transitional; 18, Transportation; 19, Waste Disposal; 31, Urban Public/Institutional; 36, Nursery; 39, Junkyard
  - Note: Discharges with known sites with the high potential to generate pollutants that could contribute to illicit discharges within its catchment area should be included in this category. Examples include by are not limited to: car dealers, car washes, gas stations, garden centers, and industrial manufacturing areas.
- Medium Density: 50% or more of catchment area is made of up of Land Use Codes = 5, Mining; 7, Participation Recreation; 8, Spectator Recreation; 9, Water-Based Recreation; 12, Medium Density Residential; 13, Low Density Residential; 26, Golf Course; 29, Marina
- Low Density: 50% or more of catchment area is made of up of Land Use Codes = 1, Cropland; 2, Pasture; 3, Forest; 4, Non-Forested Wetland; 6, Open Land; 14, Saltwater Wetland, 20, Water; 23, Cranberry Bog; 24, Powerline/Utility; 25, Saltwater Sandy Beach; 34, Cemetery; 35, Orchard; 37, Forested Wetland; 38, Very Low Density Residential; 40, Brushland/Successional

[6] Previous screening results indicate likely sewer input if any of the following are true:

- Olfactory or visual evidence of sewage,
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine

6 Dry Weather Outfall Screening and Sampling

Dry weather flow is a common indicator of potential illicit connections. The MS4 Permit requires all outfalls/interconnections (excluding Problem and excluded Outfalls) to be inspected for the presence of dry weather flow. The Environmental Health & Safety Department is responsible for conducting dry weather outfall screening, starting with High Priority outfalls, followed by Low Priority outfalls, based on the initial priority rankings described in the previous section.

6.1 Weather Conditions

Dry weather outfall screening and sampling may occur when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring. For purposes of determining dry weather conditions, program staff will use precipitation data from the following weather stations:

- KMAWORCE120 (Lakeview, Worcester) for main campus

6.2 Dry Weather Screening/Sampling Procedure

6.2.1 General Procedure

The dry weather outfall inspection and sampling procedure consists of the following general steps:

1. Identify outfall(s) to be screened/sampled based on initial outfall inventory and priority ranking
2. Acquire the necessary staff, mapping, and field equipment (see **Table 6-1** for list of potential field equipment)
3. Conduct the outfall inspection during dry weather:
    a. Mark and photograph the outfall
    b. Record the inspection information and outfall characteristics (using paper forms or digital form using a tablet or similar device) (see form in **Appendix A**).
    c. Look for and record visual/olfactory evidence of pollutants in flowing outfalls including odor, color, turbidity, and floatable matter (suds, bubbles, excrement, toilet paper or sanitary products). Also observe outfalls for deposits and stains, vegetation, and damage to outfall structures.
4. If flow is observed, sample and test the flow following the procedures described in the following sections.
5. If no flow is observed, but evidence of illicit flow exists (illicit discharges are often intermittent or transitory), revisit the outfall during dry weather within one week of the initial observation, if practicable and necessary, to perform a second dry weather screening and sample any observed flow. Other techniques can be used to detect intermittent or transitory flows including conducting inspections during evenings or weekends and using optical brighteners.
6. Input results from screening and sampling into spreadsheet and/or directly into database with mobile device. Include pertinent information in the outfall/interconnection inventory and priority ranking.
7. Include all screening data in the annual report.

6.2.2 Field Equipment

Table 6-1 lists field equipment commonly used for dry weather outfall screening and sampling. Some may be duplicative (see below).

Table 6-1. Field Equipment – Dry Weather Outfall Screening and Sampling

Equipment	Use/Notes
Clipboard	For organization of field sheets and writing surface
Field Sheets	Field sheets for both dry weather inspection and Dry weather sampling should be available with extras
Mobile Device with Collector or Field Maps, including camera and GPS	Mobile device used for conducting dry weather screening/sampling. Also used for taking photos and geospatial locating of structures.
Chain of Custody Forms	To ensure proper handling of all samples
Pens/Pencils/Permanent Markers	For proper labeling
Nitrile Gloves	To protect the sampler as well as the sample from contamination
Flashlight/headlamp w/batteries	For looking in outfalls or manholes, helpful in early mornings as well
Cooler with Ice	For transporting samples to the laboratory
Digital Camera (or tablet or mobile phone with camera)	For documenting field conditions at time of inspection
Personal Protective Equipment (PPE)	Reflective vest, Safety glasses and boots at a minimum
GPS Receiver (or tablet or mobile phone with GPS)	For taking spatial location data
Water Quality Sonde	If needed, for sampling conductivity, temperature, pH
Water Quality Meter (if needed)	Handheld meters and test kits for testing for various water quality parameters such as ammonia, surfactants, and chlorine. See Table 6-2 below for meters used.
Test Kits	Have extra kits on hand to sample more outfalls than are anticipated to be screened in a single day
Label Tape	For labeling sample containers
Sample Containers	Make sure all sample containers are clean. Keep extra sample containers on hand at all times. Make sure there are proper sample containers for what is being sampled for (i.e., bacteria requires sterile containers).
Pry Bar or Pick	For opening catch basins and manholes when necessary
Sandbags (if needed)	For damming low flows in order to take samples
Small Mallet or Hammer	Helping to free stuck manhole and catch basin covers
Utility Knife	Multiple uses
Measuring Tape	Measuring distances and/or depth of flow
Safety Cones	Safety
Hand Sanitizer	Disinfectant/decontaminant
Zip Ties/Duct Tape	For making field repairs
Rubber Boots/Waders	For accessing shallow streams/areas

Equipment	Use/Notes
Sampling Pole/Dipper/Sampling Cage	For accessing hard to reach outfalls and manholes

6.2.3 Sample Collection and Analysis

If flow is present during a dry weather outfall inspection, a sample will be collected and analyzed for the required permit parameters[4] listed in **Table 6-2**. The general procedure for collection of outfall samples is as follows:

1. At least one day prior to outfall sampling, coordinate with Alpha Analytical (508-898-9220) to schedule the laboratory analysis. This coordination will include the time of delivery and/or courier drop-off and number of samples expected to be sent for analysis. Confirm with Alpha Analytical if any anticipated hold time issues anticipated.
2. Fill out all sample information on sample bottles and field sheets (see **Appendix A** for Sample Labels and Field Sheets).
3. Put on protective gloves (nitrile/latex/other) before sampling.
4. Collect sample with dipper or directly in sample containers. If possible, collect water from the flow directly in the sample bottle, or if necessary, use grab jar and pour into the lab sample bottles, so as to not disturb the preservatives in the sample bottles. Be careful not to disturb sediments.
5. If using a dipper or other device, triple rinse the device with distilled water and/or then in water to be sampled (not for bacteria sampling).
6. Use test strips, test kits, and field meters (rinse similar to dipper) for most parameters (see **Table 6-2**).
7. Place laboratory samples on ice for analysis of bacteria and pollutants of concern.
8. Fill out chain-of-custody form (**Appendix A**) for laboratory samples.
9. Contact Alpha Analytical for lab sample pick up.
10. Dispose of used test strips and test kit ampules properly.
11. Decontaminate all testing personnel and equipment.

In the event that an outfall is submerged, either partially or completely, or inaccessible, field staff will proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results. As necessary, field staff will continue to the next upstream structure until there is no longer an influence from the receiving water on the visual inspection or sampling.

Field test kits or field instrumentation are permitted for all parameters except indicator bacteria and any pollutants of concern. Field kits need to have appropriate detection limits and ranges. **Table 6-2** lists various field test kits and field instruments that can be used for outfall sampling associated with the 2016 MS4 Permit parameters, other than indicator bacteria and any pollutants of concern.

[4] Other potentially useful parameters, although not required by the MS4 Permit, include **fluoride** (indicator of potable water sources in areas where water supplies are fluoridated), **potassium** (high levels may indicate the presence of sanitary wastewater), and **optical brighteners** (indicative of laundry detergents).

Table 6-2. Sampling Parameters and Analysis Methods

Analyte or Parameter	Instrumentation (Portable Meter)	Field Test Kit
Ammonia	NA	Hach™ Ammonia Test Strips
Surfactants (Detergents)	NA	CHEMetrics™ K-9400
Chlorine	CHEMetrics™ V-2000, K-2513 Hach™ DR300 Pocket Colorimeter™ II	NA
Conductivity	EXTECH EC500	NA
Temperature	EXTECH EC500	NA
Salinity	EXTECH EC500	NA
Temperature	EXTECH EC500	NA
Indicator Bacteria: *E. coli* (freshwater) or Enterococcus (saline water)	EPA certified laboratory procedure (40 CFR § 136)	NA
Pollutants of Concern[1]	EPA certified laboratory procedure (40 CFR § 136)	NA

[1] Where the discharge is directly into a water quality limited water or a water subject to an approved TMDL, the sample must be analyzed for the pollutant(s) of concern identified as the cause of the water quality impairment.

Testing for indicator bacteria and any pollutants of concern must be conducted using analytical methods and procedures found in 40 CFR § 136.[5] Samples for laboratory analysis must also be stored and preserved in accordance with procedures found in 40 CFR § 136. **Table 6-3** lists analytical methods, detection limits, hold times, and preservatives for laboratory analysis of dry weather sampling parameters.

[5] 40 CFR § 136: http://www.ecfr.gov/cgi-bin/text-idx?SID=b3b41fdea0b7b0b8cd6c4304d86271b7&mc=true&node=pt40.25.136&rgn=div5

Table 6-3. Required Analytical Methods, Detection Limits, Hold Times, and Preservatives[4]

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
Ammonia	**EPA**: 350.2, **SM**: 4500-NH3C	0.05 mg/L	28 days	Cool ≤6°C, H_2SO_4 to pH <2, No preservative required if analyzed immediately
Surfactants	**SM**: 5540-C	0.01 mg/L	48 hours	Cool ≤6°C
Chlorine	**SM**: 4500-Cl G	0.02 mg/L	Analyze within 15 minutes	None Required
Temperature	**SM**: 2550B	*NA*	Immediate	None Required
Specific Conductance	**EPA**: 120.1, **SM**: 2510B	0.2 µs/cm	28 days	Cool ≤6°C
Salinity	**SM**: 2520	-	28 days	Cool ≤6°C
Indicator Bacteria: *E.coli* Enterococcus	*E.coli* **EPA**: 1603 **SM**: 9221B, 9221F , 9223 B **Other**: Colilert®, Colilert-18® *Enterococcus* **EPA**: 1600 **SM**: 9230 C **Other**: Enterolert®	*E.coli* **EPA**: 1 cfu/100mL **SM**: 2 MPN/100mL **Other**: 1 MPN/100mL *Enterococcus* **EPA**: 1 cfu/100mL **SM**: 1 MPN/100mL **Other**: 1 MPN/100mL	8 hours	Cool ≤10°C, 0.0008% $Na_2S_2O_3$
Total Phosphorus	**EPA**: Manual-365.3, Automated Ascorbic acid digestion-365.1 Rev. 2, ICP/AES4-200.7 Rev. 4.4 **SM**: 4500-P E-F	**EPA**: 0.01 mg/L **SM** : 0.01 mg/L	28 days	Cool ≤6°C, H_2SO_4 to pH <2
Total Nitrogen (Ammonia + Nitrate/Nitrite, methods are for Nitrate-Nitrite and need to be combined with Ammonia listed above.)	**EPA**: Cadmium reduction (automated)-353.2 Rev. 2.0, **SM**: 4500-NO_3 E-F	**EPA**: 0.05 mg/L **SM** : 0.05 mg/L	28 days	Cool ≤6°C, H_2SO_4 to pH <2

SM = Standard Methods

6.3 Interpreting Outfall Sampling Results

Outfall analytical data from dry weather sampling can be used to help identify the major type or source of discharge. **Table 6-4** shows values identified by the U.S. EPA and the Center for Watershed Protection as typical screening values for select parameters. These represent the typical concentration (or value) of each parameter expected to be found in stormwater. Screening values that exceed these benchmarks may be indicative of pollution and/or illicit discharges.

Table 6-4. Benchmark Field Measurements for Select Parameters

Analyte or Parameter	Benchmark
Ammonia	>0.5 mg/L
Conductivity	>2,000 µS/cm
Surfactants	>0.25 mg/L
Chlorine	>0.02 mg/L (detectable levels per the 2016 MS4 Permit)
Indicator Bacteria[6]: *E.coli* *Enterococcus*	*E.coli*: the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 126 colonies per 100 ml and no more than 10% of all such samples taken during the bathing season shall exceed 410 colonies per 100 ml *Enterococcus:* the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 35 colonies per 100 ml and no more than 10% of all such samples taken during the bathing season shall exceed 130 colonies per 100 ml

[6] Massachusetts Water Quality Standards: http://www.mass.gov/eea/docs/dep/service/regulations/314cmr04.pdf

7 Catchment Investigations

Once stormwater outfalls with evidence of illicit discharges have been identified, various methods can be used to trace the source of the potential discharge within the outfall catchment area. Catchment investigation techniques include but are not limited to review of maps, historic plans, and records; manhole observation; dry and wet weather sampling; video inspection; smoke testing; and dye testing. This section outlines a systematic procedure to investigate outfall catchments to trace the source of potential illicit discharges. All data collected as part of the catchment investigations will be recorded and reported in each annual report.

7.1 System Vulnerability Factors

The Environmental Health & Safety Department will review relevant mapping and historic plans and records to identify areas within the catchment with higher potential for illicit connections. The following information will be reviewed:

- Plans related to the construction of the drainage network
- Prior work on storm drains
- Complaint records related to SSOs

Based on the review of this information, the presence of any of the following **System Vulnerability Factors (SVFs)** will be identified for each catchment:

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages
- Any storm drain infrastructure greater than 40 years old
- Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance)
- History of multiple actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance).

A SVF inventory will be documented for each catchment (see **Table 7-1**), retained as part of this IDDE Plan, and included in the annual report.

Table 7-1. Outfall Catchment System Vulnerability Factor (SVF) Inventory

University of Massachusetts Chan Medical School

Revision Date: June 30, 2022

Outfall ID	Receiving Water	1 History of SSOs	2 Storm Drain Infrastructure >40 years Old	3 Septic with Poor Soils or Water Table Separation	4 History of Actions Addressing Septic Failure
Sample 1	XYZ River	Yes/No	Yes/No	Yes/No	Yes/No

Presence/Absence Evaluation Criteria:

1. History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages
2. Any storm drain infrastructure greater than 40 years old
3. Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather that poor owner maintenance)
4. History of multiple actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather that poor owner maintenance)

7.2 Dry Weather Manhole Inspections

UMass Chan Medical School will implement a dry weather storm drain network investigation that involves systematically and progressively observing, sampling and evaluating key junction manholes in the MS4 to determine the approximate location of suspected illicit discharges or SSOs.

The Environmental Health & Safety Department will be responsible for implementing the dry weather manhole inspection program and making updates as necessary. Infrastructure information will be incorporated into the storm system map, and catchment delineations will be refined based on the field investigation, where necessary. The SVF inventory will also be updated based on information obtained during the field investigations, where necessary.

Several important terms related to the dry weather manhole inspection program are defined by the MS4 Permit as follows:

- **Junction Manhole** is a manhole or structure with two or more inlets accepting flow from two or more MS4 alignments. Manholes with inlets solely from private storm drains, individual catch basins, or both are not considered junction manholes for these purposes.

- **Key Junction Manholes** are those junction manholes that can represent one or more junction manholes without compromising adequate implementation of the illicit discharge program. Adequate implementation of the illicit discharge program would not be compromised if the exclusion of a particular junction manhole as a key junction manhole would not affect the permittee's ability to determine the possible presence of an upstream illicit discharge. A permittee may exclude a junction manhole located upstream from another located in the immediate vicinity or that is serving a drainage alignment with no potential for illicit connections.

For all catchments identified for investigation, during dry weather, field crews will systematically inspect **key junction manholes** for evidence of illicit discharges. This program involves progressive inspection and sampling at manholes in the storm drain network to isolate and eliminate illicit discharges.

The manhole inspection methodology will be conducted in one of two ways (or a combination of both):

- By working progressively up from the outfall and inspecting key junction manholes along the way, or
- By working progressively down from the upper parts of the catchment toward the outfall.

For most catchments, manhole inspections will proceed from the outfall moving up into the system. However, the decision to move up or down the system depends on the nature of the drainage system and the surrounding land use and the availability of information on the catchment and drainage system. Moving up the system can begin immediately when an illicit discharge is detected at an outfall, and only a map of the storm drain system is required. Moving down the system requires more advance preparation and reliable drainage system information on the upstream segments of the storm drain system, but may be more efficient if the sources of illicit discharges are believed to be located in the upstream portions of the catchment area. Once a manhole inspection methodology has been selected, investigations will continue systematically through the catchment.

Inspection of key junction manholes will proceed as follows:

1. Manholes will be opened and inspected for visual and olfactory evidence of illicit connections. A sample field inspection form is provided in **Appendix A**.

2. If flow is observed, a sample will be collected and analyzed at a minimum for ammonia, chlorine, and surfactants. Field kits can be used for these analyses. Sampling and analysis will be in accordance with procedures outlined in **Section 6**. Additional indicator sampling may assist in determining potential sources (e.g., bacteria for sanitary flows, conductivity to detect tidal backwater, etc.).

3. Surrounding areas will be reviewed for potential overland sources of flow or pollutant inputs. Examples include PVC pipes from sump pumps, leaky dumpsters, material storage or

stockpiles, etc. If potential overland sources are identified, photographs will be taken and notes will be documented in the inspection form. If flow from an overland source is observed, a sample of the flow will be collected as close to the sources as possible.

4. Where sampling results or visual or olfactory evidence indicate potential illicit discharges or SSOs, the area draining to the junction manhole will be flagged for further upstream manhole investigation and/or isolation and confirmation of sources.

5. Subsequent key junction manhole inspections will proceed until the location of suspected illicit discharges or SSOs can be isolated to a pipe segment between two manholes.

6. If no evidence of an illicit discharge is found, catchment investigations will be considered complete upon completion of key junction manhole sampling.

7.3 Wet Weather Outfall Sampling

Where a minimum of one (1) System Vulnerability Factor (SVF) is identified based on previous information or the catchment investigation, a wet weather investigation must also be conducted at the associated outfall. The Environmental Health & Safety Department will be responsible for implementing the wet weather outfall sampling program and making updates as necessary.

Outfalls will be inspected and sampled under wet weather conditions, to the extent necessary, to determine whether wet weather-induced high flows in sanitary sewers or high groundwater in areas served by septic systems result in discharges of sanitary flow to the MS4.

Wet weather outfall sampling will proceed as follows:

1. At least one wet weather sample will be collected at the outfall for the same parameters required during dry weather screening.

2. Wet weather sampling will occur during or after a storm event of sufficient depth or intensity to produce a stormwater discharge at the outfall. There is no specific rainfall amount that will trigger sampling. To the extent feasible, sampling should occur during the spring (March through June) when groundwater levels are relatively high.

3. If wet weather outfall sampling indicates a potential illicit discharge, then additional wet weather source sampling will be performed, as warranted, or source isolation and confirmation procedures will be followed as described in **Section 7.4**.

4. If wet weather outfall sampling does not identify evidence of illicit discharges, and no evidence of an illicit discharge is found during dry weather manhole inspections, catchment investigations will be considered complete.

7.4 Source Isolation and Confirmation

Once the source of an illicit discharge is approximated between two manholes, more detailed investigation techniques will be used to isolate and confirm the source of the illicit discharge. The following methods may be used in isolating and confirming the source of illicit discharges:

- Sandbagging
- Smoke Testing
- Dye Testing
- CCTV/Video Inspections
- Optical Brightener Monitoring
- IDDE Canines
- Human vs Animal DNA Testing

These methods are described in the sections below.

Public notification is an important aspect of a detailed source investigation program. Prior to smoke testing, dye testing, or TV inspections, the Environmental Health & Safety Department will notify the campus community using multiple communication channels.

7.4.1 Sandbagging

This technique can be particularly useful when attempting to isolate intermittent illicit discharges or those with very little perceptible flow. The technique involves placing sandbags or similar barriers (e.g., caulking, weirs/plates, or other temporary barriers) within outlets to manholes to form a temporary dam that collects any intermittent flows that may occur. Sandbags are typically left in place for 48 hours, and should only be installed when dry weather is forecast. If flow has collected behind the sandbags/barriers after 48 hours it can be assessed using visual observations or by sampling. If no flow collects behind the sandbag, the upstream pipe network can be ruled out as a source of the intermittent discharge. Finding appropriate durations of dry weather and the need for multiple trips to each manhole makes this method both time-consuming and somewhat limiting.

7.4.2 Smoke Testing

Smoke testing involves injecting non-toxic smoke into drain lines and noting the emergence of smoke from sanitary sewer vents in illegally connected buildings or from cracks and leaks in the system itself. Typically a smoke bomb or smoke generator is used to inject the smoke into the system at a catch basin or manhole and air is then forced through the system. Test personnel are placed in areas where there are suspected illegal connections or cracks/leaks, noting any escape of smoke (indicating an illicit connection or damaged storm drain infrastructure). It is important when using this technique to make proper notifications to staff and students as well as local police and fire departments.

If the initial test of the storm drain system is unsuccessful then a more thorough smoke-test of the sanitary sewer lines can also be performed. Unlike storm drain smoke tests, buildings that do not emit smoke during sanitary sewer smoke tests may have problem connections and may also have sewer gas venting inside, which is hazardous.

It should be noted that smoke may cause minor irritation of respiratory passages. Staff and students with respiratory conditions may need to be monitored or evacuated from the area of testing altogether to ensure safety during testing.

7.4.3 Dye Testing

Dye testing involves flushing non-toxic dye into plumbing fixtures such as toilets, showers, and sinks and observing nearby storm drains and sewer manholes as well as stormwater outfalls for the presence of the dye. Similar to smoke testing, it is important to inform staff and students. Police, fire, and local public health staff should also be notified prior to testing in preparation of responding to citizen phone calls concerning the dye and their presence in local surface waters.

A team of two or more people is needed to perform dye testing (ideally, all with two-way radios). One person is inside the building, while the others are stationed at the appropriate storm sewer and sanitary sewer manholes (which should be opened) and/or outfalls. The person inside the building adds dye into a plumbing fixture (i.e., toilet or sink) and runs a sufficient amount of water to move the dye through the plumbing system. The person inside the building then radios to the outside crew that the dye has been dropped, and the outside crew watches for the dye in the storm sewer and sanitary sewer, recording the presence or absence of the dye.

The test can be relatively quick (about 30 minutes per test), effective (results are usually definitive), and inexpensive. Dye testing is best used when the likely source of an illicit discharge has been narrowed down to a few specific buildings.

7.4.4 CCTV/Video Inspection

Another method of source isolation involves the use of mobile video cameras that are guided remotely through stormwater drain lines to observe possible illicit discharges. IDDE program staff can review the videos and note any visible illicit discharges. While this tool is both effective and usually definitive, it can be costly and time consuming when compared to other source isolation techniques.

7.4.5 Optical Brightener Monitoring

Optical brighteners are fluorescent dyes that are used in detergents and paper products to enhance their appearance. The presence of optical brighteners in surface waters or dry weather discharges suggests there is a possible illicit discharge or insufficient removal through adsorption in nearby septic systems or wastewater treatment. Optical brightener monitoring can be done in two ways. The most common, and least expensive, methodology involves placing a cotton pad in a wire cage and securing it in a pipe, manhole, catch basin, or inlet to capture intermittent dry weather flows. The pad is retrieved at a later date and placed under UV light to determine the presence/absence of brighteners during the monitoring period. A second methodology uses handheld fluorometers to detect optical brighteners in water sample collected from outfalls or ambient surface waters. Use of a fluorometer, while more quantitative, is typically more costly and is not as effective at isolating intermittent discharges as other source isolation techniques.

7.4.6 IDDE Canines

Dogs specifically trained to smell human related sewage are becoming a cost-effective way to isolate and identify sources of illicit discharges. While not widespread at the moment, the use of IDDE canines is growing as is their accuracy. The use of IDDE canines is not recommended as a standalone practice for source identification; rather it is recommended as a tool to supplement other conventional methods, such as dye testing, in order to fully verify sources of illicit discharges.

7.4.7 Human vs Animal DNA testing

One additional method of source isolation can be conducted through laboratory testing. There are labs that can determine the source of the bacteria levels by classifying the DNA present as human or animal (dog, bird, horse, etc.). This can be used to confirm that there is truly an illicit discharge in the system, and the suspicious water quality parameters were not from surface flow into the closed drainage system.

7.5 Illicit Discharge Removal

When the specific source of an illicit discharge is identified, UMass Chan Medical School will exercise its authority as necessary to require its removal. The annual report will include the status of IDDE investigation and removal activities including the following information for each confirmed source:

- The location of the discharge and its source(s)
- A description of the discharge
- The method of discovery
- Date of discovery
- Date of elimination, mitigation or enforcement action OR planned corrective measures and a schedule for completing the illicit discharge removal
- Estimate of the volume of flow removed.

7.5.1 Confirmatory Outfall Screening

Within one (1) year of removal of all identified illicit discharges within a catchment area, confirmatory outfall or interconnection screening will be conducted. The confirmatory screening will be conducted in dry weather unless System Vulnerability Factors have been identified, in which case both dry weather and wet weather confirmatory screening will be conducted. If confirmatory screening indicates evidence of additional illicit discharges, the catchment will be scheduled for additional investigation.

7.6 Ongoing Screening

Upon completion of all catchment investigations and illicit discharge removal and confirmation (if necessary), each outfall or interconnection will be re-prioritized for screening and scheduled for ongoing screening once every five (5) years. Ongoing screening will consist of dry weather screening and sampling consistent with the procedures described in **Section 6** of this plan. Ongoing wet weather screening and sampling will also be conducted at outfalls where wet weather screening was required due

to System Vulnerability Factors and will be conducted in accordance with the procedures described in **Section 7.3**. All sampling results will be reported in the annual report.

8 Training

Annual IDDE training will be made available to all employees involved in the IDDE program. This training will at a minimum include information on how to identify illicit discharges and SSOs and may also include additional training specific to the functions of particular personnel and their function within the framework of the IDDE program. Training records will be maintained in **Appendix B**. The frequency and type of training will be included in the annual report.

9 Progress Reporting

The progress and success of the IDDE program will be evaluated on an annual basis. The evaluation will be documented in the annual report and will include the following indicators of program progress:

- Number of SSOs and illicit discharges identified and removed
- Number and percent of total outfall catchments served by the MS4 evaluated using the catchment investigation procedure
- Number of dry weather outfall inspections/screenings
- Number of wet weather outfall inspections/sampling events
- Number of enforcement notices issued
- All dry weather and wet weather screening and sampling results
- Estimate of the volume of sewage removed, as applicable
- Number of employees trained annually.

The success of the IDDE program will be measured by the IDDE activities completed within the required permit timelines.

Appendix A

Field Forms, Sample Bottle Labels, and Chain of Custody Forms

UMass Chan Medical School Bottle Label

Water Quality Sampling Program Sample

Sample ID:_____

Laboratory Analysis: _____

Preservative: (pre-populated by lab)

Date:_____

Time:_____

Collected By: _____

Bottle Type: (pre-populated by lab)

UMass Chan Medical School Inspection Form

IDDE Outfall Screening Form
Inspection Date:
Inspector Name:
Start Time:
Structure Found: ☐ Yes ☐ No
Type of Inspection: ☐ Dry Weather ☐ Wet Weather
Date of Last Storm:
Outfall Condition:
Outfall Condition: ☐ Good: Inspect Within 2 Years ☐ Fair: Inspect Within 1 Year ☐ Failing: Requires Immediate Action ☐ Poor: Requires Maintenance ☐ Unknown
Sedimentation: ☐ No Sedimentation ☐ Slight Sedimentation ☐ High Sedimentation
Illicit Discharge Potential: ☐ Potential ☐ Obvious ☐ Unlikely
Reason for Illicit Suspicion:
Visual Inspection:
Staining: ☐ No Staining ☐ Some Staining ☐ Significant Staining
Scour Protection Condition: ☐ Good: Inspect Within 2 Years ☐ Fair: Inspect Within 1 Year ☐ Failing: Requires Immediate Action ☐ Poor: Requires Maintenance ☐ Unknown
Vegetative Growth: ☐ None ☐ < 25% Vegetated ☐ < 50% Vegetated ☐ 50% Vegetated ☐ > 50% Vegetated ☐ 100% Vegetated
Flow: ☐ Yes ☐ No
Flow Clarity: ☐ Clear ☐ Cloudy ☐ Opaque
Color of Flow: ☐ N/A ☐ Clear ☐ Tea/Coffee ☐ Clear Black ☐ Orange-Red ☐ Tan to Light Brown ☐ Milky/Dirty Dishwater Gray ☐ Milky White ☐ White Crusty Deposits ☐ Greenish-Bluish ☐ Blue ☐ Purple ☐ Dark Red ☐ Other (describe in notes)
Floatables: ☐ Yes ☐ No
Sewage, Sheens & Scum: ☐ Yes ☐ No
Visual evidence of sewage?: ☐ Yes ☐ No
Odor: ☐ None ☐ Rotten Eggs/Hydrogen Sulfide ☐ Musty Odor ☐ Sharp, Pungent ☐ Sweet, Fruit ☐ Gasoline, Petroleum ☐ Chlorine ☐ Other (describe in notes)
Water Quality Sampling
Temperature (deg C):
Conductivity (micro-Siemens/cm):
pH:
Salinity (ppm):
Ammonia (mg/L):
Chlorine (mg/L):
Surfactants (mg/L):
Additional Parameters Screened:
Sample for Lab Collected: ☐ Yes ☐ No
Lab Sample 1 Test:

Lab Sample 1 Results:
Lab Sample 2 Test:
Lab Sample 2 Results:
Lab Sample 3 Test:
Lab Sample 3 Results:
Lab Sample 4 Test:
Lab Sample 4 Results:
Lab Sample 5 Test:
Lab Sample 5 Results:
Lab Sample 6 Test:
Lab Sample 6 Results:
Lab Sample 7 Test:
Lab Sample 7 Results:
Follow-Up Investigation Needed?
Notes:
End Time:

Example Chain of Custody Form from Alpha Analytical (acquired by Pace Labs in Spring 2024)

ALPHA — **CHAIN OF CUSTODY** PAGE 1 OF 1

Date Rec'd in Lab: 5/25/21 — ALPHA Job #: L2127178

8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220 — 320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Project Information

Project Name: Halifax IDDE

Project Location: Halifax, MA

Project #:

Project Manager:

ALPHA Quote #:

Client Information

Client: VHB

Address: 101 Walnut St

Watertown, MA 02471

Phone: 617.607.6164

Email: npacheco@vhb.com

Additional Project Information:

Turn-Around Time

☑ Standard ☐ RUSH

Date Due:

Report Information - Data Deliverables

☐ ADEx ☐ EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCP Analytical Methods — ☐ Yes ☐ No CT RCP Analytical Methods

☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)

☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)

☐ Yes ☐ No NPDES RGP

☑ Other State /Fed Program: CWA MS4 — Criteria

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA 5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☐ PCB ☐ PEST; TPH: ☐ Quant Only ☐ Fingerprint; E. coli; Total Phosphorus; TSS

SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	E. coli	Total Phosphorus	TSS	Sample Comments	Total # Bottles
27171-01	OT-07	5/24	9:30	SW	NP	X				1
-02	OE-03	5/24	10:30	SW	NP	X	X	X		3
-03	cb1228	5/24	11:30	SW	NP	X				1
-04	OWR-16	5/24	12:00	SW	NP	X				1
		5/24		SW	NP					
		5/24		SW	NP					
		5/24		SW	NP					
Container Type						P	P	P		
Preservative						H	D	A		

Container Type: P= Plastic, A= Amber glass, V= Vial, G= Glass, B= Bacteria cup, C= Cube, O= Other, E= Encore, D= BOD Bottle

Preservative: A= None, B= HCl, C= HNO_3, D= H_2SO_4, E= NaOH, F= MeOH, G= $NaHSO_4$, H= $Na_2S_2O_3$, I= Ascorbic Acid, J= NH_4Cl, K= Zn Acetate, O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[redacted]	5/25 1:30pm; 5/25/21; 5/25/21 1815	[redacted]	5/25/21 13:30; 5/25/21 1546; 5/25/21 1815

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

Appendix B

IDDE Employee Training Record

Illicit Discharge Detection and Elimination (IDDE)
Employee Training Record

University of Massachusetts Chan Medical School

Date	Title	Approximate Number of Attendees	Duration	Topics Covered
12/16/2021	Bay State Roads IDDE Training for MS4 Permitting	2	2 hours	This training focuses on Year 4 and future IDDE requirements and discusses best practices for implementation of IDDE programs.
2022 (training is required annually on date of hire)	Stormwater Awareness Safety Module (incorporated into Off-Site/Powerplant Facilities online training)	96	0.5 hours	This training focuses on characteristics of non-allowable dry weather discharges and how to identify and report potential illicit discharges in the field.
2023 (training is required annually on date of hire)	Stormwater Awareness Safety Module (incorporated into Off-Site/Powerplant Facilities online training)	100	0.5 hours	This training focuses on characteristics of non-allowable dry weather discharges and how to identify and report potential illicit discharges in the field.
2024 (training is required annually on date of hire)	Stormwater Awareness Safety Module (incorporated into Off-Site/Powerplant Facilities online training)	100	0.5 hours	This training focuses on characteristics of non-allowable dry weather discharges and how to identify and report potential illicit discharges in the field.

Appendix D – MS4 Infrastructure Plan

University of Massachusetts Chan Medical School

Operations and Maintenance (O&M) Plan

For Coverage Under The

National Pollutant Discharge Elimination System (NPDES)
General Permit for Municipal Separate Storm Sewer Systems (MS4)

Updated June 30, 2024

This document was compiled based on a template created by VHB for use by MS4 clients developed by modifying a template and standard operating procedures (SOPs) from the Central Massachusetts Regional Stormwater Coalition (CMRSWC).

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Appendix A: SPCC Plan

Appendix B: Winter Road Maintenance Best Practices Details

1 Introduction

This Operation and Maintenance (O&M) Plan covers the University of Massachusetts Chan Medical School (UMass Chan Medical School) facilities, infrastructure, and other assets, with sections organized around the following categories:

- Open space,
- Building and facilities,
- Vehicles and equipment,
- Catch basins,
- Streets and parking lots,
- Winter road maintenance, and
- Structural stormwater best management practices (BMPs).

The O&M Plan outlines inspection and maintenance procedures for these assets and facilities. There are two appendices with additional details covering winter road maintenance and spill prevention and control.

This O&M Plan has been prepared by UMass Chan Medical School in part to address O&M requirements[1] of the United States Environmental Protection Agency's (USEPA) 2016 National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts, hereafter referred to as "the permit, "2016 Massachusetts MS4 Permit," or "MS4 Permit."

More specifically, this plan addresses Minimum Control Measure 6, Good Housekeeping and Pollution Prevention for Permittee Owned Operations, by describing the activities and procedures UMass Chan Medical School will implement so that infrastructure is maintained in a timely manner to reduce the discharge of pollutants from the MS4. This document fulfills the permit requirement for UMass Chan Medical School to develop an inventory and written (hardcopy or electronic) operations and maintenance procedures for open spaces, buildings and facilities, vehicles and equipment, and infrastructure within four (4) years of the effective date of the permit. These details are outlined in Section 2.3.7.A of the MS4 Permit.

Employees and contractors who conduct maintenance and operations of campus open space, buildings, vehicles and equipment, streets and parking lots, and stormwater infrastructure are given a copy of this plan and provided with regular training on best practices.

[1] See Part 2.3.7.a.iii of the 2016 MS4 Permit for Infrastructure Operation and Maintenance program requirements.

2 Open Space

2.1 Overview and Inventory

This section establishes procedures for operations and maintenance of campus open spaces owned and operated by UMass Chan Medical School, as required in the permit. The following MS4 Permit requirements are addressed in this section:

- Develop an inventory of all campus open space owned by the permittee;
- Evaluate lawn maintenance and landscaping activities to ensure practices are protective of water quality, including reduced mowing frequencies, proper disposal of lawn clippings, and use of alternative landscaping materials (e.g., drought resistant planting);
- Establish procedures for management of trash containers in open spaces (scheduled cleanings; sufficient number);
- Establish procedures to address the proper use, storage, and disposal of pesticides, herbicides, and fertilizers including minimizing the use of these products and using only in accordance manufacturer's instruction;
- Establish procedures to address waterfowl congregation areas where appropriate to reduce waterfowl droppings from entering the MS4; and
- Establish procedures to address erosion or poor vegetative cover when the permittee becomes aware of it; especially if the erosion is within 50 feet of a surface water.

Section 2.2 includes UMass Chan Medical School's approach to these requirements.

Table 1 lists the campus open space owned and operated by UMass Chan Medical School, to which these O&M procedures apply.

Table 1 Inventory of Campus Open Spaces

Name	Address or Location	Size (acres)	Responsible Department	Features	Pesticides, Herbicides, and/or Fertilizer Used (Y/N)
Quad 1	North of South Road	1.4	Facilities Maintenance	Lawn	Y
Quad 2	North of South Road	1.5		Lawn	Y
Quad 3	South of South Road	1.4		Lawn	Y
Quad 4	South of South Road	1.9		Lawn	Y

2.2 O&M Procedures

Maintaining campus open space is important for the quality of life of UMass Chan Medical School's faculty, staff, students and visitors. This section focuses on procedures to protect the water quality of waterbodies in and around UMass Chan Medical School campus by preventing pollutants in campus open space from being carried in stormwater runoff to nearby waterbodies. UMass Chan Medical School will implement the following procedures in open spaces to reduce the discharge of pollutants from the MS4. **Table 1** describes these open spaces.

2.2.1 Mowing and Landscaping

Table 1 summarizes the spaces at UMass Chan Medical School which have lawns and landscaping. Grass clippings and other organic wastes from these sites are stored in an area outside of the 3rd level of the West garage, and then disposed of off-site.

As indicated in UMass Chan Medical School's Stormwater Management Program (SWMP), UMass Chan Medical School discharges into phosphorus impaired waterbodies or tributaries. Under MS4 Permit requirements, UMass Chan Medical School acknowledges that blowing organic waste material (grass cuttings, leaf litter) into the waterbody is strictly prohibited.

Mowing and Landscaping Best Practices

Mowing

- Mow grass to 2-3 inches in height for water retention and weed control.
- Mow frequently, while cutting no more than one third of grass height per mowing.
- Reduce mowing frequencies wherever possible by establishing low/no-mow areas in lesser-used spaces.
- Remove debris and trash from landscaped areas prior to mowing.
- Collect grass clippings and leaves after mowing. Do not blow or wash them into the street, gutter, or storm drains.
- Keep mowing equipment in good state of repair, including sharp blades and well-oiled lawn mowers and maintain equipment over grassy areas or in contained washout areas that do not drain to MS4 or directly to surface water waters.
- Follow proper fueling procedures of equipment to guard against petroleum products from mistakenly entering the stormwater system.
- When establishing new plantings, use alternative landscaping material such as drought resistant plants, and native plants, based on site conditions (e.g., sunlight, wetness, slope, use) and to reduce the need for irrigation and fertilizers and pesticides.

Irrigation

- Only irrigate at a rate that can infiltrate into the soil to limit run-off.
- Irrigate in the early morning; use irrigation water conservatively; and direct irrigation equipment to appropriate vegetated areas, rather than sidewalks, parking lots, or driveways.

- Avoid irrigating close to impervious surfaces such as parking lots and sidewalks.
- Turn off irrigation systems during periods of adequate rainfall.
- Repair broken sprinkler heads as soon as possible

2.2.2 Trash and Trash Container Management

In open space sites which have trash and/or recycling receptacles, these receptacles are emptied and inspected according to a weekly schedule (more frequently, as needed). UMass Chan Medical School follows the best practices outlined in Section 3.2.2 Trash and Recyclables Management for trash receptables within campus open space. Trash docks are located indoors. Generally, receptacles are not placed or washed in areas where they could leak or overflow directly to the MS4 or a water resource.

2.2.3 Pesticides, Herbicides, and Fertilizer Use

UMass Chan Medical School minimizes the use of pesticides, herbicides, and fertilizers in an effort to protect surrounding waterbodies. Standards set forth in Massachusetts regulations on plant nutrient application (330 CMR 31.00) are followed. The state requirements for fertilizers can be found here: https://www.mass.gov/doc/330-cmr-31-plant-nutrient-application-requirements-for-agricultural-land-and-non-agricultural/download. As required by the State, only fertilizer, pesticide, and herbicide products registered with the Department of Agricultural Resources are used.

Proper approval from the applicable Conservation Commission is obtained before applying chemicals within 25 feet of resource areas as defined in the MA Wetlands Protection Act.

In accordance with TMDL and impaired waterbody requirements of the MS4 Permit, UMass Chan Medical School will use slow-release fertilizers in addition to reducing fertilizer use to reduce runoff to nutrient impaired waterbodies, as indicated in UMass Chan Medical School's SWMP. Phosphorus will only be applied in areas where a soil test indicates that it is not present in sufficient quantities. Where possible, UMass Chan Medical School will use phosphorus-free fertilizer options.

Chemical storage, including pesticides, herbicides, and fertilizers, follows the procedures outlined in Section 3.2.1 Use, Storage and Disposal of Potential Pollutants.

Pesticides, Herbicides, and Fertilizer Use Best Practices

General

- Avoid application over impervious surfaces.
- Clean up any spills with dry clean up methods (i.e., do not hose down a spill site).
- Do not hose down paved areas after application to a storm drain or drainage ditch.
- Read all labels and use products only as directed.
- Mix chemicals using clean application equipment under cover in an area where accidental spills will not enter surface water or groundwater and will not contaminate the soil.
- Spot treat infected areas instead of the entire location.
- Calibrate application equipment regularly to ensure proper application and loading rates.

Fertilizers

- Test soils before applying fertilizer to determine what nutrients need to be supplemented. Prepare and apply only as much chemical as is needed.
- Do not apply fertilizers in the following conditions:
  - Between December 1 and March 1
  - To frozen and/or snow-covered soil
  - To saturated soils or soils that are frequently flooded
  - When rain is forecast for 24 hours
- Time fertilizer application methods for maximum plant uptake, usually in the fall and spring (e.g., between April 15 and October 15). When applying at the beginning and end of planting season, take into consideration the slower uptake rate of fertilizer by plants and adjust the fertilizer application accordingly.
- Fertilizers should only be applied by properly trained personnel.
- Never apply fertilizers in quantities exceeding the manufacturer's instructions. Instead, apply small amounts throughout the growing season.

Pesticides and Herbicides

- Pesticides should only be applied by licensed or certified applicators.
- Use alternatives to pesticides and herbicides, such as manual weed control, biological controls, and Integrated Pest Management strategies (learn more at: https://www.mass.gov/files/documents/2016/08/wk/ipm-kit-for-bldg-mgrs.pdf).
- Ensure that pesticide application equipment is capable of immediate shutoff in case of emergency.
- Never apply pesticides in quantities exceeding the manufacturer's instructions.
- Apply pesticides at the life stage when the pest is most vulnerable.
- Never apply pesticides if it is raining or immediately before expected rain.
- Establish setback distances from pavement, storm drains, and waterbodies, which act as buffers from pesticide application, with disease-resistant plants and minimal mowing.
- Do not apply pesticides within 100 feet of open waters or of drainage channels.

2.2.4 Pet Waste

Dog walking is not allowed on any UMass Chan Medical School campus. UMass Chan Medical School will continue to evaluate and review applicability of the MS4 Permit requirements related to pet waste.

2.2.5 Waterfowl Congregation

Congregation of waterfowl, including Canada Geese and others, can result in large nutrient loads to surrounding waterbodies due to the volume of fecal waste produced by the waterfowl. If waterfowl cannot be deterred, drainage from congregation areas is redirected away from drainage infrastructure and waterbodies. UMass Chan Medical School campus does not contain open water features, and therefore does not currently engage in waterfowl deterrent practices, but best practices for future consideration are listed below.

Best Practices to Discourage Waterfowl Congregation

- Instruct students and visitors not to feed waterfowl through signage or other public outreach methods and enforcement.
- Avoid mowing grass up to the edge of water to provide a natural vegetative buffer around a waterbody. This provides a small barrier for waterfowl to access the shoreline and provides a buffer where nutrient can be absorbed before reaching the waterbody.
- As necessary, conduct waterfowl deterrent practices such as reflective tape, strobe lights, addling eggs, harassment (human and/or dog), habitat manipulation, exclusionary fencing, and repelling devices.

2.2.6 Slope Erosion and Vegetative Cover

Ground disturbance and eroded slopes can result in moving soil, rock, or other material from up-slope areas into a waterbody, potentially transporting excess sediment, nutrients, and other contaminants. Controlling erosion by stabilizing disturbed areas and slopes can help maintain water quality.

Table 1 lists the responsible departments on each UMass Chan Medical School campus that conduct inspections for eroding areas during on-going operation and maintenance of open space.

Upon identification of eroding areas, measures are taken immediately to minimize erosion. These measures include installing energy dissipators, re-establishing vegetation, and installing temporary erosion controls, as needed. UMass Chan Medical School or its contractors install erosion controls during any ground disturbance within 250 feet of a water body or wetland resource or greater than 1-acre in size.

UMass Chan Medical School ensures all contractors comply with their National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit(s) for erosion control, as required. Following ground disturbance, the ground will be immediately stabilized with mulch or other practices and vegetation will be re-established as quickly as possible.

3 Buildings and Facilities

3.1 Overview and Inventory

This section covers UMass Chan Medical School's approach to maintaining its buildings and facilities. UMass Chan Medical School's MS4 Permit requires development of O&M procedures for buildings and facilities where pollutants are exposed to stormwater runoff. The UMass Chan Medical School-owned buildings and facilities that these procedures apply to are listed in **Table 2**.

The goal of these procedures is to minimize the potential for sites to generate pollutants that can runoff into the drainage system or nearby waterbodies. The following MS4 Permit requirements are addressed in this section:

- Develop an inventory of all permittee-owned buildings and facilities where pollutants are exposed to stormwater runoff, including administration buildings, laboratories, and parking garages;
- Evaluate the use, storage, and disposal of petroleum products and other potential stormwater pollutants and ensure employees or contractors responsible for handling products are trained;
- Ensure Spill Prevention Plans are in place, as applicable, and coordinate with the fire department as necessary;
- Develop management procedures for dumpsters and other waste management equipment; and
- Ensure parking lots are swept and areas surrounding facilities are kept clean to reduce runoff of pollutants.

Table 2 Inventory of Buildings and Facilities

Name	Building Type	Hazardous Material Storage (Y/N)	Hazardous Material Description (flammables, coerosives, toxics etc.)	Stormwater Pollution Prevention Plan (SWPPP) Required	Parking Lot (Y/N)
Power Plant	Power Plant	Y	Ignitable, toxic, corrosive	This facility is covered by a No Exposure Certification.	Y
Albert Sherman Center	Research Labs	Y	Ignitable, toxic, corrosive	N	Y
Employee "West" Parking Garage	Parking Garage	N		N	Y
Lazare Research Building	Research	Y	Ignitable, toxic, corrosive	N	Y
Benedict Building	Clinical	Y	Ignitable	N	N
Medical School Building	Education	Y	Ignitable, toxic, corrosive	N	Y
Hospital and Lakeside Emergency Wing	Hospital and Clinics	Y	Ignitable, toxic, corrosive	N	N
Shaw Building	Offices	N		N	Y
Ambulatory Care Center	Clinical	Y	Ignitable	N	N
Visitor "South" Parking Garage	Parking Garage	N		N	Y
Medical Office Building	Office	N		N	N
New Education Research Building (NERB)	Research	Y	Ignitable, toxic, corrosive	N	Y

3.2 O&M Procedures

UMass Chan Medical School values the maintenance and upkeep of buildings and facilities to ensure the comfort and safety of faculty, staff, students and visitors, while also preventing stormwater issues associated with these facilities and ensuring that these facilities perform at high levels. UMass Chan Medical School employees participate in training on buildings and facilities to ensure best practices and skills are kept up to date.

The O&M topics listed above are of particular concern under permit requirements.

3.2.1 Use, Storage and Disposal of Potential Pollutants

Potential pollutants stored at campus facilities include, but are not limited to, oil, gasoline, antifreeze, fertilizers, pesticides, and de-icing agents and additives. Minimizing or eliminating contact of materials containing potential pollutants with stormwater can significantly reduce pollution of receiving waters. Proper material handling and storage also contributes to employee health, an organized workplace, and efficient operations.

Spill prevention plans are put in place where applicable, based on inventories of material storage and potential pollutants. The attached Spill Prevention Control and Countermeasure (SPCC) Plan (Appendix A) applies to the facilities in **Table 2** where hazardous material occurs. The SPCC Plan has been reviewed with the Worcester Fire Department and UMass Chan Medical School meets regularly with the Fire Chief. Employees and contractors who are responsible for material use are trained on the SPCC plan and the guidelines below.

Best Practices for the Use, Storage, and Disposal of Potential Pollutants

- Follow manufacturer's guidance on proper storage, disposal, and use.
- Store chemicals under cover in an enclosed controlled, ventilated, well-lit, high and dry area that is cool and insulated to protect against temperature extremes. Ensure storage areas were constructed in accordance with local fire codes for storing flammable or combustible materials.
- Confine material storage indoors whenever possible. Plug or disconnect floor drains that lead to the stormwater system.
- Confine outdoor material storage to designated areas that are covered, on impervious surfaces, away from high traffic areas, and outside of drainage pathways.
- Equip storage areas with easily accessible spill cleanup materials and portable firefighting equipment. Emergency eyewash stations and emergency drench showers should be located near the storage area.
- Storage cabinets are locked with a weather proof sign that warns of the existence and danger of the materials inside visible at a distance of 25 feet, as appropriate.
- Include material safety data sheets (MSDS) in an accessible location(s).

- Keep materials in their original containers.
- If materials are not in their original containers, clearly label all storage containers with the name of the chemical, the expiration date, and handling instructions.
- Maintain an inventory of all raw and waste materials to identify leakage. Order new materials only when needed.
- Provide secondary containment for storage tanks and drums with sufficient volume to store 110 percent of the volume of the material.
- Inspect storage areas for spills or leaks and containment units for corrosion or other failures.
- Ensure that contaminated waste materials are kept in designated containers and stored in labeled, designated, covered, and contained areas.
- Dispose of excess or obsolete materials and associated waste materials in accordance with the manufacturer's specification and all applicable regulations.

3.2.2 Trash and Recyclables Management

All liquid and solid waste must be disposed of properly. Some of the most common sources of pollution at campus facilities are a result of littering, improper collection of debris, and improper disposal of waste. Staff and students can report trash container or dumpster issues by calling 508-856-3292 (Facilities Maintenance).

Best Practices for Waste Management

- Ensure a sufficient number of waste receptacles are in place, where appropriate. Additional receptacles will be placed in high traffic areas based on observation.
- All waste and recycling receptacles must be leak-tight with tight-fitting lids or covers.
- Keep lids on dumpsters and containers closed at all times unless adding or removing material. If using an open-top roll-off dumpster, cover it and tie it down with a tarp unless adding materials.
- Place waste or recycling receptacles indoors or under a roof or overhang whenever possible.
- Locate dumpsters on a flat, paved surface not over or adjacent to catch basins and install berms or curbs around the storage area to prevent run-on and run-off.
- Arrange for waste or recycling to be picked up regularly and disposed of at approved disposal facilities. Prior to transporting waste, trash, or recycling, ensure that containers are not leaking (double bag if needed) and properly secure containers to the vehicle.
- Never place hazardous materials, liquids, or liquid-containing wastes in a dumpster or recycling or trash container.
- Do not wash trash or recycling containers outdoors or in parking lots.
- Conduct periodic inspections and clean and sweep solid and liquid waste storage areas. Clean up any liquid leaks or spills with dry cleanup methods.

- In dumpster areas, regularly pick up surrounding trash and debris and regularly sweep the area

3.2.3 General Maintenance

The following best practices are applied when conducting general maintenance at UMass Chan Medical School owned facilities. These practices apply to all spaces facilities listed in **Tables 1 and 2**.

- When power washing buildings and facilities, ensure that the washwater does not flow into the storm system. Containment or filtering systems should be provided.
- When sanding, painting, power washing, etc., ensure that sites are properly prepared (e.g., use tarps) and cleaned (e.g., use dry cleaning methods) especially if they are near storm drains. Protect catch basins when maintenance work is conducted upgradient of them. Do not conduct when it is raining or prior to expected rain.
- When painting, use a drop cloth and clean up any spills immediately.
- Do not leave open containers on the ground where they may accidentally tip over.
- Buildings should be routinely inspected for areas of potential leaks.
- Do not discharge chlorinated water into the stormwater system. Water must be properly dechlorinated and tested before it is discharged.
- Streets and parking lots surrounding UMass Chan Medical School buildings and facilities should be swept and kept clean to reduce runoff of pollutants and debris to the stormwater system.

4 Vehicles and Equipment

4.1 Overview and Inventory

This section covers UMass Chan Medical School's approach to maintaining its vehicles and equipment. UMass Chan Medical School's MS4 permit requires establishment of procedures for the storage and maintenance of UMass Chan Medical School-owned vehicles and equipment, so as to minimize their contribution of pollution to waterbodies. This section addresses the following MS4 Permit requirements:

- Develop an inventory of permittee-owned vehicles and equipment;
- Establish procedures for the storage of vehicles.;
- Evaluate fueling areas owned or operated by the permittee; and
- Establish procedures to ensure vehicle wash waters are not discharged into the municipal storm sewer system or surface waters.

An inventory of these assets is included in **Table 3** below.

Table 3 Inventory of Vehicles and Equipment

Facility	Description	Vehicle and Equipment Type Stored
Loading Dock	Grounds equipment for facility maintenance	5 Kubota UTVs 2 street sweepers (and 1 scrubber) 1 front end loader 1 backhoe 1 skid steer 1 Holder snowblower 4 ride on lawnmowers
Loading Dock	Equipment for Receiving department	Trucks and vans
South Garage	Equipment for Parking and Police departments	Parking and police vehicles
Power Plant Parking Lot	Grounds equipment for facility maintenance	10 Grounds/Maintenance Trucks
Various Parking Lots	Equipment for miscellaneous departments, such as Animal Medicine	Vans, Cars and SUVs
Parking Garages	Parking for staff, students, and visitors.	Personal vehicles

4.2 O&M Procedures

UMass Chan Medical School strives to maintain its vehicles and equipment in good working order so as to provide high quality services and ensure the safety of faculty, staff, students, and visitors, all while preventing stormwater pollution from vehicles and equipment.

UMass Chan Medical School campus follows the following procedures for vehicles and equipment:

- Fleet and equipment are inspected at the time oil changes are completed, and managers ensure that leaking vehicles or equipment are not used.
- Vehicles with fluid leaks are stored indoors or containment is otherwise provided until repaired.
- Vehicles and equipment are fueled at the fuel tank outside of the power plant. Fueling areas include spill containment measures in order to minimize exposure.
- Vehicles and equipment are maintained and washed at the following locations: indoor loading dock, which includes containment and spill prevention measures.
- Materials used for maintaining and/or washing vehicles and equipment are used, stored, and disposed of in accordance with Section 3.2.1 Use, Storage and Disposal of Potential Pollutants.
- No wash water from vehicle and equipment maintenance areas is disposed of into the drainage system or allowed to flow overland off-site.

4.2.1 Vehicle and Equipment Maintenance

UMass Chan Medical School vehicles and equipment are inspected on a regular basis, and managers ensure that leaking vehicles or equipment are not used. Vehicles with fluid leaks are stored indoors or containment is otherwise provided until repaired. The following best practices are followed for vehicle and equipment storage, maintenance, and fueling.

Best Practices for Vehicle and Equipment Storage, Maintenance, and Fueling

Vehicle Storage

- Monitor vehicles and equipment for leaks and use drip pans as needed until repairs can be performed.
- When drip pans are used, avoid overtopping.
- Drain fluids from leaking or wrecked vehicles and parts as soon as possible. Dispose of fluids properly.
- Store and park vehicles on impervious surfaces and/or under cover or indoors whenever possible.

Vehicle Maintenance

- Conduct routine inspections of heavy equipment and vehicles to proactively identify maintenance needs or potential leaks.
- Perform routine preventive maintenance to ensure heavy equipment and vehicles are operating optimally.
- Recycle or dispose of waste properly and promptly.
- Sweep and pick up trash and debris as needed.
- Do not dump any liquids or other

materials outside, especially near or in storm drains or ditches.

Body Repair and Painting

- Conduct all body repair and painting work indoors.
- Minimize waste from paints and thinners. Calculate paint needs based on surface area.
- Use dry cleanup methods (vacuum, sweep) to clean up metal filings and dust and paint chips from grinding, shaving and sanding. Sweep debris from wet sanding after allowing it to dry overnight on the shop floor. Dispose of waste properly; never dump waste into storm or sanitary sewers.
- Use sanding tools equipped with vacuum capability to pick up debris and dust.
- Store all chemicals in accordance with Section 3.2.1 Use, Storage and Disposal of Potential Pollutants.

Fueling

- Fueling areas owned or operated by UMass Chan Medical School should be covered.
- Fueling areas should be evaluated to ensure that pollutants (e.g., gasoline or oil) do not enter the MS4.
- Follow procedures in Section 4.2.3 Fuel and Oil Handling.

4.2.2 Vehicle Washing Procedures

UMass Chan Medical School conducts vehicle washing at the indoor loading dock in designated wash areas. Outdoor washing of UMass Chan Medical School vehicles should be avoided unless wash water is contained in a tight tank or similar structure. Where no alternate wash system is available, and full containment of wash water cannot be achieved, the procedures in the following sections shall be followed.

Best Practices for Vehicle Washing

General

- Bring smaller vehicles to commercial washing stations.
- Where use of detergent cannot be avoided, use products that do not contain regulated contaminants. Use of a biodegradable, phosphate-free detergent is preferred.
- Maintain absorbent pads and drip pans to capture and collect spills or noticeable leaks observed during washing activities. Clean up any spills using the procedures described in the SPCC provided in Appendix A.
- Avoid discharge of any wash water directly to a surface water (e.g., stream, pond, drainage swale, etc.)
- Minimize use of water to the extent practical.
- Solids and particulate accumulation from the washing area shall be completed through periodic sweeping and/or cleaning.
- Designate separate areas for routine maintenance and vehicle cleaning. This helps prevent contamination of wash water by motor oils, hydraulic lubricants, greases, etc.
- Store all chemicals in accordance with Section 3.2.1 Use, Storage and Disposal of Potential Pollutants.

Outdoor Vehicle Washing

- Do not use solvents except in dedicated solvent parts washer systems or in areas not connected to a sanitary sewer.
- Do not power wash, steam clean or perform engine cleaning or undercarriage cleaning.
- Grassy and pervious (porous) surfaces may be used to promote direct infiltration of wash water, providing treatment before recharging groundwater and minimizing runoff to an adjacent stormwater system. Pervious surfaces or other infiltration-based systems shall not be used within wellhead protection areas or within other protected resources.
- Impervious surfaces discharging to engineered storm drain systems shall not discharge directly to a surface water unless treatment is provided. Treatment can include a compost-filled sock designed specifically for removal of petroleum and nutrients, such as the Filtrexx™ FilterSoxx product, or equal. The treatment device shall be positioned such that all drainage must flow through the device, preventing bypassing or short-circuiting.
- All adjacent engineered storm drain system catch basins shall have a sump. These structures shall be cleaned periodically.
- Heavily soiled vehicles or vehicles dirtied from salting or snow removal efforts shall not be washed outside, without exception.

Indoor Vehicle Washing Procedures

- Detergents shall not be used in areas where oil/water separators provide pre-treatment of drainage.
- Floor drains shall be connected to a sanitary sewer or tight tank. Floor drains discharging to adjacent surface water bodies or engineered storm drain systems shall be permanently plugged or otherwise abandoned before any vehicle wash activities are completed.
- Dry clean-up methods, such as sweeping and vacuuming, are recommended within garage facilities. Do not wash down floors and work areas with water.

Engine Washing and Steam Washing Procedures

- Do not wash parts outdoors.
- Maintain drip pans and smaller containers to contain motor oils, hydraulic lubricants, greases, etc. and to capture and collect spills or noticeable leaks observed during washing activities, to the extent practicable. Clean up any spills using the procedures described in the SPCC provided in Appendix A.
- Avoid cleaning with solvents except in dedicated solvent parts washer systems. Make use of pressure washing and steam cleaning.
- Recycle clean solutions and rinse water to the extent practicable.
- Wash water shall discharge to a tight tank or a sanitary sewer via an oil/water separator. Detergents shall not be used in areas where oil/water separators provide pre-treatment of drainage.

4.2.3 Fuel and Oil Handling

Spills, leaks, and overfilling can occur during handling of fuels and petroleum-based materials, representing a potential source of stormwater pollution, even in small volumes. This section provides guidance to UMass Chan Medical School staff on a variety of ways by which fuels and petroleum-based materials can be delivered, as well as steps to be taken when petroleum products (such as waste oil) are loaded onto vehicles for offsite disposal or recycling.

Best Practices for Fuel and Oil Handling

General

- There is no smoking while fuel handling is in process or underway. Sources of flame are kept away while fuel handling is being completed. This includes smoking, lighting matches, carrying any flame, or carrying a lighted cigar, pipe, or cigarette.
- The delivery or pickup truck driver should check in with the facility upon arrival.
- The facility representative should ensure that the appropriate spill cleanup and response equipment and personal protective equipment are readily available and easily accessible. Refer to the SPCC in Appendix A for examples of spill cleanup and response materials.
- The delivery vehicle's hand brake is set, and wheels are chocked while the activity is being completed.
- Catch basins and drain manholes are adequately protected.
- No tools are to be used that could damage fuel or oil containers or the delivery vehicle.
- No flammable liquid should be unloaded from any motor vehicle while the engine is operating, unless the engine of the motor vehicle is required to be used for the operation of a pump.
- Ensure that local traffic does not interfere with fuel transfer operations. If it does, make appropriate accommodations.
- The attending persons should watch for any leaks or spills. Any small leaks or spills should be immediately stopped, and spilled materials absorbed and disposed of properly. Follow the procedures in the SPCC in Appendix A.
- In the event of a large spill or one that discharges to surface waters or an engineered storm drain system, the facility representative should activate the facility's Stormwater Pollution Prevention Plan (SWPPP) and report the incident as specified in the document.

Delivery of Bulk Fuel

- The facility representative should check to ensure that the amount of delivery does not exceed the available capacity of the tank.
- A level gauge can be used to verify the level in the tank.
- If a level gauge is not functioning or is not present on the tank, the tank should be stick tested prior to filling.
- The truck driver and the facility representative should both remain with the vehicle during the delivery process.
- The truck driver and the facility

representative should inspect all visible lines, connections, and valves for leaks.

- When delivery is complete and the hoses are removed, buckets should be placed underneath connection points to catch drippings.
- The delivery vehicle should be inspected prior to departure to ensure that the hose is disconnected from the tank.
- The facility representative should inspect the fuel tank to verify that no leaks have occurred, or that any leaked or spilled material has been cleaned and disposed of properly.
- The facility representative should gauge tank levels to ensure that the proper amount of fuel is delivered and collect a receipt from the truck driver.

Delivery of Drummed Materials

- If damaged drums are found, they should be closely inspected for leaks or punctures.
- Breached drums should be removed to a dry, well-ventilated area and the contents transferred to other suitable containers.
- Drums should be disposed of in accordance with all applicable regulations.
- Drummed materials should not be unloaded outdoors during wet weather events.
- The truck driver and the facility representative should both remain with the vehicle during the delivery process.
- Drums should be handled and unloaded carefully to prevent damage.
- Upon completion of unloading, the facility representative should inspect the unloading point and the drums to verify that no leaks have occurred, that any leaked or spilled material has been cleaned up and disposed of properly, and that the unloaded drums are not leaking.
- The facility representative should check to ensure that the proper amount of fuel or other material is delivered and collect a receipt from the truck driver.

Removal of Waste Oil

- The truck driver and the facility representative should both remain with the vehicle during the tank draining process.
- When draining is complete and the hoses are removed, buckets should be placed underneath connection points to catch drippings.
- The facility representative should inspect the loading point and the tank to verify that no leaks have occurred, or that any leaked or spilled material has been cleaned up and disposed of properly.
- The facility representative should collect a receipt from the truck driver.
- When draining bulk oil tanks:
- The facility representative should verify that the volume of waste oil in the tank does not exceed the available capacity of the disposal hauler's vehicle.
- The disposal hauler vehicle should be inspected prior to departure to ensure that the hose is disconnected from the tank.

5 Catch Basins

5.1 Overview and Inventory

This section covers UMass Chan Medical School's approach to maintaining its catch basins. Maintaining catch basins in good working order is an important best practice and MS4 Permit requirement. The Facilities Maintenance (Grounds) Department and their contractors oversee and perform routine inspections, cleaning, and maintenance of the approximately 173 catch basins that are located within the MS4 regulated area. UMass Chan Medical School regularly reviews catch basin inspection data from previous years and prioritizes cleaning of catch basins that were 50% full or more at last annual cleaning.

This section addresses the following MS4 Permit requirements:

- Establish a schedule with a goal that the frequency of routine cleaning will ensure that no catch basin at any time will be more than 50% full.
- Document in each annual report the following information:
    - Any action taken in response to excessive sediment or debris loadings
    - Total number of catch basins
    - Number of catch basins inspected
    - Number of catch basins cleaned
    - Total volume or mass of material removed from catch basins.

Catch basin locations are provided on the UMass Chan Medical School stormwater map at the following link: https://umms.maps.arcgis.com/apps/webappviewer/index.html?id=b5a254d1ec284323a9dfd837acec62fc

Additionally, the catch basin inspection tracking dashboard which displays the current status of the inspections is available at the following link:
https://vhb.maps.arcgis.com/apps/dashboards/5e06efc6af844621a5206a73b31035a3

5.2 O&M Procedures

UMass Chan Medical School will implement the following catch basin inspection and cleaning procedures to reduce the discharge of pollutants from the MS4:

- Catch basins will be cleaned such that they are no more than 50 percent full[2] at any time.
- If a catch basin sump is more than 50 percent full during two consecutive routine inspections or cleaning events, the finding will be documented, the contributing drainage area will be investigated for sources of excessive sediment loading, and to the extent practicable, contributing sources will be addressed. If no contributing sources are found, the inspection and cleaning frequency will be increased.
- Catch basins located near construction activities are inspected and cleaned more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings (i.e., catch basins more than 50 percent full). Priority will also be given to catch basins that discharge to impaired waters.
- Properly dispose of collected sediments and catch basin cleanings (solid material, such as leaves, sand, and twigs removed from stormwater collection systems during cleaning operations).
- Cleanings from stormwater-only drainage systems may be disposed at any landfill that is permitted by MassDEP to accept solid waste. MassDEP does not routinely require stormwater-only catch basin cleanings to be tested before disposal, unless there is evidence that they have been contaminated by a spill or some other means.
- Screenings may need to be placed in a drying bed to allow water to evaporate before proper disposal. In this case, ensure that the screenings are managed properly to prevent pollution.
- Catch basin cleanings must be handled and disposed in accordance with compliance with the applicable MassDEP regulations, policies, and guidance (https://www.mass.gov/files/documents/2018/03/09/catch-basins.pdf).
- Collect data on the condition of the physical basin structure, its frame, and the grate, as well as on the quality of stormwater conveyed by the structure during inspections and cleanings.
- Make note of any potential pollutants or non-stormwater flows within the catch basin. Observations of oil sheen, discoloration, and/or trash and debris can indicate sources of pollution within the storm drain system. Observations of the following can indicate a potential connection of a sanitary sewer to the storm drain system: fecal matter, sewage odors, foaming (such as from detergent), optical enhancers (such as fluorescent dye added to laundry detergent).
- If any if signs of pollution and/or sanitary sewer connections are present, notify the Environmental Health & Safety Department.

[2] A catch basin sump is more than 50 percent full if the contents within the sump exceed one half the distance between the bottom interior of the catch basin to the invert of the deepest outlet of the catch basin

6 Streets and Parking Lots

6.1 Overview and Inventory

This section covers UMass Chan Medical School's approach to maintaining its streets and parking lots. As impervious surfaces, streets and parking lots can contribute to stormwater pollution. The following MS4 Permit requirements are covered in this section:

- Establish and implement procedures for sweeping and/or cleaning streets and permittee-owned parking lots.
- Document in each annual report the following information:
    - Number of miles cleaned, volume of material removed, or weight of material removed,
    - Street sweeping schedule to target areas with high pollutant loads.

UMass Chan Medical School owns and maintains the following roads and parking lots. Each of these properties is swept following the procedures outlined below.

- North Road
- South Road
- First Road
- Second Road
- Third Road
- Fifth Road
- Parking lots

6.2 O&M Procedures

All streets and UMass Chan Medical School-owned parking lots will be swept and/or cleaned a minimum of twice per year. More frequent sweeping is required for streets and parking lots in areas that discharge to certain nutrient-impaired waters, as indicated in UMass Chan Medical School's SWMP. Sweeping must be performed in these areas a minimum of two times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

Roadways without curbs or catch basins will be swept on an as needed basis based on inspection and community knowledge.

UMass Chan Medical School will store sweepings in an area outside of the 3rd level of the West garage in accordance with MS4 regulations. Once full, sweeping debris is disposed of off-site.

The UMass Chan Medical School will implement the following street and parking lot sweeping procedures to reduce the discharge of pollutants from the MS4:

Sweeping

- Street sweeping will be conducted in dry weather. Sweeping will not be conducted during or immediately after rain storms.
- Dry cleaning methods will used whenever possible, with the exception of very fine water spray for dust control. Avoid wet cleaning or flushing of the pavement.
- When necessary, parking bans will be enacted to facilitate sweeping on busy streets.
- Sweeping will be conducted in a manner that avoids depositing debris into storm drains.
- Sweeping equipment (mechanical, regenerative air, vacuum filter, tandem sweeping) will be selected depending on the level of debris. Brush alignment, sweeper speed, rotation rate, and sweeping pattern will be set to optimal levels to manage debris.
- Sweeping equipment will be routinely inspected and maintained to reduce the potential for leaks.

Disposal

- The reuse of sweepings is recommended by MassDEP. If street sweepings are reused (e.g., as anti-skid material or fill in parking lots), they will be properly filtered to remove solid waste, such as paper or trash, in accordance with their intended reuse. All reuse and/or disposal of street sweepings will be managed in accordance with current MassDEP policies and regulations. https://www.mass.gov/files/documents/2018/05/14/street-sweepings.pdf
- Sweepings intended for reuse can be stored for up to one year in approved temporary storage areas. Storage areas will be protected to prevent erosion and runoff and should be located away from wetland resource areas and buffer zones, surface water, or groundwater.
- Sweepings are classified as solid waste. If not reused, they will be disposed of at solid waste disposal sites.

7 Winter Road Maintenance

7.1 Overview

UMass Chan Medical School performs a variety of maintenance activities to ensure safe winter driving conditions on its roads and parking lots. This section addresses the following MS4 Permit requirements:

- Establish and implement procedures for winter road maintenance including
  - Use and storage of sand and salt
  - Minimize the use of sodium chloride and other salts
  - Evaluate opportunities for use of alternative materials
- Ensure snow disposal activities do not result in disposal of snow into waters of the United States.

7.2 O&M Procedures

UMass Chan Medical School understands that winter road operations can impact water quality. As a result, the UMass Chan Medical School will implement the following winter maintenance procedures to reduce the discharge of pollutants from the MS4:

- Minimize the use and optimize the application of sodium chloride and other salt[3] (while maintaining public safety) and consider opportunities for use of alternative materials.
- Optimize sand and/or chemical application rates through the use, where practicable, of automated application equipment (e.g., zero velocity spreaders), anti-icing and pre-wetting techniques, implementation of pavement management systems, and alternate chemicals. Maintain records of the application of sand, anti-icing and/or de-icing chemicals to document the reduction of chemicals to meet established goals.
- Prevent exposure of deicing product (salt, sand, or alternative products) storage piles to precipitation by enclosing or covering the storage piles. Implement good housekeeping, diversions, containment or other measures to minimize exposure resulting from adding to or removing materials from the pile. Store piles in such a manner as not to impact surface water resources, groundwater resources, recharge areas, and wells.
- UMass Chan Medical School uses road salt and sand as deicing materials for winter road maintenance (stored in covered salt shed adjacent to power plant), and Advance and Northern ice melt as deicing materials for winter sidewalk maintenance (stored on pallets in the loading lock of the medical school and Shaw buildings).
- The MS4 Permit prohibits snow disposal into waters of the United States. Snow disposal activities, including selection of appropriate snow disposal sites, will adhere to the Massachusetts Department of Environmental Protection Snow Disposal Guidance, Guideline No. BWR G2015-01

[3] For purposes of the MS4 Permit, salt means any chloride-containing material used to treat paved surfaces for deicing, including sodium chloride, calcium chloride, magnesium chloride, and brine solutions.

(Effective Date: December 21, 2015), located at:
http://www.mass.gov/eea/agencies/massdep/water/regulations/snow-disposal-guidance.html

Additional details on best practices are included in Appendix B.

8 Structural Stormwater BMPs

8.1 Overview and Inventory

Structural stormwater Best Management Practices (BMPs) are structural controls that are designed, built, and maintained to treat stormwater prior to being discharged to the drainage system or waterbody. BMPs often retain or infiltrate stormwater, allowing natural processes like settling, vegetation uptake, and filtration to remove pollutants from runoff. Examples include infiltration structures or swales, bioretention systems (e.g., rain gardens), wet ponds, detention basins, and infiltration/leaching basins or chambers.

An inventory of structural stormwater BMPs owned and/or maintained by UMass Chan Medical School is provided in **Table 4**. Campus-owned structural stormwater BMP locations are provided on the stormwater map at the following link:
https://umms.maps.arcgis.com/apps/webappviewer/index.html?id=b5a254d1ec284323a9dfd837acec62fc

Best practices for maintenance procedures are included below.

8.2 O&M Procedures

UMass Chan Medical School understands that in order to function properly and provide associated stormwater benefits, structural stormwater BMPs must be kept in good working order.

8.2.1 Inspections

Structural stormwater BMPs will be inspected annually at a minimum.

During inspections, the following BMP components will be reviewed for signs of potential issues, as listed below.

- **Inlet and Outlet Structures**
    - Blocked flow paths
    - Inlet is functioning as expected and flow from the contributing area is reaching the BMP
    - Outlet is performing as expected and flow is leaving the BMP appropriately
    - Structural damage
    - Vegetation is well established and there are no signs of erosion
    - Evaluate level of sedimentation and trash accumulation
- **BMP Treatment Areas**
    - Flow is dispersed evenly throughout the BMP
    - Erosion and rutting on the side slopes
    - Vegetation is well established, and invasive species are not present

    - For infiltration-type BMPs, review to evaluate whether standing water exists 72 hours after a rain event
    - Identify any signs of illicit discharges or vandalism
    - Evaluate level of sedimentation and trash accumulation
- **Underground Components**
    - Evaluate level of sedimentation and trash accumulation
    - Structural damage
    - Access to components are not compromised
    - Inspect dry wells after every major storm for the first 3 months once construction is complete and annually thereafter

During inspection, UMass Chan Medical School will assign a level of service to each item reviewed. Areas where follow up maintenance is warranted will be indicated. The following maintenance activities will occur at structural BMPs based on condition determined during annual inspections:

- Repair structural damage
- Remove excess sediment, trash, and debris
- Re-establish vegetation
- Remove invasive vegetation
- Re-grade areas, as necessary to ensure proper flow patterns
- Stabilize eroded areas via vegetation establishment, placement of stone, or other energy dissipation measures

UMass Chan Medical School maintains records of annual inspections and maintenance actions performed for each structural BMP using Esri's ArcCollector mobile app.

8.2.2 Maintenance

Regular maintenance is important to prevent against premature failure of BMPs. The table on the following page outlines maintenance schedule in general and for specific BMP types.

Table 5 BMP Maintenance Schedule

Activity	Time of Year	Frequency
General		
Mow	Spring through Fall	As needed, Annually minimum
Remove dead or invasive vegetation	Fall and spring	Bi-annually
Prune	Spring or fall	Annually
If identified during inspections as needed		
Replace dead vegetation	Spring	As Needed
Stabilize eroded areas	Spring through Fall	As Needed
Re-grade areas to ensure proper flow patterns	Spring through Fall	As Needed
Remove excess sediment, trash, and debris	Spring through Fall	As Needed
Repair structural damage	Spring through Fall	As Needed
Bioretention Areas and Rain Gardens		
Mulch void areas	Spring	Annually
Replace all media and vegetation and repair structural damage as needed	Late spring/early summer	As needed
Extended Dry Detention Basin and Wet Basin		
Mow upper stage, side slopes, embankment and emergency spillway	Spring through Fall	Bi-annually
Remove sediment from basin	Year round	As required, at least once every 5 years
Remove sediment, trash and debris	Spring through Fall	Bi-annually (Minimum)
Dry Well		
Inspect dry wells	Spring through Fall	After every major storm for the first 3 months after construction completion. Annually thereafter
Infiltration Basin		

Activity	Time of Year	Frequency
Mow/rake buffer area, side slopes, and basin bottom	Spring and fall	Bi-annually
Remove trash, debris and organic matter	Spring and fall	Bi-annually

Appendix A: SPCC Plan

SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN

February 19, 2024

Prepared for:
UMass Chan Medical School
55 Lake Avenue
Worcester, Massachusetts 01655

Prepared by:
Verdantas LLC
30 Shrewsbury Street
Holden, Massachusetts 01520

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ATTACHMENTS

A: Location Map
B: Facility Plan
C: Substantial Harm Determination
D: SPCC Facility Inspection Checklists
E: Example of Discharge Prevention Briefings and Training
F: Discharge Response Equipment Inventory
G: Oil Discharge Reporting Personnel
H: Verbal Spill Report
I: Written Spill Report
J: Discharge Incident Notification Telephone Numbers and Addresses

LIST OF ACRONYMS AND ABBREVIATIONS

AST	Aboveground Storage Tank
EPA	U.S. Environmental Protection Agency
MassDEP	Massachusetts Department of Environmental Protection
NPDES	National Pollutant Discharge Elimination System
PE	Registered Professional Engineer
POTW	Publicly Owned Treatment Works
SPCC	Spill Prevention, Control, and Countermeasure
STI	Steel Tank Institute
UST	Underground Storage Tank

INTRODUCTION

PURPOSE

The purpose of this Spill Prevention, Control, and Countermeasure (SPCC) Plan is to describe measures implemented by UMass Chan Medical School (UMCMS) to prevent oil discharges from occurring at 55 Lake Avenue North in Worcester, Massachusetts (Facility), and to prepare UMCMS to respond in a safe, effective, and timely manner to mitigate the impacts of a discharge.

This Plan has been prepared to meet the requirements of Title 40, *Code of Federal Regulations,* Part 112 (40 CFR part 112), and supersedes an earlier Plan developed to meet provisions in effect since 1974.

In addition to fulfilling requirements of 40 CFR part 112, this SPCC Plan is to be used: as a reference for oil storage information and testing records; as a tool to communicate practices on preventing and responding to discharges with employees; as a guide to Facility inspections; and as a resource during emergency response.

UMCMS management has determined that this Facility does not pose a risk of substantial harm under 40 CFR part 112, as recorded in the "Substantial Harm Determination" included in Attachment C of this Plan.

This Plan provides guidance on the following key actions that UMCMS must perform to comply with the SPCC rule:

- Complete monthly and annual Facility inspections as outlined in the Inspection, Tests, and Records section of this Plan (Section 3.7) using the inspection checklists included in Attachment D.
- Perform preventive maintenance of equipment, secondary containment systems, and discharge prevention systems described in this Plan as needed to keep them in proper operating condition.
- Conduct annual briefings and discharge prevention training as outlined in the Personnel, Training, and Discharge Prevention Procedures section of this Plan (Section 3.8) and document them as described herein.
- If either of the following occurs, submit to the EPA Region I Regional Administrator and the Massachusetts Department of Environmental Protection (MassDEP) the information as detailed in Section 5.4 of this Plan:
    - the Facility discharges more than 1,000 gallons of oil into or upon the navigable waters of the U.S. or adjoining shorelines in a single spill event; or
    - the Facility discharges oil in a quantity greater than 42 gallons in each of two spill events within any 12-month period.
- Review the SPCC Plan at least once every five years and amend it to include more effective prevention and control technology, if such technology will significantly

reduce the likelihood of a spill event and has been proven effective in the field at the time of the review. Plan amendments, other than administrative changes discussed above, must be recertified by a Professional Engineer (PE) on the certification page in Section 1.2 of this Plan.

- Amend the SPCC Plan within six months whenever there is a change in Facility design, construction, operation, or maintenance that materially affects the Facility's spill potential. The revised Plan must be recertified by a PE.

- Review the Plan on an annual basis. Update the Plan to reflect any administrative changes that are applicable, such as personnel changes or revisions to contact information, such as phone numbers. Administrative changes must be documented in the Plan review log of Section 1.4 of this Plan, but do not have to be certified by a PE.

PART 1: PLAN ADMINISTRATION

1.1 MANAGEMENT APPROVAL AND DESIGNATED PERSON (40 CFR 112.7)

UMCMS is committed to preventing discharges of oil to navigable waters and the environment. UMCMS will implement and regularly review and amend this Spill Prevention, Control, and Countermeasure (SPCC) Plan. This SPCC Plan has the full approval of UMCMS management and has committed the necessary resources to implement the measures described in this Plan.

The, Environmental, Health, and Safety Manager is the designated person accountable for oil spill prevention at the Facility and has the authority to commit the necessary resources to implement this Plan.

Authorized Facility Representative (Facility response coordinator): Jo-Ann Ranslow

Signature: _____

Title: Environmental, Health, and Safety Manager

Date: _____

1.2 PROFESSIONAL ENGINEER CERTIFICATION (40 CFR 112.3(D))

The undersigned Registered Professional Engineer is familiar with the requirements of Part 112 of Title 40 of the *Code of Federal Regulations* (40 CFR part 112) and has visited and examined the Facility, or has supervised examination of the Facility by appropriately qualified personnel. The undersigned Registered Professional Engineer attests that this Spill Prevention, Control, and Countermeasure Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and the requirements of 40 CFR part 112; that procedures for required inspections and testing have been established; and that this Plan is adequate for the Facility. [40 CFR 112.3(d)]

This certification in no way relieves the owner or operator of the Facility of his/her duty to prepare and fully implement this SPCC Plan in accordance with the requirements of 40 CFR part 112. This Plan is valid only to the extent that the Facility owner or operator maintains, tests, and inspects equipment, containment, and other devices as prescribed in this Plan.

_____	42455, Massachusetts
Signature	Professional Engineer Registration Number
Suzanne L. Pisano, P.E.	Practice Leader, EHS
Name	Title
Verdantas LLC	February 19, 2024
Company	Date

1.3 LOCATION OF SPCC PLAN (40 CFR 112.3(E))

In accordance with 40 CFR 112.3(e), a complete copy of this SPCC Plan maintained at the Facility in Environmental, Health, and Safety Manager's office. This office is normally accessible 8:00 AM to 5:00 PM Monday through Friday (closed on Saturdays and Sundays).

1.4 PLAN REVIEW (40 CFR 112.3 AND 112.5)

1.4.1 Changes in Facility Configuration

In accordance with 40 CFR 112.5(a), UMCMS periodically should review and evaluate this SPCC Plan for any change in the Facility design, construction, operation, or maintenance that materially affects the Facility's potential for an oil discharge, including, but not limited to:

- commissioning of containers;
- reconstruction, replacement, or installation of piping systems;
- construction or demolition that might alter secondary containment structures; or
- changes of product or service, revisions to standard operation, modification of testing/inspection procedures, and use of new or modified industry standards or maintenance procedures.

Amendments to the Plan made to address changes of this nature are referred to as technical amendments, and must be certified by a PE. Non-technical amendments can be done (and must be documented in this section) by the Facility owner and/or operator. Non-technical amendments include the following:

- change in the name or contact information (i.e., telephone numbers) of individuals responsible for the implementation of this Plan; or
- change in the name or contact information of spill response or cleanup contractors.

UMCMS must make the needed revisions to the SPCC Plan as soon as possible, but no later than six months after the change occurs. The Plan must be implemented as soon as possible following any technical amendment, but no later than six months from the date of the amendment. The Environmental, Health, and Safety Manager is responsible for initiating and coordinating revisions to the SPCC Plan.

1.4.2 Scheduled Plan Reviews

In accordance with 40 CFR 112.5(b), UMCMS should review this SPCC Plan at least once every five years (in the past, such reviews were required every three years). Revisions to the Plan, if needed, are made within six months of the five-year review. A registered Professional Engineer certifies any technical amendment to the Plan, as described above, in accordance with 40 CFR 112.3(d). This Plan is dated February 19, 2024. The next plan review is, therefore, scheduled to take place on, or prior to, February 19, 2029.

1.4.3 Record of Plan Reviews

Scheduled reviews and Plan amendments are to be recorded in the Plan Review Log (Exhibit 1-1). This log must be completed even if no amendment is made to the Plan as a result of the review. Unless a technical or administrative change prompts an earlier review of the Plan, the next scheduled review of this Plan must occur by February 19, 2029.

Exhibit 1-1: Plan Review Log

By	Date	Activity	PE Certification Required?	Licensing State, Registration No.	Comments
Suzanne L. Pisano, P.E.	2/19/2024	Revised and Sealed	Yes	Massachusetts, #42455	Revised to reflect current Facility conditions

1.5 FACILITIES, PROCEDURES, METHODS, OR EQUIPMENT NOT YET FULLY OPERATIONAL (40 CFR 112.7)

40 CFR 112 requires that the following facilities and equipment be in place. The Facility should complete the items below when resources can be committed:

- 40 CFR 112.8(c)(6) requires "Test or inspect each aboveground container for integrity on a regular schedule and whenever you make material repairs. You must determine, in accordance with industry standards, the appropriate qualifications for personnel performing tests and inspections, the frequency and type of testing and inspections, which take into account container size, configuration, and design (such as containers that are: shop-built, field-erected, skid-mounted, elevated, equipped with a liner, double-walled, or partially buried)." UMCMS should confirm Tanks 1,3,4,5,6,7 and 8 have been tested and/or inspected as required in 40 CFR 112.8(c)(6). If testing and/or inspection can not be confirmed, testing and/or inspection should be completed as soon as it is practical to do so.

1.6 CROSS-REFERENCE WITH SPCC PROVISIONS (40 CFR 112.7)

This SPCC Plan does not follow the exact order presented in 40 CFR part 112. Section headings identify, where appropriate, the relevant section(s) of the SPCC rule. Exhibit 1-2 presents a cross-reference of Plan sections relative to applicable parts of 40 CFR part 112.

Exhibit 1-2: SPCC Cross-Reference

Provision	Plan Section	Page
112.3(d)	Professional Engineer Certification	3
112.3(e)	Location of SPCC Plan	4
112.5	Plan Review	4 Exhibit 1-1
112.7	Management Approval	3
112.7	Cross-Reference with SPCC Rule	Exhibit 1-2
112.7(a)(3)	Part 2: General Facility Information Attachment A: Location Map Attachment B: Facility Plan	7 Attachment A Attachment B
112.7(a)(4)	5.4 Discharge Notification Attachment I – Verbal Spill Report Attachment J- Written Spill Report	26 Attachment I Attachment J
112.7(a)(5)	Part 5: Discharge Response	25
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112.7(d)	3.6 Practicability of Secondary Containment	15
112.7(e)	3.7 Inspections, Tests, and Records Attachment D - Facility Inspection Checklists	15 Attachment D
112.7(f)	3.8 Personnel, Training and Discharge Prevention Procedures	16
112.7(g)	3.9 Security	16
112.7(h)	3.10 Tank Truck Loading/Unloading	17
112.7(i)	3.11 Brittle Fracture Evaluation	17
112.7(j)	3.12 Conformance with Applicable State and Local Requirements	17
112.8(b)	4.1 Facility Drainage	19
112.8(c)(1)	4.2.1 Construction	20
112.8(c)(2)	4.2.2 Secondary Containment	20
112.8(c)(3)	4.2.3 Drainage of Diked Areas	21
112.8(c)(4)	4.2.4 Corrosion Protection	21
112.8(c)(5)	4.2.5 Partially Buried and Bunkered Storage Tanks	21
112.8(c)(6)	4.2.6 Inspection Attachment D - Facility Inspection Checklists	21 Attachment D
112.8(c)(7)	4.2.7 Heating Coils	22
112.8(c)(8)	4.2.8 Overfill Prevention System	22
112.8(c)(9)	4.2.9 Effluent Treatment Facilities	22
112.8(c)(10)	4.2.10 Visible Discharges	22
112.8(c)(11)	4.2.11 Mobile and Portable Containers	22
112.8(d)	4.3 Transfer Operations, Pumping and In-Plant Processes	23
112.20(e)	Certification of Substantial Harm Determination	Attachment C

* Only selected excerpts of relevant rule text are provided. For a complete list of SPCC requirements, refer to the full text of 40 CFR part 112.

PART 2: GENERAL FACILITY INFORMATION

Name:	UMass Chan Medical School Worcester Facility
Address:	55 Lake Avenue North Worcester, Massachusetts 01655
Type:	UMass Chan Medical School (UMCMS)
Date of Initial Operations:	1960s
Owner/Operator:	UMass Chan Medical School 55 Lake Avenue North Worcester, Massachusetts 01655
Primary contact:	Jo-Ann Ranslow, Environmental, Health, and Safety Manager (508) 735-6263

2.1 FACILITY DESCRIPTION (40 CFR 112.7(A)(3))

2.1.1 Location and Activities

The Facility consists of buildings of varying size representing: approximately 3.5 million square feet of classroom, laboratory, research, office, hospital, and support space; paved parking and access roads; and landscaped areas. The Facility includes the UMCMS and University of Massachusetts Memorial Medical Center (UMMMC) buildings (including the Albert Sherman Center, the Ambulatory Care Center, the Lakeside Addition, the Benedict Building, the Lazare Research Building [LRB], the Shaw Building, the Veteran's Administration (VA) Building, Biotech 1, Biotech 2, Biotech 3 and Biotech 4), the Power Plant, a vehicle fueling area, the heliport facility (including the garage and landing pad area for the Life Flight Air Ambulance service), and three parking garages. There are two high-rise buildings, which house research laboratories, offices, and classrooms.

UMCMS serves as the Commonwealth's only public medical school and is engaged in providing graduate medical education and biomedical research. It consists of three graduate schools: The School of Medicine; The Graduate School of Biomedical Sciences; and The Graduate School of Nursing. The campus also includes the UMMMC, which is a 370-bed, acute care facility. Additionally, the UMMMC serves as a Level I Trauma Center to the region and the home base of the emergency medical helicopter service Life Flight.

Attachments A and B of this Plan shows the location (Attachment A) and Facility Plan (Attachment B) of the Facility. The Facility Plan (Attachment B) shows the location of oil containers, buildings, loading and unloading areas.

2.1.2 Oil Storage

Aboveground oil storage at the Facility consists of 11 tanks, 36 mobile containers, 41 pieces of operating equipment and 10 transformers.

The capacities of oil containers present at the Facility are listed below and are also indicated on the Facility Plan (Attachment B). All containers with capacity of 55 gallons or more are included.

Exhibit 2-1: Oil Containers

ID	Storage capacity	Contents	Description
Fixed Storage			
1	9,600 gallons	Diesel fuel	Aboveground horizontal tank outdoors along Lake Avenue near the helipad
2	4,000 gallons	Diesel fuel	Aboveground horizontal tank outdoors near the helipad
3	6,000 gallons	Jet A aviation fuel	Aboveground vertical tank outdoors at the helipad
4	84,000 gallons	Fuel oil	Aboveground horizontal tank level B of the Power Plant
5	84,000 gallons	Fuel oil	Aboveground horizontal tank level B of the Power Plant
6	84,000 gallons	Fuel oil	Aboveground horizontal tank level B of the Power Plant
7	84,000 gallons	Fuel oil	Aboveground horizontal tank level B of the Power Plant
8	84,000 gallons	Fuel oil	Aboveground horizontal tank level B of the Power Plant
9	4,000/2,000 gallons	Diesel/Gasoline	Aboveground compartmentalized tank northwest corner of the Power Plant
10	100 gallons	Diesel fuel	Aboveground day tank outside northwest corner of the Power Plant
11	3,000 gallons	Diesel fuel	Aboveground horizontal tank level A of the Ambulatory Care Center
Mobile Containers			
D1 - D21	55 gallons	Various oil	First floor of Power Plant
D22 & 23	55 gallons	Waste cooking oil	Albert Sherman Center Room AS1-2020
D24 – D36	55 gallons	Waste oil	Chemical waste storage bunker

Operating Equipment			
E-1	145 gallons	Hydraulic oil	Med School Loading Dock
E-2	180 gallons	Hydraulic oil	South Garage
E-3	180 gallons	Hydraulic oil	South Garage
E-4	180 gallons	Hydraulic oil	South Garage
E-5	185 gallons	Hydraulic oil	Teaching Hospital
E-6	210 gallons	Hydraulic oil	Benedict Building
E-7	210 gallons	Hydraulic oil	Benedict Building
E-8	200 gallons	Hydraulic oil	Power Plant
E-9	250 gallons	Hydraulic oil	Albert Sherman Center
E-10	210 gallons	Hydraulic oil	Alber Sherman Center
E-11	210 gallons	Hydraulic oil	Biotech 1
E-12	185 gallons	Hydraulic oil	Biotech 1
E-13	210 gallons	Hydraulic oil	Biotech 2
E-14	185 gallons	Hydraulic oil	Biotech 2
E-15	185 gallons	Hydraulic oil	Biotech 3
E-16	150 gallons	Hydraulic oil	Biotech 3
E-17	134 gallons	Hydraulic oil	Biotech 4
E-18	134 gallons	Hydraulic oil	Biotech 4
E-19	250 gallons	Hydraulic oil	Biotech 5
E-20	250 gallons	Hydraulic oil	Biotech 5
LF	187 gallons	Jet A fuel	Life Flight Helicopter
FL	79 gallons	Fuel oil	Front Loader
C4	75 gallons	Hydraulic oil	Chiller 4 Murry Turbine Power Plant
C5	55 gallons	Type K oil	Chiller 5 York Compressor Power Plant
C6	55 gallons	Type K oil	Chiller 6 York Compressor Power Plant
SCTG	739 gallons	Hydraulic oil	Solar CTG Power Plant
GC	135 gallons	Hydraulic oil	Enerflex Gas Compressor Power Plant
G1	300 gallons	Hydraulic oil	Power Plant 1st Floor
G2	300 gallons	Hydraulic oil	Power Plant 1st Floor

G1H	60 gallons	Hydraulic oil	Power Plant 1st Floor
G2H	60 gallons	Hydraulic oil	Power Plant 1st Floor
G3	650 gallons	Hydraulic oil	Power Plant 1st Floor
G4	969 gallons	Diesel fuel	VA Building
GB1	400 gallons	Diesel fuel	Biotech 1
GB2	150 gallons	Diesel fuel	Biotech 2
GB3a	200 gallons	Diesel fuel	Biotech 3
GB3b	400 gallons	Diesel fuel	Biotech 3
GB4a	1,000 gallons	Diesel fuel	Biotech 4
GB4b	300 gallons	Diesel fuel	Biotech 4
GB4c	1,000 gallons	Diesel fuel	Biotech 4
GB5	500 gallons	Diesel fuel	Biotech 5
Transformers			
T1	1,376 gallons	Silicon fluid	Adjacent to Power Plant
T2	320 gallons	Silicon fluid	Adjacent to Power Plant
T5	320 gallons	Silicon fluid	Basic #1 on School Level A
T6	380 gallons	Silicon fluid	Student lab 2 on School Level 8
T7	380 gallons	Silicon fluid	Student lab 2 on School Level 8
T8	380 gallons	Silicon fluid	Student lab 2 on School Level 8
T9	380 gallons	Silicon fluid	Basic #2 on School Level 8
T10	380 gallons	Silicon fluid	Basic #2 on School Level 8
T12	389 gallons	Corn Oil "FR3"	Ambulatory Care Center
T13	353 gallons	Corn Oil "FR3"	Ambulatory Care Center

Total Oil Storage: 468,705 gallons

2.2 EVALUATION OF DISCHARGE POTENTIAL

2.2.1 Distance to Navigable Waters and Adjoining Shorelines and Flow Paths

The Facility property is generally flat. Surface water runoff from snow melt and during storms discharges via overland flow and from catch basins to Lake Quinsigamond, which is located approximately 500 feet east of the heliport. Catch basins are located throughout the property, with those nearest to the lake located approximately 500 feet west of the lake along Lake Avenue North, downgradient from Tanks 1 and 2. Water that does not enter the catch basins either infiltrates unpaved areas or evaporates.

2.2.2 Discharge History

The Environmental Health & Safety Manger has confirmed the Facility has not had any reportable discharges related to the oil containers covered in this Plan in the three years prior to the effective date of this Plan.

PART 3: Discharge Prevention - General SPCC Provisions

The following measures are implemented to prevent oil discharges during the handling, use, or transfer of oil products at the Facility. Oil-handling employees are to receive on-the-job training in the proper implementation of these measures.

3.1 COMPLIANCE WITH APPLICABLE REQUIREMENTS (40 CFR 112.7(A)(2))

This section is not applicable since there is no section of 40 CFR 112 for which equivalent environmental protection is being sought in lieu of said section.

3.2 FACILITY LAYOUT DIAGRAM (40 CFR 112.7(A)(3))

Figure 1 shows the general location of the Facility on a U.S. Geological Survey topographic map. The remaining list of figures demonstrate the location of storage tanks. As required under 40 CFR 112.7(a)(3), the Facility Plan indicates the container numbers, sizes, locations and contents.

3.3 SPILL REPORTING (40 CFR 112.7(A)(4))

Each employee is responsible for reporting spills or potential spill situations immediately to the Environmental, Health, and Safety Manager. It is the Environmental, Health, and Safety Manager's responsibility to notify the appropriate agencies. Attachment H provides details on UMCMS's emergency contacts. Copies of the spill response notification forms are included in Attachments I and J.

3.4 POTENTIAL DISCHARGE VOLUMES AND DIRECTION OF FLOW (40 CFR 112.7(B))

Exhibit 3-1 presents expected volume, discharge rate, general direction of flow in the event of equipment failure and means of secondary containment for different parts of the Facility where oil is stored, used, or handled.

Exhibit 3-1: Potential Discharge Volumes and Direction of Flow

Potential Event	Maximum volume released (gallons)	Maximum discharge rate	Direction of Flow	Secondary Containment
Tank 1 – Heliport (for Emergency Generator)				
Failure of aboveground tank (collapse or puncture below product level)	9,600	Gradual to instantaneous	East toward a storm sewer system	Double-Walled Tank
Tank overfill	1 to 2,400	60 gal/min	East toward a storm sewer system	Sorbent material
Pipe failure	9,600	60 gal/min	East toward a storm sewer system	Sorbent material
Leaking pipe or valve packing	9,600	1 gal/min	East toward a storm sewer system	Sorbent material

Potential Event	Maximum volume released (gallons)	Maximum discharge rate	Direction of Flow	Secondary Containment
Tank 2 - Heliport (Emergency Generator)				
Failure of aboveground tank (collapse or puncture below product level)	4,000	Gradual to instantaneous	East toward a storm sewer system	Double-Walled Tank
Tank overfill	1 to 2,400	60 gal/min	East toward a storm sewer system	Sorbent material
Pipe failure	1	10 gal/min	East toward a storm sewer system	Sorbent material
Leaking pipe or valve packing	1	1 gal/min	East toward a storm sewer system	Sorbent material
Tank 3- Heliport				
Failure of aboveground tank (collapse or puncture below product level)	6,000	Gradual to instantaneous	Northwest toward a storm sewer system	Double-Wall Secondary Containment
Tank overfill	1 to 2,400	60 gal/min	Northwest toward a storm sewer system	Sorbent material
Pipe failure	6,000	30 gal/min	Northwest toward a storm sewer system	Sorbent material
Leaking pipe or valve packing	6,000	1 gal/min	Northwest toward a storm sewer system	Sorbent material
Tanks 4 – 8 - Powerplant				
Failure of aboveground tank (collapse or puncture below product level)	84,000	Gradual to instantaneous	East toward Lake Quinsigamond (Contained in a concrete crypt)	Concrete Containment Vault
Tank overfill	1 to 2,400	60 gal/min	East toward Lake Quinsigamond (Contained in a concrete crypt)	Sorbent material
Pipe failure	84,000	60 gal/min	East toward Lake Quinsigamond (Contained in a concrete crypt)	Sorbent material
Leaking pipe or valve packing	84,000	1 gal/min	East toward Lake Quinsigamond (Contained in a concrete crypt)	Sorbent material
Tank 9 – Vehicle Fueling Area				
Failure of aboveground tank (collapse or puncture below product level)	6,000	Gradual to instantaneous	West toward a storm water sewer system	Double-Wall Secondary Containment
Tank overfill	1 to 2,400	60 gal/min	West toward a storm water sewer system	Sorbent material
Pipe failure	6,000	10 gal/min	West toward a storm water sewer system	Sorbent material
Leaking pipe or valve packing	6,000	1 gal/min	West toward a storm water sewer system	Sorbent material
Tank 10 – Day Tank				

Potential Event	Maximum volume released (gallons)	Maximum discharge rate	Direction of Flow	Secondary Containment
Failure of aboveground tank (collapse or puncture below product level)	100	Gradual to instantaneous	West toward a storm sewer system	Double-Walled Tank
Tank overfill	1 to 6,000	10 gal/min	West toward a storm sewer system	Sorbent material
Pipe failure	100	10 gal/min	West toward a storm sewer system	Sorbent material
Leaking pipe or valve packing	100	1 gal/min	West toward a storm sewer system	Sorbent material
Tank 11- Ambulatory Care Center				
Failure of aboveground tank (collapse or puncture below product level)	3,000	Gradual to instantaneous	Contained in a liquid-tight bermed room	Contained in liquid-tight, Bermed Room
Tank overfill	2,400	60 gal/min	Contained in a liquid-tight bermed room	Sorbent material
Pipe failure	3,000	10 gal/min	Contained in a liquid-tight bermed room	Sorbent material
Leaking pipe or valve packing	3,000	1 gal/min	Contained in a liquid-tight bermed room	Sorbent material
D1-D21 - Mobile Containers : Various Oil in Power Plant				
Failure of full drum (collapse or puncture below product level)	55	Gradual to instantaneous	Contained indoors on concrete floor	Sorbent material
D22-D36 - Mobile Containers: Waste Oil				
Failure of full drum (collapse or puncture below product level)	55	Gradual to instantaneous	Contained indoors on concrete floor	Sorbent material
Tank overfill	5	20 gal/min	Contained indoors on concrete floor	Sorbent material

3.5 CONTAINMENT AND DIVERSIONARY STRUCTURES (40 CFR 112.7(C))

Methods of secondary containment at the Facility include a combination of structures (e.g., dikes) and land-based spill response (e.g., sorbents) to prevent oil from reaching navigable waters and adjoining shorelines:

- For bulk storage containers (refer to Section 4.2.2 of this Plan):
  - **Double-wall construction.** Steel containment tanks are provided as described in Section 3.4 above and are further described in Section 4.2.2 of this Plan.
- For transformers and operating equipment:
  - **Sorbent material.** Spill cleanup kits that include absorbent material, booms, and other portable barriers are in areas shown on Attachment B. The materials are located within close proximity of the oil product storage and handling areas for rapid deployment should a spill occur. The response equipment inventory for the Facility is listed in Attachment F of this Plan. The inventory should be checked monthly to ensure that used material is replenished.

3.6 PRACTICABILITY OF SECONDARY CONTAINMENT (40 CFR 112.7(D))

UMCMS management has determined that secondary containment is practicable for tanks at the Facility. The secondary containment is described in Section 4.2.2 of this Plan.

3.7 INSPECTIONS, TESTS, AND RECORDS (40 CFR 112.7(E))

As required by the SPCC rule, UMCMS should perform the inspections, tests, and evaluations described later in this section, and in the respective sections that describe different parts of the Facility (e.g., Section 4.2.6 for bulk storage containers).

3.7.1 Daily and Monthly Inspection

A UMCMS employee should perform a complete walk-through of the Facility each day the Facility is occupied. This daily visual inspection involves looking for tank/piping damage or leakage, stained or discolored soils. Daily visual inspections are not required to be documented.

The checklists provided in Attachment D are used for monthly inspections by DSU personnel. The monthly inspections cover the following key elements:

- observing the exterior of aboveground storage tanks, pipes, and other equipment for signs of deterioration, leaks and corrosion;
- observing tank foundations and supports for signs of instability or excessive settlement;
- observing the tank fill and discharge pipes for signs of poor connection that could cause a discharge, and tank vent for obstructions and proper operation;
- verifying the proper functioning of overfill prevention systems; and
- checking the inventory of discharge response equipment and restocking as needed.

All problems regarding tanks, piping, containment, or response equipment should be immediately reported to the Facilities Department. Visible oil leaks from tank walls, piping, or other components must be repaired as soon as possible to prevent a larger spill or a discharge to navigable waters or adjoining shorelines. Pooled oil should be removed immediately upon discovery.

Written monthly inspection records are the responsibility of the Environmental, Health, and Safety Manger or a designated alternate and are to be maintained in the Environmental, Health, and Safety Manager's office for a minimum of three years.

3.7.2 Annual Inspection

Facility personnel are to perform a more thorough inspection of Facility equipment on an annual basis. This annual inspection complements the monthly inspection described above and is to be performed in September of each year using the checklists provided in Attachment D of this Plan.

Written annual inspection records are the responsibility of the Environmental, Health, and Safety Manager or a designated alternate and are to be maintained in the Environmental, Health, and Safety Manager's office for a minimum of three years.

3.7.3 Periodic Integrity Testing

In addition to the above monthly and annual inspections by Facility personnel, tanks with a capacity over 5,000 gallons are to be periodically tested or inspected by an outside certified tank inspector following the American Petroleum Institute (API) Standard 653 or Steel Tank Institute (STI) Standard SP-001, latest versions, as described in Section 4.2.6 of this Plan.

3.8 PERSONNEL, TRAINING, AND DISCHARGE PREVENTION PROCEDURES (40 CFR 112.7(F))

The Environmental, Health, and Safety Manager is the Facility designee responsible for oil discharge prevention, control, and response preparedness activities at the Facility.

UMCMS management should instruct oil-handling Facility personnel in the operation and maintenance of oil pollution prevention equipment, discharge procedure protocols, applicable pollution control laws, rules and regulations, general Facility operations, and the content of this SPCC Plan. Any new Facility personnel with oil-handling responsibilities should be provided with this same training prior to being involved in any oil operation.

The Facility personnel described in Sections 3.9.1 and 3.9.3 will be trained annually on spill and emergency response procedures, including the requirements of this SPCC Plan. The training is to be focused on ensuring continued understanding and adherence to the discharge prevention procedures presented in the SPCC Plan. The training should also highlight and describe known discharge events or failures, malfunctioning components, and recently implemented precautionary measures and best practices. Facility operators and other personnel will have the opportunity during the training to share recommendations concerning health, safety, and environmental issues encountered during Facility operations.

Records of the training and discharge prevention training are to be kept in the Environmental, Health, and Safety Manager's office for a minimum of three years.

3.9 SECURITY (40 CFR 112.7(G))

UMCMS operates 24 hours a day. Security is provided at UMCMS to promote Facility integrity, safeguard the Facility from theft and vandalism, and protect the community from potential hazards associated with theft and vandalism at the UMCMS site. The Facility is located in a well-lit area and is staffed at all times. The lights are placed to enable the discovery of discharges and to deter acts of vandalism. Additionally, the UMCMS campus is continuously patrolled by the University of Massachusetts Police Department (UMPD).

Access to Tank 1-3 are secured by a chain link fence and locked with a pad lock. Tanks 4-8 and Tank 11 are secured though badge access inside the powerplant and ambulatory center.

3.10 TANK TRUCK LOADING/UNLOADING RACK REQUIREMENTS (40 CFR 112.7(H))

These requirements are not applicable to this Facility since the Facility does not have a tank truck loading / unloading rack.

3.11 BRITTLE FRACTURE EVALUATION (40 CFR 112.7(I))

This section is not applicable since there are no field-constructed tanks used for oil storage at the Facility.

3.12 CONFORMANCE WITH STATE AND LOCAL APPLICABLE REQUIREMENTS (40 CFR 112.7(J))

3.12.1 Facility License for Storage of Greater than 10,000 Gallons of Flammable or Combustible Liquid

Under Massachusetts General Law (MGL) Chapter 148, Section 13 and the Board of Fire Prevention Regulations 527 CMR 1, a Facility is required to obtain a flammable/combustible storage license from the local licensing authority if the Facility exceeds the exempt flammable liquid storage threshold listed in 527 CMR 1. The Facility stores more than 10,000 gallons of oil (i.e., the threshold for oil storage listed in 527 CMR 40.03). Therefore, the Facility is required to maintain a license from the City.

3.12.2 Facility Permit for Storage of Flammable or Combustible Liquids

Massachusetts Fire Prevention Regulations 527 CMR 1 requires a facility to obtain a flammable/combustible storage permit from the local fire department for the storage of flammable and combustible liquid (i.e., oil, gasoline, etc.). This permit must be renewed annually. Therefore, the Facility is required to obtain an annual flammable and combustible material permit from the City Fire Department for the storage of various oils.

3.12.3 Individual Tank Permits

Massachusetts Fire Prevention Regulations 527 CMR 1 Section 1.12.8.40.2.2, 502 CMR 5, and MGL, Chapter 148, Section 37, require facilities to obtain a permit from the State Fire Marshal for individual tanks with a capacity of 10,000 gallons and greater that are used to store any liquid other than water. These permits must be renewed annually. The five 84,000-gallon tanks in the crypt are subject to this permitting requirement.

3.12.3 Inspection and Permit Records

Records of the inspections described in Section 5.1 will include the type of inspection performed, inspector's name, date of inspection, and noted deficiencies. The inspection forms will be kept on file at the Facility for a minimum period of three years. Additionally, records of monthly and annual inspections of tanks greater than 10,000 gallons will be maintained for five years beyond the demolition of the tank.

Copies of the license and permit identified in Sections 3.12.1 and 3.12.2 must be conspicuously posted at the Facility. Permits issued for individual ASTs (i.e., the permits described in Section 3.12.3) must be conspicuously posted near the ASTs to which they apply.

PART 4: DISCHARGE PREVENTION – SPCC PROVISIONS FOR ONSHORE FACILITIES (EXCLUDING PRODUCTION FACILITIES)

4.1 FACILITY DRAINAGE (40 CFR 112.8(B))

The Facility property is generally flat. Surface water runoff from snow melt and during storms discharges via overland flow and from catch basins to Lake Quinsigamond, which is located approximately 500 feet east of the heliport. Catch basins are located throughout the property, with those nearest to the lake located approximately 500 feet west of the lake along Lake Avenue North, downgradient from Tanks 1 and 2. Water that does not enter the catch basins either infiltrates unpaved areas or evaporates.

4.2 BULK STORAGE CONTAINERS (40 CFR 112.8(C))

Exhibit 4-1 summarizes the tank location, type, capacity, contents and discharge prevention method of bulk storage containers at the Facility.

Exhibit 4-1: List of Oil Containers

Tank #	Location	Type (Construction Standard)	Capacity (gallons)	Contents	Discharge Prevention & Containment
1	Lake Avenue near helipad	AST horizontal (unknown)	9,600	Diesel fuel	Double-walled tank
2	Helipad	AST horizontal (unknown)	4,000	Diesel fuel	Double-walled tank
3	Helipad	AST vertical (unknown)	6,000	Jet A Aviation Fuel	Double-walled secondary containment structure
4	Power Plant	AST horizontal (unknown)	84,000	No. 2 Fuel Oil	Concrete containment vault
5	Power Plant	AST horizontal (unknown)	84,000	No. 6 Fuel Oil	Concrete containment vault
6	Power Plant	AST horizontal (unknown)	84,000	No. 6 Fuel Oil	Concrete containment vault
7	Power Plant	AST horizontal (unknown)	84,000	No. 6 Fuel Oil	Concrete containment vault
8	Power Plant	AST horizontal (unknown)	84,000	No. 6 Fuel Oil	Concrete containment vault
9	Vehicle Fueling Area	AST horizontal (unknown)	4,000	Gasoline/ Diesel fuel	Double-walled secondary containment structure
10	Vehicle Fueling Area	AST horizontal (unknown)	100	Diesel fuel	Double-walled tank
11	Ambulatory Care Center	AST horizontal (unknown)	3,000	Diesel fuel	Contained in liquid-tight, bermed room

D1 – D21	First floor Power Plant	Steel Drum	55	Various Oils	Secondary containment Pallets, spill equipment
D22 & 23	Albert Sherman Center (Rm AS1-2020	Steel Drum	55	Waste Cooking Oil	Secondary containment Pallets, spill equipment
D24- D36	Chemical Waste Storage Bunker	Steel Drum	55	Waste Oil	Secondary containment Pallets, spill equipment

4.2.1 Construction (40 CFR 112.8(c)(1))

The oil containers used at the Facility are constructed of steel, concrete or plastic. Steel tanks commonly are used for bulk oil storage and are regarded as an accepted good engineering practice. Regardless of whether the construction standard of each of the tanks is known, the bulk storage containers at the Facility are compatible with the characteristics of the oil product they contain, and with operating temperature and pressure conditions.

If applicable, piping between fixed aboveground storage tanks is to be made of steel and placed aboveground on appropriate supports. The supports should have been designed to minimize erosion and stress.

4.2.2 Secondary Containment (40 CFR 112.8(c)(2))

Five 84,000-gallon steel ASTs, each measuring approximately 12 feet in diameter and 100 feet long, are contained within an underground concrete oil crypt, which acts as sufficient secondary containment.

The tanks at the heliport (i.e., Tanks 1, 2, and 3) are double-walled tanks. In addition, Tank 3 has a concrete secondary containment capacity of 6,600 gallons. A release would set off an alarm at the Power Plant console. If oil breached the secondary containment of the leaking tank, it would most likely flow into the oil/water separator located near the heliport. Water from the oil/water separator flows to the Upper Blackstone Water Pollution Abatement District sanitary sewer system, and oil would remain in the separator until removed/cleaned up by a spill contractor.

Tank 9 is provided with a concrete secondary containment structure with a capacity of 7,000 gallons and Tank 10 a double-walled tank that is contained within the Power Plant emergency generator enclosure. If oil breached either tank's secondary containment, it would flow into the oil/water separator located near the Power Plant. Water from the oil/water separator flows to the Upper Blackstone Water Pollution Abatement District sanitary sewer system, and oil would remain in the separator until removed/cleaned up by a spill contractor.

Tank 11 is located within a secured room with a recessed floor. A release from this tank would be contained in the room until removed/cleaned up by a spill contractor.

Indoor transformers (i.e., transformers other than Outdoor Transformers 1 and 2) are provided with secondary containment in the form of secured, bermed rooms or containment berms. Floor drains are not present near indoor transformers. A release from a transformer would collect in the secondary containment until UMCMS personnel and/or spill contractors could respond with appropriate cleanup equipment.

A release of hydraulic fluid from any of the elevators located at the Facility would be contained within the elevator shaft. Elevator shafts do not have floor drains and the hydraulic fluid would remain in place until it was cleaned up by Facility personnel, an elevator maintenance contractor, or a spill response contractor.
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4.2.3 Drainage of Diked Areas (40 CFR 112.8(c)(3))

This section is not applicable since the use of dikes are not present at the Facility.

4.2.4 Corrosion Protection (40 CFR 112.8(c)(4))

This section is not applicable since there are no underground tanks or underground piping at the Facility regulated by 40 CFR 112.

4.2.5 Partially Buried and Bunkered Storage Tanks (40 CFR 112.8(c)(5))

This section is not applicable since there are no partially buried or bunkered storage tanks at the Facility.

4.2.6 Inspections and Tests (40 CFR 112.8(c)(6))

Regular visual inspection of tanks, transfer lines, and pumps for signs of wetness and leaks is an important procedure that is part of the Facility personnel's daily routine. Routine visual inspection provides a reliable means of monitoring the integrity of aboveground oil storage tanks. At the Facility, daily visual inspections are suggested, consisting of a complete walk-through of the areas having oil storage to check for tank damage or leakage, and stained or discolored soils. If any indications of potential contributors to a discharge from the oil-containing systems are found, they are to be reported to the Environmental, Health, and Safety Manager and corrected.

Each month, a methodical visual reconnaissance of the Facility's oil storage facilities is to be performed. An inspector designated by the Environmental, Health, and Safety Manager is to conduct the inspections. Leaks from tank seams, gaskets, rivets, and bolts are to be corrected promptly. The inspector's observations are to be recorded on the forms provided in Appendix D and the documentation is to be maintained with the SPCC plan for a minimum of three years. Any items that could contribute to a discharge of oil are to be brought to the attention of the Environmental, Health, and Safety Manager and corrected. These actions are intended to reduce the likelihood of an oil discharge at the Facility significantly.

Integrity testing for Tanks 1,3,4,5,6,7 and 8 could not be confirmed. If integrity testing did not occur, the action(s) needed by UMCMS to correct this deficiency are described in Section 1.5.

4.2.7 Heating Coils (40 CFR 112.8(c)(7))

This section is not applicable since no tanks at the Facility have heating coils.

4.2.8 Overfill Prevention Systems (40 CFR 112.8(c)(8))

Facility personnel are to be present throughout the filling operation to monitor the product levels in the tanks to prevent overfilling or accidental spills.

4.2.9 Effluent Treatment Facilities (40 CFR 112.8(c)(9))

The Facility has an underground drainage system and operates two 6,000-gallon oil/water separators, which flow to the Upper Blackstone Water Pollution Abatement District sanitary sewer system. One oil/water separator is located at the entrance to the Power Plant and the other is located near the heliport. Storm water runoff from outside the Power Plant and heliport flow through the oil/water separators prior to leaving the UMCMS property. Catch basins located throughout other areas of the property convey storm water runoff from the paved parking areas and roadway to outfalls that discharge to Lake Quinsigamond.

4.2.10 Visible Discharges (40 CFR 112.8(c)(10))

Observed visible discharges from containers or appurtenances – including seams, gaskets, piping, pumps, valves, rivets, and bolts – are to be eliminated promptly.

Oil is to be promptly removed from the diked areas and disposed of according to the waste disposal method described in Part 5 of this Plan.

4.2.11 Mobile and Portable Containers (40 CFR 112.8(c)(11))

There are approximately 20 to 25 55-gallon drums of oil with oil capacities greater than 55 gallons at the Power Plant. Most of the drums are stored on secondary containment pallets. A release from the drums or oil-filled equipment would flow onto the Power Plant's concrete floor. Oil released on the main level of the Power Plant could enter metal grating and flow down to the lower level of the Power Plant. In the event that oil flowed into a floor drain, it would enter the sanitary sewer system, which leads to the Upper Blackstone Water Pollution Abatement District. Most floor drains at the Power Plant are collared, and the volume of oil of most containers is insufficient to reach a floor drain.

There are two, 55-gallon drums of waste cooking oil stored at the Albert Sherman Center in Room AS1-2020 that are stored on containment pallets. This oil is picked up twice per month for use as biodiesel. A release from these drums would flow to a concrete floor and would not leave the storage area.

The chemical waste storage bunker has a storage capacity of up to 12 55-gallon drums of waste oil. However, storage volumes of waste oil generally do not exceed 110 gallons at any given time. Drums storing waste oil are located on secondary containment pallets. A release from these drums would flow onto the concrete floor. It is possible that the oil could enter a floor drain, some of which are located within several feet from drum storage. Oil entering a

floor drain would enter the sanitary sewer system, which leads to the Upper Blackstone Water Pollution Abatement District.

There are 21, 55-gallon steel drums of oil stored on the first floor of the Power Plant, including waste oil, turbine fluid, and synthetic lubricant. Drums are stored on secondary containment pallets.

Sorbent material is available for spills for all drums. Any discharged oil is to be quickly contained and cleaned up using the appropriate spill cleanup equipment.

4.3 TRANSFER OPERATIONS, PUMPING, AND IN-PLANT PROCESSES (40 CFR 112.8(D))

Transfer operations at this Facility included:

- the transfer of oil from tanker trucks to the tanks; and
- the transfer of oil from tanks to its point of use.

To minimize the potential for a release of oil during the filling of tanks at the Facility, the procedures described in this Section will be implemented by UMCMS.

UMCMS does not operate a Tank Truck Loading/Unloading rack. Instead, each tank is equipped with an independent filling location. A Facility person with appropriate oil spill training must be present when deliveries are made so response can begin immediately should an incident occur. UMCMS has developed procedures for the fueling of tanks at the facility to minimize the likelihood of spills/releases occurring during the fueling of these tanks. These procedures are as follows:

- driver reports to shift supervisor on arrival;
- shift supervisor verifies that UMCMS is the customer by reviewing paperwork;
- shift supervisor verifies the sulfur content of the fuel is equal to or less than 0.5 percent for No. 6 oil, or that ultra-low sulfur diesel (ULSD) is provided for No. 2 fuel oil;
- engineer accompanies the driver to fill area;
- engineer and driver ensure that a screen is installed in the fill pipe;
- engineer and driver verify that there are no rags in fill box or fill pipe;
- when receiving No. 6 oil, engineer and driver make sure trailer is warm;
- engineer monitors driver while the fill hose is installed in the fill pipe to ensure that rags are not used or oil spills occur;
- drivers must stay within reach of cutoff valves at all times during oil transfer
- driver notifies shift supervisor when the truck is empty;
- engineer accompanies driver while the fill line is removed and covers are put back on to ensure that rags are not used or spills occur; and
- shift supervisor signs paperwork.

The procedures require supervision of the entire delivery process and require that the delivery vehicle is parked as close as practical to the tank to be filled to minimize delivery hose length. Additionally, prior to filling a tank, UMCMS personnel manually verify the volume of fuel in the subject tank, and ensure the driver acknowledges that amount of oil to be added.

All pipe supports are to be designed to minimize abrasion and corrosion and to allow for expansion and contraction. Pipe supports are to be visually inspected during the monthly inspection of the Facility.

All aboveground piping and valves are to be examined monthly to assess their condition. Inspection includes aboveground valves, piping, appurtenances, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces. Observations are to be noted on the monthly inspection checklist provided in this Plan (see Attachment D).

Lines that are not in service or are on standby for an extended period of time are to be capped or blank-flanged and marked as to their origin.

Piping from Tank 9 is exposed to vehicular traffic. A warning sign is posted at the tank to alert vehicular traffic of overhead piping.

PART 5: DISCHARGE RESPONSE

5.1 DISCOVERY OF A RELEASE

Following the discharge of oil, the following actions should be completed in a safe yet expeditious manner:

- Identify and Quantify - quantify (estimate) the amount of oil discharged, in gallons;
- Internal Notification - notify the Facility personnel listed on Attachment H;
- Control - if it can be done safely by properly-trained personnel, initiate control actions for a small discharge or notify an emergency responder for a large discharge; and
- External Notification - notify external agencies, as necessary, as listed herein

Details of internal notification, control, external notification, cleanup and disposal, incident investigation procedures, and follow-up tasks are described herein.

5.2 INTERNAL NOTIFICATION

The staff member who first observes the discharge must immediately notify the Environmental, Health, and Safety Manager, or a designated alternate, as listed on Attachment H. The individuals listed on Attachment H are authorized to function as the emergency coordinator and can be contacted by calling their mobile telephone number. This notification must be done regardless of the size of the discharge. At the time of the notification, the person making the notification should communicate the estimated volume of the discharge. If necessary, the emergency coordinator must notify and mobilize the emergency response team.

Upon arriving on the scene, the emergency coordinator will inspect the location where the discharge has occurred and determine if there is an immediate threat to human health or safety that would require a Facility evacuation and whether outside assistance will be required. In the unlikely event that a Facility evacuation would be required, the emergency coordinator would order and oversee the evacuation.

Once there is no imminent danger to on-site personnel, steps should be implemented promptly to control the discharge. Outside assistance is available from the emergency response contractors, if needed, as identified later in this chapter.

5.3 CONTROL

Action, in a swift and responsible manner, is the surest way to minimize damage in the event of a discharge. A procedure as simple as shutting off a pump, plugging a hole with a rag or closing a valve could mean the difference between a major and a very minor discharge. Thus, extreme care in judgment should be used when responding to a discharge incident. For instance, no attempt should be made to plug a hole in a vessel when the vessel shows signs of being in danger of collapse. Also, the discharged substance should first be identified to determine the proper protective clothing and safety equipment necessary for a safe response.

To best prepare for discharge control, it is necessary to plan for the most environmentally-significant discharge for the Facility. A discharge that reaches the Neponset River would be the most environmentally-significant discharge for this Facility.

The following procedures should be followed in the event of a discharge of oil:

1. Protective equipment should always be worn when attempting to contain or clean up a discharge. At a minimum, eye protection, oil-resistant gloves, and oil-resistant footwear should be worn.

2. Absorbent material should first be placed around the perimeter of the discharge to prevent it from spreading further. Storm drains should be protected to prevent the discharge from entering them. Only after the discharge has been stopped from spreading should an effort be made to collect the discharged material. Absorbent material should be used to actually clean up the discharge. If the discharge is to an unpaved area, the material may start soaking into the ground shortly after the discharge has occurred and some of the underlying soil may also have to be removed. Shovels and brooms can be used for this purpose. Used absorbent material plus any contaminated soil should be placed into 55-gallon drums or other suitable container. Do not attempt to wash away the discharged material with water because this will only spread the material over a wider area.

3. If the discharged material has reached, or there is potential for it to enter, the Neponset River, booms must be deployed to contain oil on the water surface. The booms should be placed in the Neponset River (or closest location downstream of the spill) at a location to fully capture and retain oil from the water surface. Once contained, the oil may be removed by absorbent materials or pumping (or both).

5.4 EXTERNAL NOTIFICATION

If the discharge is of a reportable quantity, notification to regulatory and response agencies must be done immediately after immediate threats to health and safety are eliminated. A reportable quantity is *either* a release of 10 gallons of any oil other than cooking oil to the ground, 55 gallons of cooking oil to the ground, or any quantity that causes a sheen on surface water.

The emergency coordinator shall also be responsible for reporting the discharge to the appropriate federal and state authorities as outlined below.

1. Telephone Notification

   All reporting of release incidents should be conducted and documented according to the format of the release report forms provided as Attachments I and J. Attachment I, is used for verbal telephone reporting. Attachment J, supplements the information on Attachment J so that both form a written report for the release. It is very important that release reporting to the appropriate agencies be made as quickly as possible considering the strategy described in section 5.1 of this chapter even if it is necessary to later follow-up with the required data identified on Attachment I.

2. Written Report

If any amount of oil is discharged into, upon or adjacent to shorelines of Lake Quinsigamond, in addition to immediate telephone notification, MassDEP may request a written report. These requirements are detailed in Attachment K.

Discharge information must be reported to the EPA Region I Regional Administrator, with a copy to MassDEP (addresses for these agencies are included as Attachment K) within 60 days if either of the following occurs:

- the Facility discharges more than 1,000 U.S. gallons of oil into or upon the navigable waters of the United States or adjoining shorelines in a single event, or
- the Facility discharges 42 or more gallons of oil in two spill events within any 12 month period.

A report to MassDEP or the EPA Region I Regional Administrator (or both) must contain the following information:

1. name of the Facility;
2. name(s) of the owner or operator of the Facility;
3. location of the Facility;
4. maximum storage or handling capacity of the Facility and normal daily throughput;
5. corrective actions or countermeasures (or both) taken, including an adequate description of equipment repairs or replacements;
6. description of the Facility, including maps, flow diagrams, and topographic maps;
7. cause of the discharge including a failure analysis of the system or subsystem in which the failure occurred;
8. additional preventive measures taken or contemplated to minimize the possibility of recurrence; and
9. information the regional administrator may reasonably require pertinent to the plan or discharge.

5.5 CLEANUP AND DISPOSAL

1. Personnel and Equipment

Containment and cleanup activities for a relatively small discharge as described herein could be performed by Facility personnel. A relatively small discharge could effectively be managed by the emergency response team. Upon being alerted of a discharge incident, the emergency coordinator should assemble the team from personnel who are at the Facility or on-call 24-hours per day. These individuals should be trained in cleanup techniques as described herein.

A typical inventory of discharge cleanup equipment is provided as Attachment F. This equipment is stored so as to be immediately accessible to the emergency response team.

If the emergency coordinator determines that the discharge will require emergency assistance for a relatively-large discharge, a list of potential emergency response contractors includes:

1.	Triumvirate Environmental Services	(800) 966-9282
2.	New England Disposal Tech	(800) 698-1865

These brief listings are intended to provide some options to the Facility and are not intended to endorse any listed company nor exclude any firm not listed.

2. Cleanup

The largest portion of any discharge will likely be cleaned up and removed manually. If the discharge has been confined to a paved area, the discharged material should be removed by bucketing, pumping or vacuuming the oil into 55-gallon drums. After the bulk of the liquid has been removed, spreading sand or other absorbent material can be used as both a safety feature to reduce slipping and to absorb surface oils. If the discharge reached navigable waters and a skimming device was constructed across the waterway, the straw or preferably oil booms should be manually removed when they become saturated with oil and replaced with new straw or booms until all of the oil has been absorbed.

Hasty cleanups may result in large volumes of material that requires disposal. Cleanup techniques should be thought out in advance of a spill to minimize the amount of material for disposal. A designated area near the cleanup site should be established for stockpiling these materials in an environmentally safe manner prior to disposal. The material should be stockpiled in a manner that will minimize the potential for contaminating surrounding soils, groundwater or storm water runoff.

3. Disposal

Arrangements for the proper disposal of oil can be made by contacting and retaining one of the aforementioned emergency response contractors or a reputable disposal company. Containment and clean-up operations shall be performed in accordance with safe work practices. Personnel shall utilize appropriate personal protective clothing and equipment when required. Clean-up of the oil and debris should include the following precautions and procedures.

5.6 INCIDENT INVESTIGATION PROCEDURES

An incident investigation of a discharge of a reportable quantity should be initiated as soon as possible, but in no case later than 48 hours after an incident that could have or did result in a release. The incident should be investigated by Environmental, Health, and Safety Manager, or designated alternates. If, a contractor was involved, at least one contractor employee should participate on the team. The Environmental, Health, and Safety Manager or designated alternate is the designated team leader. No investigation should be undertaken until the conditions relating to the incident are safe as determined by the Environmental, Health, and Safety Manager or designated alternate. The following procedures are suggested guidelines.

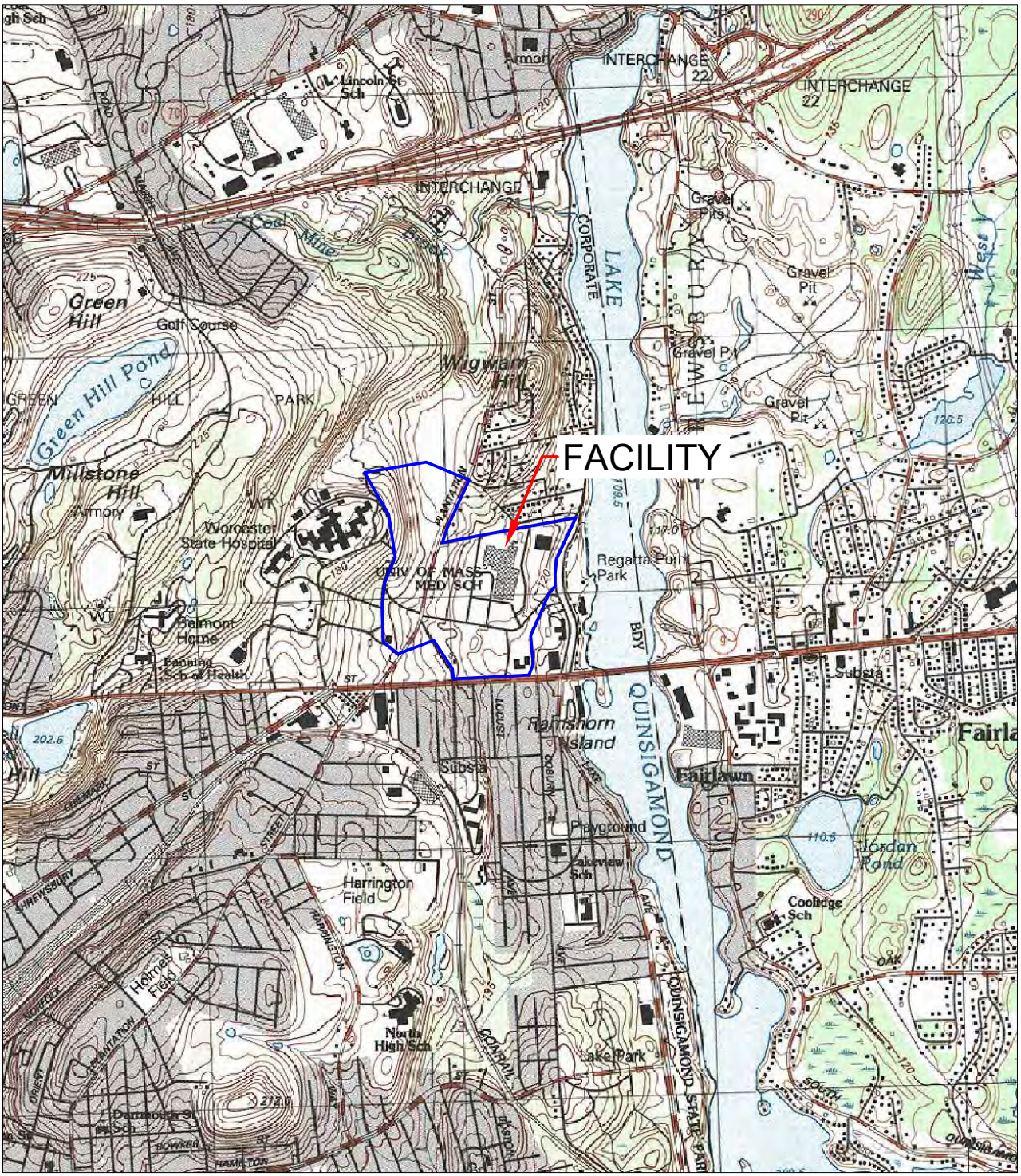
1. The Environmental, Health, and Safety Manager, or designated alternates should arrive at the incident site as soon as possible after being notified. The Environmental, Health, and Safety Manager or designated alternate should conduct or direct the balance of these procedures.
2. Upon arrival at the scene, determine from the response team that all flow has been contained and that all equipment is in place and secure.
3. If appropriate, immediately begin taking photographs of the entire incident scene.
   a. photograph from all sides;
   b. either record in writing or use a recording device to record what each picture represents; and
   c. photograph overall views and close-ups.
4. Make detailed sketches of the scene complete with measurements.
5. Record names and titles of any Facility employee witnesses.
6. Document all applicable equipment information.
7. If there is employee involvement, consider having drug or alcohol testing done as soon as possible.
8. Work with all emergency response personnel at the scene.
9. Have all questions from news media addressed by a designated company representative.
10. Upon completing the on-site investigation, report all follow-up information to the appropriate individual agencies.
11. Prepare a final and comprehensive written report insuring that all information requested in Attachment J is provided.
12. After completing all documentation, the investigation team should meet with a Facility safety representative to review the reports. The reason or cause should be reviewed and, if company related, a corrective policy and corrective action timetable should be formulated to prevent a similar incident in the future.
13. The incident reports should be reviewed with all appropriate operating, maintenance and other personnel whose work assignments involved the process when the incident occurred.
14. The cause of the discharge should be documented.
15. Identify corrective actions taken.

5.7 FOLLOW-UP

The recommendations resulting from the investigation should be presented to Facility management for resolution. Within 60 days, Facility management should develop a written schedule to implement the recommendations. If Facility management determines that one or more of the recommendations is not correct or does not resolve an identified problem in the best way, then Facility management should document in writing the reason the recommendation is not being adopted or is being adopted in modified form.

All incident investigation reports and documentation of resulting corrective actions should be maintained by the Environmental, Health, and Safety Manager and maintained with this SPCC plan for a minimum of three years.

ATTACHMENT A



0 1000′ 2000′

DRAWING SCALE

LEGEND

APPROXIMATE PROPERTY BOUNDARY

SOURCE
USGS WORCESTER, NORTH R, MASSACHUSETTS
TOPOGRAPHIC QUADRANGLE, DATED 1983.
CONTOUR INTERVAL: 3 METERS

DATE:	DECEMBER 08, 2023
PROJECT. NO.	18560
SCALE:	1″ = 2000′
DESIGNED BY:	SLP
DRAWN BY:	MYS
CHECKED BY:	SLP

UMASS CHAN MEDICAL SCHOOL

SITE LOCUS

55 LAKE AVENUE NORTH

WORCESTER, MASSACHUSETTS

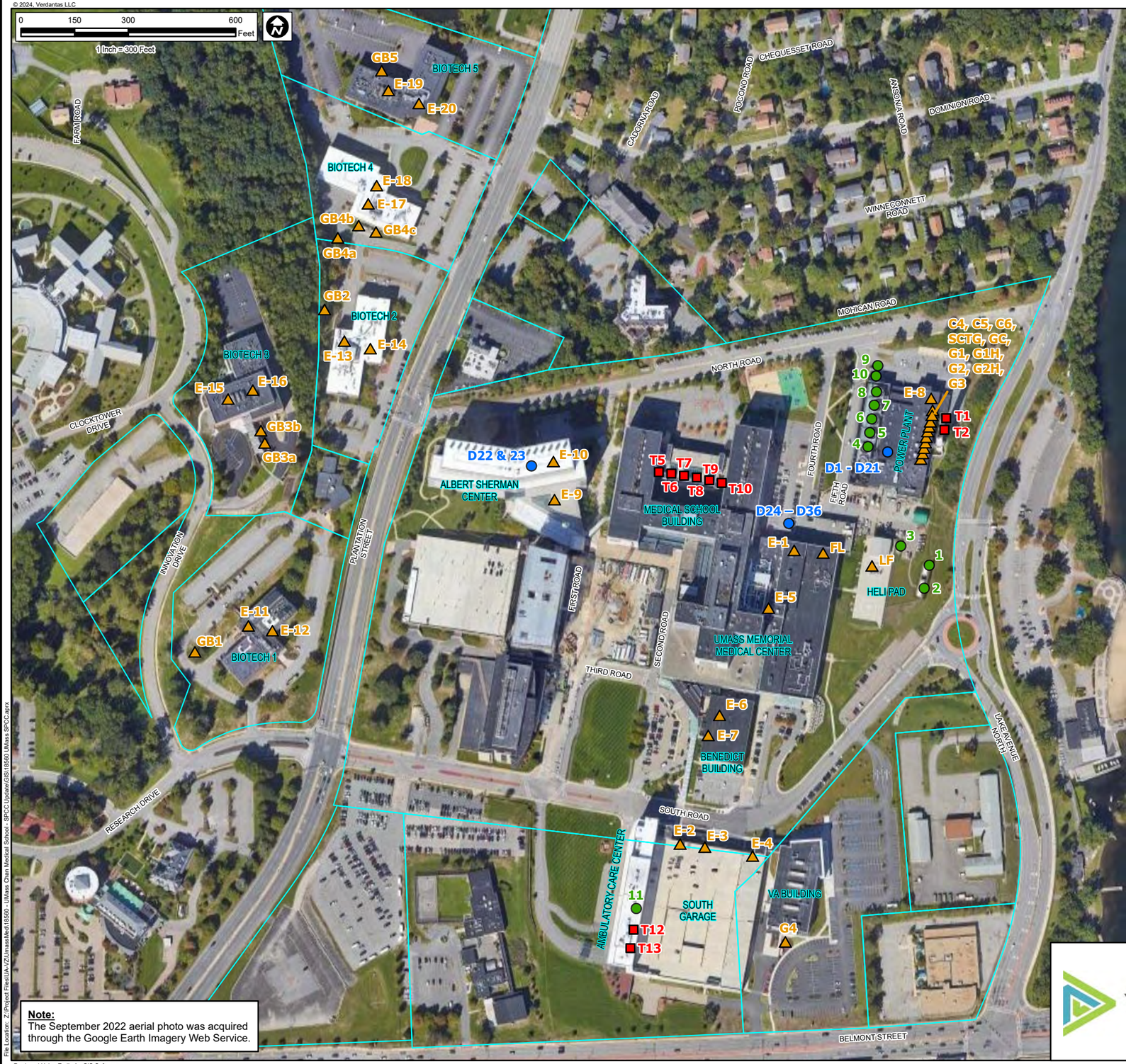
verdantas
PEOPLE FOCUSED FUTURE

1005 MAIN STREET, SUITE 8120
PAWTUCKET, RI 02860
TEL. 401.728.6860

SHEET: 1

z:\project files\ua-vz\umassmed\18560 - umass chan medical school - spcc update\cad\sheets and plans\loc-18560.dwg

ATTACHMENT B



ID	Storage capacity	Contents	Description
Fixed Storage			
1	9,600 gallons	Diesel fuel	Aboveground horizontal tank outdoors along Lake Avenue near the helipad
2	3,000 gallons	Diesel fuel	Aboveground horizontal tank outdoors near the helipad
3	6,000 gallons	Jet A aviation fuel	Aboveground vertical tank outdoors at the helipad
4	84,000 gallons	Fuel oil	Aboveground horizontal tank level B of the Power Plant
5	84,000 gallons	Fuel oil	Aboveground horizontal tank level B of the Power Plant
6	84,000 gallons	Fuel oil	Aboveground horizontal tank level B of the Power Plant
7	84,000 gallons	Fuel oil	Aboveground horizontal tank level B of the Power Plant
8	84,000 gallons	Fuel oil	Aboveground horizontal tank level B of the Power Plant
9	4,000/2,000 gallons	Diesel/Gasoline	Aboveground compartmentalized tank northwest corner of the Power Plant
10	100 gallons	Diesel fuel	Aboveground day tank outside northwest corner of the Power Plant
11	3,000 gallons	Diesel fuel	Aboveground horizontal tank level A of the Ambulatory Care Center
Mobile Containers			
D1 - D21	55 gallons	Various oil	First floor of Power Plant
D22 & 23	55 gallons	Waste cooking oil	Albert Sherman Center Room AS1-2020
D24 – D36	55 gallons	Waste oil	Chemical waste storage bunker
Operating Equipment			
E-1	145 gallons	Hydraulic oil	Med School Loading Dock
E-2	180 gallons	Hydraulic oil	South Garage
E-3	180 gallons	Hydraulic oil	South Garage
E-4	180 gallons	Hydraulic oil	South Garage
E-5	185 gallons	Hydraulic oil	Teaching Hospital
E-6	210 gallons	Hydraulic oil	Benedict Building
E-7	210 gallons	Hydraulic oil	Benedict Building
E-8	200 gallons	Hydraulic oil	Power Plant
E-9	250 gallons	Hydraulic oil	Albert Sherman Center
E-10	210 gallons	Hydraulic oil	Alber Sherman Center
E-11	210 gallons	Hydraulic oil	Biotech 1
E-12	185 gallons	Hydraulic oil	Biotech 1
E-13	210 gallons	Hydraulic oil	Biotech 2
E-14	185 gallons	Hydraulic oil	Biotech 2
E-15	185 gallons	Hydraulic oil	Biotech 3
E-16	150 gallons	Hydraulic oil	Biotech 3
E-17	134 gallons	Hydraulic oil	Biotech 4
E-18	134 gallons	Hydraulic oil	Biotech 4
E-19	250 gallons	Hydraulic oil	Biotech 5
E-20	250 gallons	Hydraulic oil	Biotech 5
LF	187 gallons	Jet A fuel	Life Flight Helicopter
FL	79 gallons	Fuel oil	Front Loader
C4	75 gallons	Hydraulic oil	Chiller 4 Murry Turbine Power Plant
C5	55 gallons	Type K oil	Chiller 5 York Compressor Power Plant
C6	55 gallons	Type K oil	Chiller 6 York Compressor Power Plant
SCTG	739 gallons	Hydraulic oil	Solar CTG Power Plant
GC	135 gallons	Hydraulic oil	Enerflex Gas Compressor Power Plant
G1	300 gallons	Hydraulic oil	Power Plant 1 ST Floor
G2	300 gallons	Hydraulic oil	Power Plant 1 ST Floor
G1H	60 gallons	Hydraulic oil	Power Plant 1 ST Floor
G2H	60 gallons	Hydraulic oil	Power Plant 1 ST Floor
G3	650 gallons	Hydraulic oil	Power Plant 1 ST Floor
G4	969 gallons	Diesel fuel	VA Building
GB1	400 gallons	Diesel fuel	Biotech 1
GB2	150 gallons	Diesel fuel	Biotech 2
GB3a	200 gallons	Diesel fuel	Biotech 3
GB3b	400 gallons	Diesel fuel	Biotech 3
GB4a	1,000 gallons	Diesel fuel	Biotech 4
GB4b	300 gallons	Diesel fuel	Biotech 4
GB4c	1,000 gallons	Diesel fuel	Biotech 4
GB5	500 gallons	Diesel fuel	Biotech 5
Transformers			
T1	1,376 gallons	Silicon fluid	Adjacent to Power Plant
T2	320 gallons	Silicon fluid	Adjacent to Power Plant
T5	320 gallons	Silicon fluid	Basic #1 on School Level A
T6	380 gallons	Silicon fluid	Student lab 2 on School Level 8
T7	380 gallons	Silicon fluid	Student lab 2 on School Level 8
T8	380 gallons	Silicon fluid	Student lab 2 on School Level 8
T9	380 gallons	Silicon fluid	Basic #2 on School Level 8
T10	380 gallons	Silicon fluid	Basic #2 on School Level 8
T12	389 gallons	Corn Oil "FR3"	Ambulatory Care Center
T13	353 gallons	Corn Oil "FR3"	Ambulatory Care Center

Note:
The September 2022 aerial photo was acquired through the Google Earth Imagery Web Service.

verdantas
PEOPLE FOCUSED FUTURE

January 2024

University of Massachusetts
Medical School

SPCC Plan

55 Lake Avenue North
Worcester, Massachusetts 01655

Figure
1

File Location: Z:\Project Files\UA-VZ\UmassMed\18560 - UMass Chan Medical School - SPCC Update\GIS\18560 UMass SPCC.aprx

Produced Using Esri's ArcGIS Software

Edited: 1/3/2024 User: drolls

ATTACHMENT C

ATTACHMENT C
Substantial Harm Determination

Facility Name: UMass Chan Medical School – Worcester Facility
Facility Address: 55 Lake Avenue North
Worcester, Massachusetts 01655

1. Does the Facility transfer oil over water to or from vessels and does the Facility have a total oil storage capacity greater than or equal to 42,000 gallons?
Yes No X

2. Does the Facility have a total oil storage capacity greater than or equal to 1 million gallons and does the Facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation within any aboveground storage tank area?
Yes No X

3. Does the Facility have a total oil storage capacity greater than or equal to 1 million gallons and is the Facility located at a distance (as calculated using the appropriate formula in 40 CFR part 112 Attachment C, Attachment C-III or a comparable formula) such that a discharge from the Facility could cause injury to fish and wildlife and sensitive environments?
Yes No X

4. Does the Facility have a total oil storage capacity greater than or equal to 1 million gallons and is the Facility located at a distance (as calculated using the appropriate formula in 40 CFR part 112 Attachment C, Attachment C-III or a comparable formula) such that a discharge from the Facility would shut down a public drinking water intake?
Yes No X

5. Does the Facility have a total oil storage capacity greater than or equal to 1 million gallons and has the Facility experienced a reportable oil spill in an amount greater than or equal to 10,000 gallons within the last 5 years?
Yes No X

Certification
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

_____ Environmental, Health, and Safety Manager
Signature Title

Jo-Ann Ranslow _____
Name (type or print) Date

ATTACHMENT D

ATTACHMENT D
SPCC Facility Inspection Checklists

UMass Chan Medical School
Worcester Facility

The following checklists are to be used for monthly and annual Facility-conducted inspections. Completed checklists must be signed by the inspector and maintained at the Facility, with this SPCC Plan, for at least three years.

UMass Chan Medical School
Worcester Facility

Monthly Inspection Checklist

This inspection record must be completed *each month* except the month in which an annual inspection is performed. Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

T-1 (Tank 1 – 9,600 gallons diesel)

	Y*	N	Description & Comments
Storage tanks			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Secondary containment is damaged or stained			
Piping			
Valve seals, gaskets, or other appurtenances are leaking			
Pipelines or supports are damaged or deteriorated			
Joints, valves and other appurtenances are leaking			
Fill and discharge piping is not properly connected			
Loading/unloading and transfer equipment			
Connections are not capped or blank-flanged			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

UMass Chan Medical School
Worcester Facility

Monthly Inspection Checklist

This inspection record must be completed *each month* except the month in which an annual inspection is performed. Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

T-2 (Tank 2– 4,000 gallons diesel)

	Y*	N	Description & Comments
Storage tanks			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Secondary containment is damaged or stained			
Piping			
Valve seals, gaskets, or other appurtenances are leaking			
Pipelines or supports are damaged or deteriorated			
Joints, valves and other appurtenances are leaking			
Fill and discharge piping is not properly connected			
Loading/unloading and transfer equipment			
Connections are not capped or blank-flanged			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

UMass Chan Medical School
Worcester Facility

Monthly Inspection Checklist

This inspection record must be completed *each month* except the month in which an annual inspection is performed. Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

T-3 (Tank 3 – 6,000 gallons jet A fuel)

	Y*	N	Description & Comments
Storage tanks			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Secondary containment is damaged or stained			
Piping			
Valve seals, gaskets, or other appurtenances are leaking			
Pipelines or supports are damaged or deteriorated			
Joints, valves and other appurtenances are leaking			
Fill and discharge piping is not properly connected			
Loading/unloading and transfer equipment			
Connections are not capped or blank-flanged			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

UMass Chan Medical School
Worcester Facility

Monthly Inspection Checklist

This inspection record must be completed *each month* except the month in which an annual inspection is performed. Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

T-4 (Tank 4 – 84,000 gallons No. 2 Fuel)

	Y*	N	Description & Comments
Storage tanks			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Secondary containment is damaged or stained			
Piping			
Valve seals, gaskets, or other appurtenances are leaking			
Pipelines or supports are damaged or deteriorated			
Joints, valves and other appurtenances are leaking			
Fill and discharge piping is not properly connected			
Loading/unloading and transfer equipment			
Connections are not capped or blank-flanged			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

UMass Chan Medical School
Worcester Facility

Monthly Inspection Checklist

This inspection record must be completed *each month* except the month in which an annual inspection is performed. Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

T-5 (Tank 5 – 84,000 gallons No. 6 Fuel)

	Y*	N	Description & Comments
Storage tanks			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Secondary containment is damaged or stained			
Piping			
Valve seals, gaskets, or other appurtenances are leaking			
Pipelines or supports are damaged or deteriorated			
Joints, valves and other appurtenances are leaking			
Fill and discharge piping is not properly connected			
Loading/unloading and transfer equipment			
Connections are not capped or blank-flanged			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

UMass Chan Medical School
Worcester Facility

Monthly Inspection Checklist

This inspection record must be completed *each month* except the month in which an annual inspection is performed. Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

T-6 (Tank 6 - 84,000 gallons No. 6 Fuel)

	Y*	N	Description & Comments
Storage tanks			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Secondary containment is damaged or stained			
Piping			
Valve seals, gaskets, or other appurtenances are leaking			
Pipelines or supports are damaged or deteriorated			
Joints, valves and other appurtenances are leaking			
Fill and discharge piping is not properly connected			
Loading/unloading and transfer equipment			
Connections are not capped or blank-flanged			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

UMass Chan Medical School
Worcester Facility

Monthly Inspection Checklist

This inspection record must be completed *each month* except the month in which an annual inspection is performed. Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

T-7 (Tank 7 84,000 gallons No. 6 Fuel)

	Y*	N	Description & Comments
Storage tanks			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Interstitial space contains liquid			
Piping			
Valve seals, gaskets, or other appurtenances are leaking			
Pipelines or supports are damaged or deteriorated			
Joints, valves and other appurtenances are leaking			
Fill and discharge piping is not properly connected			
Loading/unloading and transfer equipment			
Connections are not capped or blank-flanged			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

UMass Chan Medical School
Worcester Facility

Monthly Inspection Checklist

This inspection record must be completed *each month* except the month in which an annual inspection is performed. Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

T-8 (Tank 8 84,000 gallons No. 6 Fuel)

	Y*	N	Description & Comments
Storage tanks			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Interstitial space contains liquid			
Piping			
Valve seals, gaskets, or other appurtenances are leaking			
Pipelines or supports are damaged or deteriorated			
Joints, valves and other appurtenances are leaking			
Fill and discharge piping is not properly connected			
Loading/unloading and transfer equipment			
Connections are not capped or blank-flanged			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

UMass Chan Medical School
Worcester Facility

Monthly Inspection Checklist

This inspection record must be completed *each month* except the month in which an annual inspection is performed. Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

T-9 (Tank 9 2,000 gallons diesel fuel/2,000 gallons gasoline)

	Y*	N	Description & Comments
Storage tanks			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Interstitial space contains liquid			
Piping			
Valve seals, gaskets, or other appurtenances are leaking			
Pipelines or supports are damaged or deteriorated			
Joints, valves and other appurtenances are leaking			
Fill and discharge piping is not properly connected			
Loading/unloading and transfer equipment			
Connections are not capped or blank-flanged			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

UMass Chan Medical School
Worcester Facility

Monthly Inspection Checklist

This inspection record must be completed *each month* except the month in which an annual inspection is performed. Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

T-10 (Tank 10 gallons diesel)

	Y*	N	Description & Comments
Storage tanks			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Interstitial space contains liquid			
Piping			
Valve seals, gaskets, or other appurtenances are leaking			
Pipelines or supports are damaged or deteriorated			
Joints, valves and other appurtenances are leaking			
Fill and discharge piping is not properly connected			
Loading/unloading and transfer equipment			
Connections are not capped or blank-flanged			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

UMass Chan Medical School
Worcester Facility

Monthly Inspection Checklist

This inspection record must be completed *each month* except the month in which an annual inspection is performed. Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

T-11 (Tank 11 3,000 gallons diesel)

	Y*	N	Description & Comments
Storage tanks			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Interstitial space contains liquid			
Piping			
Valve seals, gaskets, or other appurtenances are leaking			
Pipelines or supports are damaged or deteriorated			
Joints, valves and other appurtenances are leaking			
Fill and discharge piping is not properly connected			
Loading/unloading and transfer equipment			
Connections are not capped or blank-flanged			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

UMass Chan Medical School
Worcester Facility

Monthly Inspection Checklist

This inspection record must be completed *each month* except the month in which an annual inspection is performed. Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

D-1 to D-21 Drums

	Y*	N	Description & Comments
Drums			
Drum surface shows signs of leakage			
Drum is damaged, rusted or deteriorated			
Drum foundation has eroded or settled			
Secondary containment is damaged or stained			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

UMass Chan Medical School
Worcester Facility

Monthly Inspection Checklist

This inspection record must be completed *each month* except the month in which an annual inspection is performed. Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

D-22 and D-23 Drums

	Y*	N	Description & Comments
Drums			
Drum surface shows signs of leakage			
Drum is damaged, rusted or deteriorated			
Drum foundation has eroded or settled			
Secondary containment is damaged or stained			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

UMass Chan Medical School
Worcester Facility

Monthly Inspection Checklist

This inspection record must be completed *each month* except the month in which an annual inspection is performed. Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

D-24 to D-36 Drums

	Y*	N	Description & Comments
Drums			
Drum surface shows signs of leakage			
Drum is damaged, rusted or deteriorated			
Drum foundation has eroded or settled			
Secondary containment is damaged or stained			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

UMass Chan Medical School
Worcester Facility

Annual Facility Inspection Checklist

This inspection record must be completed *each year.* If any response requires further elaboration, provide comments in Description & Comments space provided. Further description and comments, if necessary, must be provided on a separate sheet of paper and attached to this sheet. *Any item that receives "yes" as an answer must be described and addressed immediately.

	Y*	N	Description & Comments
Storage tanks			
Tank AST-1 (9,600 gallons diesel fuel)			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Interstitial space contains liquid			
T-2 (Tank 2– 4,000 gallons diesel)			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Secondary containment is damaged or stained			
T-3 (Tank 3 – 6,000 gallons jet A fuel)			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Interstitial space contains liquid			

	Y*	N	Description & Comments
Secondary containment is damaged or stained			
T-4 (Tank 4 – 84,000 gallons No. 2 Fuel)			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Interstitial space contains liquid			
T-5 (Tank 5 – 84,000 gallons No. 6 Fuel)			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Secondary containment is damaged or stained			
T-6 (Tank 6 - 84,000 gallons No. 6 Fuel)			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Secondary containment is damaged or stained			
T-7 (Tank 7 84,000 gallons No. 6 Fuel			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Interstitial space contains liquid			

	Y*	N	Description & Comments
T-8 (Tank 8 84,000 gallons No. 6 Fuel)			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Interstitial space contains liquid			
T-9 (Tank 9 2,000 gallons diesel fuel/2,000 gallons gasoline)			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Interstitial space contains liquid			
T-10 (Tank 10 gallons diesel)			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Interstitial space contains liquid			
T-11 (Tank 11 3,000 gallons diesel)			
Tank surface shows signs of leakage			
Tank is damaged, rusted or deteriorated			
Bolts, rivets, or seams are damaged			
Tank support is deteriorated or buckled			
Tank foundation has eroded or settled			
Level gauge or alarm is inoperative			
Vent is obstructed			
Interstitial space contains liquid			
Piping			
Valve seals or gaskets are leaking			
Pipelines or supports are damaged or deteriorated			

	Y*	N	Description & Comments
Joints, valves and other appurtenances are leaking			
Out-of-service pipes are not capped			
Warning signs are missing or damaged			
Fill and discharge piping is not properly connected			
Loading/unloading and transfer equipment			
Connections are not capped or blank-flanged			
Security			
Fencing, gates, or lighting is non-functional			
Response equipment			
Response equipment inventory is incomplete			
Drums 1-21 (55 Gallon Various Oils)			
Drum surface shows signs of leakage			
Drum is damaged, rusted or deteriorated			
Drum foundation has eroded or settled			
Secondary containment is damaged or stained			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			
Drums 22 and 23 (55 Gallon Waste Cooking Oil)			
Drum surface shows signs of leakage			
Drum is damaged, rusted or deteriorated			
Drum foundation has eroded or settled			
Secondary containment is damaged or stained			
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			
Drums 24-36 (55 Gallon Waste Oil)			
Drum surface shows signs of leakage			
Drum is damaged, rusted or deteriorated			
Drum foundation has eroded or settled			
Secondary containment is damaged or stained			

	Y*	N	Description & Comments
Security			
Fencing, gates, or lighting is non-functional			
Response Equipment			
Response equipment inventory is incomplete			

Additional Remarks:

Date: _____ **Signature:** _____

Time: _____ **Printed Name:** _____

Title: _____

ATTACHMENT E

ATTACHMENT E
Example of Discharge Prevention Briefings and Training

UMass Chan Medical School
Worcester Facility

Briefings will be scheduled and conducted by the Facility owner or operator for operating personnel at regular intervals to ensure adequate understanding of this SPCC Plan. The briefings will also highlight and describe known discharge events or failures, malfunctioning components, and recently implemented precautionary measures and best practices. Personnel will also be instructed in operation and maintenance of equipment to prevent the discharge of oil, and in applicable pollution laws, rules, and regulations. Facility operators and other personnel will have an opportunity during the briefings to share recommendations concerning health, safety, and environmental issues encountered during Facility operations.

Date	Subjects Covered	Employees in Attendance	Instructor(s)

ATTACHMENT F

ATTACHMENT F
Discharge Response Equipment Inventory

UMass Chan Medical School
Worcester Facility

Appendix E of the ICP provides an inventory of emergency spill and response equipment that can be found throughout the Facility.

The following safety equipment should be available to protect employees and provide containment of constituents in the event of an oil spill.

- Spill control/countermeasure materials:
    - Spill Control Kits are located at the Facility. Each kit, at a minimum, includes:
        - one drum;
        - gloves;
        - oil dry, absorbent materials (or equivalent);
        - sorbent socks and pads;
        - shovels;
        - brooms; and
        - drain pans.

- Fire extinguishers:

Portable fire extinguishers and a fire alarm pull stations are located throughout the Facility building.

ATTACHMENT G

ATTACHMENT G
Oil Discharge Reporting Personnel

UMass Chan Medical School
Worcester Facility

INTERNAL NOTIFICATION AND RESPONSE

If a spill is discovered, the individual discovering the spill will immediately take action to stop the spill and then notify the SPCC Coordinator.

FIRST CALL

Name	Title	Work Phone	24-Hour Phone
Jo-Ann Ranslow	Environmental, Health, and Safety Manager	508-856-6723	508-735-6263

ALTERNATE CALLS – FOR POWER PLANT

Name	Title	Work Phone	24-Hour Phone
Joe Collins	Director of Energy Resources	508-856-2220	508-397-1069
Bruce Hjort	Assistant Director of Energy Resources	508-856-2153	774-312-1727

After receiving notification of the spill the SPCC Coordinator will be responsible for actions and will supervise efforts to provide containment of the spill to prevent to exacerbation of the spill. Clean-up crews, under the direction of the SPCC Coordinator, should isolate or repair the source of the leak/spill to prevent additional spillage. Clean-up crews will utilize spill clean-up materials provided and employ Safe Work Practices.

The SPCC Coordinator will evaluate the need and if required will contact additional assistance (i.e., outside clean-up contractors). The contact information for outside clean-up contractors is listed below:

Triumvirate Environmental Services	New England Disposal Tech
(800) 966-9282	**(800) 698-1865**

1. **Recover or Clean-up Spills <10 Gallons**. As much material as possible should be recovered and reused where appropriate. Liquids absorbed by solid materials shall be shoveled into open-top container, mobilize spill clean-up crew; locate the source of spill and immediately stop discharge, if possible; block off the area to prevent traffic

flow from entering the spill area; notify people in the immediate area. Protect nearby catch basins and/or condensation drains with sorbent booms; deploy spill clean-up materials (e.g., sorbent boom, sorbent pads, granular adsorbent material, etc.) as appropriate.

2. **Recover or Clean-up Spills ≥10 Gallons (or ≥55 gallons of cooking oil)** mobilize the spill clean-up crew and notify the SPCC Coordinator; locate the source of spill and immediately stop the discharge, if possible; if there is a potential for fire, call the fire department immediately; notify and mobilize spill clean-up contractor (current spill contractors are **Triumvirate Environmental Services** and **New England Disposal Tech**); block off the area to prevent traffic flow from entering the spill area; deploy spill clean-up materials (e.g., sorbent boom, sorbent pads, granular adsorbent material, etc.) as appropriate. Try to contain the spill until the spill contractor arrives. Initiate the following actions for spills expected to flow towards catch basin. 1) Protect the catch basins with booms, sandbags or earthen dikes, 2) Use a shovel to create a dike and control the flow of the spill, and 3) Fuel entering catch basins must be removed by the spill clean-up contractor as soon as possible.

3. **Prepare an Internal Report.** After the spill has been controlled and/or cleaned, the SPCC Coordinator will complete the Incident Report Form recording the details of the incident. If the spill is equal to or in excess of a reportable quantity, a copy of the spill record form should be submitted to the USEPA.

4. **Evaluate the SPCC Plan** and amend if necessary. Determine the cause of the incident and evaluate the spill response procedures. Correct any deficiencies and amend the SPCC Plan accordingly. Update Oil Spill History (page iii), to describe the event after each significant spill incident.

ATTACHMENT H

ATTACHMENT H
Verbal Spill Report

UMass Chan Medical School
Worcester Facility

A REPORTABLE QUANTITY IS EITHER A RELEASE OF 10 GALLONS OF ANY OIL OTHER THAN COOKING OIL TO THE GROUND, 55 GALLONS OF COOKING OIL TO THE GROUND, OR ANY QUANTITY THAT CAUSES A SHEEN ON SURFACE WATER

1. PETROLEUM PRODUCT RELEASE TO SURFACE WATER, NOTIFY:

NRC	(800) 424-8802	DATE_____AT_____ (AM/PM)
Mass DEP	(888) 304-1133	DATE_____AT_____ (AM/PM)

2. PETROLEUM PRODUCT RELEASE TO GROUND, NOTIFY:

Mass DEP	(888) 304-1133	DATE_____AT_____ (AM/PM)

CALL IMMEDIATELY EVEN IF ALL OF THE FOLLOWING INFORMATION IS NOT AVAILABLE

1. THIS IS _____ FROM _____, TELEPHONE NUMBER_____.
2. I AM CALLING TO REPORT A SPILL ____ RELEASE ____ FIRE ____ EXPLOSION_____ OTHER (EXPLAIN) _____ AT OR FACILITY LOCATED AT _____.
3. THE MATERIAL INVOLVED IS _____ CAS NUMBER _____.
4. THE AMOUNT INVOLVED IS _____.
5. THE MATERIAL IS _____ IS NOT _____ AN EXTREMELY HAZARDOUS SUBSTANCE.
6. THE MATERIAL IS A GAS _____ LIQUID _____ SOLID _____.
7. THE DISCHARGE WAS TO THE LAND _____, WATER _____, AIR _____ OTHER _____ (EXPLAIN)_____.
8. THE INCIDENT BEGAN AT _____ AND IS ONGOING _____ OR TERMINATED AS OF _____ (TIME) ON _____ (DATE).
9. THE INCIDENT IS _____ IS NOT _____ AFFECTING A WATERWAY _____ (NAME OF WATERWAY).
10. THERE ARE _____ ARE NOT _____ INJURIES. NUMBER _____.
11. THE POTENTIAL HEALTH AND ENVIRONMENTAL HAZARDS OUTSIDE THE FACILITY ARE _____.
12. WE ARE TAKING THE FOLLOWING PRECAUTIONS:_____.
13. THIS REPORT IS _____ IS NOT _____ COMPLETE WITH MORE INFORMATION TO FOLLOW WITHIN 24 HOURS.

ATTACHMENT I

ATTACHMENT I
Written Spill Report

UMass Chan Medical School
Worcester Facility

COMPLETE THE FOLLOWING AND SUBMIT WITH THE VERBAL SPILL REPORT

1. COMPLETE NAME AND ADDRESS OF THE FACILITY WHERE THE RELEASE OCCURRED:_____
_____.
2. FACTORS CONTRIBUTING TO THE RELEASE INCLUDED THE FOLLOWING:
_____
_____.
3. QUANTITY RELEASED: _____ DURATION OF RELEASE:_____.
METHOD USED TO DETERMINE QUANTITY RELEASED: _____.
4. ACTIONS TAKEN TO RESPOND, CONTAIN, CLEANUP, AND DISPOSE OF THE SPILLED MATERIAL IS DESCRIBED ON ATTACHMENTS TO THIS FORM. (ATTACH)
5. ATTACHED IS A SKETCH SHOWING THE PATHWAY THROUGH WHICH THE DISCHARGE TO THE ENVIRONMENT OCCURRED. AFFECTED MEDIA AND ORGANISMS ARE ALSO DEPICTED. (ATTACH)
6. KNOWN OR ANTICIPATED HEALTH EFFECTS OF THE RELEASE ARE AS FOLLOWS:
_____.
7. TOTAL INJURIES RESULTING FROM THE RELEASE: _____.
8. TOTAL HOSPITALIZATIONS RESULTING FROM THE RELEASE: _____.
9. ADDITIONAL ADVICE TO EXPOSED INDIVIDUALS WAS _____ WAS NOT _____ NECESSARY.
ADVICE GIVEN WAS: _____.
10. ALL PERTINENT PREVENTION AND RESPONSE PLANS WERE REVIEWED AND IT WAS CONCLUDED THAT NO _____ THE FOLLOWING _____ CHANGES WERE NECESSARY:
_____.
11. MEASURES TO BE TAKEN TO PREVENT A DISCHARGE OF THIS TYPE IN THE FUTURE ARE:
_____
_____
_____.
12. AN INCIDENT INVESTIGATION WAS PERFORMED BY A TEAM CONSISTING OF THE FOLLOWING PERSONNEL:
_____
_____.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED AND BELIEVE THAT THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE.

SIGNATURE OF REPORTING REPRESENTATIVE DATE

_____ _____

ATTACHMENT J

ATTACHMENT J
Discharge Incident Notification Telephone Numbers and Addresses

UMass Chan Medical School
Worcester Facility

USE THE INFORMATION BELOW TO REPORT IN ACCORDANCE WITH SECTION 5 OF THIS SPCC PLAN AND 40 CFR 112.4.

1. NATIONAL RESPONSE CENTER
   TELEPHONE: (800) 424-8802
   (24-HOUR SPILL EMERGENCY HOTLINE)

2. ENVIRONMENTAL PROTECTION AGENCY REGION I
   5 POST OFFICE SQUARE, SUITE 100
   BOSTON, MA 02109
   TELEPHONE: (888) 372-7341
   (24-HOUR SPILL EMERGENCY HOTLINE)

3. MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (MassDEP)
   100 CAMBRIDGE STREET, SUITE 900
   BOSTON, MA 02114
   TELEPHONE: (888) 304-1133
   (24-HOUR SPILL EMERGENCY HOTLINE)

Appendix B: Winter Road Maintenance Best Practices Details

Equipment and Maintenance

UMass Chan Medical School will implement the following winter maintenance procedures to reduce the discharge of pollutants from the MS4:

- Calibrate equipment to reduce and optimize salt use and ensure deicing agents are being used efficiently. Provide employee training on proper calibration procedures.
- Do not overfill trucks with deicing materials as it may lead to spills.
- Optimize sand and/or chemical application rates through the use, where practicable, of automated application equipment (e.g., zero velocity spreaders), anti-icing and pre-wetting techniques, implementation of pavement management systems, and alternate chemicals.
- When possible, retrofit vehicles to include equipment such as on-board application regulators, temperature sensors for air and pavement, and anti-icing and pre-wetting equipment.
- Wash equipment using proper procedures to prevent pollutants from entering the stormwater system. Dry cleanup procedures should be used when possible. Vehicles dirtied from salt or sand application should be washed according to procedures in Section 4. Vehicles and Equipment.
- Regularly inspect and maintain equipment to reduce the potential for leaks. See Section 4. Vehicles and Equipment.

Anti-icing and Deicing

- Minimize the use and optimize the application of sodium chloride and other salt[4] (while maintaining public safety) and consider opportunities for use of alternative materials (e.g., calcium magnesium acetate, magnesium chloride, or calcium chloride).
- Remove as much snow as possible using mechanical means like plowing, blowing, or shoveling before deicing to reduce the need for road salt or other deicing chemicals.
- When possible, use anti-icing practices to prevent ice formation and reduce the need for deicers. Apply anti-icing agents 1-2 hours before winter weather events to ensure optimal performance (can be applied up to 24 prior).
- Only apply road salt when the pavement temperature is above 15° F.
- When using deicers, use pre-wetting agents (e.g., salt brine) to help them work more efficiently and to reduce road salt scatter and bounce.
- Salt brine solution used for anti-icing and pre-wetting can be stored for up to a year – concentration should be tested before use. If temperatures fall below 0° F, use a circulator pump to prevent the brine from freezing.
- Avoid mixing road salt and sand. Doing so makes both the salt and sand work less efficiently and leads to over-application.

[4] For purposes of the MS4 Permit, salt means any chloride-containing material used to treat paved surfaces for deicing, including sodium chloride, calcium chloride, magnesium chloride, and brine solutions.

- Only apply enough deicer so that plows can remove the snow and ice. Adjust the application rate of deicers based on the type of storm, type of agent used, and anti-icing and pre-wetting techniques used.
- Track the amount of deicer used and maintain records of the application of sand, anti-icing and/or de-icing chemicals to document the reduction of chemicals to meet established goals.

Storage of Deicing Materials

- Prevent exposure of deicing product (salt, sand, or alternative products) storage piles to precipitation by enclosing or covering the storage piles. Implement good housekeeping, diversions, containment or other measures to minimize exposure resulting from adding to or removing materials from the pile. Store piles in such a manner as not to impact surface water resources, groundwater resources, recharge areas, and wells.
- Store materials under covered or enclosed areas and on impervious surfaces.
- Ensure that there are adequate drainage controls in storage areas to prevent runoff from entering the stormwater system.
- Perform unloading/loading of trucks on impervious surfaces whenever possible. These areas should be frequently cleaned and swept to reduce the tracking and runoff of salt and to capture any spills.
- For liquid deicing chemicals, provide secondary storage containment.
- Do not store road salt near drinking water supplies, surface water resources, groundwater resources, recharge areas, and wells. Follow proper storage guidelines from MassDEP (https://www.mass.gov/guides/guidelines-on-road-salt-storage).

Snow Storage and Disposal

- The MS4 Permit prohibits snow disposal into waters of the United States. Snow disposal and storage activities, including selection of appropriate snow disposal sites, will adhere to the MassDEP Snow Disposal Guidance, Guideline No. BWR G2015-01 (http://www.mass.gov/eea/agencies/massdep/water/regulations/snow-disposal-guidance.html).
- Snow should not be pushed or dumped into waterbodies or wetlands, into stormwater drainage swales or ditches, or on top of catch basins.
- Snow should not be stored near drinking water areas, waterbodies, or wetlands.

UMass Chan Medical School currently disposes of snow in compliance with MS4 regulations.

Appendix E – Stormwater Management for UMMS Projects

DID YOU KNOW?

Stormwater Management for UMMS Projects

UMMS has adopted new stormwater management requirements for new development/redevelopment projects to meet the NPDES Municipal Separate Storm Sewer System (MS4) permit.

Review criteria below to determine if your project is subject to these requirements and if so, how to meet them.

Is your project exempt?

Projects that are exclusively limited to maintenance and improvement of existing roadways are exempt from the MS4 Permit's more stringent water quality requirements discussed below but **must improve existing conditions unless infeasible.**

EXEMPTIONS

Roadway projects included in this exemption: widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving projects

Does your project disturb one or more acres of land?

- Continue to design in accordance with MA Stormwater Handbook, but also meet the MS4 Permit's more stringent water quality requirements for new development and redevelopment projects.
- Incorporate low impact development site planning and design strategies, unless infeasible.
- If your project is located upstream of a phosphorus impaired waterbody (i.e., any project located on main campus in Worcester, MassBiologics in Mattapan, or the Maple Ave satellite campus in Shrewsbury) optimize design of structural best management practices (BMPs) to treat phosphorus.

Optimize your design for phosphorus removal

- Minimize impervious surfaces where possible to reduce the need for structural BMPs.
- Prioritize infiltration systems where site conditions allow.
- Design structural BMPs to treat the first flush (1/2 to 1 inch) of runoff from all impervious surfaces on the site. Small BMPs distributed throughout the site are often more effective at reducing nutrient loading than large BMPs that treat greater runoff depths from only a portion of the impervious surfaces.

DID YOU KNOW?

University of Massachusetts Medical School
UMASS

Stormwater Management for UMMS Projects

Is your project defined as new development under the MS4 permit?

NEW DEVELOPMENT

Any construction activities or land alteration resulting in total earth disturbances greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) on an area that has not previously been developed to include impervious cover.

- Design BMPs to provide treatment for the site's total post-construction impervious area. Treatment must provide an average annual pollutant removal equivalent to 90% of the average annual load of Total Suspended Solids (TSS) and 60% of the average annual load of Total Phosphorus (TP).
- Achieve that pollutant removal through one of the following methods:
  1. Design/install BMPs that together meet site TSS and TP pollutant removal requirements based on the guidance in the MS4 Permit; or
  2. Retain the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious surface area on the new development site; or
  3. Provide a combination of retention and treatment; or
  4. Utilize offsite mitigation that meets the above standards within the same USGS HUC12 as your site.

Is your project defined as redevelopment under the MS4 permit?

REDEVELOPMENT

Any construction, land alteration, or improvement of impervious surfaces resulting in total earth disturbances greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) that does not meet the definition of new development.

- Design BMPs to provide treatment for the site's total post-construction impervious area. Treatment must provide an average annual pollutant removal equivalent to 80% of the average annual load of TSS and 50% of the average annual load of TP.
- Achieve that pollutant removal through one of the following methods:
  1. Design/install BMPs that together meet site TSS and TP pollutant removal requirements based on the guidance in the MS4 Permit; or
  2. Retain the volume of runoff equivalent to, or greater than, 0.8 inches multiplied by the total post-construction impervious surface area on the redevelopment site; or
  3. Provide a combination of retention and treatment; or
  4. Utilize offsite mitigation that meets the above standards within the same USGS HUC12 as your site.

DID YOU KNOW?

Stormwater Management for UMMS Projects

Provide documentation to UMMS

» Pollutant calculations in accordance with the MS4 Permit:

- TSS and TP loading for the overall project site and to each BMP.
- TSS and TP removal for the overall project site and to each BMP (both percent reduction and annual load reduction in lb/yr) calculated for the post-construction impervious area using the BMP storage volume and pollutant removal curves (i.e., percentages) consistent with MS4 permit guidance.

» As-built drawings depicting all BMPs, both structural and non-structural, designed to manage the stormwater associated with the completed site.

SITE

The extent of construction activities, including but not limited to the creation of new impervious cover and improvement of existing impervious cover.

References

Massachusetts Small MS4 General Permit
https://www.epa.gov/npdes-permits/massachusetts-small-ms4-general-permit

BMP Pollutant Removal Tools and Information
https://www.epa.gov/npdes-permits/stormwater-tools-new-england#swbmp

Appendix F – Construction Site Runoff Control for UMMS Projects

DID YOU KNOW?

Construction Site Runoff Control for UMMS Projects

UMMS has erosion and sediment control requirements for projects under construction to meet the NPDES Municipal Separate Storm Sewer System (MS4) Permit. Review criteria below to determine if your project is subject to these requirements, and if so, how to meet them.

UMMS MS4 CONSTRUCTION SITE RUNOFF CONTROL POLICY

For all projects disturbing one or more acres, UMMS requires the use of sediment and erosion control practices at construction sites. UMMS requires proper control and disposal of construction related wastes and prohibits the discharge of such wastes to UMMS' stormwater drainage system.

If your project disturbs one or more acres, you must ensure site erosion and sediment control is performed in accordance with this policy and the procedures discussed below.

This policy is in addition to EPA's stormwater Construction General Permit (CGP) program. While this policy does not create additional requirements for the contractor beyond obtaining and complying with EPA's stormwater CGP, UMMS will be performing reviews and inspections as required to report compliance annually to EPA on this provision of UMMS' MS4 permit.

UMMS MS4 Construction Site Runoff Control Program

The purpose of UMMS' MS4 Construction Site Runoff Control Program is to minimize or eliminate erosion and maintain sediment on site so that sediment is not transported in stormwater to downstream receiving waterbodies.

UMMS ensures construction site stormwater management through compliance with the EPA's stormwater CGP. UMMS includes a bid item and special provisions on construction contracts which exceed the one-acre land disturbance threshold. The bid item and special provisions require preparation of a Stormwater Pollution Prevention Plan (SWPPP) by the contractor in accordance with EPA's stormwater CGP.

The SWPPP is a dynamic document that will be updated continually by the operators throughout construction. Generally, the SWPPP will outline and detail the required erosion and sediment controls and best practices for pollution prevention. Additional documentation included in the SWPPP includes:

- ✓ Contact information for responsible parties, the stormwater team, personnel responsible for inspections, and personnel responsible for completing corrective actions;
- ✓ Details regarding Project site information, receiving waters, any impairments or Total Maximum Daily Loads (TMDLs) associated with receiving waters;
- ✓ Project description and site maps;

DID YOU KNOW?

Construction Site Runoff Control for UMMS Projects

- ✓ Construction activities sequencing and logging;
- ✓ Allowable non-stormwater discharges;
- ✓ Documentation of inspection schedule, corrective action directives, and processes for amending the SWPPP;
- ✓ Details about required training for the stormwater team, inspectors, and operators;
- ✓ Discussion of the required erosion and sediment controls (including natural buffers, perimeter controls, sediment track-out, controls for stockpiled sediment or soil, minimizing dust, minimizing disturbance of steep slopes, topsoil controls, soil compaction, storm drain inlet protection, constructed stormwater conveyance channels, sediment basins, chemical treatment, site stabilization, and dewatering practices);
- ✓ Best practices for pollution prevention (including identifying potential sources of pollution, fueling and maintenance of equipment or vehicles, washing of equipment and vehicles, storage handling and disposal of construction products materials and wastes, washing of applicators and containers used for paint concrete or other materials, fertilizers, pavement sweeping, and spill prevention and response); and
- ✓ Compliance with other regulations including endangered species, historic preservation, and the Safe Drinking Water Act.

Site Plan Reviews

UMMS performs internal reviews of project design to ensure projects include appropriate erosion and sediment control practices, consider potential water quality impacts, and evaluate Low Impact Development (LID) in site planning and design strategies. UMMS reviews construction SWPPPs for all projects before construction begins to ensure adequate best management practices (BMPs) are planned for both during and after the construction phase of the project.

Site Inspections and Enforcement Procedures

UMMS requires contractors to perform site inspections in accordance with EPA's stormwater CGP requirements. In addition, UMMS' Resident Engineer will perform inspections of erosion and sediment controls on construction projects.

Erosion and sediment control measures must be installed in accordance with the SWPPP before any land disturbance begins for the Project and must remain in place for the duration of the Project. For permanent BMPs, UMMS' requires inspections to occur both during and after construction to ensure BMPs are functioning as designed.

UMMS prohibits the discharge of demolition debris, such as discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes to UMMS' stormwater drainage system. These wastes must be controlled on-site until they can be properly disposed of in accordance with the project's SWPPP.

DID YOU KNOW?

Construction Site Runoff Control for UMMS Projects

Sediment & Erosion Control Measures

UMMS expects the following types of sediment and erosion control measures to be included in SWPPPs for UMMS construction projects.

Minimize disturbance of steep slopes

Minimize

- **Minimize the amount of disturbed area.** Use construction phasing when possible to limit the area of exposed soil at a given time.
- **Minimize disturbance of steep slopes and stabilize slopes that do require disturbance.** Slope stabilization measures should be designed to disperse the erosive energy of flow and rainfall. Examples include straw mulch and seeding, erosion control stone, and erosion control blankets.

Protect storm drain inlets

Protect

- **Protect natural resources.** Use natural buffers when possible between disturbed areas and adjacent natural resources, such as wetlands and streams.
- **Protect all storm drain inlets and install appropriate inlet protection measures** prior to any land disturbance. Examples of inlet protection include concrete block and stone barriers (when vehicle traffic is not an issue) or at-grade, proprietary inlet protection devices, such as catch basin inserts. Depending on site and rainfall conditions, inlet protection measures often require more frequent inspection and cleaning/replacement.

Install a construction access pad

Stabilize

- **Stabilize construction site entrances and exits.** Construction access pads are one of the most important erosion control measures for preventing sediment and mud from being tracked offsite on to paved surfaces. Use a construction access pad that is at least 6 inches thick and ensure the pad slopes away from the existing roadway.
- **Minimize dust.** Depending on site and rainfall conditions, use measures such as water trucks to minimize dust and prevent sediment from being blown off site.
- **Use perimeter controls to retain and capture sediment.** Examples include silt fence barriers, sediment filter socks and other geotextile barriers. Perimeter controls should be regularly inspected and periodically replaced on longer duration construction projects.
- **Stabilize sites** when projects are complete, or operations have temporarily ceased. Include proper removal of erosion and sediment control measures as part of site clean-up (e.g., remove perimeter controls and inlet protection, such as catch basin inserts).

Minimize dust