

**THE UNIVERSITY OF MICHIGAN
MUNICIPAL STORM WATER NPDES PERMIT MI0053902
FISCAL YEAR 1997-98 ANNUAL REPORT**

In accordance with Part III, paragraph C-1 of NPDES Permit MI0053902, the University of Michigan (University) is required to submit an annual report of activities associated with the storm water system program. This program is a requirement of the NPDES permit issued by the Michigan Department of Environmental Quality Surface Water Quality Division on December 19, 1995. This report covers the period July 1, 1997 through June 30, 1998 and follows the format identified in the permit.

1. *Provide a brief summary of the implementation status of the plans for the elimination of illicit discharges, public education, and storm water pollution prevention.*

In accordance with Part II, Storm Water Management Program, “the permittee shall submit an approvable Storm Water Management Program and program implementation schedule to the Jackson District Supervisor within one year after the effective date of this permit.” The draft document “Storm Water Management Program for the University of Michigan Ann Arbor Campus” was submitted to the MDEQ Jackson District office on December 10, 1996 for review and approval. Comments were received from Ms. Melissa Middleton, Soil Erosion and Sedimentation Control Program, on June 18, 1997 regarding erosion control methods employed during operation and maintenance activity. Those comments were incorporated in OSEH Operating Guidelines *EP007 Storm Water Management Program* and *EP008 Soil Erosion Control*, both of which have been distributed to various departments at the University and are available on the OSEH Web site www.umich.edu/~oseh. No other comments on the Management Program have been received; therefor the University is proceeding with the activities proposed in the Plan. The University has undertaken several items in the management of storm water runoff and pollution prevention.

- An on-going survey of University owned/managed facilities is being conducted by the Department of Occupational Safety and Environmental Health (OSEH) in an effort to identify discharge points into the storm and sanitary systems. As concerns are identified, they are being worked toward elimination through system modifications or pollution prevention initiatives. This program will assist in identifying “illicit connections” that may be associated with University facilities. To date, one major concern was identified in this survey and was reported in the Mid-Year Report. Refer to Item 2 below for results of this survey and a discussion of the illicit connection.
- According to the Storm Water Program plan submitted to MDEQ, the University is divided into 4 distinct areas based on geographical separation - South Campus, Central Campus, Medical Campus, and North Campus. One campus area will be selected each year for 4 years to conduct a dry weather-screening program. Last year the South Campus was screened and results of the effort were reported at mid-year. This summer the Central Campus has been selected for the screening, bid specifications prepared, and a consultant selected to perform the work. We anticipate the work being performed during August and September, with any required follow-up activity during the ensuing months. A report of this activity will be provided in the 1999 Mid-Year Report.
- Education programs have been undertaken in a formalized manner since last year. OSEH established a project with the U-M School of Natural Resources and Environment (SNRE) to develop a storm water education effort addressed at faculty, staff, students, visitors, and vendors to the campus. An education advisory team was established to work with SNRE to guide and assist in developing a meaningful training effort. Members of the advisory team were drawn from the U-M OSEH, Utilities, Grounds, Waste Management, faculty, and

students. This provides the major stakeholders and operational groups input into the effort. The following documents have been prepared and are currently under final edit. These will be finalized and distributed this fall.

- ◇ “*Storm Water Education Program*”, a comprehensive document describing the methods to prevent storm water pollution in a simple, non-technical language. It is designed for the campus community with simple tips to preserve storm water quality.
- ◇ Flyers – The following three flyers were prepared to target different audiences.

“*Storm Water - What You Can Do*” – the flyer is targeted to inform staff and faculty of the University about their responsibility in preventing storm water pollution.

“*Storm Water - Your Environment, Your Responsibility*” – the flyer is targeted to inform students, staff, and faculty about storm water pollution and methods to control it.

“*Storm Water - Vendor Responsibility*” – the flyer is targeted to inform the vendors at the University about their responsibility to alleviate storm water pollution.

Additionally, as opportunities arise for education, training is being provided to staff. As an example, update-training sessions are provided for the Building Custodial Staff to educate workers on the proper disposal of wash water. Vendors during the Ann Arbor Art Festival and at University sporting events are being educated on proper disposal of gray water from the food vending operations. These efforts involve both briefing the vendors as well as providing a handout to remind them of the requirements. Training sessions are held periodically with safety coordinators from all units around campus to obtain their assistance in educating faculty and students in their areas. A short article regarding pollution prevention was placed in the OSEH Fall 1997 Safety Bulletin.

- A storm-drain stenciling project was initiated by a group of students. The message “*Dump No Waste-Keep Our Michigan Waters Blue*” was stenciled on curbs adjacent to storm drains on north campus to educate campus community about the need to prevent storm water pollution and protect the Huron river. A copy of an article from the local paper regarding this effort is attached. This effort will continue, as more students become interested.
- The following articles related to storm water programs have been posted on the OSEH Web page at www.umich.edu/~oseh. This information is available to anyone, world wide, with access to the Internet. These articles provide campus and surrounding communities simple and effective tips aimed at preserving and enhancing storm water quality.
 - ◇ Storm Water Management Program Guideline
 - ◇ Storm Water Permit Fact Sheet
 - ◇ Improving Surface Water Quality on Campus
 - ◇ Improving Storm Water Quality at Home
 - ◇ Storm Drain Stenciling Project
 - ◇ Soil Erosion Control Guidelines
 - ◇ Discharge Permits/Monitoring
- Pollution prevention efforts continue through catch basin cleaning, street/parking lot sweeping, and litter collection programs. Soil erosion control efforts were implemented at a variety of construction projects during this past year including: Tennis Center, State and Hill streets parking lot, State Street commuter lot expansion, Transportation Services parking lot,

and North Campus Dean Road reconstruction. These efforts all reduce the quantity of sediment that may reach the Huron River.

- A *Salt Use Quality Improvement Team* has made considerable progress in identifying and employing a variety of liquid and solid materials on campus. The goal of the team is to promote *Best Management Practices* for de-icing that minimize deterioration to buildings, infrastructures, and the environment without compromising the safety of the University’s students, faculty, staff, and guests. Team members are from Public Safety, OSEH, General Counsel, Risk Management, Grounds Management, Parking Services, Building Services, and Plant Construction. A pilot test program was initiated in 1995 using potassium acetate (CF7) de-icer, and calcium magnesium acetate (CMA) to replace the sand/salt mixture. Various applications were tried, including mixtures of the materials with sodium chloride. A strategy of “anti-icing” was also tried where the application was made prior to the snow/ice precipitation. Based on the success of the pilot test, the program was expanded in 1996 to include MSRB II and III on the medical campus, portions of the hospital complex, the Ingles mall area, Hill Auditorium plaza, Alumni Hall, and two parking structures. The program was further expanded in 1997 to include a variety of liquid and solid de-icers, which were used across a much wider campus compared to previous year. The following data for 1997 illustrates the increase in usage of environmentally friendly, alternative de-icers.

<u>Material</u>	<u>97/98 winter</u>	<u>96/97 winter</u>	<u>% Decrease</u>
Salt	2113.39 tons	3477.2 tons	40%
Sand	107.97 tons	766.2 tons	86%

Alternative De-Icers – Granular Materials

Ice Vice	30.15 tons
Peladow	31.83 tons
Freezeguard	8.33 tons
Sodium Acetate	1.06 tons
Calcium Magnesium Acetate	4.01 tons

Alternative De-Icers – Liquids

Magnesium Chloride	7024 gallons
Potassium Acetate	114 gallons

Initial indications of the success of the program at the parking operations showed a 41% cost saving in snow removal and a substantial reduction in use of sand. The difficulty in judging the success of alternative de-icers this year stems from the mild winter we experienced. The cost and quantity data cannot be correlated to previous year’s usage. These studies indicate there are feasible alternatives for using salt in some applications. This program will expand further in the upcoming years and additional studies will look at the effect of alternative deicers on vegetation, cost benefit on infrastructure maintenance, and safety issues.

2. *Provide a report of illicit discharges and illicit connections removed, and schedule for illicit connections and their associated discharges yet to be removed.*

The following “illicit discharges” were identified and eliminated during this reporting period:

- As in the previous year, a field survey was performed of food vendors from Ann Arbor Art Fair and Top of the Park Summer Festival during site preparation for the events to determine how gray water was handled and disposed. As a result, a central location was established for

vendors on University property for disposal into the sanitary system. Vendors were educated on transporting gray water to the proper disposal point. Proper disposal methods of gray water have been incorporated into the temporary food permits issued to them by the University to set up their booths at the festivals. During the Top of the Park Festival vendors were provided with drums and given a location to empty them. A spot check performed during the festivals showed compliance with the disposal requirements.

- Wet stone cleaning methods were successfully implemented at two renovation projects on the Ann Arbor campus - the Art Museum and the Observatory. Both projects had the potential for producing sediment in the water stream as well as paint chips from the Observatory. Wash water handling specifications were prepared that required collection and proper disposal of the water, eliminating discharge of water or sediment to the storm water system. Inspections of the projects show the contractors followed the specifications and any discharges to the storm sewer system were properly controlled.
- U-M OSEH sanitarians are working on a continual basis with kitchen and food vendor personnel in facilities across campus to ensure proper waste handling and disposal methods are used. Issues identified and corrected in the past include disposal of greasy wash water from cleaning ventilation hoods and wastewater from portable sinks.
- The drainage basins located in the tarmac surrounding Michigan Stadium were inspected to determine which were connected to the storm or sanitary systems. It was discovered that all exterior drains connect to the storm water system. As a result, all food vendors have been educated on transporting gray water to a sanitary system drain located inside the stadium for proper disposal. This has become a part of the regular inspection of all food vendors to assist with compliance. During the last football season, vendors were provided with training and a flyer informing them to dispose sanitary gray water appropriately. More sanitary connections are being installed at the vendor booths as part of a stadium renovation project currently underway and expected to be completed prior to this seasons games.
- One “illicit connection” was identified during this reporting period (reported in the 1998 Mid-Year Report) that could not be corrected immediately. During the sewer system survey discussed in Item 1 above, a potential cross connection was identified at the G.G. Brown building on North Campus. Investigation of the building revealed that cross connections exist within the building, whereby water from some of the floor drains and sinks is introduced into the storm water network instead of the sanitary sewer. The bathroom discharges were correctly connected to the sanitary sewer system.

A project to re-direct floor and sink drains at G.G. Brown to the sanitary sewer system commenced in May this year and is expected to be completed in September. The overall goal of the project is to eliminate storm and sanitary cross connections. The estimated budget is \$550,800. Key project items include:

- ◇ Replace pump, piping, and grate at the existing valve pit
- ◇ Disconnect existing floor drains to storm drains and reconnect to new sanitary lines
- ◇ Plug and patch floor drains and overflow drains in rooms having cross connections
- ◇ Remove and replace light fixtures and plaster ceiling where necessary
- ◇ Remove flooring, stenciling the abandoned pipes, and other miscellaneous tasks
- ◇ Remove and replace laboratory equipment such as fume hoods, counter tops, sinks, cabinets, etc. required to install new waste piping
- ◇ Install, inspect, and test new waste and vent piping
- ◇ Backfill and replace the concrete floor

Approximately 20% of the new sewer pipes have been installed. Saw cutting the existing floor has been completed in all the rooms. All other tasks are being completed as appropriate.

3. *Provide an evaluation and summary of the effectiveness of the Storm Water Management Program. The report shall include an assessment of the pollution reduction and probable receiving water impacts associated with program implementation. When applicable, a statement shall be included regarding any negative water quality impacts that may have occurred as a result of any illicit discharges or accidental spills during the year.*

In accordance with Part III-A, methods to evaluate effectiveness of the program can vary, depending on the type of activity undertaken. The following factors are being reported during this period; however, this may change as the program becomes more formalized.

- Item 2 above discusses the effectiveness of “illicit discharge” identification and reduction.
- During this reporting period OSEH Hazardous Material personnel responded to approximately 194 incidents, involving spills and leaks of hazardous materials. Of these, 34 potentially related to storm water issues. The majority of the spills were small, a few milliliters to a few gallons. At all locations, no discharge to the storm system was noted and materials were well below reportable quantities. The materials were all contained with spill kits; cleaned up using absorbent materials, and removed for appropriate disposal by OSEH’s on-call emergency response team. Response activities involved leaks and spills of diesel, gasoline, and hydraulic oil in parking areas, driveways, and other outdoor places. A few examples of such releases and the corresponding response actions are given below.
 - ◇ Approximately 40-50 gallons of diesel fuel was discovered in a parking lot retention basin from an unknown source. The material was contained in the basin and no release to the storm water system occurred. The fuel and contaminated water were pumped out from the retention basin and six inches of hydrocarbon contaminated soil was removed for proper disposal.
 - ◇ Approximately 25 gallons of diesel fuel was released inside the Central Heating Plant. The product was contained in concrete trenches in the vicinity of the release. No discharge to the sewers was noted. The product was cleaned up using oil dry absorbent.
 - ◇ Approximately 15 gallons of hydraulic oil spilled at the hospital loading dock from a leaking hose on a truck’s loading gate. The spill was cleaned up using vermiculite absorbent and absorbent pillows. No discharge to the storm system occurred.
 - ◇ Approximately 40 gallons of hydraulic oil leaked from a vehicle parked at the G.G. Brown loading dock. The material was cleaned up using oil dry and kitty litter absorbents. No discharge to the storm system was noted.
 - ◇ Approximately 10 gallons of antifreeze liquid spilled from a shuttle bus that developed a coolant leak. Floor dry was used to absorb the liquid. Once the liquid was absorbed, a street sweeper was used to collect the residue for proper disposal. No discharge to the storm system was noted.
- During this reporting period several training opportunities were conducted including:
 - ◇ U-M Safety Coordinator Conference held in November ’97 was attended by approximately 60 personnel. These individuals act as safety and environment points of contact for faculty, staff, and students in their respective areas and become a nucleus for disseminating information on storm water programs, among other activities. Storm water

quality control relevant issues such as proper waste disposal and pollution prevention were covered at this annual conference.

- ◇ Approximately 35 vendor booths received training in preparation for the Art Fair including the proper disposal of gray water from their operations.
 - ◇ The OSEH Safety Bulletin is distributed to approximately 170 units on campus to educate staff, faculty, students, and visitors regarding health, safety, and environmental issues. The Winter 1997 edition featured an article on storm water, chemical handling, and individual responsibility to preserve surface water quality.
 - ◇ Last Fall OSEH, with the assistance of an outside training organization, conducted a 40 hour *Emergency Response and Incident Command Training Program* for approximately 150 individuals from OSEH, Public Safety, and various other organizations across campus. These individuals are either initial responders or full responders to incidents across campus.
- A catch basin cleaning program has been underway during the last year. A contractor, HI-PO, cleans the catch basins approximately twice per year. During this past year catch basins across the campus were cleaned and the lines rodded out, resulting in approximately 204 cubic yards of sediment and debris removed from the storm water system transported for disposal off-site at EQ in Canton. In addition, an estimated 35,150 gallons of liquid waste from the cleaning operations was transported off site for disposal as liquid industrial waste.
 - The University Parking Services and Grounds and Waste Management Department (G&WM) conduct street and parking lot-cleaning programs. During this period approximately 200 cubic yards of sediment was collected and sent off site for disposal. In addition to sweeping and vacuuming of surface lots and parking structures, Parking Services Department has involved itself in using alternate de-icers during the winter. This was done to improve customer service, decrease the damage to structures from use of salt, prevent clogging of drains due to sand, and to become environmentally friendly. The G&WM performs a litter collection program, where approximately 180 cu. yards of litter was collected and sent for off-site disposal as normal municipal waste.

4. *Provide proposed modifications and updates to the Storm Water Management Program, including an update on areas added to the University's municipal separate storm water drainage system due to annexation or other statutory processes. Proposed modifications and updates shall include schedules for implementation when appropriate.*

No changes to the program are proposed at this time.

5. *Provide revisions, if necessary to the assessments of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) & (v).*

No revisions are proposed at this time.

6. *Provide a summary of any data, including water testing or screening data, that has been developed since the previous annual report and which is not reported elsewhere in the annual report.*

Monitoring data on the storm water system dry weather screening for South Campus was provided in the 1988 Mid-Year Report. No other data has been developed during this period.

7. *Provide the previous year's annual expenditures and proposed budget for the fiscal year following the report.*

The expenditures and budget are shown in the following table.

ACTIVITY	97-98 UNIVERSITY LABOR AND MATERIALS ²	97-98 CONTRACTOR COST OR DIRECT PAYMENTS	98-99 BUDGET ESTIMATE
Permit administration	\$20,620		\$20,000
G.G. Brown Sewers retrofitting project	\$7,820	\$34,000	\$508,980
OSEH Survey of building connections to storm system	\$41,870	\$10,730	\$60,000
Storm water education program	\$21,640		\$40,000
Catch basin maintenance and cleaning program	\$86,389	\$345,565	\$500,000
Street sweeping program	\$39,956		\$45,000
Parking structure cleaning program	\$388,920		\$431,825
Storm water utility charges paid to Ann Arbor		\$387,355	\$450,000
OSEH spill response activity	Footnote 1		
Plant Extension Division	Footnote 1		
Waste Management Department	Footnote 1		
TOTALS	\$607,215	\$777,650	\$2,055,805

Footnotes: 1 - These departments and divisions have moderate storm water costs and are not tracked separately by the University budget system.

2 - University labor costs include estimated base salary, 28% for benefits, and 52% for indirect cost recovery charges.

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