

## Introduction

### Regulatory

In 1990, the Environmental Protection Agency (EPA) issued the National Pollutant Discharge Elimination System (NPDES) Phase 1 Storm Water Rules, which were in response to the 1987 Clean Water Act Amendments. There were three components of the Phase 1 Rule. First, they covered all construction sites impacting greater than 5 acres. Second, they identified 10 specific industrial source categories based on Standard Industrial Code (SIC), which required permitting. Finally, the Phase 1 Rule identified 'large' and 'medium' municipally separate storm sewer systems (MS4s) located in incorporated places or counties with populations greater than 100,000 as subject to developing storm water pollution prevention plans. See the EPA Phase II NPDES Storm Water Program's website <http://cfpub.epa.gov/npdes/stormwater/swphase2.cfm> for additional information.

On December 8, 1999, the EPA issued the NPDES Phase 2 Storm Water Rules in the Federal Register. The Phase 2 Storm Water Rule covers MS4s in urbanized areas with a population less than 100,000. It is important to note that the Phase 2 rule is not limited to 'municipally owned' storm sewer lines. It includes other storm sewer systems at large facilities such as prisons, military complexes and universities. Therefore, the Duluth Campus is covered under the Phase 2 rules.

The Minnesota Pollution Control Agency (MPCA) accepted responsibility for implementation of this program from the EPA. On June 25, 2002, MPCA finalized and approved general permit MN R580000 for 'authorization to discharge storm water associated with municipal separate storm sewer systems under the National Pollutant Discharge Elimination System/State Disposal System permit program.' This General Permit incorporates EPA's six minimum control measures as well as other state specific requirements. The MPCA's web site describing these requirements can be found at <http://www.pca.state.mn.us/water/stormwater/stormwater-ms4.html>.

In response to this new regulatory requirement, the University of Minnesota (U of M) created a Storm Water Task Force in 2000, consisting of U of M Environmental Health and Safety (EHS) and University of Minnesota Twin Cities (UMTC) Facilities Management (FM) employees, which monitored the MPCA general permit process. The U of M Storm Water Task Force systematically reviewed UMTC campus operations and developed the framework for storm water pollution prevention plans for the U of M.

In the summer of 2002, it was determined that the Duluth Campus would also be required to apply for coverage under the Phase 2 program. At this time UMD Facilities Management was asked to look into what this meant for our campus. Facilities Management put together a team of individuals (UMD SWPPP Development Team) familiar with general campus operations to develop a draft SWPPP. This draft was developed under the guidance of the U of M's Department of Environmental Health and Safety. The UMD draft SWPPP was presented for public comment at an open meeting held on February 13, 2003. Comments were taken until February 24, 2003 and then evaluated with the help of U of M's Department of Environmental Health and Safety and appropriate changes were made to the draft. When the plan is implemented, a formal UMD Storm Water Steering Committee will be formed to further develop and review the policies and procedures outlined in the best management practices (BMPs). This

committee and its sub-committees will be comprised of major stakeholders and other interested parties from across our community.

In addition to 'MS4' coverage, the Phase 2 Rules lower the threshold for construction site coverage from 5 acres to 1 acre. Even though there are significant overlaps between the U of M's SWPPP's and the MPCA Construction Site Program, these are separate and distinct regulatory programs with differing special permit requirements. The *University of Minnesota Standards and Procedures for Construction* (<http://www.facm.umn.edu/cons/>) requires submittal of an MPCA Construction Site Application for all projects impacting greater than 1 acre. The U of M construction standards address the construction site runoff control and post-construction site runoff control requirements for the U of M SWPPP's, as well as requiring compliance with the MPCA Construction Site Program.

Further, the Phase 2 Rule adds additional industrial sites based on the SIC. As an example, municipal fleet and maintenance facilities may now be required to apply for separate coverage under the Phase 2 rule, such as construction sites. The U of M Department of Environmental Health and Safety is in the process of determining if any of the UMD facilities may now be required to apply for industrial permits.

As a newly regulated MS4, the U of M submitted permit applications with campus specific Storm Water Pollution Prevention Plans before March 10<sup>th</sup> 2003 as required by the Phase II Rule. The SWPPPs must identify specific best management practices (BMPs) that; reduce discharge of pollutants to the 'maximum extent practicable (MEP)', protect water quality, and satisfy the appropriate water quality requirements of the Clean Water Act. In several instances, information, design, and control overlaps occur between the UMTC and UMD. In other words, applicable best management practices (BMP) developed for one U of M site, such as Regents policies or construction standards, will be used to fulfill BMP requirements for other sites. The U of M must fully define and implement the best management practices identified in their storm water pollution prevention plans in accordance with the time schedules set out in the plan.

### **Campus Background**

In 1895, the Minnesota Legislature created the Normal School at Duluth, which was located at 2205 East Fifth Street. In 1921, the institution became the Duluth State Teachers College, and on July 1, 1947, it became a coordinated campus of the University of Minnesota. In 1948, ground was broken for the first building of the upper (main portion) campus, approximately 1/2 mile northwest from the old campus, to accommodate the service men and women returning from World War II. Currently UMD is a comprehensive regional research and educational institution with a fall 2002 enrollment of approximately 9,800.

The UMD campus is located at the western end of Lake Superior within the Duluth city limits and is approximately one mile northwest of the north shore of Lake Superior. The UMD campus elevation ranges from 450 feet to 600 feet above the elevation of Lake Superior. The campus (City of Duluth) climate is transitional type with the average maximum temperature of 74 degrees F and an average minimum temperature of 2 degrees F. The average annual precipitation in the form of rainwater is 10 inches and in the form of snowfall is 70 inches. Information published by the United States Geological Survey Hydrologic Atlas HA-582 indicates that surficial soils in the general area are lake clays with poor drainage. These soils are described as predominantly stratified clay with

silt and sand, which are generally less than 50 feet thick. The regional surficial groundwater gradient in the campus vicinity is to the southeast, toward Lake Superior.

The main portion of the UMD campus covers over 244 acres of land, including 55 undeveloped acres on the northwest side of the campus, commonly referred to as the Bagley Nature Area (BNA). Over 75 acres (30%) is covered with impervious surfaces (2002). This includes over 50 academic and residence buildings, parking lots, roads, sidewalks, and impervious recreational areas. The storm water is divided into two localized drainage basins: Oregon Creek to the south and the West Branch of Tischer Creek (*a designated trout stream, MN Rules 6264.0050 Subpart 4 (78)*) on the north. The campus has over 6 miles of storm sewer lines and two existing wet sedimentation ponds, Fire Hall Pond (built 1979) and Eric Clarke Pond (built 1965), which were both dredged back to their original capacities in 2001.

As a non-traditional MS4, UMD is not made up of a contiguous piece of property, but is actually many parcels dispersed through out northern Minnesota. In addition to the main portion of the campus, the University of Minnesota Duluth has several sites in the urbanized area around the City of Duluth. It is our understanding that these auxiliary sites are also required to be part of our SWPPP.

- **Lower Campus** – This site is located 3 blocks southeast of the main portion of campus within the urbanized area of Duluth, Minnesota. The site was originally Normal School at Duluth / Duluth State Teachers College and in 1947 it became the University of Minnesota Duluth. The lower (old) campus has 2 buildings on 3.5 acres and has minimal storm sewer. Both buildings as well as the surrounding lands are listed on the *National Historic Register*. Oregon Creek flows directly under the Research Laboratory Building and is confined by stonewalls.
- **Glensheen** – This site is located on the shores of Lake Superior within the urbanized area of Duluth, Minnesota. It is a museum of the historical Congdon Estate completed in 1908. This site is listed on the *National Historic Register*. The estate is comprised of 10 acres with 6 buildings and 85,000 sq. ft. of impervious surface. Tischer Creek (*a designated trout stream, MN Rules 6264.0050 Subpart 4 (78)*) forms the west edge of the property, and Bent Brook bisects the center the property. Minor drainage systems discharge into both of these creeks. Overland flow flows toward each of the creeks as well as Lake Superior (*a restricted discharge waters, MN Rules. 7050.0180, subp. 6 (A)*). There are no known UMD storm sewer lines discharging into Lake Superior, but there are rock lined drainage trenches that lead to the shoreline. The building septic system was originally designed to flow out to the end of the pier and into Lake Superior. This system was disconnected in 1941 and connected to the city sanitary system. The main grounds are irrigated with Tischer Creek water via a gravity fed system originating at a dam and filtration unit up stream. This irrigation system was constructed as part of the original estate construction. The property was given to the U of M in 1969 and began operating as a museum in 1979. The estate has about 70,000 visitors a year. The property is maintained and operated by it's staff and is assisted by Facilities Management crews when requested.
- **Natural Resources Research Institute (NRRI)** – This site is located near the Duluth International Airport, within the urbanized area of Duluth, Minnesota. The site was originally part of the Duluth Air Force Base and was acquired by the U of

M in 1983. The facility is used as a research center for the development of Minnesota's natural resources in an environmentally sound manner. The property consists of one main building, two storage sheds and outdoor storage on 7.6 acres. There is approximately 131,400 sq. ft. of impervious surface at this site. Storm sewer from this site drains into the road ditch and eventually into Miller Creek (*a designated trout stream, MN Rules 6264.0050 Subpart 4 (53) and a 303(d) waters for temperature and biota per MPCA 2002 tmdl-303d list*).

- **Limnology** - This site is located on the shores of Lake Superior within the urbanized area of Duluth, Minnesota. It is used as rental property for the U of M, currently housing the Lake Superior Center and a single-family residence. The facility was constructed around 1888 as a fish hatchery for the U.S. Fish Commission and was acquired by the U of M from the U.S. Department of Interior in 1948. This site is listed on the *National Historic Register*. The property consists of the main building, an adjacent house, two small sheds, and a gravel drive/parking lot all on 2.8 acres. There is approximately 14,000 sq. ft. of impervious surface at this site. There is no known UMD storm sewer on this site, overland flow flows toward Lake Superior (*a restricted discharge waters, MN Rules. 7050.0180, subp. 6 (A)*) and the mouth of the Lester River (*a designated trout stream, MN Rules 6264.0050 Subpart 4 (47) and a 303(d) waters for turbidity and mercury per MPCA 2002 tmdl-303d list*).

### **Existing Storm Water Concerns**

Educational, like commercial, areas tend to have large buildings and large parking lot areas to facilitate the transient nature of the population. The compact nature of our campus means high impervious surface percentages and little excess land area for the traditional retention/detention pond BMPs.

Common pollutants in runoff include pesticides, fertilizers, excess quantity of water, increased temperature in trout waters, oils and greases, metals, pathogens, salt, sediment, cigarette butts, paper and plastic, and other debris.

The top five potential pollutants for the UMD community are believed to be:

- Quantity (Storm Surge) of Water – High percentage of directly connected impervious surfaces
- Temperature – Trout stream and high percentage of dark colored directly connected impervious surfaces
- Floatables – Wind blown debris from vehicles, trash and cigarette receptacles, construction sites, exterior events, and litterbugs
- Suspended Solids– Construction site erosion and road and parking lot sanding
- Hydrocarbons – Fueling operations and auto “drippings”

This program will focus on these potential pollution sources through the use of best management practice on our campus.