



**HUMBOLDT STATE UNIVERSITY**

**Environmental Health and Safety**



# **Stormwater Pollution Management**



## **INTRODUCTION**

Humboldt State University is situated in Arcata, California, in Humboldt County. The facility is generally bounded by HWY 101 to the west, 14<sup>th</sup> street to the south, Union street and the Arcata Forest to the east and the lower northern slope of above Jolly Giant Creek to the north. The main campus is 144 acres approximately 1,000,000 square feet of which is compromised of buildings. Significant surface waters include Jolly Giant and Campbell Creeks, which drain into the Arcata bay.

The purpose of this guidebook is to provide the necessary information regarding general storm water, the impacts of pollution and general prevention methods. Federal regulations require outreach programs and informative materials be available to faculty, staff and students in order ensure that the minimum control measures are being understood and implemented. General Storm Water Management guidelines are presented in this guidebook and are intended to provide the most relevant information for the general public regarding best management practices and potential water quality impacts.

Humboldt State University is committed to helping maintain the integrity of the local waterways through conscientious activism and proactive management programs.

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## **REGUALTORY OVERVIEW**

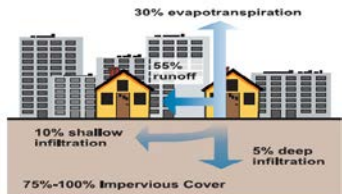
Humboldt State University is regulated under NPDES or National Pollutant Discharge Elimination System Phase II requirements developed by the U.S. EPA. These regulations designate the university as a small MS4 or Municipal Separate Storm Sewer System- and require the development of a Storm Water Management Program (SWMP) which shall be implemented as a mean of reducing the discharge of pollutants generated campus-wide to the “Maximum Extent Practicable” or MEP, and helping to protect overall water quality of local waterways. Implementation of the management plan shall satisfy the appropriate water quality requirements of the Clean Water Act and those of the Regional Water Quality Control Board Basin Plan.

The management plan shall be outlined in such a way that its implementation is transparent and qualifiable. Execution of the MEP standard requires the development of Best Management Practices (BMPs) and the achievement of measurable goals to satisfy each of the six minimum control measures. It is expected that these six elements, when implemented in concert, will result in significant reductions of pollutants discharged into receiving water bodies.

## STORMWATER

Stormwater is water that originates from rainfall. It may also be used to apply to water that originates with snowmelt that enters the stormwater system. Stormwater that does not soak into the ground becomes surface runoff, which either flows directly into surface waterways or is channeled into storm sewers, which eventually discharges to surface waters.

Since humans began living in concentrated village or urban settings, stormwater runoff has been an issue. During the Bronze Age, housing took a more concentrated form, and impervious surfaces emerged as a factor in the design of early human settlements.



Because impervious surfaces (parking lots, roads, buildings, compacted soil) do not allow rain to infiltrate into the ground, more runoff is generated than in the undeveloped condition.

## **POLLUTION**

When pollutants are carried to surface waters by rainfall it is termed urban runoff. Daily human activities result in the presence of pollutants on roads, lawns, roofs, farm fields, etc... When it rains or by means of irrigation, water runs off and ultimately makes its way to a river, lake, or the ocean, carrying pollutants with it. While there is some attenuation of these pollutants before entering the receiving waters, the quantity of human activity results in large enough quantities of pollutants to impair these receiving waters.

Stormwater pollution is designated into one of two categories: Point source pollution and Non-point source pollution. Point source pollution is storm water where discharges occur to a body of water at a single location. For example, an industrial facility may convey all of its runoff through multiple storm drain lines that all converge into one large drain, which then enters straight into a body of water like a river or creek. Non-point source pollution (NPS) comes from things like: run off from agricultural or livestock areas, as well as contaminated storm water which is washed off of parking lots, roads and highways, or urban runoff. However, urban runoff can also be channeled into storm drain systems and discharged through pipes to local surface waters, and would be considered a point source.

## **COMMON SOURCES AND EFFECTS**

**Oil and grease** - Oil from various sources can enter waterways. Oil and grease float on the water's surface and block sunlight needed by underwater fish and plants. Oil and grease can also damage stream habitat and sensitive spawning areas when they cling to sand and gravel particles that settle to the bottom of streambeds. Oil also reduces the solubility of oxygen in the water, which thereby reduces respiration in aquatic life forms.

**Heavy metals** - Heavy metals like lead, zinc, and mercury, are ingredients in many commonly used products like batteries, fuels, paints, pesticides, and cleaners (e.g. algacides). They can also be found in industrial-strength materials like rubber and can be toxic to fish and other aquatic life in streams.

**Nutrients** - Nutrients like Phosphorus and Nitrogen are transported into streams when storm water picks up fertilizer and animal manure residues on the ground. When excessive amounts of nutrients end up in water bodies, they accelerate algae growth and causes eutrophication, which disrupts life in ponds and streams.

**Chemicals** - Toxic chemicals in fuels, paints, cleaning products, and pesticides can harm water quality. Organic chemicals have a wide range of toxic effects on aquatic life, including causing tumors and skin lesions and disrupting reproductive functions.

Mud and sediment - are readily carried by storm and flood waters, causing excessive buildup (commonly called sedimentation).

When storm water flows across construction sites and unplanted fields, it picks up loose dirt, creating mud, which is quickly carried into streams where it causes sedimentation pollution. When too much sediment accumulates on streambeds, it damages fish-spawning areas, alters habitat where bottom-dwelling organisms live and reproduce, and interferes with fish migration. In addition, dirt and sand often pick up oil and grease in their path, which introduces additional chemical contaminants that are toxic to fish and other aquatic organisms.

Anything on the concrete –Whether it is thrown on the ground intentionally or spilled on accident, anything that lands on the ground has the potential to enter waterways and interfere with the habitat for fish and other aquatic organisms. Most commonly these types of intrusions come from cigarette butts paper wrappers, plastics and even things like spilled beverages –when considered on an aggregate scale adds up to a significant source of pollution. For example: It is estimated that **4.5 trillion cigarette butts worldwide are littered each year**. The butts are made of cellulose-acetate, a type of plastic and can take years to break down and contain dangerous chemicals such as arsenic, cadmium cyanide and lead. The toxic chemicals are leached into aquatic ecosystems, threatening the water and the marine life in it.

## **STORMWATER MANAGEMENT PLAN**

There are 6 minimum control measures aimed at achieving improved water quality and targeted to all sources regulated under phase II requirements and they are:

- Public (campus) Outreach and education
- Public Involvement
- Illicit Discharge Detection and Elimination
- Pollution Prevention/Good Housekeeping for maintenance and plant operations
- Construction Site Stormwater Runoff Control
- Post-construction Stormwater Management in new development and redevelopment

BMPs are outlined in the management plan as a way to meet the MEP requirements in order to reduce the discharge of pollutants, and include things like education, street sweeping, operating procedures, spill/leak detection, pesticide/herbicide minimization, stenciling drains, keeping updated maps and physical retention around “high risk” drains. BMPs are updated as needed to adjust to any additions or changes to permit requirements, as well to any physical changes to campus or operations. Everyone on campus is encouraged to monitor storm drains and surrounding areas for pollutants and advise EH&S if new BMPs should be implemented. Reducing water pollution is everyone’s responsibility.



## **REDUCE POLLUTION**

- Only rain goes into storm drains- never pour anything into a storm drain, and stop all noticeable leaks
- Wash your car on a the lawn as the grass will filter pollutants, or use the car wash
- Use a pooper scooper- Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local water bodies
- Check your car, boat, motorcycle, and other machinery and equipment for leaks and spills
- Clean up spilled fluids with an absorbent material like kitty litter or sand. Don't rinse the spills into a nearby storm drain and remember to properly dispose of the absorbent material
- Store substances properly to avoid leaks and spills.
- Purchase and use nontoxic, biodegradable, recycled, and recyclable products whenever possible.
- Clean paint brushes in a sink, not outdoors



