

Stormwater--Basic Information

Introduction

Stormwater is the flow of water that results from precipitation and occurs immediately following rainfall or as a result of snowmelt. Stormwater runoff is regulated under the Clean Water Act and can have a number of impacts on the environment, wildlife, livestock, and people. There are both civil and criminal penalties for violating the Clean Water Act.

This training will introduce the requirements for base personnel related to stormwater management. When you complete this training, you will be familiar with the following:

- definition of stormwater
- typical stormwater pollutants
- Best Management Practices related to stormwater
- stormwater monitoring program



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What is Stormwater?

Stormwater is water from precipitation that flows across the ground and pavement when it rains or when snow and ice melt. The water seeps into the ground or drains into what we call storm sewers or just flows over undeveloped land. Storm sewers are the drains you see at street corners or at low points on the sides of streets. Collectively, the draining water is called stormwater runoff. It eventually flows into lakes, rivers, wetlands, and oceans.

Stormwater is a concern because of the pollutants it can carry. These pollutants have the potential to harm or kill fish and wildlife. They can also pose a danger to people who swim or fish in these waters. Stormwater can also affect the landscape in unwanted ways such as mudslides.



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Stormwater Pollutants

Almost any stormwater contaminant can pose a severe threat to fish and other aquatic life as well as wildlife, livestock, and people. Contaminants such as oil, grease, and other chemicals (e.g. pesticides and herbicides) can be very toxic. Several scientific studies have shown that the toxic effect of these chemicals is twice as severe on aquatic life as on people. This is also true for heavy metals such as iron, copper, and zinc.

Small quantities of contaminants such as chemicals can cause a lot of damage. For example, one gallon of used oil can contaminate over 100,000 gallons of lake or river water. Also, some chemicals can stay in the environment for a very long time. For example, the half life of dichlorodiphenyltrichloroethane (an illegal pesticide known as DDT) is over 100,000 years



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Stormwater Pollutants



Along with contaminants such as oil, grease, and chemicals, stormwater pollutants also include nutrients, bacteria, and pathogens. Nutrients such as fertilizer and animal waste deplete oxygen in the water and promote the growth of harmful bacteria and pathogens such as salmonella. Bacteria and pathogens in lakes and streams hurt aquatic life by consuming their natural food supplies as well as posing a harmful threat to them.

Once bacteria and pathogens are in a lake or river, they tend to spread very fast and are very hard to eliminate. It is estimated that about 75 percent of stormwater pollutants consist of nutrients, bacteria, pathogens, and sediment.

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Stormwater Pollutants

Litter, debris, mud, and sediment are additional stormwater pollutants. Litter and debris are trash. Trash hurts aquatic life by making it difficult for natural plants to grow due to oxygen depletion. It also interferes with the feeding cycle of aquatic animals. For example, a turtle may think that a french fry carton is something to eat and may not be able to digest it.

Mud and sediment interfere with the oxygen that fish breathe in the water. The more mud and sediment, the less oxygen it can hold. Fish can suffocate and die. Mud and sediment can also interfere with the growth of some kinds of aquatic plant life. Finally, excess sediment can change the flow patterns of rivers and streams and may cause extreme damage to land such as mudslides. It is estimated that sediment is the largest stormwater pollutant in the world.



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Best Management Practices

Compliance with federal, state, and local stormwater programs revolve around the use of Best Management Practices (BMPs).

BMPs include structural and engineering controls, processes, procedures, and prohibitions of practices that are used to prevent or reduce pollutant runoff during storm events.

While this training does not focus on any structural or engineering controls, it does address the following practices that can be implemented by personnel accomplishing their day-to-day jobs:

- good housekeeping
- preventive maintenance
- spill response
- visual inspections

These are controls that can be used by almost everyone at Holloman Air Force Base, everyday. For controls more specific to your job, contact your unit environmental coordinator.



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Good Housekeeping

Good housekeeping practices can prevent or reduce pollutant runoff during a storm event.

These practices include the following:

- Don't let vehicles drip oil (report leaks on Air Force Form 244).
- Clean off drum lids.
- Pick up trash and close dumpster lids.
- Cover equipment left outside and put metal on dunnage.
- Put as much material and equipment (i.e. drums) inside as possible.
- Keep potential spills away from storm drains.
- **Do not put anything down storm drains.** They are for natural rainfall!
- Only perform abrasive blasting/painting in a facility approved and certified for those activities.



Contact your unit environmental coordinator for general housekeeping practices related to your work activity or facility.



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Preventive Maintenance

Preventive maintenance involves the regular inspection, testing, and replacement or repair of equipment and operational systems. A preventive maintenance program can prevent breakdowns and failures through adjustment, repair, or replacement of equipment before a major breakdown or failure occurs.

The following are two key elements for a preventative maintenance program:

- **Identify systems with a potential to pollute.**
 - Inspect valves, pipes, pumps, storage tanks, etc. for leaks.
 - Use equipment for its intended purpose and within its intended range of operation.
 - Ensure equipment is calibrated if required and fit for use (i.e., no corrosion).

- **Verify maintenance of structural Best Management Practices.**
 - catch basins
 - oil/water separators
 - drains
 - inlets/outlets



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Spill Response

If a spill occurs, call the Fire Department and the Environmental Flight immediately and perform the following actions:

- **Safety First. Don't take risks.** If you are not qualified to clean up the spill, do not jeopardize your safety.
- Stop the spill at its source.
- Protect storm drains and waterways such as rivers, streams, wetlands, and lakes.
- Use your spill kit. Spread absorbent material onto the spilled chemical.
- Follow your emergency procedures.
- Clean spilled material according to the Holloman Air Force Base Spill Prevention Control and Countermeasures Plan.



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Inspection Program

An inspection program is used at Holloman Air Force base to ensure that our Best Management Practices (BMPs) are working. The inspections are conducted quarterly by the Unit Environmental Coordinator and the Stormwater Program Manager.

Common recurring problems we notice include the following:

- **metal on the ground**
 - Iron and copper are pollutants.
 - Arsenic, lead, and silver are worse.
- **housekeeping issues**
 - Trash adds nutrients to stormwater runoff causing oxygen depletion.
- **mud**
 - Sediment fills the drains and is harmful to aquatic life.
 - Vehicles, construction, washing, and erosion cause mud.
- **painting and sandblasting**
 - Trace chemicals and metals on the ground wash into stormwater.



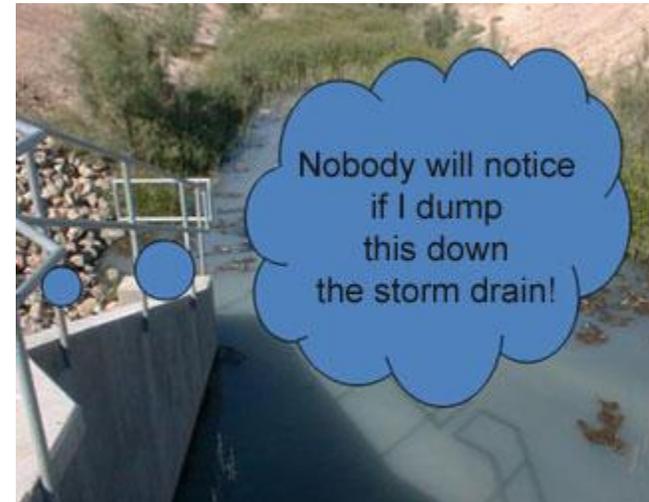
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Stormwater Sampling

Continuous automated monitoring is conducted to detect pollutants before a significant amount is released to the environment. The sampling monitors are automated and collect a water sample each time it rains. These samplers are placed at the end of each outfall.

Samples are analyzed for different things, depending upon what type of work is performed near the outfall. For example, an outfall near an auto repair garage could be sampled for oil, grease, and antifreeze.

Users must report spills before they get to outfalls. Spills that make it to an outfall can result in fines and potential criminal liability (You could go to jail). Sampling helps ensure that our Best Management Practices are working.



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Summary

Stormwater runoff may contain contaminants that pose a danger to the environment as well as to animals and people. Because of this, stormwater runoff is regulated under the Clean Water Act. It is everyone's responsibility, through the use of Best Management Practices (BMPs), to comply with all federal, state, and local stormwater regulations.

You have now reached the end of this training and should be familiar with the following:

- Stormwater is water from precipitation that flows across the ground and pavement when it rains or when snow and ice melt.
- Almost any stormwater contaminant can pose a threat to fish and other aquatic life, wildlife, livestock, and people.
- Holloman Air Force Base (AFB) personnel (Active Duty, Civilians, and Contractors) have a significant impact on Holloman's Stormwater quality and legal liability.
- BMPs are the tools you use to make positive impacts and keep our operations legal. The following practices can be performed by base personnel in their day-to-day jobs:
 - good housekeeping
 - preventive maintenance
 - spill response
 - visual inspections
- An inspection program is implemented at Holloman AFB, to ensure that our BMPs are working.
- Stormwater is regulated under the Clean Water Act. Non-compliance can result in fines and potential criminal liability.

If you have any questions or comments about stormwater management, contact your Unit Environmental Coordinator or the Holloman AFB Stormwater Manager at 3931.

