

Chapter 12 - Storm Water Management (REDACTED)

12.1 Applicability

This instruction is applicable to all civil servants and contractor employees, NASA Research Park Partners and tenant personnel at Ames Research Center (Ames) and Crows Landing Flight Facility (Crows Landing).

12.2 Purpose

This chapter establishes minimum requirements for an Ames Storm Water Pollution Prevention Plan (SWPPP) management program to protect human health and the environment and comply with applicable Federal, state, and local regulations.

12.3 Policy

It is the policy of the Ames Research Center to:

1. Comply with all pertinent statutory and regulatory requirements and Executive Orders related to storm water pollution prevention management. Ames recognizes and will comply with applicable Federal, state, and local regulations.
2. Consult with Federal, state, and local agencies, as appropriate, about the best techniques and methods to manage storm water pollution prevention, including:
 - U.S. Environmental Protection Agency (EPA)
 - Regional Water Quality Control Board (RWQCB)
 - State Water Resources Control Board (SWRCB)
 - State of California Department of Fish and Game
 - Santa Clara Valley Water District (SCVWD)
3. Promote employee awareness of storm water pollution prevention management through training and active information dissemination.

12.4 Authority

All relevant Federal, state, and local laws and regulations related to storm water management:

1. Title 40, Code of Federal Regulations, Parts 122, 123, and 124
2. Federal Water Pollution Control Act (Clean Water Act), Section 402(p)
3. Executive Order 12088, amended by Executive Order 12580, Federal Compliance with Pollution Control Standards
4. State and local laws and regulations related to storm water management:
 - California Oil Pollution Control Act
 - California Porter-Cologne Water Quality Control Act
 - National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges of Storm Water Associated with Industrial Activity in Santa Clara County to South San Francisco Bay or Its Tributaries (General Permit No. CAS000001).
 - NPDES General waste discharge requirements for discharge or reuse of extracted and treated groundwater resulting from the cleanup of groundwater contaminated by volatile organic compounds (CAG12003 for NASA Regional Groundwater Reemediation Program located at **REDACTED** Moffett Field, California).

5. NASA Policy Directive 8800.16, NASA Environmental Management
6. Environmental Excellence for the Twenty-First Century, NASA Strategy Document
7. Ames Management Instruction 8800.4, Ames Environmental Programs

12.5 Responsibilities

12.5.1 Environmental Services Office, Code QE, (Environmental Office)

1. Identify laws and regulations to which Ames must adhere.
2. Develop Ames policy to comply with the identified laws and regulations.
3. Provide oversight and direction.
4. Provide consultation, services, and support.
5. Prepare the SWPPP and the Ames Storm Water Monitoring Plan.
6. Submit the Storm Water Annual Report to the appropriate regulatory agency.
7. Maintain permits and pay fees.
8. Conduct annual inspections of industrial areas for storm water compliance.
9. Collect and analyze storm water samples.
10. Collect and analyze sample(s) of discharge from emergency pumps during storm or flood events.
11. Collect and analyze samples of Eastern Diked Marsh downgradient of sediment basin for same analysis as sludge.

12.5.2 All Personnel

1. Conduct all operations in compliance with all applicable storm water regulations, requirements, and permit conditions.
2. Maintain and make available required records, as requested by the Environmental Office, and/or regulatory agencies.
3. Participate and provide input in order to complete plans and reports on time.
4. Provide access for inspections, assessments, and audits by the Environmental Office, and/or regulatory agencies.
5. Implement corrective actions, if required.
6. Obtain training, as required.
7. Maintain training records.
8. Maintain operations in accordance with the Ames SWPPP.
9. Inform the Environmental Office of changes in operations affecting storm water pollution prevention.
10. Maintain good housekeeping procedures in all outdoor areas.

12.5.3 Facilities Engineering, Code FEF

REDACTED

12.5.4 Plant Engineering Branch, Code JFP

REDACTED

12.5.5 Line Management and Contracting Officers Technical Representatives

REDACTED

12.6 Definitions

12.6.1 Best Management Practice (BMP)

Any program, technology, process, citing criteria, operating method, measure, or device that controls, prevents, removes, or reduces pollution.

12.6.2 Dry Season

The time period from June 1 to September 30 of each year.

12.6.3 Effluent

Any gas or liquid emerging from a pipe or similar outlet.

12.6.4 Groundwater

The part of the subsurface water that is in the zone of saturation.

12.6.5 Storm Water

Surface runoff associated with a rain fall.

12.6.6 Storm Water Monitoring Plan

A component of the National Pollutant Discharge Elimination System General Storm Water Permit in which methods and means of sampling storm water are discussed.

12.6.7 SWPPP

Storm Water Pollution Prevention Plan.

12.6.8 Storm Water Settling Basin

A human-made basin constructed to slow the movement of storm water in order to allow pollutants to settle out.

12.6.9 Wet Season

The time period from approximately October 1 to May 31 of each year.

12.7 Affected Operations

Any outdoor operation that may directly or indirectly come in contact with storm water. Some examples of affected operations are vehicle and equipment maintenance, aircraft maintenance, painting operations, concrete cutting, construction, and landscaping projects.

A threat to the quality of storm water may take many forms. Examples of some potential threats include contamination by solvents, heavy metals, oils, paints, and by erosion and concrete-cutting runoff activities. Even very small amounts of any of these contaminants can have a profound impact on the quality of storm water runoff.

12.8 General Management Requirements

Storm water pollution prevention must be managed at all levels according to the hazards present. The following are general storm water pollution prevention management requirements:

1. Keep all hazardous materials away from storm drain access.
2. Maintain and promote good housekeeping measures in all applicable areas.
3. Implement storm water BMPs, as appropriate.
4. Appropriate spill cleanup materials and personal protective equipment must be available in areas where hazardous or other inappropriate materials may come in contact with storm water.

5. Releases must be cleaned up immediately by trained personnel and all releases must be documented.
6. All storage areas must be free of debris and rainwater.
7. All storage areas must be labeled and secured.
8. Dumpsters must remain closed.

12.9 Specific Management Requirements

12.9.1 Storm Water Best Management Practices

Source control BMPs are operational practices that prevent pollution by reducing potential pollutants at the source. They typically do not require additional maintenance or construction, but can be implemented through common-sense precautions and modest changes in routine operations or maintenance practices.

Ames has developed and implemented storm water best management practices for industrial activities onsite. The BMPs can be found in Appendix A of this chapter.

For information regarding construction activities, the California Storm Water Best Management Practices Handbook for Construction Activity may be obtained through the Environmental Office.

12.9.2 Employee Training

Employee training, like equipment maintenance, is not so much a best management practice as it is a method by which to implement BMPs. This highlights the importance of training and of integrating the elements of employee training from the individual source control measures into a comprehensive training program.

1. General requirements
 - Integrate training regarding storm water quality management with existing training programs.
 - Identify and implement BMPs.
 - Promote employee ownership of problems and the solutions.
 - Integrate employee feedback into training and BMP implementation.
2. BMP employees shall become familiar with BMPs that relate to their jobs.
3. SWPPP is included in ongoing training programs, including all hazardous waste and hazardous materials management classes.

12.9.3 Good Housekeeping

1. General requirements
 - Maintain dry and clean floors and ground surfaces.
 - Regularly pick up and dispose of garbage, debris, and waste material.
 - Make sure that equipment is working properly.
 - Routinely inspect for leaks or conditions that could lead to discharges of chemicals or contact of storm water with raw materials, intermediate materials, waste materials, or products.
 - Ensure that spill cleanup procedures are understood by employees.
2. Material storage practices

Improper storage can result in the release of materials and chemicals that can cause storm water runoff pollution. Proper storage techniques include:

- Provide adequate aisle space to facilitate material transfer and easy access for inspections.
- Store containers, drums, and bags away from direct traffic routes to prevent accidents.
- Stack containers according to manufacturer's instructions to avoid damaging the containers from improper weight distribution.
- Store containers on pallets or similar devices to prevent container corrosion, which can result from moisture on the ground.

12.9.4 Erosion Prevention

Erosion prevention measures must be employed during any construction and/or grounds maintenance activities.

1. Leave as much vegetation (plants) onsite as possible.
2. Minimize the time that soil is exposed. Water the exposed areas to control dust.
3. Prevent runoff from flowing across disturbed areas (divert the flow to vegetated area).
4. Stabilize the disturbed soils as soon as possible.
5. Slow down the runoff flowing across the site.
6. Provide drainage ways for the increased runoff (use grassy swales rather than concrete drains).
7. Remove sediment from storm water runoff before it leaves the site.

12.9.5 Spill Prevention and Response

Spills and leaks are a large source of industrial storm water pollutants, and in most cases they are avoidable. Establishing standard operating procedures, along with proper employee training, can reduce accidental releases. Refer to Chapter 13 in this handbook, Spill Prevention Control and Countermeasures and Facility Response Plan.

12.9.6 Buildings and Grounds Maintenance

Buildings and grounds maintenance includes taking care of landscaped areas around the facility, cleaning parking lots and pavement other than in the area of industrial activity, and cleaning the storm drainage system. Certain normal maintenance activities can generate materials that must be properly disposed of. Other maintenance activities can enhance water quality if they are carried out more frequently and with a view to avoiding storm water pollution.

1. General requirements

Prevent or reduce the discharge of pollutants to storm water from buildings and grounds maintenance by washing and cleaning up with as little water as possible, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the storm water collection system.

2. Pesticide/fertilizer management

- Proper use of pesticides and fertilizers will reduce the risk of discharge to storm water.
- Pesticide applicators must be licensed with the California Department of Pesticide Regulation and county agricultural commissioners.
- No person shall:
 - Pollute water supplies or waterways while loading, mixing, or applying pesticides on NASA property.
 - Transport, handle, store, load, apply, or dispose of any pesticide, container, or apparatus in such a manner as to pollute water supplies or waterways, or cause damage or injury to land, humans, plants, or animals.

- Do not apply pesticides/fertilizers during the wet season, as they may be carried from the site by the next storm.
- Avoid overwatering, not only to conserve water, but also to avoid the discharge of water that may have become contaminated with nutrients and pesticides.
- Store pesticides and application equipment in a responsible manner.
- Properly dispose of used containers.

12.9.7 Elimination of Non-storm Water Discharges

The Industrial Storm Water General Permit generally prohibits discharges of anything except storm water to the storm drainage system. There are many ways in which nonstorm water from industrial plants can enter the storm drainage system. In most cases, the discharges result from practices that are now illegal, even though they may have been inadvertent or permissible in the past. Discharging industrial process water, building wastewater, and water from other sources is prohibited, with few exceptions. Unauthorized discharges take two forms:

1. **Illicit connections** -Improper permanent connections that allow wastewater to enter storm drains. Connections that allow sanitary or process wastewater to enter the storm drain are prohibited, including all storm drain connections from indoor drains and sinks.
2. **Illegal dumping** - Releasing of water that has been exposed to industrial activities to the properly connected storm drainage system. Pollutants can be introduced to the storm drains inadvertently, by routine practices that discharge water outdoors, or by routinely discharging wastes, wash water, and other materials to storm drains, catch basins, and other conveyance facilities. A large part of this improper discharge results from employees' lack of understanding, coupled with a lack of readily available, proper routes of discharge. Call the Environmental Office whenever you do not know what to do.

Examples of nonstorm water discharges to the storm water collection system include any water used directly in the manufacturing process (process water), noncontact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, sink and drinking fountain wastewater, sanitary wastes, or other wastewater.

1. General requirements
 - Provide well-marked, proper disposal or collection methods for wastewater wherever you frequently use wash water, discharge cooling water, or produce a liquid waste that might otherwise reach the storm drain.
 - Employee training should especially emphasize proper disposal of non-storm water. Ensure that employees understand that storm drains connect directly to streams and the bay without treatment.
2. Illicit connections
 - Illicit connections to the storm drain system must be corrected as soon as possible. Upon discovery of an illicit connection, immediately notify the Environmental Office.
 - Report schedule for correcting illicit connections to the Environmental Office.
 - Ames reports all illicit connections to the Regional Water Quality Control Board.
3. Recommendations for utilities connected to the storm drain:
 - Plug or disconnect/remove all floor drains.
 - Remove obsolete sinks, equipment, etc.
 - Reroute required connections to the sanitary sewer.

To summarize, the Industrial Storm Water General Permit generally prohibits discharges of anything except storm water to the storm drains. If you have a question regarding a nonstorm water discharge, contact the Environmental Office.

12.9.8 Outdoor Loading/Unloading of Materials

The loading/unloading of materials usually takes place outside. Loading or unloading of materials occurs in two ways: materials in containers or direct liquid transfer. Materials leaked, spilled, or lost during loading/unloading may collect in the soil or on other surfaces and be carried away in runoff or when the area is cleaned.

1. When materials are received, they shall remain in the travel path only for a time reasonably necessary to transport the materials, but no longer than 24 hours.
2. Use a written operations plan that describes procedures for loading and/or unloading. Encourage the use of drip plans during transfers.
3. Have an emergency spill cleanup plan readily available.
4. Employees trained in spill containment and cleanup should be present during the loading/unloading.
5. Establish depots of cleanup materials next to or near each loading/unloading area, and train employees in their use.
6. Park delivery vehicles so that spills or leaks can be contained.
7. Cover the loading/unloading docks to reduce exposure of materials to rain, if possible.
8. Cover the storm drain inlet during transfer if it is in the proximity of the loading/unloading area.

12.9.9 Outdoor Process Equipment Operations and Maintenance

Storm water can accumulate pollutants by exposure to numerous small leaks, spills, and other discharges of outdoor equipment. Large equipment may require specifically designed structural or advanced BMPs to reduce the potential for storm water to contact pollutants. Ordinary precautions, such as those that follow, may suffice for smaller equipment.

Outdoor equipment includes rooftop cooling towers or air conditioners, rooftop air vents for industrial equipment, outdoor air compressors and other service equipment, indoor wet processes where leaks or discharges may discharge to outdoor areas, and material transfer areas, such as loading areas where forklifts or trucks may carry pollutants outdoors on their tires.

1. General requirements
 - Inspect equipment on a regular basis for leaks, malfunctions, and staining on and around the equipment, and other evidence of leaks and discharges.
 - Assign an inspector the responsibility of reporting a spill to the Environmental Office.
 - Develop a routine for taking actions on the report of a spill, cleaning up the spill, and repairing the leak to prevent future spills.
 - If absorbent material is used on a spill, sweep and dispose of material immediately.
 - Place equipment on an impermeable surface, or install a drip pan beneath potential leak points.
 - Construct a simple roof to minimize the amount of rainwater that contacts the equipment and install a berm to prevent runoff and runoff. Contact a Fire Protection Engineer to ensure that Uniform Building Code and Uniform Fire Code requirements are met, if required.

2. Air compressors

Air compressors and other equipment produce small quantities of automatic blowdown water, which commonly contains lubricating oil or other potential pollutants.

- Blowdown water may not be discharged to any outside areas that flow to the storm drain.
- Blowdown water must be discharged to the sanitary sewer or into landscaping that is capable of absorbing the quantity of water that is routinely discharged.

3. Electrical Equipment

- Take care in tapping oil-containing equipment. Avoid drips and leaks whenever possible.
- Place an absorbent pad with the impervious lining side down under electrical equipment prior to tapping. The absorbent material will retain small drips with impervious backing inhibiting leakage.
- Properly dispose of oil-contaminated materials. Any PCB-contaminated absorbent materials must be bagged, labeled, and disposed of in accordance with 40 CFR 761.
- For all PCB-containing electrical equipment, follow Ames Procedures for PCB Management found in Chapter 9 of this handbook, Polychlorinated Biphenyl Management. If you have any questions regarding the PCB Program, contact the Environmental Office.

12.10 Metrics

- a. Percent compliance with federal, state, and local storm water regulations. Goal: 100% compliance
- b. Percent of required inspections/observations completed. Goal: 100% compliance
- c. Percent change in discharge of storm water due to redevelopment (volume, flow or discharge of sediment or contaminants into impaired waters). Goal: No net increase

12.11 Sources of Additional Information or Assistance

1. Environmental Office (Code QE, REDACTED)
2. Environmental Office (WWW Home Page at <http://q.arc.nasa.gov>)
3. Ames Storm Water Pollution Prevention Plan
4. California Storm Water Best Management Practices for Construction Activity

12.12 Appendices

12.12.1 Appendix A: Best Management Practices: Non-Structural

12.12.1.1 Employee Training Best Management Practices

Description

This Best Management Practice includes training of all personnel who are responsible for: (1) implementing activities identified in the Storm Water Pollution Prevention Plan (SWPPP); (2) conducting inspections, sampling and visual observations and (3) managing storm water. Training should address topics such as good housekeeping, material-handling procedures, preventive maintenance, spill response and actions necessary to implement all Best Management Practices identified in the SWPPP. The SWPPP identifies periodic dates for this training, which is annually offered at Ames Research Complex. Records are maintained of all training sessions held. Employee training, like equipment maintenance, is not so much a best management practice as it is a method by which to implement Best Management Practices.

This highlights the importance of training and of integrating the elements of employee training from the individual source control measures into a comprehensive training program.

Targeted Constituents

- Sediments
- Nutrients
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

Applicability

This Best Management Practice is applicable to all industrial activities at Ames Research Complex.

Requirements

1. Integrate training regarding storm water quality management with existing training programs.
2. Promote employee ownership of problems and the solutions.
3. Integrate employee feedback into training and Best Management Practice implementation.
4. Employees shall be trained on the SWPPP, existing Best Management Practices and potential new Best Management Practices.
5. Environmental Compliance / Safety Trainers are employed under the Safety, Health and Medical Services Office, Code QH, and Environmental Services Office, Code QE. Regularly scheduled safety and environmental courses are available to all civil servants at Ames Research Complex and to contract employees on a space-available basis.

12.12.1.2 Erosion Control And Site Stabilization Storm Water Best Management Practices**Description**

This includes a description of all sediment and erosion control activities. This may include the planting and maintenance of vegetation, diversion of run-on and runoff, placement of sandbags, silt screens or other sediment control devices, etc. Any site where soils are exposed to water and wind can have soil erosion and sedimentation problems. Erosion is a natural process in which soil and rock materials is loosened and removed. Sedimentation occurs when soil particles are suspended in surface runoff or wind and are deposited in streams and other water bodies.

Human activities can accelerate erosion by removing vegetation, compacting or disturbing the soil, changing natural drainage patterns and by covering the ground with impermeable surfaces (pavement, concrete, and buildings). When the land surface is developed or "hardened" in this manner, storm water can not seep into or "infiltrate" the ground. The result is in larger amounts of water moving more quickly across the site, which can carry more sediment and other pollutants to creeks and streams. Because the vegetation primarily consists of marshlands and grasslands, soil erosion prevention is not required in many areas of Ames Research Complex. However, erosion prevention measures are considered during any construction and / or grounds maintenance activities.

Targeted Constituents

- Sediment
- Heavy Metals
- Toxic Materials

Applicability

This Best Management Practice is applicable to all building, construction and landscaping activities at Ames Research Complex.

Requirements

1. Identify areas which, due to topography, activities or other factors, have a high potential for significant soil erosion, and identify structural, vegetative, and / or stabilization measures used to limit erosion,
2. Retain as much vegetation (plants) onsite as possible.
3. Minimize the time that soil is exposed. Water exposed areas to control dust.
4. Prevent runoff from flowing across disturbed areas (divert the flow to vegetated areas).
5. Stabilize the disturbed soils as soon as possible by planting vegetation or hydroseeding.
6. Slow down the run-off flowing across site (regrading, silt fences, planting).
7. Provide drainage ways for the increased run-off (use grassy swales rather than concrete drains).
8. Remove sediment from storm water run-off before it leaves the site.
9. For large piles of soil where tarps or other covers are not feasible, place filtering media (e.g. straw bales, rocks, silt fences, etc.) around the base of each pile or at the storm drain inlet to remove these materials from rainwater run-off.

12.12.1.3 Good Housekeeping Best Management Practices

Description

Good housekeeping practices are designed to maintain a clean and orderly work environment. Often the most effective first step towards preventing pollution in storm water from industrial sites simply involves using good common sense to improve the facility's basic housekeeping methods. Poor housekeeping can result in more waste being generated than necessary and an increased potential for storm water contamination. A clean and orderly work area reduces the possibility of accidental spills caused by mishandling of chemicals and equipment, thereby reducing safety hazards. Well maintained material and chemical storage areas should minimize discharges of materials / pollutants that could contaminate storm water. Simple procedures can be used to promote good housekeeping, including improved operation and maintenance of industrial machinery and processes, material storage practices, material inventory controls, routine and regular clean-up schedules, maintaining well organized work areas, and educational programs.

It is the policy of NASA Ames Research Center that managers as well as line supervisors are responsible for ensuring that personnel are educated in proper environmental hazards management, including storm water pollution prevention.

Targeted Constituents

- Sediments
- Nutrients
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals

- Toxic Materials
- Oil and Grease

Applicability

This Best Management Practice is applicable to all industrial activities at Ames Research Complex.

Requirements

1. Conduct formal monthly inspections of all buildings and surrounding areas to ensure the following:
 - a. Outside areas are cleaned and organized;
 - b. Drips, leaks, or evidence of such, from equipment or pipes are contained;
 - c. Adequate space in work areas to minimize spill potential;
 - d. Garbage removed regularly;
 - e. Walkways and passageways easily accessible;
 - f. Walkways and passageways free of materials that could be spilled;
 - g. Evidence of dust from painting, sanding, or other industrial activities; and
 - h. Cleanup procedures for spilled materials exist.

An inspection log should be maintained in order to feed other environmental reporting requirements at Ames Research Complex. Moreover, a formal annual inspection of Ames Research Complex should be conducted to verify industrial activities in Storm Water Pollution Prevention Plan and identify new activities and Best Management Practices.

2. Conduct annual inventory of chemical substances, including hazardous materials and pollutants that are present on-site. This inventory shall meet the requirements of the OSHA-required inventory of chemicals and toxic substances.
3. Maintain a current file of all MSDS for chemicals and toxic substances.
4. Label chemical containers in accordance with OSHA, EPA, DOT and other applicable federal, state and local requirements.
5. Maintain dry and clean floors and ground surfaces by using brooms, shovels, vacuum cleaners, and cleaning machines.
6. Regularly pickup and dispose of garbage, debris and waste material.
7. Make sure equipment is working properly.
8. Routinely inspect for leaks or conditions that could lead to discharges of chemicals or contact of storm water with raw materials, intermediate materials, waste materials, or products.
9. Ensure that all employees understand spill cleanup procedures.
10. Improper storage can result in the release of materials and chemicals that can cause storm water runoff pollution. Proper storage techniques include:
 - a. Providing adequate aisle space to facilitate material transfer and easy access for inspections;
 - b. Storing containers, drums and bags away from direct traffic routes to prevent accidental containers from improper weight distribution;
 - c. Stacking containers according to manufacturer's instructions to avoid damaging the containers from improper weight distribution; and

- d. Storing containers on pallets or similar devices to prevent container corrosion, which can result from moisture on the ground.
11. Maintain an up-to-date inventory of all materials (hazardous and non-hazardous). This inventory helps to keep material costs down caused by overstocking, enables the tracking of materials stored and handled on site, and identifies which materials and activities pose the most risk to the environment.
12. Clearly mark on the inventory hazardous materials that require special handling, storage, use, and disposal considerations.
13. Keep the work site clean and orderly. Removing debris in a timely fashion. Sweep the area.
14. Cover materials of particular concern such as hazardous materials or sand piles that must remain outdoors, particularly during the rainy, season.
15. Educate employees who are doing the work.
16. Inform on-site contractors of NASA Ames Research Center policy. Include appropriate provisions in their contract to make certain proper housekeeping and disposal practices are implemented.
17. Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.
18. Do not dump waste liquids down the storm drain.
19. Advise concrete truck drivers to not wash their truck over the storm drain.
20. Cleaning equipment or tools over catch basins is prohibited.

12.12.1.4 Inspections Best Management Practices

Description

This Best Management Practice includes, in addition to the preventative maintenance inspections identified in the General Permit, an inspection schedule of all potential pollutant sources. Tracking and follow-up procedures shall be described to ensure adequate corrective actions are taken and Storm Water Pollution Prevention Plans are made.

Targeted Constituents

- Heavy Metals
- Toxic Materials
- Floatable Materials
- Oxygen Demanding Substances
- Oil and Grease

Applicability

This Best Management Practice is applicable to all industrial activities at Ames Research Complex.

Requirements

1. Identify buildings, facilities and conditions at Ames Research Complex that have a potential to contaminate storm water. This list shall be included in the Storm Water Pollution Prevention Plan and Best Management Practices Handbook.
2. Visually inspect and verify that measures used to eliminate storm water pollution are working effectively.

3. Specific red flags to visually inspect include:
 - a. Corroded drums;
 - b. Drums without plugs or covers;
 - c. Corroded or damaged tanks, tank supports or tank drain plugs;
 - d. Torn bags or bags exposed to rainwater;
 - e. Corroded or leaking pipes;
 - f. Leaking valves or fittings;
 - g. Leaking pumps / hose / nozzle connections;
 - h. Broken / cracked dikes, walls, or other containment systems;
 - i. Chemicals / dust / materials blown by wind;
 - j. Improperly maintained or defective dry chemical conveying systems; and
 - k. Recent or ongoing construction activities.

12.12.1.5 Material Handling and Storage Best Management Practices

Description

This Best Management Practice includes all procedures to minimize the potential for spills and leaks and to minimize exposure of significant materials to storm water and authorized non-storm water discharges. Accidental releases of materials from underground liquid storage tanks, aboveground storage tanks, drums, containers, and dumpsters present the potential for contaminated storm waters with many different pollutants. Materials spilled, leaked or released from storage containers and dumpsters may accumulate in soils or on the surfaces. The materials may then be carried away by storm water runoff. Currently, hazardous materials are stored outdoors at Ames Research Complex. They are secured in secondary contained and roofed chemical storage facilities or lockers. Standard Operating Procedures (SOPs) for each of the materials prohibit materials from contacting storm water runoff in the event of an accident or spill.

This Best Management Practice also addresses the loading and unloading of materials, which usually takes place outside at the NASA Ames Supply Support Facility at [REDACTED], the Naval Air Reserve Hazardous Materials Warehouse at Moffett Federal Airfield Facility [REDACTED] and the California Air National Guard Facilities [REDACTED]. Loading or unloading of materials occurs in two ways: Materials in containers or direct liquid transfer. Materials leaked, spilled or lost during loading / unloading may collect in the soil or on other surfaces and be carried away by runoff or when the area is cleaned. Rainfall may wash pollutants from machinery used to unload or move materials. The loading or unloading may involve rail or truck transfer.

Targeted Constituents

- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

Applicability

This Best Management Practice is applicable to all industrial activities at Ames Research Complex, in particular, those areas where containers storing liquid materials are located outside of buildings. It should be noted that the storage of reactive, ignitable or flammable liquids must

comply with the California Health and Safety Code, the Santa Clara County Hazardous Materials Storage Ordinance and the Local Fire code.

Requirements

1. Prevent or reduce the discharge of pollutants to storm water from outdoor container storage areas by storing hazardous substances in chemical storage lockers or facilities, installing safeguards against accidental releases, providing secondary containment, conducting weekly inspections and training employees in standard operating procedures and small spill cleanup techniques.
2. Protect materials from rainfall, runoff and wind dispersal by implementing controls such as:
 - a. Store materials indoors or in a chemical storage locker;
 - b. Cover the storage area with a roof; and
 - c. Minimize storm water run-on by enclosing the area or providing a berm.
3. Storage of oil and hazardous materials must meet specific federal, state and local standards including:
 - a. Spill Prevention Control and Countermeasure Plan (SPCC);
 - b. Secondary containment, integrity and leak detection monitoring; and
 - c. Emergency preparedness plans.
4. Operator must be trained in proper storage.
5. All hazardous materials storage areas and hazardous waste accumulation areas must be inspected weekly. Hazardous materials and hazardous waste inspections must be documented. Documentation must be kept on file for a period of five (5) years. Inspections must include the following questions:
 - a. Are all materials correctly segregated?
 - b. Are hazardous materials / waste storage areas clearly identified, describing hazard class(es) of materials in storage?
 - c. Are all containers (and secondary containment, if needed) labeled to identify the material / waste hazard?
 - d. Is the secondary containment free of liquid or debris?
 - e. Are all containers in good condition?
 - f. Are MSDSs available for all hazardous materials in inventory?
6. Hazardous materials shall be properly stored:
 - a. Hazardous materials should be placed in a designated area;
 - b. The designated storage area should be covered with a roof;
 - c. Designated areas should be paved, free of cracks and gaps and liquid tight in order to contain leaks and spills;
 - d. Liquid materials should be secondarily contained to hold 10 percent of the volume of all the containers or 110 percent of the volume of the largest container, whichever is greater;
 - e. Drums stored in an area where unauthorized persons may gain access must be secured to prevent accidental spillage, pilferage or any unauthorized use; and
 - f. Employees trained in emergency spill cleanup procedures should be present with dangerous waste, liquid chemicals or other wastes are loaded or unloaded.

7. Using engineering safe guards and thus reducing accidental releases of pollutants can prevent operator errors. Safeguards include:
 - a. Overflow protection devices on tank systems to warn the operator to automatically shutdown transfer pumps when the tank reaches full capacity;
 - b. Protective guards (bollards) around tanks and aboveground piping to prevent vehicle or forklift damage; and
 - c. Clearly tagging or labeling all valves to reduce human error.
8. Weekly inspections should be conducted to include:
 - a. A check for external corrosion and structural failure;
 - b. A check for spills and overfills due to operator error;
 - c. A check for failure of piping system (pipes, pumps, flanges, coupling, hoses and valves);
 - d. A check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa;
 - e. Visual inspection of new tank or container installation, loose fittings, loose valves, poor welding and improper or poorly fitted gaskets; and
 - f. Inspect tank foundations, connections, coatings, tank walls and exposed piping system. Look for corrosion, leaks, cracks, scratches and other physical damage that may weaken the tank or container system.
9. Proper use of pesticides and fertilizers will reduce the risk of loss to storm water. In addition:
 - a. Pesticide applicators must be licensed with the California Department of Pesticide Regulation and county agricultural commissioners;
 - b. No person shall pollute water supplies or waterways while loading, mixing or applying pesticides on Ames Research Complex property;
 - c. No person shall transport, handle, store, load, apply or dispose of any pesticide, container or apparatus in such a manner as to pollute water supplies or waterways, or cause damage or injury to land, humans, plants or animals;
 - d. Pesticides / fertilizers should not be applied during the wet season as they may be carried from the site by the next storm;
 - e. Avoid over-watering not only to conserve water but to avoid the discharge of water which may have become contaminated with nutrients and pesticides;
 - f. Store pesticides and application equipment in a responsible manner; and
 - g. Properly dispose of the used containers.
10. Storm water from parking lots may contain undesirable concentrations of oil, grease, suspended particulates and metals such as copper, lead, cadmium and zinc, as well as the petroleum byproducts of engine combustion. Deposition of air particulates, generated by the facility or by adjacent industries, may contribute significant amounts of pollutants. Therefore, the following maintenance operations shall occur:
 - a. Sweeping of main streets shall be conducted monthly and sweeping of parking lots shall be conducted quarterly. Sweeping should be conducted with a vacuum sweeper, rather than a mechanical brush sweeping device which is not as effective at removing the fine particulates;
 - b. Cleaning of catch basins and building laterals shall be conducted annually;

- c. Maintain painted stencils that mark storm drain inlets "No Dumping! Flows to Bay." This stencil will minimize inadvertent dumping of liquid wastes; and
 - d. Debris will be disposed of off-center at an approved landfill site.
11. Prevent or reduce the discharge of pollutants to storm water from outdoor loading / unloading of materials through implementation of the following:
- a. When materials are received, they shall remain in the travel path only for a time reasonably necessary to transport the materials but no longer than 24 hours;
 - b. Use a written operations plan that describes procedures for loading and / or unloading;
 - c. Have an emergency spill cleanup plan readily available;
 - d. Employees trained in spill containment and cleanup should be present during the loading / unloading;
 - e. Establish depots of cleanup materials next to or near each loading / unloading area and train employees in their use;
 - f. Park delivery vehicles so that spills or leaks can be contained; and
 - g. Cover the loading / unloading docks to reduce exposure of materials to rain.

12.12.1.6 Preventive Maintenance Best Management Practices

Description

Preventative maintenance includes the regular inspection and maintenance of structural storm water controls (catch basins, oil / water separators, etc.) as well as other facility equipment and systems. Certain normal maintenance activities can enhance water quality if they are carried out more frequently and /or in a more deliberate fashion.

Targeted Constituents

- Sediments
- Nutrients
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

Applicability

This Best Management Practice is applicable to all industrial activities at Ames Research Complex.

Requirements

1. Prevent or reduce the discharge of pollutants to storm water from buildings and grounds maintenance by washing and cleaning up with as little water as possible, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the storm water collection system.
2. Conduct an inventory of each facility / system / equipment that upon failure could result in discards which may contaminate storm water runoff.
3. Conduct monthly informal inspections of the inventoried equipment that could result in storm water contamination.

4. Equipment to be inspected as part of the preventative maintenance Best Management Practice includes things such as:
 - Pipes
 - Storage tanks and bins
 - Process handling equipment
 - Storm water management devices (oil/water separators, catch basins, and other structural Best Management Practices)
 - Pumps
 - Pressure vessels
 - Secondary containment devices
 - Fuel dispensing pumps
 - Fuel dispensing nozzles.

12.12.1.7 Quality Assurance Best Management Practices

Description

This Best Management Practice includes the procedures to ensure that all elements of the Storm Water Pollution Prevention Plan and Monitoring Program are adequately conducted.

Targeted Constituents

- Sediments
- Heavy Metals
- Toxic Materials
- Floatable Materials
- Oxygen Demanding Substances
- Oil and Grease

Applicability

This Best Management Practice is applicable to all industrial activities at Ames Research Complex.

Requirements

1. Identify buildings, facilities and conditions at Ames Research Complex that have a potential to contaminate storm water. This list shall be included in the Storm Water Pollution Prevention Plan.
2. Visually inspect and verify that measures used to eliminate storm water pollution are working effectively.
3. Annually complete a multi-media compliance self-assessment administered by the NASA Environmental Services Office, Code QE.

12.12.1.8 Recordkeeping and Internal Reporting Best Management Practices

Description

This Best Management Practice includes the procedures to ensure that all records of inspections, spill maintenance activities, corrective actions, visual observations, etc., are developed, retained, and provided, as necessary, to the appropriate facility personnel.

Targeted Constituents

- Heavy Metals
- Toxic Materials
- Floatable Materials
- Oxygen Demanding Substances
- Oil and Grease

Applicability

This Best Management Practice is applicable to all industrial activities at Ames Research Complex.

Requirements

1. Records and internal reports are performed regularly as determined by the federal, state and local standards.
2. Internal reports include such information as:
 - a. The location of stored materials are proper whether indoors or in a chemical storage locker;
 - b. Are all materials correctly segregated;
 - c. Are all containers labeled to identify the material / waste and hazard; and
 - d. Is the secondary containment free of liquid or debris.
 - e. Are all containers in good condition
 - f. Are MSDSs available for all hazardous materials in inventory.
3. Weekly inspections of tanks and containers of hazardous materials should be conducted to include:
 - a. A check for external corrosion and structural failure;
 - b. A check for spills and overfills due to operator error;
 - c. A check for failure of piping system (pipes, pumps, flanges, coupling, hoses and valves)
 - d. A check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa;
 - e. Visual inspection of new tank or container installation, loose fittings, loose valves, poor welding and improper or poorly fitted gaskets; and
 - f. Inspect tank foundations, connections, coatings, tank walls and exposed piping system. Look for corrosion, leaks, cracks, scratches and other physical damage that may weaken the tank or container system.
4. Daily inspections of tanks and containers of hazardous waste should be conducted to include:
 - a. A check for external corrosion and structural failure;
 - b. A check for spills and overfills due to operator error;
 - c. A check for failure of piping system (pipes, pumps, flanges, coupling, hoses and valves)
 - d. A check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa;
 - e. Visual inspection of new tank or container installation, loose fittings, loose valves, poor welding and improper or poorly fitted gaskets; and

- f. Inspect tank foundations, connections, coatings, tank walls and exposed piping system. Look for corrosion, leaks, cracks, scratches and other physical damage that may weaken the tank or container system.

12.12.1.9 Spill Response and Prevention Best Management Practices

Description

This includes spill clean-up procedures and necessary clean-up equipment based upon the quantities and locations of significant materials that may spill or leak. Spills and leaks together are one of the largest industrial sources of storm water pollutants, and in most cases are avoidable. The most common causes of unintentional releases and spills include the following:

- Lack of awareness regarding proper hazardous materials handling procedures;
- External corrosion and structural failure of storage containers;
- Improper equipment or facility installation;
- Spills and overfills due to operator error;
- Failure of piping systems (pipes, pumps, couplings, hoses, valves); and
- Leaks during pumping of liquids or gases from trucks to a storage facility and vice-versa.

Establishing standard operating procedures such as safety and spill prevention procedures along with proper employee training can reduce these accidental releases. Avoiding spills and leaks is preferable to cleaning them up after they occur, not only from an environmental standpoint, but also because spills cause increased operating costs and lower productivity.

Targeted Constituents

- Floatable Materials
- Heavy Metals
- Toxic Materials
- Oil and Grease

Applicability

This Best Management Practice is applicable to all industrial activities at Ames Research Complex.

Requirements

1. Hazardous materials are segregated according to hazard class, stored in secondary containment to prevent accidental release, labeled according to the container's contents and the material's hazard, and accurately inventoried for reporting to the Environmental Services Office, and to federal, state and local regulatory agencies.
2. Hazardous materials storage areas are equipped with emergency spill response equipment appropriate to the types of materials in use and storage.
3. The hazardous materials storage areas are inspected weekly to ensure that storage requirements are being satisfied.
4. It is the responsibility of managers and supervisors at Ames Research Complex to ensure employee training in these areas:
 - a. safe handling of hazardous materials in the employee's work place including spill response, segregation, and secondary containment;
 - b. proper disposal of hazardous waste including sewer discharge prohibitions; pickup procedures, and Emergency Response and First Responder Training.

5. Building Emergency Action Plans (BEAPs) are available at each building and include a Hazardous Substance Plan. The Hazardous Substance Plan details the chemical inventory of the building, hazardous substance spill procedure, and hazardous chemicals training.
6. The NASA-Ames Research Center Site Contingency Plan is the guideline for emergency response to incidents involving hazardous materials / hazardous waste and / or hazardous waste constituents. The emergency coordination and notification for incidents involving hazardous waste and / or hazardous materials shall be in accordance with federal, state, and local statutory and regulatory requirements. Contact the Environmental Services Office at REDACTED for additional information.
7. In the event of a spill near a storm drain: block, dike, divert and / or cover the storm drain to prevent a release from entering the storm water system.
8. In the event of a spill that cannot be cleaned up by two people within 1/2 hour with cleanup materials available on the scene, call Ames Dispatch at REDACTED immediately.

12.12.1.10 Waste handling/Recycling Best Management Practices

Description

This Best Management Practice includes the procedures or processes to handle, store or dispose of waste materials or recyclable materials. Hazardous waste is accumulated at Ames Facility REDACTED and Moffett Federal Airfield Facilities REDACTED. The containment structure of the accumulation areas prohibits materials from contacting storm water runoff. Rainwater captured within the containment structures is pumped to portable holding tanks and the water is characterized. The water is either discharged to the sanitary sewer system or managed as a hazardous waste, as determined from the characterization.

Targeted Constituents

- Heavy Metals
- Toxic Materials
- Floatable Materials
- Oxygen Demanding Substances
- Oil and Grease

Applicability

This Best Management Practice is applicable to all industrial activities at Ames Research Complex.

Requirements

1. Prevent or reduce the discharge of pollutants to storm water from outdoor container storage areas by storing hazardous substances in chemical storage lockers or facilities, installing safeguards against accidental releases, providing secondary containment, conducting weekly inspections and training employees in standard operating procedures and small spill cleanup techniques.
2. Protect materials from rainfall, runoff and wind dispersal by implementing controls such as:
 - a. Store materials indoors or in a chemical storage locker;
 - b. Cover the storage area with a roof; and
 - c. Minimize storm water run-on by enclosing the area or providing a berm.
3. Storage of oil and hazardous materials must meet specific federal, state and local standards including:

- a. Spill Prevention Control and Countermeasure Plan (SPCC).
 - b. Secondary containment, integrity and leak detection monitoring; and
 - c. Emergency preparedness plans.
4. Waste materials and recyclables are segregated according to hazard class, stored in secondary containment to prevent accidental release, labeled according to the container's contents and the material's hazard and accurately inventoried for reporting to the Environmental Services Office and to federal, state and local regulatory agencies.
 5. Waste materials and recyclables storage areas are equipped with emergency spill response equipment appropriate to the types of materials.
 6. The waste materials and storage areas are inspected weekly to ensure that storage requirements are being satisfied. Hazardous waste inspections must be documented. Documentation must be kept on file for a period of five (5) years. Inspections must include the following questions:
 - a. Are all materials correctly segregated?
 - b. Are hazardous materials / waste storage areas clearly identified, describing hazard class(es) of materials in storage?
 - c. Are all containers (and secondary containment, if needed) labeled to identify the waste material and hazard class?
 - d. Are all containers intact and in good condition?
 - e. It is the responsibility of managers and supervisors at Ames Research Complex to ensure employee training in these areas:
 - safe handling of hazardous materials in the employee's work place including spill response, segregation and secondary containment;
 - proper disposal of hazardous waste including sewer discharge prohibitions; pickup procedures, and
 - Emergency Response and First Responder Training.
 - f. Building Emergency Action Plans (BEAPs) are available at each building and include a Hazardous Substance Plan. The Hazardous Substance Plan details the chemical inventory of the building, hazardous substance spill procedure and hazardous chemicals training.
 - g. The NASA-Ames Research Center Site Contingency Plan is the guideline for emergency response to incidents involving hazardous materials / hazardous waste and/ or hazardous waste constituents. The emergency coordination and notification for incidents involving hazardous waste and / or hazardous materials shall be in accordance with federal, state and local statutory and regulatory requirements. Contact the NASA Environmental Services Office, Code QE at **REDACTED**.
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12.12.2 Appendix B: Best Management Practices--Structural

12.12.2.1 Control Devices Best Management Practices

Description

This Best Management Practice includes berms or other devices that channel or route run-on and runoff storm water away from pollutant sources.

Targeted Constituents

- Sediments
- Nutrients
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

Applicability

This Best Management Practice is applicable to all industrial activities at Ames Research Complex.

Requirements

1. Identify conditions at Ames Research Complex where control device channels or reroutes storm water.
2. Visually inspect and verify that the control device integrity has not been breached.
3. Maintain the storm water drainage system, both the east and west side drainage systems.

12.12.2.2 Overhead Coverage Best Management Practices

Description

This Best Management Practice includes structures that provide horizontal coverage of materials, chemicals and pollutant sources from contact with storm water and authorized non-storm water discharges. Materials spilled, leaked or lost from storage containers may accumulate in soils or on the surfaces and be carried away by storm water run-off. It should be noted that the storage of reactive, ignitable, or flammable liquids must comply with fire codes.

Targeted Constituents

- Sediments
- Nutrients
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

Applicability

This Best Management Practice is applicable to all industrial activities at Ames Research Complex where materials are stored out doors (e.g., REDACTED).

Requirements

1. Identify horizontal covered structures at Ames Research Complex that contain materials with the potential to contaminate storm water. This list shall be included in the Storm Water Pollution Prevention Plan.
2. Prevent or reduce the discharge of pollutants to storm water from outdoor storage areas by installing safeguards against accidental releases, installing secondary containment, conducting regular inspections, and training employees in standard operating procedures and spill cleanup techniques.
3. Building Emergency Action Plans (BEAPs) are available at each building and include a Hazardous Substance Plan. The Hazardous Substance Plan details the chemical inventory of the building, hazardous substance spill procedure, and hazardous chemicals training.
4. Weekly inspections will be conducted for hazardous material storage locations. In particular attention will be given to storm water in these locations and proper disposal of storm water.
 - a. If rainwater accumulates in the covered area, but does not contain a visible sheen and has not come in contact with any spilled material, it is permissible to discharge the accumulated water onto a grassy or otherwise vegetated area.
 - b. If grassy or vegetated areas are not in the proximity of the covered area, it may be permissible for the water to be discharged to the sanitary sewer system. NASA's Environmental Services Office must be notified and grant approval for any discharge of rainwater to the sanitary sewer system.
 - c. If water in the covered area does exhibit a visible sheen, or if the potential for pollutants is present, the water must be removed from the area and containerized in drums, tanks, totes, etc. Contact NASA Environmental Services Office to request sampling and analysis and proper disposal procedures.
 - d. In the event of spilled materials or rainwater overflow of the covered area, contact the Environmental Office.
5. Other applicable Best Management Practices include
 - a. Good Housekeeping
 - b. Material Handling and Storage
 - c. Spill Response
 - d. Waste Handling/Recycling
 - e. Employee Training

12.12.2.3 Retention Ponds Best Management Practices**Description**

This Best Management Practice includes basins, ponds, surface impoundments, bermed areas, etc., which do not allow storm water to discharge from the facility.

Targeted Constituents

- Sediments
- Nutrients
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

Applicability

This Best Management Practice is applicable to the Storm Water Settling Basin and the Storm Water Retention Ponds located on the northwest end of Ames Research Complex.

Requirements

1. The Storm Water Settling Basin passively treats storm water run-off. The storm water flows through the settling basin and pollutants are removed as they adhere to particulates in the water. These particulates then settle out and form sludge at the bottom of the settling basin. An absorbent boom is strung across the settling basin to help trap floating contaminants.
2. Maintenance of the Storm Water Settling Basin will include:
 - a. Removal of accumulated sediment should be cleaned before the wet weather season, by mid-August.
 - b. Sampling of the sediment and including the results in the Settling Basin Sludge Report.
 - c. Replacement of absorbent boom when it is full of oil and visibly heavier, and floats lower in the water.
 - d. Sample storm water at the influent and effluent locations during the first storm fall and the last storm fall of the season. Results will be included in the Storm Water Annual Report.
3. The Storm Water Retention Pond collects and passively treats storm water run-off. It is essentially a small lake with rooted wetland vegetation along the perimeter. The permanent pool of water provides a quiescent volume for continued settling of particulate contaminants and uptake of dissolved contaminants by aquatic plants between storms. The wetland vegetation is present to improve the removal of dissolved contaminants and to reduce the formation of algal mats. The Storm Water Retention Pond helps where the removal of the dissolved constituent fraction is of concern, particularly nutrients and metals. Dissolved contaminants are removed by a combination of processes: physical adsorption to bottom sediments and suspended fine sediments, natural chemical flocculation, and uptake by aquatic plants.
4. Other appropriate Best Management Practices include:
 - a. Preventive Maintenance
 - b. Material Handling and Storage
 - c. Recordkeeping and Internal Reporting
 - d. Inspections
 - e. Control Devices
 - f. Water Treatment

12.12.2.4 Secondary Containment Best Management Practices**Description**

This Best Management Practice includes containment structures around storage tanks and other areas for the purpose of collecting any leaks or spills. Secondary containment is defined as a level of containment external to, and separate from, the primary containment. Secondary containment must be large enough to contain 110% of the volume of a primary container, or in the case of multiple containers, 150% of the volume of the largest container, or 10% of the aggregate internal volume of all containers. If the storage facility is open to rainfall, the secondary containment must also be able to accommodate the volume of a twenty-four hour rainfall. Rainwater, which accumulates in secondary containments, should be removed as soon as possible. However, pursuant to local regulatory requirements:

- The disposal of rainwater from secondary containment areas directly into the storm drain is prohibited, and
- The disposal of rainwater from secondary containment areas into the sanitary sewer system must be approved by the NASA Environmental Services Office, Code QE, and local regulatory agency.

The Santa Clara County Hazardous Materials Storage Ordinance promotes the protection of life, health, resources and property through prevention and control of unauthorized discharges of hazardous materials. An integral portion of this ordinance involves the use of secondary containment. Complying with local regulations and adopting the requirements listed on the following page to ensure secondary containment areas are clean and pollutant-free and enable the discharge of rainwater from these areas with minimal effort. If operators have any questions or concerns regarding secondary containment, or removal of rainwater from secondary containment, contact the Environmental Office.

Targeted Constituents

Listed below are the targeted constituents that should be prevented from contaminating rainwater that enters secondary containments.

- Heavy Metals
- Toxic / Hazardous Materials
- Oxygen Demanding Substances
- Heavy, Solid, fibrous Matter, or Viscous Substances

Applicability

This Best Management Practice is applicable to all locations where secondary containments exist throughout Ames Research Complex.

Requirements

The following procedures have been developed to ensure that rainwater, which collects in secondary containment, is handled in an appropriate manner. Operators must follow these procedures to ensure that any discharges of rainwater from secondary containments to the environment comply with all applicable regulations:

1. Protect hazardous materials and hazardous material storage areas from rainfall, run-off and wind dispersal when possible.
2. Perform regular inspections to ensure that secondary containment areas are free of spilled materials, trash and rubbish.
3. Train personnel in good housekeeping techniques, standard operating procedures and any other training which may apply.
4. If rainwater accumulates in secondary containment, but does not contain a visible oily sheen and has not come in contact with any spilled material, it is permissible to discharge the accumulated water onto a grassy or otherwise vegetated area.

If grassy or vegetated areas are not in the proximity of the secondary containment structure, it may be permissible for the water to be discharged to the sanitary sewer system. NASA Environmental Services Office must be notified and grant approval for any discharge of rainwater to the sanitary sewer.

5. If water in the secondary containment does exhibit a visible sheen, or if the potential for pollutants is present, the water must be removed from the secondary containment and containerized in drums, tanks, totes, etc. Contact the NASA Environmental Services Office to request sampling and analysis and proper disposal procedures.

6. In the event spilled materials or rainwater overflow the secondary containment area, contact the NASA Environmental Services Office.

12.12.2.5 Water Treatment Best Management Practices

Description

This Best Management Practice includes groundwater treatment systems, inlet controls, infiltration devices, oil/water separators, retention ponds, vegetative swales, etc., that reduce the pollutants in storm water discharges and authorized non-storm water discharges.

Targeted Constituents

- Sediments
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

Applicability

This Best Management Practice is applicable to all industrial activities at Ames Research Complex.

Requirements

1. Identify buildings, facilities and conditions at Ames Research Complex that have a potential for malfunction and contaminate storm water. This list shall be included in the Storm Water Pollution Prevention Plan.
2. Control potential pollutants before discharging water to the storm drain system with the use of oil-absorbent booms. The absorbent material preferentially absorbs oil, and does not fill with water. It can be used on storm water with small concentrations of oily materials. When the boom is spent, it is full of oil and visibly heavier, and floats lower in the water. The booms are inexpensive enough that they may easily be replaced whenever the absorbent is saturated.
3. Maintain oil / water separators regularly to retain its effectiveness and to avoid spilling oily wastes. The separator should be pumped out periodically and replaced with clean water. The separator should be cleaned once before the wet weather season, by mid-September, and then periodically between storms. For inlets that do not carry much flow, three cleanings per year are sufficient: once before the rainy season to remove materials that have accumulated; once after the first major storm; and once at the end of the rainy season to prevent slow loss or evaporation of the collected oily wastes. If flows are heavy, monthly cleaning may be necessary.
4. Groundwater treatment systems effluent that discharges to the storm drain system must comply with general NPDES permit requirements.
 - a. Inspect the facility weekly for external corrosion, structural failure, failure of piping system, leaks or spills, loose fittings, loose valves, and other physical damage that may weaken the treatment system.
 - b. Functional tests should be performed regularly on equipment to ensure that alarm systems are working properly.
 - c. Sampling of influent and effluent waters for constituents of concern shall be done regularly per NPDES permit requirements

5. Building [REDACTED] pump station is located at [REDACTED]. Storm and surface waters are pumped out of [REDACTED] and into the [REDACTED]. [REDACTED]
 - a. Inspect the facility daily for equipment failure, failure of the piping system, leaks or spills, loose fittings, loose valves, and other physical damage that may weaken the pumping system.
 - b. Functional tests should be performed regularly to ensure that systems are working properly.
6. Other applicable Best Management Practices include
 - a. Good Housekeeping
 - b. Spill Response
 - c. Employee Training
 - d. Recordkeeping and Internal Reporting
 - e. Inspections
 - f. Control Devices
 - g. Outdoor Process Equipment Operations and Maintenance

12.12.3 Appendix C: Stormwater Best Management Practices--Site Specific

[REDACTED]

END OF DOCUMENT