



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

MAR 24 2003

FROM: HQ AFCESA/CESC  
139 Barnes Drive, Suite 1  
Tyndall AFB FL 32403-5319

SUBJECT: **Engineering Technical Letter (ETL) 03-1: Storm Water Construction Standards**

**1. Purpose.** This ETL prescribes procedures and practices to eliminate or minimize storm water pollution resulting from Air Force construction activities. All Air Force construction projects must use storm water best management practices (BMP) and pollution-prevention measures consistent with the scope and extent of the activities taking place at the construction site to achieve compliance with applicable local, state, or federal storm water construction permitting regulations.

**2. Application:** All Air Force installations.

**2.1. Authority:** Air Force Instruction (AFI) 32-7041, *Water Quality Compliance*.

**2.2. Effective Date:** Immediately.

**2.3. Ultimate Recipients:**

- Base civil engineers (BCE) responsible for construction activity on Air Force installations
- U.S. Army Corps of Engineers (USACE) and U.S. Navy offices responsible for design and construction of Air Force facilities

**2.4. Coordination:** Major command (MAJCOM) Environmental (CEV) (water managers) and pavement engineers.

**3. References.**

**3.1. Environmental Protection Agency (EPA):**

- Title 40 Code of Federal Regulations (CFR) Parts 122.26(b), 122.31, 122.32, 122.34, and 123.35 (available at [http://www.access.gpo.gov/nara/cfr/waisidx\\_02/40cfrv18\\_02.html](http://www.access.gpo.gov/nara/cfr/waisidx_02/40cfrv18_02.html))
- Storm Water Phase II regulations as published in Federal Register, FR68772, December 8, 1999
- Title 40 CFR Part 450, Subpart B, "Erosion and Sediment Control" (proposed), as published in Federal Register FR42644, June 24, 2002
- General Permit for Discharges from Large and Small Construction Activities (Draft), Phase II

**APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED**

- 78116 Federal Register/ Vol 67, No. 245/ Friday, December 20, 2002, "Proposed National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges From Construction Activities; Notice"
- EPA Menu of BMPs, available at <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm>

**3.2. Unified Facility Guide Specification (UFGS) (available at <http://www.ccb.org/ufgs/ufgs.htm>):**

- UFGS 01356A, *Storm Water Pollution Prevention Measures*
- UFGS 02300A, *Earthwork* (excavation, embankment, and grading)
- UFGS 02370A, *Soil Surface Erosion Control*
- UFGS 02371A, *Wire Mesh Gabions (and Mattresses)*
- UFGS 02621A, *Foundation Drainage System*
- UFGS 02620A, *Subdrainage System*
- UFGS 02921A, *Seeding*
- UFGS 02922A, *Sodding*
- UFGS 02630A, *Storm-Drainage System*
- UFGS 02630N, *Storm Drainage*

**3.3. Air Force:**

- AFI 32-7041, *Water Quality Compliance*, available at <http://www.e-publishing.af.mil/pubfiles/af/32/afi32-7041/afi32-7041.pdf>

**3.4. Joint Publications:**

- Army Technical Manual (TM) 5-820-1/Air Force Manual (AFM) 88-5. Chapter 1, *Surface Drainage Facilities for Airfields and Heliports*, available at <http://www.usace.army.mil/inet/usace-docs/armytm/tm5-820-1/>
- TM 5-820-3/AFM 88-5, Chapter 3, *Drainage and Erosion-Control Structures for Airfields and Heliports*, available at <http://www.usace.army.mil/inet/usace-docs/armytm/tm5-820-3/>
- TM 5-820-4/AFM 88-5, Chapter 4, *Drainage for Areas Other than Airfields*, available at <http://www.usace.army.mil/inet/usace-docs/armytm/tm5-820-4/>

**3.5. Department of Defense (DOD):**

- DOD Instruction (DODI) 4715.5, *Management of Environmental Compliance at Overseas Installations*, available at <http://www.dtic.mil/whs/directives/corres/html/47155.htm>

**4. Acronyms.**

AFI	- Air Force Instruction
AFM	- Air Force Manual
BCE	- base civil engineer
BMP	- best management practice
CEV	- Environmental

CFR	- Code of Federal Regulations
CGP	- construction general permit
DOD	- Department of Defense
DODI	- Department of Defense Instruction
EIAP	- Environmental Impact Analysis Process
EPA	- Environmental Protection Agency
FGS	- Final Governing Standards
HUC	- hydrologic unit code
MAJCOM	- major command
MS4	- municipal separate storm sewer system
NOI	- Notice of Intent
NPDES	- National Pollutant Discharge Elimination System
OEBGD	- Overseas Environmental Baseline Guidance Document
SWMP	- Storm Water Management Plan
SWPPP	- Storm Water Pollution Prevention Plan
TM	- Technical Manual
UFC	- Unified Facilities Criteria
UFGS	- Unified Facilities Guide Specification
USACE	- U.S. Army Corps of Engineers

## 5. Definitions.

**5.1. Affected Construction Area.** For the purpose of determining requirements for storm water control, the affected construction area is the site perimeter encompassing all areas that are disturbed during project construction and are so delineated on a site map, and may consist of natural boundaries, physical boundaries (e.g., curbs, gutters, catchments), or any other chosen line of demarcation to encompass the site. It also includes any off-site storage and control areas dedicated to the project.

**5.2. Qualified Storm Water Professional.** A qualified storm water professional is a person who by experience and training is knowledgeable in the principles and practices of construction-related erosion and sediment controls and construction site pollution prevention. Credentials that are cited in the site log of the storm water control site plan designate the qualified storm water professional (see paragraph 8.2.3).

**6. Requirements.** This ETL establishes the Air Force's mandatory requirements for soil and erosion control at construction sites. It also requires the implementation of BMPs (see paragraph 10.3) and pollution-prevention measures at these sites.

**6.1. EPA or State Phase II Storm Water Regulations.** This ETL can be used to fulfill requirements of 40 CFR 122.34(b)(4)(ii)(A), (B), and (C) "Construction site storm water runoff control," and can be cited for this purpose by any base that is an operator of a regulated small municipal separate storm sewer system (MS4).

**6.2. Environmental Compliance.**

**6.2.1. Storm Water Construction (National Pollutant Discharge Elimination System [NPDES]) Permits.** Construction projects covered by this ETL will typically be required to obtain an NPDES storm water construction permit and comply with its substantive and procedural requirements. If NPDES coverage is required, all permit provisions must be complied with completely and permit coverage must be obtained before commencement of construction, with lead-time dependent upon the jurisdiction. The storm water control site plan required by this ETL must contain or reference a declaration that the project either does or does not require an NPDES storm water construction permit and include an explanation of the reason for either circumstance. See Attachment 1 for suggested permit declaration language and refer to AFI 32-7041, paragraph 2.12, for further guidance on NPDES storm water construction permit requirements. Overseas installations should refer to the Overseas Environmental Baseline Guidance Document (OEBGD) or their Final Governing Standards (FGS) to determine if any NPDES-type permits are applicable.

**6.2.2. Notice of Intent (NOI).** The only means to obtain NPDES permit coverage for a construction project is through a construction general permit (CGP). To obtain this coverage, submit a complete and accurate NOI, when required, in accordance with the format and within the timeframe prescribed by the applicable federal, state, or municipal jurisdiction and comply fully with the terms of the corresponding general permit.

**6.2.3. Storm Water Pollution Prevention Plan (SWPPP).** The primary means to achieve compliance with a CGP is to prepare and implement a construction SWPPP in accordance with the terms of the permit. When NPDES permit coverage is required for a construction project, the storm water control site plan required by this ETL must be tailored to address all requirements specified for the SWPPP in the general permit.

**6.2.4. Small MS4.** If the base is designated as a regulated small MS4, it must have its own separate storm water NPDES permit and a base-wide Storm Water Management Plan (SWMP) that includes construction and post-construction requirements to control storm water. Make sure any plans developed for any activities or practices undertaken during a specific construction project are consistent with the base-wide plans.

**7. Construction Site Storm Water Control Goals.** Proper construction site drainage is critical for efficient and timely completion of earthwork. Design and implement Air Force construction projects to meet the following storm water control goals:

**7.1.** Offset temporary or permanent increases in imperviousness of an affected construction area to the maximum extent possible with storm water BMPs that will reduce site storm water discharges and pollutant loadings to pre-construction levels or better.

**7.2.** Use construction management and operations practices that focus on source control before committing to collection, storage, and treatment.

**7.3.** Plan and schedule the installation of the final storm drainage facilities and post-construction storm water BMPs to render their maximum usage during the construction period.

## **8. Construction Site Management to Control Storm Water.**

**8.1.** Any activity that disturbs or breaks the topsoil or results in the movement of earth on land at an Air Force construction site must implement measures to manage and control storm water runoff while the construction activity is taking place, and must stabilize the site when the activity is completed.

**8.1.1.** Construction sites with an affected construction area exceeding 1 acre must have a storm water control site plan in effect before groundbreaking can begin. Prepare the storm water control site plan as part of the project design, or develop a set of specifications to obtain it as part of the construction contractor's project bid. A combination of these two methods offers the best means to produce a storm water control site plan. A storm water control site plan must contain an NPDES permit declaration (see paragraph 6.2).

**8.1.2.** In addition, Air Force construction sites with an affected construction area exceeding 5 acres must also have a storm water control site plan prepared by a qualified storm water professional and must have a qualified storm water professional on site during the construction period to oversee implementation of the site plan.

**8.1.3.** Construction sites having an affected construction area smaller than 1 acre must still be evaluated for their potential to generate and/or contaminate storm water runoff. When warranted, measures equivalent to those that would be specified in a storm water control site plan must be developed and implemented. Ensure that any measures chosen are consistent with the size and nature of the project.

**8.2.** Storm Water Control Site Plan. Prepare a storm water control site plan consisting of a site narrative, site map, and site log.

**8.2.1.** Site Narrative. Provide information to characterize the construction site and describe the construction activities that are to take place at the site, the storm water control measures that will be implemented during the construction period, and the stabilization practices that will be implemented before project completion.

**8.2.1.1.** Describe each activity that disturbs soil and groundcover on the site (i.e., grubbing, excavating, grading, embankment).

**8.2.1.2.** Describe the pollution prevention and storm water runoff and erosion control BMPs selected for implementation at the site.

**8.2.1.3.** Describe the source control and housekeeping BMPs.

**8.2.1.4.** Describe the interim and permanent stabilization practices.

**8.2.1.5.** Develop an implementation schedule for the activities in paragraphs 8.2.1.1 through 8.2.1.4 and relate their descriptions to the locations and legends shown on the site map (see paragraph 8.2.2) and to the timeframes recorded in the site log (see paragraph 8.2.3).

## **8.2.2. Site Map.**

**8.2.2.1.** Show the site boundary, perimeters of control areas, and areas where construction activities will occur.

**8.2.2.2.** Graphically depict the construction activities that will occur within the site boundary and each demarcated perimeter area.

**8.2.2.3.** Locate the BMPs chosen for the project by the use of a symbol and legend.

**8.2.2.4.** Index area demarcations and activity symbols to their corresponding narrative descriptions and site log timeframes.

**8.2.3. Site Log.** Maintain a permanent record of the activities and events called for in the site plan and keep this information available on-site from the start to the end of construction.

### **8.2.3.1. Certification.**

**8.2.3.1.1.** Provide a certification signature block whereby the designated construction site manager or qualified storm water professional certifies that the storm water control site plan is in effect and that all measures required before groundbreaking have been implemented.

**8.2.3.1.2.** Provide a certification signature block whereby the designated construction site manager or qualified storm water professional certifies that the affected site area is stabilized, all remaining storm water control measures have been upgraded to their final design configuration, and all construction site control areas have been removed and returned to their final stabilized state.

### **8.2.3.2. Journal Entries.**

**8.2.3.2.1.** Record when soil disturbance starts and ends for any sequenced portion of the project or sectioned area of the site.

**8.2.3.2.2.** Record when any control areas are activated and when they are disassembled and cleaned up to restore them to their original state.

**8.2.3.2.3.** Record when any runoff and erosion control BMP is installed and/or implemented, and indicate whether an inspection schedule is established to monitor its state and condition.

**8.2.3.2.4.** Record when rain events occur (time, duration, intensity) and describe any observations on the effectiveness of the storm water control site plan to handle the event.

**8.2.3.3.** Inspections. Develop and display on the site log the inspection schedule for each item and activity requiring inspection as part of the site control plan, notate when these inspections take place, and identify the inspector. Indicate on the inspection schedule if any exceptions were discovered during the inspections (see paragraph 8.2.3.4).

**8.2.3.4.** Exceptions. Date and describe any inspection findings and describe any response actions, if required. Note any pertinent findings reported by any involved or concerned party about site storm water matters.

**8.2.3.5.** Site Log Termination Instructions. The site log will be maintained as a permanent record in the facility folder and should contain instructions, preferably on the cover page, concerning the state of the site at project termination, indicating what items remain and their requirements for maintenance and upkeep.

**8.3.** Plan Implementation. The construction site manager or the on-site qualified storm water professional will certify by his/her signature on the site log that the approved storm water control site plan is in effect before commencing project construction (see paragraph 8.2.3.1.1).

**8.4.** Plan Completion (Final Site Stabilization). The construction site manager or the on-site qualified storm water professional will certify by signature on the site log that construction is completed and the site is stabilized (see paragraph 8.2.3.1.2).

**8.5.** Content Required for Environmental Compliance. The applicable storm water construction permit may be the driving force behind the required content of the storm water control site plan. The required content appears to vary slightly from location to location depending on the permitting jurisdiction, but the substance and level of effort for this content can vary dramatically depending on location and other site-specific factors.

**8.5.1.** Use the EPA SWPPP content in 40 CFR 450.21 as a guide for content requirements for Air Force storm water control site plans, and adjust it accordingly to meet site-specific permit requirements and project-specific construction activity.

**8.5.2.** Air Force storm water control site plans must also include the following information:

- Site identification (see <http://www.epa.gov/surf3>)
  - Watershed name

- 8-digit hydrologic unit code (HUC)
  - Permit references (e.g., ID #, type, NOI)
- Site information (Note: Most of this information can be referenced from customary design documents, but should be summarized in the storm water control site plan)
  - Soil type
  - Native vegetation type
  - Discharge locations (existing and planned)
  - Drainage patterns
  - Slope and terrain (before and after grading)
  - Total construction site area (acres)
  - Total site area disturbed (acres)
  - Total construction cost (\$000)
- Non-impervious/impervious site areas (before and after)
  - Paved and unpaved road area
  - Paved and unpaved parking area
  - Aquatic area (on-site or nearby)
- BMPs selected
  - Descriptive name
  - Drainage area served
  - Estimated control efficiency
  - Estimated cost of implementing selected practice
- Construction cost
  - Total cost of construction
  - Estimated cost to implement storm water control site plan
- Run-off information (optional)
  - Average run-off coefficient (before and after)
  - Design storm (frequency, intensity)

**9. Source Control and Housekeeping.** Establish control areas for construction activities that have a potential to introduce pollutants and contaminants into storm water runoff. For smaller projects it may be necessary to combine or co-locate control areas or establish site-specific work practices if it is not practical to establish control areas.

**9.1. Solid Waste Management.** Clear the construction site daily of trash, including organic debris, packaging materials, scrap, surplus building material, and domestic waste. Designate waste collection areas and provide containers that are regularly removed for disposal.

**9.2. Material Delivery and Storage.** Designate a material storage area that is provided with secondary containment. Store material on pallets and provide a covering or shelter for soluble materials to prevent storm water exposure. As construction proceeds, relocate the storage area into the building shell when feasible. Inspect storage facilities at least weekly and after each rain event.

**9.3. Concrete Waste.** Designate an area for a temporary pit to be used for concrete mixers and mix truck washout. Dispose of hardened concrete offsite. Prohibit concrete truck operators from dumping or cleaning their trucks in any manner that results in water discharge into storm drains from the curb and gutter. Inspect the washout area daily for runoff control adequacy and weekly for removal of hardened concrete.

**9.4. Paint and Painting Supplies.** Construction activity involving paint and painting supplies must be conducted to keep pollutants out of storm water discharge by ensuring appropriate material storage, use, and cleanup. Inspect the site weekly for evidence of improper disposal and cleanup of painting activities. Prohibit construction workers from disposing of paint waste or painting equipment cleanup solvents or wastewater in any manner that results in discharge to storm drains.

**9.5. Vehicle Fueling, Maintenance, and Cleaning.** Designate a fueling point provided with a secondary containment area. Minimize the mobile fueling of equipment (i.e., equipment should be taken to a designated fueling area when feasible). Use drip pans when fueling and lubricating equipment. Limit on-site maintenance and cleaning of equipment as much as possible. Inspect the fueling area weekly and after all rain events. Muddy equipment should be cleaned before it tracks mud onto base streets or public highways and any resulting on-site wash water should be properly contained and discharged.

**9.6. Hazardous Waste Management.** Prohibit the disposal of hazardous wastes and materials (e.g., paints and solvents, petroleum products, fertilizers, herbicides and pesticides, soil stabilization products, asphalt products, concrete) into the base storm water collection system. Ensure that construction workers understand proper material use and disposal as required by the base hazardous waste management plan.

## **10. Storm Water Control Site Work and Construction Activity.**

**10.1. Drainage and Post-Construction Storm Water Controls.** The construction project itself must and will have drainage and storm water management features that are an integral part of the designed construction project and remain permanently as part of the final completed project. The structural BMPs chosen to manage storm water during the construction phase must be consistent with these final features. Straw wattles, gabions, riprap, or any other structural BMPs used during the construction phase for soil and erosion control must be validated by the project design and may be used during the construction period at less than their final design specifications until they are upgraded at project completion.

**10.2. Storm Water Retention.** At construction sites where 10 or more acres served by a common draining location are disturbed, or open excavation will produce excessive erosion or discharge of turbid water to local water bodies, some means must be provided for storm water sediment control (sediment basin, trap, filter, or chamber) or equivalent measures to minimize sediment release to surface water or the storm water collection system.

**10.2.1.** Install boundary-specific sediment controls (e.g., silt fences, straw bales, straw wattles, erosion control mats, sediment traps) at side slope and down slope boundaries that do not have provisions to collect and retain storm water runoff for sediment.

**10.2.2.** All basins and ponds must be temporarily constructed to drain dry at a rate sufficient to achieve the desired level of control (no wet ponds). If approved by the Air Force and validated by the project design, storm water from construction site activity may be collected in permanent ponds or basins that are designed as final permanent features of the construction project and have the appropriate permits.

**10.2.3.** Stage construction activity to minimize the amount of disturbed soil exposed at any given time and also the period of disturbed soil exposure.

### **10.3. Storm Water BMPs for Construction.**

**10.3.1.** The EPA maintains a web site of construction BMPs, in addition to BMPs for all aspects of storm water management at:

<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm>

**10.3.2.** DOD and Air Force guide specifications and facility criteria correspond with many of the construction BMPs listed at the EPA's web site. Although there are some differences between DOD criteria and EPA BMPs, they can be resolved by using engineering judgment. The suggested practice is to look at both, as the choice of either or a combination of both may be the appropriate solution.

**10.3.3.** It is recommended to stay within the bounds of the BMPs, UFGSs, and UFCs when devising an overall storm water control strategy for a construction site. When necessary for more complex construction projects, qualified project designers should be relied on to develop unique construction site storm water control strategies.

**10.4. Inlet Protection.** Operable storm drain inlets or ones that become operable during construction must be protected so that storm water runoff will not enter the conveyance system without first being filtered or treated to remove sediment.

**10.5. Stabilization.** Stabilization practices must be initiated as soon as possible in any portion of the site where clearing and grubbing, excavation, embankment, and or grading activities have temporarily or permanently ceased. In no case should stabilization practices be deferred more than 14 days from cessation of activity, unless unsuitable or emergency conditions exist.

**11. Point of Contact.** Recommendations for improvements to this ETL are encouraged and should be furnished to: HQ AFCESA/CESC, 139 Barnes Drive, Suite 1, Tyndall AFB, 32403-5319, Attention: Mr. Gary Jacks, DSN 523-6190, (850) 283-6190, [gary.jacks@tyndall.af.mil](mailto:gary.jacks@tyndall.af.mil).

MICHAEL J. COOK, Colonel, USAF  
Director of Technical Support

Atch  
1. Storm Water Control Declaration  
2. Distribution List

## STORM WATER CONTROL DECLARATION

All Air Force construction projects must affirm by declaration that the project does or does not require an NPDES construction storm water permit and must provide a thorough explanation of the circumstances. This determination needs to be made early in the project development—preferably during the project definition phase—and should also be covered during the Environmental Impact Analysis Process (EIAP). The following is suggested language to include on applicable contract or project documents and can be written to show intent during the early project development but must indicate completion before project groundbreaking. The declaration should include the following or equivalent content:

1. The Air Force has determined that this project involves the disturbance, breakage and/or movement of earth on land at a construction site encompassing a total aggregate site area of \_\_\_\_\_ acre(s).

2.

a. This construction site area is less than one acre and does not require an NPDES storm water construction permit. The activities taking place at this site (will be/have been) evaluated for their potential to generate or contaminate storm water. Best management practices and pollution prevention practices appropriate for this size and type project will be implemented during project construction.

**Or**

b. This construction site area involves the repair and maintenance of a facility that does not change the original line and grade, hydraulic capacity or purpose of the facility site and therefore does not require an NPDES storm water construction permit.

**Or**

c. This construction site area is greater than one acre or is less than one acre but is judged to be part of a larger common plan of development exceeding one acre and requires coverage under an NPDES storm water construction permit.

(1) This project comes under the jurisdiction of construction general permit #\_\_\_\_\_. A Notice of Intent (NOI) to comply with the provisions of this general construction permit will be/was issued \_\_\_\_\_ (date), \_\_\_\_\_ (days) before groundbreaking of this project commences.

3. Activity at this construction site (will be/was) completed (by) on \_\_\_\_\_ (date), and a Notice of Termination (will be/was) issued \_\_\_\_\_ (date).

## DISTRIBUTION LIST

### DEPARTMENT OF DEFENSE

Defense Commissary Service (1) Director of Facilities Bldg 8400 Lackland AFB TX 78236-5000	Defense Technical Information Center (1) ATTN: DTIC-FDA Alexandria VA 22034-6145
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### SPECIAL INTEREST ORGANIZATIONS

IHS (A.A. DeSimone) (1) 1990 M Street NW, Suite 400 Washington DC 20036	Construction Criteria Database (1) National Institute of Bldg Sciences 1201 L Street NW, Suite 400 Washington DC 20005
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