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Section 1

The Contractor Re-Certification Training Program
CONTRACTOR RECERTIFICATION PROGRAM

Course Description
Inspector and Contractor Re-Certification Program, Controlling Construction Site Erosion and Sedimentation

This half-day program has been developed for those previously certified under the program. The program covers:
- Update of the Keep it Clean Partnership requirements
- An update and review of Colorado Stormwater Program requirements and permitting
- Types of Best Management Practices (BMP’s) for specific situations to control erosion and sedimentation
- Stormwater Management Plan (SWMP) maintenance
- Inspecting and maintaining construction site BMP’s.

Re-Certification Completion Requirement
Completion of a recognized training program in stormwater management, erosion, and sediment control during the past three calendar years is required to maintain a current certification. You cannot miss more than 10% of the total in class time. You must pass the re-certification test with a score of at least 72%. There is no grandfathering.

What if I miss more than the allowable class time?
Makeup is required. You may attend the section(s) you missed at a later date.

What if I don’t pass the re-certification test?
Retesting is permitted, but you must retest within six months of your original test date. You can take the test as many times as you wish. Re-testing will be made available.

Certification Expiration
Contractor certifications and re-certifications are valid for three years from the date you passed your examination. You will receive a card with the expiration date printed directly on the front.

Refresher Training
You must attend/complete a recognized refresher-training program before your certification/re-certification expires. A listing of recognized refresher programs is available from the Keep it Clean Partnership.
### TOPICAL OUTLINE FOR THE RE-CERTIFICATION TRAINING CONTRACTOR PROGRAM

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COURSE OBJECTIVES FOR CONTRACTOR RE-CERTIFICATION TRAINING PROGRAM

1. Describe the State of Colorado’s regulatory requirements under the Water Quality Control Act for stormwater management and erosion control during construction activities.
   a) Name the state agency in Colorado with authority to implement the stormwater management and erosion control provisions of the Water Quality Control Act.
   b) Describe the permitting requirements for the stormwater management and erosion control program.
   c) Locate specific legal requirements for the stormwater management and erosion control program.
   d) List the components of a stormwater management plan (SWMP).
   f) Describe the stormwater permit conditions.
   g) Identify local requirements for controlling erosion on construction sites.

2. Identify areas on a construction site that could be affected by erosion, including roadways, culverts, walls, and steep slopes.

3. Evaluate site conditions for erosion potential, and identify site conditions to avoid.
   a) Identify steep slope areas that have greater erosion potential.
   b) Identify soil types that present greater erosion potential.
   c) Identify areas of a construction site that present long slope lengths.
   d) Evaluate the run-on potential for a construction site.
   e) Evaluate the total tributary acreage for a construction site.
   f) Identify times of the year that present the greatest potential for erosion.

4. Select administrative and structural BMP’s for construction site erosion control.
   a) Evaluate the benefits of short-term vs. long-term BMP’s.
   b) Determine which BMP’s will be (or could be) permanent erosion control or flood control structures.
   c) Evaluate specific constraints and limitations for implementing construction site BMP’s.
   d) Match construction site conditions with the best BMP.
   e) Justify the use of BMP’s for specific areas of a construction site.

5. Install BMP’s for construction site erosion control.
   a) Locate and read specifications for the installation of construction site BMP’s.
   b) Identify the tools and resources required to install construction site BMP’s.
c) Apply design criteria for BMP's to actual site conditions.

d) Describe installation requirements based on applicable specifications.

6. Evaluate construction site BMP's for effectiveness and maintenance requirements and oversee maintenance activities for BMP's.

7. Inspect construction site BMP's.
   a) Develop a site inspection schedule based on permit requirements.
   b) Identify areas of a construction site requiring inspection.
   c) Document and communicate inspection findings to others.
Section 2

The Stormwater Regulations and Program Requirements
THE COLORADO STORMWATER REGULATIONS

Regulatory Requirements

Stormwater Runoff and the Construction Industry
Stormwater is made up of rain, snow, and hail, as well as snowmelt runoff, surface runoff, and drainage associated with storm events. Storm drain systems consist of gutters, storm drains, underground pipes, open channels, culverts, and creeks. In Boulder County, as in many Colorado counties, storm drain systems drain directly to streams with no treatment. Flowing to streams, stormwater picks up pollutants such as sediment, oil and grease, and nutrients, as it travels over hard surface, such as pavement, asphalt, and roofs. These pollutants are delivered directly to our streams and are a major source of water pollution. This training will focus on pollutants generated by construction sites and the practices that control stormwater pollution from construction sites.

Soil exposed during construction activities contributes sediments to stormwater runoff. Animal and plant life in streams suffer negative effects from increased sediments delivered from construction sites to streams. These effects from increased sediment include:

- clogging of fish spawning areas and areas for raising young fish
- clogging and abrading fish gills, causing suffocation and injury
- reducing water clarity, making it difficult to find food
- displacing aquatic organisms that are food for fish
- transporting of additional contaminants, such as nutrients and metals

Construction materials, such as fuel, concrete wash water, and hydraulic fluids, also are pollutants that can be carried to streams by stormwater.

Practices designed to prevent increased stormwater sediment loads and construction materials pollutants are available. When these practices, known as BMPs, are properly implemented, sediment and pollutants generated by construction sites are greatly reduced.

To address sediment and pollutants in stormwater runoff, a system of federal, state, and local regulations exists, which requires programs to manage sources of stormwater pollution that discharge to municipal storm drain systems and streams. Specific requirements for construction site management are currently in effect through state and local regulations.
Regulatory Requirements

Federal Requirements
The Federal Clean Water Act (CWA) requires that cities, counties, and other public facilities that meet specific population standards apply for a stormwater permit for their storm sewer systems (see figure below). The goal of the stormwater permit program is to reduce the amount of pollutants entering streams, lakes, and rivers as a result of runoff from residential, commercial, municipal, and industrial areas, including construction sites.

The federal regulations which govern these permit standards require cities and counties to implement the six programs designed to reduce pollutant loading from urban areas via storm sewer systems.
These six programs include:

1. **Public Education**: provide information and training for the general public to help them understand their role in stormwater pollution impacts to streams in their community.

2. **Public Involvement**: provide opportunities for the public to be involved in decisions which address stormwater pollution management.

3. **Illicit Discharge Elimination**: develop and implement programs to track and stop illegal discharges to storm sewer systems.

4. **Construction Management**: develop and implement ordinances and inspection and enforcement procedures to manage sediment and pollutant discharges from construction sites which disturb greater than 1 acre.

5. **Post Construction Management**: develop and implement ordinances and inspection and enforcement procedures to manage pollutant discharges after construction is complete.

6. **Municipal Good Housekeeping**: implement procedures and practices to prevent pollution from operations of city, county, and other public entities.

In Colorado, the Environmental Protection Agency (EPA) has given responsibility for implementing these regulations and permits to the Colorado Department of Public Health and Environment (CDPHE). This training will focus on putting the requirements of the construction management programs into action in the State of Colorado.

**Colorado Requirements**

CDPHE has implemented state regulations which require identified cities and counties and other public entities to permit their storm sewer systems and implement the six programs to manage stormwater pollution, as required by the federal regulations (See previous figure). The permit will allow five years to fully implement all six programs. Cities and counties are required to develop and put a construction management program into action; however, the state will also require a CDPHE general construction permit for any soil-disturbing activities at construction sites. This permit is required for private and public projects, which disturb greater than one acre as part of development or redevelopment construction activities. The general construction permit requires implementation of BMPs to manage generation of sediment and pollutants.

**CDPHE General Construction Permit**

Currently, construction sites, both private and public are required to obtain a general construction permit from CDPHE if they:

- Disturb over at least 1 acre; or
- Are part of a larger common plan of development or sale that will disturb at least one acre.
The general construction permit requires the permit holder to (refer to the permit itself for the complete requirements):

- Develop a Stormwater Management Plan (SWMP).
- File a permit application at least 10 days prior to the start of construction activities.
- Maintain the SWMP and keep it onsite.
- Install BMPs according to specifications outlined in the SWMP.
- Perform inspections of stormwater and erosion controls following each significant storm event and every 14 days.
- Maintain inspection records.
- Provide SWMP and records to inspector upon request.
- Maintain and modify BMPs to reflect current conditions of job site.
- Achieve stabilization.
- Remove all temporary BMPs.
- Inactivate permit.
- Prevent contamination, pollution, or degradation of State Waters.

The SWMP must identify appropriate stormwater pollution prevention measures or BMPs. A BMP is defined as any program, technology, process, practice, operating method, measure, or device which controls, prevents, removes, or reduces pollution. This training will provide information about available stormwater BMPs, appropriate installation and maintenance, and final site stabilization.

For more specific information about SWMP requirements and general construction permit application forms, contact the Water Quality Control Division, Stormwater Program, by calling (303) 692-3517 or visit the website: http://www.cdphe.state.co.us/wq/PermitsUnit/stormwater/construction.html.

In a few limited situations, some or all of the General Construction permit requirements may be waived for construction sites disturbing less than five acres. One condition is met if a local government or entity has a State-designated Qualifying Local Program. A construction activity disturbing less than five acres in a municipality with a Qualifying Local Program may not be required to submit an application, inactivation, or fees to the State, although State permit coverage is still obtained through the local municipality. The local municipality will be responsible for notifying you that you do not need to apply for State coverage, if this is an option. You can review a list of municipalities with Qualifying Local Programs at the website listed above.

Sites that are under five acres of disturbance may also apply for coverage under the R-Factor Waiver. In general, the waiver is for sites that will be completed and stabilized in a few months and during dry times of the year. Sites that will be seeded for final stabilization will generally not qualify.

The application with instructions is located at the website listed above and in the back of this manual.
Local Government Requirements
In Boulder County, the county, and cities of Boulder, Longmont, Louisville, and towns of Erie and Superior are required by federal and state regulations to develop local programs that meet the requirements for a state storm sewer permit. These Boulder County entities will develop common standards for construction sites, which will be incorporated into individual community ordinances.

As a result, your development and construction projects will be subject, in the future, to requirements designed to improve stormwater quality such as:

- Training and certification requirements for employees.
- Expanded plan check and review.
- Increased site inspection.

As of March 2003, Keep it Clean Partnership, municipalities begin development of the six programs required by the state permit for their storm sewer system. The local construction program required by this permit will be developed over the five years of the permit cycle. All six programs will be developed and implemented by 2008.

This training and re-certification is designed to meet the Keep it Clean Partnership
contractor training requirements when training is required for compliance with the state storm sewer permit. The information provided in this manual supports the Keep it Clean Partnership training, which will be provided to meet Keep it Clean Partnership entity permit requirements. This training was developed in advance of permit requirements due to early funding received from EPA to develop a training program. Contact the Keep it Clean Partnership Coordinator for information on specific local construction site requirements, as the Construction Program is implemented by Keep it Clean Partnership entities.

Other Construction-Related Permits and Reporting
There are other permits that may be required of construction operations. They may include, but are not limited to:

- Water Quality Control Division (WQCD) Process Water General Permits
  - Construction Dewatering – 303-692-3500
  - Minimal Industrial Discharge (example: hydrostatic testing) – 303-692-3500
  - Sand and Gravel w/ process water – 303-692-3500

Permits NOT from WQCD
- Corps of Engineers 404 Wetlands Permit – 303-979-4120
- General Air Pollution Emission Notice: Construction Permit – 303-692-3100

These permits and reporting requirements are beyond the scope of this training but are listed for the student’s benefit.

DEVELOPING AND IMPLEMENTING A SWMP

Introduction
The key document providing the description of the Best Management Practices (BMP’s) for a construction project is the Stormwater Management Plan (SWMP). The SWMP must include a site description, map, and the BMPs to be used on the project. The SWMP is a requirement of a construction permit for stormwater and must be completed and implemented at the time the project breaks ground. Be sure to have the plan at the job site. Also, the plan must be revised to reflect the current site conditions. The State of Colorado does not require the SWMP be submitted to the Water Quality Control Division as part of the permit filing process; however, they may ask for a copy, and those sites filing for a permit must sign, that they indeed have a SWMP they will implement. Further, if a state inspector visits a construction site, they will ask to review the plan. As far as the State of Colorado is concerned, no formal revision procedure for a SWMP is required, but the plan must reflect the current site conditions. Development and revisions to a SWMP may require specific procedures be followed depending on the project and location.

Some local jurisdictions require that the SWMP be submitted for review and approval prior to the issuance of a grading permit. Be sure to check with the local authorities for
any specific SWMP requirements. These plans are also known as Stormwater Pollution Prevention Plans and may go by another name in any particular jurisdiction.

**Key Points for the SWMP**

- Required as a permit condition
- Must reflect current site conditions
- Local jurisdictions may require submittal for approval
- Must be available for review by state inspectors
- Is available as a public document

The State of Colorado Water Quality Control Division has developed a guidance document for developing a SWMP. The document is included in the back of this manual.
Section 3

BMP Installations: New Technologies, Project Phasing, and Installing Cover
ADMINISTRATIVE CONTROLS FOR EROSION CONTROL

Any activity that minimizes the amount of erosion or sedimentation is a BMP. **Administrative controls are BMPs that involve the way work is executed and do not involve the actual construction or installation of a BMP.** The best example of an administrative control is training. The more workers understand about controlling erosion, the better site work will be conducted according to SWMP. Further, workers installing BMPs need to know exactly how they are to be installed and how they are designed to function. In fact, it can be even more important for installers to understand just how a BMP is supposed to work.

GRADING TECHNIQUES FOR EROSION CONTROL

Grading techniques for temporary erosion control can be used to minimize erosion and facilitate infiltration and plant growth. These techniques include:

- Surface roughening (or leaving the surface rough)
- Terracing slopes
- Maintaining vegetative buffers
- Rounding the slope at the tops of cuts, transitions, and roadway ditches
- Avoiding angles in cut- and fill- transition areas by rounding transition line
- Rounded channel bottoms
- Construct cut and fill slopes at stable angles to avoid slumping
- Use in conjunction with seeding
- Rough- cut street controls
- Diversions
- Slope drains

Diversion Ditch and Berm
Avoid excessive compacting of the soil surface, as it inhibits the growth of vegetation. Roughened areas should be seeded and mulched as soon as possible. Fill slopes should be left with loose, uncompacted fill (4”-6” deep) that can be grooved using a disk. Grooves along the contour should be 2”-4” deep and spaced 6” apart. Steeper slopes can be stair-stepped (terraced). During the process of cut-and-fill, avoid letting side cast or waste material enter waterways or placing it on unstable areas. Efficiently move excavated material to areas needing fill or to a stockpile. Remove stumps cleanly and relatively free of soil. Use slow, controlled grading for rough-cut road maintenance to avoid damage from graders to stabilized slopes. Berms or a windrow of topsoil can divert water down the road causing erosion. At the same time, berms can be used to keep runoff from eroding fill slopes. Rundowns can be placed at intervals in the berm to convey water from the top of the slope to the bottom. See Section 9 of the manual for more information. Berms are easily constructed and may serve as an alternative to sediment barriers like silt fence.

Planning, Scheduling, and Phasing of BMP’s include:

- Keeping as much of the existing vegetation as possible for as long as possible.
- Adjusting the BMP’s as the project progresses.
- Scheduling work in such a way to avoid large open or disturbed areas during the time of the year of the heaviest precipitation.
- Complete or stabilize areas of the job as soon as possible or at least during the same season.
- Be sure drainage features for the job are fully functional as part of the construction process.
- Keep slope stabilization, erosion, and sediment control as current as possible with site construction.
- Locate and develop borrow pits to minimize sediment.
- Place debris, overburden, soil stockpiles, and waste materials away from waterways and areas of runoff.
- Stabilize the site prior to winter shutdown to avoid serious erosion during spring meltdown. Remember, it may not be possible to install any erosion or sediment control BMP’s because of snowpack.
- Installation of BMP’s on areas that are planned to left exposed for 30 days or more.
- Locate stockpiles and other pollutant sources at least 50’ from waterways.
COVERING THE SOIL
There are many ways to cover exposed or disturbed areas. Regardless of the method, cover protects the soil from raindrop impact, wind erosion, facilitates the infiltration of stormwater, slows the flow velocity, and protects planted areas. Covering areas previously seeded is absolutely necessary. Cover should be applied within 14 days to all disturbed areas that are not at final grade but will remain open for longer than 30 more calendar days (from Urban Drainage and Flood Control District, Volume 1 & 3 Drainage Criteria Manual)

VEGETATIVE COVER

Introduction
Grasses and other types of vegetative cover are one of the most important BMPs. Vegetative cover:

- Protects the soil from raindrop impact
- Facilitates infiltration of runoff, thus reducing erosion
- Helps remove pollutants from runoff
- Requires minimal maintenance
- May be integral to a drainage structure (e.g. grass-lined swale)
- Helps reduce noxious weeds
- Provides habitat for wildlife
- Returns disturbed areas to a natural state
- Good public relations

In addition, re-establishing vegetative cover may be mandated by officials. Vegetative cover could include grasses, shrubs, bushes, trees, ground cover, and other plants. When planning for re-vegetation, be sure to check on all requirements that may apply. For example, the city, county, or other applicable government agency may require specific types of seed mixes at specific application rates. Other considerations include:

- Type of soil and soil preparation
- Will the area be irrigated?
- What watering restrictions may apply?
- Type of seed mix and application rate (see the Drainage Criteria Manual Vol. 1)
- Method of planting (e.g. drill seeing, hydroseeding)
- Type of cover (e.g. mulching)
- Time of year (fall and spring)
- Elevation
- Project phasing
- Long-term maintenance plan
- Topography
- Weed management and control
Establishing Vegetative Cover
The first step to establishing vegetative cover is actually to evaluate the site for existing cover to properly plan re-vegetation activities. Also, save as much of the existing vegetation as possible. For example, leaving vegetative buffer strips, especially along water bodies, slows the runoff and allows infiltration of the stormwater providing filtering. This filtering effect reduces the amount of pollutants. If necessary, set up barriers so equipment and vehicles do not damage the existing cover. As construction proceeds, establish cover as soon as slopes are worked to completion. In fact, by design, diligently work slopes, and once completed, re-vegetate. Do everything you can to make the re-vegetation efforts succeed. Temporary cover like rye grass can provide both the benefits of erosion control and shade for the protection of permanent grasses.

The process basically can be outlined as follows:

- Site evaluation (prior to construction)
- Sample soil for analysis as necessary
- Review of existing plans (e.g. drainage plan, landscaping)
- Development of seeding plan or planting plan
- Site preparation
- Seeding and planting
- Maintenance

Things you can do to ensure successful planting:

- **Drill seed** when possible. The drill seeder “opens” the soil with a shank or disc, drops the seed at the desired depth, and compacts the soil with a pack wheel, providing an effective seeding method. Further, the grooves left behind catch water, helping to keep valuable moisture for plant growth. Be sure to drill seed on the contour.

- Use **proper seed mix** and application rate. For example, adapted species may be more readily available, less expensive, and establish themselves faster than native species. When broadcast seeding, the application rate should be doubled.
• **Remove plant competition.** The infestation of weeds makes it all the harder to establish the desired cover. In addition, most communities have code requirements for the control of noxious weeds. Establishing a good stand of cover can reduce the cost of weed control programs as well as protect the slopes from erosion.

• **Prepare a good seedbed.** A seedbed that is too “fluffy” does not provide good seed-to-soil contact. A seedbed that is too compact can interfere with seed germination and growth. Work slopes on the contour.

• **Don’t prepare slopes for seeding and leave them for extended periods of time.** A crust forms on the surface of the soil that requires reworking.

• **Cover seed to the proper depth** (e.g. ¼” to ½” for most seed mixes). Ensure good seed-to-soil contact. If broadcast seeding, hand rake lightly into the soil. For larger areas, drag an object over the surface to help seed to soil contact.

• **Plant at the proper time of the year.** Spring and fall are the best times to plant.

• **Ensure even seed distribution.**

• **Provide sufficient plant nutrients** like nitrogen, phosphorus, and potassium. Soil conditioners and slow-release fertilizers may include humate conditioner and biosol (fertilizer). Any mixture must be thoroughly mixed into the soil.

**Blowing Landscape Materials**
Blower trucks can shoot landscape materials including mulch, compost, topsoil, and other landscape materials quickly and easily. The operator can walk the site (300’ - 500’ of hose), blowing the material on exposed slopes and under and around plants. The machines can move up to fifteen yards per hour. Getting topsoil and amendments onto exposed slopes can speed up the planting schedule, thus establishing cover sooner.

**Rolled Erosion Control Products (RECP)**
*A rolled erosion control product* is a product made up of either natural or synthetic material designed to be rolled onto an exposed area and stapled in place to protect it from erosion and to facilitate seed growth. These products provide a good method to protect steeper slopes, drainage ways like roadside ditches, and stream banks.

*Erosion Control Blankets:* made from natural organic materials, like mulch or excelsior (shredded aspen), and manufactured into a blanket. The blanket is formed into a roll for ease of handling and shipping and later placement. These
blankets have netting stitched into the material for additional support. The netting may be a natural product or a geosynthetic mesh.

**Turf Reinforcement Mats (TRM):** a permanent, nondegradable rolled erosion control product made from stabilized (UV) synthetic materials formed into a reinforcement matrix. These products are three-dimensional meaning they have thickness. TRM's offer an alternative to hard armor materials like rip rap. Composite Turf Reinforcement Mats (C-TRM) are made of the same basic synthetic materials as TRM’s, but they incorporate a natural product like coconut fiber. Between the net structure and the natural fiber matrix, a product that can be rolled into place is produced. Successful installations of C-TRM provide extensive interaction between the vegetative root structure of planted grasses and the three-dimensional netting structure.

**Installation Guidelines for Rolled Erosion Control Products (RECP)**

These products are only as good as their installation. All are designed to be rolled onto the area and stapled in place. Additional supporting construction practices may be required (e.g. check slots for blankets). Proper installation of all RECP includes:

- Soil prepared and planted
- Proper placement (orientation)
- Trenching and anchoring of product
- Contact with the ground (avoid “tenting”)
- Stapling pattern and number of staples
- Proper overlapping of rolls

1. Start at the top of the slope by excavating a 6” by 6” trench called an anchor slot. Allow enough of the roll for placement in the anchor slot with 12” to 24” on top.
2. Place the blanket into the trench and anchor with a row of staples in the bottom.
3. Backfill and compact the trench. Seed disturbed area as necessary.
4. Fold the remaining portion of the blanket or mat back over the compacted trench and staple or stake (12” intervals or as necessary).
5. Roll the blanket or mat over the surface of the ground. Blankets will unroll with the proper side down.
6. Overlap: when connecting two consecutive rolls, overlap shingle style – end over end.
Mulching
Mulching with certified weed-free straw or hay is a temporary BMP. However, seeding before applying mulch to establish permanent vegetative cover is of course a permanent BMP. The maximum time limit for exposure after the application of mulch (mulch only) is 12 months. Therefore, if an area to be mulched will be left for more than a year, it should also be seeded.

Installation Requirements for Mulching
Considerations:
- Availability of straw or hay (certified weed- and seed- free)
- Types of slopes to be mulched
- Time schedule
- Equipment availability
- Time area(s) planned to be idle
- Apply if area is to be left exposed for 30 days or more

The long-stemmed straw or hay mulch (hay preferred) should be applied evenly at a rate of 2 tons per acre. At least 50% by weight of the mulch should be ten inches in length or longer to provide good cover and facilitate securing. The method of application depends on the slopes to be mulched. For example, using a mechanical crimper is limited to slopes flatter than 3:1. Hydraulic mulching may be necessary for steeper slopes, difficult installations, and areas with limited access. Hydraulic mulching is applied by mixing wood cellulose fibers mixed with water and a tackifying agent (2,000 pounds per acre) and sprayed onto the slopes.

The best way to secure mulch is anchoring by crimping. Crimping is a mechanical method of anchoring mulch using a weighted roller. The crimping device is drawn behind a tractor over the surface immediately after applying the mulch. The crimper wheels or mulch disc resemble a sheep’s foot and “punches” the mulch into the ground.
A portion of the crimped straw stands upright among the horizontal fibers, creating windrows and preventing migration in high winds.

**Mulch blowing** (power mulching) equipment is usually towed behind large flatbed trucks that carry the mulch bales. Crews remove the baling wires and feed them into the machine, which cuts them into smaller pieces. If planning to use crimping as the anchoring method, mulch blowing may not be the most effective means to apply the mulch, as it tends to chop up the fibers into shorter lengths.

**Bonded Fiber Matrix**
Like other forms of cover, **bonded fiber matrix** (also called hydro-matting) is designed to:
- Reduce the amount of runoff by facilitating infiltration.
Section 3 – Controlling Construction Site Erosion and Sedimentation

- Protect the slopes from erosion by providing a protective layer over the soil.
- Promote seed germination and growth by providing a protective layer.

Bonded fiber matrix (BFM) is a product that is applied hydraulically (liquid slurry) using standard hydraulic seeding equipment. Once dry, the material forms a porous protective cover that adheres to the surface. The matrix of biodegradable fibers is held together by organic tackifiers and other bonding agents that are insoluble in water. BFM can also be mixed with the other ingredients (seed, fertilizer) for hydroseeding, providing the convenience of a one-step application. However, it is important to remember that mixing seed with anything that could result in the seed being “bound up” in a topical layer can hurt germination rates.

Possible applications for BFM:
- Steeper slopes with uneven surfaces
- Slopes with obstacles, like rock formations
- Slopes with stands of existing vegetation
- Slopes exposed to harsh conditions

Installation Requirements

- Mix according to manufacturer’s recommendations.
- Apply at a rate of 3,000 to 4,000 pounds per acre or as directed by the manufacturer.
- Spray apply the BFM in layers until soil is evenly covered.
- Don’t apply if precipitation is anticipated. Plan so the BFM has an opportunity to dry.
- Apply so there are no gaps between the product and the soil to prevent tenting and possible erosion under the material.

Applied Bonded Fiber Matrix (still wet)
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LIST OF CONTACTS

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Colorado State University Cooperative Service - 303-776-4865

Native Plant Revegetation Guide for Colorado
-http://parks.state.co.us/cnap/Revegetation_Guide/Reveg_index.html

Water Quality Permitting for the Construction Industry

Colorado Department of Public Health and Environment (CDPHE)

Water Quality Control Division

Discharge permits related to the construction industry

Colorado Water Quality Control Division..........................(303) 692-3500
Stormwater Program..............................................................(303) 692-3517
Stormwater General Permits
Matt Czahor..............................................................(303) 692-3575
Nathan Moore..............................................................(303) 692-3555

http://www.cdphe.state.co.us/wq/PermitsUnit/stormwater/construction.html

Construction Dewatering General Permits
Nicole Rolfe..............................................................(303) 692-3500

Minimal Industrial Discharge (MINDI) General Permit
Nicole Rolfe..............................................................(303) 692-3500

Sand and Gravel General Permit........................................(303) 692-3500

Other Colorado State Agencies

Department of Natural Resources
Soil Conservation Board..............................................(303) 866-3311
Colorado State Forest Service...........................................(970) 491-6303
Department of Agriculture............................................(303) 239-4100

Federal Agency Contacts

Region VIII Environmental Protection Agency (EPA), Stormwater Program
Greg Davis..............................................................(303) 312-6082
Lee Hanley..............................................................(303) 312-6555
www.epa.gov

Army Corps of Engineers 404 Permitting............................(303) 979-4120
Natural Resources Conservation Service
Colorado State Office.............................(720) 544-2810
FAX (720) 544-2962

Associations
Colorado Weed Management Association - www.cwma.org

International Erosion Control Association (IECA)...........(970) 879-3010
FAX (970) 879-8563

IECA Mountain States Chapter
http://msc-ieca.org/

Colorado Chapter, Soil and Water Conservation Society
President, Wendell Hassell......................................(303) 422-2440
Sample Examination Test
1. Best Management Practices (BMP’s) used to control erosion and sedimentation include which of the following:

   a) Scheduling of activities
   b) Preserving natural vegetation
   c) Installation of clean water diversions
   d) All of the above

2. Stormwater runoff is water generated by which of the following:

   a) Washing out a concrete truck
   b) Rain water & snow melt
   c) Dewatering an excavation
   d) Washing mud from vehicles prior to leaving the site

3. Collecting sediment from runoff is the best way to prevent water pollution caused by sediment.

   True     False

4. The goal of the stormwater regulations is to improve water quality by reducing the amount of pollutants that wash into waterways.

   True     False

5. Which of the following are keys to establishing vegetative cover on disturbed areas:

   a) Proper seedbed preparation
   b) Seed selection and method of application
   c) Time of year planting is done
   d) All of the above
6. The Stormwater Management Plan (SWMP) contains the best management practices to:
   a) Control erosion and sedimentation
   b) Control suspended solids in construction dewatering
   c) Protect species habitat
   d) None of the above

7. Proper installation of blankets includes:
   a) Digging anchor and check slots
   b) Overlapping the edges
   c) Stapling or pinning
   d) All of the above

8. A ______________ may be used to prevent water from impacting a slope by conveying runoff from the top to the bottom of the slope.
   a) Dozer track
   b) Rundown
   c) Geotextile
   d) Slope drain

9. For silt fence installations to be effective, they must:
   a) Be placed on the toe of the slope
   b) Block water flow completely
   c) Be placed up and down the slope
   d) None of the above

10. Effective best management practices (BMP’s) for erosion control include:
    a) Removing sediment from runoff in a sediment pond.
    b) Working disturbed areas to completion and final stabilization
    c) Phasing construction to minimize disturbance
    d) b & c only
State of Colorado
Construction Guidance Document:
Preparing Stormwater Management Plans

Updated 7/2007
APPENDIX A

SWMP GUIDANCE

PREPARING A STORMWATER MANAGEMENT PLAN (SWMP)
Stormwater Construction General Permit

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A. INTRODUCTION

This guidance document is designed to help you develop a Stormwater Management Plan (SWMP) for your construction project, as required for compliance with the CDPS general permit for Stormwater Discharges Associated with Construction Activities (the Stormwater Construction Permit). It explains what each of the SWMP requirements means, and gives some options for you to consider in developing Best Management Practices (BMPs) that are best suited to your site during construction.

This guidance document primarily addresses the SWMP requirements in the Stormwater Construction Permit. Other requirements and limitations, such as records retention, reporting, inspections, etc., are detailed in the Stormwater Construction Permit itself. Also note that the SWMP and the Stormwater Construction Permit only cover discharges of stormwater.

Stormwater Management Plan (SWMP) Goal: To identify possible pollutant sources that may contribute pollutants to stormwater, and identify Best Management Practices (BMPs) that, when implemented, will reduce or eliminate any possible water quality impacts. The SWMP must be completed and implemented at the time the project breaks ground, and revised as construction proceeds, to accurately reflect the conditions and practices at the site.

Construction activities use and produce many different kinds of pollutants which may impact water quality. The main pollutant of concern at construction sites is sediment. Grading activities remove grass, rocks, pavement and other protective ground covers, resulting in the exposure of underlying soil to the elements. The soil is then easily picked up by wind and/or washed away by rain or snowmelt. For example, sediment runoff rates from construction sites are typically 10 to 20 times greater than those from agricultural lands, and 1,000 to 2,000 times greater than those of forest lands. During a short period of time, construction activity can contribute more sediment to streams than would normally be deposited over several decades, causing physical and biological harm to our State’s waters. The added sediment chokes the river channel and covers the areas where fish spawn and plants grow. Excess sediment can cause a number of other problems for waterbodies, such as increased difficulty in filtering drinking water, and clogging the waters which can kill plants growing in the river and suffocate fish. A number of pollutants, such as nutrients, are absorbed onto sediment particles and also are a source of pollution associated with sediment discharged from construction sites.

In addition, construction activities often require the use of toxic or hazardous materials such as petroleum products, fertilizers, pesticides and herbicides, and building materials such as asphalt, sealants and concrete, which may pollute stormwater. These materials can be harmful to humans, plants and aquatic life.

B. GENERAL GUIDANCE

BMPs: Best Management Practices (BMPs) encompass a wide range of erosion and sediment control practices, both structural and non-structural in nature, that are intended to reduce or eliminate any possible water quality impacts from stormwater leaving a construction site. The individual BMPs appropriate for a particular construction site are largely dependant of the types of potential pollutant sources present, the nature of the construction activity, and specific-site conditions.


**Nonstructural BMPs**, such as preserving natural vegetation, preventive maintenance and spill response procedures, schedules of activities, prohibition of specific practices, education, and other management practices are mainly operational or managerial techniques.

**Structural BMPs** include treatment processes and practices ranging from diversion structures and silt fences, to retention ponds and inlet protection.

Most of the BMPs referenced here are widely used in the construction industry. They generally involve a simple and low cost approach, and can be very effective when properly installed and maintained.

The Stormwater Construction Permit requires the use of a self-designed SWMP. This plan is based on the use of BMPs. For construction sites, there are several types of BMPs: those that prevent erosion, those that prevent construction materials from introducing pollutants to stormwater, and those that remove sediment and other pollutants before they can be discharged (see box, to right).

**Implementation:** The SWMP focus is primarily on controls used **during** ground surface disturbing activities. This focus means that many sediment control BMPs, such as silt fence and inlet protection, must be installed **before** disturbing activities begins, **not after**.

**Common Sense Approach:** Your SWMP is intended to be a usable document, not a paper exercise. Therefore, do not include practices that may sound good, but are unreasonable or not feasible for your site. Failure to implement your SWMP, even if the BMPs listed do not make sense, puts you in automatic violation of the Stormwater Construction Permit. For example, a blanket statement that runoff from all disturbed areas will be controlled by silt fences, even if the slope or channels are too steep/narrow for this particular BMP, would be unreasonable.

On the other hand, if a particular BMP is listed in the SWMP, but then later turns out to be impractical or ineffective, the SWMP must be amended to reflect the changes/improvements made.

**SWMP Items, Format:** When preparing your plan, **make sure to address each item included in this guidance.** If it is not applicable to your site, briefly explain why. A simple "Not Applicable" is not enough. **Failure to address each item is a violation of the Stormwater Construction Permit.**

In addition, your SWMP should follow the same format as the SWMP requirements listed in Section C, below. That is, even if you are using an existing document (such as plans and specs) that addresses the required SWMP items, you should include a cross-reference for each of the SWMP items that indicates where it can be found in your existing document. You must be able to provide all required components of the SWMP to a State, EPA, or local agency inspector at your site, so the location and format of the information must be clear to the site personnel in charge of SWMP implementation.

**Existing Controls:** Note that the SWMP should include any existing stormwater controls at your site, not just new or proposed ones. It can also include any erosion, sediment or drainage controls which are required by other regulations, such as local erosion and sediment control ordinances, if you are also using them to meet the SWMP requirements.

**Control Implemented by Other Parties:** A permittee will often have to rely on controls implemented by other parties to ensure adequate management of stormwater runoff. For example, if a permit certification is obtained to cover a lot in a larger development, the permittee may need to rely on BMPs implemented by an entity in charge of the larger development, such as street sweeping, inlet protection, or a water quality detention pond that treats runoff from several different lots. In such situations, the BMPs implemented by the other party must be fully addressed by the permittee's
SWMP, and written agreements must exist between the permittee and the party implementing the BMP(s) to ensure adequate operation and maintenance of those BMPs. Additional guidance is available in the Stormwater Fact Sheet for Construction, available from the Division’s web site at www.cdphe.state.co.us/wq/PermitsUnit.

**SWMP Availability:** A copy of the SWMP must be kept on site, readily available to the operator, and to Division or EPA personnel for review during inspections. City, county, and local agencies may also request the SWMP as part of a local oversight program. If an office location is not available at the site, the SWMP must be managed so that it is available at the site when construction activities are occurring (e.g., by keeping the SWMP in a superintendent’s vehicle.)

C. **STORMWATER MANAGEMENT PLAN REQUIREMENTS**

In this section, the text in *italics*, and marked with the **Permit** banner, is quoted directly from the Stormwater Construction Permit. The text in standard typeface is provided as guidance in the preparation of your SWMP. The references (Part I.C, for example) correspond to the location of the item in the Stormwater Construction Permit, unless it specifically references a section in this document.

C.1 **SWMP GENERAL REQUIREMENTS**

*Part I.B Stormwater Management Plan (SWMP) - General Requirements*

1. **A SWMP shall be developed for each facility covered by this permit.** The SWMP shall be prepared in accordance with good engineering, hydrologic and pollution control practices. *(The SWMP need not be prepared by a registered engineer.)*

2. **The SWMP shall:**
   a) **Identify all potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges associated with construction activity from the facility;**
   b) **Describe the practices to be used to reduce the pollutants in stormwater discharges associated with construction activity at the facility; and ensure the practices are selected and described in accordance with good engineering practices, including the installation, implementation and maintenance requirements; and**
   c) **Be properly prepared, and updated in accordance with Part I.D.5.c, to ensure compliance with the terms and conditions of this permit.**

3. **Facilities must implement the provisions of the SWMP as written and updated, from commencement of construction activity until final stabilization is complete, as a condition of this permit.** The Division reserves the right to review the SWMP, and to require the permittee to develop and implement additional measures to prevent and control pollution as needed.

4. **The SWMP may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans under section 311 of the CWA, or Best Management Practices (BMPs) Programs otherwise required by a separate CDPS permit, and may incorporate any part of such plans into the SWMP by reference, provided that the relevant sections of such plans are available as part of the SWMP consistent with Part I.D.5.b.**

   For any sites with permit coverage before June 30, 2007, the permittee’s SWMP must meet the new SWMP requirements as summarized in Section 11.1 of the rationale. Any needed changes must be made by October 1, 2007.

The General Requirements section provides the broad expectations for the preparation, contents and implementation of a SWMP. The specific items that must be included in the SWMP are addressed in the SWMP Contents sections below.
C.2 SWMP CONTENTS – Narrative Site Description

Part I.C.1 Stormwater Management Plan (SWMP) – Contents: Site Description

The SWMP shall include the following items, at a minimum:

Site Description. The SWMP shall clearly describe the construction activity, to include:

a) The nature of the construction activity at the site.
b) The proposed sequence for major activities.
c) Estimates of the total area of the site, and the area and location expected to be disturbed by clearing, excavation, grading, or other construction activities.
d) A summary of any existing data used in the development of the site construction plans or SWMP that describe the soil or existing potential for soil erosion.
e) A description of the existing vegetation at the site and an estimate of the percent vegetative ground cover.
f) The location and description of all potential pollution sources, including ground surface disturbing activities (see Part I.A.2.b), vehicle fueling, storage of fertilizers or chemicals, etc.
g) The location and description of any anticipated allowable sources of non-stormwater discharge at the site, e.g., uncontaminated springs, landscape irrigation return flow, construction dewatering, and concrete washout.
h) The name of the receiving water(s) and the size, type and location of any outfall(s). If the stormwater discharge is to a municipal separate storm sewer system, the name of that system, the location of the storm sewer discharge, and the ultimate receiving water(s).

This part requires a narrative description of the overall scope and physical characteristics of the project, as follows:

a) Include a description of the construction activities at the site (e.g., type of project, a summary of the grading activities, installation of utilities, paving, excavation, landscaping, etc) and the final disposition of the property.
b) Describe the sequence of events involved in the construction project, such as grading, excavation, etc.
c) This information, which is also required in the application, is useful in determining the extent of control measures needed.
d) Data describing soils or erosion potential will typically not be needed. This information only needs to be included if it was used in development of the SWMP, such as for BMP design.
e) It is necessary to include the percentage of existing vegetative ground cover in order to determine, after construction, when the site has been finally stabilized. See Part I.C.4 of the Stormwater Construction Permit (also Section C.5 of this document), for final stabilization criteria. Final stabilization of the site is necessary before coverage under the Stormwater Construction Permit can be terminated.
f) Describe all materials and activities at the site that may have an impact on stormwater. These may include such things as: ground disturbing activities; equipment or vehicle washing; fertilizers, chemicals, or other materials storage; vehicle maintenance or fueling; waste incineration, treatment, storage or disposal; haul roads; off-site vehicle tracking; loading/unloading areas, etc.
g) Will there be any discharge from the project site during construction that is not from stormwater? If so, describe the source and how it will be handled.
h) The receiving water information is also required in the permit application. For example, “runoff from the east side of the site will go to a roadside ditch which discharges to Jimmy Smith Gulch; runoff from the west side of the site will go to an unnamed tributary to Westerly Creek.”
C.3 SWMP CONTENTS – Site Map

Part I.C.2 Stormwater Management Plan (SWMP) – Contents: Site Map

The SWMP shall include a legible site map(s), showing the entire site, identifying:

a) construction site boundaries;
b) all areas of ground surface disturbance;
c) areas of cut and fill;
d) areas used for storage of building materials, equipment, soil, or waste;
e) locations of dedicated asphalt or concrete batch plants;
f) locations of all structural BMPs;
g) locations of non-structural BMPs as applicable; and
h) locations of springs, streams, wetlands and other surface waters.

A site map must be developed for each construction project. The site map must show those items listed above. It does not need to be drawn to scale, but it should be legible and easy to read. Maps that are part of the construction plans, such as a grading plan, are a good base for developing the site map, if they are amended to include all required information as discussed below. Local municipalities may also have maps suitable as bases to begin mapping procedures. If no other suitable base maps are available, one must be developed. Regardless of the source of the base map, the site map needs to be of suitable scale to show the construction portion of the site and the features within it.

Using Construction Plans, Plans Developed to Meet Local Stormwater Requirements, or Other Plans:

In many cases, some of the information required for the SWMP will also be included in items such as construction plans, documents developed for a local stormwater program, material management plans, etc. These materials may be used to meet the SWMP requirements, if they are amended and/or supplemented to include all required information. If the SWMP will be incorporated into the construction plan, all of the required narrative information must also be included in the plans, or developed as a separate document. If a separate document is used for some of the information not in the construction plans, or if the information will be included in several locations, the permittee must still be able to provide all required components of the SWMP to a State or EPA inspector. If this approach is used, it is highly recommended that an index be provided that references the location(s) of all information required for the SWMP.

In addition to the items specifically mentioned in the permit, above, it is useful to also indicate on the map the following:

- **Drainage basins for each outfall** – Field inspection can usually accomplish this task with acceptable accuracy. Look for high areas such as crests of hills, parking lots, roads, etc., which would form the division between drainages. Gullies and swales are indicators of stormwater flow direction. Obviously, if runoff is observed during a storm, most uncertainties can be eliminated. The drainage areas shown should include the portions of the site where the activities described in I.C.1.f of the Stormwater Construction Permit (see the permit language in Section C.2, above) occur, as well as those portions (such as upslope areas) contributing stormwater that mixes with runoff from the construction area.

- **Surface water bodies** – Mark on the site map any surface water bodies, including dry water courses, lakes, streams, springs, wetlands, detention ponds, roadside or irrigation ditches, etc. These do not necessarily need to be within the construction portion of the site, but may be adjacent to it or impacted by stormwater runoff. Also include any existing storm sewers.

- **Existing and planned structural stormwater pollution control measures** – Show on the map the location of any structural stormwater pollution control measures, such as detention ponds, diversion ditches, covered material storage areas, fuel farm secondary containment structures, etc. Refer to the guidance on how to “Document Selected BMPs in the SWMP” in Section C.4, below.

- **Areas where construction activities take place** – for those construction activities identified in Part I.C.1.a of the Stormwater Construction Permit (see the permit language in Section C.2, above).
In addition, other features could be included to make the SWMP a more comprehensive and usable plan. For example, a later section of the SWMP includes requirements for material handling and spill prevention procedures, which could include a site map showing where materials are stored. By including materials handling, loading and storage areas on the site map, all information would be in one place on a single base map. Also, including such items as site entrance(s), vehicle parking areas and direction of stormwater flow on the site map adds to its overall utility.

Refer to Section D of this guidance for sources of sample maps, such as the Douglas County Grading, Erosion, and Sediment Control (GESC) Manual and the Construction Industry Compliance Assistance Center.

C.4 SWMP CONTENTS – Stormwater Management Controls

Part I.C.3 Stormwater Management Plan (SWMP) – Contents: Stormwater Management Controls

The SWMP must include a description of all stormwater management controls that will be implemented as part of the construction activity to control pollutants in stormwater discharges. The appropriateness and priorities of stormwater management controls in the SWMP shall reflect the potential pollutant sources identified at the facility.

The description of stormwater management controls shall address the following components, at a minimum:

- Part I.C.3 Stormwater Management Plan (SWMP) – Contents: SWMP Administrator

  a. SWMP Administrator: The SWMP Administrator can be an individual(s), position or title – this entity is responsible for developing, implementing, maintaining, and revising the SWMP. Remember that the SWMP Administrator is the contact for all SWMP-related issues and is the person responsible for its accuracy, completeness, and implementation. Therefore, the SWMP Administrator should be a person with authority to adequately manage and direct day-to-day stormwater quality management activities at the site.
Part I.C.3 Stormwater Management Plan (SWMP) – Contents: Identification of Potential Pollutant Sources

b) Identification of Potential Pollutant Sources - All potential pollutant sources, including materials and activities, at a site must be evaluated for the potential to contribute pollutants to stormwater discharges. The SWMP shall identify and describe those sources determined to have the potential to contribute pollutants to stormwater discharges, and the sources must be controlled through BMP selection and implementation, as required in paragraph (e), below.

At a minimum, each of the following sources and activities shall be evaluated for the potential to contribute pollutants to stormwater discharges, and identified in the SWMP if found to have such potential:

1) all disturbed and stored soils;
2) vehicle tracking of sediments;
3) management of contaminated soils;
4) loading and unloading operations;
5) outdoor storage activities (building materials, fertilizers, chemicals, etc.);
6) vehicle and equipment maintenance and fueling;
7) significant dust or particulate generating processes;
8) routine maintenance activities involving fertilizers, pesticides, detergents, fuels, solvents, oils, etc.;
9) on-site waste management practices (waste piles, liquid wastes, dumpsters, etc.);
10) concrete truck/equipment washing, including the concrete truck chute and associated fixtures and equipment;
11) dedicated asphalt and concrete batch plants;
12) non-industrial waste sources such as worker trash and portable toilets; and
13) other areas or procedures where potential spills can occur.

b. Identification of Potential Pollutant Sources: The first thing to do is evaluate all pollutant sources and activities at the site for the potential to contribute pollutants to stormwater discharges. Part I.C.3.b of the Stormwater Construction Permit (see permit language above) lists 13 pollutant sources that must be evaluated for the reasonable potential to contribute pollutants to runoff. During the evaluation, consider the following types of conditions that might affect the potential for a pollutant source to contribute pollutants to stormwater:

- the frequency of the activity (i.e., does it occur every day, or just once a month; can it be scheduled to occur only during dry weather?);
- characteristics of the area where the activity takes place, e.g., area, surface type (pavement, gravel, vegetation, etc.), and physical characteristics such as site gradients and slope lengths;
- ability of primary and secondary containment (fuel tanks, drum storage, etc.) at product storage and loading/unloading facilities to prevent and contain spills and leaks;
- proximity of product storage and loading/unloading facilities to waterways or drainage facilities;
- concentration and toxicity of materials which may be found in the site's stormwater runoff;
- contamination of storage facilities/containment with stored materials (e.g., used oil drums or tanks coated with spilled oil)

Each pollutant source recognized through this process as having the potential to contribute pollutants to stormwater, must be identified in the SWMP along with the specific stormwater management control (BMPs) that will be implemented to adequately control the source. Note: the actual evaluation of the potential pollutant sources does NOT need to be included in the SWMP – just the resultant pollutant sources and their associated BMPs.
Part 1C.3. Stormwater Management Plan (SWMP) –

c) Best Management Practices (BMPs) for Stormwater Pollution Prevention - The SWMP shall identify and describe appropriate BMPs, including, but not limited to, those required by paragraphs 1 through 8 below, that will be implemented at the facility to reduce the potential of the sources identified in Part 1C.3.b to contribute pollutants to stormwater discharges. The SWMP shall clearly describe the installation and implementation specifications for each BMP identified in the SWMP to ensure proper implementation, operation and maintenance of the BMP.

1) Structural Practices for Erosion and Sediment Control. The SWMP shall clearly describe and locate all structural practices implemented at the site to minimize erosion and sediment transport. Practices may include, but are not limited to: straw bales, wattles/sediment control logs, silt fences, earth dikes, drainage swales, sediment traps, subsurface drains, pipe slope drains, inlet protection, outlet protection, gabions, and temporary or permanent sediment basins.

2) Non-Structural Practices for Erosion and Sediment Control. The SWMP shall clearly describe and locate, as applicable, all non-structural practices implemented at the site to minimize erosion and sediment transport. Description must include interim and permanent stabilization practices, and site-specific scheduling for implementation of the practices. The SWMP should include practices to ensure that existing vegetation is preserved where possible. Non-structural practices may include, but are not limited to: temporary vegetation, permanent vegetation, mulching, geotextiles, sod stabilization, slope roughening, vegetative buffer strips, protection of trees, and preservation of mature vegetation.

3) Phased BMP Implementation. The SWMP shall clearly describe the relationship between the phases of construction, and the implementation and maintenance of both structural and non-structural stormwater management controls. The SWMP must identify the stormwater management controls to be implemented during the project phases, which can include, but are not limited to, clearing and grubbing; road construction; utility and infrastructure installation; vertical construction; final grading; and final stabilization.

4) Materials Handling and Spill Prevention. The SWMP shall clearly describe and locate all practices implemented at the site to minimize impacts from procedures or significant materials (see definitions at Part I.E) that could contribute pollutants to runoff. Such procedures or significant materials could include: exposed storage of building materials; paints and solvents; fertilizers or chemicals; waste material; and equipment maintenance or fueling procedures. Areas or procedures where potential spills can occur must have spill prevention and response procedures identified in the SWMP.

5) Dedicated Concrete or Asphalt Batch Plants. The SWMP shall clearly describe and locate all practices implemented at the site to control stormwater pollution from dedicated concrete batch plants or dedicated asphalt batch plants covered by this certification.

6) Vehicle Tracking Control. The SWMP shall clearly describe and locate all practices implemented at the site to control potential sediment discharges from vehicle tracking. Practices must be implemented for all areas of potential vehicle tracking, and can include: minimizing site access; street sweeping or scraping; tracking pads; gravelized parking areas; requiring that vehicles stay on paved areas on-site; wash racks; contractor education; and/or sediment control BMPs, etc.
Part IC.3 Stormwater Management Plan (SWMP) –

7) Waste Management and Disposal, Including Concrete Washout.
   i) The SWMP shall clearly describe and locate the practices implemented at the site to control stormwater pollution from all construction site wastes (liquid and solid) including concrete washout activities.
   ii) The practices used for concrete washout must ensure that these activities do not result in the contribution of pollutants associated with the washing activity to stormwater runoff.
   iii) Part I.D.3.e of the permit authorizes the conditional discharge of concrete washout water to the ground. The SWMP shall clearly describe and locate the practices to be used that will ensure that no washout water from concrete washout activities is discharged from the site as surface runoff or to surface waters.

8) Groundwater and Stormwater Dewatering:
   i) The SWMP shall clearly describe and locate the practices implemented at the site to control stormwater pollution from the dewatering of groundwater or stormwater from excavations, wells, etc.
   ii) Part I.D.3.d of the permit authorizes the conditional discharge of construction dewatering to the ground. For any construction dewatering of groundwater not authorized under a separate CDPS discharge permit, the SWMP shall clearly describe and locate the practices to be used that will ensure that no groundwater from construction dewatering is discharged from the site as surface runoff or to surface waters.

c. Best Management Practices (BMPs) for Stormwater Pollution Prevention

i) Selecting and locating appropriate BMPs: When selecting BMPs, consider first those that limit the source of the pollutant. It is much more efficient, from both a cost and environmental standpoint, to prevent the pollution in the first place than to clean up polluted stormwater. For example, mulching disturbed ground to reduce erosion, in most cases, is easier and more effective than trying to capture and treat sediment-laden runoff before it reaches State waters.

ii) Specific BMPs for Material Handling and Spill Prevention: Where materials can impact stormwater runoff, existing and planned practices that reduce the potential for pollution must be described. For example, materials should be stored and handled in covered areas to prevent contact with stormwater, and chemicals should be stored within berms or other secondary containment devices to prevent leaks and spills from contacting stormwater runoff. In general, spill prevention and response procedures should include the following:
   • notification procedures to be used in the event of an accident. At the very least, the SWMP Administrator should be notified. Depending on the nature of the spill and the material involved, the Colorado Department of Public Health and Environment (24-hour spill reporting line – 877-518-5608), downstream water users, or other agencies may also need to be notified;
   • instructions for clean-up procedures, and identification of spill kit location(s);
   • provisions for absorbents to be made available for use in fuel areas, and for containers to be available for used absorbents; and
   • procedures for properly washing out concrete truck chutes and other equipment in a manner and location so that the materials and wash water can not discharge from the site, and never into a storm drain system or stream.

Once source reduction BMPs have been evaluated, more costly options, such as mitigation of impacts or stormwater treatment through detention storage, must be considered as necessary. The selection of BMPs is subject to the judgment of the individual permittee, based on the conditions at the site. It is important to keep in
mind that BMPs included in the SWMP and implemented at the site must be adequately designed to provide control for all potential pollutant sources associated with construction activity to prevent pollution or degradation of State waters. Therefore, in order to comply with your permit terms and conditions, appropriate practices must be implemented in keeping with the pollutant(s) involved and the risk potential at the facility. Redundant BMP use is highly recommended to eliminate reliance on any one (or two) BMPs, and is often necessary to provide an adequate treatment train to remove pollutants in runoff.

In addition, the BMPs selected for use must be appropriately designed and implemented, following good engineering practices. It is best to base BMP design and implementation on professionally accepted references. Many well-accepted references are available that include guidance on proper BMP selection, design, and implementation. Some counties, cities, and local agencies have adopted criteria manuals for stormwater BMPs. Section D.1 of this guidance contains a discussion of additional resources for more in-depth information on stormwater quality BMPs.

### BMP location
A permittee must ensure that BMPs implemented to control stormwater pollution are located prior to the stormwater discharge to a receiving water or a stormwater collection system. To meet this condition, BMPs may be implemented at any location that allows for adequate treatment of stormwater pollutants, as long as all of the following criteria are met:

- All BMPs are located:
  - prior to the stormwater leaving the control of the permittee, i.e., where the permittee is capable of ensuring the BMPs’ proper operation and maintenance (see below section on Ensuring BMPs);
  - prior to discharge to a receiving water defined as Waters of the United States (see below section on Protecting Waters of the US); and
  - prior to discharge into a municipal storm sewer or other stormwater collection system not owned by the permittee (unless specific permission is granted).
- BMPs are implemented to control all pollutant sources covered by the permit certification (i.e., unmanaged pollutant sources are not located down slope from the last BMP at a site).
- BMPs are implemented in accordance with the site’s SWMP.

Although it is acceptable, and often advisable when used in conjunction with redundant BMPs, to locate structural BMPs in areas of concentrated flow (e.g., check dams along drainage ditches, detention ponds, etc.), remember that removing sediment from stormwater is often not as efficient a practice as preventing erosion in the first place, and that once erosion starts, additional sediment control BMPs will almost always be necessary to prevent the discharge of sediment from the site. The most efficient construction site BMPs are those that prevent erosion from occurring.

### Ensuring BMPs are under the Control of the Permittee
If a permittee will rely on contracts or agreements with other entities to manage BMPs (e.g., when BMPs will be located off of the permittee’s property and implemented by a second party, such as a site developer), the guidance found in Part G.2.b of the Stormwater Fact Sheet—Construction (available from the Division’s web site at [www.cdpe.state.co.us/wq/PermitsUnit](http://www.cdpe.state.co.us/wq/PermitsUnit)) must be followed to ensure the BMPs are properly addressed in the SWMP and implemented in the field. A permittee may not rely on a BMP owned or operated by a second party if the permittee does not have permission to use the BMP, and/or if they do not have any agreements in place to ensure its adequate operation and maintenance in accordance with the permittee’s SWMP.

### Protecting Waters of the United States
BMPs must not be located within waterways, including wetlands, that are defined as Waters of the United States, unless specifically authorized by and in compliance with a separate 404 permit (also referred to as Dredge and Fill permits) from the U.S. Army Corps of Engineers. Even when BMPs may be authorized in natural waterways, such BMPs are only intended to control pollutants originating from activities within the waterway, and additional BMPs are still necessary to prevent sediment from the remainder of the site from entering that waterway. Note that even if a drainage has been modified by a private or municipal entity, it still may be considered Waters of the
iii) Documenting Selected BMPs in the SWMP (including phasing of BMP implementation): The SWMP must describe the specific stormwater management controls (BMPs) that will be implemented at the site to adequately control each identified pollutant source (see Section C.4.b, above). Estimated dates for BMP implementation and maintenance are required, and any existing controls must also be discussed. The plan shall identify both structural and non-structural control measures that are necessary for erosion and sediment control at the site. Thoroughly describe how the BMP used at the site will change with the different stages of construction activity at the site, and make sure that BMPs implemented for dedicated concrete or asphalt batch plants, if applicable, and vehicle tracking controls, are clearly documented.

BMP description: Level of detail
BMP descriptions provided in the SWMP must contain adequate detail to ensure proper implementation at the site. The following information must be addressed in the SWMP:

- What BMPs will be implemented?
- When will the BMPs be implemented? Many BMPs will only be implemented during specific phases of the project. For example, site fence and detention ponds may be installed prior to grading, while inlet protection for a newly constructed stormwater collection system will need to be installed upon completion of the inlets.
- Where will the BMPs be implemented? The SWMP must clearly indicate the locations where BMPs will be implemented. For structural BMPs, this will usually require including the locations on the site map discussed in Section C.3 above.
- How will the BMPs be implemented? The installation and implementation specifications included in the SWMP must be sufficient to ensure proper implementation, including procedures for operation and maintenance of the BMP. For example, if a site fence will be used at a site, in addition to the timing and location of installation, the SWMP must provide information such as trenching depth, stake spacing, materials, etc. BMP installation and implementation criteria must follow good engineering practices. Although it is not necessary to include design calculations in the SWMP, such as those used to determine pond capacity or slope limitations for site fence, this information may be useful to include in the SWMP and site BMPs if necessary, as discussed below.

iv) Non-Stormwater Discharges: Except for emergency fire fighting activities, landscape irrigation return flow, uncontaminated springs, construction dewatering and concrete washout water, the Stormwater Construction Permit only covers discharges composed entirely of stormwater.

**Concrete Washout water** can NOT be discharged to surface waters or to storm sewer systems without separate permit coverage. The discharge of Concrete Washout water to the ground, under specific conditions, may be allowed by the Stormwater Construction Permit when appropriate BMPs are implemented. Additional information on this subject is available in the Stormwater Fact Sheet - Construction, available from the Division's web site at www.cdphe.state.co.us/wq/PermitsUnit.

**Construction Dewatering water** can NOT be discharged to surface waters or to storm sewer systems without separate permit coverage. The discharge of Construction Dewatering water to the ground, under specific conditions, may be allowed by the Stormwater Construction Permit when appropriate BMPs are implemented. Additional information on this subject is available in the Stormwater Fact Sheet - Construction, available from the Division's web site at www.cdphe.state.co.us/wq/PermitsUnit.
Aside from the exceptions noted above, non-stormwater discharges must be addressed in a separate permit issued for that discharge. Contact the Division or visit our web page at [www.cdpe.state.co.us/wq/PermitsUnit](http://www.cdpe.state.co.us/wq/PermitsUnit) for guidance and applications.

v) **Stormwater Dewatering:** The discharge of pumped stormwater, only, from excavations, ponds, depressions, etc., to surface waters, or to a municipal separate storm-sewer system (MS4) is allowed by the Stormwater Construction Permit, as long as the dewatering activity and associated BMPs are identified in the SWMP (including location of the activity), and BMPs are implemented in accordance with the SWMP.

Note: Pumping stormwater does not by itself render the pumped water a process water, provided that the pump does not contribute additional pollutants to the discharge. If, however, a sheen is visible on the water leaving the pump, a separate discharge permit is required.

d. **Revising BMPs and the SWMP:** At nearly every site, the implemented BMPs will have to be modified to adapt to changing site conditions, or to ensure that potential pollutants are consistently and properly managed. The pollutant sources and management practices at a site must be reviewed on an ongoing basis (and specifically during the required inspections listed in Part I.D.6 of the Stormwater Construction Permit and discussed below). When BMPs or other site conditions change, the SWMP must be modified to accurately reflect the actual field conditions. Examples include, but are not limited to, removal of BMPs, identification of new potential pollutant sources, addition of BMPs, modification of BMP installation and implementation criteria or maintenance procedures, and changes in items included in the site map and/or description. SWMP revisions must be made prior to changes in site conditions, except for Responsive SWMP Changes, as follows:

- SWMP revisions must be made immediately after changes are made in the field to address BMP installation and/or implementation issues; or
- SWMP revisions must be made as soon as practicable, but in no case more than 72 hours, after change(s) in BMP installation and/or implementation occur at the site that require development of materials to modify the SWMP (e.g., design of retention pond capacity)

The SWMP should be viewed as a “living document” that is continuously being reviewed and modified as part of the overall process of assessing and managing stormwater quality issues at the site. The following illustration summarizes the process of evaluating, selecting, documenting, implementing, and revising BMPs.
C.5 SWMP CONTENTS – Final Stabilization and Long-term Stormwater Management

Part LC.4 Stormwater Management Plan (SWMP) – Contents: Final Stabilization and Long-term Stormwater Management

a) The SWMP shall clearly describe the practices used to achieve final stabilization of all disturbed areas at the site, and any planned practices to control pollutants in stormwater discharges that will occur after construction operations have been completed at the site.

b) Final stabilization practices for obtaining a vegetative cover should include, as appropriate: seed mix selection and application methods; soil preparation and amendments; soil stabilization practices (e.g., crimped straw, hydro mulch or rolled erosion control products); and appropriate sediment control BMPs as needed until final stabilization is achieved; etc.

c) Final stabilization is reached when all ground surface disturbing activities at the site have been completed, and uniform vegetative cover has been established with an individual plant density of at least 70 percent of predisturbance levels, or equivalent permanent, physical erosion reduction methods have been employed.

The Division may, after consultation with the permittee and upon good cause, amend the final stabilization criteria in this section for specific operations.

Typically, the stormwater discharges associated with construction activity are eliminated when the site is finally stabilized. As soon as practicable after construction activities have been completed in a disturbed area, permanent stabilization should be started to prevent further erosion of soil from that area. All disturbed areas (except those portions covered by pavement or a structure) must be finally stabilized once all construction activities are completed in order to inactivate the permit coverage. Sediment that collects within the site’s drainage system and permanent water quality or quantity controls is also considered unstabilized soil, and must be removed prior to the site being considered finally stabilized.

The SWMP must include a description of what measures will be taken to finally stabilize the site. The method of stabilization must be provided for all areas that will remain pervious (i.e., vegetated or landscaped instead of paved, built on, or otherwise structurally stabilized). Questions that may need to be addressed include: What type of cover will be used? What are the specific seed mixtures and application rates? Are additional BMPs needed to prevent erosion as the vegetation becomes established? Will the soil need to be amended? Will special methods be employed on any steep slopes or areas of concentrated flow?

Inactivation of permit coverage

Coverage under the Stormwater Construction Permit may be inactivated by the permittee when the site has attained final stabilization, all temporary erosion and sediment control measures have been removed, and all components of the SWMP are complete.

Any planned stormwater management controls to prevent or control pollution of stormwater after construction is completed must be addressed here. They typically include retention or detention ponds, infiltration measures, vegetative swales, and natural depressions.

New developments, buildings, etc., will often incorporate elements of permanent stormwater quality control into their design. The SWMP must be prepared consistent with these structural and nonstructural controls. Where possible, permanent stormwater quality controls can be constructed at the initial stages of construction, or modified at the end of construction. This can increase the efficiency of the controls by using them during both the building and operational phases of the project. When a permanent structural control is initially used as a construction BMP, the SWMP must contain the necessary information discussed in the guidance for documenting BMPs, Section C.4 above.
Use of Permanent Detention Ponds as BMPs during Construction

Permanent detention ponds are allowed to be used as a temporary construction BMP, if: a) the pond is clearly designated as a construction BMP in the SWMP, b) detention pond inspection and maintenance are described as required in Part I.B.2, Part I.C.3, and Parts I.D.6, 7, and 8 of the Stormwater Construction Permit; and c) the pond is designed and implemented for use as a BMP during construction in accordance with good engineering, hydrologic and pollution control practices. In addition, stormwater discharges from the pond must not cause or threaten to cause pollution or degradation of State waters. When a permanent detention pond is used in this manner, redundant upgradient erosion and sediment control BMPs are still necessary in almost all cases to comply with the permit requirements to select and design BMPs to prevent pollution or degradation of State waters.

The design and implementation of the pond may differ from what will exist upon completion of the project when the BMP becomes a permanent water quality feature. In this case, the description of the BMP included in the SWMP must address these differences. For example, if the outfall will be modified during construction to provide additional filtering or settling of sediment (which may or may not be necessary, depending on the existence of upstream BMPs, sediment loading to the pond, final outlet design, etc.), those modifications must be included in the SWMP. If additional temporary stabilization of the pond (e.g., at points of concentrated flow into or through the pond, unstable slopes, etc.) is needed to prevent erosion and transport of sediment from the pond during construction, this must also be addressed.

Prior to inactivation of the permit, the pond must be stabilized in accordance with the permit requirements and sediment removed from the site's drainage system. Although not related to compliance with the construction stormwater permit, the pond may need to be inspected and modified following construction in order to meet local permanent BMP design criteria.

C.6 SWMP CONTENTS – Inspection and Maintenance Procedures

Part I.C.5, Stormwater Management Plan (SWMP) – Contents: Inspection and Maintenance

Part I.D.6 of the permit includes requirements for site inspections. Part I.D.7 of the permit includes requirements for BMP maintenance. The SWMP shall clearly describe the inspection and maintenance procedures implemented at the site to maintain all erosion and sediment control practices and other protective practices identified in the SWMP, in good and effective operating condition.

a. Inspection Schedules: The minimum inspection schedule described in Part I.C.6.a of the Stormwater Construction Permit requires that a thorough inspection of the stormwater management system be performed and documented at least every 14 days, and within 24 hours of any precipitation or snowmelt event that causes surface erosion (i.e., that results in stormwater running across the ground). If more frequent inspections are required to ensure that BMPs are properly maintained and operated, the inspection schedule must be modified to meet these needs.

Exceptions to the minimum inspection schedule are also provided. Any use of an exception is temporary, and does not eliminate the requirement to perform routine maintenance due to the effects of a storm event or other conditions that may impact BMP performance, including maintaining vehicle tracking controls and removing sediment from impervious areas.

Additionally, this part of the SWMP must also include maintenance procedures for the BMPs, as discussed below. You will need to set up a schedule appropriate to the activity and the BMP. Preventive maintenance should be coupled with periodic inspections.

b. Inspection Procedures: The inspection must include observation of:
- the construction site perimeter and discharge points (including discharges into a storm sewer system);
- all disturbed areas;
- areas used for material/waste storage that are exposed to precipitation;
c. BMP Maintenance/Replacement and Failed BMPs: The Stormwater Construction Permit requires that all erosion and sediment control practices and other protective measures identified in the SWMP be maintained in effective operating condition and in accordance with good engineering, hydrologic and pollution control practices. Therefore, site inspection procedures must address maintenance of BMPs that are found to no longer function as needed and designed, as well as preventive maintenance to proactively ensure continued operation (e.g., removing collected sediment outside the acceptable tolerances of the BMP).

A preventive maintenance program should prevent BMP breakdowns and failures by proactively maintaining or replacing BMPs and equipment. Site inspections should uncover any conditions, such as deteriorating silt fence or water collected in fuel tank secondary containment, which could result in the discharge of pollutants to storm sewers and surface waters. For example, sediment that has been collected by sediment controls, such as silt fence and inlet protection, should be removed on a regular basis, to prevent failure of BMPs, and remove the potential of that sediment from being discharged from the site if the BMP did fail. Removed sediment must be moved to an appropriate location where it will not become an additional pollutant source, and should never be placed in ditches or streams. Maintenance activities to correct problems noted during inspections must be documented as discussed in the Record Keeping section, below.

The inspection process must also include procedures to ensure that, when needed, BMPs are replaced or new BMPs added to adequately manage the pollutant sources at the site. This procedure is part of the ongoing process of revising the BMPs and the SWMP as discussed Section C.4, above, and any changes to BMPs must be recorded in the SWMP. The SWMP must be modified as appropriate as soon as practicable after such inspections.

BMPs that have failed, or have the potential to fail without maintenance or modifications, must be addressed as soon as possible, immediately in most cases, to prevent the discharge of pollutants.

d. Record Keeping and Documenting Inspections: Keeping accurate and complete records serves several functions. First, keeping records of spills, leaks, inspections, etc. is a requirement of the Stormwater Construction Permit; therefore, enforcement action, including fines, could result if records are not adequate. Second, by keeping accurate and detailed records, you will have documentation of events which could prove invaluable should complications arise concerning the permit, lawsuits, etc.

The permittee must document inspection results and maintain a record of the results for a period of 3 years following expiration or inactivation of permit coverage. These records must be made available to the Division or EPA upon request. The following items must be documented as part of the site inspections:

i) The inspection date;
ii) Name(s) and title(s) of personnel making the inspection;
iii) Location(s) of discharges of sediment or other pollutants from the site;
iv) Location(s) of BMPs that need to be maintained;
v) Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
vi) Location(s) where additional BMPs are needed that were not in place at the time of inspection;
vii) Deviations from the minimum inspection schedule as provided in Section C.6.a above;
Controlling Construction Site Erosion and Sedimentation

vi) Description of corrective action for items iii, iv, v, and vi, above, dates corrective action(s) taken, and measures taken to prevent similar occurrences, including changes to the SWMP, as necessary; and

ix) After adequate corrective action(s) has been taken, or where a report does not identify any incidents requiring corrective action, the report shall contain a signed statement indicating the site is in compliance with the permit to the best of the signer’s knowledge and belief.

In addition to inspection records, the permittee may opt to keep a log book for use in tracking other items related to the SWMP such as those listed below. Additional information such as dated photographs, field notebooks, drawings and maps, and the items below, etc. can also be included where appropriate.

- BMP operation and maintenance
- stormwater contamination
- contacts with suppliers
- notes on the need for and performance of preventive maintenance and other repairs
- implementation of specific items in the SWMP
- training events (given or attended)
- events involving materials handling and storage
- contacts with regulatory agencies and personnel
- notes of employee activities, contact, notifications, etc.

Records of spills, leaks, or overflows that result in the discharge of pollutants must be documented and maintained. You may also want to record other spills that are addressed to, even if they do not result in a discharge of pollutants. Information that should be recorded for all occurrences includes the time and date, weather conditions, reasons for the spill, etc. Some spills may need to be reported to the Division immediately. Specifically, a release of any chemical, oil, petroleum product, sewage, etc., which may enter waters of the State of Colorado (which include surface water, ground water, and dry gullies or storm sewers leading to surface water) must be reported. More guidance is available on the web at www.cdphe.state.co.us/hm/spillsandreleases.htm. The Division’s toll-free 24-hour number for environmental hazards and chemical spills and releases is 1-877-518-5608.

D. ADDITIONAL SWMP AND BMP RESOURCES

There are a multitude of resources available to the construction industry to assist in complying with the requirements of the Stormwater Construction Permit. The following suggested list of resources can provide valuable tools to assist you in developing and implementing your SWMP as effectively and efficiently as possible. However, the guidance found in the resources listed below in no way replaces the requirements of the Stormwater Construction Permit, as described in Sections A through C, above. Therefore, when using the following resources, especially in the case of example plans and maps, it is essential that you ensure that all of the requirements included in this guidance document and the Stormwater Construction Permit are being met.

Many of the resources below require access to the internet. If you are unable to obtain any resources you need due to a lack of access to the internet, please contact the Division at (303) 692-3517 and we can try to assist you in obtaining the information you need.

D.1. RESOURCES – BMP Design and Implementation

a. BMP Design Criteria Manuals:

Be sure to check with the local city or county to determine if they require that specific design criteria be met. The following are some highly respected criteria manuals that can be used in designing and implementing BMPs for your site.
Controlling Construction Site Erosion and Sedimentation

- **Urban Drainage and Flood Control District**
  - This criteria manual is commonly used by cities and counties in the Denver metropolitan area. The manual includes discussion of stormwater quality management and BMPs for many activities, including construction.
  - This manual is a highly respected across the country and a great resource for professionally accepted design criteria for construction BMPs.
  - Available free from the “download” section of the Urban Drainage and Flood Control District web page:
    - [http://www.udfccd.org/](http://www.udfccd.org/)

- **Douglas County**
  - The criteria manual for compliance with Douglas County’s GESC permitting program for stormwater quality. Includes an excellent discussion of effective stormwater management strategies, design criteria, and several very useful sample site maps.
  - Available for download free from the Douglas County Public Works web page:
    - [http://www.douglas.co.us/publicworks/engineering/GESC.html](http://www.douglas.co.us/publicworks/engineering/GESC.html)
  - Also available in print or CD-ROM from the Engineering Division office:
    - Douglas County Public Works Department - Engineering Division
    - 100 Third Street
    - Castle Rock, CO 80104
    - Phone: 303-660-7490

b. **General BMP Selection and Design Guidance**

- **Colorado Department of Transportation**
  Erosion Control and Stormwater Quality Guide
  - Guidance on BMP selection and design applicable specifically to highway development projects, but also useful as general guidance.
  - Available online from CDOT’s MS4 Program web page at:
    - [http://www.dot.state.co.us/environmental/envWaterQual/wqms4.asp](http://www.dot.state.co.us/environmental/envWaterQual/wqms4.asp)

- **EPA Menu of BMPs**
  Construction Site Storm Water Runoff Control
  - EPA guidance for cities and counties who are required to develop programs to regulate construction activities in their jurisdiction. The BMP fact sheets provide a good discussion of various structural and nonstructural BMPs.

- **International Stormwater Best Management Practices (BMP) Database**
  - Database of monitoring results showing effectiveness of structural and non-structural BMPs. Currently, the database and web site do not include much analysis of the data; this will be added in the future. Data contributions are being solicited on an ongoing basis.
  - Available online at: [http://www.bmpdatabase.org](http://www.bmpdatabase.org)

c. **Special Applications**

- **Burn Areas:**
Controlling Construction Site Erosion and Sedimentation

Water Quality Control Division – Stormwater Program www.cdphe.state.co.us/wq/permitsunit

- Soil Bioengineering:
  Available online at: http://ftp.colostate.edu/Library/MISC/USDA%200077%201801%20SDTDC.pdf

  Available online at: http://www.ianpubs.unl.edu/epublic/live/g1307/build/g1307.pdf

D.2. RESOURCES – Example Management Plans

- Construction Industry Compliance Assistance Center - Stormwater Pollution Prevention Plans
  A website with examples of actual stormwater plans prepared for a range of construction projects located in various states. “The purpose of presenting these documents is to demonstrate various approaches to SWPPP development. Please note that the examples presented here should not be accepted as templates in the preparation of a SWPPP, since each SWPPP must be designed to handle the specific needs of a particular construction site.” (Note that Colorado’s plan is referred to as ‘SWMP’ instead of ‘SWPPP’. Not all of the example plans will meet the requirements of the Colorado General Permit. Therefore, it is essential that this SWMP/SWPPP guidance document be used to ensure your completed plan contains all of the required elements and is appropriate for your site.
  Available online at: http://www.cicacenter.org/swppp.html

D.3. RESOURCES – Training

- Rocky Mountain Education Center (Located at Red Rocks Community College, Lakewood) - Stormwater Management and Erosion Control Course
  One-day course, with an optional additional half-day in the field, on the principles and practices of erosion and sediment control. Recommended for municipal erosion control inspectors and those practicing erosion control in the field. This course is required for the CDOT certified erosion control supervisor certification. Course is given at Red Rocks Community College in Lakewood. Course CETC #150.

  Stormwater Compliance Inspector Course
  Two-day course (including half-day in the field) on preparing for and conducting a comprehensive construction site inspection. Recommended for municipal erosion control inspectors, construction site managers, and those practicing erosion control in the field. Prerequisite: Stormwater Management and Erosion Control Course (see above). Course is given at Red Rocks Community College in Lakewood. Course CETC #151.
  - Contact the Rocky Mountain Education Center at (800) 933-8394
  - Schedule of classes available online at: http://www.rcc.edu/rome/cetc.html

- Keep it Clean Partnership (Boulder) Erosion Control Training and Certification
  The Keep it Clean Partnership provides a low-cost, eight-hour erosion control training and recertification program available for both public and private inspectors and contractors.
  - Contact the Keep it Clean Partnership at 303-441-1439
  - http://bcl.boulder.co.us/basin/kicp/kicp_construction.htm
State of Colorado
General Permit Application
Stormwater Discharges Associated with Construction Activity

http://www.cdphe.state.co.us/wq/PermitsUnit/SWConstructionApplication.pdf

Updated 7/2007
Controlling Construction Site Erosion and Sedimentation

STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY

GENERAL PERMIT APPLICATION

and

STORMWATER MANAGEMENT PLAN PREPARATION GUIDANCE

Revised 7/07

Contact Information

Colorado Department of Public Health and Environment
Water Quality Control Division – Stormwater Program
WQCD Permits-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246

Telephone: (303) 692-3517
Email: cdphe.wqstorm@state.co.us
Web Page: www.cdphe.state.co.us/wq/PermitsUnit

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APPLICABILITY

This application is for use by all entities engaged in construction activities to obtain coverage under the general permit for Stormwater Discharges Associated with Construction Activities (the Stormwater Construction Permit). Construction activity refers to ground surface disturbing activities, which include, but are not limited to, clearing, grading, excavation, demolition, installation of new or improved haul roads and access roads, staging areas, stockpiling of fill materials, and borrow areas. Construction does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

Stormwater Construction Permit coverage is required by State and Federal regulations for stormwater discharged from any construction activity that disturbs at least 1 acre of land (or is part of a larger common plan of development or sale that will disturb at least 1 acre). A “common plan of development or sale” is a site where multiple separate and distinct construction activities may be taking place at different times on different schedules, but still under a single plan. This includes phased projects, projects with multiple filings or lots, and projects in a contiguous area that may be unrelated but still under the same contract. If the project is part of a common plan of development or sale, the disturbed area of the entire plan must be used in determining permit requirements, and all portions of the project must be covered.

NOTES:

Stormwater Management Plan Preparation Guidance – The guidance, available as Appendix A to this application, has been revised and updated.

Additional Guidance – Additional information, including further discussion on permittee and operator liability, is available in the Stormwater Fact Sheet – Construction, available from the Division’s web site at www.cdphe.state.co.us/wq/PermitsUnit. If you have questions on completing this application, you may contact the Division at cdphe.wqstorm@state.co.us or (303) 692-3517.
Controlling Construction Site Erosion and Sedimentation

Water Quality Control Division – Stormwater Program

INSTRUCTIONS

A) Submitting the Application

Application Due Date: At least ten days prior to the anticipated start of construction, the owner or operator of the construction activity must submit an application as provided by the Water Quality Control Division (Division). This form may be reproduced, and is also available from the Division’s web site (see previous page for address/contact information). Applications received by the Division are processed, and a permit certification and other relevant materials will be sent to the attention of the legally responsible person (Item 9 on the application form).

Permit Fee: Do not send any payment with this application. You will be billed once you are covered under a permit. Current permit fees can be obtained from the Division’s web site at www.cdphe.state.co.us/wq/PermitsUnit.

Application Completeness: The application must be completed accurately and in its entirety or the application will be deemed incomplete—processing of the application will not begin until all required information is received. One original copy of the completed application (no faxes or e-mails) must be submitted to the Division to initiate the application process (see page 1 above for address/contact information).

Do not include a copy of the Stormwater Management Plan, unless requested by the Division.

B) Who May Apply For and Maintain Permit Coverage

The Permit applicant must be a legal entity that meets the definition of the owner and/or operator of the construction site, in order for this application to legally cover the activities occurring at the site. The applicant must have day-to-day supervision and control over activities at the site and implementation of the SWMP. Although it is acceptable for the applicant to meet this requirement through the actions of a contractor, as discussed in the examples below, the applicant remains liable for violations resulting from the actions of their contractor and/or subcontractors. Examples of acceptable applicants include:

- **Owner or Developer** - An owner or developer who is operating as the site manager or otherwise has supervision and control over the site, either directly or through a contract with an entity such as those listed below.

- **General Contractor or Subcontractor** - A contractor with contractual responsibility and operational control (including SWMP implementation) to address the impacts construction activities may have on stormwater quality.

- **Other Designated Agents/Contractors** - Other agents, such as a consultant acting as construction manager under contract with the owner or developer, with contractual responsibility and operational control (including SWMP implementation) to address the impacts construction activities may have on stormwater quality.

An entity conducting construction activities at a site may be held liable for operating without the necessary permit coverage if the site does not have a permit certification in place that is issued to an owner and/or operator. For example, if a site (or portion of a site) is sold or the contractor conducting construction activities changes, the site’s permit certification may end up being held by a permittee (e.g., the previous owner or contractor) who is no longer the current owner and/or operator. In this case, the existing permit certification will no longer cover the new operator’s activities, and a new certification must be issued, or the current certification transferred.

**Utilities, Other Subcontractors, etc.:** A separate permit certification is not needed for subcontractors, such as utility service line installers, where the permittee or their contractor is identified as having the operational control to address any impacts the subcontractor’s activities may have on stormwater quality. Although separate permit coverage may not be needed in some cases, these entities are not exempt from the stormwater regulations for all of their projects and may still be held liable if their activities result in the discharge of pollutants.

**Leases:** When dealing with leased land or facilities, the lessee shall be considered the “owner” for the purposes of stormwater permitting if they are responsible for the activities occurring at the site.
C) Permitting for Developments with Multiple Owners and/or Operators

For situations where multiple entities meet the definition of owners and/or operators for different portions of a development (e.g., a single development with multiple lots owned and operated by separate entities), it is essential that the permittees, owners, and operators at the site correctly follow the guidance on who may apply for coverage under the Stormwater Construction Permit (see Part B, above).

When a portion of a permitted site is sold to a new owner, a permit certification must be in place that is held by an entity meeting the definition of owner and/or operator of that sold lot. This may be accomplished in one of the following ways:

- **Coverage Under the Existing Certification** – Activities at the sold area may continue to be covered under an existing permit certification for the project if the current permittee meets the definition of operator for the sold area. To meet the definition of operator, the current permittee must have contractual responsibility and operational control to address the impacts that construction activities at the sold area may have on stormwater runoff (including implementation of the SWMP for the sold area). Therefore, a legally binding agreement must exist assigning this responsibility to the current permit holder on behalf of the new owner and/or operator for the sold area. It is not necessary to notify the Division in such case. However, documentation of the agreement must be available upon request, and the SWMP must be maintained to include all activities covered by the Stormwater Construction Permit.

- **New Certification Issued – Reassignment** – A new permit certification may be issued to the new owner and/or operator of the sold area. The existing permittee and the new owner and/or operator must complete the Reassignment Form (available from the Division’s web page, see page 1) to remove the sold area from the existing permit certification and cover it under a certification issued to the owner and/or operator of the sold area. Both entities must have SWMPs in place that accurately reflect their current covered areas and activities.

A more detailed explanation is available in the Stormwater Fact Sheet – Construction, available from the Division’s web site (see page 1).

D) Instructions for the Application Form

**Item 1 - Applicant Information:** Provide the company name, address, phone number, email address for applicant, and local contact information for the project. Indicate whether the applicant is the owner, the developer, or a contractor.

**Item 2 - Location of the Construction Site:** Provide the following information:

- **Street Address** – Provide the address of the construction site. If an exact address is not available you may use an approximate address, the nearest intersection or boundary streets including directional identifiers (e.g., “S. of Park St. between 5th Ave. and 10th Ave.”, or “W. side of C.R. 21, 3.25 miles N. of Hwy 10”) or other identifying information. A street name without an address, intersection, mile marker, or other identifying information describing the location of the project is not adequate. For linear projects, the route of the project should be described as best as possible with the location more accurately indicated by a map (see Item 3).

- **Project Name, City, and County** – If the project is located within the unincorporated portion of a county, write “unincorporated” in the space provided for the city name.

- **Latitude/Longitude** - For the approximate center point of the property, to the nearest 15 seconds. The latitude and longitude must be provided as either degrees, minutes, and seconds, or in decimal degrees with three decimal places. This information may be obtained from a variety of sources, including:
  - Surveyors or engineers for the project should have, or be able to calculate, this information.
  - EPA maintains a [web-based siting tool](https://www.epa.gov/tri/report/siting_tool/index.htm) as part of their Toxic Release Inventory program that uses interactive maps and aerial photography to help users get latitude and longitude. The siting tool can be accessed at [www.epa.gov/tri/report/siting_tool/index.htm](https://www.epa.gov/tri/report/siting_tool/index.htm).
  - U.S. Geological Survey topographical map(s), available at area map stores.
  - Using a Global Positioning System (GPS) unit to obtain a direct reading.

*Note:* the latitude/longitude required above is not the directional degrees, minutes, and seconds provided on a site legal description to define property boundaries.
Item 3 - Legal Description or Map: One of these two items must be provided:
- **Legal Description** of the entire site covered by the application. The description must include subdivision(s), block(s), and lot(s) (providing the metes and bounds or just the township/section/range, is not adequate). This information should be available for subdivided properties from documents submitted to or maintained by the city or county, such as the subdivision plat or deed. If this information is not available, a map must be submitted. – or –
- **Site Map** that defines the boundaries of the site covered by the application. The level of detail that must be provided will depend on the nature of the project and must be adequate so that it can be determined during a field audit what construction activities are covered under the issued certification. For typical developments within a specific surveyed property, a map that clearly shows the property boundaries should be obtainable. For projects located in areas with adjacent construction areas that will not be covered by the application (such as multi-lot developments with multiple owners/operators), this detail is essential. However, for projects such as road or utility projects, where providing this detail may not be feasible or necessary to distinguish the project from adjacent activities, a less detailed map showing the approximate area is adequate. Maps must have a minimum scale of 1:24000 (the scale of a USGS 7.5 minute map). Maps must be folded to 8½ x 11 inches. **Do not** submit grading plans or other blueprints as the site map or the application will be rejected. This is not the same as the map required in the SWMP (see Appendix A).

Item 4 - Area of Construction Site: Provide both the total area of the construction site, and the area that will undergo disturbance, in acres. **Note:** aside from clearing, grading and excavation activities, disturbed areas also include areas receiving overburden (e.g., stockpiles), demolition areas, and areas with heavy equipment/vehicle traffic and storage that disturb existing vegetative cover (see construction activity description under the APPLICABILITY section on page 1).

If the project is part of a **larger common plan of development or sale** (see the definition under the APPLICABILITY section on page 1), the disturbed area of the total plan must also be included.

Item 5 - Nature of Construction Activities: Check the appropriate box or boxes, or if the descriptions provided do not fit the project, provide a brief description that indicates the general nature of the construction activities for which permit coverage is being requested. A more detailed description of the project must be included in the Stormwater Management Plan (see Item 8).

Item 6 - Anticipated Construction Schedule: Provide the current estimated start and final stabilization dates for the construction project as follows:

- **Construction Start Date** - This is the day you expect to begin ground disturbing activities, including grubbing, stockpiling, excavating, demolition, and grading activities.

- **Final Stabilization Date** - in terms of permit coverage, this is when the site is finally stabilized. This means that all ground surface disturbing activities at the site have been completed, and all disturbed areas have been either built on, paved, or a uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels. **Permit coverage must be maintained until the site is finally stabilized. Even if you are only doing one part of the project, the estimated final stabilization date must be for the overall project.** If permit coverage is still required once your part is completed, the permit certification may be transferred or reassigned to a new responsible entity(s).

Item 7 - Receiving Water(s): Identify the receiving water of the stormwater from your site. Receiving waters are any waters of the State of Colorado. This includes all water courses, even if they are usually dry. If stormwater from the construction site enters a ditch or storm sewer system, identify that system and indicate the ultimate receiving water for the ditch or storm sewer. **Note:** a stormwater discharge permit does not allow a discharge into a ditch or storm sewer system without the approval of the owner/operator of that system.
Controlling Construction Site Erosion and Sedimentation

Item 8 - Stormwater Management Plan (SWMP) Certification: The certification of completion of a SWMP must be signed by the applicant or their authorized agent. Appendix A contains the requirements for the SWMP during the period of construction (as listed in the Stormwater Construction Permit). Submittal of the SWMP with the application is not required, however, it must be developed and implemented, and kept at the construction site. The Division reserves the right to request the SWMP at any time.

Item 9 - Signature of Applicant: The applicant must be either the owner and/or operator of the construction site. Refer to Part B of the instructions for additional information. The application must be signed by the applicant to be considered complete. In all cases, it shall be signed as follows:

a) In the case of corporations, by a principal executive officer of at least the level of vice-president or his or her duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the application originates.

b) In the case of a partnership, by a general partner.

c) In the case of a sole proprietorship, by the proprietor.

d) In the case of a municipal, state, or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee if such representative is responsible for the overall operation of the facility from which the discharge described in the form originates.

This certification includes an acknowledgment that the applicant understands that the permit coverage, and therefore the applicant’s liability, will be for the entirety of the construction project described and applied for, until such time as the application is amended or the certification is transferred, inactivated, or expired.