Chapter 6 - Problem Solving and Innovative Best Management Practices

This section provides users with examples of how engineers can be creative in their design and implementation of EPSC measures. The guidelines listed in this handbook are to help the engineer realize best design practices of EPSC measures as well as detailing best installation practices in the SWPPP narratives. Ultimately, the engineer can design a site at their discretion, and their designs may vary from the recommendations herein; however, it is their responsibility for creating a design that keeps the construction site in compliance with the CGP.

6.1 Common Issues and Site Specific Design

SWPPPs require site specific tailoring to function effectively. The performance of EPSC measures depends on how well they are matched to site constraints and hydrology. For example, silt fence loses effectiveness when installed along the perimeter of a site that includes ditches or within drainage ditches where concentrated flow occurs. In the later scenario, check dams or other flow dissipating practices are more appropriate. Similarly, silt fence placed upgradient of the disturbance contributes no treatment benefit and only adds unnecessary cost. Careful evaluation of drainage patterns, disturbance limits, and runoff sources during the design phase enables EPSC measures to be both efficient and cost-effective. Ideally, these considerations are to be used in tandem with implementing measures that have the least environmental impact. For instance, the negative impacts of blasting to create a sediment basin in rocky terrain may offset the benefits of that sediment basin throughout its operational lifespan. Similarly, purchasing more right-of-way land on a linear project to construct a sediment trap is likely more of an economic burden than purchasing and installing bypass pipes that allow unpolluted water to bypass the construction site. This changes the outlook of sediment control to include other aspects such as managing the work, water, and erosion.

6.2 Traditional Erosion and Sediment Control Management

Historically, construction stormwater management has focused on treating the visible symptoms of stormwater impacts including sediment accumulation in receiving waters, wetlands, and on adjacent properties. Although sediment control remains a regulatory priority, the term “erosion control” has often been applied loosely, giving the impression that the causes of sediment transport were not being addressed when management efforts were largely reactive. Over time, stormwater practices have advanced by incorporating soil conservation principles established in agriculture, where controlling soil detachment at its source is fundamental (Edwards et al., 2015; Kazaz et al., 2022). These lessons have shifted construction stormwater management toward a more preventative or proactive model.

Source-control practices such as surface stabilization, vegetative buffers, and velocity reduction now play a greater role in construction stormwater management plans. By limiting soil detachment and exposure, these practices reduce the load on downstream sediment controls and improve overall treatment efficiency. This combined strategy of addressing erosion at its source while maintaining sediment capture downstream represents a more technically sound and science-based approach to construction stormwater management that overall reduce downstream water quality impairments associated with construction.

6.3 Five Pillars of Construction Stormwater Management

Construction stormwater management is essential for minimizing the environmental impacts of soil disturbance. The Five Pillars of Construction Stormwater Management (Fagan, 2020) provide a prioritized framework based on effectiveness and cost efficiency:

1. Manage communication;
2. Manage work;
3. Manage water;
4. Manage erosion; and
5. Manage sediment

This framework guides planning, design, construction, and troubleshooting across a wide range of projects, including transportation, residential, commercial, and utility-scale solar development. Applied effectively, the Five Pillars reduce erosion, control sediment transport, and support compliance with regulatory requirements, resulting in more efficient and environmentally protective construction practices.

6.3.1 Manage Communication

The first pillar, *managing communication*, establishes the foundation for effective stormwater management by aligning project teams, contractors, inspectors, and regulatory agencies on objectives, methods, and performance expectations. Clear communication reduces misinterpretation, minimizes compliance risk, and facilitates efficient implementation of EPSC measures. Key practices in this pillar include delineating sensitive areas through physical demarcation, delivering or obtaining essential trainings and credentialing, conducting routine inspections, allocating resources for maintenance, and engaging stakeholders through outreach.

Communication also directly supports regulatory compliance. For instance, when designers convey that silt fence typically functions for only six months, contractors can incorporate replacement costs into bids, and owners can anticipate additional material purchases if the project extends in duration.

6.3.2 Manage Work

The second pillar, *managing work*, addresses the execution of construction activities with the objective of minimizing soil disturbance, preserving site stability, and protection of natural features. Core practices include phasing and sequencing to limit exposed soil, selective clearing to retain stabilizing vegetation, stabilized access roads that prevent sediment tracking, effective topsoil management to support final stabilization, implementation of water conservation practices, and installation of temporary stream crossings or vegetated filter strips.

For example, specifying on plan sheets that work within a buffer zone is to occur only during dry conditions, followed by immediate stabilization, significantly reduces the risk of sediment discharge. Such measures align construction sequencing with weather conditions, lowering the likelihood of sediment mobilization and ensuring compliance with regulatory requirements.

6.3.3 Manage Water

The third pillar, *managing water*, focuses on controlling runoff to prevent contact with disturbed soils and to reduce erosion risk. Effective water management lessens reliance on downgradient sediment controls by intercepting, diverting, or safely conveying flows before they reach vulnerable areas. Key practices include diversion channels, slope drains, cofferdams, piling, shoring, berms, and other flow control structures (see Section 4.3). On sites adjacent to streams or wetlands, temporary diversions or cofferdams isolate work zones and limit sediment transport. Slope drains and flumes convey water safely down exposed slopes, reducing gully formation and soil loss.

For example, during roadway construction near a wetland, a geotextile-lined diversion channel can redirect stormwater away from disturbed areas, while slope drains discharge runoff into collection points stabilized with conventional riprap. These strategies minimize soil detachment, reduce sediment laden flows, and protect downstream aquatic resources and habitats.

6.3.4 Manage Erosion

The fourth pillar, *managing erosion*, is often viewed as the first line of defense for preventing soil loss on construction sites, though these pillars demonstrate other construction related aspects that come before *managing erosion*. This pillar emphasizes stabilizing exposed soils, controlling runoff energy, and reducing erosive processes such as raindrop, sheet, and rill erosion. EPSC measures include surface stabilization, hydraulic mulching, vegetative establishment, temporary slope protection, streambank stabilization, hard armoring, etc. (see Section 4.2).

For example, on hillside residential projects, hydraulic mulch can be applied immediately after grading to limit raindrop and sheet erosion. ECBs, preferably those that are environmentally- and wildlife- friendly, on steep slopes hold soils in place until vegetation establishes. In stream restoration, live staking with native cuttings can be paired with log structures to stabilize banks and accelerate recovery (Section 3.3.2.2). At stormwater outfalls, riprap apron and stilling basins dissipate flow energy and prevent scouring, ensuring long-term stability of receiving channels.

6.3.5 Manage Sediment

The fifth pillar, *managing sediment*, serves as the last line of defense in preventing sediment from leaving a construction site. Sediment controls are designed to intercept, capture, and retain mobilized sediment, particularly during storm events, thereby reducing loads to receiving waters. Key practices include perimeter controls such as silt fence and wattles, inlet protection for curb and area drains, track-out controls at site entrances, sediment basins and traps, enhanced treatments such as polymer or flocculant applications, etc. (see Section 4.4). In application, perimeter barriers are placed along downgradient slopes to intercept sheet flow, while inlet protections such as silt socks or rock filters prevent sediment entry into stormwater infrastructure. Stabilized construction entrances with geotextile underlayment and coarse aggregate reduce sediment tracked onto roadways. At larger sites, sediment basins provide controlled detention, allowing suspended solids to settle before discharge. These measures operate most effectively as an integrated system, reducing off-site sediment transport during peak runoff events.

For example, during commercial site development, silt fence can be installed along the downgradient perimeter to intercept sheet flow and trap suspended sediment. Curb inlet protection using sand-filled bags can be placed around storm drain openings to prevent sediment laden runoff from entering the storm sewer system. A construction entrance with geotextile fabric underlay and coarse aggregate can be used to reduce track-out by heavy equipment and trucks, and a sediment basin can be constructed at the low point of the site to collect and treat runoff from multiple drainage areas.

6.4 Innovative EPSC Measures

During construction, EPSC measures specified in the SWPPP can become less effective, overwhelmed, or useless when challenged by improper installation, inadequate maintenance, or storm events that exceed design capacity. These failures reduce system resiliency, allowing sediment laden runoff to leave the site, degrade downstream water quality, and create regulatory compliance risks. To address these limitations, recent efforts have focused on integrating innovative approaches into the design and implementation of EPSC measures. Many of these techniques emerged from research targeting common deficiencies observed after storm events, with the goal of enhancing system performance, reliability, and resilience. The following sections describe several innovations that have been scientifically evaluated and demonstrated to improve effectiveness under field conditions.

6.4.1 Silt Fence Innovations

Silt fences remain the most widely used perimeter control measure on construction sites due to their low cost and small footprint. Perhaps the greatest silt fence challenge is the need for an environmentally friendly, plastic-free alternative (Whitman et al., 2025). However, field performance is also a pressing issue that has long been limited by two persistent deficiencies: structural instability and inefficient dewatering. Conventional installations often fail under hydrostatic loading when posts deflect or spacing is excessive, and geotextile pores frequently clog, extending ponding durations well beyond design expectations and time under stress. These shortcomings compromise site operations, increase the risk of bypass flows, and reduce overall system reliability.

To address both issues, Whitman et al. (2021) introduced a plywood dewatering board addition to silt fence installations. The design of the dewatering board provided controlled effluent, reduced the time silt fence was under maximum stress, while preserving sediment retention and water quality standards. Results demonstrated that the silt fence equipped with a dewatering board achieved a 96% sediment retention rate, which was acknowledged to be consistent with previously reported values for conventional silt fences. The silt fence with dewatering board system was able to maintain consistent sediment capture while substantially reducing dewatering times from 24 hours to approximately four hours. For stability, reduced post spacing, reinforced fabrics, and optimized installation geometry substantially increase load-bearing capacity. Structural testing in this work indicated post spacing of four to eight feet for steel posts (depending on size) and five feet for wood posts to reduce sagging, overtopping, and fabric failure (Whitman et al., 2021).


Photo courtesy of J. B. Whitman

Together, these innovations demonstrate importance of integrating practical engineering enhancements into traditional sediment control measures. The proposed dewatering board offers a low-cost, easily implemented solution that significantly improves silt fence performance in both structural stability, dewatering efficiency, and storm resiliency. The dewatering board monitored herein was constructed by drilling four one inch holes along the centerline at heights of three, six, nine, and 12 inches above the ground surface elevation, cutting a 90° angle V-notch weir in the board at an elevation of 18 inches above the ground surface elevation, and attaching it to the silt fence application with metal T-posts, staples, and heavy duty zip ties at the lowest elevation point. More importantly, these improvements can be achieved without major modifications to existing installation practices or extensive additional training for field personnel.

6.4.2 Wattle Ditch Check Dam Innovations

Wattles are commonly employed as ditch check dams and perimeter barriers largely due to low material costs and straightforward installation. However, conventional installation techniques frequently compromise performance, particularly under concentrated flow conditions (i.e., as ditch checks). Standard practice typically involves driving wooden stakes through the wattle, which punctures the netting, accelerates material degradation, and diminishes structural integrity. This method also increases buoyancy, allowing flow beneath the wattle and promoting localized erosion. Although trenching has been suggested to limit undercutting, inspections and visual observations have indicated it can be counterproductive by reducing ground contact and creating preferential subsurface flow paths, further undermining wattle efficacy.

Research has identified several design enhancements that improve wattle performance without adding installation complexity (Donald et al., 2013). A-frame staking (driving stakes at opposing angles on either side of the wattle) anchor wattles securely while preserving netting integrity and wattle compaction. Placing a geotextile underlay or heavy RECP beneath the wattle protects the channel bed from scouring when the system is overtopped. Additionally, securing the wattle with U-shaped sod staples ensures intimate contact with the underlying layer, minimizing flow bypass and undercutting. Finally, curving the ends of the wattle upstream helps to direct water toward the center of the ditch check and reduces the likelihood of flow bypassing around the edges.

Collectively, these improvements extend the service life of wattles, increase sediment capture efficiency, protect channel bottoms from high-velocity flows, and reduce maintenance requirements, enhancing their reliability as an effective EPSC measure.

6.4.3 Inlet Protection Practice Innovations

Silt fence barriers are one of the most common inlet protection practices because of their material availability and straightforward installation. Despite their prevalence, they are not recommended in Tennessee due to inconsistent field performance. Failures are typically associated with inadequate structural integrity, limited impoundment capacity, excessive detention times, or rapid overtopping and bypass. Nevertheless, large-scale testing has shown that with structural enhancements and thoughtful design, silt fence inlet protection can achieve high levels of performance (Perez et al., 2015). In such cases, reinforced configurations are advisable to overcome the deficiencies of standard silt fence inlet protection installations.

To improve structural stability, Perez et al. (2015) tested a system that combined T-posts with 2 × 4 lumber bracing, including perimeter and diagonal members to create a rigid, self-supporting frame. This design resisted structural deformation and maintained impoundment across a 31 foot test channel. However, similar to Section 6.4.1, dewatering is necessary to prevent clogging in silt fence pores and excessively long impoundment times. Perez et al. (2015) recommended a vertical 2 × 4 dewatering board installed with a series of staggered holes ranging from 0.25 to 1.5 inches in diameter, increasing from bottom to top (shown in the photo to the right). This configuration provided slower release of the most turbid, sediment laden water near the base while allowing higher flows to discharge from the upper portion of the impoundment. The staged-release board successfully balanced detention and drainage, preventing prolonged flooding while preserving high sediment capture efficiency of silt fence.


Photo courtesy of J. B. Whitman

The reinforced T-post and lumber installation with the dewatering board was identified as the most feasible and effective installation for silt fence inlet protection. It maintained impoundment across the full channel width, provided effective structural resistance, and fully dewatered within 90 minutes. Compared with conventional silt fence inlet protection practices, this design markedly increased impoundment capacity, reduced risk of catastrophic failure, and balanced sedimentation potential with acceptable drawdown times. These results demonstrate that with modest structural enhancements and the addition of a controlled dewatering mechanism, silt fence inlet protection can function as a reliable and cost-effective EPSC measure.

6.5 Problem Solving

Although EPSC measures are widely implemented, construction sites frequently encounter recurring deficiencies arising from improper installation, insufficient maintenance, site specific limitations, and inadequate planning. Typical failure modes include compromised silt fences, unstabilized soils, sediment laden runoff bypassing control structures, and inadequately protected inlets and conveyance channels. Addressing these challenges requires strategies that are responsive to site conditions and aligned with regulatory criteria.

Effective problem solving involves not only the selection of appropriate control measures but also a clear understanding of how critical variables, such as slope gradient, soil erodibility, rainfall intensity and duration, drainage area size, and construction sequencing, govern erosion and sediment transport dynamics. Proactive planning and timely implementation are essential, supported by continuous monitoring to verify functionality and identify performance deficiencies. Maintenance must be performed promptly to restore effectiveness, particularly following high intensity rainfall events. Equally important is the capacity for adaptive management. As site conditions evolve, EPSC practices must be reevaluated and refined to maintain performance. Field observations, coupled with engineering judgment, provide the basis for modifications that ensure measures remain effective throughout all phases of construction. By systematically diagnosing common EPSC failures and applying targeted, evidence based solutions, project teams can minimize environmental impacts and maintain regulatory compliance.

6.5.1 Inadequate Perimeter Controls

Silt fence barriers are among the most frequently employed perimeter controls on construction sites, yet they are also among the most frequently misapplied. Performance deficiencies typically stem from improper installation, unsuitable placement, and inadequate maintenance. A common failure mode is undercutting, where insufficient trenching permits stormwater to erode beneath the fabric. Similarly, placement within concentrated flow paths often leads to overtopping or structural blowouts during storm events. End sections are frequently left unsecured or oriented downslope, creating preferential flow paths around the installation. Equally important is recognizing the intended scale of application. Silt fences are designed to treat relatively small drainage areas, typically no more than 0.25 acres of disturbed soil per 100 feet of silt fence. When used to intercept runoff from larger disturbed areas, flow volumes and velocities often exceed barrier capacity, resulting in overtopping, blowouts, and accelerated failure. Compounding these issues, fences often degrade prematurely due to ultraviolet exposure, geotextile clogging, or neglect of inspection and maintenance following rainfall events.

These recurring shortcomings have prompted the development of revised strategies and best practices. To optimize performance, guidance documents consistently emphasize installing silt fence along contour lines, with the fabric trenched to a minimum of six inches and backfilled with compacted soil to ensure a sealed ground interface. J-hooks or end returns should be constructed at specified intervals and at the terminus of each fence run preventing preferential flow paths. Routine inspections are critical to sustain effectiveness, particularly following storm events when fabric tears, displaced posts, or excessive sediment accumulation are most likely. Prompt maintenance to repair or replace damaged sections preserves the functional integrity of the barrier. Without such upkeep, structural degradation and bypass flow rapidly diminish performance.

When properly designed, installed, and maintained, silt fences can provide effective last-line perimeter control, intercepting sheet flow, promoting impoundment, and facilitating onsite sediment deposition.

6.5.2 Unstable Soil and Delayed Seeding

Unstabilized soil and delayed seeding are among the primary drivers of erosion and sedimentation on construction sites, particularly in regions such as Tennessee where frequent rainfall can rapidly mobilize exposed soil. When grading or clearing activities are not promptly followed by stabilization, bare soils are highly susceptible to sheet erosion, rill formation, and sediment laden runoff. These risks are amplified on steep slopes and large disturbed areas that remain idle due to poor scheduling, adverse weather, or inadequate oversight. Prolonged soil exposure not only accelerates onsite erosion but also diminishes the effectiveness of perimeter controls. Uncontrolled runoff can exceed the design capacity of silt fences, sediment basins, and other sediment control measures, leading to bypass and failure. Consequently, regulatory frameworks mandate that disturbed areas be stabilized as soon as practicable.

Best practices emphasize rapid establishment of temporary cover following disturbance. Common approaches include seeding and mulching immediately after grading, phasing construction to minimize the area of exposure at any given time, and installing ECBs or sod on steep slopes and in drainage channels. Where seeding is not seasonally feasible, hydromulch or bonded fiber matrix products, or temporary vegetation can provide effective interim stabilization. These proactive stabilization measures, when implemented consistently, reduce erosion risks, protect water quality, and help projects remain compliant with TDEC stormwater regulations.

6.5.3 Construction Exits

Construction exits, also known as stabilized construction entrances, are critical EPSC measures designed to minimize the tracking of sediment and mud from construction sites onto public roads. Despite their widespread use, poorly designed or improperly maintained exit pads frequently fail to prevent offsite sedimentation, leading to clogged storm drains, unsafe road conditions, and violations of local and state environmental regulations. Common problems include using insufficient stone thickness or size, failing to install geotextile fabric beneath the stone, and constructing pads that are too short to remove sediment from vehicle tires. Additionally, when construction exit pads are installed on slopes or allow runoff to flow across them, they often become saturated and ineffective, allowing mud to bypass the pad entirely. Without regular maintenance, stone can become compacted or buried under sediment, eliminating its ability to dislodge soil from vehicle tires.

To address these deficiencies, stabilized construction exits must conform to detailed design specifications. Pads should be constructed of clean, uniformly graded crushed stone of sufficient size to promote tire flex and dislodge sediment and placed over a geotextile underlay to prevent subgrade contamination. Dimensions must accommodate the largest vehicles on site, with lengths adequate to allow multiple tire rotations and widths sufficient for safe ingress and egress. Pads should be installed on level ground where feasible, with diversion swales or berms directing runoff away from the entrance and adjacent roadways. Where high traffic volumes or persistent tracking are anticipated, supplemental measures such as tire wash stations are recommended. Routine inspections, sediment removal, and stone replenishment are essential to sustain pad effectiveness and minimize offsite sediment transport.

6.5.4 Channel and Slope Erosion

Channel and slope erosion are major concerns on construction sites as intense rainfall can quickly transform exposed slopes and temporary drainage channels into sources of significant sediment loss. Common problems include failing to stabilize channels before directing water into them, allowing concentrated flows to accelerate down steep or unvegetated slopes, and neglecting to implement temporary flow control measures. These oversights often lead to rill and gully formation and headcut migration, undercutting of channel banks, and excessive sediment loading downstream. Additionally, construction activities can inadvertently alter natural drainage patterns or increase flow volumes, compounding erosion risks if appropriate controls are not in place. In many cases, sediment basins and silt fences become overwhelmed due to upstream channel or slope failures, reducing their effectiveness and increasing maintenance burdens.

To address these challenges, several EPSC measures can be utilized to reduce flow velocity and protect disturbed soil surfaces. On slopes, strategies include minimizing the area and duration of exposure, using tracking to disrupt runoff, shortening slopes, and immediately applying temporary seed and mulch. RECPs, particularly environmentally- and wildlife-friendly alternatives, are recommended for steeper grades or high flow areas, providing both mechanical protection and a medium for vegetation growth. In drainage channels, temporary check dams made of stone, wattles, or compost logs can be used to slow runoff, trap sediment, and prevent downcutting. Stone must be properly sized for stability. Channel linings, such as TRMs, sod, or (conventional, soil, or void-filled) riprap, can be utilized based on flow intensity and soil type. Energy dissipaters, like level spreaders, rock aprons, or preformed scour holes, can be placed at outfalls to reduce uncontrolled scour at discharge points. These measures, when combined with proper grading, phased construction, and routine inspections and maintenance, form a comprehensive strategy to control channel and slope erosion.

6.5.5 Unprotected Storm Drain Inlets

Unprotected storm drain inlets are a frequent source of sediment discharge from construction sites, often leading to clogged drainage systems, localized flooding, and downstream water quality violations. During grading and earthwork operations, runoff from disturbed areas can carry large volumes of sediment directly into nearby curb inlets, drop inlets, or area inlets if effective inlet protection measures are not installed. Common problems include using inadequate materials or failing to secure devices properly, allowing runoff to bypass the protection altogether. Inlet controls are also frequently undersized, not maintained after storm events, or removed prematurely before final site stabilization. These failures reduce the effectiveness of the entire erosion and sediment control system and place projects at risk of non-compliance.

To combat these issues, guidelines recommend several well-tested strategies for inlet protection based on inlet type and flow conditions. For curb inlets, gravel-filled bags or block and gravel barriers are often used to filter runoff while allowing overflow through the top. Drop inlets are commonly protected with gravel and hardware cloth baskets or sediment filter logs arranged in a ring around the opening (Section 4.4.4). All devices must be installed with adequate ponding area upstream and must not create traffic hazards or block emergency drainage. Maintenance is critical, protection measures must be inspected after rain events, with sediment and debris removed before the next storm. In high flow or paved areas, reinforced inlet devices or manufactured solutions may be needed.

6.5.6 Sediment Basins on Rocky Sites

Constructing sediment basins on rocky or shallow bedrock sites presents unique challenges that can compromise performance if not properly addressed. One of the most common problems is the inability to excavate the basin to the required depth due to hard subsurface conditions, which limits storage volume and reduces basin capacity. Additionally, achieving a proper seal at the bottom of the basin can be difficult, leading to underdrainage and turbidity as water seeps through rock fractures. Embankment construction can also be problematic when suitable soil is not available on site, making it difficult to compact berms or form stable spillways. Furthermore, installing outlet structures, such as risers and skimmer systems, into uneven or unstable rock surfaces may lead to leaks, misalignments, or structural failure under high flow conditions. These issues are often compounded by poor site planning or rushed installation schedules that do not allow time for necessary excavation or adaptation.

To address these challenges, guidelines recommend several adaptive strategies for sediment basin construction on rocky terrain. If full excavation is not feasible, designers can modify basin geometry to include wider, shallower configurations that maintain storage volume through increased surface area or the adoption of multiple measures used in a treatment train to achieve equivalency (Section 5). Where seepage is a concern, geosynthetic liners or clay blankets can be used to seal the bottom of the basin. For embankments, contractors can import suitable fill material or use rock-core berms wrapped in geotextile fabric to maintain structural integrity. Outlet structures can be stabilized with concrete pads or anchor systems to prevent shifting, and emergency spillways can be armored to handle overflows. Regular inspections, maintenance, and as-built verifications are essential to ensure the basin is functioning as intended. These strategies allow for effective sediment control even on difficult sites.

6.6 Compliance and Enforcement

The SWPPP, EPSC plans, and inspection reports serve as CGP compliance records for the permittee and must be retained at the construction site or another location accessible to TDEC-DWR. Instances of noncompliance may arise from out-of-date documents, lack of maintaining measures, inappropriately placed measures, or ineffective and incorrectly installed measures. Such instances may be considered a permit violation. When a noncompliance event occurs, TDEC-DWR may issue a notice of violation (NOV) letter to the permittee requesting prompt corrective actions be taken, remediating any sediment loss.

The primary objective of TDEC is to achieve permit compliance and prevent pollutant discharge to waters of the state; enforcement actions can generally be avoided through timely cooperation and corrective actions. In general, three response scenarios apply when sediment is discharged from a construction site. First, if sediment is released offsite to a downgradient property (i.e., a non-waterbody), the permittee and/or contractor must remove the discharged material, evaluate the cause of the release, and repair, maintain, or install additional EPSC measures to prevent recurrence. Notification to TDEC is not required in this scenario; however, the discharge, why the discharge occurred, and all corrective actions must be documented in the site inspection records. Second, if a sediment discharge reaches a receiving water and is of sufficient magnitude to require remediation or restoration, both submission of an ARAP and notification to TDEC are required. Notification to the TDEC-DWR must describe the severity of the discharge, indicate that an ARAP will be (or was) submitted for waterway maintenance, identify the cause of the release, outline proposed measures to prevent future occurrences, and provide a timeline for EPSC measure maintenance or improvements. Finally, if a discharge results in the delivery of sediment, increased turbidity, or an objectionable color contrast to a receiving water but does not warrant remediation or restoration, notification to TDEC is not required. In this case, the inspector, permittee, and/or contractor must investigate the cause of the discharge, implement or improve EPSC measures to prevent recurrence, and document the release and all corrective actions in the site inspection logs. All inspection records must be made available upon request or during site visits.

There are some instances where compliance with the CGP is maintained, but sediment export was observed. This often results from events exceeding the design storm. If it can be documented that onsite rainfall depth exceeded the design storm (recorded from NOAA Atlas 14), and the SWPPP, EPSC plans, and inspection reports have been maintained, the sediment release may not be a compliance issue. The design storm intensity can also be exceeded and verified with NOAA Atlas 14. In this case, the duration used is equal to the T_C (not 24 hours) of the watershed draining to the outfall in question. Under these scenarios where a site compliance is maintained during a sediment release, the permittee is still responsible for remediating any sediment loss.

In certain cases, TDEC may require submission of a corrective action plan (CAP) detailing measures to be taken to address specific violations. Prior to formal enforcement, TDEC-DWR may schedule a compliance review meeting with the permittee to establish a coordinated plan for achieving compliance. These meetings are generally held following recurring NOVs to the permittee for failing to achieve compliance. Continued or repeated noncompliance may result in formal enforcement proceedings. In such cases, TDEC-DWR may conduct a Natural Resource Damage Assessment (NRDA) to determine appropriate monetary penalties to offset impacts to state waters. In addition, TDEC-DWR may require the permittee to attend EPSC related educational/training courses.

Persistent issues with inadequate design may stem from substandard engineering practices. For example, cost-saving design decisions may compromise environmental protection and compliance. Although engineers are not typically subject to financial penalties under the CGP, they are licensed and regulated by the Tennessee Board of Architectural and Engineer Examiners. Licensure status may be verified, and formal complaints submitted, through the Tennessee Department of Commerce and Insurance online portal at https://access.cloud.commerce.tn.gov/portal/public.

TDEC-DWR is the NPDES permitting authority responsible for regulating water quality under the CWA. However, many stormwater related complaints received by TDEC pertain to flooding, which falls outside of such regulatory authority. In such cases, disputes are typically resolved under civil drainage law, which states a landowner may not:

1. Obstruct the natural flow of water;
2. Increase the natural volume of runoff;
3. Accelerate the natural velocity of flow; or
4. Change the direction of the natural flow of runoff.

Details of natural drainage laws can be found at https://mrln.mtas.tennessee.edu/se/final/Portal/Default.aspx?component=b-USER&record=d36502cd-ecc1-44e4-a67a-d6648dac2502.

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