Municipal Stormwater Management Overview

For Construction Contractors

City of Spokane Valley

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PURPOSE & DISCLAIMER

The purpose of this booklet is to assist in the protection of water quality from sources of pollution. This booklet contains information about temporary erosion and sediment control (TESC), low impact development (LID), underground injection control (UIC), and best management practices (BMPs). This information includes ways to prevent and correct some of the most commonly observed concerns on construction sites as well as the importance of each practice.

This document does not include all possible practices but rather highlights some of the most common. For more information, reference the weblinks on the back page of this document.

TEMPORARY EROSION & SEDIMENT CONTROL (TESC)

Temporary Erosion and Sediment Control Plans outline practices for preventing sediment runoff from construction sites through the use of man-made structures, land management techniques, or natural processes. The Construction Stormwater General Permit requires a Certified Erosion and Sediment Control Lead (CESCL) to inspect sites. The link below provides more information about becoming a CESCL. This section provides highlights from the CESCL training course.

https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Certified-erosion-sediment-control

WHY IS TESC IMPORTANT?

Unmitigated site development can result in soil erosion that can adversely impact adjacent property, infrastructure, and environmental and recreational resources. Effective erosion and sediment control (ESC) BMPs on construction sites can greatly reduce undesirable environmental impacts and costs.

Municipalities may apply escalating enforcement measures to developers who fail to implement proper erosion and sediment control procedures. Not complying with municipal codes can result in project delays, fines, or even imprisonment.

SWPPP

A stormwater pollution prevention plan (SWPPP) details the BMPs used to avoid environmental loss and degradation from poorly managed construction activity. A TESC plan must address the following elements, which are consistent with the thirteen SWPPP elements outlined in Special Condition S9 of Ecology's Construction Stormwater General Permit and in Chapter 7 Construction Stormwater Pollution Prevention of the Ecology Stormwater Management Manual for Eastern Washington (SWMMEW).

- Element 1: Mark Clearing Limits
- Element 2: Establish Construction Access
- Element 3: Control Flow Rates
- Element 4: Install Sediment Controls
- Element 5: Stabilize Soils
- Element 6: Protect Slopes
- Element 7: Protect Drain Inlets
- Element 8: Stabilize Channels and Outlets
- Element 9: Control Pollutants
- Element 10: Control Dewatering
- Element 11: Maintain BMPs
- Element 12: Manage Project
- Element 13: Protect LID BMPs

TESC TIPS

1. **Budget for Temporary BMPs**
   - Purchase - Installation - Maintenance - Removal
   - Factor in labor costs
2. **Grade and Excavate in Dry Season**
   - Dry season is May 1 - October 1
   - Phase construction to preserve native vegetation and reduce exposure
3. **Use Your SWPPP**
   - Review - Reference - Revise
   - Keep SWPPP posted on-site at all times
4. **Keep Up-to-Date Records**
   - Log Books - Reports - Maintenance - Inspection Forms
   - Required by Department of Ecology and Jurisdictions
5. **Protect Permanent Stormwater Controls**
   - Ponds - Treatment Systems - Low Impact Development (LID)
   - Reduce the need for maintenance at final inspection

SITE LOG BOOK

Keep ongoing records of:

- Changes to TESC plans
- BMP implementation
- BMP maintenance or replacement
- Visual inspections
- All relevant field notes
- Spill information (date, time, amount, location, material, clean-up method, notifications made, and disposal)
- Discharge monitoring reports (DMRs) and sampling

GOOD HOUSEKEEPING

- Keep site clean
- Regularly inspect and maintain BMPs
- Cover and store hazardous materials (use secondary containment)
- Use concrete washout controls
- Follow solid waste BMPs
- Hold regular tailgate check-ins with crew
- Have spill kit on site

PROHIBITED DISCHARGE

- Untreated construction stormwater over 25 NTUs
- Washout from concrete (slurry), stucco, paint, and concrete form release oils
- Soaps or solvents used for vehicle or equipment washing
- Equipment leaks and toxic substances from a spill
- Wheel wash wastewater
- Sediment track-out from vehicles

PERIMETER CONTROLS

- Proper installation is key:
  - Key in and backfill to prevent runoff from going under silt fences
  - Space support posts a maximum of 6 feet apart
  - Overlap adjacent fence sections generously to prevent escape of runoff
- Mark project area correctly
- Perform required maintenance
- Add BMP reinforcement for sites with high flow or wind potential
- Select BMPs by filtration and retention needs
- Consider public safety
- Use BMPs in combination

STABILIZE SITE

- Minimize exposed areas
- Preserve native vegetation
- Phase grading and excavation
- Minimize slope length and pitch whenever possible
- Stabilize slopes
- Cover stockpiles
- Use BMPs in combination

INLET AND OUTLET PROTECTION

- Install early in project
- Perform required maintenance; inspect regularly

Inlet Protection BMPs:

- Inserts/socks
- Coir pads
- Bio-bags/sand bags
- Compost socks

Outlet Protection BMPs:

- Rip rap
- Sediment fence
- Wattles/socks/sand bags

- Use protection BMPs as last line of defense

ESTABLISH SITE ACCESS

- Install stabilized pad 12-inch thick of 4-inch to 8-inch quarry spalls, or a 4-inch course of asphalt treated base, or use existing pavement at all site entrances and exits
- Install geotextile fabric underlayment beneath spalls
- Do not use crushed concrete
- Use wheel wash when a stabilized pad fails to prevent sediment track-out
- Sweep track-out as necessary (at least daily)
- Inspect site access regularly, especially after large storm events

LOW IMPACT DEVELOPMENT (LID)

Low impact development applies stormwater and land use management approaches that strive to imitate natural processes by emphasizing conservation, utilizing on-site natural features, site planning, and distributed stormwater management practices in the project's design.

Developers are encouraged to use LID techniques and non-structural methods to minimize impervious surfaces and disturbing native soils and vegetation. Factor in site conditions and long-term maintenance when considering using LID approaches.

Construction Stormwater General and Municipal Permit Requirements:

- Use and maintain erosion and sediment controls on areas that drain to infiltration BMPs. Restore BMPs by removing sediment and, if applicable, replace sediment-laden soils with those meeting the BMP's design specifications.

LOW IMPACT DEVELOPMENT (CONT.)

- Keep construction equipment and foot traffic off infiltration BMPs to avoid compaction. Similarly, protect landscaped and protected natural areas from compaction by construction equipment.
- Clean permeable pavements fouled with sediments, as well as those failing SWMMEW or manufacture infiltration tests.

WHY IS LID IMPORTANT?

LID improves stormwater management and protects surface waters. Installing LID systems can result in cleaner air and water, as well as enhance flood protection, habitat, and green spaces.

LID may help meet or, in some cases, completely satisfy Ecology's requirements for runoff water quality treatment (Core Element #5) and flow control (Core Element #6).

LID PRINCIPLES

Follow the key principles of LID for site design, construction, and long-term maintenance:

- Preserve native vegetation
- Protect critical areas (e.g., wetlands, groundwater recharge areas, flood-prone areas, geologically unstable areas, and habitat conservation areas)
- Minimize surfaces that prevent water from seeping into the ground
- Minimize disturbance and compaction of site soils
- Preserve existing flow paths
- Infiltrate stormwater runoff
- Disperse stormwater
- Utilize natural surfaces
- Utilize small-scale, distributed LID BMPs

UNDERGROUND INJECTION CONTROL (UIC)

Stormwater Underground Injection Control wells are structures used to direct stormwater runoff underground, usually under the force of gravity. UIC wells consist of:

- A hole whose depth exceeds its largest surface dimension
- An underground fluid distribution system (e.g., perforated pipes or dry wells) to distribute the stormwater below ground

WHY ARE UICS IMPORTANT?

UIC wells are another approach to managing stormwater runoff, which includes the added benefit of replenishing groundwaters. As such, federal and state regulations govern the use of UIC wells to prevent groundwater contamination. UIC wells not designed, operated, and maintained according to these laws may result in penalties, including preventing further use of the well.

WHY ARE UICS IMPORTANT? (CONT.)

UIC wells require frequent inspection and preventative maintenance to ensure they perform as intended. As such, UIC wells require protection from runoff with sediment generated during construction as it could quickly prevent infiltration. If necessary, remove debris and sediment to eliminate the buildup of materials that could prevent infiltration. Also see **Inlet and Outlet Protection** on Page 11 for additional ways to protect drywells during construction.

BEST MANAGEMENT PRACTICES (BMPS)

Best Management Practices consist of measures, approved by the Department of Ecology, used to prevent or reduce the release of pollutants and other adverse impacts (e.g., high flows) to surface and groundwaters. Construction stormwater BMPs may be used individually or required in combination. They can be structural (e.g., silt fence, wheel wash, settling ponds) or nonstructural (e.g., street sweeping, source control pollution prevention measures, maintenance procedures, prohibited practices).

This section introduces common BMPs utilized during construction. Information about the BMPs included in this document can be found at the QRL code on this page. QRL codes for each BMP are provided on the subsequent pages, with more information about installation and maintenance practices.

WHY ARE BMPS IMPORTANT?

Unmanaged runoff during a project's construction phase can harm surface and groundwaters, vegetation, habitat, property, and infrastructure. Avoiding these harms requires pre-project planning, including the gathering of site-specific information based on the site's characteristics. It also requires ongoing site awareness and diligence during the construction phase, including monitoring weather forecasts, proper installation and maintenance of BMPs, and pollution prevention practices. Collectively, these actions can contribute to reducing construction-related impacts on the site and surrounding areas.

Used properly, BMPs provide erosion and sediment control, provide pollution prevention, minimize unwanted compaction, and protect on- and off-site infrastructure, property, and natural areas.

COMMON BMPS

BMP C233E Silt Fence

Silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

COMMON BMPS (CONT.)

BMP C106E Wheel Wash

Wheel washes reduce the amount of sediment transported onto paved roads by washing dirt from the wheels of motor vehicles prior to the motor vehicles leaving the construction site.

COMMON BMPS (CONT.)

BMP C105E Stabilized Construction Access

Stabilized construction entrances reduce the amount of sediment transported onto paved roads by vehicles or equipment. This is done by constructing a stabilized pad of quarry spalls at entrances and exits for construction sites.

COMMON BMPS (CONT.)

BMP C107E Construction Road / Parking Area Stabilization

Stabilizing roads, parking areas, and other on-site vehicle transportation routes immediately after grading reduces erosion caused by construction traffic or stormwater runoff.

COMMON BMPS (CONT.)

BMP C103E High-Visibility Fence

High-visibility fencing:

- Restricts clearing to approved limits
- Prevents disturbance of sensitive areas, their buffers, and other areas required to be left undisturbed
- Limits construction traffic to designated construction entrances, exits, or internal roads
- Protects areas where marking with survey tape may not provide adequate protection.

COMMON BMPS (CONT.)

BMP C235E Wattles

Wattles are temporary erosion and sediment control barriers consisting of straw, compost, or other material that is wrapped in biodegradable tubular plastic or similar encasing material. They reduce the velocity and can spread the flow of rill and sheet runoff and can capture and retain sediment.

BMP C209E Outlet Protection

Outlet protection prevents scour at conveyance outlets and minimizes the potential for downstream erosion by reducing the velocity of concentrated stormwater flows.

BMP C201E Grass Lined Channels

Grass lined channels are channels with a vegetative lining for conveyance of runoff to help prevent the transport of sediment and erosion.

COMMON BMPS (CONT.)

BMP C202 Riprap Channel Lining

Riprap channel lining is used when natural soils or vegetated stabilized soils in a channel are not adequate to prevent channel erosion.

BMP C241E Sediment Pond (Temporary)

Sediment ponds are temporary ponds used during construction to remove sediment from runoff originating from disturbed areas of the site. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 millimeters). Consequently, they usually reduce turbidity only slightly.

BMP C207E Check Dams

Construction of check dams across a swale or ditch reduces the velocity of concentrated flow and dissipates energy at the check dam.

COMMON BMPS (CONT.)

BMP C101E Preserving Natural Vegetation

The purpose of preserving natural vegetation is to reduce erosion wherever practicable. Limiting site disturbance is the single most effective method for reducing erosion. For example, conifers can hold up to about 50% of all rain that falls during a storm. Up to 20% to 30% of this rain may never reach the ground but is taken up by the tree or evaporates. Another benefit is that the rain held in the tree can be released slowly to the ground after the storm.

COMMON BMPS (CONT.)

BMP C162 Scheduling

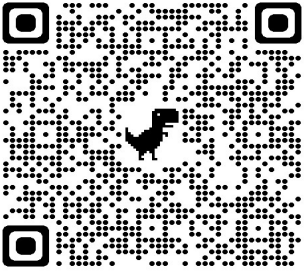
Sequencing a construction project can reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking.

MUNICIPAL STORMWATER CODES

The EWA MS4 Phase II Permit requires implementing and enforcing programs to reduce pollutants in stormwater from construction activities that disturb one acre or more, and from construction projects of less than one acre that are part of a larger common plan or sale.

Permittees must implement code or other regulatory mechanisms to require erosion and sediment controls and other construction phase stormwater pollution controls at new development and redevelopment projects.

Not complying with municipal codes can result in project delays, fines, or even imprisonment.



City of Spokane Valley Stormwater Code

RESOURCES

City of Spokane Valley
10210 E Sprague Ave
Spokane Valley, WA, 99206
509-720-5000

Spokane Regional Stormwater Manual