

**NPDES Order CAS 000005
BMP Fact Sheets**

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BMP 1-01 SEDIMENT CONTROLS

Scheduling

Scheduling must be considered for applicable projects year-round.

When

How

Use the following measures as applicable:

- Avoid scheduling construction activities during a rain event.
- Consider scheduling major soil disturbing activities or activities near environmentally sensitive areas (e.g., adjacent to water bodies) during the non-rainy season.
- Monitor the weather forecast for seasonable and unseasonable rain events. Weather information is available from the Interactive Weather Information Network (IWIN) website at <http://iwin.nws.noaa.gov/iwin/ca/ca.html>
- Always be prepared to deploy erosion and sediment control and soil stabilization BMPs. Off site sediment discharges can occur during the non-rainy season because of unseasonable rainfall, wind, non-storm water discharges, and vehicle tracking and must be prevented.

PLUS, DURING THE RAINY SEASON

- Sequence work to minimize or avoid soil-disturbing activities during forecasted rain events.
- Limit disturbed soil area to the amount of acreage that can be protected prior to a forecasted rain event.
- Stabilize disturbed soil areas as soon as practical, and, at a minimum, prior to a forecasted rain event.
- Protect environmentally sensitive areas, such as drainage channels, streams, and natural watercourses.
- When rainfall is forecast, adjust the construction schedule to implement soil stabilization and sediment controls on all disturbed areas prior to the onset of rain.

Maintenance and Inspection

- Review applicable scheduling and sequencing of construction activities throughout the project to minimize the amount or time that soil is exposed and the total area of exposed soil.
- Inspect erosion and sediment controls prior and after each storm event, and routinely throughout the rainy season (to be consistent with all the other BMPs).

BMP 1-02 SEDIMENT CONTROLS

Silt Fence

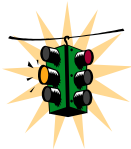
When Silt fences are temporary linear sediment barriers made of permeable fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff. Silt fences allow sediment to settle from runoff before water leaves the construction site.

Silt fences are placed:

- Below the toe of exposed and erodible slopes.
- Down-slope of exposed soil areas.
- Around temporary stockpiles.
- Along streams and channels.
- Along the perimeter of a project.

How

- Construct silt fences with a setback of at least 3 feet from the toe of a slope in areas suitable for temporary ponding or deposition of sediment. Where a 3-foot setback is not practicable, construct as far from the toe of the slope as practicable.
- Generally, silt fences shall be used in conjunction with soil stabilization source controls up slope to provide effective control, particularly for slopes adjacent to water bodies or Environmentally Sensitive Areas.
- Construct the length of each reach (length of fence) so that the change in base elevation along the reach does not exceed 1/3 the height of the barrier; each reach should not exceed 500 feet. The last 6 feet of the reach should be turned upslope.
- The maximum length of slope draining to the silt fence should be 200 ft or less.
- Excavate a trench to place the bottom of the silt fence into that is not wider or deeper than necessary.
- Key-in, or bury the bottom of silt fence fabric in trench and tamp into place. If it is not feasible to trench along the slope contour, use sand bags or backfilling to key in the bottom of the fabric.
- Install fence post at least 12 inches below grade on down slope side of trench.
- **Silt fences should not be considered for installation below slopes steeper than 1:1 (vertical : horizontal) or that contain a high number of rocks or loose dirt clods.**



Maintenance and Inspection

- Repair or replace split, torn, slumping, undercut or weathered fabric.
- Inspect silt fences prior and after each storm event, and routinely throughout the rainy season.
- Remove accumulated sediment when it reaches one third (1/3) of the barrier height. Removed sediment shall be incorporated in the project at appropriate locations or disposed of in accordance with all applicable laws and regulations.
- Silt fences that are damaged and become unsuitable for the intended purpose shall be removed and disposed of and replaced with new silt fence barriers.
- Remove silt fence when no longer needed. Fill and compact post-holes and anchorage trench, remove sediment accumulation, and grade fence alignment to blend with adjacent ground.

BMP 1-03 SEDIMENT CONTROLS

Fiber Rolls

When A fiber roll consists of straw, flax or other similar materials that are rolled and bound into a tight roll that is generally placed on the face of slopes at regular intervals to intercept runoff, reduce flow velocity, release the runoff as sheet flow and provide the removal of sediment.

- May be used along the top, face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
- Fiber rolls may be used as check dams.
- Fiber Rolls can also be used where flows are moderately concentrated, such as ditches, swales, and storm drain inlets (Storm Drain Inlet Protection to divert and/or detain flows.).
- Fiber rolls are appropriate for perimeter site control or along streams, channels, storm drain inlets, or around stockpiles to intercept sediment laden storm water and non-storm water runoff.

How Installation

- Locate fiber rolls on level contours spaced 8 to 20 feet apart along the face of the slope.
- Its best to stake fiber rolls into a 2 to 4 inch deep trench.
- Drive stakes into fiber rolls at a minimum of 4-foot intervals
- If more then one fiber roll is placed in a row, fiber rolls should be butted together and not overlapped.

Removal

- If used on slopes, fiber rolls are typically left in place.
- If used as Storm Drain Inlet Protection, stockpile control, or other temporary control measures, the fiber rolls should be removed at the completion of the construction project.
- If fiber rolls are removed, collect and dispose of fiber roll and sediment accumulation as appropriate. Fill and compact holes, trenches, depressions, or any other ground disturbance to blend with adjacent ground.

Maintenance and Inspection

- Repair or replace spilt, torn, unraveling, or slumping fiber rolls.
- Inspect fiber rolls if rain is forecasted, perform maintenance as needed.
- Inspect fiber rolls prior and after each storm event, and routinely throughout the rainy season.

BMP 1-04 SEDIMENT CONTROLS

Gravel Bag Berm

- When** A gravel bag berm consists of a single row of gravel bags that are installed end-to-end to form a barrier across a slope to intercept runoff, reduce its flow velocity, release the runoff as sheet flow and provide some sediment removal. Gravel bags can also be used where flows are moderately concentrated, such as ditches, swales, and storm drain inlets (Storm Drain Inlet Protection to divert and/or detain flows). Gravel bag berms are appropriate for perimeter site control or along streams, channels, storm drain inlets, or around stockpiles to intercept sediment laden storm water and non-storm water runoff. Use gravel bag berms:
- Where it is desirable to filter sediment in runoff. Note that gravel bag berms are generally more permeable than sand bags. Sand bag barriers should be used in cases where it is desirable to block and pond flows (e.g., for containment of non-storm water flows).
 - Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
 - On a project-by-project basis to maximize effectiveness.
 - Gravel bags may be implemented with other BMPs to maximize sediment containment.
- How**
- When used as a linear control for sediment removal:
 - Install along a level contour.
 - Turn ends of gravel bag row up slope to prevent flow around the ends.
 - Generally, gravel bag barriers are used in conjunction with temporary soil stabilization controls up slope to provide effective control.
 - When used for concentrated flows:
 - Stack gravel bags to required height. When the height requires 3 rows or more, use a pyramid approach.
 - Upper rows of gravel bags shall overlap joints in lower rows.
 - Construct gravel bag barriers with a setback of at least 3 feet from the toe of a slope. Where a 3-foot setback is not practicable, construct as far from the toe of the slope as practicable.
- Maintenance and Inspection**
- Inspect gravel bag berms prior and after each storm event, and routinely throughout the rainy season.
 - Reshape or replace gravel bags as needed.
 - Repair washouts or other damages as needed.
 - Inspect gravel bag berms for sediment accumulations and remove sediments when accumulation reaches one-third of the berm height. Removed sediment shall be incorporated in the project at appropriate locations or disposed of in accordance with all applicable laws and regulations.
 - Remove gravel bag berms when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilize the area. Removed sediment shall be incorporated in the project at appropriate locations or disposed of in accordance with all applicable laws and regulations.

BMP 1-05 SEDIMENT CONTROLS

Sand Bag Barrier

- When** A sand bag barrier is a temporary linear sediment barrier consisting of stacked sand bags, designed to intercept and slow sediment-laden storm water and non-storm water runoff. Sand bag barriers allow sediment to settle from runoff before water leaves the construction site.
- Sand bags can be used where flows are moderately concentrated, such as ditches, swales, and storm drain inlets to divert and/or detain flows. See BMP on Storm Drain Inlet Protection.
 - To divert or direct flow away from disturbed slopes or create a temporary sediment basin.
 - During construction activities in streambeds when the contributing drainage area is 1 to 5 acres.
 - To capture and detain non-storm water flows until proper cleaning operations occur.
 - When site conditions or construction sequencing require adjustments or relocation of the barrier to meet changing field conditions and needs during construction.
 - To temporarily close or continue broken, damaged or incomplete curbs.

Sand bag barriers are used:

- Where it is desirable to block and pond flow (e.g., for containment of non-storm water flows). Use caution when using sand bag barriers in traffic areas or other areas where potential flooding is not desirable.
- Along the perimeter of a site, vehicle and equipment fueling and maintenance areas, chemical storage areas, or stockpiles.
- Below the toe or down slope of exposed and erodible slopes.
- Parallel to streams, channels, and roadways.
- Across channels to serve as a barrier for utility trenches or provide a temporary channel crossing for construction equipment, or to reduce stream impacts.

- How**
- When used as a linear control for sediment removal:
 - Install along a level contour.
 - Turn ends of sand bag row up slope to prevent flow around the ends.
 - Generally, sand bag barriers shall be used in conjunction with temporary soil stabilization controls up slope to provide effective control.
 - When used for concentrated flows:
 - Stack sand bags to required height. When the required height is three rows or more, use a pyramid approach. Upper rows of sand bags shall overlap joints in lower rows.
 - Construct sand bag barriers with a setback of at least 3 feet from the toe of a slope. Where a 3-foot setback is not practicable, construct as far from the toe of the slope as practicable.

BMP 1-05 SEDIMENT CONTROLS

Sand Bag Barrier

Maintenance and Inspection

- Inspect sand bag barriers prior and after each storm event, and routinely throughout the rainy season.
- Repair washouts or other damages as needed, or as directed by the projects Environmental Representative.
- Inspect sand bag barriers for sediment accumulations and remove sediments when accumulation reaches one-third the barrier height.
- Remove sand bags when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilized the area. Incorporate removed sediment at appropriate project locations or dispose of in accordance with all applicable laws and regulations.

BMP 1-06 SEDIMENT CONTROLS

Storm Drain Inlet Protection

When A device used at storm drain inlets to protect against the discharge of sediment-laden storm water and non-storm water runoff from construction activities. The device develops a pond behind it giving the sediment time to settle out before discharge to the storm drain. Do not construct such that runoff will result in:

- Ponding into road traffic or onto erodible surfaces or slopes, or
- Overflowing onto the sidewalk

This BMP is required on all construction projects where sediment laden surface runoff may enter a storm drain inlet and watercourses.

How

- Identify downstream storm drain inlets that have the potential to runoff from construction activities.
- Where a storm drain inlet is on or at the bottom of a slope, a series of small check dams (i.e., gravel bags) constructed at intervals along the slope may be required to slow the runoff.
- Select appropriate protection and construct inlet protection based on the configuration of inlets at the site.

Maintenance and Inspection

- Inspect inlet protection devices prior and after storm event, and routinely throughout the rainy season.
- Remove inlet protection devices at the end of the construction period, or when the inlet can no longer be impacted by the project.
- During inspections:
 - Inspect bags, silt fence, or filter fabric for holes, gashes, and snags.
 - Check gravel bags for proper arrangement and displacement; and
 - Remove the sediment behind the barrier when it reaches one-third the height of the barrier. Removed sediment should be incorporated in the project or disposed of in accordance with all applicable laws and regulations.

BMP 1-07 SEDIMENT CONTROLS

Tracking Controls

When Tracking controls reduce offsite tracking of sediment and other pollutants by providing a stabilized entrance at defined construction site entrances and exits and/or providing methods to clean-up sediment or other materials to prevent them from entering a storm drain by sweeping or vacuuming.

- Stabilize entrances should be implemented on a project-by-project basis in addition to other BMPs.
- Sweeping or vacuuming should be implemented when sediment is tracked from the project site onto public or private paved roads, typically at points of site exit.
- Use stabilized entrances and/or sweeping at construction sites:
 - where dirt or mud is tracked onto public roads
 - adjacent to water bodies
 - where poor soils are encountered, such as soils containing clay.
 - where dust is a problem during dry weather conditions.

How Stabilized Construction Entrances

- Limit the points of entrance/exit to the construction site by designating combination or single purpose entrances and exits. Require all employees, subcontractors and others to use them. Limit speed of vehicles to control dust.
- Grade each construction entrance/exit to prevent runoff from leaving the construction site.
- Route runoff from stabilized entrances/exits through a sediment-trapping device before discharge.
- Design stabilized entrance/exit to support heaviest vehicles and equipment that will use it.
- Select construction access stabilization (aggregate, asphaltic concrete, concrete) based on longevity, required performance, and site conditions.
- Use of constructed or constructed/manufactured steel plates with ribs for entrance/exit access is allowed.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 inches deep, or place aggregate to a depth recommended by a geotechnical engineer. A crushed aggregate greater than 3 inches but smaller than 6 inches shall be used.

Street Sweeping and Vacuuming

- Inspect potential sediment tracking locations routinely.
- Visible sediment tracking should be swept or vacuumed as needed. Manual sweeping is appropriate for small jobs.
- Manual sweeping is appropriate for small projects. For larger projects, it is preferred to use sweeping methods that collect removed sediment and material.

If not mixed with debris or trash, incorporate the removed sediment back into the project or dispose of it at an approved disposal site.

BMP 1-07 SEDIMENT CONTROLS

Tracking Controls

Maintenance and Inspection

Stabilized Construction Entrance

- Inspect routinely for damage and assess effectiveness. Repair if access is clogged with sediment.
- Where tracking has occurred on roadways sweeping should be conducted the same day. Preferably water should not be used to wash sediment off the streets. If water is used, it should be captured preventing sediment-laden water from running off the site.
- Keep all temporary roadway ditches clear.

Street Sweeping and Vacuuming

- Inspect inlet and outlet access points routinely and sweep tracked sediment as needed.
- Be careful not to sweep up any unknown substance or any object that may be potentially hazardous.
- After sweeping is finished, properly dispose of sweeper wastes.

BMP 1-08 SEDIMENT CONTROLS

Stockpile Management

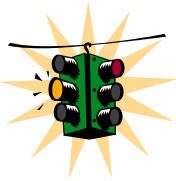
When Use this BMP when projects require stockpiled soil and paving materials. The stockpile management practices used differ based on forecasted weather or terrain.

- Protection of stockpiles must be implemented whenever there is a potential for transport of materials by a water source (forecast precipitation or any non-storm water runoff).

How

- One or more of the following options may be used to manage stockpiles and prevent stockpile erosion and sediment discharges for stormwater and non-storm water runoff/run-on.

- Stockpile may be returned to the excavation if precipitation is forecast.
- Protect stockpiles from stormwater run-on using a temporary perimeter sediment barrier such as berms, silt fences, fiber rolls, covers, sand/gravel bags, or straw bale barriers, as appropriate.
- Stockpiles may be hauled off or temporarily stored in a protected location off site.
- Keep stockpiles organized and surrounding areas clean.
- Protect storm drain inlets, watercourses, and waterbodies from stockpiles, as appropriate.
- Implement dust control practices as appropriate on all stockpiled material.
- **Stockpiles left on site must be covered, stabilized, or protected with a perimeter sediment barrier prior to the onset of precipitation.**



Maintenance and Inspection

Repair and/or replace covers, and perimeter containment structures as needed.

BMP 2-01 WASTE MANAGEMENT AND MATERIAL CONTROLS

Material Delivery and Storage

When If it is necessary to store materials at a construction site. This BMP does not apply to materials and supplies stored on trucks that are driven on site and off site daily.

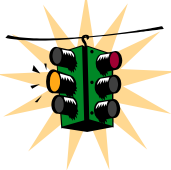
How Use the following measures as appropriate:

- Only store the minimum amount of material that is needed for the job.
- Locate storage areas away from storm drain inlets, drainage systems, and watercourses to prevent storm water run-on from reaching the materials.
- If practical, store materials in enclosed storage containers such as cargo containers.
- Store materials on impervious surfaces or use plastic groundcovers to prevent any spills or leakage from contaminating the ground.
- For known hazardous materials, keep materials covered using plastic or other waterproof materials.
- If necessary provide secondary containment systems around material storage areas to prevent contaminated run-off/run-on from leaving storage area(s).
- Keep adequate supply of spill kit materials nearby.
- Ensure that qualified personnel are available when hazardous materials are delivered to ensure proper delivery and storage in designated area.
- When storage area is no longer needed, return it to original condition.
- Bagged materials such as cold patch, concrete mix, and other materials with the potential to pollute runoff should be placed on pallets and under cover.

Maintenance and Inspection Repair or replace covers, containment structures, or perimeter controls as needed to ensure proper functioning. Perform routine inspections of designated delivery and storage areas.

BMP 2-02 WASTE MANAGEMENT AND MATERIAL CONTROLS

Material Use

- When** Apply this BMP when the following materials are used or prepared on site:
- Pesticides and herbicides.
 - Fertilizers and soil amendments.
 - Detergents.
 - Petroleum products such as fuel, oil, and grease.
 - Asphalt and other concrete components.
 - Hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds.
 - Mastic, pipe wrap, primers, and paint.
 - Concrete compounds.
 - Welding material.
 - Other materials that may be detrimental if released to the environment.
- How**
- Reduce or eliminate use of hazardous materials on site when practical.
 - Allow empty latex paint and paint cans, used brushes, paint rags, absorbent materials, and drop cloths to thoroughly dry before disposal with other construction debris and in accordance with all applicable laws and regulations.
 - Do not remove the original product label; it contains important safety and disposal information. Use the entire product before disposing of the container.
 - When possible, mix paint indoors, otherwise use secondary containment structures. Do not clean paintbrushes or rinse paint containers into a street, gutter, storm drain, sanitary sewer or watercourse.
 - Dispose of any paint thinners, residue and sludge(s), that cannot be recycled, as hazardous waste. For water-based paint, clean brushes to the extent practical, and rinse into a concrete washout pit or temporary sediment trap. For oil-based paints, clean brushes to the extent practical and filter and reuse thinners and solvents.
 - If possible, recycle residual paints, solvents, non-treated lumber, and other materials.
 - **Do not over-apply fertilizers, pesticides, and soil amendments. Prepare only the amount needed. Strictly follow the recommended usage instructions.**
 - Keep an ample supply of spill clean up material near use areas. Instruct employees in spill clean up procedures.
 - Avoid exposing applied materials to rainfall unless sufficient time has been allowed for them to dry or cure.
 - Hazardous materials use shall also be managed in accordance with the BMP on “Hazardous Materials/Waste Management.”
- 
- Maintenance and Inspection**
- Spot-check employees and contractors regularly throughout the job’s duration to ensure appropriate practices are being employed.

BMP 2-03 WASTE MANAGEMENT AND MATERIAL CONTROLS

Spill Control

When	<p>This best management practice (BMP) applies to all construction sites at all times. Spill control procedures are implemented anytime chemicals and/or hazardous substances are stored. Substances may include, but are not limited to fuels, lubricants, solvents, fertilizers, pesticides, herbicides, soil binders, coolants, paints, and sewage.</p> <p>To the extent that work can be accomplished safely, spills of materials or chemicals shall be contained and cleaned up immediately.</p>
How	<p>Stop the spillage of material if it can be done safely. Clean the contaminated area, and properly dispose of contaminated materials. Use the following spill prevention and controls when applicable.</p> <ul style="list-style-type: none">• Prevent spill from entering storm drain system or waterbody.• To the extent that it doesn't compromise clean up activities, spills shall be covered and protected from storm water run-on during rainfall.• Spills shall not be buried or diluted with wash water.• Used clean up materials, contaminated materials, and recovered spill material shall be stored and disposed of in accordance with all applicable laws and regulations. Refer to BMP on "Hazardous Materials/Waste Management".• Use absorbent materials on spills rather than using water to hose down the spill.• When water is used for cleaning and decontamination of a spill, the water shall not be allowed to enter storm drain inlets or watercourses, and shall be collected and disposed of properly. Dispose of these materials in accordance with all applicable laws and regulations.• Keep spill cleanup kits in areas where any materials are used and stored.
Maintenance and Inspection	<ul style="list-style-type: none">• Perform routine inspections to verify that spill control clean up materials are near material storage, unloading, and use areas.

BMP 2-04 WASTE MANAGEMENT AND MATERIAL CONTROLS

Soild Waste Management

When	<p>These BMPs should be used on all construction projects that generate solid waste. Solid wastes may include, but are not limited to concrete, cement, asphalt rubble, masonry brick/block, vegetation debris, steel and scrap metals, pipe and electrical cuttings, non-hazardous equipment parts, Styrofoam, general trash and other materials used to transport and package construction materials.</p>
How	<ul style="list-style-type: none">• Practice good housekeeping and keep site clean.• Use “dry” methods for site clean up such as sweeping, vacuuming and hand pick-up.• Designate a waste storage area on site. If a designated waste storage area is not feasible, remove wastes from the site regularly.• Prohibit littering by employees, contractors and visitors.• Trash receptacles should be available on site and/or on construction vehicles.• Protect wastes from being washed away by rainfall, storm water run-on, or other waters (irrigation, water line breaks, etc.).• To prevent storm water run-on from contacting stored solid waste (stockpiled materials) use berms, secondary containment, covered dumpsters/roll-offs or other temporary diversion structure or measures.• For materials with the potential for spills or leaks, stockpile on impervious surfaces or use plastic groundcovers to prevent spills or leaks from infiltrating the ground.• Do not hose out or clean out dumpsters or containers at the construction site.• Prevent solid waste and trash from entering and clogging storm drain inlets.• As practical, incorporate any removed clean sediment and soil back into the project.• Reference BMP on Stockpile Management.
Maintenance and Inspection	<ul style="list-style-type: none">• Collect site trash regularly, especially before rainy or windy conditions.• Perform routine inspections of site, including storage areas, dumpsters, stockpiles and other areas where trash and debris are collected.• Close trashcan lids and dumpster covers before rainy or windy conditions.

BMP 2-05 WASTE MANAGEMENT AND MATERIAL CONTROLS

Hazardous Materials/Waste Management

- When** Use this BMP when projects involve the storage and use of hazardous materials, and the generation of waste byproducts, from the following:
- Petroleum products such as oils, fuels, greases, cold mix, and tars
 - Glues, adhesives, and solvents
 - Herbicides, pesticides, and fertilizers
 - Paints, stains, and curing compounds
 - Other hazardous or toxic substances
- How** Hazardous materials and wastes shall be managed in accordance with the following procedures:
- Minimize the amount of hazardous materials stored at the construction site and the production and generation of hazardous waste at the construction site.
 - Cover or containerize and protect from vandalism any hazardous materials and wastes.
 - Clearly mark all hazardous materials and wastes. Place hazardous waste containers in secondary containment systems if stored at the construction site.
 - Stockpiled cold mix should be placed on and covered with plastic (See BMP 1-08 on Stockpile Management).
 - Do not mix waste materials, because this complicates or inhibits disposal and recycling options and can result in dangerous chemical reactions.
 - Storm water that collects within secondary containment structures must be inspected prior to being discharged to ensure no pollutants are present. Contaminated storm water is not allowed to be discharged and should be disposed of in accordance with all applicable laws and regulations.
 - Spills cannot be discharged from a secondary containment system. See BMP 2-03 on Spill Control.
 - Hazardous waste must be segregated from other solid waste and disposed of properly.
 - In addition to following this BMP, employees or contractors are responsible for compliance with federal, state, and local laws regarding storage, handling, transportation, and disposal of hazardous waste.
- Maintenance and Inspection**
- Routinely inspect the covers on hazardous material storage areas for tears or flaws and repair as necessary.
 - All secondary containment systems must be able to hold the volume of the largest container in the storage area, plus provide sufficient additional capacity for storm events.
 - Perform routine inspections to ensure that no hazardous materials or waste are improperly left exposed to storm water.

BMP 2-06 WASTE MANAGEMENT AND MATERIAL CONTROLS

Contaminated Soil Management

When This contaminated soil management BMP should be used whenever soil contamination is suspect or contaminated soil is encountered. Construction crews should be extra vigilant on projects located in highly urbanized or industrial areas where soil contamination may have occurred because of spills, illicit discharges, and leaks from underground storage tanks.

Contaminated soils may also be encountered during digging and trenching activities on highways and roadways.

How Contaminated soil wastes should be managed in accordance with the following procedures:

- Identify contaminated soil; look for the following:
 - Soil that is discolored, black, gray, white; or
 - Soil that has an unusual odor, such as, petroleum, acid, alkaline, sewage, solvent, or any other chemical smell.
 - Project location in area with prior history of the site's chemical use and storage and other similar factors.
- When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the discharger or authorized representative shall have those soils sampled and tested to ensure proper handling and public safety measures are implemented. The discharger or its authorized representative will notify the appropriate local, State, or federal agency(ies) and RWQCB when contaminated soil is found at a construction site, and will notify the RWQCB through the submittal of the LCTN or NOT at the completion of the project.

Maintenance and Inspection

- Perform routine inspections of digging and trenching operations looking for contaminated soils.
- All contaminated soils must be managed as hazardous substances, if applicable, in accordance with applicable laws and regulations.

BMP 2-07 WASTE MANAGEMENT AND MATERIAL CONTROLS

Sanitary/Septic Waste Management

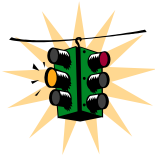
When	Use this BMP on all construction sites that use temporary or portable sanitary/septic waste systems.
How	<p>Sanitary/septic wastes shall be managed in accordance with the following procedures:</p> <ul style="list-style-type: none">• Incorporate into regular safety meetings, education of employees, contractors, and suppliers on:<ul style="list-style-type: none">– potential dangers to humans and the environment from sanitary/septic wastes– approved sanitary/septic waste storage and disposal procedures.• Temporary sanitary facilities should be located away from drainage facilities, watercourses, and from traffic circulation. When subjected to high winds or risk of high winds, temporary sanitary facilities shall be secured to prevent overturning.• Sanitary wastewater should not be buried or discharged, except to a properly permitted sanitary sewer discharge facility. A permit may be required from the local Sanitation District.• Use only reputable, licensed sanitary/septic waste haulers.• Temporary sanitary facility's holding tanks shall be emptied prior to transport.
Maintenance and Inspection	<ul style="list-style-type: none">• Onsite sanitary/septic waste storage and disposal should be routinely inspected.• Ensure that sanitary/septic facilities are maintained in good working order routinely serviced by a licensed service.

BMP 2-08 WASTE MANAGEMENT AND MATERIAL CONTROLS

Liquid Waste Management

- When**
- Liquid waste management is applicable to construction projects that generate non-hazardous byproducts, residuals, or wastes, that include but are not limited to:
 - Drilling slurries and drilling fluids
 - Grease-free and oil-free wastewater and rinse water
 - Dredging spoils
 - Other non-storm water liquid discharges not permitted by separate permits.
 - Separate BMPs should also be referenced for the following onsite liquid wastes:
 - Dewatering operations (BMP 3-01 Dewatering Operations)
 - Liquid hazardous wastes (BMP 2-05 Hazardous Materials/Waste Management), or
 - Concrete slurry residue (BMP 3-05 Concrete/Coring/Sawcutting and Drilling Waste Management)

- How**
- Vehicle and equipment cleaning using water is discouraged on site Reference BMP 3-03 Vehicle and Equipment Washing.
 - Drilling residue and drilling fluids shall not be discharged to a storm drain or waterbody and must be disposed of in accordance with all applicable laws and regulations..
 - Wastes generated as part of an operational procedure, such as waterladen dredged material and drilling mud, should be contained and not allowed to flow into drainage channels or receiving waters.
 - Contain non-hazardous liquid wastes in a controlled area, such as a lined holding pit, lined sediment basin, roll-off bin, or portable tank. Reference BMP 2-03, Spill Control.
 - Containment devices must be of sufficient quantity or volume to completely contain the liquid wastes generated and any addition volume based on anticipated rainfall.
 - **Do not locate containment areas or devices where accidental release of the contained liquid can threaten health or safety, or discharge to watercourses, storm drain system, or to a receiving water.**
 - Capture all liquid wastes running off a surface that has the potential to affect the storm drainage system. Examples are: wash water and rinse water from cleaning walls or pavement.
 - Disposal of liquid wastes are subject to specific laws and regulations, or to requirements of other permits secured for the construction project.



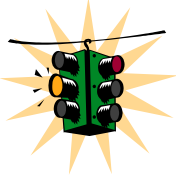
Maintenance and Inspection

- Remove deposited solids from containment areas and containment systems as needed, and at the completion of the project.
- Inspect containment areas and containment systems routinely for damage, and repair as needed.

BMP 3-01 NON-STORM WATER DISCHARGE CONTROLS

Dewatering Operations

- When**
- This BMP is applicable to trench or excavation dewatering.
 - Discharges of non-storm water from a trench or excavation that contain sediments or other pollutants to the sanitary sewer, storm drain systems, creek bed (even if dry), or receiving waters is prohibited.
 - **This BMP is not applicable to utility vault or sub-structure dewatering. For these applications, refer to the BMP 3-06 on Dewatering Utility Substructures and Vaults.**
 - **This BMP is not applicable if the water is known, or suspected to be, contaminated.**



- How**
- Water generated by dewatering activities may be managed in accordance with the following procedures:
- Use water where possible for construction activities such as compaction and dust control. If used for these applications, ensure that the water will infiltrate and not run-off from the land to storm drain systems, to creek beds (even if dry) or to receiving waters.
 - If allowed, infiltrate to an appropriate landscaped, vegetated or soil area. Note: Infiltration may be prohibited in accordance with local requirements. See “When” above.
 - Non-contaminated water may be discharged to land for infiltration when:
 - The water contain sediment but is not contaminated with other pollutants.
 - The water does not run-off from the land to storm drain systems, to creek beds (even if dry) or other surface waters.
 - Permission from the property owner on which the infiltration will occur has been received.
 - The local RWQCB and local agency(ies) have been contacted and discharge is authorized or permitted, if applicable.
 - If a permit is required, provide temporary onsite storage (Baker tanks, etc.) of water removed from trenches, excavations, etc., until a permit to discharge is obtained. Discharge water in accordance with permit conditions.
 - If a permit is obtained for discharge to a storm water or sanitary sewer system, conduct all dewatering discharge activities in accordance with permit requirements.
 - If dewatering is prohibited, provide temporary onsite storage (Baker tanks, etc.) of water removed from trenches, excavations, etc., and dispose of the water in accordance with all applicable laws and regulations.
 - Dewatering activities may be prohibited or need coverage under a separate permit issued by the RWQCBs. Dischargers or authorized representatives shall check with the appropriate RWQCBs for any required permit or basin plan conditions prior to initial dewatering activities to land, storm drains, or waterbodies.

BMP 3-01 NON-STORM WATER DISCHARGE CONTROLS

Dewatering Operations

Maintenance and Inspection

- Inspect pumps, hoses and all equipment before use. Monitor dewatering operations to ensure it does not cause offsite discharge or erosion.
- Inspect routinely, when applicable activities are under way.

BMP 3-02 NON-STORM WATER DISCHARGE CONTROLS

Paving Operations

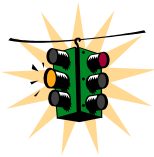
When Use this BMP for projects that involve pavement surfacing, resurfacing, removal, or patching applications of the following:

- Cold mix
- Asphalt
- Chip seal, seal coat, tack coat, slurry seal, or fog seal
- Portland cement concrete

For pavement grinding, sawcutting, coring or drilling, refer to BMP Concrete/Coring/Sawcutting and Drilling Waste Management.

How Use the following methods as applicable:

- Protect storm drain inlets near work and downgradient of the area to be paved.
- If onsite mixing is planned then an area must be designed for conducting the mixing. This area should be paved or made impervious (e.g., plastic or wood sheeting) and be located away from storm drain inlets or watercourses.
- Minimize overspray of tackifying emulsions or placement of other paving materials beyond the limits of the area to be paved.
- Use dry methods to clean equipment and conduct cleaning in accordance with the BMP 3-03 on Vehicle and Equipment Washing.
- Material use and stockpiles to be managed in accordance with BMPs 1-08 and 2-02 on Stockpile Management and Material Use, respectively.
- Collect and remove all broken asphalt and concrete, recycle when feasible and dispose of materials in accordance with local, state, and federal requirements.
- **Do not apply asphalt, concrete paving, seal coat, tack coat, slurry seal or fog seal if rain is expected during the application or curing period.**
- **Avoid if possible, transferring, loading, or unloading paving materials near storm drain inlets or watercourses. If not possible, use BMP 1-06 on Storm Drain Inlet Protection.**



Maintenance and Inspection

- Inspect and maintain equipment and machinery routinely to minimize leaks and drips.
- Inspect inlet protection measures routinely.

BMP 3-03 NON-STORM WATER DISCHARGE CONTROLS

Vehicle and Equipment Washing

When	Use these procedures on all construction sites where vehicle and equipment cleaning is performed. Note that onsite vehicle and equipment washing is not typically performed on small LUPs type construction projects.
How	<p>Use the following methods as applicable:</p> <ul style="list-style-type: none">• Use “dry” cleaning methods such as wiping down, rather than water washing vehicles or equipment.• Whenever possible washing should not be conducted at the construction site• If onsite vehicle washing must be conducted, use the following general methods:<ul style="list-style-type: none">– Vehicle and equipment washing must be located away from storm drain inlets, drainage systems, or watercourses.– Place sand bags or another type of berm around storm drain inlets and drainage systems to prevent wash water from entering a storm inlet, drainage system or watercourse.– Never discharge wash water to the storm drain system. Collect and dispose of the water in accordance with all applicable laws and regulations.– Use as little water as possible. High-pressure sprayers may use less water than a hose.– Use a positive shutoff valve to minimize water usage.
Maintenance and Inspection	Monitor employees and contractors through the duration of the construction project to ensure appropriate practices are being implemented.

BMP 3-04 NON-STORM WATER DISCHARGE CONTROLS

Vehicle and Equipment Fueling

When Use this BMP for projects where onsite fueling of vehicles and equipment, including handheld equipment, is planned.

Vehicle and equipment fueling, except for handheld equipment, is typically not done on the construction site. Onsite fueling of vehicles and equipment may be planned if it is impractical to send vehicles and equipment off site for fueling.

Handheld equipment is treated separately from other equipment. Handheld equipment includes those smaller, manually operated pieces of equipment such as trenchers, mowers, chainsaws, generators, and other equipment that need fueling during regular daily operation.

How Use the following measures as applicable:

Fueling Vehicles and Handheld Equipment

- If practical, fuel vehicles and equipment off site.
- Mobile fueling equipment is the preferred equipment used for onsite fueling.
- Fuel storage and fueling areas should be located away from storm drain inlets, drainage systems, and watercourses.
- All fueling will be conducted with the fueling operator in attendance at all times regardless if fuel nozzles are equipped with automatic shutoff features.
- Fuel tanks should not be “topped off.”
- All fueling operators should have readily available spill containment and cleanup equipment and materials.
- Clean up any spills immediately and properly dispose of contaminated materials.
- Properly store and dispose of rags and absorbent material used to clean up any spilled fuel.
- Mobile fueling trucks and operators must have all necessary permits, licenses and training.

Maintenance and Inspection

- Check to ensure adequate supply of spill cleanup materials are available.
- Perform routine inspections of designated fueling areas.
- Report spills in accordance with all applicable federal, state and local laws and regulations and in accordance with reporting requirements of this permit. .

BMP 3-05 NON-STORM WATER DISCHARGE CONTROLS

Concrete/Coring/Sawcutting and Drilling Waste Management

When Projects where concrete and asphalt are used or where slurry or pavement/concrete wastes are generated by construction activities, including:

- Sawcutting
- Coring/drilling
- Grinding, re-paving or patching
- Encasing conduit in concrete
- Tower footings

For managing any concrete curing compounds, use the BMP on Hazardous Materials/Hazardous Waste Management. For managing paving operations, use BMP Paving Operations.

How

- Install storm drain protection at any down-gradient inlets that may be impacted by the activity. See the BMP 1-06 on Storm Drain Inlet Protection.

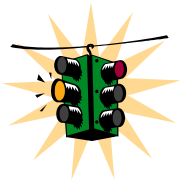
- Use dry techniques wherever possible. If water used, minimize the amount of water used during coring/drilling or sawcutting. During wet coring or sawcutting, use shovel or wet vacuum to lift the slurry from the pavement. Additionally, if wet vacuuming is not adequate to capture wastewater from the activity, sand bag barriers or other containment should be used.

- If concrete residue remains after drying, the area should be swept up and residue removed to avoid contact with storm water or entering a storm drain or waterbody via the wind.

- **Do not wash residue or particulate matter into a storm drain inlet or watercourse.**

- The following options should be used for concrete truck chute and/or pump and hose washout:

- If available, arrange to use an existing concrete washout station. Upon entering site, concrete truck drivers should be instructed about practices being used on site.
- **Concrete Washouts:** Washout stations can be a plastic lined temporary pit or bermed areas designed with sufficient volume to completely contain all liquid and waste concrete materials plus enough capacity for rainwater. The designated area must be located away from storm drain inlets, or watercourses.
- **Washout in Trench:** Manually rinsing the concrete truck chute into the trench itself.
- **Bucket Washout:** Manually rinsing the chute into a wheelbarrow, plastic bucket or pail, and then empty the bucket into the concrete truck barrel or on top of the placed concrete.



Maintenance and Inspection

- Responsible personnel should ensure that all concrete truck drivers are instructed about project practices when the trucks arrive onsite.
- Clean out designated washout areas as needed or at a minimum when the washout is 75 percent full to maintain sufficient capacity throughout the project duration.
- Any designated onsite washout areas must be cleaned out and all debris removed upon project completion. Dispose of concrete waste according to the BMP 2-04 on Solid Waste Management.
- Inspect routinely, when applicable activities are underway to ensure that concrete washout does not overflow.

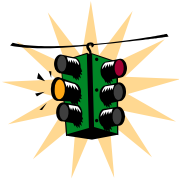
BMP 3-06 NON-STORM WATER DISCHARGE CONTROLS

Dewatering Utility Substructures and Vaults

When This BMP is applicable to utility substructure (vault) dewatering. This BMP does not apply to trench, excavation or other general dewatering associated with construction activities.

How The discharge of water from dewatering of vaults and substructures to the storm drain is allowed under an existing NPDES permit (General Permit CAG990002, Order No. 2001-11-DWQ). General requirements for discharge under this permit are listed below:

- All dewatering discharges conducted by utility crews, including contractors, shall follow the latest versions of permittee's dewatering procedure for Vault and Substructure Dewatering.
- Discharges to land require prior approval from the landowner.
- If the water to be discharged conforms to the practices within the dewatering procedure, the discharge is allowed.
- **During discharge, do not allow pollutants (e.g., sediment) to come in contact with the discharge. For example, if there is pre-existing soil in the path of the discharge (i.e., gutter), it must be swept up or avoided before discharging the substructure water.**



Maintenance and Inspection

- Implement applicable provisions of the dewatering procedure.
- Inspect pumps, hoses and equipment before use and routinely when applicable activities are underway.
- Observe dewatering activities to ensure they do not cause erosion or discharge of potential pollutants.

BMP 3-07 NON-STORM WATER DISCHARGE CONTROLS

Vegetation Management Including Mechanical and Chemical Weed Control

When Use this BMP whenever vegetation control is used. Vegetation control may consist of manual or mechanical removal of vegetation and/or chemical treatment.

How General Vegetation Management Procedures:

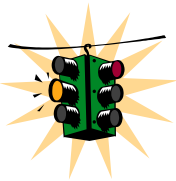
- Do not allow vegetation debris to enter storm drain inlets and watercourses.
- Identify drain inlets and watercourses, both upstream and downstream of the work site(s).
- Pre-plan the work to protect stormwater drainage systems and watercourses from discharge of potential pollutants, maintain equipment in good operating condition.
- Set up the work area to minimize the tracking of material by vehicles and equipment in or out of the work area.

Practice Good Housekeeping at the Work Site(s):

- Litter and debris should be collected and disposed of properly.
- Containers of liquids should be secured with lids until needed.
- Transport collected non-hazardous materials for proper disposal. If the material is a hazardous waste, follow the BMP on Hazardous Materials & Hazardous Waste Management. Contact your Environmental Representative.
- If a leak or spill occurs, protect drainage systems and watercourses from spilled material; follow the BMP on Storm Drain Inlet Protection.

Mechanical Weed Control Procedures

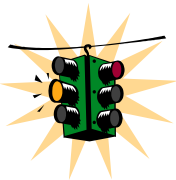
Mechanical weed control is the physical removal of weeds or unwanted vegetation growing around electric utility poles and electric distribution or transmission structures for fire control.



- **Do not stack or leave removed weeds or vegetation or other debris on or near drain inlets or in the storm water drainage system or watercourses.**
- **Do not fuel equipment next to drain inlets or place fuel or oil cans near or in watercourses, the storm drainage system or next to a drain inlet.**
- **Because of fire control requirements, do not leave cut vegetation around structures.**

Chemical Weed Control Procedures

This method of weed and vegetation control uses herbicides to eliminate and prevent weed growth. The purpose is to control vegetation growth year-round as needed for effective fire control.



To achieve effective vegetation control through chemical means and protect the environment, application personnel should:

- Use the correct herbicide for the application.
- Consider the seasonal timing of the application as applicable.
- **Do not use chemical vegetation control prior to a forecasted rain event.**

The applicators shall follow the following procedures:

- Consider alternative techniques as a first alternative to the use of chemicals.
- Consider using less toxic chemicals.
- Apply in accordance with label instructions and all applicable laws and regulations.

BMP 3-07 NON-STORM WATER DISCHARGE CONTROLS

Vegetation Management Including Mechanical and Chemical Weed Control

How (continued)

- Apply pesticides only as specified on the “Pesticide Use Recommendation” on the label. The pesticide label is considered the law, and use of an herbicide inconsistent with the label is considered a violation. Follow safety and application methods as specified in the Annual Pesticide Safety Training.
- Follow the herbicide/pesticide application protocol when near storm water drainage system or watercourses.
- Calibrate the spray rig as needed, to ensure accurate application of herbicides.
- Record the use of all herbicides.
- Avoid using overhead irrigation for as long as recommended by the chemical manufacturer after applying pesticides or post-emergents.
- Avoid applying post-emergents prior to a predicted rain event.

Maintenance and Inspection

- Ensure that spraying equipment is maintained to prevent malfunctions.
- Inspect to confirm that mechanical and chemical weed control procedures have not created an erosion problem.

BMP 3-08 NON-STORM WATER DISCHARGE CONTROLS

Over-Water Protection

When	<p>Prior to conducting over water activities, confirm the need for permits with appropriate local and state agencies.</p> <p>This BMP applies to projects where:</p> <ul style="list-style-type: none">• Construction, maintenance or repair activities will be conducted above surface waters. These activities include, but are not limited to, chipping, grinding, scraping, welding/burning, painting, wrapping and coating of pipes and conduits.• Surface waters (dry or running) include creeks, streams, rivers, lakes and wetlands, bays, estuaries and oceans.
How	<p>Use the following measures as applicable:</p> <ul style="list-style-type: none">• Containment systems must be properly designed and installed prior to the beginning of any operation that may impact a water body to prevent discharge of pollutants to surface waters.• The work area should be kept clean of all trash and potential pollutants.• Containment booms should be placed around the area of work as necessary to contain the discharge of potential contaminants such as oil and hydraulic fluid.• Special attention should be given to existing and forecasted wind and weather conditions to prevent pollutant discharges to surface waters.• Shrouds should be used to prevent paint overspray, welding slag, and other pollutants from entering surface waters and being dispersed into the air. Shrouding may not be effective during periods of high wind.• Shrouds should be large enough to adequately enclose or segregate the working area from surface waters. This may include a plywood barrier, visqueen, and scaffolding to help prevent fugitive material from entering surface waters.• Support structures such as scaffolding shall be used in conjunction with shrouding to withstand potential wind stress.• Contaminated shrouding material and equipment shall be thoroughly cleaned or disposed of properly.
Maintenance and Inspection	<ul style="list-style-type: none">• Inspect the containment systems and shrouds routinely during work activities to ensure their integrity.

BMP 3-09 NON-STORM WATER DISCHARGE CONTROLS

Removal of Underground Utility Location/Mark-Out Paint

When	Use this BMP when small LUPs involve mark-out by painting surfaces where underground utilities are located and where paint is required to be removed by local jurisdictions or another authority.
How	<p>Use the following methods and options to remove Utility Mark-Out Paint:</p> <ul style="list-style-type: none">• Use non-toxic, light degradable mark-out paint when possible• Hydro Pressure wash• Dry abrasive blast/grinding• Wet abrasive blast/grinding• Wet/Dry Vacuum• Dry Sweep• Install storm drain inlet protection at adjacent down gradient inlets during wet hydro pressure washing and wet abrasive blasting and grinding.• Minimize the amount of water used during hydro washing.• Use shovel or wet vacuum to lift the paint slurry from the pavement or surface.• If wet vacuuming is not adequate to capture all wastewater from these activities, use additional containment (sand bags, booms, or other containment devices) methods near the work area to prevent the discharge to a storm drain inlet or watercourse.• If paint residue remains after drying, the area should be swept up and residue removed to avoid contact with storm water.• If paint residue remains after sweeping, the area can be water washed, as long as the water containing the paint residue is not allowed to enter storm drain inlets or watercourses.• All waste should be disposed of using the BMP 2-08 for Liquid Waste Management.
Maintenance and Inspection	<ul style="list-style-type: none">• Inspect all containment systems to ensure proper placement prior to starting utility paint removal operations• Inspect and adjust equipment frequently; and maximize efficiency of the paint removal operations.

BMP 4-01 EROSION CONTROL AND SOIL STABILIZATION

Preservation of Existing Vegetation

- When** This BMP is applicable to projects when:
- There are areas on site where no construction activity is planned or will occur later.
 - Identify areas to be preserved in the immediate vicinity of the construction site, and mark as appropriate before clearing and grubbing or other soil disturbance activities begin.
 - Areas with vegetation that can be preserved to protect against soil erosion, such as on steep slopes, watercourses, and building sites in wooded areas.
 - Areas designated as Environmentally Sensitive Areas (ESAs), or where federal, state, or local government regulations require preservation, such as wetlands, vernal pools, marshes, etc. These areas are typically flagged by a qualified biologist.
- How** Use the following measures as applicable:
- Preserve existing vegetation whenever possible.
 - Whenever possible minimize disturbed areas by locating temporary roadways to avoid stands of trees and shrubs and follow existing contours to reduce cutting and filling.
 - Construction materials, equipment storage and parking areas should be located outside the drip line of any tree to be retained.
 - Consider the impact of grade changes to existing vegetation and the root zone.
 - Remove any markings, barriers, or fencing after project is completed.
- Maintenance and Inspection**
- Maintain the clearly marked limits of disturbance during construction as appropriate to preserve vegetation.
 - Inspect barriers regularly during construction.

BMP 4-02 EROSION CONTROL AND SOIL STABILIZATION

Temporary Soil Stabilization (General)

- When** This BMP is applicable to projects when steep slopes are disturbed.
- For surface protection methods to prepare or protect the soil surface from the combined erosive effects of wind, rain, and storm water runoff.
 - On slopes where the soil has been exposed because of construction activities, one or more Soil Stabilization BMPs may be required to be implemented.
- How**
- Use one or more of the below temporary soil stabilization practices when applicable as described above:
 - Hydraulic Mulch.
 - Hydro seeding.
 - Soil Binders.
 - Straw Mulch.
 - Geotextiles, Plastic Covers and Erosion Control Blankets/Mats.
 - Implement prior to the onset of precipitation.
 - Implement BMPs such as fiber rolls or gravel bag berms to break up the slope lengths as follows:
 - On steep slopes, BMPs should be placed on slopes 100 feet and greater at intervals no greater than 50 feet.
 - On very steep slopes, BMPs should be placed on slopes 50 feet and greater at intervals no greater than 25 feet.
 - Permanent erosion control shall be applied to areas deemed substantially complete during the project's defined seeding window.
 - Refer to individual Soil Stabilization BMPs for specific instructions for use.
- Maintenance and Inspection**
- Refer to individual temporary soil stabilization BMPs for maintenance and inspection requirements.

BMP 4-03 EROSION CONTROL AND SOIL STABILIZATION

Hydraulic Mulch

- When**
- Hydraulic mulch is typically applied to disturbed areas requiring temporary protection until permanent vegetation is established or disturbed areas that must be re-disturbed following an extended period of inactivity.
 - Avoid use in areas where the mulch would be incompatible with immediate earthwork activities and would have to be removed.
- How**
- Prior to application, roughen embankment and fill areas by rolling with a crimping or punching type roller or by track walking. Track walking shall only be used where other methods are impractical.
 - Avoid mulch over-spray onto the traveled way, sidewalks, lined drainage channels, and existing vegetation.
 - Hydraulic Mulches:
 - Apply as a liquid slurry using a hydraulic application machine (i.e., hydroseeder) at rates of mulch and stabilizing emulsion recommended by the manufacturer. Wood fiber hydraulic mulches are generally short-lived (only last a part of a growing season) and must be applied 24 hrs before rainfall to dry and become effective.
 - Hydraulic Matrices:
 - Apply a combination of wood fiber and/or paper fiber mixed with acrylic polymers as binders. Apply as a liquid slurry using a hydraulic application machine (i.e., hydroseeder) at rates recommended by the manufacturer. Hydraulic matrices must be applied 24 hours before rainfall to dry and become effective.
 - Bonded Fiber Matrix (BFM)
 - Apply BFM using a hydraulic application machine (mulch and tackifier are pre-mixed in a single bag) in accordance with manufacturers instructions. Do not apply immediately before, during, or after a rainfall.
- Maintenance and Inspection**
- Maintain an unbroken, temporary mulched ground cover throughout the period of construction when the soils are not being reworked. Inspect before expected rainstorms and repair any damaged ground cover and re-mulch exposed areas of bare soil.
 - After any rainfall event, maintain all slopes to prevent erosion.

BMP 4-04 EROSION CONTROL AND SOIL STABILIZATION

Hydroseeding

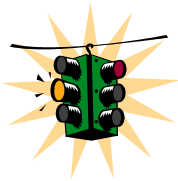
- When** Hydroseeding typically consists of applying a mixture of fiber, seed, fertilizer, and stabilizing emulsion with hydro-mulch equipment, which temporarily protects disturbed soil areas from erosion. It is applied on:
- Disturbed Soil Areas (DSAs) requiring temporary protection until permanent vegetation is established, or
 - DSAs that must be redisturbed following an extended period of inactivity.
- How**
- Avoid use of hydroseeding in areas where the best management practice (BMP) would be incompatible with future earthwork activities and would have to be removed such as:
 - Steep slopes are difficult to protect with temporary seeding.
 - Temporary seeding may not be appropriate in dry periods without supplemental irrigation.
 - Temporary vegetation may have to be removed before permanent vegetation is applied.
 - Temporary vegetation is not appropriate for short-term inactivity.
 - Hydroseeding can be accomplished using a multiple-step (with straw mulch) or a one-step process (mixed with hydraulic mulch, hydraulic matrix, or bonded fiber matrix). When the one-step process is used to apply the mixture of fiber, seed, etc., the seed rate shall be increased to compensate for all seed not having direct contact with the soil.
 - Prior to application, roughen the slope, fill area, or area to be seeded with the furrows trending along the contours.
 - Apply a straw mulch as necessary to keep seeds in place and to moderate soil moisture and temperature until the seeds germinate and grow.
 - Follow-up applications shall be made as needed to cover weak spots, and to maintain adequate soil protection.
 - Avoid over-spray onto the travel way, sidewalks, drainage channels and existing vegetation.
- Maintenance and Inspection**
- All seeded areas shall be inspected for failures and re-seeded, fertilized, and mulched within the planting season, using not less than half the original application rates. Any temporary revegetation efforts that do not provide adequate cover must be revegetated.
 - After any rainfall event, maintain all slopes to prevent erosion.

BMP 4-05 EROSION CONTROL AND SOIL STABILIZATION

Soil Binders

When Soil binders are typically applied to disturbed soil areas requiring short-term temporary protection. Because soil binders can often be incorporated into the work, they may be a good choice for areas where grading activities will soon resume.

- How**
- Soil binders are selected after an evaluation of site-specific factors. Binders have the following limitations:
 - Soil binders generally experience spot failures during heavy rainfall and may need reapplication after a storm and do not hold up to pedestrian or vehicular traffic.
 - Soil binders may not penetrate soil surfaces made up primarily of silt and clay, particularly when compacted.
 - Some soil binders may not perform well with low relative humidity. Under rainy conditions, some agents may become slippery or leach out of the soil.
 - May not cure if low temperatures occur within 24 hours of application.
 - Follow manufacturer's recommendations for application procedures and cleaning of equipment after use. Any onsite cleaning must use appropriate BMPs for pollution prevention plans.
 - Prior to application, roughen embankment and fill areas. Track walking shall only be used where rolling is impractical.
 - Soil binders should not be applied during or immediately before rainfall, as they require a minimum curing time of 24 hours before they are fully effective.
 - Avoid over-spray onto the traveled way, sidewalks, lined drainage channels, sound walls, and existing vegetation.
 - **Do not apply soil binders to frozen soil, areas with standing water, under freezing conditions, or when the temperature is below 4°C (40°F) during the curing period.**
 - More than one treatment is often necessary, although the second treatment may be diluted or have a lower application rate.
 - For liquid agents:
 - Crown or slope ground to avoid ponding.
 - Uniformly pre-wet ground according to manufacturer's recommendations.
 - Apply solution under pressure. Overlap solution 150 to 300 mm (6 to 12 in).
 - Allow treated area to cure for the time recommended by the manufacturer; typically, at least 24 hours.
 - Apply second treatment before first treatment becomes ineffective, using 50 percent application rate.
 - In low humidities, reactivate chemicals by re-wetting according to manufacturer's recommendations.



Maintenance and Inspection

- Reapplying the selected soil binder may be needed for proper maintenance. Traffic areas should be inspected routinely.
- After any rainfall event, maintain all slopes to prevent erosion.

BMP 4-06 EROSION CONTROL AND SOIL STABILIZATION

Straw Mulch

- When** Straw mulch is used when:
- Temporary soil stabilization surface cover is needed on disturbed areas until soils can be prepared for re-vegetation and permanent vegetation is established.
 - In combination with temporary and/or permanent seeding strategies to enhance plant establishment.
 - Note, there is a potential for introduction of weed-seed and unwanted plant material with straw.
- How**
- A tackifier is the preferred method for anchoring straw mulch to the soil on slopes. Tackifiers act to glue the straw fibers together and to the soil surface, and the tackifier shall be selected based on longevity and ability to hold the fibers in place. Soil binders (tackifier) will generally experience spot failures during heavy rainfall events.
 - A tackifier is typically applied at a rate of 125 pounds per acre. In windy conditions, the rates are typically 150 pounds per acre.
 - Crimping, punch roller-type rollers, or track-walking may also be used to incorporate straw mulch into the soil on slopes. Track walking shall only be used where other methods are impractical.
 - Avoid placing straw onto the traveled way, sidewalks, lined drainage channels, sound walls, and existing vegetation.
 - Straw mulch with tackifier shall not be applied during or immediately before rainfall.
 - Apply loose straw at a minimum rate of 4,000 pounds per acre, either by machine using a straw blower or by hand distribution.
 - The straw mulch must be evenly distributed on the soil surface.
 - Anchor the mulch in place by using a tackifier or by “punching” it into the soil mechanically. “Punching” of straw does not work in sandy soils.
 - Methods for holding the straw mulch in place depend on the slope steepness, accessibility, soil conditions and longevity. If the selected method is incorporation of straw mulch into the soil, then do as follows:
 - On small areas, a spade or shovel can be used.
 - On slopes with soils, which are stable enough, and of sufficient gradient to safely support construction equipment without contributing to compaction and instability problems, straw can be “punched” into the ground using a knife-blade roller or a straight bladed coulter, known commercially as a “crimper.”
 - On small areas and/or steep slopes, straw can also be held in place using plastic netting or jute. The netting shall be held in place using 11 gauge wire staples, geotextile pins or wooden stakes (as described in BMP on “Geotextiles, Plastic Covers and Erosion Control Blankets/Mats”).
 - Remove straw as necessary prior to permanent seeding or soil stabilization.
- Maintenance and Inspection**
- The key consideration in maintenance and inspection is that the straw needs to last long enough to achieve erosion control objectives.
 - Reapplication of straw mulch and tackifier may be required to maintain effective soil stabilization over disturbed areas and slopes.
 - After any rainfall event, maintain all slopes to prevent erosion.

BMP 4-07 EROSION CONTROL AND SOIL STABILIZATION

Geotextiles, Plastic Covers and Erosion Control Blankets/Mats

- When**
- The following methods are used when disturbed soils may be particularly difficult to stabilize or access, including the following situations:
 - Steep slopes, generally steeper than 1:3 (V:H).
 - Slopes where the erosion hazard is high.
 - Slopes and disturbed soils where mulch must be anchored.
 - Disturbed areas where plants are slow to develop adequate protective cover.
 - Channels with high flows.
 - Channels intended to be vegetated.
 - Slopes adjacent to water bodies of Environmentally Sensitive Areas (ESAs).
 - Blankets and mats are generally not suitable for excessively rocky sites, or areas where the final vegetation will be mowed (because staples and netting can catch in mowers).
 - Plastic results in 100 percent runoff, therefore, their use is limited to:
 - Covering stockpiles.
 - Covering small graded areas for short periods, such as through an imminent storm event, until alternative measures may be installed.
- How**
- Proper site preparation is essential to ensure complete contact of the blanket or matting with the soil.
 - Grade and shape the area of installation.
 - Remove all rocks, clods, vegetation or other obstructions so that the installed blankets or mats will have complete, direct contact with the soil.
 - Prepare seedbed by loosening of topsoil.
 - Seed the area before blanket installation for erosion control and revegetation. Seeding after mat installation is often specified for turf reinforcement application. When seeding prior to blanket installation, all check slots and other areas disturbed during installation must be re-seeded. Where soil filling is specified, seed the matting and the entire disturbed area after installation and prior to filling the mat with soil.
 - U-shaped wire staples, metal geotextile stake pins or triangular wooden stakes can be used to anchor mats and blankets to the ground surface.
 - Wire staples and metal stakes should be driven flush to the soil surface.
 - All anchors should be 6 in to 18 in long and have sufficient ground penetration to resist pullout. Longer anchors may be required for loose soils.
 - Installation on slopes – Consult the manufacturer’s recommendations for installation. In general, these will be as follows:
 - Begin at the top of the slope and anchor the blanket in a 6 in deep by 6 in wide trench. Backfill trench and tamp earth firmly.
 - Unroll blanket downslope in the direction of water flow.
 - Overlap the edges of adjacent parallel rolls 2 in to 3 in and staple every 3 ft.
 - When blankets must be spliced, place blankets end over end (shingle style) with 6 in overlap. Staple through overlapped area, approximately 12 in apart.
 - Lay blankets loosely and maintain direct contact with the soil. Do not stretch.
 - Staple blankets sufficiently to anchor blanket and maintain contact with the soil. Staples shall be placed down the center and staggered with the staples placed along the edges.
 - Blankets and mats must be removed and disposed of prior to application of

BMP 4-07 EROSION CONTROL AND SOIL STABILIZATION

Geotextiles, Plastic Covers and Erosion Control Blankets/Mats

Maintenance and Inspection

permanent soil stabilization measures.

- Areas treated with temporary soil stabilization should be inspected routinely and before and after significant forecasted storm events. Any failures should be repaired immediately. Areas treated with temporary soil stabilization should be maintained to provide adequate erosion control. Temporary soil stabilization should be reapplied or replaced on exposed soils when greater than 10 percent of the previously treated area becomes exposed or exhibits visible erosion.
- If washout or breakage occurs, re-install the material after repairing the damage to the slope or channel.

BMP 4-08 EROSION CONTROL AND SOIL STABILIZATION

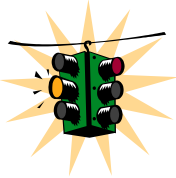
Dust (Wind Erosion) Control

When This practice is implemented on exposed soils or materials subject to wind erosion.

How Use the following measures as applicable:

- Water applied for dust control should be applied evenly and in a manner that does not generate runoff.
- Appropriate methods of applying dust control (covers or water and the means to apply it) should be available for projects with the potential to create dust.
- Dust control must be implemented in accordance with local air quality requirements.
- Non-potable water should not be conveyed in tanks or drainpipes that will be used to convey potable water and there should be no connection between potable and nonpotable supplies. Non-potable tanks, pipes and other conveyances should be marked “**NON-POTABLE WATER – DO NOT DRINK.**”
- If reclaimed wastewater is used for dust control, the sources and discharge must meet California Department of Health Services water reclamation criteria and the Regional Water Quality Control Board (RWQCB) requirements.

(dry or running)



Maintenance and Inspection

- Check areas protected to ensure coverage.
- Reapply water or maintain covers, as necessary to maintain their effectiveness.