#54 SOIL MANAGEMENT PLANS

• When is a Soil Management Plan Required?

All minor developments that have land disturbing activity of 7,000 square feet or greater shall amend the soils under any Pollution Generating Pervious Surfaces.

All major developments sites that create Pollution Generating Pervious Surfaces shall amend the soils under these surfaces.

See the handout "Stormwater and Residential Construction" for more information on minor and major developments.

• What is a Pollution Generating Pervious Surface?

A pollution generating pervious surface (PGPS) means any pervious surface subject to the use of pesticides and fertilizers or loss of soil. Typical residential PGPS include lawns and landscaped areas. Mark Clearing Limits or Areas of Disturbance. Describe the extent of your overall project. Indicate the boundaries of lawn, landscaping, trees to be preserved, and any sensitive buffer areas that need to be marked.

• I Need to Amend My Soils. Now What?

If you need to amend your soils, there are four methods to achieve compliance:

1. Leave undisturbed vegetation and soil alone. Protect it from compaction by fencing and keeping materials storage and equipment off these areas during construction. Note: In addition to a SWPPP, if your project disturbs more than 7,000 square feet of area a soil management plan may be required.
2. Amend the existing site topsoil or subsoil either at default "pre-approved" rates, or at custom calculated rates to meet the soil quality guidelines based on specifiers' tests of the soil and amendment. The default pre-approved rates are:
   - ➢ In planting beds, place 3 inches of compost and till in to an 8 inch depth;
   - ➢ In turf areas, place 1.75 inches of compost and till in to an 8 inch depth.
3. Stockpile existing topsoil during grading, and replace it prior to planting. Stockpiled topsoil must also be amended at the default "pre-approved" rate or at a custom calculated rate.
4. Import topsoil mix of sufficient organic content and depth to meet the requirements. The default pre-approved rates for imported topsoils are:
   - ➢ For planting beds, a mix by volume of 35 percent compost with 65 percent mineral soil;
   - ➢ For turf areas, a mix by volume of 20 percent compost with 80 percent mineral soil.

More than one method may be used on different portions of the same site. Soil that already meets the depth and organic matter quality standards and is not compacted does not need to be amended.

• What Information Do I Provide to the County?

A soil management plan is required to be submitted to the County. This plan includes the following items:

- ❖ Scaled site plan on minimum 11"x 17" paper.
- ❖ Identify areas where each amendment option will be applied and clearly indicate the option used (1-4 to the left).
- ❖ Identify compost, topsoils and other organic materials for amendment and mulch.
- ❖ Calculate amendment, topsoil and mulch volumes. For pre-approved amendment rates, figure the square footage of each area and complete the following calculation:

  _____inches of compost or imported topsoil

  x 3.1 (conversion factor, inches to cubic yards)

  _____ =cu.yards per 1,000 square feet

  X_____square feet in this area

  _____= cubic yards of amendment

At final inspection, a field verification of your amended soil will take place. If you are intending to bring topsoil from a permitted composting facility, please have truck trip tickets on site for review.

A list of permitted composting facilities is maintained by the Washington State Department of Ecology. For an up-to-date listing of local permitted composting facilities please visit the DOEwebsite: http://www.ecy.wa.gov/programs/swfa/compost/.

Kitsap County Department of Community Development
614 Division Street, MS-36
Port Orchard, WA 98366-4682
www.kitsapgov.com/dcd/

Phone: (360) 337-5777
Fax: (360) 337-4925
Form Number: DCD5054
Revision Date: 12/1/2010

GUIDE TO DEVELOPING A SOIL MANAGEMENT PLAN

This section outlines steps for professional specifiers to prepare a Soil Management Plan (SMP) to meet the provisions of BMP T5.13 in the Department of Ecology's Stormwater Manual for Western Washington. The main steps to creating the SMP are:

Step 1: Review Site Landscape Plans and Grading Plans.

Examine all areas that will not be covered by structures, impervious surfaces, or stormwater detention / infiltration structures, to assess how grading will impact soil conditions and determine areas where different soil treatments may be applied.

Those allowed soil treatment options are:

Option 1: Areas where native soil and/or vegetation will be retained in place;
Option 2: Areas where topsoil or subsoil will be amended in place;
Option 3: Areas where topsoil will be stripped and stockpiled prior to grading for reapplication, and;
Option 4: Areas where imported topsoil will be applied.

Step 2: Visit Site to Determine Soil Conditions

Working with plans, check the soil in each area to identify information outlined in the chart below.
Identify compaction of subgrade in each area by digging down to a level that will be 12" below finished grade.
Use a shovel or "rod penetrometer" driven solely by the your weight, as described in Section 3, and illustrated in Section 6 "Field Guide to Verifying Soil Quality and Depth."

Areas	Assess Conditions	Include Information on SMP
Native vegetation / undisturbed soil to be preserved	✓ Established native plants. ✓ Undisturbed topsoil and duff layer.	✓ Identify those areas to be left undisturbed and fenced during construction.
Topsoil not requiring grading, but cleared of native vegetation	✓ Depth of compacted layers less than 12 inches deep. ✓ Presence of organic matter that may make amendment unnecessary, or allow calculation of reduced amendment rate. ✓ If planning to use calculated amendment rate, sample and test soil as described in Step 4.	✓ Will scarification be needed? What depth of scarification is required to allow compost incorporation and achieve 12 inches uncompacted depth? ✓ Will area be amended with compost or topsoil at "pre-approved" rate, or custom calculated rate? ✓ Can areas be protected from compaction during construction?
Areas to be cut during grading	✓ Quantity of topsoil that can pbe stockpiled and reapplied. ✓ Depth of any compacted layer less than 12 inches below ultimate finished grade. ✓ Presence of organic matter in subgrade or topsoil that may make amendment unnecessary, or allow calculation of reduced amendment rate. ✓ If planning to use calculated amendment rate, sample and test soil as described in Step 4.	✓ Will scarification be needed? What depth of scarification is required to allow compost incorporation and achieve 12 inches uncompacted depth? ✓ Will topsoil be stockpiled during grading and reapplied? Will it require supplemental topsoil or compost to achieve 8 inches depth at specified organic content? ✓ Will area be amended with compost or topsoil at "pre-approved" rate, or at custom calculated rate?
Areas to be filled during grading	✓ Estimate what subgrade conditions will be when fill is in place. ✓ Depth of any compacted layer less than 12 inches below ultimate finished grade. ✓ Presence of organic matter in fill soil that may make amendment unnecessary, or allow calculation of reduced amendment rate. ✓ If planning to use calculated amendment rate, sample and test soil as described in Step 4.	✓ What depth of scarification is required to allow compost incorporation and achieve 12 inches uncompacted depth? ✓ Will area be amended with compost or topsoil at "pre-approved" rate, or custom calculated rate?

Step 3: Select Amendment Options.

The most convenient and economic method for achieving the Soil Quality and Depth guidelines depends on: site soil conditions, grading, and resulting subgrade compaction; the practicality of stockpiling topsoil during grading; and site access issues.

"Pre-Approved" or custom calculated rates?
Use of "Pre-Approved" amendment rates may simplify planning, however custom calculated rates can save substantial effort and expense—easily repaying the expense of testing and calculations. (See testing required for custom rates at right and on next page, and calculation method in Section 7 "Resources".)

Often pasture or woodland soils have adequate organic matter if existing organic layers are preserved. Also, compost products will frequently provide the desired soil organic matter content at lower applications than the Pre-Approved rates (which are based on "average" conditions).

Identifying Options on the Site Plan and SMP form

- Identify the areas where each amendment option will be applied by outlining each area on the site plan with a dark, thick-line pen.
- Assign each area an identifying number or letter (A, B, C…) on the plan, and on the Soil Management Plan form.

Step 4: Identify Compost, Topsoils and Other Organic Materials for Amendment and Mulch.

Amendments for Pre-Approved rates must be compost meeting the definition for "Composted Materials" in WAC 173-350, section 220, (available online at http://www.ecy.wa.gov/programs/swfa/compost/) or topsoil manufactured from these composts plus clean sand or sandy loam soil. Products must be identified on the Soil Management Plan form, and recent product test results must be provided showing that they meet the additional requirements in this Guide for organic matter content and carbon to nitrogen ratio (see specification in Section 3).

For Custom Calculated amendment rates (see right, next page, and formula in Section 7 "Resources"), organic matter may be provided by:

- Compost (as defined above), or
- Other by organic materials with a carbon to nitrogen ratio under 25:1 (35:1 for native plantings), meeting the same contaminant standards as "Composted Materials" in WAC 173-350, section 220.

These products must be identified on the Soil Management Plan form, and recent test results provided showing that they meet these requirements.

Step 5: Calculate Amendment, Topsoil and Mulch Volumes on SMP form

- For Pre-Approved amendment rates, figure the square footage of each area and complete the simple calculation to convert inches of amendment into cubic yards.
- To compute custom calculated amendment rates, use soil and amendment test results and the *Model Amendment Rate Calculator Spreadsheet* and/or the *Equation for Calculating Compost Application Rates* (both are in Section 7 "Resources") to achieve the target Soil Organic Matter content (10% SOM for landscape beds, or 5% SOM for turf areas).

Site Assessment Supplies

- Copy of site grading plan
- Sturdy shovel
- Tape measure

If using custom calculated amendment rates requiring soil tests:

- Clean bucket or stainless steel bowl for mixing soil samples
- Sealable bags for soil samples, and indelible ink pen to label

Sampling and Testing for Custom Calculated Amendment Rates

Soil and amendments submitted for testing should be a composite of samples taken from several spots on a site or in a pile of amendment.

Soil:

Gather samples from soil that will be the subgrade after all grading operations are completed, before placement of imported topsoil or amendments.

- Take samples from 10-12 spots in each area. Imagine a line dividing the area in half lengthwise, then divide each half into five near equal sized widths. Take samples near the middle of each subsection.
- At each sampling spot dig a spades-width hole at least 8 inches deep, then shave a 1 inch slice from the side of the hole to use in the composite sample.
- Thoroughly mix the 10-12 samples from each turf or planting area together in a clean plastic bucket or bowl. Place 2 cups of the mix into a sealable plastic bag for testing (some tests may require more soil, ask laboratories).
- Label the bag with the site information, area of sample; plus your name, address and phone number.

Amendment:

Producers of composts and manufactured topsoils can usually provide test results for their products. If tests are

nonexistent or incomplete, conduct necessary tests on each proposed amendment.

- Take samples from 10-12 spots in pile of material. Imagine a line dividing the pile in half lengthwise, then gather samples from five spots equally spaced along the length of each side of the pile.
- At each sampling spot, dig a spades-width hole at least 8 inches deep. Use a clean cup or trowel to collect a cup of amendment from the bottom of each hole.
- Thoroughly mix the 10-12 samples from each pile together in a clean plastic bucket or bowl. Place 2 cups of the mix into a sealable plastic bag for testing (some tests may require more compost, ask laboratories).
- Label the bag with the product and supplier information; plus your name, address and phone number.

Tests to Conduct for Custom Calculated Amendment Rates:

Soil	Compost Amendment
- Bulk Density	- Bulk Density
- Percent Organic Matter (by "loss on ignition" method)	- Percent Organic Matter (by "loss on ignition" method)
	- Moisture Content as is
	- Carbon to Nitrogen Ratio (C:N)
	- Heavy Metals Analysis (per WAC 173-350, section 220)

Model SOIL MANAGEMENT PLAN for BMP T5.13

(available as MS Word file at www.SoilsforSalmon.org)

PROJECT INFORMATION Page # ____ of ____ pages

Complete all information on page 1; only site address and permit number on additional pages.

Site Address / Lot No.:	
Permit Type:	**Permit Number:**
Permit Holder:	**Phone:**
Mailing Address:	
Contact Person:	**Phone:**
Plan Prepared By:	

ATTACHMENTS REQUIRED (*Check off required items that are attached to this plan*)

___ **Site Plan showing, to scale:**	___ Areas of undisturbed native vegetation (no amendment required) ___ New planting beds and turf areas (amendment required) ___ Type of soil improvement proposed for each area
___ **Soil test results (required if proposing custom amendment rates)**	
___ **Product test results for proposed amendments**	

AREA #_____ (*should match Area # on Site Plan*)

PLANTING TYPE ___ Turf ___ Planting Beds	___ Undisturbed native vegetation ___ Other: _____	
SQUARE FOOTAGE OF THIS AREA: _____ square feet		
SCARIFICATION ___ Subsoil will be scarified	___ inches (depth) of scarification needed to achieve finished total 12" loosened depth.	
PRE-APPROVED AMENDMENT METHOD: ___ Topsoil import ___ Amend with compost ___ Stockpile and amend (_____ cu. yds. stockpiled)	____ inches of compost or imported topsoil applied X 3.1 (*conversion factor, inches to cubic yards*) _____ = cu. yards per 1,000 sq. ft. X ____ ,000s sq.ft. in this area _____ = cubic yards of amendment → → → → → → (*needed to cover this area to designated depth*)	PRODUCT: _____ QUANTITY: _____ CU. YDS.
CUSTOM AMENDMENT ___ Topsoil import ___ Topsoil & compost lift ___ Amend ___ Stockpile and amend (____ cu. yds. stockpiled)	**Attach test results and calculations.** ____ inches organic matter or topsoil import X 3.1 _____ = cu. yards / 1,000 sq. ft. X ____ ,000s sq.ft. in this area _____ = cubic yards of amendment → → → → → →	PRODUCT: _____ QUANTITY: _____ CU. YDS.
MULCH	____ ,000 sq.ft. X 6.2 (*conversion, to give 2 inch mulch depth*) _____ = cubic yards of mulch → → → → → →	PRODUCT: _____ QUANTITY: _____ CU. YDS.

TOTAL AMENDMENT/TOPSOIL/MULCH FOR ALL AREAS (*complete on page 1 only, totaling all areas/pages in this Plan*)

❑ **Product #1:** _____	❑ **Quantity:** _____ **cu. yds.**	
❑ **Test Results:** ___ **% organic matter**	___ **C:N ratio <25:1** (except mulch, or <35:1 for native plants)	___ **"stable" (yes/no)**
❑ **Product #2:** _____	❑ **Quantity:** _____ **cu. yds.**	
❑ **Test Results:** ___ **% organic matter**	___ **C:N ratio <25:1** (except mulch, or <35:1 for native plants)	___ **"stable" (yes/no)**
❑ **Product #3:** _____	❑ **Quantity:** _____ **cu. yds.**	
❑ **Test Results:** ___ **% organic matter**	___ **C:N ratio <25:1** (except mulch, or <35:1 for native plants)	___ **"stable" (yes/no)**

Date:	**Inspector:**	**Approved:**	**Revisions Required:**
Date:	**Inspector:**	**Approved:**	**Revisions Required:**

COMMENTS: _____