BUREAU OF WATERSHED MANAGEMANT PROGRAM GUIDANCE

Storm Water Management Program

Construction Site Soil Loss and Sediment Discharge Calculation Guidance

Effective: June 2015
Guidance #: 3800-2015-06

Notice: This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations, and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

APPROVED:

Pam Biersach, Director
Bureau of Watershed Management

June 22, 2015
Date

A. STATEMENT OF PROBLEM BEING ADDRESSED

Department guidance is not currently available regarding methods and procedures that should be used to document compliance with the 5 tons per acre per year sediment performance standard for construction sites found in s. NR151.11, Wis. Adm. Code. This guidance establishes a procedure that can be used to verify compliance with the sediment performance standard for construction sites.

B. BACKGROUND

The s. NR 151.11, Wis. Adm. Code, sediment performance standard for construction sites is applicable to construction sites that will disturb 1 acre or more of land and require coverage under the Department's construction site storm water discharge general permit. Subch. III of ch. NR 216, Wis. Adm. Code, identifies the erosion and sediment control plan requirements for sites that must obtain permit coverage.

The sediment performance standard for construction sites has been in effect since October 1, 2002. Initially, this performance standard required the design of erosion and sediment control plans to remove 80% of the average annual sediment load discharged from construction sites. As of January 1, 2013, the sediment performance standard was revised to require the design of erosion and sediment control plans to discharge no more than 5 tons per acre per year of sediment from construction sites until final stabilization is achieved.

Previously, compliance with the sediment performance standard was assumed for all permitted construction sites with erosion and sediment control plans designed in accordance with the subch. III of ch. NR 216, Wis. Adm. Code. The procedure identified in this guidance document is the new policy for establishing compliance with the sediment performance standard. Although alternative approaches to establishing compliance may be proposed, following the procedure identified in this guidance will minimize delays during the plan review and permitting process.

Effective January 1, 2016, applications for permit coverage must include documentation demonstrating compliance with the sediment performance standard. The documentation must be developed in accordance with Step 6 of the compliance verification procedure described in this guidance.

NOTE: S. NR 151.11, Wis. Adm. Code, identifies several prescriptive practices and measures that must be implemented regardless of compliance with the sediment performance standard.

C. DISCUSSION

The procedure described in this guidance document will require soil loss and sediment discharge calculations in most cases to evaluate the effectiveness of erosion and sediment control plans and verify compliance with the sediment performance

standard. However, it should be understood that the results of soil loss and sediment discharge calculations will not supersede minimum regulatory erosion and sediment control plan requirements or other construction site performance standards. In addition, there are specific site conditions where soil loss and sediment discharge calculations are not appropriate to establish compliance with the sediment performance standard (see **Prescriptive Compliance** discussion in Step 1 of the compliance verification procedure).

A spreadsheet-based calculator has been developed in conjunction with this guidance. It is suggested that this tool, or equivalent method, is used to conduct the soil loss and sediment discharge calculations (see **Soil Loss and Sediment Discharge Calculation Tool** description on Page 8).

D. GUIDANCE

Compliance Verification Procedure

The following procedure should be used to verify compliance with the sediment performance standard for construction sites (see Appendix A for examples):

Step 1: ***Determine the location(s) where soil loss and sediment discharge calculations will be conducted.***

a) Representative Worst Case: Select the representative worst case condition to represent the entire site and each major phase of construction. The representative worst case condition is the location where the combination of the soil loss and sediment control practice removal efficiency produces the highest sediment discharge rate. Factors that should be considered when determining the representative worst case condition include the following:

- Soil loss is highest in the summer months.
- Soil loss is highest from silty soil textures.
- Soil loss increases more with slope steepness than slope length.

NOTE: The representative worst case condition does not include the locations identified under **b) Prescriptive Compliance**.

Typically, several potential locations, combinations of practices and/or compliance schedules (see Step 2) will need to be evaluated in order to establish the representative worst case condition. Consultation with the administering authority (DNR and/or jurisdictional municipality) is recommended to discuss the approach that will be used to determine the representative worst case condition for large sites (greater than 10 acres) or complex projects.

If the representative worst case condition meets the sediment performance standard, it can be assumed that all other locations meet the standard and the construction schedule for the site can be developed based on the representative worst case condition. However, it is not necessary to use a single representative worst case condition to represent the entire site. For sites with highly variable conditions and/or practices, it may be more appropriate to determine the representative worst case condition for each drainage area. In this case, area-specific construction schedules can potentially be developed as long as the sediment performance standard is met in each area.

Modification of the erosion and sediment control plan to include construction phasing, targeted area soil stabilization and/or high efficiency sediment control practices may be needed when the initial representative worst case condition is not consistent with the anticipated construction schedule for the overall site. For example, on a 7 acre site with 2 acres at 6% slope and 5 acres at 2% slope, the representative worst case condition is likely to be located in the 6% slope area. However, if the erosion and sediment control plan requires the contractor to complete grading and stabilization activities in the 6% slope area in a shorter period of time, the 2% slope area may become the representative worst case condition.

b) Prescriptive Compliance: There are locations on construction sites where soil loss and sediment discharge calculations are not appropriate to establish compliance with the sediment performance standard. At these locations, a prescriptive compliance approach should be used rather than soil loss and sediment discharge calculations.

Prescriptive compliance should be established by designing and including appropriate measures in the erosion and sediment control plan. Compliance with the 5 tons per acre per year sediment performance standard can be assumed at prescriptive compliance locations where appropriate measures have been included in the erosion and sediment control plan. Specific locations where the prescriptive compliance approach should be used are as follows:

1. Soil stockpiles.

2. Utility trench excavations.

3. Utility trench backfills provided that soil stabilization practices are implemented within 14 days after placement of the backfill.

4. Areas of channel flow including temporary or permanent swales.

   NOTE: Channel side slope areas above the design storm event flow depth should be considered slopes.

5. Small areas that are not considered representative of the site provided that these areas are less than 10% of the total land disturbance area and are no larger than 1 acre.

6. Discrete land disturbance areas less than 1 acre (e.g., electric transmission towers).

7. Side slopes of storm water management practices including permanent storm water ponds that will be used as sediment basins during site construction.

8. Slopes exceeding 20%. Specific prescriptive measures for slopes exceeding 20% that are collectively assumed to meet the 5 tons/acre/year standard are as follows:

    i. Provide stable diversion of off-site runoff around the slope.

    ii. Provide slope interruption devices in accordance with Manufactured Perimeter Control and Slope Interruption Products Technical Standard 1071.

    iii. Design and implement approved soil stabilization measures per DNR technical standards.

    iv. Schedule land disturbance activities to limit exposure of bare soil in accordance with Table 1.

Table 1 – Maximum Period of Bare Soil Exposure for Slopes Exceeding 20%

Slope Area Drains to Sediment Basin or Sediment Trap?	**Maximum Period of Bare Soil Exposure (Calendar Days)**	
	Land Disturbance Between September 16th and May 1st	***Land Disturbance Between May 2nd and September 15th***
Yes	90	90
No	60	30

Step 2: ***Determine the compliance period(s)***

Compliance periods include the duration of land disturbance and the time necessary to establish vegetation after seeding during the growing season (60 days). Compliance periods are 12 months or less and can occur in more than one calendar year depending on the start of construction and what time of year seeding occurs.

For construction durations that exceed 12 months, compliance must be evaluated to confirm that 5 tons/acre/year standard is not exceeded in any consecutive 12 month period. For example, if an 18 month construction project discharges 2 tons/acre in the first 6 months, 3 tons/acre in the second 6 months, and 3 tons/ace in the final 6 months, then the project is not in compliance, as the final 12 months discharges 6 tons/acre/year (see Appendix A – Example 4).

Soil loss calculations are highly sensitive to time of year due to seasonal variations in rainfall intensity. In addition, calculated soil loss increases as the duration of soil exposure increases. With these factors in mind, a conservative approach is recommended when selecting the start dates and/or duration of construction for the soil loss and sediment discharge calculations. Using a conservative approach will minimize the potential need to re-run the calculations if the construction schedule changes.

If the start date is unknown during the plan development process, a start date of May 1st should be assumed so that land disturbance during the time of year that generates the highest soil loss is considered in the calculations. If this approach is used, it would be possible to develop a construction schedule using durations (e.g., 6 months maximum soil exposure) rather than specific start and end dates.

Step 3*: Conduct soil loss calculations based on the location(s) selected in Step 1 and compliance period(s) determined in Step 2.*

Soil loss calculations must be conducted using the principles of the Universal Soil Loss Equation (USLE) to estimate soil loss during the compliance period(s). Soil loss calculations are only intended for sheet and rill erosion. Gully or channel erosion is not considered in soil loss calculations or this procedure. The input variables for soil loss calculations include climate, soil texture, topography and soil cover:

a) Climate (Rainfall Factor - R): Monthly climate data should be used that accurately represents the variability of rainfall-runoff erosivity for the proposed site location.

b) Soil Texture (Soil Erodibility Factor - K): Soil texture should be selected based on the dominant texture that will be exposed to rainfall and runoff considering all phases of construction.

c) Topography (Slope Length – L, Slope % - S): Slope steepness (percent slope) and slope length should represent average overland flow conditions prior to concentrated flow areas or channels. Manufactured slope interruption products can be used to reduce effective slope lengths.

d) Soil Cover (Land Cover Factor - C): Areas where land disturbing construction activities will occur should be considered bare soil until soil stabilization practices

are installed. Estimated erosion control efficiencies for soil stabilization practices are identified in Table 2.

Step 4: ***Conduct sediment discharge calculations.***

Sediment discharge should be calculated by applying the sediment removal efficiency for the sediment control practice to the calculated soil loss after sediment deposition is considered (see Appendix B – Sediment Discharge). Estimated sediment removal efficiencies for sediment control practices are identified in Table 3.

Step 5: ***If necessary, modify the erosion and sediment control plan and re-calculate.***

If the calculated sediment discharge from the site exceeds 5 tons/acre/year, the construction schedule, soil stabilization practices and/or sediment control practices should be adjusted and the compliance verification procedure repeated until the sediment performance standard is met.

Table 2- Estimated Erosion Control Efficiency for Soil Stabilization Practices[1]

Practice	Erosion Control Efficiency	DNR Technical Standard
Directional Tracking or Tillage	10%	1067
Land Applied Polymer[2]	50%	1050
Seeding[3]	60%	1059
Mulch or Erosion Matting[4]	80%	1058, 1052
Mulch or Erosion Matting with Seeding	90%	1058, 1052, 1059
Sod	99%	NA
Impervious Surface[5]	100%	NA

[1] Permanent and temporary soil stabilization measures must be re-applied as necessary to maintain or restore effectiveness.
[2] Polymer application with or without seeding is considered a temporary soil stabilization measure.
[3] A minimum period of 60 days shall be assumed for establishment of dense vegetative cover after seeding during the growing season.
[4] Mulching and erosion matting with or without seeding are considered temporary soil stabilization measures.
[5] Rooftops, sidewalks, driveways, gravel or paved parking lots and streets.

Table 3 – Estimated Sediment Removal Efficiency for Sediment Control Practices[6]

Practice	Sediment Removal Efficiency	DNR Technical Standard
Sediment Basin	80%	1064
Sediment Trap	80%	1063
Silt Fence	40%	1056
Straw Bale Barrier	40%	1055
Manufactured Perimeter Control	40%	1071
Vegetative Buffer	40%	1054
Inlet Protection	30%	1060
Ditch Check Sediment Trap	30%	1063, 1062

Step 6: *Document the results of soil loss and sediment discharge calculations*

The results of soil loss and sediment discharge calculations must be documented in a summary report and included with permit applications submitted to the administering authorities. The summary report should identify the input variables used in the calculations (e.g., a screenshot of the spreadsheet tool) and the locations where the input variables were measured or determined (e.g., a map that clearly identifies the slope and soil conditions and sediment control practices). All areas that were evaluated to establish the representative worst case condition should be included in the summary report.

Soil Loss and Sediment Discharge Calculation Tool

A computer-based tool has been developed to assist in the calculation of soil loss and sediment discharge from construction sites. The DNR Soil Loss and Sediment Discharge Calculation Tool is an Excel spreadsheet application that is available for download from the Department's storm water program website (see http://dnr.wi.gov/topic/stormwater/). Supporting documentation is provided in Appendix B.

Implementation and Construction Schedules

Erosion and sediment control plans should identify appropriate practices for each major construction activity and the timing of when each practice will be constructed, installed or implemented. This is typically accomplished in the form of a construction schedule identified on the erosion and sediment control plan or detail sheets.

[6] Practices such as dewatering, tracking pads and dust control are not included in Table 3 or sediment discharge calculations because they are not directly associated with sediment removal during runoff events.

The duration of soil disturbance and timing of soil stabilization have a significant impact on soil loss and sediment discharge from construction sites. As a result, the soil loss and sediment discharge calculations will have a direct influence on construction schedules. Construction schedules identified in erosion and sediment control plans must be consistent with the dates or durations used in the soil loss and sediment discharge calculations.

Ideally, construction projects will progress as assumed in the soil loss and sediment discharge calculations and as indicated on the construction schedule. However, weather conditions and other factors can alter construction projects such that the soil loss and sediment discharge calculations and construction schedule no longer represent the actual site conditions. When this occurs, re-verification of compliance is necessary.

Re-Verification of Compliance

Soil loss and sediment discharge calculations should be re-run if significant deviations from the compliance period (start date or duration of soil exposure) or specified erosion and sediment control practices are anticipated or identified either before or during construction. Erosion and sediment control plans and/or construction schedules may need to be modified based on the results of the re-run.

Unfortunately, it may not be possible to re-verify compliance in all cases. When re-verification of compliance is not possible, the administering authorities must be contacted to discuss the appropriate course of action.

NOTE: S. NR 216.50(2), Wis. Adm. Code, requires that the Department is notified at least five working days prior to making erosion and sediment control plan modifications for sites where the Department conducted a plan review during the permitting process.

Examples

Examples of the compliance verification procedure are provided in Appendix A.

DRAFTED BY:

Peter Wood, Water Resources Engineer
On behalf of the Storm Water Liaison Team

6/19/15
Date

APPROVED:

Mary Anne Lowndes, Chief
Runoff Management Section

6/23/15
Date

Runoff Management Policy Management Team approved on June 19, 2015.

Appendix A

Examples

Example 1 – One Soil Type

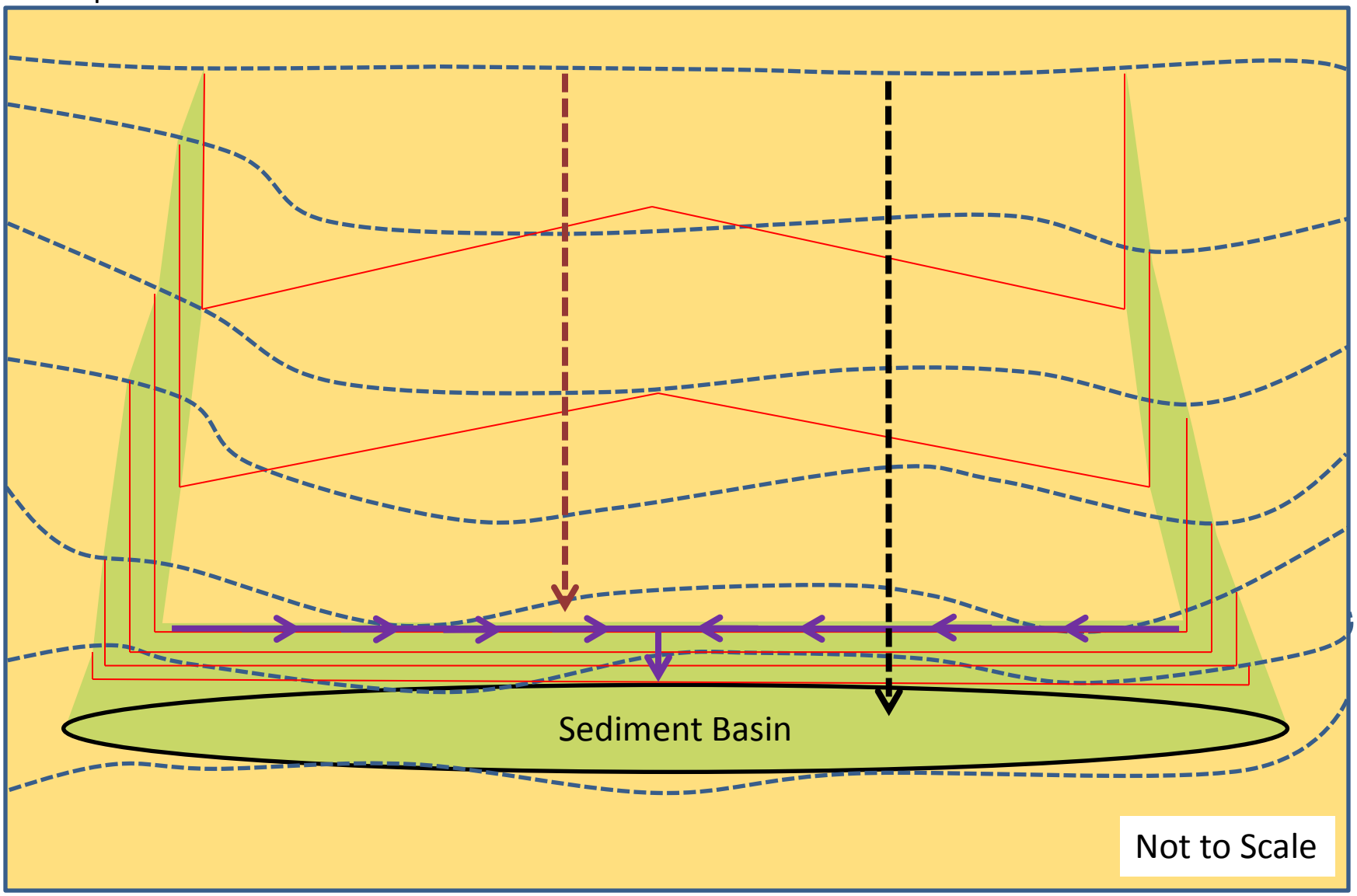
Given

- Site Location: Waukesha County
- Initial Grading: 300-ft slope @ 7%, 05/01/2015 to 06/01/2015
- After Fill Slope Construction: 250-ft slope @ 4%, Trial 1 - 06/01/2015 to 09/01/2015, Trial 2 – 06/01/2015 to 08/15/2015
- Seed & Mulch or Erosion Matting: Trial 1 - 09/01/2015, Trial 2 – 08/15/2015
- 60 Day Vegetation Establishment: Trial 1 - 11/01/2015, Trial 2 – 10/15/2015
- Soil Type: Silt loam
- Sediment Control Practice: Sediment Basin

Compliance Verification Procedure

- Step 1 – Locations: Identify the county where construction will occur (Waukesha), representative worst case slope locations & conditions (300-ft @ 7%, 250-ft @ 4%) and dominant soil texture (silt loam). Identify prescriptive compliance measures on the erosion and sediment control plan for fill slopes exceeding 20% and the sediment basin.
- Step 2 – Compliance Period: Identify the anticipated construction schedules and durations.
- Step 3 – Soil Loss Calculations: Enter the locations and compliance periods in the spreadsheet tool to conduct the soil loss calculations.
- Step 4 - Sediment Discharge Calculations: Enter sediment basin in the spreadsheet tool as the sediment control practice to conduct the sediment discharge calculations.
- Step 5 – Plan Modification and Re-calculation: Trial 1 exceeds 5 tons/acre/year. For Trial 2, reduce the duration of bare ground in the spreadsheet tool and re-run. Compliance is verified by Trial 2. Develop the construction schedule for the erosion and sediment control plan based on Trial 2.
- Step 6 – Documentation: Provide screenshots of the Trial 1 and Trial 2 spreadsheets and a map identifying the locations of the input variables.

Example 1 – Sediment Basin



Runoff Diversions (Channel Flow)

Existing Contour

Final Contour

Silt Loam Soils

Prescriptive Compliance Area

Representative Worst Case Slope – Initial Grading

Representative Worst Case Slope – After Fill Slope Established

Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

DRAFT VERSION 02-18-2015

WISCONSIN DEPT. OF NATURAL RESOURCES

YEAR 1

Developer: Example 1

Project: Trial 1 - Sediment Basin

Date: 05/28/2015

County: Waukesha

PRINT HELP PAGE

Version 1.0

Land Disturbing Activity	Begin Date	End Date	Period % R	Annual R Factor	Sub Soil Texture	Soil Erodibility K Factor	Slope (%)	Slope Length (feet)	LS Factor	Land Cover C Factor	Soil loss A (tons/acre)	Sediment Control Practice	Sediment Discharge (tons/acre)
Bare Ground	05/01/2015	06/01/2015	11.0%	130	Silt Loam	0.43	7.0%	300	1.43	1.00	8.8	Sediment Basin	1.6
Bare Ground	06/01/2015	09/01/2015	60.0%	130	Silt Loam	0.43	4.0%	250	0.58	1.00	19.4	Sediment Basin	3.8
Seed with Mulch or Er	09/01/2015	11/01/2015	17.0%	130	Silt Loam	0.43	4.0%	250	0.58	0.10	0.5	Sediment Basin	0.1
End	11/01/2015	-----	-----	-----	-------	-----	4.0%	250	0.58	------	-----		
		-----	-----	-----	-------	-----	4.0%		-----	-----	-----		
		-----	-----	-----	-------	-----			-----	-----	-----		
										TOTAL	28.7	TOTAL	5.4
												% Reduction Required	8%

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.
The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.
For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

4/1-5/15	and	8/7-8/29	Turf, introduced grasses and legumes
Thaw-6/30			Native Grasses, forbs, and legumes

Designed By:	
Date	

Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

DRAFT VERSION 02-18-2015

WISCONSIN DEPT. OF NATURAL RESOURCES

YEAR 1

Developer: Example 1

Project: Trial 2 - Sediment Basin

Date: 05/28/2015

County: Waukesha

PRINT HELP PAGE

Version 1.0

Land Disturbing Activity	Begin Date	End Date	Period % R	Annual R Factor	Sub Soil Texture	Soil Erodibility K Factor	Slope (%)	Slope Length (feet)	LS Factor	Land Cover C Factor	Soil loss A (tons/acre)	Sediment Control Practice	Sediment Discharge (tons/acre)
Bare Ground	05/01/2015	06/01/2015	11.0%	130	Silt Loam	0.43	7.0%	300	1.43	1.00	8.8	Sediment Basin	1.6
Bare Ground	06/01/2015	08/15/2015	52.0%	130	Silt Loam	0.43	4.0%	250	0.58	1.00	16.8	Sediment Basin	3.3
Seed with Mulch or E r	08/15/2015	10/15/2015	22.0%	130	Silt Loam	0.43	4.0%	250	0.58	0.10	0.7	Sediment Basin	0.1
End	10/15/2015	-----	-----	-----	-------	-----	4.0%	250	0.58	------	-----		
		-----	-----	-----	-------	-----	4.0%		-----	-----	-----		
		-----	-----	-----	-------	-----			-----	-----	-----		
										TOTAL	26.3	TOTAL	4.9
												% Reduction Required	NONE

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.
The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.
For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

4/1-5/15 Thaw-6/30	and	8/7-8/29	Turf, introduced grasses and legumes Native Grasses, forbs, and legumes

Designed By:	
Date	

Example 2 – Two Soil Types

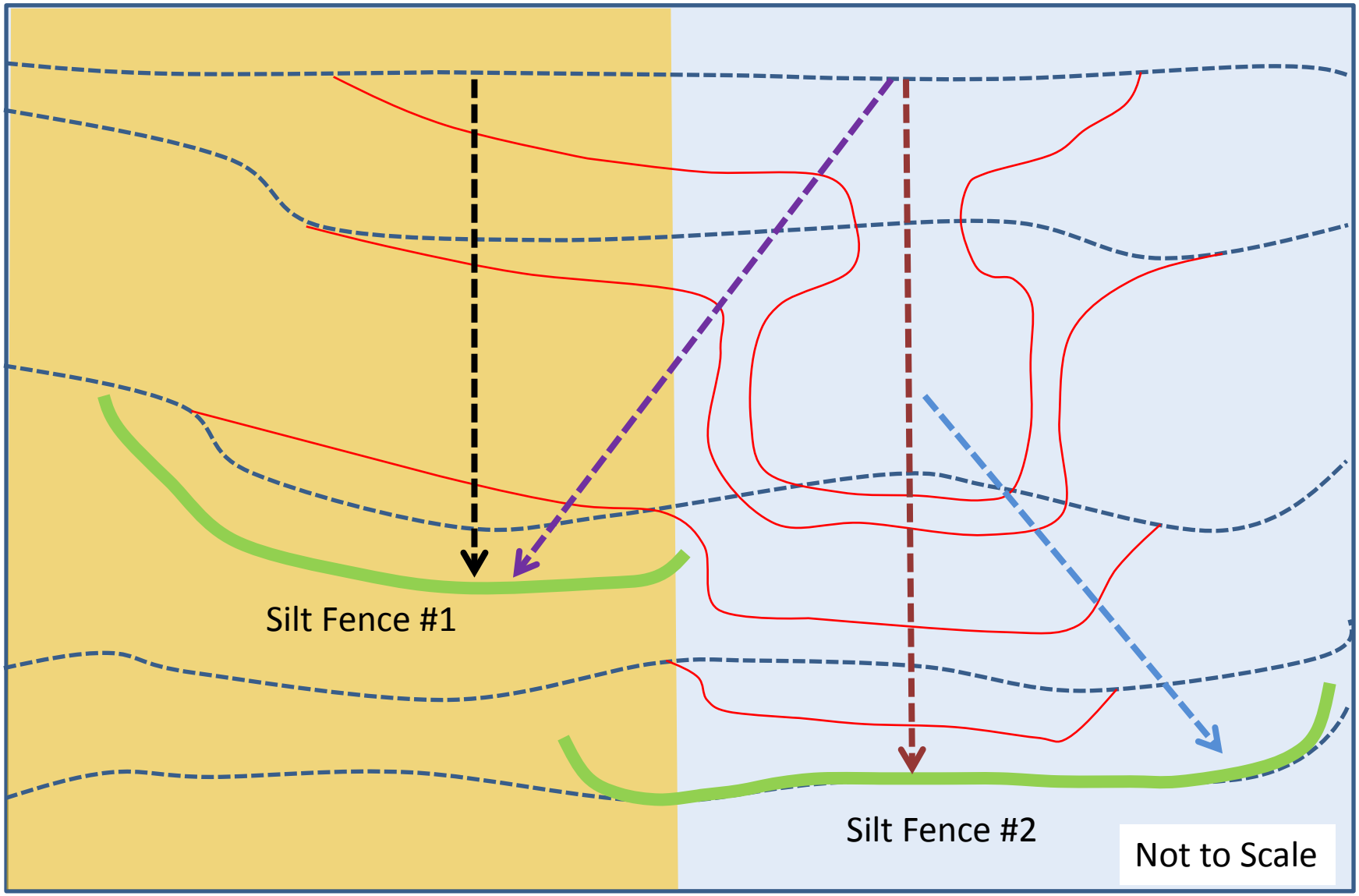
Given

- Site Location: Waukesha County
- Initial Grading: 05/01/2015 to 06/01/2015, 40-ft slope @3% (Silt Fence Drainage Area #1), 60-ft @3% (Silt Fence Drainage Area #2)
- After Fill Slope Construction: Silt Fence Drainage Area #1 - 06/01/2015 to 8/10/2015, 60-ft slope @3%, Silt Fence Drainage Area #2 – 06/01/2015 to 07/10/2015, 50-ft @7%
- Seed & Mulch or Erosion Matting: Silt Fence Drainage Area #1 - 08/10/2015, Silt Fence Drainage Area #2 – 07/10/2015
- 60 Day Vegetation Establishment: Silt Fence Drainage Area #1 - 10/10/2015, Silt Fence Drainage Area #2 – 09/10/2015
- Soil Type: Silt Fence Drainage Area #1 - Silt loam, Silt Fence Drainage Area #2 - Clay
- Sediment Control Practice: Silt Fence

Compliance Verification Procedure

- Step 1 – Locations: Identify the county where construction will occur (Waukesha), representative worst case slope locations & conditions and dominant soil texture (silt loam and clay).
- Step 2 – Compliance Period: Identify the anticipated construction schedules and durations.
- Step 3 – Soil Loss Calculations: Enter the locations and compliance periods in the spreadsheet tool to conduct the soil loss calculations.
- Step 4 - Sediment Discharge Calculations: Enter silt fence in the spreadsheet tool as the sediment control practice to conduct the sediment discharge calculations.
- Step 5 – Plan Modification and Re-calculation: Compliance is verified by initial evaluation (no plan modification and re-calculation required). Develop the construction schedule for the erosion and sediment control plan based on the Silt Fence Drainage Area #2 compliance period (worst case) or develop separate construction schedules for Silt Fence Drainage Area #1 and Silt Fence Drainage Area #2.
- Step 6 – Documentation: Provide screenshots of the Silt Fence Drainage Area #1 and Silt Fence Drainage Area #2 spreadsheets and a map identifying the locations of the input variables.

Example 2



Silt Fence

Existing Contour

Final Contour

Silt Loam Soils

Clay Soils

Representative Worst Case Slope - Silt Fence #1 Initial

Representative Worst Case Slope - Silt Fence #1 Final

Representative Worst Case Slope - Silt Fence #2 Initial

Representative Worst Case Slope - Silt Fence #2 Final

Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

DRAFT VERSION 02-18-2015

WISCONSIN DEPT. OF NATURAL RESOURCES

YEAR 1

Developer: Example 2

Project: Silt Fence #1

Date: 02/26/2015

County: Waukesha

PRINT HELP PAGE

Version 1.0

Land Disturbing Activity	Begin Date	End Date	Period % R	Annual R Factor	Sub Soil Texture	Soil Erodibility K Factor	Slope (%)	Slope Length (feet)	LS Factor	Land Cover C Factor	Soil loss A (tons/acre)	Sediment Control Practice	Sediment Discharge (tons/acre)
Bare Ground	05/01/2015	06/01/2015	11.0%	130	Silt Loam	0.43	3.0%	40	0.21	1.00	1.3	Silt Fence	0.7
Bare Ground	06/01/2015	08/10/2015	48.8%	130	Silt Loam	0.43	3.0%	60	0.24	1.00	6.6	Silt Fence	3.7
Seed with Mulch or Er	08/10/2015	10/10/2015	24.1%	130	Silt Loam	0.43	3.0%	60	0.24	0.10	0.3	Silt Fence	0.1
End	10/10/2015	-----	-----	-----	-------	-----	3.0%	60	0.24	------	-----		
		-----	-----	-----	-------	-----	3.0%		-----	-----	-----		
		-----	-----	-----	-------	-----			-----	-----	-----		
										TOTAL	8.2	TOTAL	4.4
												% Reduction Required	NONE

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.
The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.
For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

4/1-5/15 Thaw-6/30	and	8/7-8/29	Turf, introduced grasses and legumes Native Grasses, forbs, and legumes

Designed By:	
Date	

Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

DRAFT VERSION 02-18-2015

WISCONSIN DEPT. OF NATURAL RESOURCES

YEAR 1

Developer: Example 2

Project: Silt Fence #2

Date: 02/26/2015

County: Waukesha

PRINT HELP PAGE

Version 1.0

Land Disturbing Activity	Begin Date	End Date	Period % R	Annual R Factor	Sub Soil Texture	Soil Erodibility K Factor	Slope (%)	Slope Length (feet)	LS Factor	Land Cover C Factor	Soil loss A (tons/acre)	Sediment Control Practice	Sediment Discharge (tons/acre)
Bare Ground	05/01/2015	06/01/2015	11.0%	130	Clay	0.32	3.0%	60	0.24	1.00	1.1	Silt Fence	0.6
Bare Ground	06/01/2015	07/10/2015	27.4%	130	Clay	0.32	7.0%	50	0.58	1.00	6.7	Silt Fence	3.3
Seed with Mulch or Er	07/10/2015	09/10/2015	37.1%	130	Clay	0.32	7.0%	50	0.58	0.10	0.9	Silt Fence	
End	09/10/2015	-----	-----	-----	-------	-----	7.0%	50	0.58	------	-----		
		-----	-----	-----	-------	-----	7.0%		-----	-----	-----		
		-----	-----	-----	-------	-----			-----	-----	-----		
										TOTAL	8.7	TOTAL	3.9
												% Reduction Required	NONE

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.
The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.
For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

4/1-5/15	and	8/7-8/29	Turf, introduced grasses and legumes
Thaw-6/30			Native Grasses, forbs, and legumes

Designed By:	
Date	

Example 3 – Two Sediment Control Practices & Seeding After Growing Season

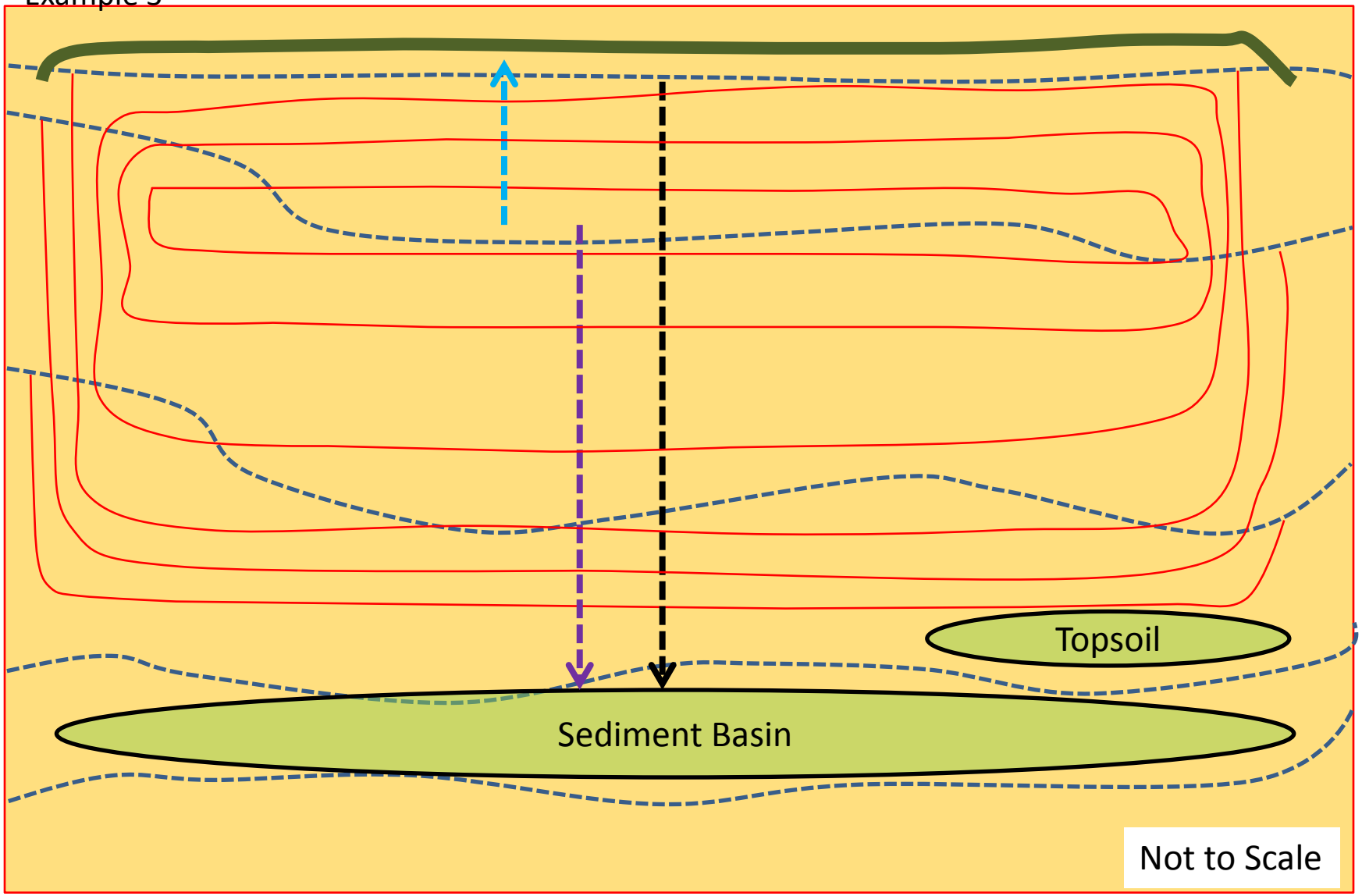
Given

- Site Location: Waukesha County
- Initial Grading: Silt Fence Drainage Area - 05/16/2015 to 06/15/2015, 50-ft slope @2%, Sediment Basin Drainage Area – 05/16/2015 to 06/15/2015, 200-ft @2%
- Fill Slope Construction: Silt Fence Drainage Area - 06/15/2015 to 07/15/2015, 50-ft slope @3%, 07/15/2015 to 10/15/2015, 50-ft @5%, Sediment Basin Drainage Area – 06/15/2015 to 10/15/2015, 150-ft @7%
- Seed & Mulch or Erosion Matting: 10/15/2015
- 60 Day Vegetation Establishment: Seeding After Growing Season - Extend to 05/15/2016 per Appendix B
- Soil Type: Silty clay
- Sediment Control Practices: Silt Fence and sediment basin

Compliance Verification Procedure

- Step 1 – Locations: Identify the county where construction will occur (Waukesha), representative worst case slope locations & conditions and dominant soil texture (silty clay). Identify prescriptive compliance measures on the erosion and sediment control plan for the topsoil stockpile and the sediment basin.
- Step 2 – Compliance Period: Identify the anticipated construction schedules and durations.
- Step 3 – Soil Loss Calculations: Enter the locations and compliance periods in the spreadsheet tool to conduct the soil loss calculations.
- Step 4 - Sediment Discharge Calculations: Enter silt fence and sediment basin as the sediment control practices to conduct the sediment discharge calculations.
- Step 5 – Plan Modification and Re-calculation: Compliance is verified by initial evaluation (no plan modification and re-calculation required). Develop the construction schedule for the erosion and sediment control plan based on the silt fence and sediment basin compliance periods.
- Step 6 – Documentation: Provide screenshots of the Silt Fence and Sediment Basin spreadsheets and a map identifying the locations of the input variables.

Example 3



Silt Fence
Existing Contour
Final Contour
Silty Clay Soils
Prescriptive Compliance Area
Representative Worst Case Slope – Initial Grading
Representative Worst Case Slope – Sediment Basin Final
Representative Worst Case Slope – Silt Fence

Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

DRAFT VERSION 02-18-2015

WISCONSIN DEPT. OF NATURAL RESOURCES

YEAR 1

Developer: Example 3

Project: Silt Fence

Date: 02/19/2015

County: Waukesha

PRINT HELP PAGE

Version 1.0

Land Disturbing Activity	Begin Date	End Date	Period % R	Annual R Factor	Sub Soil Texture	Soil Erodibility K Factor	Slope (%)	Slope Length (feet)	LS Factor	Land Cover C Factor	Soil loss A (tons/acre)	Sediment Control Practice	Sediment Discharge (tons/acre)
Bare Ground	05/16/2015	06/15/2015	13.6%	130	Silty Clay	0.28	2.0%	50	0.16	1.00	0.8	Silt Fence	0.3
Bare Ground	06/15/2015	07/15/2015	24.0%	130	Silty Clay	0.28	3.0%	50	0.22	1.00	2.0	Silt Fence	0.9
Bare Ground	07/15/2015	10/15/2015	42.0%	130	Silty Clay	0.28	5.0%	50	0.38	1.00	5.8	Silt Fence	3.4
Seed with Mulch or Er	10/15/2015	05/15/2016	20.4%	130	Silty Clay	0.28	5.0%	50	0.38	0.10	0.3	Silt Fence	0.1
End	05/15/2016	-----	-----	-----	-------	-----	5.0%		-----	------	-----		
		-----	-----	-----	-------	-----			-----	------	-----		
										TOTAL	8.8	TOTAL	4.8
												% Reduction Required	NONE

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.
The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.
For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

4/1-5/15 Thaw-6/30	and	8/7-8/29	Turf, introduced grasses and legumes Native Grasses, forbs, and legumes

Designed By:	
Date	

Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

DRAFT VERSION 02-18-2015

WISCONSIN DEPT. OF NATURAL RESOURCES

YEAR 1

Developer: Example 3

Project: Sediment Basin

Date: 02/19/2015

County: Waukesha

PRINT HELP PAGE

Version 1.0

Land Disturbing Activity	Begin Date	End Date	Period % R	Annual R Factor	Sub Soil Texture	Soil Erodibility K Factor	Slope (%)	Slope Length (feet)	LS Factor	Land Cover C Factor	Soil loss A (tons/acre)	Sediment Control Practice	Sediment Discharge (tons/acre)
Bare Ground	05/16/2015	06/15/2015	13.6%	130	Silty Clay	0.28	2.0%	200	0.25	1.00	1.2	Sediment Basin	0.2
Bare Ground	06/15/2015	10/15/2015	66.0%	130	Silty Clay	0.28	7.0%	150	1.01	1.00	24.3	Sediment Basin	3.3
Seed with Mulch or E r	10/15/2015	05/15/2016	20.4%	130	Silty Clay	0.28	7.0%	150	1.01	0.10	0.8	Sediment Basin	
End	05/15/2016	-----	-----	-----	-------	-----	7.0%	150	1.01	------	-----		
		-----	-----	-----	-------	-----	7.0%		-----	-----	-----		
		-----	-----	-----	-------	-----			-----	-----	-----		
										TOTAL	26.3	TOTAL	3.5
												% Reduction Required	NONE

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.
The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.
For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

4/1-5/15 Thaw-6/30	and	8/7-8/29	Turf, introduced grasses and legumes Native Grasses, forbs, and legumes

Designed By:	
Date	

Example 4 – Construction > 12 Months

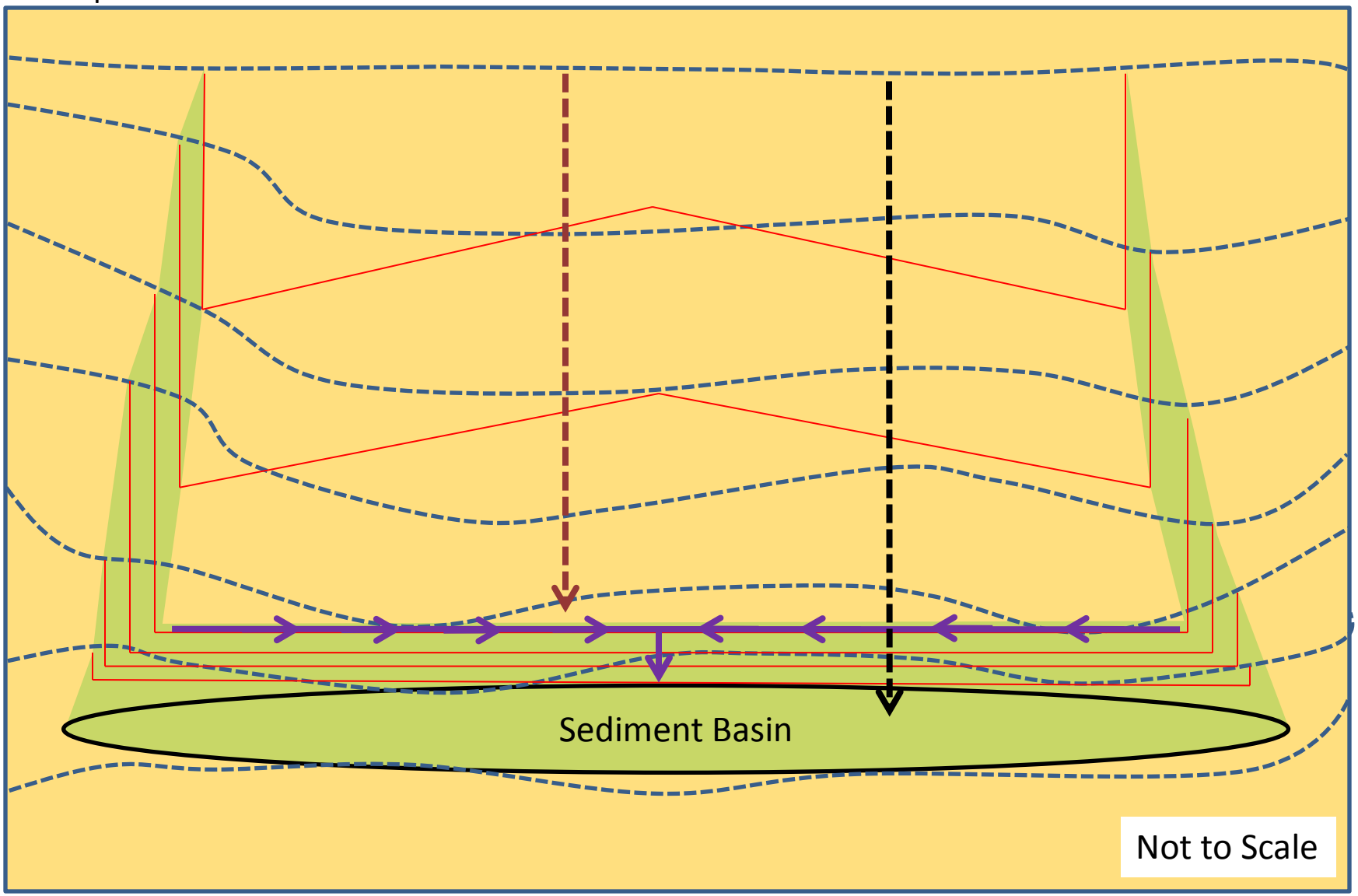
Given

- Site Location: Waukesha County
- Initial Grading: 05/01/2015 to 07/01/2015, 300-ft slope @5%
- After Fill Slope Construction: 07/01/2105 to 8/30/2016, 250-ft slope @ 2%
- Seed & Mulch or Erosion Matting: 08/30/2016
- 60 Day Vegetation Establishment: 10/30/2016
- Soil Type: Silt loam
- Sediment Control Practice: Sediment Basin

Compliance Verification Procedure

- Step 1 – Locations: Identify the county where construction will occur (Waukesha), representative worst case slope locations & conditions (300-ft @ 5%, 250-ft @ 2%) and dominant soil texture (silt loam). Identify prescriptive compliance measures on the erosion and sediment control plan for fill slopes exceeding 20% and the sediment basin.
- Step 2 – Compliance Period: Identify the anticipated construction schedules and durations. For Year 1 spreadsheet, use the first 12 months of construction (05/01/2015 to 04/30/2015). For Year 2 spreadsheet, use the 12 months prior to the 60 day vegetation establishment date (11/01/2015 to 10/30/2016).
- Step 3 – Soil Loss Calculations: Enter the locations and compliance periods in the spreadsheet tool to conduct the soil loss calculations.
- Step 4 - Sediment Discharge Calculations: Enter a sediment basin in the spreadsheet tool as the sediment control practice to conduct the sediment discharge calculations.
- Step 5 – Plan Modification and Re-calculation: Compliance is verified by initial evaluation (no plan modification and re-calculation required). Develop the construction schedule for the erosion and sediment control plan based on the specified compliance periods.
- Step 6 – Documentation: Provide screenshots of the Year 1 and Year 2 spreadsheets and a map identifying the locations of the input variables.

Example 4



Runoff Diversions (Channel Flow)

Existing Contour

Final Contour

Silt Loam Soils

Prescriptive Compliance Area

Representative Worst Case Slope – Initial Grading

Representative Worst Case Slope – After Fill Slope Established

Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

DRAFT VERSION 02-18-2015

WISCONSIN DEPT. OF NATURAL RESOURCES

YEAR 1

Developer: Example 4

Project: Sediment Basin

Date: 02/19/2015

County: Waukesha

PRINT HELP PAGE

Version 1.0

Land Disturbing Activity	Begin Date	End Date	Period % R	Annual R Factor	Sub Soil Texture	Soil Erodibility K Factor	Slope (%)	Slope Length (feet)	LS Factor	Land Cover C Factor	Soil loss A (tons/acre)	Sediment Control Practice	Sediment Discharge (tons/acre)
Bare Ground	05/01/2015	07/01/2015	30.0%	130	Silt Loam	0.43	5.0%	300	0.93	1.00	15.6	Sediment Basin	2.9
Bare Ground	07/01/2015	04/30/2016	70.0%	130	Silt Loam	0.43	2.0%	250	0.26	1.00	10.3	Sediment Basin	1.9
End	04/30/2016	-----	-----	-----	-------	-----	2.0%	250	0.26	------	-----	Sediment Basin	
		-----	-----	-----	-------	-----	2.0%	250	0.26	-----	-----		
		-----	-----	-----	-------	-----	2.0%		-----	-----	-----		
		-----	-----	-----	-------	-----			-----	-----	-----		
										TOTAL	25.9	TOTAL	4.8
												% Reduction Required	NONE

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.
The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.
For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

4/1-5/15 Thaw-6/30	and	8/7-8/29	Turf, introduced grasses and legumes Native Grasses, forbs, and legumes

Designed By:	
Date	

Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

DRAFT VERSION 02-18-2015

WISCONSIN DEPT. OF NATURAL RESOURCES

YEAR 2

Developer: Example 4

Project: Sediment Basin

Date: 02/19/2015

County: Waukesha

PRINT HELP PAGE

Version 1.0

Land Disturbing Activity	Begin Date	End Date	Period % R	Annual R Factor	Sub Soil Texture	Soil Erodibility K Factor	Slope (%)	Slope Length (feet)	LS Factor	Land Cover C Factor	Soil loss A (tons/acre)	Sediment Control Practice	Sediment Discharge (tons/acre)
Bare Ground	11/01/2015	08/30/2016	82.5%	130	Silt Loam	0.43	2.0%	250	0.26	1.00	12.2	Sediment Basin	2.3
Seed with Mulch or Er	08/30/2016	10/30/2016	17.3%	130	Silt Loam	0.43	2.0%	250	0.26	0.10	0.3	Sediment Basin	0.0
End	10/30/2016	-----	-----	-----	-------	-----	2.0%	250	0.26	------	-----		
		-----	-----	-----	-------	-----	2.0%	250	0.26	-----	-----		
		-----	-----	-----	-------	-----	2.0%		-----	-----	-----		
		-----	-----	-----	-------	-----			-----	-----	-----		
										TOTAL	12.4	TOTAL	2.3
												% Reduction Required	NONE

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.
The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.
For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

4/1-5/15 Thaw-6/30	and	8/7-8/29	Turf, introduced grasses and legumes Native Grasses, forbs, and legumes

Designed By:	
Date	

Appendix B

Soil Loss & Sediment Discharge Calculation Tool for Construction Sites in Wisconsin

HELP PAGE

The *Soil Loss & Sediment Discharge Tool for Construction Sites in Wisconsin* worksheet was developed to estimate soil loss from sheet and rill erosion and the effect of sediment control practices on sediment discharge. It does not predict soil loss and associated sediment discharge resulting from channel erosion. The worksheet uses the following variables. They are entered by the user or automatically calculated. Included below are the descriptions of the variables used.

Column #	Variable	Type
1	Land Disturbing Activity	entered by user
2	Begin Date	entered by user
3	End Date	automatically calculated
4	% **R** to Date	automatically calculated
5	Period % **R**	automatically calculated
6	Annual **R** Factor	automatically calculated
7	Sub Soil Texture	entered by user
8	Soil Erodibility **K** Factor	automatically calculated
9	Slope % **S**	entered by user
10	Slope Length **L**	entered by user
11	**LS** Factor	automatically calculated
12	Land Cover **C** Factor	automatically calculated
13	Soil Loss	automatically calculated
14	Sediment Control Practice	entered by user
15	Sediment Discharge	automatically calculated

Variable Descriptions:

Activity **(pull-down menu))**

The land disturbing activity relates to the type of disturbance that is occurring on the ground. The land disturbing activity inputs may be selected using the drop-down menu.

Activity Inputs	Description
Bare ground	Usually the initial disturbance occurs when the ground is left bare due to stripping vegetation, grading, or other actions that leave the soil devoid of cover.
Directional tracking or tillage	The process of creating ridges and furrows on the contour to slow sheet runoff on unvegetated slopes per DNR Technical Standard 1067.
End	Final stabilization or end of construction year. Final stabilization for the purposes of this calculation may include the installation of a hard surface that covers the disturbed ground completely such as asphalt paving, stone base coarse, or geotextile.
Mulch or erosion mat	The application of a minimum of 1.5 tons/acre straw or other comparable mulch meeting DNR Technical Standard 1058 or erosion control matting meeting DNR Technical Standard 1052.
Seed and mulch or erosion mat	The application of a minimum of 1.5 tons/acre anchored straw, other comparable mulch, or installation of erosion control mat. Enter this activity if the seeding and mulching are done at the same time. It is not necessary to also enter *seeding* if this input is used. Requires 60 days of cover establishment during the growing season. Mulching is recommended on all disturbed areas that are to be seeded to control erosion and establish cover. See also DNR Technical Standards 1058 and 1052.
Seeding	The application of permanent or temporary seeding without the use of mulch. Not to be used with *seed and mulch.* Requires 60 days of cover establishment during the growing season. See also DNR Technical Standard 1059.
Sod	The installation of sod for cover establishment.
Land Applied Polymer	The land application of products containing water soluable anionic polyacrylamide as temporary soil binding agents to reduce erosion per DNR Technical Standard 1050.

Date **(entered by user)**

The date the planned land disturbing activity begins, e.g. 5/15/2014. The activity is assumed to continue until the next activity is entered. A 60 day cover establishment period, during the growing season, is recommended for the establishment of seeding.

Notes:

1. If construction schedules are unknown, a start date of May 1st of the following year may be assumed.

2. Temporary stabilization activities are required by NR 151.11(8)(d) when land disturbing construction activities have temporarily ceased and will not resume for a period exceeding 14 calendar days. Establishment of temporary vegetation in late summer/early fall is a common means of compliance with this provision during winter shut-down. If temporary seeding is completed within the recommended dates, then 'Sod' can be used to represent the activity between the 60 day establishment period and beginning of the next land disturbing activity.

3. Recommended temporary seeding dates based on USDA Wisconsin Agronomy Technical Note 6 are:

    - Oats - 4/1 to 9/1
    - Annual ryegrass - 4/1 to 9/1
    - Forage sorghum –5/15 to 7/15
    - Sorghum - Sudangrass hybrid –5/15 to 7/15
    - Sudangrass – 5/15 to 7/15
    - Winter wheat - 8/1 to 10/1
    - Winter cereal rye - 8/1 to 10/15

4. It is recommended that the temporary vegetation be incorporated into the soil prior to the permanent seeding application to minimize competition.

5. Recommended permanent seeding dates are included on the spreadsheet page under the table for reference. These dates are based on which planting zone the project county is located in and dates in USDA Wisconsin Agronomy Technical Notes 5 and 6.

6. When the seeding dates are later than the noted recommended dates, the *end* of the cover establishment should be extended to ***May 15*** of the following spring to allow for growth.

7. For periods of construction that exceed 12 months, compliance must be determined to ensure that 5 tons/acre/year is not exceeded in any given 12 month period.

% R to Date **(automatically calculated)**
The percentage of the annual **R** factor from January 1 to the entered date.

Period % R **(automatically calculated)**
The percentage of the annual **R** factor calculated for the period from one land disturbing activity to the next.

Annual R factor **(automatically calculated)**
The rainfall factor, **R**, is the number of erosion-index units in a normal year's rain. The

erosion index is a measure of the erosive force of a specific rainfall. For example, in Dane County the rainfall factor is 150**.**

Sub Soil Texture **(entered by user)**
The soil texture at the exposed surface for the predominant soil type in the area of the land disturbing activity, e.g., clay. This information is available from site-specific soil borings or pits or in published county soil surveys. For areas with significant cut or fill, the soil type exposed to erosion may not be the layer immediately below the topsoil. This must be entered for line 1 in Year 1 and line 1 in Year 2 (if used). Subsequent lines default to the soil type above them.

Soil Erodibility K Factor **(automatically calculated)**
A factor used to express the erosiveness of the soil layer below the topsoil for a specific soil type.

Slope % S **(entered by user)**
The percent slope for the representative portion of the disturbed area, regarding overland flow and not channel flow, e.g. .05 or 5 (depending on version of Excel). Where small areas of steep slopes are present on the site, consider utilizing erosion control mats or other measures such that these areas do not represent the 'worst case' erosion condition.

Slope Length L **(entered by user)**
Slope length (in feet) measured along the overland flow path from the top to the bottom of the slope of the representative disturbed area. Channel lengths are not included in the slope length.

LS Factor **(automatically calculated)**
The spreadsheet calculates LS factor value based on the ratio between the percent slope and length of slope of the representative disturbed area.

Land Cover C Factor **(automatically calculated)**
The cover and management factor is the ratio of soil loss from an area with a specified cover and management practice to that from a unit plot of bare land. The input for the *Activity* corresponds to this factor.

Soil Loss **(automatically calculated)**
The predicted value of soil loss (tons per acre) that corresponds to the time period of each land disturbing activity entered. This value is calculated using the equation: A=(%R)x(R)x(K)x(LS)x(C).

Sediment Control Practice **(entered by user)**
The sediment control practice proposed down gradient of the soil disturbance to reduce the overall sediment discharge from the site. These practices include silt fence, ditch checks, inlet protection, vegetative buffers, sediment traps, sediment basins, and manufactured sediment control practices. If two practices are utilized, enter the most efficient one.

Sediment Control Practice	***Description***
Ditch Check Sediment Trap	A temporary dam constructed across a swale or drainage ditch to reduce the velocity of water flowing in the channel. See DNR Technical Standard 1062.
Inlet Protection	A temporary barrier installed around a storm drain inlet, drop inlet or curb inlet. See DNR Technical Standard 1060.
Manufactured Perimeter Control	Manufactured perimeter control and slope interruption products include a variety of products designed to detain or slow the flow of sediment-laden sheet flow runoff from small areas of disturbed soil. See DNR Technical Standard 1071.
Sediment Basin	A sediment control device constructed with an engineered outlet, formed by excavation or embankment to intercept sediment-laden runoff and retain the sediment from drainage areas between 5 and 100 acres. See DNR Technical Standard 1064.
Sediment Trap	A temporary sediment control device formed by excavation or embankment to intercept sediment-laden runoff and retain the sediment from drainage areas less than 5 acres. See DNR Technical Standard 1063.
Silt Fence	Silt fence is a temporary sediment barrier of entrenched permeable geotextile fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff from small areas of disturbed soil. See DNR Technical Standard 1056.
Straw Bale Barrier	A temporary sediment barrier consisting of a row of entrenched and anchored straw bales, hay bales or equivalent material used to intercept sediment-laden sheet flow from small drainage areas of disturbed soil. See DNR Technical Standard 1055.
Vegetative Buffer	An area of dense vegetation intended to slow runoff and trap sediment. Dense vegetation is defined as an existing stand of 3 – 12 inch high grassy vegetation that uniformly covers at least 90 % of a representative 1 square yard plot. Woody vegetation shall not be counted for the 90% coverage. No more than 10% of the overall buffer can be comprised of woody vegetation. See DNR Technical Standard 1054.

Sediment Discharge **(automatically calculated)**
The predicted value of sediment discharge (tons per acre) that corresponds to the time period of each land disturbing activity entered. The sediment discharge is the soil loss

less a deposition value that varies based on soil type, slope and slope length. The value approximates the difference between the USLE soil loss and the sediment delivery from RUSLE2 version 1.26.10.0. If a sediment control practice is specified, then the soil discharge is further reduced relative to the efficiency of the practice.

Sediment Discharge = (A-D)*(1-Removal efficiency of the practice), where
Deposition factor (D) = %R for Period*Estimated 1 year soil deposition
If A-D < 0, then Sediment Discharge = 0 tons/acre

Sediment Deposition for 1 year (units tons/acre/year) is estimated as follows:

Soil Type	Slope < 5%	Slope >= 5%
Sand	0.5	0.1239S^2-1.185S+4.7104
Silt	1	0.1318S^2.1167
Clay	28.444(LS)^2-13.143(LS)+3.0984	18.037(LS)-6.583

Percent Reduction Required **(automatically calculated)**
The percentage value in the total's row corresponds to the reduction in sediment discharge necessary to comply with NR 151.11(6m)(b)2. It is required that the cumulative sediment discharge rate not exceed 5 tons per acre per year for all sites. Please note that the calculator does not correct for durations over 1 year. If construction is scheduled to exceed 1 year duration from initial ground disturbance, please complete a second spreadsheet with the subsequent years. Each year should start on the anniversary of the initial ground disturbance.

Compliance with the sediment discharge limit can be achieved by:

1. Reducing the length of time that bare soil is exposed.
2. Installing additional erosion control measures.
3. Implementing shorter time frames for stabilizing areas of the site with steep slopes or requiring that soil disturbance is limited to months with lower soil loss potential.
4. Installing a sediment basin or other sediment control measures below the disturbed area.

Troubleshooting:

Security
On many computers, active content in the spreadsheet is disabled when first opened. Active content must be enabled for the drop-down buttons to function correctly. This can be done by clicking on the yellow Enable Content button at the top of the screen when opening.

Software

This spreadsheet was last modified using Microsoft Office Professional Plus 2010 Excel Version 14.7015.1000. Use of earlier versions may result in loss of functionality.

Data Entry

If data is entered in a random fashion, portions of the spreadsheet may not function as intended. If this occurs, remove all entered data and re-enter sequentially row-by-row starting at the top.

REFERENCES:

Balousek, J.D., Roa-Espinosa, A., Bubenzer, G.D., "Predicting Erosion Rates on Construction Sites Using the Universal Soil Loss Equation in Dane County", Urban Water Resources Conference, Chicago, IL, February 2000.

Wischmeier, W.H. and Smith, D.D., Predicting Rainfall Erosion Losses – A Guide to Conservation Planning, United States Department of Agriculture, Washington, D.C., 1978.

USDA, NRCS, Wisconsin Agronomy Technical Note 5, Establishing and Maintaining Native Grasses, Forbs, and Legumes, April 2013.

USDA, NRCS, Wisconsin Agronomy Technical Note 6, Establishing and Maintaining Introduced Grasses and Legumes, April 2013.