Rule Updates!

From the Wisconsin DNR Storm Water Program

Waukesha County Stormwater University

April 9, 2014

What are we talking about here?

- Rules that affect construction site storm water runoff
  - i.e., erosion and sediment control (ESC)
    - i.e., dirt
      - i.e., runoff
        - i.e., dirt in runoff

2013 Wisconsin Act 20

- No, no…I got it

- Commercial building authority over the years:
  - Act 28 – 2009 DOC to DNR
  - Act 32 – 2011 DNR to DSPS
  - Act 20 – DSPS back to DNR

2013 Wisconsin Act 20

- Amended authorities for municipal ordinances
- Changed s.281.33(3) references from "minimum" to "uniform statewide" standards
  - DNR may determine that rules promulgated under s.281.16(2) – – i.e., NR 151 and technical standards – – will meet requirement for establishing uniform statewide standards

2013 Wisconsin Act 20

- Uniformity of statewide standards only pertains to:
  - Standards for water quality at construction sites
  - Municipal ordinances for erosion control for new development, redevelopment and infill
  - Municipal ordinances for post-construction storm water management for new development and infill only

2013 Wisconsin Act 20

- Municipalities have authority to adopt ordinances with stricter provisions to control storm water quantity or control flooding, or to comply with federally approved TMDL requirements

This is very important!

ESC on Non-permitted sites

- Rules for non-permitted sites?
- Prescriptive standards under NR 151.105 for sites less than 1 acre
- Implement BMPs to "prevent or reduce" the following:
  - Tracking
  - Sediment released to inlets (inlet protection)
  - Sediment released to adjacent waters
  - Sediment released to drainage ways flowing off site
  - Sediment released from dewatering practices
  - Sediment released from soil stockpiles (existing more than 7 days)
  - Pollution into waters of chemicals, cement and other building compounds

ESC on Non-permitted sites

- The catch-all:
  - Immediate temporary stabilization required for disturbed areas which will remain open for a period exceeding 14 calendar days

- Bottomline:
  - If you are disturbing soil, then follow DNR technical standards to minimize (with the goal of eliminating) pollution

ESC on Permitted sites

- Same prescriptive standards as non-permitted sites with the following “prevent or reduce” add-ons:
  - Erosive flows in channels
  - Untreated wash water from vehicle and wheel washing releasing to waters of the state

- New sediment performance standards after January 1, 2013

ESC on Permitted Sites

- *Plan* must incorporate:
  - Minimization of soil compaction and preservation of topsoil
  - Minimization of land disturbance on slopes of 20% or more
    - i.e., sequence and phasing to limit duration of exposed areas
  - Maintenance of existing vegetation (i.e., sequence and phasing)

ESC on Permitted Sites

- We had the 80%
- Standard is now allowable release of 5 tons/acre/year
  - NR 151.11(6m)(b)2.:
    - "For **construction sites**...BMPs that, by design, discharge no more than 5 tons per acre per year, or to the maximum extent praticable, of the sediment load carried in runoff **from initial grading to final stabilization**"

ESC on Permitted Sites

- What does 5 tons/acre/year look like?
  - It's a dime thickness of sediment spread over an acre

Wow Bryan, that's very interesting! I'm actively listening to what you're saying.

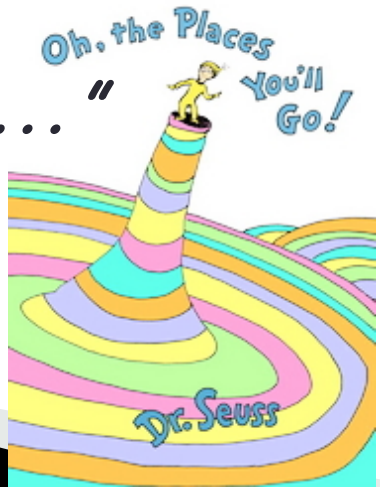
ESC on Permitted Sites

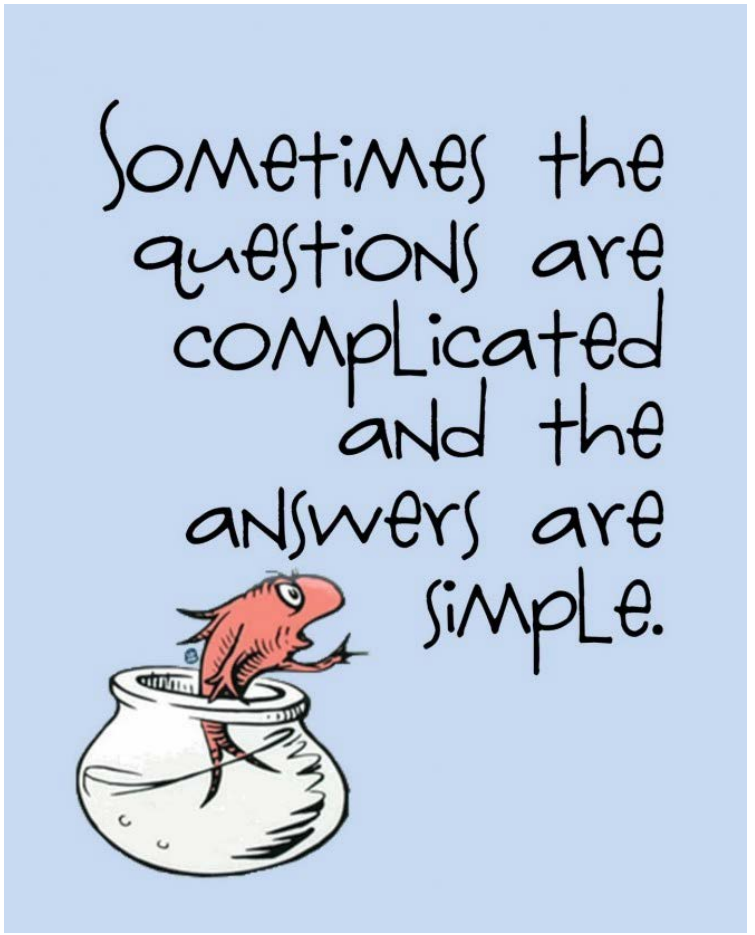
- Now, a few questions to consider:
  - What is the point of application for the standard?
  - What is the representative condition on which to base the estimation?
  - How do you respond to ever-changing site conditions? (static model/representation vs. dynamic site)
  - How will DNR regulate the 5 tons/acre/year?
  - Will the Notice of Intent form ever be changed?

ESC on Permitted Sites

Answers could be comple-simplexicated!

"You can get so confused
that you'll start in to race
down long wiggled roads at a
break-necking pace
and grind on for miles across
weirdish wild space,
headed, I fear, toward a most
useless place.
The Waiting Place..."
-Dr. Seuss



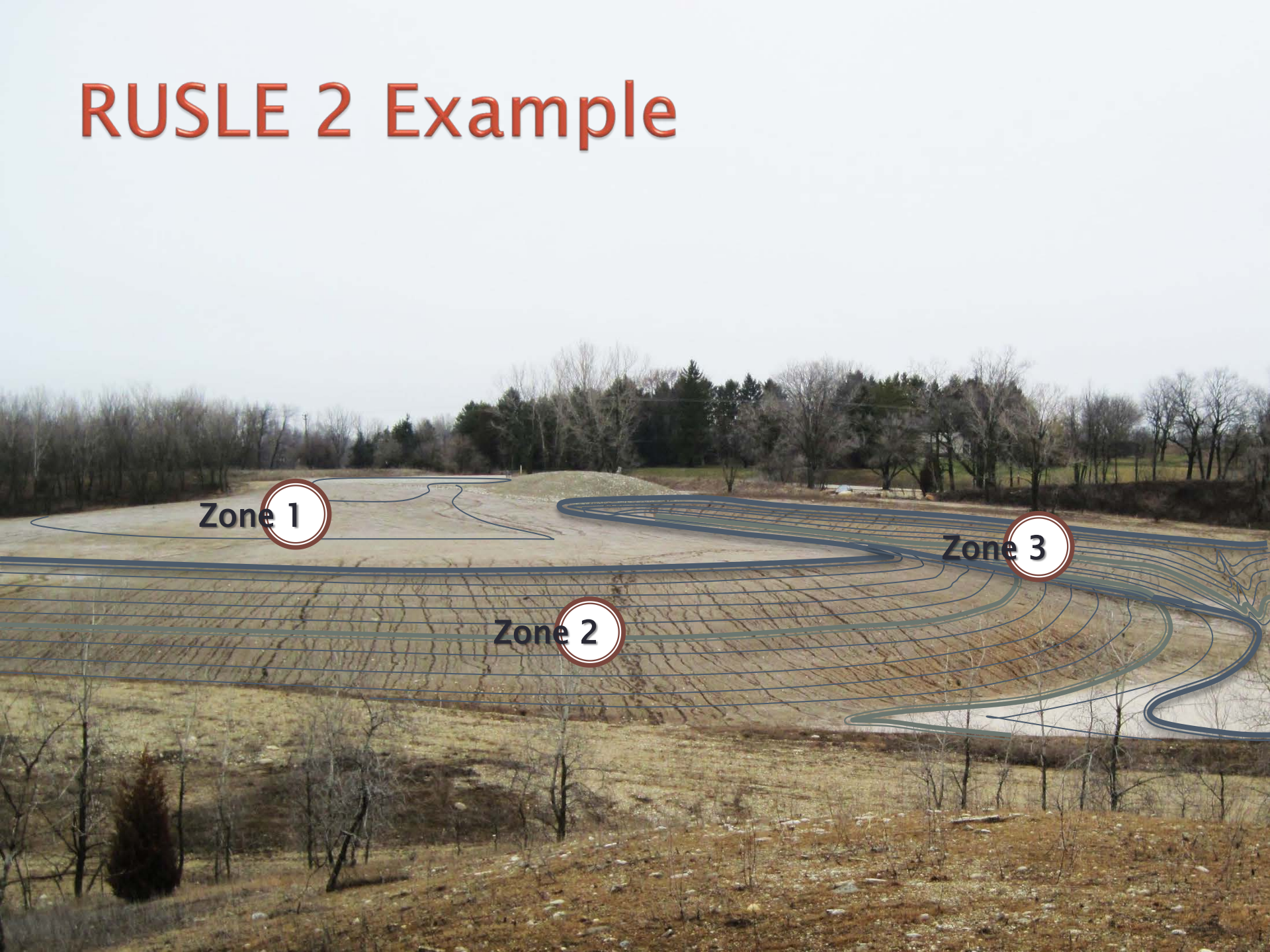


ESC on Permitted Sites

- The Revised Universal Soil Loss Equation (RUSLE) 2 will be the framework behind the Department's approach going forward

- Estimates soil loss due to erosion based on the following:
  - Erodibility
  - Erosivity
  - Site characteristics
  - BMP controls

RUSLE 2 Example



Soil Loss & Sediment Discharge Calculations

Soil loss and sediment discharge calculations should be conducted for all points of surface discharge from the construction site. Points of discharge may include outfalls from sediment basins and traps, discharges to storm sewer inlets and roadside ditches or diffuse discharges from silt fence or other linear practices.

Soil loss and sediment discharge calculation results are represented as unit area loads. With this in mind, the results for one point of discharge can be applied to other points of discharge with the same characteristics. Compliance with the construction site performance standard can be established at each point of discharge or as a composite of all points of discharge using an area weighted average.

Calculate ***soil loss*** based the anticipated duration of construction, including the period of bare soil and implementation of soil stabilization practices. Soil loss calculations are typically conducted using the universal soil loss equation or equivalent methodology. The primary input variables for soil loss calculations include climate, soil texture, topography and soil cover.

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

b. ***Soil Texture:*** 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 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:*** Areas where land disturbing construction activities will occur should be considered bare soil until soil stabilization practices are installed. An area weighted average should be used to represent areas where land disturbance will be conducted in phases and/or where partial area stabilization will occur. Estimated erosion control efficiencies for soil stabilization practices are identified in Table 1.

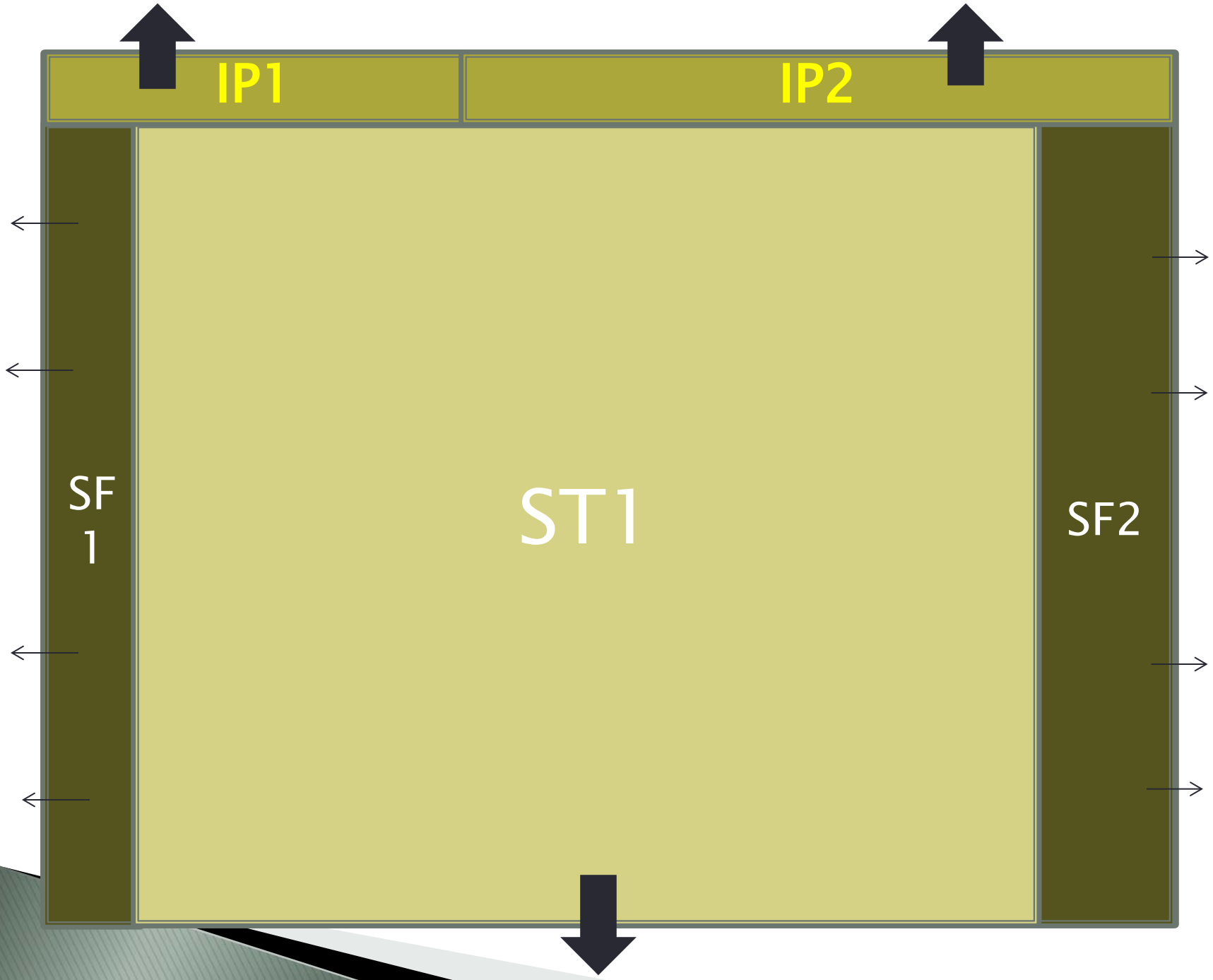
Table 1- Estimated Erosion Control Efficiency for Soil Stabilization Practices

Practice	Erosion Control Efficiency
Directional Tracking or Tillage	10%
Land Applied Polymer	50%
Seeding	60%
Mulch or Erosion Matting	80%
Mulch or Erosion Matting with Seeding	90%
Sod	99%

Calculate ***sediment discharge*** by applying sediment removal efficiencies for the sediment control practices to the soil loss calculated in step 1. Estimated sediment removal efficiencies for sediment control practices are identified in Table 2. If the calculated sediment discharge from the site exceeds 5 ton/acre/year, the construction schedule, soil stabilization practices and/or sediment control practices should be adjusted and the procedure repeated until the performance standard is met.

Table 2 – Estimated Sediment Removal Efficiency for Sediment Control Practices

Practice	Sediment Removal Efficiency by Soil Texture		
	Coarse	***Medium***	***Fine***
Sediment Basin	80%	80%	80%
Sediment Trap	80%	80%	80%
Silt Fence	60%	40%	20%
Straw Bale Barrier	60%	40%	20%
Manufactured Perimeter Control	60%	40%	20%
Vegetative Buffer	60%	40%	20%
Inlet Protection	50%	30%	10%
Ditch Check Sediment Trap	50%	30%	10%
NOTE: Practices such as dewatering, tracking pads and dust control are not included in Table 1 or sediment discharge calculations because they are not directly associated with sediment removal during runoff events.			


IP1
IP2
SF
1
ST1
SF2

Universal Soil Loss Equation for Construction Sites

for use in the State of Wisconsin

WISCONSIN DEPT. OF NATURAL RESOURCES

Developer:

Project: IP1 - 0.25 Acres

Date: 03/25/2014

County: Waukesha

PRINT HELP

Version 3.0

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=%RxRxKxLSxC (tons/acre)	Percent Reduction Required
												5.0 tons/acre
Bare Ground	05/01/2014	06/01/2014	11.0%	130	Sand	0.15	2.0%	25	0.13	1.00	0.3	
Bare Ground	06/01/2014	06/14/2014	7.4%	130	Sand	0.15	2.0%	25	0.13	1.00	0.2	
Seed and Mulch	06/14/2014	08/14/2014	43.9%	130	Sand	0.15	2.0%	25	0.13	0.10	0.1	
End	08/14/2014	-----	-----	-----	-------	-----			-----	------	-----	
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										TOTAL	0.6	NONE

Universal Soil Loss Equation for Construction Sites

for use in the State of Wisconsin

WISCONSIN DEPT. OF NATURAL RESOURCES

Developer:

Project: IP2 - 0.5 acres

Date: 03/25/2014

County: Waukesha

PRINT HELP

Version 3.0

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=%RxRxKxL SxC (tons/acre)	Percent Reduction Required
												5.0 tons/acre
Bare Ground	05/01/2014	06/01/2014	11.0%	130	Clay	0.32	2.0%	25	0.13	1.00	0.6	
Bare Ground	06/01/2014	06/14/2014	7.4%	130	Clay	0.32	2.0%	25	0.13	1.00	0.4	
Seed and Mulch	06/14/2014	08/14/2014	43.9%	130	Clay	0.32	2.0%	25	0.13	0.10	0.2	
End	08/14/2014	-----	-----	-----	-------	-----			-----	------	-----	
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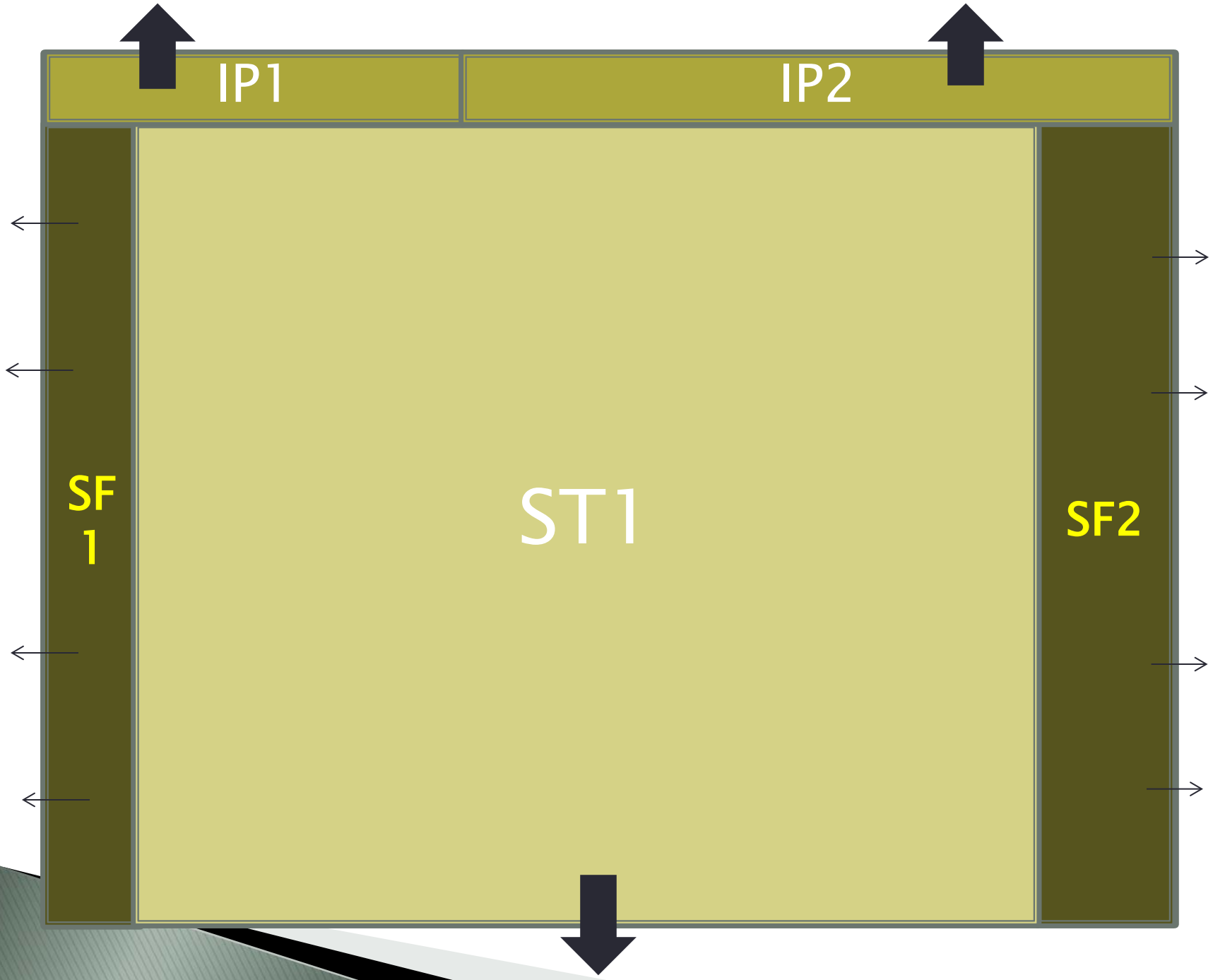
										TOTAL	1.3	NONE


IP1
IP2
SF 1
ST1
SF2

Universal Soil Loss Equation for Construction Sites

for use in the State of Wisconsin

WISCONSIN DEPT. OF NATURAL RESOURCES

Developer:

Project: SF1 - 0.5 acres

Date: 03/25/2014

County: Waukesha

PRINT HELP

Version 3.0

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=%RxRxKxL SxC (tons/acre)	Percent Reduction Required
												5.0 tons/acre
Bare Ground	05/01/2014	06/01/2014	11.0%	130	Silt Loam	0.43	5.0%	25	0.27	1.00	1.6	
Bare Ground	06/01/2014	06/14/2014	7.4%	130	Silt Loam	0.43	25.0%	25	3.11	1.00	12.9	
Seed and Mulch	06/14/2014	08/14/2014	43.9%	130	Silt Loam	0.43	25.0%	25	3.11	0.10	7.6	
End	08/14/2014	-----	-----	-----	-------	-----			-----	------	-----	
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										TOTAL	22.2	77%

Universal Soil Loss Equation for Construction Sites

for use in the State of Wisconsin

WISCONSIN DEPT. OF NATURAL RESOURCES

Developer:

Project: SF2 - 1 acre

Date: 03/25/2014

County: Waukesha

PRINT HELP

Version 3.0

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=%RxRxKxL SxC (tons/acre)	Percent Reduction Required
												5.0 tons/acre
Bare Ground	05/01/2014	06/01/2014	11.0%	130	Silt Loam	0.43	5.0%	75	0.46	1.00	2.9	
Bare Ground	06/01/2014	06/14/2014	7.4%	130	Silt Loam	0.43	5.0%	75	0.46	1.00	1.9	
Seed and Mulch	06/14/2014	08/14/2014	43.9%	130	Silt Loam	0.43	5.0%	75	0.46	0.10	1.1	
End	08/14/2014	-----	-----	-----	-------	-----			-----	------	-----	
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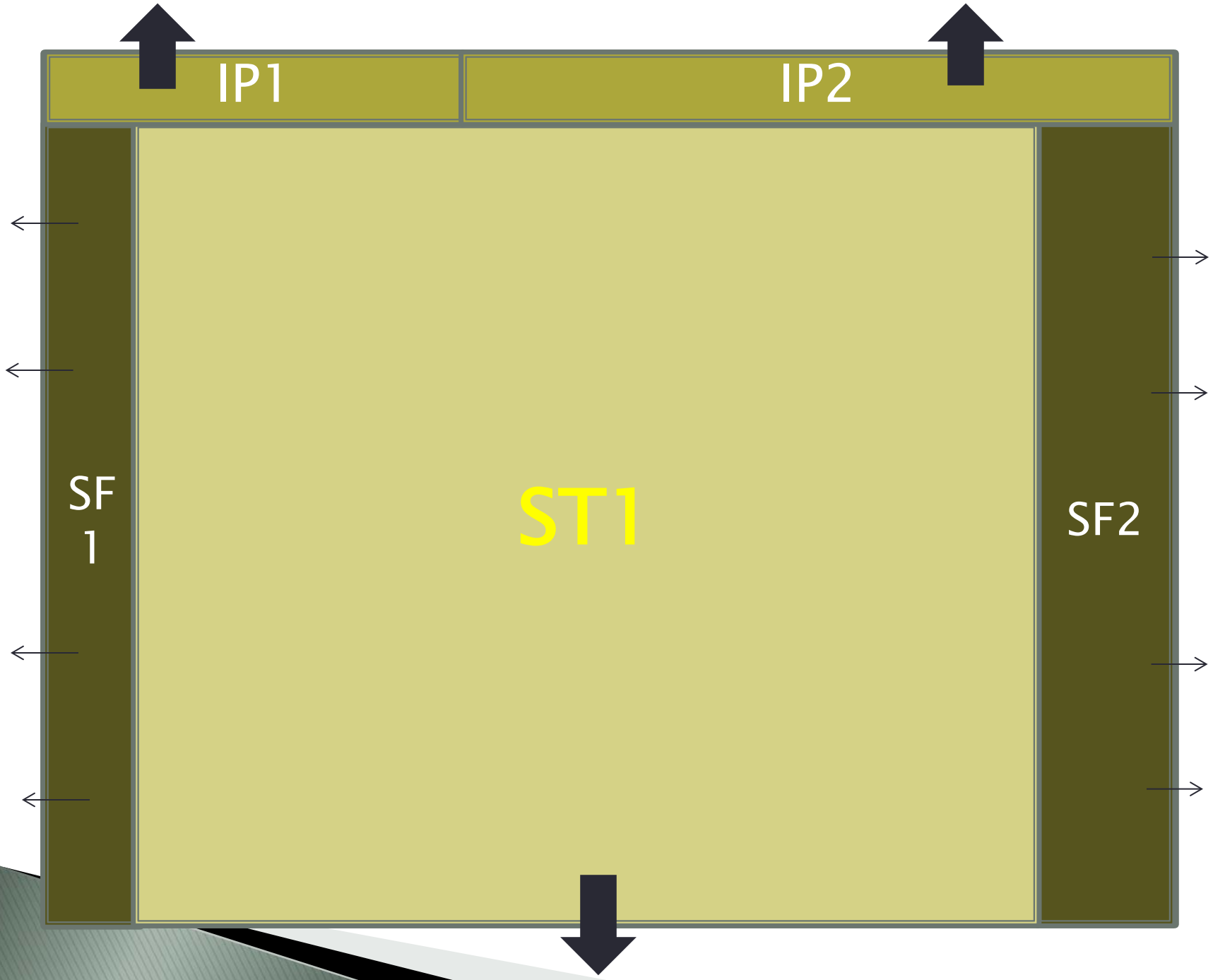
										TOTAL	5.9	16%


IP1
IP2
SF
1
ST1
SF2

Universal Soil Loss Equation for Construction Sites

for use in the State of Wisconsin

WISCONSIN DEPT. OF NATURAL RESOURCES

Developer:

Project: SB1 - 10 Acres

Date: 03/25/2014

County: Waukesha

PRINT HELP

Version 3.0

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=%RxRxKxL SxC (tons/acre)	Percent Reduction Required
												5.0 tons/acre
Bare Ground	05/01/2014	06/01/2014	11.0%	130	Silt Loam	0.43	8.0%	200	1.41	1.00	8.7	
Bare Ground	06/01/2014	08/01/2014	43.0%	130	Silt Loam	0.43	4.0%	200	0.53	1.00	12.7	
Bare Ground	08/01/2014	08/14/2014	8.4%	130	Silt Loam	0.43	2.0%	200	0.25	1.00	1.2	
Seed and Mulch	08/14/2014	10/14/2014	22.4%	130	Silt Loam	0.43	2.0%	200	0.25	0.10	0.3	
End	10/14/2014	-----	-----	-----	-------	-----			-----	------	-----	
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									TOTAL		22.8	78%

Universal Soil Loss Equation for Construction Sites

for use in the State of Wisconsin

WISCONSIN DEPT. OF NATURAL RESOURCES

Developer:

Project: SB1 - 10 Acres (Winter)

Date: 03/25/2014

County: Waukesha

PRINT HELP

Version 3.0

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=%RxRxKxLSxC (tons/acre)	Percent Reduction Required
												5.0 tons/acre
Bare Ground	02/01/2014	03/01/2014	2.0%	130	Silt Loam	0.43	8.0%	200	1.41	1.00	1.6	
Bare Ground	03/01/2014	05/01/2014	7.0%	130	Silt Loam	0.43	4.0%	200	0.53	1.00	2.1	
Bare Ground	05/01/2014	05/14/2014	4.6%	130	Silt Loam	0.43	2.0%	200	0.25	1.00	0.6	
Seed and Mulch	05/14/2014	07/14/2014	37.4%	130	Silt Loam	0.43	2.0%	200	0.25	0.10	0.5	
End	07/14/2014	-----	-----	-----	-------	-----			-----	------	-----	
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										TOTAL	4.8	NONE

Area	Acres	Soil Loss (tons/acre)	Sediment Control (%)	Sediment Discharge (tons/acre)
IP1	0.25	0.6	50	0.3
IP2	0.5	1.3	10	1.2
SF1	0.5	22.2	40	13.3
SF2	1.0	5.9	40	3.5
SB1	10	22.8	80	4.5

Area Weighted Average = 4.6 tons/acre

Maximum Months of Soil Disturbance

Sediment Basins & Sediment Traps

Soil Texture →

Slope ↓

	Coarse	Medium	Fine
0 to 2%	> 12	> 12	> 12
2.1 to 5%	> 12	8	> 12
5.1 to 10%	7	2.5	3
> 10%	2	0.5	0.75