Section 3: Soil Pits

Please bring all materials for this section:

Munsell color book, soil knife, tape measurer, shovel, etc.

What to expect:

For the soils section, we have soil pits available to look at. The participants will get into the pit and analyze the soil matrix for seasonal water tables. Depths to brief, moderate and long SWT and bedrock will be measured and a loading rate calculated.

We also have two soil samples that have been lab analyzed for clay content. Participants will texture the soil and provide a percentage amount for sand, silt and clay content.

Loading rate charts and soil texture triangle will be provided.

What to expect:

Grades for soil pits will be calculated by comparing the participants findings to the committees' findings. Soil textures will be compared to soil lab results.

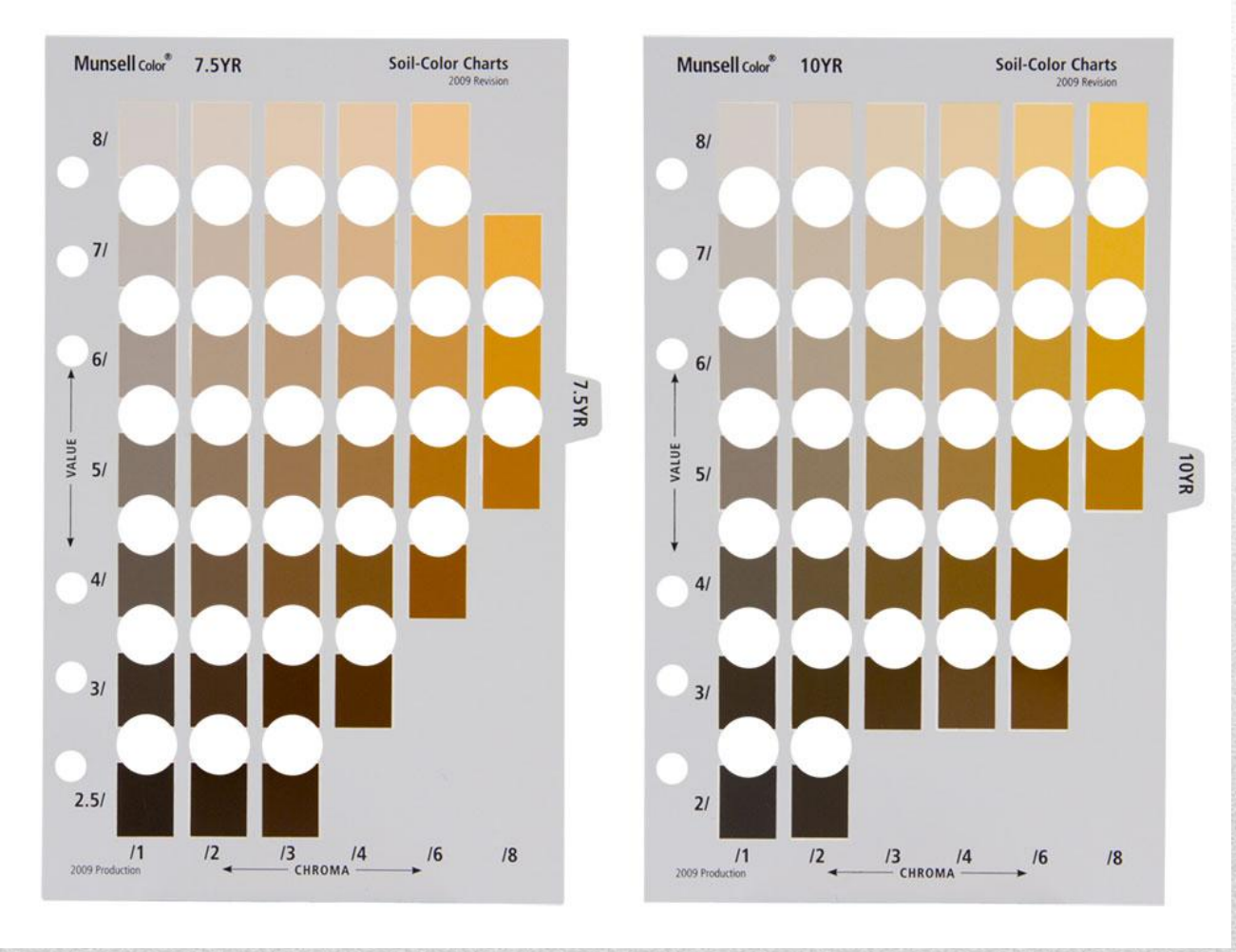
SWT depths: within 2 inches high or low = **full credit**

within 4 inches high or low = **half credit**

Soil textures: Clay content % within 5% = **full credit**

Clay content % within 10% = **half credit**

Defining Seasonal Water Tables



Use Munsell Color Book to define chromas and soil colors

Defining Seasonal Water Tables

1. Brief SWT:

- Concentrations or depletions with chroma ≥ 3: less than 20% of the mass is chroma 3 depletions

AND/OR

- 2% or more black (manganese) masses

Defining Seasonal Water Tables

2. Moderate SWT:

- Depletions with chroma ≤ 2 comprise less than 50% of the mass

AND/OR

- Chroma 3 depletions comprise more than 20%

3. Long SWT:

- Chroma ≤ 2 in 50% or more of the mass

Adjusting Seasonal Water Tables
(pg. 22 in Regs)

1. Brief & Moderate
   - (Moderate – Brief) ÷ 3 = Difference
   - Moderate – Difference = Adjusted Moderate
2. Moderate & Long
   - (Long – Moderate) ÷ 2 = Difference
   - Long – Difference = Adjusted Long
3. Brief & Long
   - (Long – Brief) ÷ 6 = Difference
   - Long – Difference = Adjusted Long

Adjusting Seasonal Water Tables

1. Soil pit with brief @ 17”, moderate @ 29”

(Moderate – Brief) ÷ 3 = Difference

(29” - 17”) ÷ 3 =

12” ÷ 3 = 4”

29” - 4” = 25” ← Adjusted Moderate

2. Soil pit with brief @ 13”, moderate @ 28”

(Moderate – Brief) ÷ 3 = Difference

(28” - 13”) ÷ 3 =

15” ÷ 3 = 5”

28” - 5” = 23” ← Adjusted Moderate

Adjusting Seasonal Water Tables

3. Soil pit with moderate @ 24”, long @ 38”

(Long – Moderate) ÷ 2 = Difference

(38” - 24”) ÷ 2 =

14” ÷ 2 = 7”

38” - 7” = **31” ← Adjusted Long**

4. Soil pit with brief @ 15”, long @ 39”

(Long – Brief) ÷ 6 = Difference

(39” - 15”) ÷ 6 =

24” ÷ 6 = 4”

39” - 4” = **35” ← Adjusted Long**

Adjusting Seasonal Water Tables

5. Soil pit with brief @ 18”, moderate @ 24”, long @ 38”

(Moderate – Brief) ÷ 3 = Difference

(24” - 18”) ÷ 3 =

6” ÷ 3 = 2”

24” - 2” = **22” ← Adjusted Moderate**

(Long – Adj. Moderate) ÷ 2 = Difference

(38” - 22”) ÷ 2 =

16” ÷ 2 = 8”

38” - 8” = **30” ← Adjusted Long**

What would the loading rate be for this soil on 8’ centers?

→ 0.35 ←

Adjusting Seasonal Water Tables

6. Soil pit with brief @ 15”, moderate @ 27”, long @ 47”

(Moderate – Brief) ÷ 3 = Difference

(27” - 15”) ÷ 3 =

12” ÷ 3 = 4”

27” - 4” = **23” ← Adjusted Moderate**

(Long – Adj. Moderate) ÷ 2 = Difference

(47” - 23”) ÷ 2 =

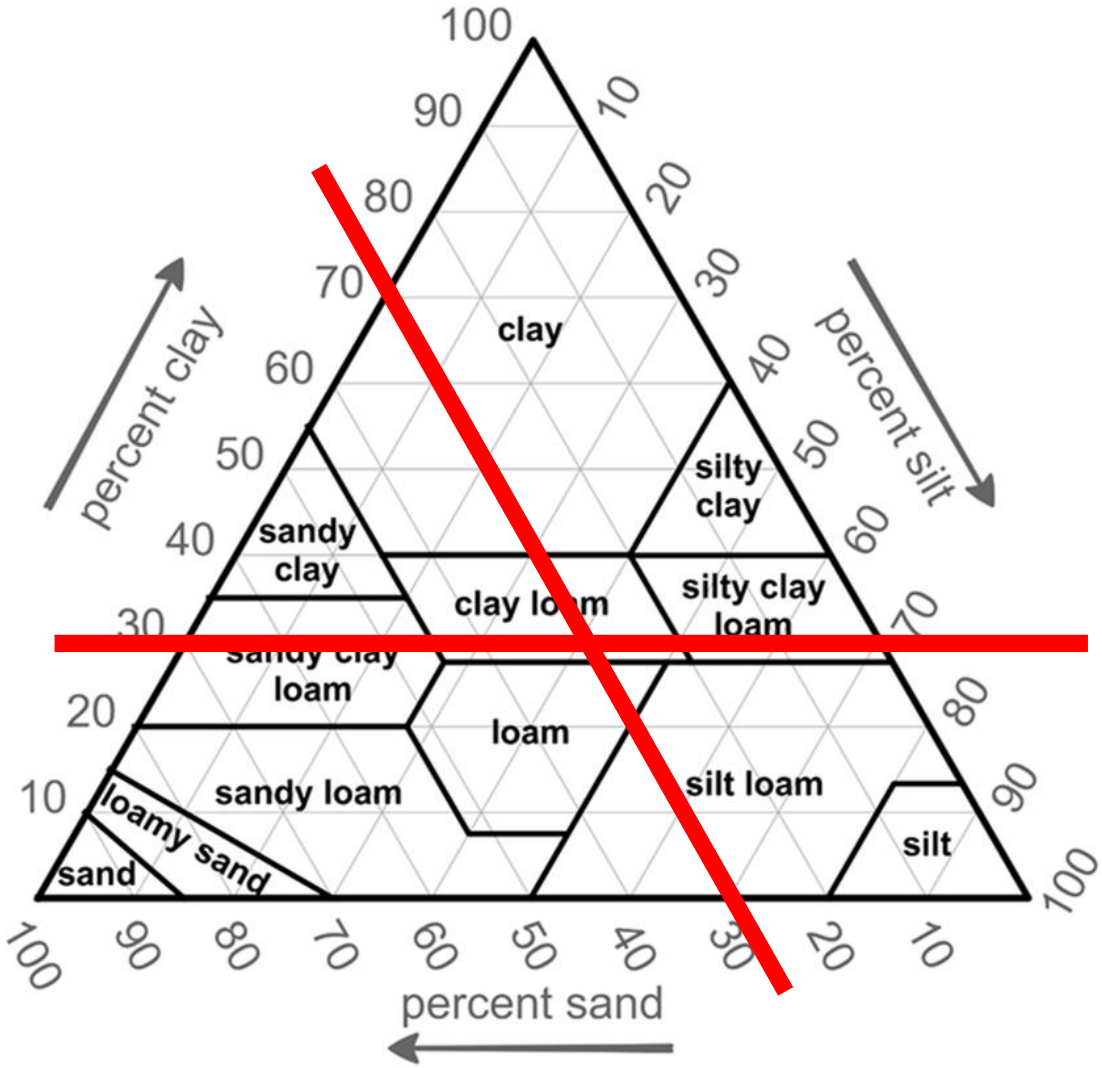
24” ÷ 2 = 12”

47” - 12” = **35” ← Adjusted Long**

What would the loading rate be for this soil on 10’ centers?

→ 0.40 ←

Example #1



Sand: 30

Clay: 30

Silt: 40

Soil Texture:

Clay Loam

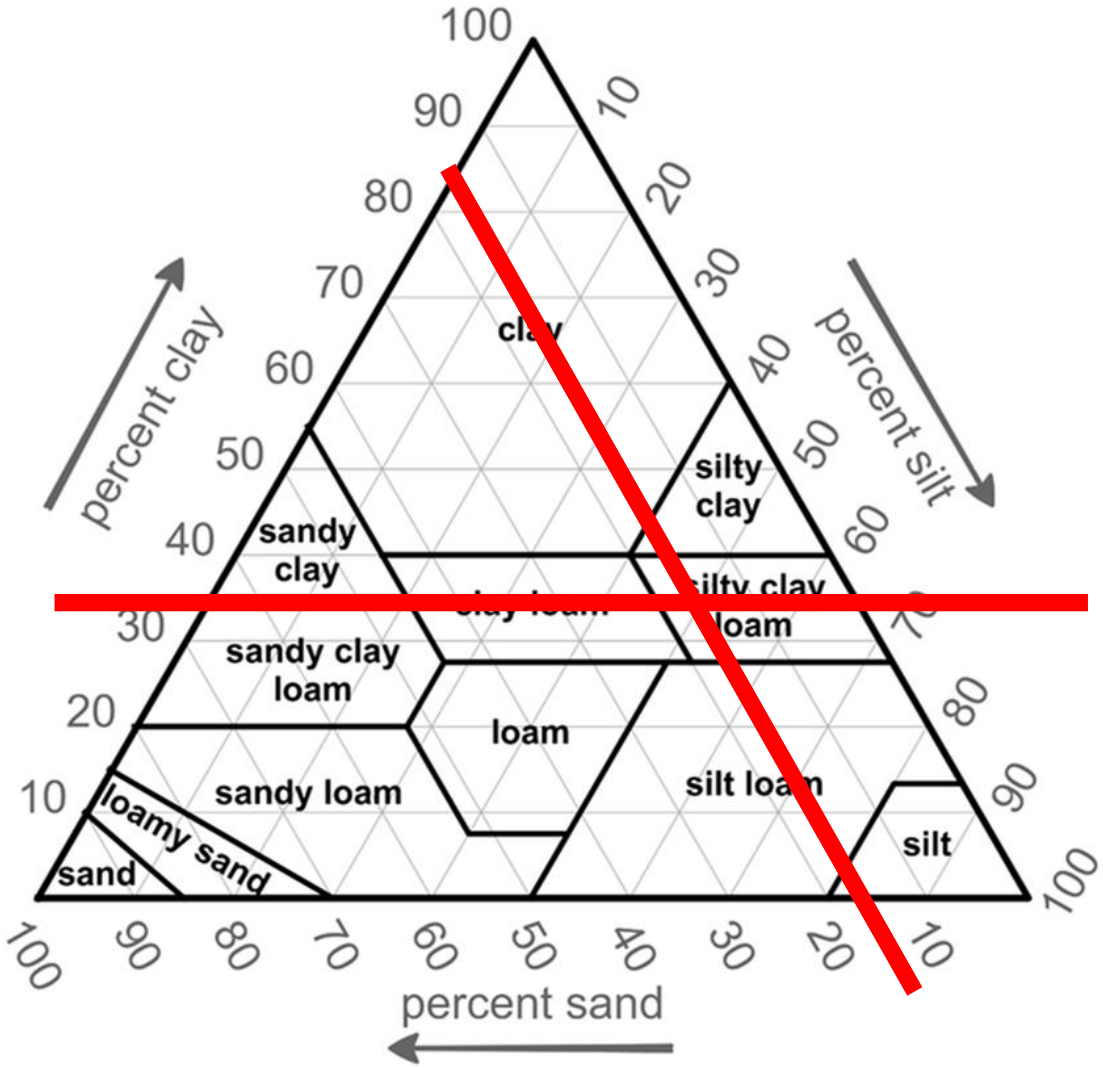
Conductivity:

Low

Moderate

High

Example #2



Sand: 15
Clay: 35
Silt: 50

Soil Texture:
Silty Clay Loam

Conductivity:
Low
Moderate
High

Example #3

Sand: 40

Clay: 50

Silt: 10

Soil Texture:

Clay

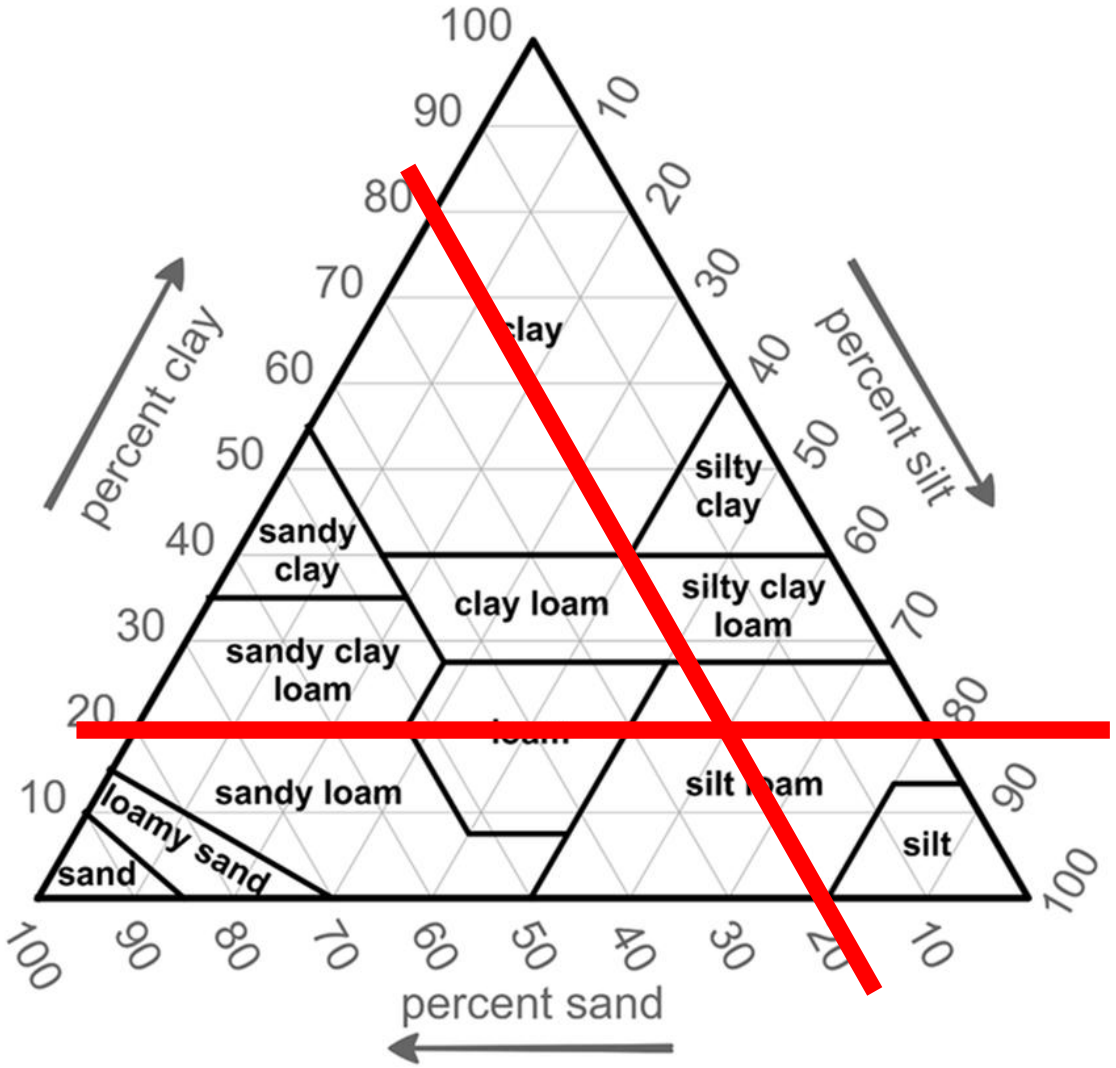
Conductivity:

Low

Moderate

High

Example #4



Sand: 20
Clay: 20
Silt: 60

Soil Texture:
Silt Loam

Conductivity:
Low
Moderate
High

Designated Representative Exam

Soils Test

(100 pts.)

Name _____ *Time In*_____

Time Out _____

Indicate the following for each of the 2 soil pits. Give the soils characteristics (concentration, depletions, chroma, etc.) that determine the depths to each SWT if they are observed. Calculate the loading rate, or indicate "no load" for each pit based on the most limiting SWT.
EVALUATE PITS BETWEEN THE FLAGS ON THE SIDE OF PIT
EVALUATE EACH PIT TO A DEPTH OF 48 INCHES.
DISREGARD CLAY CONTENT IN DETERMINING SWT's

	Pit # _____	**Pit # _____**
REDOX FEATURES (7 pts)	_____	_____
	_____	_____
	_____	_____
Depth to Brief SWT (10 pts)	_____"	_____"
REDOX FEATURES (7 pts)	_____	_____
	_____	_____
	_____	_____
Depth to Moderate SWT (10 pts)	_____"	_____"
REDOX FEATURES (2 pts)	_____	_____
	_____	_____
	_____	_____
Depth to Long SWT (3 pts)	_____"	_____"
Depth to bedrock (1 pt. each)	_____"	_____"
Loading rate. Use 10' centers (Show calculations) (5 pts. each)	_____	_____

Name _____Date _____

Answer the following questions using the provided soil samples. Be sure to include the sample number (Sand and silt percentages are for determining textural class only):

	Sample # _____	**Sample # _____**
Sand percentage (0 pts. each)	_____%	_____%
Silt percentage (0 pts. each)	_____%	_____%
Clay percentage (3 pts. each)	_____%	_____%
Soil Texture (1 pt. each) (from textural triangle)	_____	_____
Hydraulic conductivity (1 pt. each)	_____	_____