

# DEQ Certification Class Presentations

**Class presentations are provided for study/review purposes only. Printouts of these PowerPoint slides will not be allowed into the exam testing centers.**

**August 2024**



# Exercise 1B

## Stormwater Site Design

# Exercise 1B Materials

In your participant guide:

- Exercise 1B Instructions
  - Use this sheet to jot down your results and notes

## Exercise 1B: Instructions

### STORMWATER SITE DESIGN

Using the site from Exercise 1A, assume that three acres can be preserved as "forest" rather than developed as managed turf. Follow the instructions below to evaluate water quality compliance. Use the New Development Compliance spreadsheet. Assume "C" soils throughout and use the New Development Compliance spreadsheet.

#### Site Information

- Project area = 6.7 acres
- Post-development land cover:
  - Forest = 3 acres
  - Managed turf = 1.75 acres
  - Impervious cover = 1.95 acres
  - Assume "C" soils throughout

#### EVALUATE FOR WATER QUALITY COMPLIANCE

- Determine the total post-development phosphorus load.
- Determine the site treatment volume.
- Determine the pollutant removal requirement (load reduction required).
- Determine the average efficiency needed for water quality compliance (removal requirement/total load).

#### Instructions

1. Modify the site data you entered in Exercise 1A.
2. Determine the results using the summary information at the bottom of the Site tab.
3. Save the spreadsheet as "EX1B.xls" or similar.

#### Helpful Hints:

1. Make sure you are using the New Development Spreadsheet and refer to Module 4 for a description of the Site tab.
2. Make sure the site data still adds up to 6.7 acres as in the previous exercise.

# Exercise 1B Materials

## VRRM 4.1 New Development Spreadsheet

DEQ Virginia Runoff Reduction Method New Development Compliance Spreadsheet - Version 4.1

Project Name:   
 Date:

BMP Design Specifications List: 2024 Stds & Specs

**Site Information**

ENTER AREAS IN DATA INPUT CELLS FOR RESULTS

Post-Development Project (Treatment Volume and Loads)

(Land Cover (acres))

	A Soils	B Soils	C Soils	D Soils	Totals
Forest (acres) - undisturbed, protected					0.00
Forest or adjacent land					0.00
Mixed Open (acres) - undisturbed (temporarily disturbed) grass or					0.00
Managed Turf (acres) - disturbed, graded					0.00
Or lands or other turf to be					0.00
Impervious Cover (acres)					0.00
					0.00

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)

**LAND COVER SUMMARY - POST DEVELOPMENT**

Land Cover Summary		Treatment Volume and Nutrient Loads	
Forest Cover (acres)	0.00	Treatment Volume (acre-ft)	0.0000
Managed As Forest	0.00	Treatment Volume (cubic feet)	0
% Forest	0%	TP Load (lb/yr)	0.00
Mixed Open (acres)	0.00	TN Load (lb/yr)	0.00
Managed As mixed open	0.00		
% Mixed Open	0%		
Managed Turf Cover (acres)	0.00		
Managed As turf	0.00		
% Managed Turf	0%		
Impervious Cover (acres)	0.00		
As impervious	0.00		
% Impervious	0%		
Site Area (acres)	0.00		
Site Aa	0.00		

# Exercise 1B

## Stormwater Site Design

### Site Information:

- Project area = 6.7 acres
- Post-development land cover
  - Forest (preserved) = **3 acres**
  - Managed turf = **1.75 acres**
  - Impervious cover = **1.95 acres**
  - Pre and post soils all “C” and they will be decompacted to maintain HSG “C”

### Determine:

- ❑ Total phosphorus load
- ❑ Site T<sub>v</sub>
- ❑ Pollutant removal requirement
- ❑ Average efficiency required for removal requirement

**Enter site data**

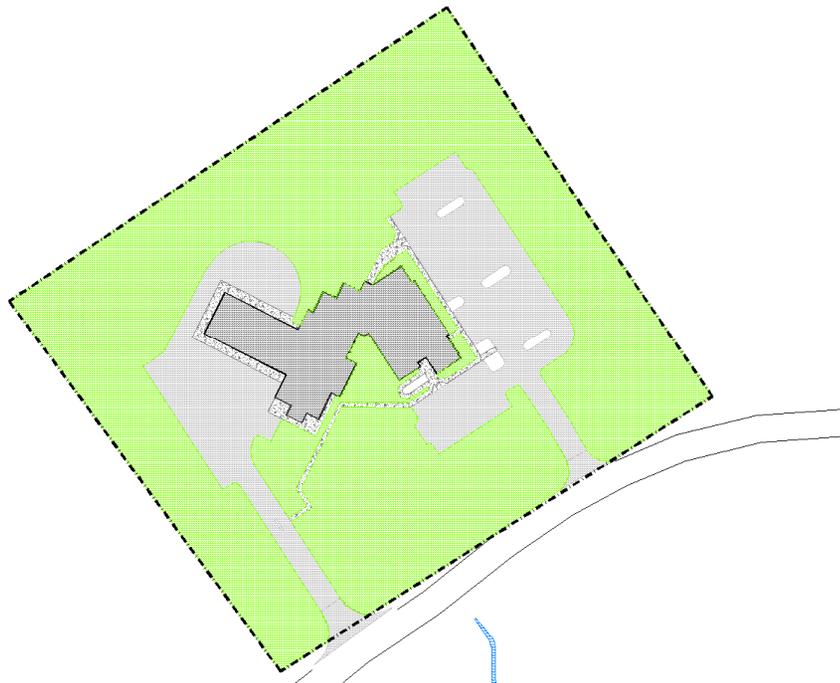
**Site Information**

**Post-Development Project (Treatment Volume and Loads)**

**Land Cover (acres)**

	A Soils	B Soils	C Soils	D Soils	Totals
Forest (acres) -- undisturbed, protected forest or reforested land			3.00		3.00 *
Mixed Open (acres) -- undisturbed/infrequently maintained grass or shrub land					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed			1.75		1.75
Impervious Cover (acres)			1.95		1.95
					6.70

*\* Forest and Mixed Open areas must be protected in accordance with the Virginia Runoff Reduction Method*



**Light green = Managed turf**  
**Dark gray = Building**  
**Light gray = Parking and sidewalks**

# Results

## Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	1.48
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## LAND COVER SUMMARY -- POST DEVELOPMENT

### Land Cover Summary

Forest Cover (acres)	3.00
Weighted Rv (forest)	0.04
% Forest	45%
Mixed Open (acres)	0.00
Weighted Rv (mixed open)	0.00

### Treatment Volume and Nutrient Loads

Treatment Volume (acre-ft)	0.1965
Treatment Volume (cubic feet)	8,558
TP Load (lb/yr)	3.23
TN Load (lb/yr)	42.14

**Save results as: EX1B.xlsm**

Overall efficiency required =  $100 \times (1.48 \div 3.23) = 46\%$

**\*High overall reduction efficiency for a 30% impervious site\***

# Exercise 1A and 1B Compared

	Exercise 1A	Exercise 1B
Total phosphorus load	5.21 lb/yr	3.23 lb/yr
Reduction required	3.47 lb/yr	1.48 lb/yr
Required treatment volume	10,518 cf	8,558 cf
Overall efficiency required	67%	46%

## Stormwater site design reduces:

- ✓ Phosphorus leaving the site
- ✓ Required amount of reduction

# Questions?

