



Schofield, Barbini & Hoehn Inc.
Land Surveying & Civil Engineering

12 Surveyor's Lane, Box 339
Vineyard Haven, Mass.
508-693-2781
www.sbhinc.net
dhoehn@sbhinc.net

Meeting House Place Nitrogen Load Calculations
August 15, 2019

Total Perimeter Land Area = 54.3 acres

MVC WQMP Adjusted Nitrogen Load Limit (Edgartown Great Pond) = 1.40 kg/ac/year

MVC WQMP maximum nitrogen load for 54.3 acres = 76.0 kg/year

A & B 28 lots @29,553 sf average per lot

Maximum interior house square footage = 4,800 sf + garage

Average footprint – roofs + covered decks & porches = 6,000 sf per lot
(average 3,200 sf footprint, 800 sf garage, 2,000 sf decks/porches)

Average uncovered porch & deck – 1,000 sf per lot

Average driveway square footage – 2,500 sf per lot

Pools – 14 lots x 800 sf per lot (20'x40') (no Nitrogen contribution)

Patios – 2,000 sf per lot

Maximum number bedrooms = 5 per lot

Fertilized lawn & gardens = 4,000 sf per lot per policy (all land within lots exclusive of zoning setbacks, roofs, covered decks & porches, uncovered decks & porches, driveway, pool & patio shall be considered "landscaped area" as per MVC WQMP)

Proposed "no-cut no-touch" setbacks (30 front/15 side/10 rear) = 10,806 sf/lot
average = 37% of average lot area

Roads

Roads – sections A & B = 2,000 linear feet x 16 feet wide = 32,000 sf

Road shoulders – 2,000 linear feet x 6 feet (3 feet per side) = 12,000 sf

Townhouses 10 units + road on 1.4 ac lot

Maximum unit square footage = 1,000 sf

Average footprint – roof + covered decks = 1,200 sf per unit

Average driveway square foot – 500 sf per unit (50' x 10' including parking)

Patios – 1,000 sf per unit

Maximum number of bedrooms (10 units @ 3 BR)

Fertilized lawn & gardens = 1,000 per unit

Road – section T – 190 linear feet x 16 feet wide = 3,040 sf

Road shoulders – 190 linear feet x 6 feet (3 feet per side) = 1,140 sf

"No-cut no-touch" setbacks (30/10/10) = 15,868 sf = 26% of Townhouse lot

2.

Nitrogen Loading Estimates

*N loads from Wastewater

1. Standard Title V nitrogen contribution

$185.5 \text{ gal/day} \times 365 \text{ days} = 67,700 \text{ gal/year}$

$67,700 \times 90\% \text{ leach rate} \times 3.785 \text{ lit/gal} \times 26.25 \text{ mg/l N} / 1,000,000 = 6.05 \text{ kg/yr/dwlg}$

2. Wastewater facility contribution

$67,700 \times .9 \times 3.785 \times 3 \text{ mg/l N} / 1,000,000 = 0.69 \text{ kg /yr/dwlg}$

Meeting House Wastewater facility N contribution:

$28 \text{ lots} \times 0.69 = 19.3 \text{ kg/year}$

$10 \text{ units} \times 0.69 = 6.9 \text{ kg/year}$

Total 26.2 kg/year

*Roads (runoff into vegetated areas)

$\text{Impervious roads} = 32,000 \text{ sf} + 3,040 \text{ sf} = 35,040 \text{ sf}$

MVC WQMP Formula:

$35,040 \text{ sf} \times 46.9 \text{ inches annual precip} / 12 \text{ inches per ft} \times 90\% \text{ leaching rate} \times 28.3 \text{ liters/cu ft} \times 0.75 \text{ mg/liter N per policy} / 1,000,000 = \mathbf{2.6 \text{ kg/year}}$

*Road Shoulders

$\text{Road Shoulders} = 12,000 \text{ sf} + 1,140 \text{ sf} = 13,140 \text{ sf}$

MVC WQMP:

$13,140 \text{ sf} \times 46.9 \text{ inches precip} / 12 \text{ inch per ft} \times 65\% \times 28.3 \text{ liters/cu ft} \times 0.75 \text{ mg/liter} / 1,000,000 = \mathbf{0.7 \text{ kg/year}}$

*Roofs + Covered Decks & Porches (runoff into mulched and vegetated areas)

$28 \times 6,000 \text{ sf} + 10 \times 1,200 \text{ sf} = 180,000 \text{ sf}$

MVC WQMP Formula:

$180,000 \text{ sf} \times 46.9 \text{ inches annual precip} / 12 \text{ inches per foot} \times 90\% \text{ leaching rate} \times 28.3 \text{ liters/cu ft} \times 0.38 \text{ mg/liter N per policy} / 1,000,000 = \mathbf{6.8 \text{ kg/year}}$

*Driveways (runoff into vegetated shoulders)

$\text{Driveways} = 28 \text{ lots} \times 2,500 \text{ sf} + 10 \text{ units} \times 500 \text{ sf} = 75,000 \text{ sf}$

MVC WQMP Formula:

$75,000 \text{ sf} \times 46.9 \text{ inches annual precip} / 12 \text{ inches per foot} \times 65\% \text{ leaching rate} \times 28.3 \text{ liters/cu ft} \times 0.75 \text{ mg/liter N per policy} / 1,000,000 = \mathbf{4.0 \text{ kg/year}}$

3. Nitrogen Loading Estimates (continued)

***Uncovered Porch & Decks (runoff into mulched and vegetated areas)**

28 lots x 1,000 sf + 10 units x 500 sf = 33,000 sf
 33,000 sf x 46.9 inches precip per year / 12 inches per foot x
 65% leaching rate x 28.3 liters/cu ft x 0.75 mg/liter / 1,000,000 = **1.8 kg**

***Pools**

14 x 800 sf per pool (assume 20' x 40')
No Nitrogen Load

***Patios (runoff into mulched and vegetated areas)**

28 x 2,000 sf + 10 x 1,000 sf = 66,000 sf
 66,000 sf x 46.9 inches precip per year / 12 inches per foot x 90% leaching rate x 28.3
 liters/cu ft x 0.38 mg/liter N (roofs) / 1,000,000 = **2.5 kg**

***Fertilized Lawn & Gardens**

28 lots x 4,000 sf per lot = 112,000 sf
 10 units x 1,000 sf per unit = 10,000 sf
 122,000 sf x 3 lbs N per 1,000 sf x 20% leaching rate / 2.205 lb/kg = **33.2 kg/year**

Remaining Land Calculations (treated the same as fertilized lawn & gardens)

Average Lot size	29,553 sf	Townhouse Lot	60,984 sf lot
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No-touch setbacks	10,506 sf	No-touch setbacks	15,868 sf
Roof/covered porches	6,000 sf	Roof/covered porches	12,000 sf
Uncovered Porch/Deck	1,000 sf	Road	3,040 sf
Driveway	2,500 sf	Road Shoulders	1,140 sf
Pool (800 sf for 1/2 lots)	400 sf	Driveways	5,000 sf
Patios	2,000 sf	Patios	10,000 sf
Fertilized lawn/gardens	4,000 sf	Fertilized lawn/gardens	10,000 sf

Total ave. lot used area=	26,406 sf	Total ave. lot used area=	57,048 sf
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29,553 sf average lot area –		60,984 sf lot area –	
26,406 sf lot area used =		57,048 sf lot area used =	
3,147 sf remaining land per lot		3,936 sf remaining land in lot	

28 lots x 3,147 sf/lot remaining land =		3,936 sf remaining land x	
88,116 sf remaining land x 3 lbs N per		3 lbs N per 1,000 sf x	
1,000 sf x 20% leach rate / 2.205 lb/kg		20% leach rate / 2.205 lb/lg	
= 24.0 kg/yr from remaining land		= 1.1 kg/yr from remaining land	

4.

Nitrogen Loading Estimates (continued)

**Totals = 26.2 + 2.6 + 0.7 + 6.8 + 4.0 + 1.8 + 2.5 + 33.2 + 24.0 + 1.1 =
102.9 kg/year prior to mitigation**

******* Note: Fertilized lawn and gardens shall be limited to a maximum of 4,000 sf per lot. "Remaining land" shall not be fertilized but shall be assumed to contribute the same amount of nitrogen as fertilized lawn and shrubs**

Mitigation

Hotchkiss lots

6.05 kg/yr – 0.69 kg/yr wastewater facility = **5.36 kg per lot** if sewer
12 lots x 5.36 kg per lot = **64.3 kg**

Applicant proposes to provide town sewer to all 12 Hotchkiss Lane lots at applicant's expense. If all 12 lots owners do not want to tie in to town sewer, applicant guarantees tying in a minimum of 6 properties to town sewer at the applicant's expense, either on Hotchkiss Lane or in other areas in the Edgartown Great Pond Watershed.

Total nitrogen load from project if all 12 Hotchkiss Lane lots tie in:

102.9 kg (see above)

-64.3

38.6 kg / year net nitrogen generation

Total project nitrogen reduction after mitigation = 38.6 kg/year with full Hotchkiss Lane participation, 51% of the allowed nitrogen generation based on MVC WQMP, 49% reduction of allowed nitrogen generation based on MVC WQMP.

If the applicant only gets 6 Hotchkiss or other lots to tie into sewer, the total nitrogen load after mitigation is 70.7 kg/year, 93% of allowed per policy, 7% reduction of allowed nitrogen generation per policy.