

STARPOINT REFUEL

Stormwater Exemption Memo

GENERAL DESCRIPTION

Starpoint Refuel is located at 1950 US Hwy 15/501 N, Chapel Hill, NC 27516. The project will demolish the existing Budget Truck Rental, Exxon-Mobil, and Angel Upholstery that exist on the site today and replace it with a Starpoint Refuel gas station and convenience store. The overall impervious area for the parent parcel will be reduced as a result of this redevelopment. The calculations show a reduction in the overall SCS Curve Number from 91 to 82 for the parcel. Pre- and post-development hydrology calculations are attached in the appendix for reference.

McAdams is requesting an exemption from further stormwater management and calculations per the following provisions:

Town of Chapel Hill Code of Ordinances – Article 5

5.4.5. Waivers for Stormwater Management Facilities Requirements.

Unless otherwise exempted by this section, every development application shall provide for stormwater management. The requirements for stormwater management facilities may be waived in whole or in part by the approving body, if it is demonstrated by the applicant that at least one (1) of the following conditions applies:

(a) Alternative measures for on-site and/or off-site management of stormwater have been proposed, and these measures are approved by the town manager and comply with local ordinance(s).

(b) It is otherwise demonstrated that the proposed development will not produce any significant change to the existing pre-application hydrology.

Jordan Lake Rules – 15A NCAC 02B .0265.3.vi

Proposed new development that would replace or expand structures or improvements that existed as of December 2001, the end of the baseline period, and that would not result in a net increase in built-upon area shall not be required to meet the nutrient loading targets or high-density requirements except to the extent that it shall provide stormwater control at least equal to the previous development. Proposed new development that would replace or expand existing structures or improvements and would result in a net increase in built-upon area shall have the option either to achieve at least the percentage loading reduction goals stated in 15A NCAC 02B .0262 as applied to nitrogen and phosphorus loading from the previous development for the entire project site, or to meet the loading rate targets described in Sub-Item (3)(a)(i). These requirements shall supersede those identified in 15A NCAC 02B .0104(q);

CALCULATION METHODOLOGY

- Using WebSoil Survey, the on- and off-site soils were determined to be from hydrologic soil group (HSG) 'B' soils. Since the method chosen to compute both pre- and post-development peak flow rates and runoff volumes is dependent upon the soil type, care was taken when selecting the appropriate Soil Conservation Number (SCS CN).

Within each sub-basin, an approximate proportion of each soil group was determined using NRCS Web Soil Survey Maps. Once an approximate proportion was determined, a composite SCS CN was computed for each cover condition.

- A composite SCS Curve Number was calculated for both the pre- and post-development condition for each sub-basin using SCS curve numbers and land cover conditions. Land cover conditions for the on-site pre-

development conditions were taken from surveyed information collected by The John R. McAdams Company, Inc. Land cover conditions for the on-site post-development condition were taken from the proposed site plan.

- The existing on-site topography used in the analysis is from a field survey by The John R. McAdams Company, Inc.

DISCUSSION OF RESULTS

PEAK RUNOFF CONTROL REQUIREMENTS

As the development results in a decrease in the SCS Curve Number, this will result in a decrease in flow leaving the site. A stormwater management device is not needed to control peak flow. In existing conditions, the flow from the site sheet flows into an existing swale to the west and south of the site. In proposed conditions, the water will be collected and discharged into the existing storm sewer system on Smith Level Rd. and US 15/501.

POLLUTANT AND NUTRIENT CONTROL REQUIREMENTS

Jordan lake rules states TSS and nutrients are not required to be met if impervious area is reduced.

CONCLUSION

If the development on this tract is built as proposed within this report, then the requirements set forth in Town of Chapel Hill regulations will be met without additional stormwater management facilities. However, modifications to the proposed development may require that this analysis be revised. Some modifications that would **require** this analysis to be revised include:

1. The proposed site impervious surface exceeds the amount accounted for in this report.
2. The post-development watershed breaks change significantly from those used to prepare this report.

The above modifications may result in the assumptions within this report becoming invalid. The computations within this report will need to be revisited if any of the above conditions become apparent as development of the proposed site moves forward.



I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume: HSG 'A' = 0.0%
HSG 'B' = 100.0%
HSG 'C' = 0.0%
HSG 'D' = 0.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	61	Assume good condition
Wooded	55	Assume good condition

II. PRE-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Roof	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
<i>Totals</i>	0	0.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	39,785	0.91	-
Onsite open	61	10,091	0.23	Assume good condition
Onsite wooded	55	0	0.00	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	61	0	0.00	Assume good condition
Offsite wooded	55	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area = 1.14 acres
49,876 sf

Composite SCS CN = 91

% Impervious = 79.8%

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

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Cover Condition	SCS CN	Comments
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II. PRE-DEVELOPMENT

A. Onsite Impervious Breakdown

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Driveway / Parking Lot	0	0.00
Roof	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
<i>Totals</i>	0	0.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	28,767	0.66	-
Onsite open	61	21,109	0.48	Assume good condition
Onsite wooded	55	0	0.00	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	61	0	0.00	Assume good condition
Offsite wooded	55	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total IC area = 1.14 acres
49,876 sf

Composite SCS CN = 82

% Impervious = 57.7%

III. TIME OF CONCENTRATION INFORMATION

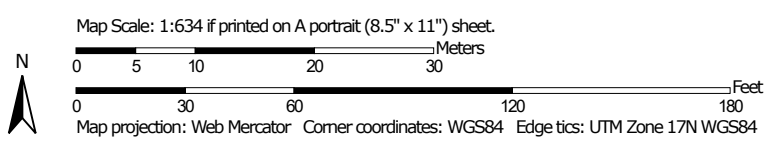
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Hydrologic Soil Group—Orange County, North Carolina
(Project Area)




Soil Map may not be valid at this scale.



Hydrologic Soil Group—Orange County, North Carolina
(Project Area)

MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

Soil Rating Lines


-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

Soil Rating Points






-  A
-  A/D
-  B
-  B/D

-  C
-  C/D
-  D
-  Not rated or not available

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Orange County, North Carolina
Survey Area Data: Version 22, Jan 21, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 15, 2015—Oct 19, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ApB	Appling sandy loam, 2 to 6 percent slopes	B	1.1	100.0%
Totals for Area of Interest			1.1	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher