

**Re-store N Station Phase II Amendment
SP2015 – 00032**

**Revised Groundwater Recharge Calculations
Based upon Existing and Proposed Site Development
(Concept Plan dated 12/4/2015)**



Prepared by Old Dominion Engineering - 2/18/16

Annual Precipitation - 46 inches
Site Area - 4.06 Acres (1.4978 Acres Pervious)

Median Recharge per USGS Regional Aquifer System Analysis - 13 inches
Pervious Area Recharge - 1.4978 acres x 13"/yr = 1,449 gpd

Rainwater Harvesting Recharge* - 7,075 sqft x 46"/yr x .95 = 528 gpd

Storm Water Management Practices** - 2.3998 acres x 13"/yr = 2,321 gpd

Daily Groundwater Recharge from Precipitation - 4,298 gpd

Estimated Groundwater Withdrawal - 1,625 GPD

Long Term Groundwater Recharge Due to Onsite Dispersal*** - 1,544 GPD

Estimated Total Long Term Groundwater Recharge - 5,842 GPD

The estimated long term ground water recharge at the site is 5,842 gpd and the estimated groundwater withdrawal is 1,625 gpd.

It is not anticipated that groundwater withdrawal of this magnitude will impact neighboring wells or general groundwater supplies. Furthermore, the proposed groundwater usage does not pose a threat of groundwater contamination under normal circumstances.

Notes:

* Rainwater harvesting is being planned for the rooftops of the existing building (2775 sqft) and 4300 sqft of the new building. Rainwater harvesting will be used for all pervious area grass and landscaping (including tree) watering. Estimated recharge at 95% of 46" precipitation per year.

** The site will use Storm Water Management Practices utilizing underground detention with outlet control to throttle discharge to pre developed conditions. The underground detention will utilize an open bottom storage reservoir which will allow infiltration into

the ground. Hayesville soils are very permeable at increasing depths. ODE is estimating these areas to recharge at a rate similar to USGS Regional Aquifer Study (13" per year). It actually could be a greater percentage of recharge due to increased soil permeabilities at the projected depth of storm water detention.

*** One of the main advantages of an onsite treatment and dispersal waste water system is that the water removed from the aquifer for use is treated and dispersed in the same general immediate vicinity. The vast majority of water usage (>95%) is eventually returned to the aquifer as treated effluent and will serve as additional ground water recharge. The estimated water usage at the site is 1,625 GPD. Long term recharge from treated effluent will approach 95% of withdrawn water or 1,544 GPD.