



MARYLAND DEPARTMENT OF THE ENVIRONMENT

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Larry Hogan
Governor

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Boyd Rutherford
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June 22, 2015

Ms. Margaret Anzalone, Board Member
Dorchester Citizens for Planned Growth LLC
217 Linthicum Dr.
Cambridge, MD 21613-3607

Re: Application for Beaver Run Mobile Home Park
State Discharge Permit 14-DP-3811
Dorchester County

Dear Ms. Anzalone:

We are aware of your interest in the Beaver Run Mobile Home Park and would like you to know that the Department has made a Final Determination on the discharge permit application. Copies of the notice and Response Document are enclosed for your convenience.

If you have any questions or require additional information on this permit, please Dr. Ching-Tzone Tien, Ph.D., P. E., Chief, Ground Water Discharge Permits Division, at (410) 537-3662.

Sincerely,

Edwal Stone, Program Manager
Wastewater Permits Program
Water Management Administration

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Enclosure



**MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION**

NOTICE OF FINAL DETERMINATION

Dorchester County

Application for State Discharge Permit, 14-DP-3811:

ACG Maryland, LLC, 301 Felspar Way, Gary, North Carolina 27518 submitted an application for a permit to discharge an average of 6,750 gallons per day of treated wastewater from the Beaver Run Mobil Home Park, located at 3658 Karen Circle, Linkwood, Maryland to ground waters via a sandlined trench/drip dispersal system.

A public hearing was held on the tentative determination on May 28, 2015. After reviewing all submitted comments, a final determination has been made by the Department to issue the permit without changes.

The Department is proposing to issue the Permit with the following limitations and conditions: (1) BOD₅: 30 mg/l (monthly average);(2) Suspended solids: 30 mg/l (monthly average); (3) total nitrogen 8 mg/l (monthly average) and (4) Flow: 6,750 gallons (monthly average).

The following conditions are also a part of this permit: 1) The permittee shall monitor the performance of the absorption bed system via inspection ports and groundwater monitoring wells; and 2) The treatment system and the onsite wastewater disposal system shall be operated by a Maryland certified operator; and 3) The permittee shall monitor groundwater quality via 4 wells.

Any person adversely affected by this final determination may request a judicial review. The judicial review must be filed no later than **August 3, 2015** in the circuit court of the county where the activity will occur.

Persons wishing to review the final permit may do so by contacting Dr. Tien to make an appointment. Copies of documents may be obtained at a cost of \$0.36 per page.

Publication Dates: Please publish on **July 1 and 8, 2015**

MARYLAND DEPARTMENT OF THE ENVIRONMENT

WATER MANAGEMENT ADMINISTRATION

1800 Washington Boulevard

Baltimore, Maryland 21230

Response to Public Comments

Regarding

Beaver Run Mobile Home Park

State Discharge Permit Application No. 14-DP-3811

June 17, 2015

RESPONSE DOCUMENT

State Discharge Permit Application No. 14-DP-3811

ACG Maryland, LLC, 301 Felspar Way, Gary, North Carolina 27518 submitted an application for a permit to discharge an average of 6,750 gallons per day of treated wastewater from the Beaver Run Mobil Home Park, located at 3658 Karen Circle, Linkwood, Maryland to ground waters via a sandlined trench/drip dispersal system.

A Notice of Tentative Determination to issue a discharge permit was published on February 20 and February 27, 2015, and a public hearing was held on May 28, 2015. Extensive written comments received during the public participation process and testimony received during the public hearing on the tentative determination have been reviewed. A summary of the significant comments related to the proposed groundwater permit and the Department's response are provided below.

COMMENT (Nutrients input to Transquaking River)

The proposed replacement drainfield system will add nutrients to the nearby surface water since wastewater from the existing failed system is currently pumped and hauled away. The Transquaking River TMDL calls for a 30 percent reduction and 32 percent reduction in phosphorus. MDE needs to show where these reductions are coming from.

RESPONSE

Currently, wastewater from 23 mobile homes are treated by septic tank and disposed of via drainfield. Wastewater from 22 mobile homes are hauled away to the Cambridge Wastewater Treatment Plant.

Per the attached calculations, wastewater discharge from the 23 mobile homes results in 630 lb/yr nitrogen load to the groundwater system and 315 lb/yr to the surface water system based on a total nitrogen (TN) concentration of 60 mg/l in the septic tank effluent and a 50% delivery ratio to surface water.

The proposed groundwater discharge permit conditions for 45 mobile homes require the effluent disposed of at the sandlined trench/drip dispersal field to meet $TN < 8\text{mg/l}$ which results in 38.6 lb/yr nitrogen load to groundwater and 19.3 lb/yr to the surface water based on a 160 lb/acre/yr vegetation uptake in the drip dispersal field. and a 50% delivery ratio to surface water.

Based on the above TN loading calculations, the proposed wastewater treatment and disposal systems will reduce approximately 94% of the existing TN load to the Transquaking River.

Phosphorus data included in Table 3-18 of the "US EPA, Onsite Wastewater Treatment Systems Manual, EAP/625/R-00/008" show an average of 0.4 mg/l at 2 ft unsaturated soil depth of an onsite system and 0.18 mg/l at 4 ft unsaturated soil depth due to absorption of phosphorus by soils. These phosphorus data below the soil treatment zone is better than an ENR phosphorus effluent quality of 0.3 mg/l. Therefore, phosphorus impact to groundwater/surface water from an onsite system is insignificant.

COMMENT (No Nutrients input to Transquaking River)

Due to pump and haul, the facility hasn't been operating for three years resulting in no nutrients going into the River. Beaver Run is a small wastewater facility with a small amount of nutrient impact to the River. But there is an issue of cumulative effect, cumulative impact, that really should be addressed.

RESPONSE

In the past three years, wastewater from 23 mobile homes has been disposed of via drainfield system with some nutrients going into the River. As shown in the attached nitrogen loading calculations, the proposed wastewater facility will result in a 94% nitrogen load reduction and minimize the cumulative impact to water quality.

COMMENT (Wastewater facility for the whole park)

ACG Maryland, LLC (the Permittee) should make the package treatment plant to handle wastewater from whole Beaver Run Village and remove more nutrients.

RESPONSE

The proposed permit is for effluent discharge from 45 Mobile Homes in areas associated with Phases 3, 4 and 5 with a failed septic system and not for the entire Beaver Run Mobile Home Park. This comment is beyond the scope of this permit.

COMMENT (Nutrient Reduction in Higgins Millpond and the Transquaking River)

From 2012 to present, the pump and transport program for wastewater in the mobile home park represents a temporary reduction that may be reversed when the permit goes into effect when it comes to nitrogen.

RESPONSE

As shown in the attached TN load calculations, when the permit becomes effective with an effluent TN limitation of <8mg/l, there will be a 94 % reduction of TN load to Higgins Millpond and the Transquaking River comparing with the current pump and haul operation for wastewater from 22 mobile homes and discharge of septic tank effluent via drainfield from 23 mobile homes.

COMMENT (NPDES Permit and wasteload allocation for impaired water)

While many sources of nutrients in the watershed can be attributed to agricultural sources, this permit and the pending Valley Proteins permit are the only two permitted source under NPDES. The Clean Water Act requires quantified reduction in permitted discharge to meet the wasteload allocations for the impaired water.

RESPONSE

This is a State groundwater discharge permit and not a NPDES permit. This permit does not have an assigned wasteload allocation to meet.

COMMENT (Nitrate calculations and groundwater monitoring)

Groundwater concentrations for nitrate need to be accounted for, both in conceptual pre-permit calculation but also verified by groundwater load modeling of the potential effects of eutrophication in the surface water

RESPONSE

Nitrate is a component of TN. The attached TN load calculations demonstrate that the TN (mostly in nitrate form in groundwater) concentration of the groundwater percolate will be 1.88 mg/l which is less than the 3 mg/l required effluent TN concentration from an ENR wastewater treatment plant to eliminate eutrophication in the surface water.

**Comparison of Nitrogen Loads to Groundwater and Surface Water
at Beaver Run Mobile Home Park**

- Given:
- (1) Wastewater flow: 150 gpd/home.
 - (2) Total nitrogen (TN) concentration of septic effluent: 60 mg/l
 - (3) TN concentration of Wastewater Treatment Plant (WWTP) effluent: 8 mg/l

- I. Case One – Nitrogen load of septic tank effluent from 45 mobile homes with flow of 6750 gpd

Calculate: (1) Nitrogen load (N_1) of septic effluent to groundwater

$$N_1 = (6750 \text{ gpd} \times 365 \text{ day/yr}) / 1,000,000 \times 60 \text{ mg/l} \times 8.34 = 1233 \text{ lb/yr}$$

- II. Case two – Nitrogen load of septic tank effluent from 23 mobile homes (22 units - pump & haul) with flow of 3450 gpd

Calculate: (1) Nitrogen load (N_1) of septic effluent to groundwater

$$N_1 = (3450 \text{ gpd} \times 365 \text{ day/yr}) / 1,000,000 \times 60 \text{ mg/l} \times 8.34 = 630 \text{ lb/yr}$$

III. Case three – Nitrogen load of WWTP effluent from 45 mobile homes with flow of 6750 gpd

Calculate: (1) Nitrogen load (N_1) of WWTP effluent to groundwater

Using the following nitrogen balance equation included in the “MDE Guidelines for Land Application/Reuse of Treated Municipal Wastewater” to determine the TN concentration (a) in the percolate after uptaken by the grass planted at the sand lined trench/ drip dispersal application field

Nitrogen Balance Equation

$$W = \frac{4.43 C + a(P - ET) - cP}{y - a - y(d + n)}$$

where:

W = wastewater loading (acre-inch/acre-year): 6750 gpd onto 0.78 acres or 116.3 acre-inch/acre-yr

C = removal of nitrogen in crop (lbs/acre-year), 160 lb/acre/yr similar to Rye grass

a = allowable nitrogen concentration in percolation or runoff water (mg/L)

P = precipitation (acre-inch/acre-year); 40 inch/yr

ET = potential evapotranspiration (assumes that P + W will allow potential ET to be realized in all cases) (acre-inch/acre-year): 28inch/yr

c = concentration of nitrogen in precipitation (mg/L): 0.5 mg/l

y = concentration of nitrogen in wastewater (mg/L): 8 mg/l

d = fraction of nitrogen which is denitrified ($\% \times 10^{-2}$): 0

n = fraction of nitrogen which is volatilized as ammonia ($\% \times 10^{-2}$): 0

$$w = [(6750 \text{ gpd} \times 365) / 27,154 \text{ gal/acre-inch}] / 0.78 \text{ acre} = 116.3 \text{ acre-inch/acre-yr}$$

$$116.3 = \frac{4.43(160) + a(40 - 28) - 0.5(40)}{8 - a - 8(0 + 0)}$$

$$116.3(8 - a) = 708.8 + 12a - 20$$

$$930.4 - 116.3a = 688.8 + 12a$$

$$241.6 = 128.3a$$

$$a = 1.88 \text{ mg/l}$$

$$N_1 = (6750 \text{ gpd} \times 365 \text{ day/yr}) / 1,000,000 \times 1.88 \text{ mg/l} \times 8.34 = 38.6 \text{ lb/yr}$$

Comparison of Nitrogen Loads to Groundwater and Surface Water

Case No.	Descriptions of Wastewater Treatment and Disposal	Nitrogen Load (N_1) to Groundwater (lb/year)	Nitrogen Load to Surface Water (lb/year)**	% of Nitrogen load to Case I (surface water)
1	Wastewater from 45 mobile homes are treated by septic tank and disposed of via drainfield	$N_1 = 1233$ (no treatment zone)	$N_1 = 616.5$ (no treatment zone)	100%
2	Currently, wastewater from 23 mobile homes are treated by septic tank and disposed of via drainfield. Wastewater from 22 mobile homes are hauled away to Cambridge WWTP	$N_1 = 630$ (no treatment zone)	$N_1 = 315$ (no treatment zone)	51%
3	Wastewater from 45 mobile homes are treated by a proposed WWTP to meet $TN < 8\text{mg/l}$ effluent limit, and disposed of via sand lined trench/ drip dispersal application field	$N_1 = 38.6$	$N_1 = 19.3$	3.1% (6.1% of N_1 in Case II, Current operation, or a 93.9% reduction)

* *

Using a delivery factor of 50% since the disposal drainfields is less than 1000 ft away from the Higgins Millpond which drains to the Transquaking River.

Phosphorus calculation is not included since phosphorus is effectively removed by soil absorption. Phosphorus data included in Table 3-18 of the "US EPA, Onsite Wastewater Treatment Systems Manual, EAP/625/R-oo/008" show an average of 0.4 mg/l at 2 ft unsaturated soil depth of an onsite system and 0.18 mg/l at 4 ft unsaturated soil depth. These data is close to an ENR phosphorus effluent quality of 0.3 mg/l.