Submitted By Applicant - 12/12/2019
Hearing.

Summary for Pond 1P: Leaching Field #1

Inflow Area = 0.348 ac, 39.41% Impervious, Inflow Depth > 2.57" for 50-year event
Inflow = 1.95 cfs @ 11.90 hrs, Volume= 0.074 af
Outflow = 0.25 cfs @ 12.14 hrs, Volume= 0.074 af, Atten= 87%, Lag= 14.0 min
Discarded = 0.25 cfs @ 12.14 hrs, Volume= 0.074 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 46.59' @ 12.14 hrs Surf.Area= 864 sf Storage= 1,168 cf

Plug-Flow detention time= 38.1 min calculated for 0.074 af (100% of inflow)
Center-of-Mass det. time= 37.7 min (827.4 - 789.7)

Volume	Invert	Avail.Storage	Storage Description
#1	44.00'	1,516 cf	**12.00'W x 72.00'L x 6.00'H Prismatoid** 5,184 cf Overall - 1,394 cf Embedded = 3,790 cf x 40.0% Voids
#2	44.00'	1,188 cf	**6.00'D x 6.00'H Vertical Cone/Cylinder** x 7 Inside #1 1,394 cf Overall - 3.0" Wall Thickness = 1,188 cf
		2,704 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.00'	**8.270 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.25 cfs @ 12.14 hrs HW=46.59' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.25 cfs)

Summary for Pond 2P: Leaching Field #2

Inflow Area = 0.180 ac, 64.33% Impervious, Inflow Depth > 3.82" for 50-year event
Inflow = 1.42 cfs @ 11.90 hrs, Volume= 0.057 af
Outflow = 0.16 cfs @ 12.18 hrs, Volume= 0.057 af, Atten= 89%, Lag= 17.0 min
Discarded = 0.16 cfs @ 12.18 hrs, Volume= 0.057 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 49.02' @ 12.18 hrs Surf.Area= 384 sf Storage= 997 cf

Plug-Flow detention time= 56.6 min calculated for 0.057 af (100% of inflow)
Center-of-Mass det. time= 56.0 min (821.6 - 765.6)

Volume	Invert	Avail.Storage	Storage Description
#1	44.00'	683 cf	**12.00'W x 32.00'L x 6.00'H Prismatoid** 2,304 cf Overall - 597 cf Embedded = 1,707 cf x 40.0% Voids
#2	44.00'	509 cf	**6.00'D x 6.00'H Vertical Cone/Cylinder x 3 Inside #1** 597 cf Overall - 3.0" Wall Thickness = 509 cf
		1,192 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.00'	**8.270 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.16 cfs @ 12.18 hrs HW=49.02' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Summary for Pond 3P: Leaching Field #3

Inflow Area = 0.261 ac,100.00% Impervious, Inflow Depth > 5.47" for 50-year event
Inflow = 2.52 cfs @ 11.90 hrs, Volume= 0.119 af
Outflow = 0.27 cfs @ 12.17 hrs, Volume= 0.119 af, Atten= 89%, Lag= 16.0 min
Discarded = 0.27 cfs @ 12.17 hrs, Volume= 0.119 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 49.96' @ 12.17 hrs Surf.Area= 648 sf Storage= 1,991 cf

Plug-Flow detention time= 59.0 min calculated for 0.119 af (100% of inflow)
Center-of-Mass det. time= 58.7 min (784.7 - 726.0)

Volume	Invert	Avail.Storage	Storage Description
#1	44.00'	1,157 cf	**12.00'W x 54.00'L x 6.00'H Prismatoid** 3,888 cf Overall - 995 cf Embedded = 2,893 cf x 40.0% Voids
#2	44.00'	848 cf	**6.00'D x 6.00'H Vertical Cone/Cylinder x 5** Inside #1 995 cf Overall - 3.0" Wall Thickness = 848 cf
		2,005 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.00'	**8.270 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.27 cfs @ 12.17 hrs HW=49.96' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Summary for Pond 4P: Leaching Field #4

Inflow Area = 0.061 ac,100.00% Impervious, Inflow Depth > 5.47" for 50-year event
Inflow = 0.60 cfs @ 11.90 hrs, Volume= 0.028 af
Outflow = 0.09 cfs @ 12.06 hrs, Volume= 0.028 af, Atten= 85%, Lag= 9.8 min
Discarded = 0.09 cfs @ 12.06 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 47.01' @ 12.06 hrs Surf.Area= 264 sf Storage= 408 cf

Plug-Flow detention time= 31.5 min calculated for 0.028 af (100% of inflow)
Center-of-Mass det. time= 31.1 min (756.9 - 725.7)

Volume	Invert	Avail.Storage	Storage Description
#1	44.00'	474 cf	**12.00'W x 22.00'L x 6.00'H Prismatoid** 1,584 cf Overall - 398 cf Embedded = 1,186 cf x 40.0% Voids
#2	44.00'	339 cf	**6.00'D x 6.00'H Vertical Cone/Cylinder x 2** Inside #1 398 cf Overall - 3.0" Wall Thickness = 339 cf
		814 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.00'	**8.270 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.09 cfs @ 12.06 hrs HW=47.00' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Summary for Pond 5P: Leaching Field #5

Inflow Area = 0.059 ac,100.00% Impervious, Inflow Depth > 5.47" for 50-year event
Inflow = 0.58 cfs @ 11.90 hrs, Volume= 0.027 af
Outflow = 0.09 cfs @ 12.06 hrs, Volume= 0.027 af, Atten= 85%, Lag= 9.7 min
Discarded = 0.09 cfs @ 12.06 hrs, Volume= 0.027 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 46.91' @ 12.06 hrs Surf.Area= 264 sf Storage= 394 cf

Plug-Flow detention time= 30.7 min calculated for 0.027 af (100% of inflow)
Center-of-Mass det. time= 30.3 min (756.0 - 725.8)

Volume	Invert	Avail.Storage	Storage Description
#1	44.00'	474 cf	**12.00'W x 22.00'L x 6.00'H Prismatoid** 1,584 cf Overall - 398 cf Embedded = 1,186 cf x 40.0% Voids
#2	44.00'	339 cf	**6.00'D x 6.00'H Vertical Cone/Cylinder x 2 Inside #1** 398 cf Overall - 3.0" Wall Thickness = 339 cf
		814 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.00'	**8.270 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.09 cfs @ 12.06 hrs HW=46.90' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Summary for Pond 6P: Leaching Field #6

Inflow Area = 0.362 ac,100.00% Impervious, Inflow Depth > 5.47" for 50-year event
Inflow = 3.55 cfs @ 11.90 hrs, Volume= 0.165 af
Outflow = 0.38 cfs @ 12.16 hrs, Volume= 0.165 af, Atten= 89%, Lag= 16.0 min
Discarded = 0.38 cfs @ 12.16 hrs, Volume= 0.165 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 49.30' @ 12.16 hrs Surf.Area= 984 sf Storage= 2,723 cf

Plug-Flow detention time= 56.8 min calculated for 0.164 af (100% of inflow)
Center-of-Mass det. time= 56.4 min (782.0 - 725.7)

Volume	Invert	Avail.Storage	Storage Description
#1	44.00'	1,724 cf	**12.00'W x 82.00'L x 6.00'H Prismatoid** 5,904 cf Overall - 1,593 cf Embedded = 4,311 cf x 40.0% Voids
#2	44.00'	1,357 cf	**6.00'D x 6.00'H Vertical Cone/Cylinder** x 8 Inside #1 1,593 cf Overall - 3.0" Wall Thickness = 1,357 cf
		3,082 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.00'	**8.270 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.38 cfs @ 12.16 hrs HW=49.30' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.38 cfs)

Submittal by Applicant - 12/12/19 Hearing

WILLIAMS
BuildwithWilliams.com
Building Company, Inc.

Regarding the requirements of Section 8 - Soil Removal of the General Bylaws of the Town of Truro:

Williams Building Company has calculated the following volumes for the Cloverleaf Rental Housing Development as proposed per the Site Plan dated 11/1/2019 prepared by J.M. O'Reilly Associates, Civil Engineers.

CUT & STOCKPILE: 1,270 cubic yards

CUT groundcover and "duff layer" for reuse

CUT & FILL: 7,990 cubic yards

CUT from elevation 55' to 62' at center (east) of site;

FILL at rear (north east) of site elevation 36' to 46'

EXCAVATE & BACKFILL: 5,122 cubic yards for building foundations

CUT & REMOVE: 7,212 cubic yards

CUT from access roadway and CUT from elevation 55' to 62'

REMOVE / EXPORT from site

259A North Street, Suite 2 | Hyannis, MA 02601 | P: 508-394-3644 | F: 508-394-3266 | BuildwithWilliams.com

J.M. O'Reilly & Associates, Inc.
Professional Engineering, Land Surveying & Environmental Services
Site Development • Property Line • Subdivision • Sanitary • Land Court • Environmental Permitting

Decmebr 11, 2019

JMO-8446A

MEMORANDUM
I/A TECHNOLOGY TREAMENT COSTS

As reviewed with the F.A.S.T. manufacturer, the anticipated costs of the implementation of the additional treatment of 4,200 gpd of sewage flow for nitrogen reduction to 19 ppm, is as follows:

Unit Costs:	$ 49,500 each OR 99,000 Total
Install & Hookup:	$10,000 each OR $ 20,000
Total Budget:	$ 119,000

In addition to the unit costs, there are costs for installation, wiring and connections.

The yearly costs for the Operation and maintenance (O&M) for the unit would be approximately $ 3,100 per year per unit OR $6,200 per year (4 O&M visits per year)

1573 Main Street, P.O. Box 1773, Brewster, MA 02631 • Phone: (508) 896-6601 • Fax: (508) 896-6602
www.jmoreillyassoc.com

Submittal by Applicant - 12/12/19 Public Hearing.

SUBDIVISION RULES ANF REGULATIONS:

Roadway Standards (Section 3.6)

- Adjacent Properties: Access road is within 25 feet of side line, adjacent to Unit 21 (east), 13 feet provided, 25 feet required. (Section 3.6.7)
- Design standards for Appendix 2 – Table 2 - Type C
    - Roadway Width (not including berms):
        - Loop Road, 14 foot travel way, with 1 foot berms provided (one-way traffic)
    - Radius at centerline of street
        - 290 feet required, 35 to 45 feet provided,
    - Maximum Grade:
        - 8% Maximum, Main Access Road 10% proposed
    - Curb Cut Radius:
        - 30 feet required; 15 foot radius provided on main access road – exit lane
    - Dead-end Street:
        - 1,000 feet maximum; loop roadway is about 1,200 feet long

Specifications for Construction (Section 4)

- 4.1.8 Berms: 18 inch berms required; 12 inch berms proposed
- 4.1.10 Vegetation: Trees within the proposed limit of work line shall be removed as needed to allow for the construction of the development, beyond the edge of clearing for the roadway.
- 4.2.4 Drainage Treatment: Vegetated swales MAY be incorporated into drainage facilities; there are NO vegetated swales included on the project due to site constraints.