State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

CHRIS CHRISTIE
GOVERNOR

KIM GUADAGNO
LT. GOVERNOR

BOB MARTIN
Commissioner

Mail Code 401-04Q
Division of Water Supply & Geoscience
Water System Operations Element
Bureau of Water System Engineering
401 E. State Street - P.O. Box 420
Trenton, New Jersey 08625-0420
Tel #: (609) 292-2957 - Fax #: (609) 633-1495
http://www.nj.gov/dep/watersupply/

PERMIT*

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit.

Permit No. WCP160003 **PWSID No.** NJ0807001	**Issuance Date** February 24, 2017	**Effective Date** February 24, 2017	**Expiration Date** February 23, 2022
Name and Address of Applicant Greenwich Township Water Department 420 Washington Avenue Gibbstown, NJ 08027		**Location of Activity/Facility:** Memorial & Fairmount Avenues Block # 201, Lot # 1.02 and 2 Greenwich Township, Gloucester County	
		Type of Permit Potable Water Supply	**Statute(s):** N.J.S.A. 58:12A-1.1 et seq.

This permit grants permission to:

1. Construct additions and alterations to an existing water treatment plant comprising installation of two (2) GAC (granular activated carbon) adsorbers using Filtrasorb 400 (F-400) activated carbon to remove Perfluorinated Compounds (PFCs) from the raw water of Wells 4A and 6, treatment facility ID # TP004014;
2. Operate the facilities approved by this permit and distribute water for potable purposes from said works.

According to an Engineer's Report entitled:

	Date	**Prepared By**
Well #4A/6 Water Treatment Plant Upgrades	06/21/2016	Dante Guzzi Engineering Associates, LLC

According to Plans entitled:

	Date	**Prepared By**
Greenwich Water Treatment Upgrades	07/23/2015	Dante Guzzi Engineering Associates, LLC

According to Specifications entitled:

	Date	**Prepared By**
Water Treatment Upgrade	06/30/2016	Dante Guzzi Engineering Associates, LLC

Additional information: 11/28/2016 and 01/11/2017

This permit is subject to specific and general conditions contained in the following page(s):
Continued on Requirements Page -- 1 of 2

Approved by the authority of:

Bob Martin
Commissioner
Department of Environmental Protection

Diane E. Zalaskus, P.E., Assistant Director

* The word permit means approval, certification, registration, etc.

GREENWICH TWP W DEPT
0807001

SDW Construction Permit : WCP160003

Permit Requirements

Submittal/Action Requirements

Applicable Subject Items	Submittal/Action Type	Requirement
TP004014, Memorial Ave. TP for Wells 4A & 6 (WSYG805892)	Completed construction certification report	Within thirty days of completion of the approved facilities the permittee/engineer shall notify the Bureau of Water System Engineering of the completion date and certify that the facilities were constructed in accordance with the approved plans and specifications by returning the enclosed Construction Completion Certification. Submission shall be no later than 30 days after expiry of permit. [N.J.A.C. 7:10-11]

Text Requirements

All Phases

TP004014, Memorial Ave. TP for Wells 4A & 6 (WSYG805892)

1. TREATMENT PLANT SPECIFIC CONDITIONS.
2. The permittee shall prepare documented maintenance procedures and schedules for the treatment equipment, and maintain a documented record of the date and extent of maintenance that is carried out. These procedures and records shall be maintained on site and shall be made available for review upon the request of Department personnel. [N.J.A.C. 7:10-11]
3. For this permit to remain valid, the facilities approved in this permit shall be constructed and placed into service within five years from the effective date of the permit. [N.J.A.C. 7:10-11]
4. The permittee shall sample the water at the point of entry (POE) to the distribution system for perfluorinated compounds (PFCs) at least once per calendar quarter. The samples shall be analyzed using EPA Method 537 by a NJ Certified Laboratory. The selected laboratory should be capable of reaching the following minimum reporting limits: 5 ng/L or lower for PFNA and PFOS, and 10 ng/L or lower for the remaining PFC analytes included in the method. Electronic copies of laboratory reports shall be submitted to the Bureau of Safe Drinking Water using the following email address: watersupply@dep.nj.gov. The results shall be submitted by the 10th day of the month following the month in which the analysis was completed. [N.J.A.C. 7:10-11]
5. The permittee is advised the approved treatment plant and processes will require periodic maintenance and replacement of media. Therefore, it is recommended that the permittee prepare an Asset Management Plan for the treatment plant and it should be made available for review upon request of Department personnel. [N.J.A.C. 7:10-11]
6. The permittee is advised that the two (2) GAC adsorbers shall not be operated in parallel and the flow through GAC adsorbers shall not exceed 700 gpm (1.008 MGD). [N.J.A.C. 7:10-11]
7. The permittee is advised that Perfluorinated Compounds (PFCs) are not currently the regulated contaminants under the Federal or State Safe Drinking Water programs. Therefore, an empty bed contact time (EBCT) of the GAC system is not included in the calculation of total and firm capacity. If PFCs become the regulated contaminants and the Maximum Contaminant Levels are adopted, the permittee may be required to provide the EBCT of 20 minutes. The permittee is advised that with the addition of GAC system the system's total and firm capacity is 1.812 MGD and 1.008 MGD, respectively. [N.J.A.C. 7:10-11]
8. PERMIT GENERAL CONDITIONS.
9. The permit is revocable, or subject to modification or change, at any time, when in the judgment of the New Jersey Department of Environmental Protection such revocation, modification or change shall be necessary. [N.J.A.C. 7:10-11]
10. The issuance of this permit shall not be deemed to affect in any way action by the New Jersey Department of Environmental Protection on any future application. [N.J.A.C. 7:10-11]

Text Requirements

All Phases

TP004014, Memorial Ave. TP for Wells 4A & 6 (WSYG805892)

11. The works, facilities and/or activities shown by plans and/or other engineering data, which are this day approved, subject to the conditions herewith established, shall be constructed and/or executed in conformity with such plans and/or engineering data and said conditions. [N.J.A.C. 7:10-11]
12. No change in plans or specifications shall be made without prior written permission from the Bureau of Water System Engineering. Modification requests shall be submitted on the applicable form available at www.state.nj.us/dep/watersupply/dws_const.html. [N.J.A.C. 7:10-11]
13. The granting of this permit shall not be construed in any way to affect the title or ownership of property, and shall not make the New Jersey Department of Environmental Protection or the State a party in any suit or question of ownership of property. [N.J.A.C. 7:10-11]
14. This permit does not waive the obtaining of Federal or other State or Local Government consent when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained. [N.J.A.C. 7:10-11]
15. A copy of this permit shall be kept at the work site, and shall be exhibited upon the request of Department personnel. [N.J.A.C. 7:10-11]
16. In the examination of plans and/or other engineering data, the New Jersey Department of Environmental Protection does not examine the structural features of the design, such as thickness of concrete or its reinforcement, the efficiency of any electrical or mechanical equipment or apparatus, and the approval herewith given does not include these features. [N.J.A.C. 7:10-11]
17. Water distribution by said works shall at all times meet the applicable standards for quality. Additional units for the derivation, treatment and for distribution of the water shall be established if and when required by the New Jersey Department of Environmental Protection. [N.J.A.C. 7:10-11]
18. The operations of the public water facility shall be under the supervision of an operator or operators who shall possess a valid license or licenses issued by the New Jersey Department of Environmental Protection, pursuant to the provisions of the Water Supply and Wastewater Operators' Licensing Act, N.J.S.A. 58:11-64 et seq. [N.J.A.C. 7:10-11]
19. The minimum required licensing classification(s) shall be W-2 and T-3 or equivalent in accordance with the Licensing of Water Supply and Wastewater Treatment System Operators, N.J.A.C. 7:10A-1.1 et seq. [N.J.A.C. 7:10-11]
20. The public water facilities shall be operated in such a manner so as to be in full compliance with the New Jersey Safe Drinking Water Act Rules at N.J.A.C. 7:10-1.1 et seq. and the Water Supply Allocation Rules at N.J.A.C. 7:19-1.1 et seq. [N.J.A.C. 7:10-11]
21. The public water facilities shall be operated in such a manner as to optimize the use of all available sources of water in order to achieve and maintain compliance with Water Allocation Permit 5253. [N.J.A.C. 7:10-11]
22. As per N.J.A.C. 7:10-11.17, an applicant for a permit under this subchapter or any person, subject to the limitation on third party appeal rights set forth in P.L. 1993, c.359 (N.J.S.A. 52:4B-3.1 through 3.3), who believes himself or herself to be aggrieved with respect to any decision made by the Department regarding such permit application submitted pursuant to this subchapter, may contest the decision and request an adjudicatory hearing pursuant to the Administrative Procedure Act, N.J.S.A. 52:14B-1 et seq., and the Uniform Administrative Procedure Rules, N.J.A.C. 1:1 within 20 calendar days of the receipt of the permit decision. Filing details and the required form to be submitted are available at www.state.nj.us/dep/watersupply/dws_const.html. [N.J.A.C. 7:10-12]

State of New Jersey

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BOB MARTIN
Commissioner

CONSTRUCTION COMPLETION CERTIFICATION

Attention: Bureau of Water System Engineering
Engineering Section

PERMIT NO.: WCP160003 **ISSUANCE DATE:** February 24, 2017

I (We) hereby certify that the following has been built and placed into service* and was completed in accordance with the approved plans, specifications, and other supporting information.

APPLICANT: Greenwich Township Water Department

PWSID: NJ0807001

PROJECT DESCRIPTION: additions and alterations to an existing water treatment plant comprising installation of two (2) GAC (granular activated carbon) adsorbers using Filtrasorb 400 (F-400) activated carbon to remove Perfluorinated Compounds (PFCs) from the raw water of Wells 4A and 6, treatment facility ID # TP004014

MUNICIPALITY: Greenwich Township

COUNTY: Gloucester

COMPLETION DATE: _____

DATE FACILITIES WERE PLACED INTO SERVICE *: _____

_____
Signature of Engineer & Embossed Seal

_____
Name of Engineer / New Jersey License Number

_____
Date

* Placed into service means that the water mains or other permitted infrastructure changes are actually delivering water to all consumers approved by the permit, except to the extent that the remaining number of realty improvements not being served is below the threshold for needing a permit, i.e. less than 30 realty improvements or 12,000 GPD of non-residential demand.

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SYSTEM ENGINEERING
TECHNICAL REVIEWER'S REPORT

REVIEWER: Ramesh Patel

PREPARED ON: 09/09/2016
REVISED ON: 01/31/2017

PROJECT NO.: WCP160003

APPLICANT: Greenwich Township Water Department

PWSID NO.: NJ0807001

MUNICIPALITY: Greenwich Township

COUNTY: Gloucester

SUBJECT: additions and alterations to an existing water treatment plant comprising installation of two (2) GAC (granular activated carbon) adsorbers using Filtrasorb 400 (F-400) activated carbon to remove Perfluorinated Compounds (PFCs) from the raw water of Wells 4A and 6, treatment facility ID # TP004014

LOCATION OF WORK: 1200 Memorial Ave., Block # 201, Lot # 1.02 & 2

DESIGN ENGINEER: Dante Guzzi

N.J.P.E. LICENSE NO.: 36455

ENGINEERING FIRM: Dante Guzzi Engineering Associates, LLC

ESTIMATED COST: $614,257.00

PERMIT FEE: $4,435.54

SOURCES OF INFORMATION

APPLICATION RECEIVED: June 30, 2016
APPLICATION DATED: June 27, 2016
SIGNED BY: George W. Shivery, Jr., Mayor

ENGINEER'S REPORT:

	Date	Prepared By
Well #4A/6 Water Treatment Plant Upgrades	06/21/2016	Dante Guzzi Engineering Associates, LLC

ENGINEER'S DRAWINGS:

	Date	Prepared By
Greenwich Water Treatment Upgrades	07/23/2015	Dante Guzzi Engineering Associates, LLC

ENGINEER'S SPECIFICATIONS:

	Date	Prepared By
Water Treatment Upgrade	06/30/2016	Dante Guzzi Engineering Associates, LLC

ADDITIONAL INFORMATION DATED: 11/28/2016 and 01/11/2017

GIS Submission

Greenwich Township Water Department did not submit the GIS with this application. Permit condition # 23 of WCP160002 will require permittee to submit GIS by March 31, 2017.

PRESERVATION AREAS

Area	(Y/N)	Comments
Highlands Planning Area	N	
Highlands Preservation Area	N	
WQMP Consistent		In Sewer Service Area
Pinelands	N	

Assessment/Billing Information

Permit Fee/Assessment Information:

Assessment ID	Amount	Status	Date	Type
1846942	$4,435.54	Closed (Paid In Full)	07/13/16	Fee(Initial Application)

Annual Operating Fee Activity within the last 24 months:

Assessment ID	Activity Number	Amount	Status	Date	Type
1518542	WBC030012	$720.00	Closed (Paid In Full)	09/09/14	FEE(Annual Fee)
1695912	WBC030013	$720.00	Closed (Paid In Full)	08/27/15	FEE(Annual Fee)
1835629	WBC030014	$720.00	Open (Pending Payment)	07/07/16	FEE(Annual Fee)

Enforcement Information

Enforcement Actions within the last 12 months:

NJEMS No.	Lead Investigator	Status	Date	Comments
NEA160001	Bisese, Charles	Pending	05/02/16	
PEA160001	Bleicher, Mike	Effective	04/25/16	
PEA150003	Carson, Heather	Effective	10/20/15	

Violation Requirements from Enforcement Actions within the last 12 months:

NJEMS No.	Requirements	Noncompliance Desc.
NEA160001	Public community and non-transient, non-community water systems must monitor for volatile organic compounds at a frequency specified in 40 CFR 141.24(f) and submit a compliance sampling report to the Department within the first ten days of the month following the month in which any test, measurement, or analysis is made, or the first ten days following the end of the	Failure to monitor for volatile organic compounds and/or submit a compliance sampling report to the Department within the first ten days of the month following the month in which any test, measurement, or analysis is made, or the first ten days following the end of the required monitoring period, whichever of these is shortest, in accordance with N.J.A.C. 7:10-5.4(a). Violation Details: MONITORING,

	required monitoring period, whichever of these is shortest, in accordance with N.J.A.C. 7:10-5.4(a) and 40 CFR 141.24(f).	ROUTINE MAJOR for VOCS FEDERAL for the period 07/01/2015 to 09/30/2015 for the following sample point ID: TP004014 TREATMENT PLANT.
PEA150003	Public community and non-transient, non-community water systems must monitor for volatile organic compounds at a frequency specified in 40 CFR 141.24(f) and submit a compliance sampling report to the Department within the first ten days of the month following the month in which any test, measurement, or analysis is made, or the first ten days following the end of the required monitoring period, whichever of these is shortest, in accordance with N.J.A.C. 7:10-5.4(a) and 40 CFR 141.24(f).	Failure to monitor for volatile organic compounds and/or submit a compliance sampling report to the Department within the first ten days of the month following the month in which any test, measurement, or analysis is made, or the first ten days following the end of the required monitoring period, whichever of these is shortest, in accordance with N.J.A.C. 7:10-5.4(a). Violation Details: MONITORING, ROUTINE MAJOR for VOCS FEDERAL for the period 07/01/2015 to 09/30/2015 for the following sample point ID: TP004014 TREATMENT PLANT.
PEA160001	Public water systems that use chlorine or chloramines must measure the disinfectant residual level in the distribution system at the same time and place as total coliforms are sampled as specified in 40 CFR 141.132(c)1 and submit a compliance sampling report to the Department within ten days after the end of each quarter in which samples were collected in accordance with 40 CFR 141.134(a). [40 CFR 141.132(c)(1)]	Failure to measure the disinfectant residual level in the distribution system at the same time and place as total coliforms are sampled as specified in 40 CFR 141.132(c)1 and/or submit a compliance sampling report to the Department within ten days after the end of each quarter in which samples were collected in accordance with 40 CFR 141.134(a). Violation Details: MONITORING, ROUTINE (DBP), MAJOR for CHLORINE for the period 03/01/2016 to 03/31/2016 for the following sample point ID: DS DISTRIBUTION SYSTEM.
PEA160001	Public water systems that use chlorine or chloramines must measure the disinfectant residual level in the distribution system at the same time and place as total coliforms are sampled as specified in 40 CFR 141.132(c)1 and submit a compliance sampling report to the Department within ten days after the end of each quarter in which samples were collected in accordance with 40 CFR 141.134(a). [40 CFR 141.132(c)(1)]	Failure to measure the disinfectant residual level in the distribution system at the same time and place as total coliforms are sampled as specified in 40 CFR 141.132(c)1 and/or submit a compliance sampling report to the Department within ten days after the end of each quarter in which samples were collected in accordance with 40 CFR 141.134(a). Violation Details: MONITORING, ROUTINE (DBP), MAJOR for CHLORINE for the period 01/01/2016 to 01/31/2016 for the following sample point ID: DS DISTRIBUTION SYSTEM.

PEA160001	Public water systems that use chlorine or chloramines must measure the disinfectant residual level in the distribution system at the same time and place as total coliforms are sampled as specified in 40 CFR 141.132(c)1 and submit a compliance sampling report to the Department within ten days after the end of each quarter in which samples were collected in accordance with 40 CFR 141.134(a). [40 CFR 141.132(c)(1)]	Failure to measure the disinfectant residual level in the distribution system at the same time and place as total coliforms are sampled as specified in 40 CFR 141.132(c)1 and/or submit a compliance sampling report to the Department within ten days after the end of each quarter in which samples were collected in accordance with 40 CFR 141.134(a). Violation Details: MONITORING, ROUTINE (DBP), MAJOR for CHLORINE for the period 02/01/2016 to 02/29/2016 for the following sample point ID: DS DISTRIBUTION SYSTEM.

Construction Completion Certification (CCC)

Expired permits and permits to expire within the next 6 months missing CCCs: None

Master Permit Applicability Determination

Number of permit applications for water main extension and/or replacements and/or transmission mains in each of the preceding three years.

Year	2013	2014	2015	2016
Number of Permits	0	0	0	0
	Total number of permits over the preceding three years =			0
	Ave number over the preceding three years = (Total/3 years =) If number in 2016 > 2013 then use 2016 in calculation			0

Since over the three preceding years less than four permit applications per year for water main extension and/or replacements and/or transmission mains have been received the Water System is not required to submit a Master Permit application.

General Description of Project

This permit is for additions and alterations to an existing water treatment plant comprising installation of two (2) GAC (granular activated carbon) adsorbers using Filtrasorb 400 (F-400) activated carbon to remove Perfluorinated Compounds (PFCs) from the raw water of Wells 4A and 6, treatment facility ID # TP004014.

Existing Treatment Plant Description

1. One 800 gpm packed column aerator for Well 6 and one 800 gpm induced draft aerator for Well 4A;
2. Potassium permanganate feed system;
3. Sodium hydroxide feed system;
4. Calcium hypochlorite feed system;
5. Two 800 gpm upflow solids contact clarifiers;
6. Two 800 gpm high service pumps;
7. Two 600 gpm horizontal greensand pressure filters;
8. Tablet chlorination disinfection system; and
9. Emergency generator.

GAC Adsorbers

The Bureau issued temporary treatment approval WTA150002 on November 16, 2015 to Greenwich Township Water Department (GTWD) for installation of two granular activated carbon (GAC) adsorbers. GTWD installed two (2) 10 feet diameter GAC adsorbers in series downstream of greensand filter and upstream of post chlorination by cutting the effluent line from the existing greensand filter and rerouting to the influent of the first GAC adsorber. The effluent of the second GAC adsorber was connected back to the other end of the effluent line prior to the chemical injection points. Each adsorber is filled with 20,000 pounds (700 cu.ft.) of virgin GAC F-400 (28.5 lbs/cu.ft.) media. The GAC adsorbers operate in a downflow mode. Sample taps are installed at the influent and effluent lines of the GAC units. Each GAC adsorber is equipped with a minimum of three (3) media sample ports, three (3) water sample ports, an isolation valve and a drain. The sampling ports are equally spaced and extended approximately 12 inches into the media bed.

Design Criteria

- Source: Well 4A @ 800 gpm and Well 6 @ 800 gpm, total flow = 1,600 gpm = 2.304 MGD
- Contaminant = Perfluorinated Compounds (PFCs)
- Designed concentration = < 10 ppt
- Number of GAC adsorbers: 2 in series
- Material: Carbon steel
- Diameter: 10 feet
- Height: 22 feet
- Area of contact: 78.540 sq.ft./adsorber
- **Design flow rate: 700 gpm (1.008 MGD)**
- Mode of operation: Downflow in series
- Surface loading rate = 8.9 gpm/sq.ft. (700 ÷ 78.540)

- Media: Carbon Filtrasorb F400
- Carbon mass: 20,000 pounds/adsorber
- Carbon volume: 700 cu.ft./adsorber
- Media thickness: 9.0 feet per adsorber (700 cu.ft./78.54 sq.ft.)
- **Maximum flow** @ 20 empty bed contact time = **525 gpm** (700 cu.ft. X 2 GAC x 7.48 gal/cu.ft. ÷ 20 minutes) = **0.756 MGD**
- Effective size of media: 0.55 – 0.75 mm
- Uniformity coefficient: <1.9

The GAC adsorbers are proposed to operate in series and shall not be operated in parallel. Per manufacturer's specifications, the system can provide 15 minutes of EBCT to a flow of 350 gpm through one GAC adsorber. Therefore, two GAC adsorbers in series will provide 15 minutes of EBCT to a flow of 700 gpm and 20 minutes of EBCT to a flow of **525 gpm** (15 x 350 ÷ 20). In accordance with N.J.A.C. 7:10-11.15(h), the GAC units shall provide a minimum of 20 minutes of empty bed contact time (EBCT) when used for adsorption of organic compounds. Since the PFCs are not regulated contaminants at this time, the Bureau gives treatment credit of **700 gpm**. When PFCs will become regulated contaminants, the Bureau may require the water system to modify the treatment in the future.

The GAC adsorption system was placed in service on April 21, 2016. During the first month of operation, weekly water samples were collected at influent, in between, and effluent of GAC units. The results of those samples are listed in the following table and they are satisfactory:

Sample Date	Sample Number	Sample Location	Perfluorononanoic Acid PFNA ppb	Perfluorooctanesulfonic Acid PFOS ppb	perfluorooctanoic Acid PFOA ppb	
			Method: EPA 537 (put online 04/21/2016)			
		MDL	0.00035	0.0002	0.00023	
5/5/2016	L6240561-3	Pre GAC	0.013	0.014	0.0086	
	L6240561-5	Btn GAC	ND	ND	ND	
	L6240561-1	Post GAC	**ND**	**0.00020J**	**0.00032J**	
5/12/2016	L6247687-5	Pre GAC	0.012	0.011	0.011	
	L6247687-1	Btn GAC	ND	ND	0.0011J	
	L6247687-3	Post GAC	**ND**	**ND**	**0.00033J**	
5/19/2016	L6260938-3	Pre GAC	0.02	0.018	0.013	
	L6260938-5	Btn GAC	ND	ND	ND	
	L6260938-1	Post GAC	**ND**	**0.00028J**	**0.00030J**	
6/9/2016	L6306911-3	Pre GAC	0.019	0.019	0.013	
	L6306911-5	Btn GAC	ND	0.00020J	0.0027	
	L6306911-1	Post GAC	**ND**	**ND**	**0.00083J**	

Note: J = Estimated value > MDL but < RL (lab reporting limit)

Even though GAC adsorbers are not required to backwash regularly, the system has the capability to backwash the adsorbers. The volume of backwash waste is estimated at 30,000 gallons per adsorber which will be discharged directly in to the sanitary sewer system. Greenwich Township Water Department owns and operates its own sanitary sewer system.

Total treatment capacity = 700 gpm = **1.008 MGD**
Firm treatment capacity = **0 gpm** (the only filter out of service)

Treatment Building

A new 22 feet by 36 feet by 24 feet (outside dimensions) tall masonry treatment building will be constructed to house the GAC system. The new building will be constructed behind the existing treatment building. The building is located outside the 100-year flood zone.

Water Quality Impact Assessment

Addition of two GAC units will not impact the water quality with regards to lead and copper.

System Source Capacity

Name	Facility ID	Sources Capacity MGD	Treatment Capacity MGD	Status
Walnut & Washington St TP	TP002005	Well 5 @ 1.080	0.804	Active
Memorial Avenue TP	TP004014	Well 4A @ 1.152 Well 6 @ 1.152	1.008	Active
	Total	**3.384**	**1.812**	

The firm capacity of Memorial Avenue Treatment Plant is 1.008 MGD with either one of wells out of service or one of the treatment units (filter, aerator & clarifier) out of service. Therefore, the worst case scenario is Well No. 5 or its treatment facilities out of service.

Firm capacity = 1.812 – 0.804 = **1.008 MGD**

System Demands

	2012	2013	2014	2015	2016
January	16.500	17.495	18.698	17.688	15.750
February	15.590	17.561	16.353	16.286	13.914
March	17.640	18.222	18.133	16.499	14.366
April	19.718	16.729	20.280	17.529	13.934
May	21.329	17.710	19.370	17.632	18.451

June	25.820	23.970	22.210	16.448	19.354
July	31.281	23.545	23.740	19.910	23.082
August	22.323	23.013	22.030	23.420	24.403
September	18.586	18.389	20.708	21.440	20.320
October	17.578	16.723	18.978	21.024	18.952
November	15.581	15.512	17.536	15.902	14.481
December	17.195	15.780	18.530	15.610	14.172
Peak (MGM)	**31.281**	23.970	23.740	23.420	24.403
Total (MGY)	**239.141**	224.649	236.566	219.388	211.179

Peak Month = 31.281 MGM (July 2012)
Peak Daily Demand = 31.281/31 = **1.009 MGD**
Peak Annual Demand = 239.141 MGY (2012)
Annual Average Daily Demand = 239.141/366 = 0.653 MGD

Water Allocation Analysis

GTWD's current allocation limits as specified in Water Allocation Permit No. 5253 are as follows:

SOURCE	gpm	MGD	MGM	MGY
4A	800	1.152		
5	750	1.08		
6	800	1.152		
TOTALS	**2350**	**3.384**	**46.8**	**348**

Interconnection

GTWD has the following two emergency interconnections:

System Name	Location	ID #	Status	Availability	Size Inches
Paulsboro Water Department	RT. 44 & Berkley Road	08-217	Active	Emergency	8
Paulsboro Water Department	Swedesboro Ave. & Berkley Road	08-218	Active	Emergency	8

Storage Tanks

Name	Facility ID	Storage Capacity	Effective Capacity
Memorial & Fairmount Standpipe at Well # 4	01	0.375 MG	0.188 MG
Elevated Storage Tank/ Memorial Avenue at 6 TP	03	1.500 MG	1.500 MG
Elevated Storage Tank Vine Street	05	0.110 MG	0.110 MG
	Total	1.985 MG	1.798 MG

GTWD's effective storage capacity is higher than the annual average daily demand of 0.653 MGD. Therefore, GTWD has adequate finished water storage.

Deficit Surplus Evaluation

Firm Capacity: 1.008 **MGD**

Allocation Limits:

(Monthly)	46.800	**MGM**
(Yearly)	348.000	**MGY**

Contract Limits:

(Monthly)	0.000	**MGM**
(Yearly)	0.000	**MGY**

Total Limits:

(Monthly)	46.800	**MGM**
(Yearly)	348.000	**MGY**

Five Year Peak Demand:

(Daily)	1.009	**MGD**
Month/Year	07/2012	
(Monthly)	31.281	**MGM**
Month/Year	07/2012	
(Yearly)	239.141	**MGY**
Year	2012	

Allocated Demand:

(Daily)	0.000	**MGD**
(Monthly)	0.000	**MGM**
(Yearly)	0.000	**MGY**

Total Peak Demand:

(Daily)	1.009	**MGD**
(Monthly)	31.281	**MGM**
(Yearly)	239.141	**MGY**

Deficit/Surplus:

(Monthly)	15.519	**MGM**
(Yearly)	108.859	**MGY**

Firm-Peak Total:

(Daily)	-0.001	**MGD**

WAP Number: 5253

As you can see from the above Deficit Surplus Evaluation, GTWD's firm capacity is in deficit (-0.001 MGD). Therefore, the Bureau of Water System Engineering will not accept any new water main extension permit applications that have the potential to increase the water demands until such time as firm capacity becomes surplus.

License

GTWD's current license requirement W-2 and T-3 will not change.

Items		Points	**W** Based on Population	**T** Based on Points
Population	4,921	1	**2**	
Peak production	1.0 MGD	1		
Sources	Ground	6		
Pre and post disinfection		8		
pH adjustment		8		
Sand pressure filters		10		
Flocculation without sedimentation (clarifiers)		10		
Corrosion inhibitors – orthophosphate		8		
Aeration		8		
GAC adsorbers (Approved under Permits WCP160002 and WCP160003)		15		
Total Points		**75**		**3**

Conclusion

Since the project as constructed has improved the infrastructure, it is recommended that this project be approved.

Note that the clarifiers are uncovered and so exposed to contamination and so cannot be considered as ground water.

As this is a pre-existing condition this will be addressed under separate correspondence.

Recommendations

Check One:

[x] Examination of the engineering data submitted indicated that the project, as designed, complies substantially with our rules and regulations.

It is therefore recommended that the project be APPROVED and permit issued for construction, derivation, distribution, subject to the usual conditions.

[ ] Examination of the engineering data submitted indicates that the project, as designed, does not comply with our rules and regulations.

It is therefore recommended that the project be DISAPPROVED.

[ ] The project has remained technically deficient beyond the due date specified by the Department for providing additional information.

It is therefore recommended that the project be RETURNED.

RECOMMENDED PROVISOS

Check One:

[x] Specific conditions to approval

[ ] Reasons for disapproval

[ ] Reasons for return

[ ] None required

Ramesh Patel
Bureau of Water System Engineering

Reviewed By

Section Chief Approval

Date: 2/23/17.

Monitoring Schedule for GREENWICH TWP W DEPT (NJ0807001)			
Routine Total Coliform			
Schedule Starts	Schedule Ends	Sampling Period	Requirements
01/01/1991	Continuous	1/1--12/31	5 Sample(s)/MN

Stage 2 DBP Schedules

DBP	Sample Point ID	Site	Schedule Starts	Schedule Ends	Warmest Month	Required Months to Sample In	Requirements
HAA5	2	END OF DOROTHY AVE	10/01/2013	Continuous	August	August	1 Sample(s)/YR
TTHM	2	END OF DOROTHY AVE	10/01/2013	Continuous	August	August	1 Sample(s)/YR
HAA5	1	GREENWICH LIFT STATION 9	10/01/2013	Continuous	August	August	1 Sample(s)/YR
TTHM	1	GREENWICH LIFT STATION 9	10/01/2013	Continuous	August	August	1 Sample(s)/YR

Contaminant Groups

Sample Point ID	Analyte Group	Schedule Starts	Schedule Ends	Sampling Period	Sampling Year	Requirements
DS	LEAD AND COPPER	01/01/2007	Continuous	6/1--9/30	2018	20 Sample(s)/Every 3Y
TP002005	INORGANICS	01/01/2002	Continuous	Anytime	2018	1 Sample(s)/Every 3Y
TP002005	RADIOLOGICALS	01/01/2017	Continuous	Anytime	2018	1 Sample(s)/Every 6Y
TP002005	SECONDARY	01/01/2002	Continuous	Anytime	2018	1 Sample(s)/Every 3Y
TP002005	VOCS FEDERAL	01/01/2004	Continuous	Anytime	2017	1 Sample(s)/YR
TP002005	VOCS STATE	01/01/2004	Continuous	Anytime	2017	1 Sample(s)/YR
TP004014	INORGANICS	01/01/2008	Continuous	Anytime	2018	1 Sample(s)/Every 3Y
TP004014	RADIOLOGICALS	01/01/2014	Continuous	Anytime	2021	1 Sample(s)/Every 6Y
TP004014	SECONDARY	01/01/2008	Continuous	Anytime	2018	1 Sample(s)/Every 3Y
TP004014	VOCS FEDERAL	04/01/2008	Continuous	Anytime	2017	1 Sample(s)/QT
TP004014	VOCS STATE	04/01/2008	Continuous	Anytime	2017	1 Sample(s)/QT

Individual Contaminants

Sample Point ID	Analyte	Schedule Starts	Schedule Ends	Sampling Period	Sampling Year	Requirements
TP002005	NITRATE	01/01/2003	Continuous	Anytime	2017	1 Sample(s)/YR
TP002005	SODIUM	01/01/2003	Continuous	Anytime	2017	1 Sample(s)/QT
TP004014	NITRATE	01/01/2008	Continuous	Anytime	2017	1 Sample(s)/YR
TP004014	SODIUM	04/01/2011	Continuous	Anytime	2017	1 Sample(s)/QT