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March 9, 2015

Timothy DiGiulio, P.E.  
NYSDEC - Region 7  
615 Erie Blvd. West  
Syracuse, NY 13204-2400

**Re: Oak Orchard WWTP – Submittal for Conditional Approval for Re-Rate of BOD**

Dear Mr. ~~DiGiulio~~ <sup>TIM</sup>:

The County would like to extend our appreciation to the NYSDEC for the conditional approval to increase the design influent biochemical oxygen demand (BOD<sub>5</sub>) capacity at the Oak Orchard WWTP from 14,200 lbs/day to 17,100 lbs/day. In accordance with your letter dated January 8, 2015, the County is providing the following responses for the conditional approval within the required sixty (60) days.

Internal Sampling Plan and Schedule for Process Control

The process control sampling plan was reviewed and updated by Joe Pieklik, Head Operator, and the Process Control Engineering staff assigned to the Oak Orchard facility. The updated sampling plan provides the operations staff with reasonable assurances to operate the facility in a manner to ensure the continued exceptional performance and compliance with SPDES permit requirements. Based on their review, the following modifications have been implemented:

1. Addition of BOD<sub>5</sub> (24 hr. composite - 2x week) for primary, secondary and final effluent.
2. Addition of Ammonia-Nitrogen (24 hr. composite - 2x week) for secondary effluent.
3. Addition of CBOD<sub>5</sub>, BOD<sub>5</sub>, TSS, TKN, Ammonia-Nitrogen (24 hr. comp. 1x week) for plant RAS.

The complete process control sampling plan and schedule is provided as Attachment No. 1.

Current Dosage and Feed Rates for Polymer and Chlorine – Verification of Storage Capacity

As requested, the County reviewed the historic polymer and chlorine usage to ensure adequate storage capacity. In addition, we also reviewed the same for the aluminum sulfate coagulant. As detailed in Attachment No. 2, the County summarized and reviewed monthly cationic polymer, aluminum sulfate, and sodium hypochlorite (both disinfection and odor control) usage for 2014. The data was further broken-down into daily usage/dosage in lbs/day or gallons/day as applicable. For reference, Attachment No. 2 also includes the annual process chemical usage for the past five (5) years.

The following table summarizes, based on average daily usage, the number of days available for each process chemical based on the existing storage capacity:

Metric/Chemical	Cationic Polymer	Aluminum Sulfate	Sodium Hypochlorite (Disinfection)	Sodium Hypochlorite (Odor Control)
Storage – Working Capacity	(4) – 2,000 lb totes	(2) – 5,518 gallon tanks	(2) - 930 gallon tanks	(1) – 4,851 gallon tank
Daily Usage	453 lbs/day	319 gal/day	22 gal/day	20 gal/day
No. of Days Available	17.7 days	34.6 days	84.5 days	242.6 days

Based on the working capacity of the chemical bulk storage, and the number of days available, the County contends the existing capacity is adequate for the facility’s current needs. When specified in the *Recommended Standards for Wastewater Facilities (10 State Standards)*, the working capacity exceeds the recommended minimum supply.

It should be noted that the disinfection chemical usage will be further evaluated as part of the County’s pending upgrades to the disinfection system for SPDES permit compliance with the total residual chlorine (TRC) limit of 0.045 mg/l, which is effective November 11, 2018. Additional information regarding the County’s chlorination/dechlorination disinfection approach and schedule will be provided by April 1, 2015, as required in the SPDES permit Schedule of Compliance.

Long-Term Plan to Increase Process Capacity – Including Schedule

On August 1, 2013, the County submitted a Plan for Future Growth with a referenced report prepared by our consultant GHD titled *Oak Orchard Wastewater Treatment Plant Capacity Evaluation*, dated July 2013. The Plan for Future Growth identified three (3) possible approaches to enhancing treatment plant capacity which included Magnetite Ballasted Settling (BioMag), Moving Bed Biofilm Reactor (MBBR) Pretreatment (prior to secondary aeration), and Integrated Fixed-Film Activated Sludge (IFAS) Post-Treatment (after secondary aeration). As previously stated each technology has their advantages and disadvantages, however, the most compelling difference is the gain in BOD<sub>5</sub> capacity and the corresponding Capital and Operation and Maintenance cost. The following table summarizes those estimates.

Alternative	BOD <sub>5</sub> Loading Increase (lbs/day)	Capital Cost	O&M 20-year Present Worth Cost
Magnetite Ballasted Settling	5,771	\$7,060,000	\$4,400,000
MBBR Pre-Treatment	4,173	\$6,500,000	\$4,500,000
IFAS Post-Treatment	4,972	\$4,150,000	\$2,200,000

The County still considers the Capacity Evaluation report a planning-level guide of available options to increase capacity based on future growth within the Oak Orchard service area.

These alternatives to enhance or upgrade the capacity will be considered for Capital Improvement Planning (CIP) only in the event the annual BOD<sub>5</sub> loading meets or exceeds 90% of the re-rated design load of 17,100 lbs/day.

Consequently, the County's schedule will be based on the self-imposed exceedance of the 90% threshold, which is more restrictive than Title 6 of the New York Code, Rules and Regulations (NYCRR) Part 750-2-9(c)(2), which requires action should the facility exceed the design loading for BOD<sub>5</sub> during any eight (8) months of the calendar year. This is necessary since the County's CIP development process is typically a minimum 5-year process from County Executive and Legislative approval through construction completion. However, it is the County's intent to avoid the need for additional capacity through stakeholder consensus and the successful implementation of allocations on the remaining BOD<sub>5</sub> capacity as identified in the following projected growth plan.

#### Projected Growth Plan of the Service Area

The County Department of Water Environment Protection presently approves or denies all wastewater capacity applications for all new developments with connections to the sanitary sewers in the Consolidated Sanitary District. An Oak Orchard service area allocation plan has now been developed to successfully guide the remaining allocations of capacity in the service area. The plan incorporates the above mentioned 10% factor of safety and then prioritizes allotments to serve the economic development interests of the entire county, and accordingly plans for, and reserves, an appropriate amount of available BOD<sub>5</sub> load allocation to new industrial development projects. Distinct allotments for new commercial projects and new residential development are then provided for in three (3) year allowances to allow local municipal planners the ability to prioritize project approvals to best serve local municipal comprehensive planning goals. This allocation plan will reasonably prevent the need for increased wastewater treatment plant BOD<sub>5</sub> process capacity over an anticipated ten (10) year planning horizon; it is further anticipated that the allocations will be re-evaluated every three (3) years to determine if adjustments are appropriate.

The County believes the preceding responses satisfy the NYSDEC's request for additional information on operations monitoring, process chemical storage capacities, long-term planning for increased process capacity, if needed, and reasonable projected growth plans and estimates for long-term planning. As a result, the County respectfully requests that unconditional approval be applied to the influent BOD<sub>5</sub> design load of 17,100 lbs/day at the Oak Orchard WWTP.

Should you have any questions or comments regarding this correspondence, please do not hesitate to contact me at this office.

Sincerely,

ONONDAGA COUNTY DEPARTMENT OF  
WATER ENVIRONMENT PROTECTION



Tom Rhoads, P.E.  
Commissioner

DJS/

Enclosure

cc w/enc: Valarie D. Ellis, P.E., NYSDEC Region 7  
Robert Wither, P.E., NYSDEC Albany  
Joe Pieklik, Oak Orchard Head Operator  
**File - Oak Orchard SPDES Correspondence**

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**Oak Orchard WWTP**  
**Action Plan Related to 20% BOD Influent Design Limit Re-Rate**  
**Influent and Final Effluent SPDES Sampling Schedule**  
**SPDES Number: NY- 0030317**

Parameter	SPDES Requirements			OCDWEP Monitoring		
	Frequency	Location(s)	Sample Type	Frequency	Location(s)	Sample Type
<b>Dates: June 16 - October 31</b>						
Flow	Continuous	Effluent	Recorder	Continuous	Effluent	Recorder
CBOD <sub>5</sub> Day	2/week	Inf/Eff	24 hr Comp	2/week	Inf/Eff	24 hr Comp
TSS	2/week	Inf/Eff	24 hr Comp	2/week	Inf/Eff	24 hr Comp
BOD <sub>5</sub> Day **	1/month	Influent	24 hr Comp	2/week	Influent	24 hr Comp
TKN	2/week	Effluent	24 hr Comp	2/week	Inf/Eff	24 hr Comp
Ammonia - Nitrogen	2/week	Effluent	24 hr Comp	2/week	Inf/Eff	24 hr Comp
TKN	2/week	Effluent	24 hr Comp	2/week	Inf/Eff	24 hr Comp
UOD	2/week	Inf/Eff	Calc	2/week	Inf/Eff	Calc
pH - S.U.	3/day	Inf/Eff	Grab	3/day	Inf/Eff	Grab
Settleable Solids	3/day	Inf/Eff	Grab	3/day	Inf/Eff	Grab
Tot. Phosphorus	2/week	Effluent	24 hr Comp	2/week	Inf/Eff	24 hr Comp
Temp. - Deg C.	3/day	Inf/Eff	Grab	3/day	Inf/Eff	Grab
Dissolved Oxygen	2/week	Effluent	Grab	1/day	Effluent	Grab
Hg Method 1631	1/quarter	Effluent	Grab	1/quarter	Inf/Eff	Grab
<b>Dates: November 1 - June 15</b>						
Flow	Continuous	Effluent	Recorder	Continuous	Effluent	Recorder
CBOD <sub>5</sub> Day	2/week	Inf/Eff	24 hr Comp	2/week	Inf/Eff	24 hr Comp
TSS	2/week	Inf/Eff	24 hr Comp	2/week	Inf/Eff	24 hr Comp
BOD <sub>5</sub> Day **	1/month	Influent	24 hr Comp	2/week	Influent	24 hr Comp
TKN	2/week	Effluent	24 hr Comp	2/week	Inf/Eff	24 hr Comp
Ammonia - Nitrogen	2/week	Effluent	24 hr Comp	2/week	Inf/Eff	24 hr Comp
UOD	2/week	Inf/Eff	Calc	2/week	Inf/Eff	Calc
pH - S.U.	3/day	Inf/Eff	Grab	3/day	Inf/Eff	Grab
Settleable Solids	3/day	Inf/Eff	Grab	3/day	Inf/Eff	Grab
Tot. Phosphorus	2/week	Effluent	24 hr Comp	2/week	Inf/Eff	24 hr Comp
Temp. - Deg C.	3/day	Inf/Eff	Grab	3/day	Inf/Eff	Grab
Dissolved Oxygen	2/week	Effluent	Grab	1/day	Effluent	Grab
Hg Method 1631	1/quarter	Effluent	Grab	1/quarter	Inf/Eff	Grab
<b>Dates: May 15 - October 15</b>						
Fecal Coliform	2/week	Effluent	Grab	2/week	Effluent	Grab
Total Chlorine Res.	3/day	Effluent	Grab	3/day	Effluent	Grab

\*\* Revised Final Effluent frequency.

**Oak Orchard WWTP**  
**Action Plan Related to 20% BOD Influent Design Limit Re-Rate**  
**Internal Sampling Plan & Schedule for Process Control**  
 SPDES Number: NY- 0030317

PRIMARY EFFLUENT Parameter	Original OCDWEP Sampling		Revised OCDWEP Monitoring	
	Frequency	Sample Type	Frequency	Sample Type
CBOD <sub>5</sub>	2/week	24 hr Comp	2/week	24 hr Comp
TSS	2/week	24 hr Comp	2/week	24 hr Comp
VSS	2/week	24 hr Comp	2/week	24 hr Comp
TP	2/week	24 hr Comp	2/week	24 hr Comp
pH	1/day	Grab	1/day	Grab
Temp	1/day	Grab	1/day	Grab

AERATION TANKS Parameter	Original OCDWEP Sampling		Revised OCDWEP Monitoring	
	Frequency	Sample Type	Frequency	Sample Type
TSS	1/day	Grab	1/day	Grab
VSS	1/day	Grab	1/day	Grab
pH	1/day	Grab	1/day	Grab
Temp	1/day	Grab	1/day	Grab
DO	1/day	Grab	1/day	Grab
MLSS	1/day	Grab	3/day	Grab
MLVSS	1/day	Grab	3/day	Grab

SECONDARY EFFLUENT Parameter	Original OCDWEP Sampling		Revised OCDWEP Monitoring	
	Frequency	Sample Type	Frequency	Sample Type
CBOD <sub>5</sub>	2/week	24 hr Comp	2/week	24 hr Comp
TSS	2/week	24 hr Comp	2/week	24 hr Comp
TP	2/week	24 hr Comp	2/week	24 hr Comp
pH	1/day	Grab	1/day	Grab
Temp	1/day	Grab	1/day	Grab
F/M Ratio	2/week	Grab	2/week	Grab
MCRT	2/week	Grab	2/week	Grab
DO	1/day	Grab	1/day	Grab
Ammonia - Nitrogen	2/week	24 hr Comp	2/week	24 hr Comp

RETURN ACTIVATED SLUDGE Parameter	Original OCDWEP Sampling		Revised OCDWEP Monitoring	
	Frequency	Sample Type	Frequency	Sample Type
SS	2/week	Grab	2/week	Grab
VSS	2/week	Grab	2/week	Grab
pH	1/day	Grab	1/day	Grab

PLANT WASTE RETURN FLOW Parameter	Original OCDWEP Sampling		Revised OCDWEP Monitoring	
	Frequency	Sample Type	Frequency	Sample Type
CBOD <sub>5</sub>			1/week	24 hr Comp
BOD <sub>5</sub>			1/week	24 hr Comp
TSS			1/week	24 hr Comp
TKN			1/week	24 hr Comp
Ammonia - Nitrogen			1/week	24 hr Comp

**OAK ORCHARD WWTP**  
**Chemical Usage Summary - 2014**  
 SPDES Number: NY- 0030317

MATERIAL	Cationic Polymer	Aluminum Sulfate AlSO <sub>4</sub>	Sodium Hypochlorite (NaOCl)	
			Disinfection	Odor Control
MONTH/UNITS	Lbs	GALS	GALS	GALS
JANUARY	10,584	9,114	0	731
FEBRUARY	12,832	7,992	0	333
MARCH	14,711	10,441	0	514
APRIL	16,189	8,404	2	122
MAY	15,129	8,275	418	290
JUNE	14,840	8,641	447	601
JULY	14,583	9,019	739	1,228
AUGUST	14,133	10,485	773	1,340
SEPTEMBER	13,041	10,126	847	1,372
OCTOBER	14,711	10,606	482	434
NOVEMBER	12,784	10,744	0	148
DECEMBER	11,676	12,520	0	157
<b>TOTAL</b>	<b>165,213</b>	<b>116,367</b>	<b>3,708</b>	<b>7,270</b>
<b>AVERAGE</b>	<b>13,768</b>	<b>9,697</b>	<b>309</b>	<b>606</b>
Feed Days	365	365	166	365
Gal /Day		319	22	20
Lbs. /Day	453			
Storage Tank - Working Capacity	2,000 lb Totes	5,518 Gal	930 Gal	4,851 Gal
On-Site	4 Plus Totes	2 - Tanks	2 - Tanks	1 - Tank

**5 - YEAR ANNUAL TOTAL CHEMICAL USAGE**

Annual Usage	Cationic Polymer	Aluminum Sulfate AlSO <sub>4</sub>	Sodium Hypochlorite (NaOCl)	
			Disinfection	Odor Control
	Lbs	GALS	GALS	GALS
2010	222,400	75,363	3,127	23,347
2011	195,241	88,036	5,265	14,705
2012	175,027	104,117	4,798	15,989
2013	140,578	109,208	4,197	14,009
2014	165,213	116,367	3,708	7,270