Onondaga County Department of
WATER ENVIRONMENT PROTECTION

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August 1, 2013

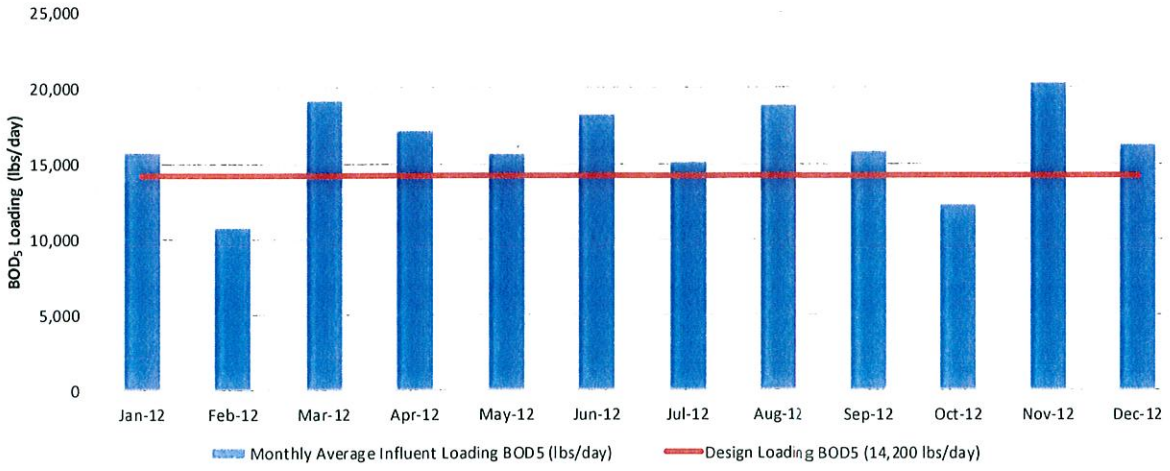
Joseph Zalewski, P.E.
New York State Department of Environmental Conservation
Division of Water
615 Erie Boulevard West
Syracuse, New York 13204-2400

Re: Oak Orchard Wastewater Treatment Plant (NY0030317) – Plan for Future Growth

Mr. Zalewski: Joe

During the preparation of the 2012 Annual Certification Form for the Oak Orchard Wastewater Treatment Plant (WWTP), it was observed that the Department exceeded the design loading for Biochemical Oxygen Demand (BOD_5) during ten (10) out of twelve (12) months in the 2012 calendar year. The monthly average loadings relative to the design capacity are detailed below in Figure No. 1.

Figure 1 - Oak Orchard WWTP Influent BOD_5 Loading/Design Capacity (2012)



Per Title 6 of the New York Code, Rules and Regulations (NYCRR) Part 750-2-9(c)(2), the permittee shall submit a Plan for Future Growth should the facility exceed the design loading for BOD_5 during any eight (8) months of the calendar year. Specifically, the plan shall include:

(a) Provisions for obtaining any necessary funding;
(b) Provisions for preparation and submission to the regional water engineer of approvable engineering reports and/or plans and specifications to provide for growth of discharges in the POTW service area; and,
(c) A demonstration of the permittee's ability to impose a connection moratorium in any and all parts of the service area or, if the permittee does not have such authority, a proposed schedule, not to exceed three years, to obtain such authority or a statement from the permittee's designated legal representative that existing law precludes the permittee from obtaining such authority.

The Department is submitting this correspondence to comply with the required Plan for Future Growth within the Oak Orchard WWTP service area. The plan specifically addresses current treatment performance, options for compliance with annual certification requirements, re-rating of the facility to achieve compliance and short-term growth, and actions towards evaluating opportunities for long-term growth. The three (3) plan elements required by Title 6 NYCRR Part 750-2-9(c)(2), are addressed throughout the document.

Background and Compliance History

The Oak Orchard WWTP has been in service for over 32 years, providing treatment for design flows of 10 mgd with advanced secondary treatment using a high purity oxygen activated sludge process. Wastewater is collected throughout significant sections of the Town of Clay and portions of the Town of Cicero; along with the Village of North Syracuse. Wastewater influent is primarily comprised of both residential and commercial sources; noteworthy is that Clintons Ditch Cooperative is a significant industrial contributor with a high strength BOD_5 loading.

The County is currently conducting a project that includes design and construction phase services to address various infrastructure improvements to that were recommended during the completion of the Facility Plan submitted in April 2009. These improvements were determined necessary to maintain, not enhance, the current treatment capabilities of the facility.

That being said, the Oak Orchard facility had exemplary treatment performance during 2012, resulting in no permit violations and meeting the criteria for the National Association of Clean Water Agencies (NACWA) Peak Performance Gold Award for the second consecutive year. This level of performance, a model for any permittee, served as the foundation of our approach detailed herein.

Temporary Suspension of New Sewer Service Connections

This Department indeed has the ability to impose a connection moratorium by way of the Onondaga County Administrative Code, Article II.A, and Onondaga County Local Law No. 1 (Section 2 and

20). For brevity, those documents have not been included herein, rather, the documents can be viewed at http://www.ongov.net/forms/images/code.pdf, and http://static.ongov.net/WEP/wepdf/Revised_SUO_LocalLaw_Adopted21Dec2010_Filed19Jan2011.pdf, respectively.

After submission of the annual certification for 2012 to the NYSDEC, the Department met with the Towns of Clay and Cicero, County Leadership, and potential stakeholder groups to discuss the regulatory situation. The Department made presentations at several meetings and at the annual planning symposium on capacity constraints, including the regulatory condition at Oak Orchard.

Accordingly, and as a proactive measure to address design capacity concerns, on April 1, 2013, the Department issued a Notice of Temporary Suspension of New Sewer Connections within Oak Orchard Service Area. The temporary suspension noted the BOD capacity condition of the Oak Orchard WWTP and as such warranted the following steps:

> *Subject to the exceptions described in the following subparagraphs, all new connections within the Oak Orchard service area are temporarily suspended for a six (6) month period commencing April 1, 2013. The following are excepted:*
>
> *(i) Subdivisions with prior OCDWEP approval, evidenced by issuance of an Onondaga County Department of Health, Division of Environmental Health (OCDOH) "Approval of Sanitary Sewer Extension" letter, provided that OCDWEP has been notified by the applicant of the start of subdivision construction and that such work has been performed within the time frame stated in such letter.*
> *(ii) The subdivision received preliminary approval or a "capacity assurance statement" from OCDWEP within the two year period prior to the date of this Notice, subject to the requirement that all applicable permits and approvals be obtained.*
> *(iii) A permit has been issued to an applicant from OCDWEP or the County Executive within the two year period prior to the date of this Notice, subject to the requirement that all other applicable permits and approvals be obtained.*

The complete notice can be viewed at:
http://static.ongov.net/WEP/OakOrchard_WWTP/Notice_Oak_Orchard_Service_Area_04042013.pdf

On or before October 1, 2013, the Department will determine if the Temporary Suspension shall be extended, or if the approach outlined herein, based on the NYSDEC acquiescence, is adequate to lift the suspension.

Wastewater Capacity Management Action - Pump Station Diversion

In order to increase available BOD capacity at Oak Orchard, the Department has the unique opportunity to divert the flow from Gaskin Road Pump Station (PS), a County-owned pump station in the Oak Orchard service area, to the Wetzel Road WWTP. This will provide significant hydraulic

and organic loading relief at the Oak Orchard WWTP (It is noted that the recently upgraded Wetzel Road WWTP was designed to accommodate same). Originally, the sewage from Gaskin Road PS was directed to the Wetzel Road WWTP, however, the configuration of the pump station required "short and fast" drawdowns which presented difficulties at the newly upgraded Wetzel Road facility, specifically short-term flow capacity. The Department has since completed an adjustment of the pump station float elevations to minimize the peak flow impacts from Gaskin Road PS on the Wetzel Road WWTP. **As of the date of this letter, flow has since been diverted to the Wetzel Road facility**.

The Department does not conduct regular monitoring of the Gaskin Road pump station for conventional parameters other than flow. Upon diversion, the Department currently anticipates an average reduction in flow to Oak Orchard on the order of 0.8 MGD. BOD_5 monitoring was recently added at the influent wet well at the Gaskin Road pump station to determine wastewater strength, and we anticipate an average daily reduction of 1,050 to 2,000 lbs/day of BOD_5 with diversion. For 2012, this would have equated to a 14% flow reduction and 12% BOD_5 loading reduction at the Oak Orchard WWTP. These estimates will be refined once a more robust and seasonal data set has been gathered.

The diversion modification alone, pending the gathering of additional long term data, has the potential to achieve compliance with the monthly BOD_5 design loading requirements identified on the annual certification and Title 6 NYCRR Part 750-2-9(c)(2), necessitating the Plan for Future Growth. Based on the 2012 data set, and the high end of the anticipated load reduction from diversion, the corresponding monthly loading at the Oak Orchard WWTP would have exceeded the design loading for Biochemical Oxygen Demand (BOD_5) during only six (6) out of twelve (12) months in the 2012 calendar year; well below the Title 6 NYCRR Part 750-2-9(c)(2) threshold. However, this modification by itself will not allow opportunities for growth within the service area.

Request for Re-rating Proceedings

Assessing the analytical data and performance in response to the Annual Certification findings has presented what the Department believes is a prudent opportunity to appropriately classify/quantify the capabilities of the Oak Orchard WWTP. Specifically, we firmly believe that it is appropriate and necessary to re-rate the Oak Orchard WWTP design capacity based on actual performance rather than design standards which were established prior to actual construction. As you know, design standards are a guidance to ensure a design will perform as required for permit compliance prior to capital investment in plant construction. However, in this case we have a facility that has consistently exceeded the estimated design and continues to demonstrate higher levels of actual performance; implying that the original design safety factors were too conservative.

Based on our research and consultation with local engineering firms, the NYSDEC does not have guidance manual or policy on how to conduct a re-rating of the facility based on proven performance. However, it is also our understanding that several municipalities in New York State have successfully re-rated their WWTPs. In our opinion, this approach should not appear extraordinary

since many permit modifications for tertiary treatment process additions are based on finite periods of pilot testing. Moreover, performance based re-rating could be viewed as a long-term pilot test in determining a facility's capabilities.

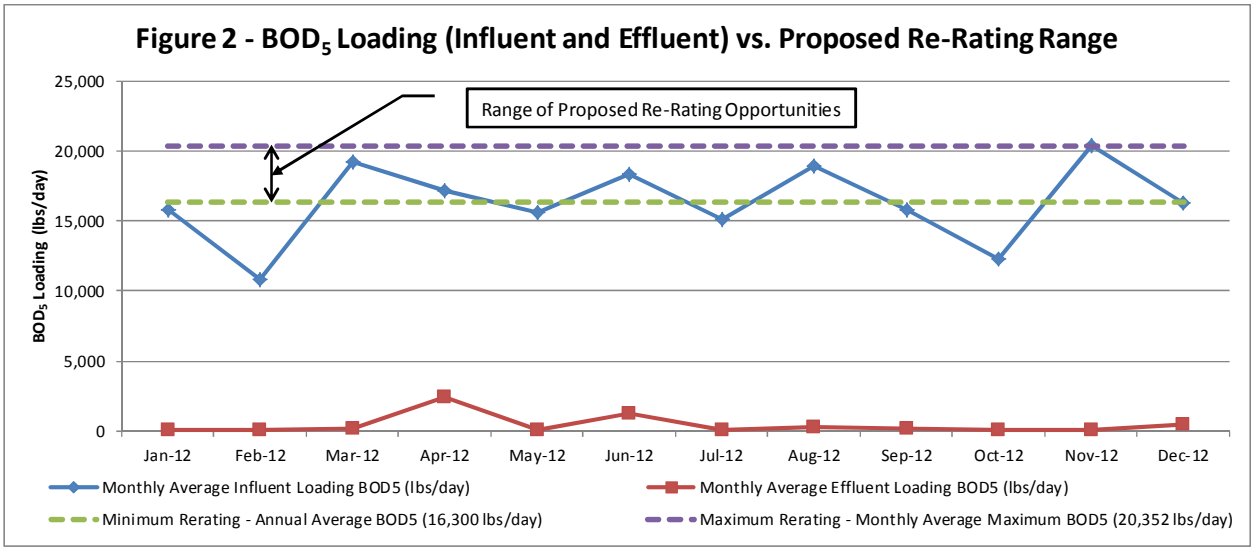
The Department believes there are two (2) approaches to take regarding re-rating. The first involves re-rating based on either the average or peak monthly BOD_5 loading and the ability to maintain removal efficiency and permit compliance. The second approach involves the establishment of a rating based on Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) which was added to the Oak Orchard WWTP SPDES Permit in lieu of BOD_5 in 1988. The second option would appear to be the most viable since BOD_5 monitoring is no longer required by permit (other than for completion of the Annual Certification Form).

BOD_5 Approach – For the purposes of discussion, the Department used the 2012 data set since this represents the longest period of elevated BOD_5 loadings and concentrations (worst case scenario). At a minimum, the re-rate could be established based on the annual average BOD_5 loading for 2012, 16,300 lbs/day, since the facility maintained compliance for the entire year and achieved 97.3% removal efficiency. At the high end, albeit justified based on performance, the re-rate could be established based on the maximum monthly BOD_5 loading of 20,352 lbs/day, during which the facility achieved 99.6% removal efficiency (October 2012). Table No. 1 provides a summary of the monthly loadings (influent and effluent) as well as the corresponding removal efficiency.

Table No.1

Month	Monthly Average Influent Loading BOD_5 (lbs/day)	Monthly Average Effluent Loading BOD_5 (lbs/day)	Removal Efficiency
Jan-12	15,748	105	99.3%
Feb-12	10,794	114	98.9%
Mar-12	19,207	180	99.1%
Apr-12	17,206	2,426	85.9%
May-12	15,602	98	99.4%
Jun-12	18,297	1,294	92.9%
Jul-12	15,121	111	99.3%
Aug-12	18,873	302	98.4%
Sep-12	15,840	221	98.6%
Oct-12	12,247	72	99.4%
Nov-12	20,352	85	99.6%
Dec-12	16,312	453	97.2%
Average	**16,300**	**455**	**97.3%**

Figure No. 2 graphically displays the monthly loadings (influent and effluent) overlaid with the proposed re-rating range for BOD_5. The purpose here is not to establish the re-rating, but open the discussion and provide a reasonable basis for performance based capacity limitations.



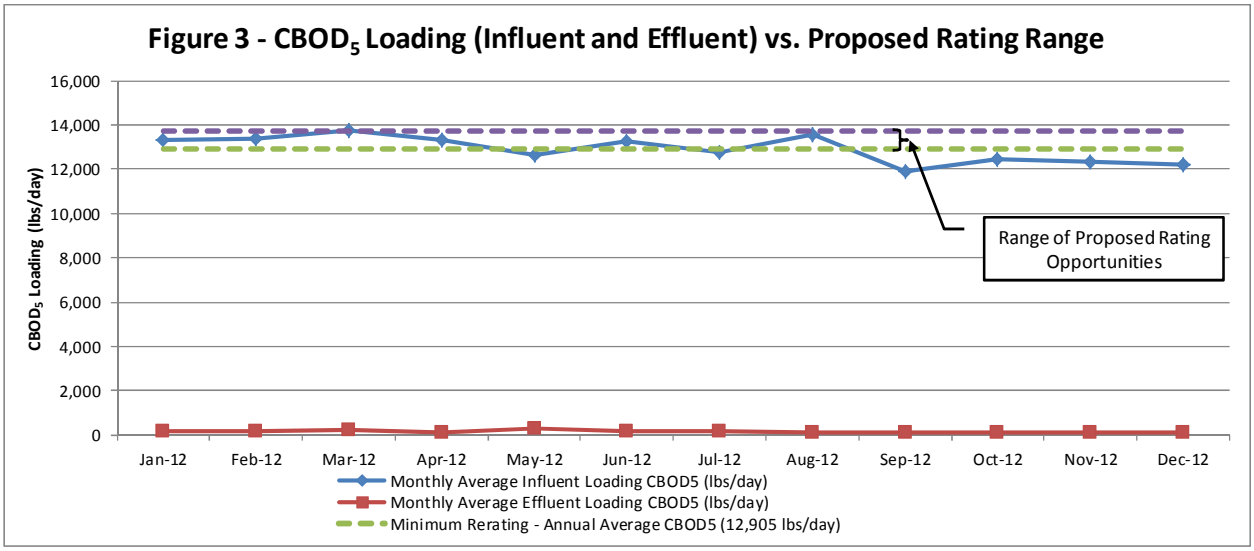
$CBOD_5$ Approach - Again, the Department used the 2012 data set since this represents the longest period of elevated $CBOD_5$ loadings and concentrations (worst case scenario). This is actually the preferred approach for two (2) reasons: 1) the BOD_5 dataset is very limited (one time per month) since the parameter is not required by permit (although the Department is confident the loadings are representative), and 2) $CBOD_5$ is monitored more frequently (two times per week) since the Oak Orchard WWTP SPDES Permit opted for $CBOD_5$ limits in lieu of BOD_5 limits in 1988.

Again, at a minimum, the rating could be established based on the annual average $CBOD_5$ loading for 2012, 12,905 lbs/day, since the facility maintained compliance for the entire year and achieved 98.9% removal efficiency. At the high end, albeit justified based on performance, the rating could be established based on the maximum monthly $CBOD_5$ loading of 13,736 lbs/day, during which the facility achieved 98.3% removal efficiency (March 2012). Table No. 2 provides a summary of the monthly loadings (influent and effluent) as well as the corresponding removal efficiency.

Table No. 2

Month	Monthly Average Influent Loading $CBOD_5$ (lbs/day)	Monthly Average Effluent Loading $CBOD_5$ (lbs/day)	Removal Efficiency
Jan-12	13,300	164	98.8%
Feb-12	13,404	188	98.6%
Mar-12	13,736	233	98.3%
Apr-12	13,307	101	99.2%
May-12	12,669	258	98.0%
Jun-12	13,240	175	98.7%
Jul-12	12,761	184	98.6%
Aug-12	13,547	76	99.4%
Sep-12	11,903	78	99.3%
Oct-12	12,483	85	99.3%
Nov-12	12,328	112	99.1%
Dec-12	12,186	119	99.0%
Average	**12,905**	**148**	**98.9%**

The Figure No. 3 graphically displays the monthly loadings (influent and effluent) overlaid with the proposed rating range for $CBOD_5$.



Again, the purpose here is not to establish the rating, rather initiate a discussion and provide a reasonable basis for performance based capacity limitations. This approach makes the most sense because it is difficult to educate the impacted communities on why economic growth could be restricted based on an operating parameter (BOD_5) that has no limitations specifically identified by permit.

Sources of BOD_5 Load Growth and Industrial User Pretreatment

As previously stated, Clintons Ditch Cooperative is a significant industrial contributor to the BOD_5/$CBOD_5$ loading at the Oak Orchard WWTP. In 2012 the average daily BOD_5 load from this facility was 4,155 lbs/day, representing on average 26% of Oak Orchard's influent loading and 29% of the design capacity. For a historical perspective, growth at this facility has occurred slowly over time. Table No. 3 provides a brief snap shot of the key loadings from this facility since 1977.

Table No. 3

Year	BOD_5 Loading (lbs/day)	Clinton Ditch Cooperative's Percentage of Oak Orchard Design Capacity
1977	537	<4%
1979	1,997	14%
2012	4,155	29%

In April 2013, the Department initiated preliminary discussions with Clintons Ditch Cooperative regarding the feasibility and associated economic impacts of implementing pretreatment of their process wastewater. Importantly, if full and effective pretreatment were initiated at this industry, the BOD_5 loading could potentially be reduced on average by 3,655 lbs /day (22% of the Oak Orchard WWTP's 2012 BOD_5 loading). However, the Department is still pursuing initial discussions with the industry to evaluate the options available for potentially pretreating their high strength BOD_5 wastewater, and we are aware that the Pollution Prevention Institute is also helping the industry with options.

It should be noted that since 1980, the increase in loading from Clinton Ditch Cooperative is of the same order of magnitude as the increased loading due to residential growth. In 1980, the Oak Orchard Service area residential population was estimated at 45,791 residents; 10 States Standards assumes 0.17 lb/day/capita or 7,784 lbs/day from residential sources. In 2010, the residential population was estimated at 56,188 residents; assuming 0.17 lb/day/capita or 9,552 lbs/day from residential sources. The 0.17 lb/day/capita is a very conservative estimate. 10 States Standards recommends 0.22 lbs/day/capita for households with garbage disposals, so at the high end the estimated residential loading could be as much as 12,361 lbs/day, assuming all new homes have disposals and all older homes in the service area were retrofitted for disposals. Clearly, the actual residential value falls somewhere in between 9,552 and 12,361 lbs/day of BOD_5.

Facility Plan – April 2009/June 2010

The Oak Orchard WWTP Facilities Plan was completed by Stearns & Wheler Engineers (now GHD Consulting Service Inc.) in April 2009 and amended in June 2010. This effort evaluated and recommended necessary facility improvements for meeting treatment requirements for current and future flow and loading conditions. The recommended improvements were estimated at $77 M and included improvements to the Davis Road PS as well as plant process modifications. The

department is currently conducting an infrastructure improvement project based on this report to improve the basic function of the plant for an estimate of over $13M. These improvements are focused on structural, architectural and mechanical systems and are not intended to increase either flow or load capacity. Decisions for future improvements were postponed due to cost.

Capacity Evaluation

The Department recently contracted with GHD Consulting Service Inc. to complete a Capacity Evaluation of the Oak Orchard WWTP. The primary goal of this evaluation was to provide options for increasing the capacity of the facility while minimizing the need for additional and costly process tankage construction. As mentioned before, the Facility Plan estimated $77M would be necessary to upgrade the plant. This new capacity evaluation presents several lower cost opportunities for addressing capacity issues only.

Many options and technologies were screened as part of this evaluation, and the three (3) technologies that warranted detailed consideration 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). Each of these technologies have their advantages and disadvantages as detailed in the report, however, the most compelling difference is the gain in BOD_5 capacity and the corresponding Capital and Operation and Maintenance cost. Table No. 4 summarizes these estimates.

Table No. 4

Alternative	BOD_5 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 Department considers the capacity evaluation report a planning-level guide of available options for growth within the Oak Orchard service area depending on the level of investment or projected growth deemed necessary. This document is intended to be used as a tool for future discussions with the Onondaga County elected officials and the Towns and other stakeholders to seek collaboration on the future direction and development within the Oak Orchard service area. The full capacity evaluation report can be viewed at: http://static.ongov.net/WEP/OakOrchard_WWTP/7-25-13_Oak_Orchard_WWTP_Cap_Report.pdf.

Funding Provisions

The administrative and legislative process for this Department to procure capital improvement funding is described in the Onondaga County Administrative Code and Onondaga County Capital

Improvement Plan (these documents can be viewed at: http://www.ongov.net/forms/images/code.pdf and http://www.ongov.net/finance/documents/CIP2013-2018ADOPTEDBOOK.pdf, respectively.

At this point in time, no specific funding has been identified as additional discussions are needed with the NYSDEC (in regards to plant re-rating), Towns of Clay and Cicero, County Leadership, and potential stakeholder groups to identify capacity needs.

In closing, the Department is requesting a coordination meeting with the NYSDEC Region 7 Staff to discuss the required application to re-rate an existing facility based on contemporary performance and applicable/permitted design parameters. At the same time, this will be an opportunity to review the approach presented by the County herein, and respond to any questions.

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

Sincerely,

ONONDAGA COUNTY DEPARTMENT OF
WATER ENVIRONMENT PROTECTION

Tom Rhoads, P.E.
Commissioner

DJS/

Attach

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