pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

North East Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0061077**
Facility Type	**Municipal**	APS ID	**544856**
Major / Minor	**Minor**	Authorization ID	**1132606**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Lake Winola Municipal Authority** **Wyoming County**	Facility Name	**Lake Winola WWTP**
Applicant Address	PO Box 59 Lake Winola, PA 18625-0059	Facility Address	SR 2010 Lake Winola, PA 18625
Applicant Contact	Ronald Manglaviti	Facility Contact	Edward Graham
Applicant Phone	(570) 378-3733	Facility Phone	(570) 563-1354
Client ID	43745	Site ID	271040
Ch 94 Load Status	Not Overloaded	Municipality	Overfield Township (Treatment Plant) Tunkhannock Township (Outfall #001)
Connection Status	No Limitations	County	Wyoming
Date Application Received	March 31, 2016	EPA Waived?	Yes
Date Application Accepted	See below.	If No, Reason	-
Purpose of Application	RENEWAL OF EXISTING NPDES PERMIT.		

NPDES Permit renewal application for 0.0875 POTW (servicing Overfield Township) discharging to Mill Run (CWF; Stream Code# 28703), near the confluence with the North Branch Susquehanna River.

- The 2015 ADF discharge was estimated at 0.049795 MGD, the 2014 ADF was estimated at 0.05073 MGD, and the 2013 ADF was estimated at 0.05042 MGD. Highest monthly average flow was 0.05732 MGD in July 2015.
- 2017 Chapter 94 Report indicated a 0.05029 MGD ADF, and April 2017 0.05443 MGD highest monthly average flow.
- 2016 Chapter 94 Report indicated a 0.04923 MGD ADF, and June 2016 0.05374 MGD highest monthly average.
- They generated 4.83 dry tons sludge in previous year (not identified as whether 2016 or 2017 in NPDES Form Application) without Application indicating any offsite disposal or beneficial use.

Background Information:

- **Project reassigned on 1/22/2018.**
- **NPDES Permit expiration date of 9/30/2016. Previous Reviewer did not mark application as complete in E-facts or on application copy. Application received 3/31/2016, due 4/3/2016. Assumed complete in time for administrative extension by DEP managerial decision.**
- WWTP is located in different TOPO Quad (Factoryville) near Lake Winola at ~1140 Feet Elevation. (E-maps shows two ponds at the approximate location in Overfield Township (-75.853399; 41.523634 between two ponds), off Hug Lane (which is accessible via Dalton Road). Outfall #001 is located near intersection of Route 92 and Roosevelt Highway. The locations are about 2.6 miles apart.
- **Continuing Long-Term Pattern of Ammonia-N exceedances. (See compliance history section for details).**
- **Separate Part II WQM Permit Application No. 6618401 for replacement offsite Pump Station (pumping to facility lagoons & considered integral part of WWTP) under separate review (some overlapping issues). The replacement pump station was built prior to permitting.**

Approve	Deny	Signatures	Date
X		James D. Berger, P.E. / Environmental Engineer	October 25, 2018
X		Amy M. Bellanca, P.E. / Environmental Engineer Manager	

Part C Special Conditions (changes bolded):
Part C.I.A through C: Updated Standard Sewage Facilities (Stormwater prohibition; Necessary property rights; Residuals management)
Part C.I.D: New Chlorine Minimization Condition
Part C.I.E: New Responsible Operator condition (to identify certified operator in charge of Treatment Facility and Pump Station and any person designated by him/her to do Operator duties such as sampling). Inspector noted certified operator also operates other facilities and might not be onsite to conduct sampling personally. General Information Form identified a certified operator (individual) at the WWTP operator (i.e. not an Authority employee).
Part C.I.F: Existing Changes in Stream/discharge Condition
Part C.I.G: New Groundwater Monitoring condition (form will be with final NPDES Permit).
Part C.II: New Schedule of Compliance (Ammonia-N and Total Residual Chlorine)
Part C.III: New standard Solids management conditions (lagoon) modified to require liner inspection upon sludge removal.
Part C.IV: New TRE conditions for Copper and Lead

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.0875
Latitude	41º 30' 30.97"	Longitude	-75º 53' 57.12"
Quad Name	Tunkhannock	Quad Code	0638 (2.20.3)
Wastewater Description:	Sewage Effluent		

Receiving Waters	Mill Run (a.k.a. Osterhout Creek).	Stream Code	28703
NHD Com ID	66407995	RMI	0.1000
Drainage Area	5.69 square miles	Yield (cfs/mi^2)	0.0093
Q_{7-10} Flow (cfs)	0.0532 (~0.0344 MGD)	Q_{7-10} Basis	USGS PAStreamstats
Elevation (ft)	~590 Feet	Slope (ft/ft)	-
Watershed No.	4-G	Chapter 93 Class.	CWF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	-		
Source(s) of Impairment	-		
TMDL Status	-	Name	-

Background/Ambient Data:		Data Source:
pH (SU)	-	No upstream Mill Run data available
Temperature (°F)	-	See above
Hardness (mg/L)	**44.9**	**Application data for upstream of Outfall on Mill Run. Additional data indicated 43.5 mg/l at confluence of stream and river (not during low flow conditions), and WWTP discharge grab sample of 114 mg/l.**
Fecal Coliform:	720/100 ml	Monitor Point No. 154340, Sequence No. 831, Sample No. 2143113 (6/21/2017) showed spiking of fecal coliform at Outfall Location (as compared to other sampling at that location on Mill Run). See Table below for details.
MMTECMF (E Coli)	980/100 ml	See above.

Nearest Downstream Public Water Supply Intake		Danville, PA	
PWS Waters	Susquehanna River	Flow at Intake (cfs)	-
PWS RMI	-	Distance from Outfall (mi)	~60 miles per Application

Changes Since Last Permit Issuance:

- **Mill Run is a Natural Trout Reproduction stream (October - May DO WQS applies).**
- **Outfall No. 001 Coordinates updated per 2016 NPDES Permit Renewal Application. Actual discharge is ~375 feet closer to the River than previous coordinates, located near confluence of Mill Run with Susquehanna River. NHD had previously indicated a discharge to Winola Lake itself. New Outfall #001 Latitude: 41º 30' 30.16; Longitude: -75º 53' 57.70"**

Other Comments:

- **Effluent-dominated Stream: At Q7-10 low flow and NPDES Permit Basis ADF flow, Mill Run is a 2.5:1 effluent-dominated stream.**

- **Mill Run and Susquehanna River & Lagrange Island: Mill Run discharges to Susquehanna River, at location where a large "island" ("Lagrange Island" or "La Grange Island" per different sources) on the Susquehanna River shown is shown on DEP E-maps and USGS mapping.**
    - **High Flow Periods: During high flow periods, the Lagrange Island appears to divide Susquehanna River flow to an uncertain degree, with some flow on the Mill Run side of Lagrange Island.**
    - **Low Flow Periods: Both E-maps and USGS PAStreamstats indicate the Susquehanna River flow is on the other side of Lagrange Island (from Mill Run) during low flow periods. Mill Run must then traverse the length of Lagrange Island before reaching the flowing river. Per regulatory requirements, the DEP Water Quality Modeling and Water Quality-based Effluent Limits (WQBELs) must address low flow conditions (i.e. no Susquehanna River dilution).**
    - Susquehanna River (WWF) Impairment: Mercury and PCBs for fish consumption. Facility is not expected to be a source for PCBs or mercury to the Susquehanna River.
    - Lake Winola: Lake Winola discharges to Trib 28682 To Beaver Creek (CWF), without any flow directed to Mill Run.
- **Ammonia-N issues: There is an existing long-term pattern of Ammonia-N noncompliance (summer and winter). See Compliance Section for details.**
    - **Resolution: This permit contains a Schedule of Compliance to address the problem.**
    - **Conceptual Outfall Relocation Option: The Authority requested feedback regarding a conceptual Outfall No. 001 relocation in terms of whether that would help address Ammonia-N issues:**
        - **The proposed outfall location (still on Mill Run during Q7-10 low flow conditions) will not allow for less stringent Water Quality-Based Effluent Limits (WQBELs). Water Quality modeling was not done as it would not help the Authority:**
            - The proposed location will not significantly increase receiving stream Q7-10 low flow assumptions (~0.04 square miles of additional watershed area only). No Susquehanna River dilution at this new location during low-flow periods.
            - Antibacksliding prohibitions prohibit any less stringent permit limits.
        - Conceptual Location for relocated Outfall No. 001: For informational purposes only:
            - Latitude: 41˚, 30', 28"; converting to 41.507778 degrees
            - Longitude: -75˚, 54', 03"; converting to -75.900833 degrees
            - Slight Increase (0.04 square miles) in Drainage Area: USGS PAstreamstats estimated only a 5.73 square mile drainage area at low flow conditions.
            - Practical Obstacle: The proposed relocation would require undertunneling an existing railroad line, requiring Railroad permission (potentially unavailable).
    - Other Options: The Authority is free to investigate other potential outfall locations/Antibacksliding Exception requirements and/or other Ammonia-N treatment options during the Schedule of Compliance (Ammonia-N) Feasibility Study.
- Nutrients: This is a Phase 5 Chesapeake Bay facility. Additional monitoring will be added in this permit term as a standard requirement.
- Fecal Coliform Data: E-maps indicate fecal coliform monitoring on Mill Run at Outfall Location at Monitor Point# 154340 in 2017:

Sampling Date	Fecal Coliforms (#/100 ml)	E-Coli (#/100 ml)
6/13/2017	30	40
6/13/2017	50	50
6/15/2017	60	30
6/21/2017	720	980
6/27/2017	90	160
6/29/2017	100	110
7/5/2017	80	50

Treatment Facility Summary

Treatment Facility Name: Lake Winola WWTP

WQM Permit No.	Issuance Date	Scope
6685401	5/6/1985	• Low Pressure Sewer (LPS) System (~38,934 LF main; ~30,560 LF laterals with 446 simplex grinder pumps & 10 duplex grinder pumps) with **lift/pump station (two 250 GPM @ 100 Feet TDH pumps) with ~1322 LF 6-inch force main to convey sewage to WWTP**; • 0.0875 MGD WWTP consisting of influent flow meter (sonic) system, two aerated lagoons in series (2nd lagoon having 2 cells) and (vacuum feed gas chlorinator) chlorination system/contact tank. Lagoons designed to store sludge for 20 years prior to cleaning and disposal. • ~13,900 LF 6-inch pipeline to outfall on Mill Run. • Module 5A (Phase I Supplemental Geology and Groundwater Information) found in file, but no Phase II. Proposed groundwater monitoring points 1b, 2b, and 3b listed in Module 5A Part IV. Underdrains under lagoon synthetic liner to be placed in each lagoon.
6618401	**TBD**	**Part II WQM Permit Application for as-built "replacement" offsite Pump Station pumping LPS collection system flow to lagoons (no headworks screening). Under DEP Technical Review. As-built Pump station includes two (2) 300 GPM @ 112 Feet TDH pumps.**

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Facultative Lagoons	Tablet chlorination per NPDES application.	0.0875

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.0875	243*	Not Overloaded	Storage in lagoon until removal for offsite disposal.	Disposal offsite

*4/24/2018 WQM Pump Station Module 1 claimed 364.4 lbs BOD5/day, but no WWTP rerating was requested or shown to be technically justified. The Module 1 also identified expected peak instantaneous/hourly flow at 231 GPM (0.33264 MGD) or alternatively 0.2625 MGD peak hourly flow (reason for discrepancy not clear). The 2018 WQM Permit Application Pump Station Module 22 retained original Pump Station WWTP Module 1 design assumption (0.0875 MGD average; 0.136 MGD max/peak instantaneous).

Changes Since Last Permit Issuance:

- They are presently using a composite sampler per Inspector to help address potential biasing due to diurnal lagoon biology, etc. No data on when it was installed.
- **Evidence of Liner System Failure and Need for Repair/Replacement: The 2018 Lagoon Underdrain monitoring data appears to indicate lagoon liner failure (see below for details). In addition, fecal coliform was found in the downgradient groundwater monitoring wells. See Table 2 below for summary of 2018 Authority-provided monitoring data.**
- **Missing Approved Groundwater Monitoring Well and original WQM Part II Permit Module 5A Phase II Submittal: Facility was unable to locate an approved groundwater monitoring well to allow for 2018 sampling (see below for details) and the original Module 5A Phase II (post-well installation)**

"Supplementary Geology and Groundwater Information" submittal. **The Well will have to be replaced if the Authority cannot locate the missing well or otherwise cannot sample it. NOTE: The missing well was presumably the upgradient or side-gradient monitoring point for direct comparison to the provided downgradient monitoring well results.**

Other Comments:

- **General Facility Description from Original 1985 WQM Permitting: The facility has had a long-term pattern of Ammonia-N permit limit exceedances (see Compliance Section) and has apparent Liner failure (see underdrain data). Therefore, this section has been expanded to summarize as-designed/as-operated site conditions:**
  - **Design Flows**:
    - Source: Sewage from ~38,934 Linear Feet of Low Pressure Sewer (LPS) System which includes ~ 449 simplex grinder pumps and ~10 duplex grinder installations at full build-out.
    - Present Flows per NPDES Permit Application Present Operating Information:
      - Present ADF: 0.050094 MGD, ~34.8 GPM
      - Daily Max Flow: 0.10482 MGD, ~72.8 GPM
      - MMAF: 0.0689 MGD; ~47.8 GPM
    - WQM Application Module 1:
      - ADF: 0.0875 MGD ADF (~60.76 GPM)
      - Runoff Flow Rate: 0.131 MGD (16 hour runoff period)
      - Maximum Flow Rate: 0.20 MGD (~136.9 GPM)
    - WQM Application Module 2:
      - Sewer System: maximum 250 GPM flow rate (0.360 MGD).
      - Pump Station: 0.0865 MGD average flow. (Max flow number was "136", presumably 0.136 MGD (~94.4 GPM) to account for interference effects when both pumps operated as equivalent to DE Report Table 1 max flow of 131,250 GPD).
    - Design Engineer Report Table 1 (Summary of Design Basis):
      - Peak Hourly Flow: 262,500 GPD (~182.3 GPM) (factor of 3 for peak flows, a factor generally assumed due to potential I&I contribution not generally found in an LPS System as noted in the application)
  - **Offsite Pump Station**: **The offsite Pump Station (two pumps, no screen, no grinders) pumps the grinded sewage flows through a 6-inch force-main directly to a Manhole and the aerated facultative Treatment Lagoon No. 1 (no intervening headworks).** The Pump Station is located off Lithia Valley Road (TR 430).
    - **Original Pump Station Pump Sizing:**
      - **250 GPM (0.360 MGD) @ 100 Feet TDH (4-inch centrifugal "solids handling" pumps)**
      - **Each of the two pumps (250 GPM at 100 Feet TDH) could handle a flow that is a factor of 7 greater than the Authority-identified present Annual Average Daily Flow (ADF) and 4 times greater than the Treatment Plant's ADF design flow. If both pumps were operating, the combined pumping rate would almost double (limited by pump interference and friction factors).**
      - **Per Chapter 94 Reports, the Authority experimented with VFDs at the Pump Station, but then removed them. The Authority Engineer indicated the pump station pumping capacity was increased by "altering the electrical frequency by which the pumps operated, basically increasing the pumps impeller speed" and "the frequency controller which increased the speed of the pumps was removed years ago".**
    - **Replacement Pump Station Pump Sizing per separate 2018 WQM Permit Application: Two constant speed submersible non-clog centrifugal pumps (no screens or grinders). The application-identified 840-gallon pump cycle volume during the application-identified 2.8 minutes pump run cycle means the lagoons receive flow in discontinuous pulses.**
      - **300 GPM (0.432 MGD) @112 Feet TDH for 3.4± FPS Design Average Velocity in Force Main. Estimated 103 Feet Static Head and 9 Feet Friction Loss**
      - **Each of the two pumps (300 GPM at 112 Feet TDH) could handle a flow that is a factor of 8.5 greater than the Authority-identified Annual Average Daily Flow and 4.9 times greater than the Treatment Plant's design flow. If both pumps were**

operating, the combined pumping rate would almost double (limited by pump interference and friction factors).

- **See Table 1 (below) to see the non-steady state "pulsed" flows (variable both diurnally and seasonally) at different flow rates.**

- **Rationale for Pump Oversizing: Not explained. No explanation for increasing pump sizing provided. NOTE: The original oversizing might have been meant to address potential force-main clogging from the LPS System solids during diurnal/seasonal low flow periods.**

- **6-inch Force Main (between Pump Station and Manhole/Lagoon): Force main type was assumed to be PVC in 2018 WQM Permit Application (but not clearly identified as such in the original WQM Permitting). In addition, available piping cross-sectional flow area will likely be reduced by scaling since construction circa 1985.**
- Manhole prior to Lagoon No. 1:
  - The influent sampling point is at the manhole just prior to the discharge into the lagoons.
  - Plant Influent Manhole invert elevations are 1147.5 Feet influent and 1147.0 Feet effluent per NPDES Application P&I figure
  - Manhole has inlet flow metering system (ultrasonic within influent force main with "indicating, totalizing and recorded output")
- **Aerated Facultative Lagoons**: The Lagoon System was designed for a minimum thirty (30) days detention time in summer, and a minimum sixty (60) days detention time in winter (with each cell having its own minimum detention time set forth in the permit application). The lagoons were designed to accommodate 20-years of sludge accumulation prior to the need for cleaning and disposal. Total Lagoon Volume of 3,297,000 gallons.
  - **Aeration Requirements: The original WQM permitting assumed a minimum working level of 2.0 mg/l (but WQM permitting calculations did not explicitly address nitrification requirements in addition to BOD5 requirements).**
  - **Lagoon No. 1:** 75 feet wide by 230 feet long, single 45 mil reinforced Hypalon or Chlorinated polyethylene liner with underdrains:
    - Lagoon Basin 1 Volume: 2,054,200 gallons (62.3% total lagoon volume)
    - **Basin 1 (1 cell) Design Minimum Detention Times: See Table 1 for calculated detention times (Lagoon Capacity in Million Gallons divided by MGD flow rate).**
      - **Summer Detention Time: 18.7 days**
      - **Winter Detention Time: 37.4 days**
    - Per NPDES Permit Application:
      - Provided Drawing showed Lagoon #1 had bottom elevation of 1136.0 Feet, invert elevation of 1132.5 Feet, with berms at 1149.0 Feet. Application drawing estimated H.W.L at 1146.0 Feet
      - Lagoon No. 1 (upper lagoon) Sludge Depth on 3/30/2018: Average 8.2-inch sludge depth (ranging from 24-inch in one corner to 2-inch in other locations).
  - **Lagoon No. 2**: 2 Cells: 42 feet wide by 200 feet long, single 45 mil reinforced Hypalon or Chlorinated polyethylene liner with underdrains, divided in half with a baffle arrangement to provide three (3) cells total.
    - **Lagoon Basin Volume:** 1,242,800 gallons (37.69% total volume, 18.8% each cell).
    - **Basin 2 (2 cells) Design Minimum Detention Times: See Table 1 for calculated detention times (Lagoon Capacity in Million Gallons divided by MGD flow rate).**
      - **Summer Detention Time: 5.65 days (Cell 1) and 5.65 days (Cell 2)**
      - **Winter Detention Time: 11.3 days (Cell 1) and 11.3 days (Cell 2)**
    - Per NPDES Permit Application:
      - Provided Drawing showed Lagoon #2 had bottom elevation of 1127.0 Feet, invert elevation of 1124.0 Feet, with berms at 1140.0 Feet. Application drawing/figure estimated H.W.L at 1137.0 Feet, and centerline baffle.
      - Lagoon No. 1 (Lower Lagoon, no mention of baffling to create two cells) Sludge Depth on 3/30/2018: Averaged depth of 13.36-inch ranging from 2-inch (one location only) to 23-inch.
- **Lagoon Liner System Underdrains:**
  - **The Authority-provided "As Built As Designed" Drawing No. 4 (Erosion, Sedimentation & Drainage Control Plan) showed underdrain "interceptor" trenches with 6-inch perforated corrugate aluminum piping being conveyed by 6-inch non-perforated aluminum pipes to Monitoring Manhole M.H., whereupon it was directed to an 8-inch non-perforated piping**

downhill (toward where a 50-foot Rocklined V ditch would also discharge surface water). No apparent connection to the (uphill) Chlorine Contact Tank location (where site effluent would discharge to gravity pipeline to Outfall No. 001) or the 6-inch 13,900 LF outfall line.
- **See below for 2018 underdrain sampling results indicating liner failure (fecal coliform, etc.).**

- Disinfection/Chlorination System and Outfall Line: The lagoon discharge is then chlorinated (gas chlorine per original design; converted to tablet chlorination per current NPDES Permit Renewal Application) and discharged to a 6-inch outfall line (~ 13,900 Linear Feet) that discharges to Mill Run (CWF).
  - The current NPDES Permit application indicates the effluent sampling point is at the discharge from the chlorine contact tank.
  - Chlorination Effluent Invert elevation at 1136.0 feet.
  - The April 8, 1985 Department Permits & Grants Section memorandum indicate an effluent flow meter was to be placed at or near the Outfall No. 001 discharge location to Mill Run so that integrity of the line can be periodically checked.
- **Groundwater Monitoring Well System: Three wells were approved. However, the Authority has not been able to locate the Module 5A Phase II documentation regarding installed groundwater monitoring wells. The Authority only located two groundwater monitoring wells (both downgradient of the lagoons). See below for Authority-provided 2018 sampling data. In the absence of upgradient groundwater data for direct comparison, this reviewer must defer to the DEP Geologist for interpreting the 2018 sampling results.**

- **As-built/As-operated Treatment Plant Limitations and Potential Ammonia-N causes: The facility has had an ongoing long-term pattern of Ammonia-N exceedances (per Compliance History Section) during both summer and winter months.**
  - **The available DEP files do not appear to include any Authority Engineer investigation of the cause(s) of the long-term pattern of Ammonia-N exceedances (other than Authority comments about cold weather impacts and/or lagoon turnover). Internet sources note that lagoon ammonia-N exceedances can be caused by many different factors: inadequate alkalinity; inadequate aeration; excessive sludge build-up; short-circuiting of normal lagoon flows/inadequate hydraulic detention times; disruption of normal lagoon flow patterns; disruption of existing sludge blankets; cold weather impacts; etc.**
  - **The Authority correspondence indicated that it has looked at some treatment options over the years, but apparently did not implement any of the Authority-correspondence identified options.**
  - **This as-built facility is subject to the following overall general limitations in terms of Ammonia-N issues:**
    - **Lagoons can be susceptible to cold weather impacting treatment lagoon biology, with the year-round (summer) ammonia-N exceedances masking cold weather impacts.**
    - **The circa 1985-constructed Facility (including offsite pump station) pre-dates the current DEP Domestic Wastewater Facilities Manual, and therefore was not designed/built to meet current design standards.**
      - **Liner system technology "state-of-the-art" changed substantially in the late 1980s.**
      - **It is unclear if the Authority is monitoring the lagoon process adequately in terms of available alkalinity, adequate aeration, etc.**
    - **The oversized Offsite Pump Station flows (with non-steady-state "pulsed" flows to the Treatment Lagoon No. 1) is a potential source of problems from lagoon short-circuiting, impacts on normal lagoon flows/sludge blanket, liner system, impacts on lagoon biology, etc.).**
    - **There is no headworks (screen) between the Offsite Pump Station (lacking screen or grinders) and Treatment Lagoon No. 1. Grinded LPS sewage can recombine and cause problems in the receiving lagoons (including clogging aeration systems).**
    - **There are no provisions for chemical feed systems such as alkalinity addition (to assist the lagoon treatment biology) or pH adjustment (single daily pH sampling would not catch diurnal pH variability in the receiving lagoons).**
    - **Authority was uncertain regarding when lagoon sludge was previously removed.**

Existing 85% Reduction POTW Requirement: There is no influent concentration data available to determine if the 85% minimum concentration reduction requirement was met.

- **2017 Chapter 94 Report**: **No mention of long-term pattern of intermittent ammonia-N issues.**
  - **No plant upgrades planned for next five (5) years.**
  - No calibration report for flow measuring equipment found for this POTW in this Report.
  - No sewer extensions in 2017, and none "currently planned"
  - No existing or projected hydraulic or organic overloading.
  - Max monthly loadings reported:
    - 2017 BOD5 Loading: 146 lbs BOD5/day monthly average (October 2017)
    - 2018 Hydraulic Loading: 0.05443 MGD monthly average (April 2017)

- **Chapter 94 Report Information relevant to Pump Station**:
  - 2015, 2016 and 2017 Chapter 94 Reports: No projected hydraulic or organic overloads.
  - 2015 Chapter 94 Report: Indicated 1 intermediate pump station located downslope of the WWTP, built in 1986. Noted to have had an original 250 GPM capacity that was increased to 300 GPM (via VFDs) in 1998, but no associated Part II WQM Permit found in files. Report indicated new Pump Station in design phase.
  - 2016 Chapter 94 Report: New Authority Chairman noted. New 300 GPM pump station was indicated to have been designed, with possible start-up in 2017.

Compliance History

DMR Data for Outfall 001 (from December 1, 2016 to November 30, 2017)

Parameter	NOV-17	OCT-17	SEP-17	AUG-17	JUL-17	JUN-17	MAY-17	APR-17	MAR-17	FEB-17	JAN-17	DEC-16
Flow (MGD) Average Monthly	0.04685	0.04699	0.04860	0.05259	0.04914	0.04886	0.05113	0.05443	0.04934	0.05374	0.05240	0.05217
Flow (MGD) Daily Maximum	0.05412	0.07318	0.06112	0.06821	0.07251	0.06377	0.06387	0.07825	0.08024	0.07991	0.07815	0.07012
pH (S.U.) Minimum	7.09	7.08	7.05	7.24	7.0	6.9	7.0	7.0	7.0	7.0	7.0	7.0
pH (S.U.) Maximum	7.28	7.28	7.37	7.38	7.1	7.0	7.1	7.1	7.1	7.1	7.2	7.1
DO (mg/L) Minimum	6.34	6.13	6.53	6.35	6.3	6.3	6.4	6.4	6.4	7.2	7.2	7.3
TRC (mg/L) Average Monthly	0.027	0.027	0.026	0.025	0.025	0.024	0.026	0.026	0.024	0.025	0.025	0.022
TRC (mg/L) Instantaneous Maximum	0.035	0.033	0.037	0.031	0.029	0.028	0.029	0.029	0.028	0.028	0.024	0.029
CBOD5 (lbs/day) Average Monthly	1.17	1.2	1.23	3.0	1.23	3.0	1.3	1.4	1.2	1.4	1.3	1.3
CBOD5 (lbs/day) Weekly Average	1.17	1.2	1.23	3.0	1.23	3.0	1.3	1.4	1.2	1.4	1.3	1.3
CBOD5 (mg/L) Average Monthly	**3.00**	**3**	**3.00**	**1.32**	**3**	**1.23**	**3**	**3.0**	**3**	**3**	**3**	**3**
CBOD5 (mg/L) Weekly Average	**3.00**	**3**	**3.00**	**1.32**	**3**	**1.23**	**3**	**3.0**	**3**	**3**	**3**	**3**
TSS (lbs/day) Average Monthly	2.54	3.2	2.46	6.0	3.99	4.0	5.8	6.5	2.3	7	4.2	6.5
TSS (lbs/day) Weekly Average	3.12	3.6	3.28	5.5	5.33	4.0	9.5	8.0	2.9	9	6.2	7.0
TSS (mg/L) Average Monthly	6.50	8	6.00	2.42	8.5	1.64	13.5	2.9	5.5	15.5	9.5	15
TSS (mg/L) Weekly Average	8.00	9	8.00	2.58	13	1.64	22	3.6	7	20	14	16
Fecal Coliform (CFU/100 ml) Geometric Mean	3.16	2	21.90	1.73	3.7	1.4	1	1.0	1	1	1	1

Fecal Coliform (CFU/100 ml) Instantaneous Maximum	10	2	120.00	3	7	2.0	1	1.0	1	1	1	1
Ammonia (lbs/day) Average Monthly	**0.39**	**0.52**	**3.24**	**1.50**	**0.41**	**5.97**	**3.3**	**2.9**	**2.5**	**0.81**	**4.2**	**1.5**
Ammonia (mg/L) Average Monthly	**1.00**	**1.29**	**7.90**	**3.51**	**1.0**	**14.55**	**7.64**	**6.5**	**6.0**	**1.8**	**9.5**	**3.5**
Ammonia (mg/L) Weekly Average	**1.00**	**1.57**	**14.80**	**4.51**	**1.0**	**19.0**	**7.84**	**9.09**	**11.9**	**2.7**	**7.22**	**4.96**

DMR Data for Outfall 001 (from September 1, 2017 to August 31, 2018)

Parameter	AUG-18	JUL-18	JUN-18	MAY-18	APR-18	MAR-18	FEB-18	JAN-18	DEC-17
Flow (MGD) Average Monthly	0.05280	0.05155	0.05150	0.04736	0.04800	0.04920	0.05162	0.04644	0.04892
Flow (MGD) Daily Maximum	0.16278	0.09371	0.06246	0.10785	0.07741	0.08806	0.10362	0.07836	0.05342
pH (S.U.) Minimum	7.01	6.91	6.84	6.83	7.01	7.06	7.02	7.01	7.05
pH (S.U.) Maximum	7.58	7.15	7.26	7.27	7.25	7.28	7.31	7.24	7.30
DO (mg/L) Minimum	6.25	6.45	6.42	6.28	5.76	6.59	6.56	6.54	6.53
TRC (mg/L) Average Monthly	0.024	0.028	0.017	0.028	0.026	0.026	0.025	0.025	0.027
TRC (mg/L) Instantaneous Maximum	0.031	0.034	0.033	0.034	0.034	0.032	0.026	0.029	0.034
CBOD5 (lbs/day) Average Monthly	1.32	2.58	6.02	1.17	1.23	1.2	1.29	1.17	1.23
CBOD5 (lbs/day) Weekly Average	1.32	3.44	6.45	1.17	1.23	1.2	1.29	1.17	1.23
CBOD5 (mg/L) Average Monthly	**3**	**6**	**14.0**	**3**	**3**	**3**	**3**	**3**	**3**
CBOD5 (mg/L) Weekly Average	**3**	**8**	**15.0**	**3**	**3**	**3**	**3**	**3**	**3**
TSS (lbs/day) Average Monthly	5.06	5.59	10.54	3.71	5.1	6.6	4.1	4.68	3.90
TSS (lbs/day) Weekly Average	5.72	6.02	12.47	4.29	7.8	6.8	4.3	5.07	5.74
TSS (mg/L) Average Monthly	11.50	13	24.5	9.5	12.5	16.5	9.5	12	9.5

TSS (mg/L) Weekly Average	13	14	29	11	19	17	10	13	14
Fecal Coliform (CFU/100 ml) Geometric Mean	4	12.7	40	4	4	4	2.83	2.88	5.65
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	4	40	400	4	4	4	4	4	16
Ammonia (lbs/day) Average Monthly	**0.88**	**4.23**	**5.1**	**14.96**	**11.7**	**10.8**	**12.8**	**10.8**	**0.41**
Ammonia (mg/L) Average Monthly	**1.99**	**9.84**	**7.83**	**38.35**	**28.5**	**27.1**	**29.75**	**27.7**	**1.00**
Ammonia (mg/L) Weekly Average	**2.08**	**12.2**	**15.8**	**41.00**	**34.0**	**27.6**	**30.1**	**29.1**	**1.00**

Compliance History

Effluent Violations for Outfall 001, from: March 1, 2017* To: August 31, 2018

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Ammonia	05/31/17	Avg Mo	7.64	mg/L	6.0	mg/L
Ammonia	06/30/17	Avg Mo	5.97	lbs/day	4.5	lbs/day
Ammonia	06/30/17	Avg Mo	14.55	mg/L	6.0	mg/L
Ammonia	06/30/17	Wkly Avg	19.0	mg/L	9.0	mg/L
Ammonia	09/30/17	Wkly Avg	14.80	mg/L	9.0	mg/L
Ammonia	09/30/17	Avg Mo	7.90	mg/L	6.0	mg/L
Ammonia	01/31/18	Avg Mo	27.7	mg/L	18.0	mg/L
Ammonia	01/31/18	Wkly Avg	29.1	mg/L	27.0	mg/L
Ammonia	02/28/18	Avg Mo	29.75	mg/L	18.0	mg/L
Ammonia	02/28/18	Wkly Avg	30.1	mg/L	27.0	mg/L
Ammonia	03/31/18	Avg Mo	27.1	mg/L	18.0	mg/L
Ammonia	03/31/18	Wkly Avg	27.6	mg/L	27.0	mg/L
Ammonia	04/30/18	Avg Mo	28.5	mg/L	18.0	mg/L
Ammonia	04/30/18	Wkly Avg	34.0	mg/L	27.0	mg/L
Ammonia	05/31/18	Avg Mo	14.96	lbs/day	4.5	lbs/day
Ammonia	05/31/18	Avg Mo	38.35	mg/L	6.0	mg/L
Ammonia	06/30/18	Avg Mo	5.1	lbs/day	4.5	lbs/day
Ammonia	06/30/18	Avg Mo	7.83	mg/L	6.0	mg/L

Ammonia	07/31/18	Avg Mo	9.84	mg/L	6.0	mg/L
Ammonia	07/31/18	Wkly Avg	12.2	mg/L	9.0	mg/L

* EDMR reporting started in March 2017. Previous violations therefore not addressed in above table.

Summary of Inspections and Correspondence:

FACILITY NAME	INSP PROGRAM	INSP ID	INSPECTED DATE	INSP TYPE	INSPECTION RESULT DESC	INSPECTOR ID	INSPECTOR	# OF VIOLATIONS
LAKE WINOLA MUN AUTH	WPCNP	2111183	10/03/2012	Routine/Complete Inspection	Violation(s) Noted	00512922	MILLER, JEREMY	1
LAKE WINOLA MUN AUTH	WPCNP	2401536	05/28/2015	Compliance Sampling	Violation(s) Noted	00512922	MILLER, JEREMY	1
LAKE WINOLA MUN AUTH	WPCNP	2505248	09/17/2015	Routine/Partial Inspection	Violation(s) Noted	00512922	MILLER, JEREMY	1
LAKE WINOLA MUN AUTH	WPCNP	2623467	07/19/2017	Routine/Partial Inspection	Violation(s) Noted	00512922	MILLER, JEREMY	1
LAKE WINOLA MUN AUTH	WPCNP	2642152	08/10/2017	Compliance Evaluation	Violation(s) Noted	00512922	MILLER, JEREMY	2

Additional Compliance-related History:

- 1/19/2018: Compliance meeting at NERO: Discussion included construction of new pump station without Department approval.
- 1/14/2017 Milnes Letter: Request for additional 45 days to submit a Part II WQM Permit application (pump station)
- 8/11/2017 Milnes Letter: Indicated new Pump Station constructed (same location as old Pump Station) and old Pump Station demolished.
- 8/10/2017 Inspection: Violations noted (TRC at 1.52 mg/l; Ammonia-N at 28.63 mg/l). Note pump station had been replaced circa March 2017. Authority indicated a refrigerated automatic composite sampler had been ordered. **eDMR reporting was not consistent with Inspection field sampling reporting**.
- 7/31/2017 Milnes Letter: Noted Authority had ordered an ISCO 5800 refrigerated composite sampler
- **7/19/2017 NOV: Violation for grab sampling CBOD5 when 8-hour composite sampling is required**.
- 10/18/2016 SSO Event: at pump station on Mislevy Road.
- 9/15/2015 Inspection: Violations noted (2.76 mg/l DO; 2100/100 ml Fecal coliforms).
- 5/28/2015 Compliance Inspection: Small leak in aeration lines noted.

Other Comments:

- **DMR Reporting Limitation and Issue**: The previous NPDES Permit only required 8-hour composite sampling for CBOD5, with grab sampling for Ammonia-N (2/month) and other constituents.
    - The Application appears to indicate they did not composite sample for CBOD5 (identified as “grab samples” only).

- **The identical CBOD5 monthly and weekly average results (2/month sampling) seems unusual, with the TSS results showing the expected variability. As the facility was not composite sampling per existing NPDES permit, there is potential for noncompliance in terms of minimum sampling frequency here.**
- **Grab sampling limitations means the facility might have had undetected short-term Ammonia-N (or other) exceedances (during normal lagoon diurnal biological treatment variability and/or between grab sampling events) in addition to normal grab sample biasing concerns**.
- **Daily grab pH sampling would not catch diurnal pH changes due to treatment biology in the lagoons**, **if taken at the same time each day or week**.
- EDMR Reporting Data: EDMR reporting started in March 2017. December 2016 – February 2017 data (above EDMR table) came from paper DMRs.

- **Missing Groundwater Well: The original Part II WQM permit required installation of three groundwater monitoring wells. The Department asked for groundwater monitoring data, but only data from two (2) groundwater monitor wells was provided. If the missing well cannot be located or sampled, the facility would need to replace this monitoring well to comply with original WQM permitting.**
- **Provided Lagoon Underdrain Monitoring/Sampling Results Indicating Liner Failure: The Authority-provided monitoring results indicate liner failure (see Treatment Plant Section and Table 2). The Authority provided a copy of its "Procedures for Lake Winola Municipal Authority Lagoon Cleaning and High Pressure Air Purge Cleaning System Modifications" that did not appear to have any liner system inspection/repair provisions during previous sludge removal/lagoon cleaning.**
- **Continuing Long-Term Pattern of Ammonia-N violations continued in Summer 2018 (see above): This has been a long-term pattern discussed in assorted communications between the Authority and Department, with Authority indicating it is currently looking at either Outfall Location (see Discharge & Stream Section) or supplemental Ammonia-N treatment:**
  - **Partial History:**
    - **6/25/2001: 6/25/2001 Authority (Milnes Engineering Inc.) Letter indicated: "the facility is performing well within the permitted limits with the exception of Ammonia-Nitrogen that occasionally exceeds the maximum limit. Apparently this problem is indicative of an aerated-facultative lagoon system with low ammonia nitrogen levels being hard to achieve during certain period". The letter also indicated the Authority was "evaluating alternative methods for use in the additional reduction of ammonia nitrogen required for compliance" (including air stripping, upflow submerged floating bed reactors).**
    - **1/30/2013: 1/30/2013 Authority (Milnes Engineering Inc.) Letter responding to the 1/14/2013 NOV (citing Ammonia-N exceedances during August 2011, June-August 2012) noted the lagoon nitrification process might be "compromised somewhat due to the temperature below 50 ºF. It is surprising to see that the months cited for violation were during the summer when the water temperature should have been warm enough to support the nitrification process". NOTE: The 9/21/2011 NPDES Permit only required 2/month Ammonia-N grab sampling which could miss diurnal lagoon effluent variability and/or short-term excursions above existing permit limits.**
    - **10/19/2015: 10/19/2015 Authority (Milnes Engineering Inc.) Letter responding to 9/17/2015 NOV. The Authority Letter referenced the 1/30/2013 Authority Letter regarding Ammonia-N options.**
    - **3/29/2016: 3/29/2016 NPDES Permit Renewal Application Cover Letter (Milnes Engineering Inc.) stated: "Since the original permit issuance the WWTS has, on infrequent occasions, experienced difficulties in achieving effluent compliance associated with ammonia nitrogen limits." The NPDES Permit Renewal Application's attached 2015 Compliance-related Correspondence indicated Ammonia-N exceedances. The Application indicated an average Ammonia-N concentration of 6.49 mg/l for 104 samples, whereas the summer monthly average limit is 6.0 mg/l ammonia-N.**
    - **6/1/2018: 6/1/2018 Authority (Milnes Engineering Inc.) Response Letter stated: "The Authority recognizes that the existing Wastewater Treatment System (WWTS) will continue to experience periodic noncompliance with existing ammonia-N permit limits and the need to address this." "The referenced air stripping, upflow submerged floating bed reactors, etc. are no longer being considered."**

- **Other: See Communication Log (below) for assorted permitting-related telephone calls discussing Ammonia-N issues and options.**

- **Ammonia-N Exceedance Months (May, June and September 2017; Jan and February 2018): No Authority Engineering analysis of the Ammonia-N issues was found in the available DEP files. The pattern of Ammonia-N exceedances might include cold weather nitrification issues (cited by Authority), but summer/fall exceedances would require other causes. The Authority Engineer idea that the late May and June exceedances were a result of a late lagoon "turnover" (of ambient temperature induced stratification) is not consistent with September 2017 exceedances or winter exceedances. The Ammonia-N exceedances months did not correlate to the DMR/EDMR-reported months of highest daily max flow, the highest monthly average flow or the largest Max/Average Flow ratio (March and April 2017):**
  - **May 2017 (Ammonia-N Concentration Exceedance):**
    - **Daily Max Flow: 0.06389 MGD**
    - **Monthly Average Flow: 0.05113 MGD**
    - **Max/Average Ratio: 1.25**
  - **June 2017 (Ammonia-N Concentration and Mass Load Exceedance):**
    - **Daily Max Flow: 0.06377 MGD**
    - **Monthly Average Flow: 0.04886 MGD**
    - **Max/Average Ratio: 1.31**
  - **September 2017 (Ammonia-N Average/Weekly Concentration Exceedance):**
    - **Daily Max Flow: 0.06112 MGD**
    - **Monthly Average Flow: 0.0486 MGD**
    - **Max/Average Ratio: 1.26**

- **Potential Lead Spiking Issue: Application data indicated effluent lead concentration of 94 ug/l (single grab sample). Cause unknown. Additional lead data was non-detect at 0.005 mg/l (above DEP Target QL). Spiking is a potential site issue.**
- **Replacement Pump Station Issues**: **Facility constructed new replacement pump station without WQM permit**. The new pumps are oversized (300 GPM) compared originally approved design (250 GPM), with potential impact on lagoon operation (oversized pumps potentially impacting receiving lagoon by potential short-circuiting, pressure waves on microbes by on/off operation, etc. as likely contributing cause to warm weather ammonia-N exceedances).

10/25/2018 Open Violations per Client WMS Query Results:

Permit: PA0061077
Client ID: 43745
Client: All

Open Violations: 0

No data was found using the criteria entered. Please revise your choices and try again

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.0875
Latitude 41º 30' 30.16" **Longitude** -75º 53' 57.70"
Wastewater Description: Sewage Effluent

Permit Limits and Monitoring: Changes will be bolded

Parameter	Limit (mg/l unless otherwise specified)	SBC	Model/Basis
CBOD5	18.0 Lbs/d 29.0 Lbs/d 25.0 40.0 50.0	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	Existing Technology limit (Chapter 92a.47) supported by water quality modeling. Application data indicates a daily max of 25 mg/l and average of 8.64 mg/l (104 **grab** samples).
TSS	22.0 Lbs/d 33.0 Lbs/d 30.0 45.0 60.0	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	Existing Technology limit (Chapter 92a.47). Application data indicates a daily max of 32 mg/l, and an average or 11.07 mg/l (104 **grab** samples).
pH	6.0 – 9.0 SU	Inst. Min - IMAX	Existing Technology limit (Chapter 92a.47). Application data indicates a range of 6.9 – 7.2 SU (104 samples).
Dissolved Oxygen (DO)	5.0	Inst. Min	Existing WQBEL limit supported by Water Quality Modeling. **Application data did not address DO. Above EDMR data indicated not violation. See below regarding Natural Trout Reproduction Stream non-summer WQS considerations.**
Fecal Coliform (5/1 – 9/30)	200/100 ml 1,000/100 ml	Geo Mean IMAX	Existing Technology limit (Chapter 92a.47). Application data indicated daily max of 120/100 ml and average of 7.31/100 ml.
Fecal Coliform (10/1 – 4/30)	2,000/100 ml 10,000 ml/100 ml	Geo Mean IMAX	See above.
Total Residual Chlorine **(First 3 years)**	0.5 1.0	Monthly Average IMAX	Existing TBEL. Application data indicated maximum of 0.033 mg/l TRC and average of 0.02 mg/l. The Authority engineer did not know when the site upgraded to tablet chlorination.
Total Residual Chlorine (4th and 5th Year of Permit)	**0.05** **0.18**	**Monthly Average** **IMAX**	**New WQBEL based on TRC Spreadsheet water quality modeling. Three years Schedule of Compliance due to facility's need to address ongoing Ammonia-N violations and new Copper and Lead limits/TRE conditions might require concurrent plant upgrades.**
Ammonia-Nitrogen (May 1 - Oct 31)	Report 4.5 Lbs/d 6.0 9.0 12.0	Total Annual Monthly Average Monthly Average Weekly Average IMAX	Existing WQBELS supported by updated Water Quality Modeling. **Application data indicated daily max of 33.6 mg/l (violation) and average of 6.49 mg/l (103 grab samples). See Compliance Section for related information.**

Ammonia-Nitrogen (Nov 1 - Apr 30)	Report (lbs) 13.0 Lbs/d 13.0 27.0 36.0	Total Annual Monthly Average Monthly Average Weekly Average IMAX	See above
Total Phosphorus	**Report Lbs/d** **Report Lbs/d** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**New Annual Chesapeake Bay monitoring requirement for Phase 5 CB facility. Application data indicated 4.96 mg/l TP (single grab sample).**
Total Nitrogen (Nitrate-Nitrite-N + TKN measured in same sample)	**Report Lbs/d** **Report Lbs/d** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**New Annual Chesapeake Bay monitoring requirement for Phase 5 CB facility. Application data indicated 29.6 mg/l TN (single grab sample).**
Copper **First 3 years**	**Report Lbs/d** **Report** **Report**	**Monthly Average** **Monthly Average** **Daily Max**	**New WQBEL with TRE conditions due to Reasonable Potential Analysis. See Reasonable Potential Analysis for details.**
Copper **4th and 5th Years**	**Report Lbs/d** **0.023** **0.036** **0.046**	**Monthly Average** **Monthly Average** **Daily Max** **IMAX**	**See above**
Lead **First 3 Years**	**Report Lbs/d** **Report** **Report**	**Monthly Average** **Monthly Average** **Daily Max**	**See above. Submitted 24-hour Composite Lead sampling data did not meet DEP Target QL. However, Application grab sample indicated 0.094 mg/l, indicating spiking event.**
Lead **4th and 5th Years**	**Report Lbs/d** **0.007** **0.012** **0.014**	**Monthly Average** **Monthly Average** **Daily Max** **IMAX**	**See above**
Zinc	Not needed	-	Not needed per Reasonable Potential Analysis.
Influent BOD5	**Report Lbs/d** **Report Lbs/d** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**New reporting requirement (Chapter 92a.61) to allow for monitoring of influent to lagoons and to allow calculation of minimum reduction.**
Influent TSS	**Report Lbs/d** **Report Lbs/d** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**See above.**
BOD5 Minimum Reduction	**85%**	**Monthly Average**	**Existing TBEL requirement being added to Part A to allow for monitoring/reporting.**
TSS Minimum Reduction	**85%**	**Monthly Average**	**See above.**

Comments:

- **Sampling Requirements:**
  - **24-hour Composite Effluent and Influent Sampling is being required due to potential biasing of grab sampling data for constituents, diurnal lagoon biological activity impacting effluent quality, and to eliminate sampling biasing that might impact DMR accuracy.**
  - **Frequency of Ammonia-N sampling being increased to weekly due to pattern of exceedances.**
  - **Flow, DO, and TRC monitoring increased to daily when discharging.**
- Future DO Consideration: Mill Creek is a Natural Trout Reproduction stream. There is no available water quality modeling program to address the Chapter 94 non-summer criterion, so no new limits will be required at this time.

As facility is considering upgrades to address ammonia-N exceedances, they will be cautioned that the DO limit during reproduction seasons (non-summer) might be increased in the future. Any WWTP upgrade should address this as a design consideration. The Department retains broad authority to reopen this permit if more stringent DO requirements are determined to be needed in the future.

- Relocation of Outfall #001 Option: Not addressed in this permit as the conceptual location is still along Mill Run during low flow conditions, i.e. no River dilution to provide any significant benefit. They did not evaluate any Antibacksliding Exception's applicability. The regulatory "anti-backsliding" provisions prohibit relaxation of existing Water Quality-Based Effluent Limits (WQBELs) except for rare exceptions spelled out in the Federal Clean Water Act (CWA) Section 402(o) and 40 CFR 122.44(l).

Reasonable Potential Analysis: Copper and Lead require permit limits and TRE Conditions. The Authority's additional sampling did not meet the DEP Target QL for lead, but application data included a single high lead grab sample result indicating apparent spiking. See Toxic Screening Spreadsheet, TOXCONC Spreadsheet Output, and PENTOXSD output.

- **Lead Spiking: The initial application grab sampling including a lead spiking event. Identified commercial sources included Dentist office, gas station, Civil & Site Contractor, and Tyler Memorial Hospital as potential sources for metals.**
- Hardness Data: In-stream Hardness Sampling Grab Sample Result (upstream of Outfall) was 44.9 mg/l Total Hardness. Discharge Hardness Grab Sample Result was at 114 mg/l Total Hardness. This data was incorporated into the PENTOXSD modeling.
- **Updated Metals Data & TOXCONC analysis:**

Date of Sampling	Lead (mg/l)	Copper (mg/l)	Zinc (mg/l)	Sample type**
Application Data*	**0.094 mg/l (collected 3/1/2016) 1 sample**	**0.028 mg/l AVG 0.032 mg/l Max 2 samples**	**<0.055 AVG <0.055 Max 2 samples**	**Grab**
4/5/2018	<0.005	0.0161	0.0167	24-hour composite
4/10/2018	<0.005	0.0121	0.0155	24-hour composite
4/17/2018	<0.005	0.0133	0.016	24-hour composite
4/25/2018	<0.005	0.0119	0.0134	24-hour composite
5/1/2018	<0.005	0.0092	0.0133	24-hour composite
5/8/2018	<0.005	0.01	0.01	24-hour composite
5/15/2018	<0.005	0.0261	0.0327	24-hour composite
5/24/2018	<0.005	<0.005	<0.010	24-hour composite
5/30/2018	<0.005	0.0079	0.0271	24-hour composite
6/6/2018	<0.005	<0.005	<0.010	24-hour composite
TOXCONC LTA	NA (TOXCONC result null due to division by zero).	0.0194147	0.0263728	-
TOXCONC COE	NA	0.4866627	0.4432000	-
DEP QL	**0.001**	**0.004**	**0.005**	-

* **Application data indicated effluent lead concentration of 94 ug/l (single grab sample). Cause unknown. New 24-hour ND level will be used in modeling (above DEP Target Q). Using TOXCONC LTAMEC for PENTOXSD modeling for copper and zinc, given potential biasing of original grab samples.**
****Lab ND levels varied for copper and zinc.**

Table 1 (Flows, Lagoon Detention Times, and Replacement Pump Station Flows)

Flows	Loading (MGD unless stated otherwise)	Detention Time (all lagoons) (days)	Detention Time (Lagoon 1) (days)	Calculated Pumping Minutes at 300 GPM* out of 1440 minute/day	Calculated "Pulses/day" (GPD flow rate divided by assumed 840-gallon cycle in WQM application)***
Peak Flows (Instantaneous and Hourly)**	0.33264 ~231 GPM	9.91	6.18	~1108	396
MMAF**	0.0689 ~48 GPM	47.85	29.8	~230	82
Daily Max Flow**	0.10482 ~73 GPM	31.45	19.6	~350	125
Present ADF**	0.050094 ~35 GPM	65.82	41	~167	60
NPDES Permit basis ADF	0.0875 ~61 GPM	~37.7	23.5	~292	105

* One pump working. If both 300 GPM (0.432 MGD) pumps activated, pump interference and friction factors would reduce flow to less than 600 GPM (0.862 MGD).
** As estimated by Authority Engineer.
*** Water hammer is an increase in pressure in the pipe caused by a sudden change in the velocity. The velocity change usually results from the closing of a valve or other rapid change in flow conditions. Each "pulse" represents a sudden change in velocity with pressure wave propagating out into Lagoon No. 1.

Table 2 (Groundwater and Underdrain Sampling Data)

Constituent	Authority-provided Underdrain Sampling Data from Manhole (MH)*	Groundwater Well 1	Groundwater Well 2
Coordinates	**41˚, 31', 23.57" -75˚, 51', 14.53" Invert elevation not provided**	**41˚, 31', 24.60" -75˚, 51', 15.65" 20-feet deep (downhill of lagoons, ~surface elevation 1120 Feet)**	**41˚, 31', 26.50" -75˚, 51', 15.24 20-feet deep (downhill of lagoons, ~surface elevation of 1120 Feet)**
"pH" (SU)	6.8	8	7.8
Specific Conductivity (uS/cm)	649	758	556
Chloride (mg/l)	14.3	29.2	7.3
Nitrate (mg/l)	9.18	2.76	1.81
Nitrite (mg/l)	0.14	<0.05	<0.05
Ammonia (mg/l)	7.22	<1.0	<1.0
TKN (mg/l)	7.5	<1.0	<1.0
TP (mg/l)	2.33	<0.1	<0.1
Total Coliform	**TNTC (too numerous to count)**	**68**	**794**
Fecal Coliform (E Coli) (CFU/100 ml)	**260**	**<4**	**<4**
Dissolved Solids (mg/l)	342	416	330

*** Authority-provided Drawing No. 4 indicates that the lagoon underdrains direct flow to this manhole, and then to a pipeline that appears to discharge to surface topography downhill of the lagoons.**

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.5

Facility: **Lake Winola WWTP** NPDES Permit No.: **PA0061077** Outfall: **001**
Analysis Hardness (mg/L): **114** Discharge Flow (MGD): **0.0875** Analysis pH (SU): **7**

Parameter		Maximum Concentration in Application or DMRs (µg/L)	Most Stringent Criterion (µg/L)	Candidate for PENTOXSD Modeling?	Most Stringent WQBEL (µg/L)	Screening Recommendation
Total Dissolved Solids			500000			
Chloride			250000			
Bromide			N/A			
Sulfate			250000			
1,4-Dioxane			N/A			
Total Lead		5	3.18	Yes	7.994	Establish Limits
Total Copper		19.4147	9.33	Yes	23.621	Establish Limits
Total Zinc		26.3728	119.8	No	211.718	

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
04G	28703	MILL RUN

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
0.127	Lake Winola STP	PA0060177	0.087	CBOD5	25		
				NH3-N	6	12	
				Dissolved Oxygen			5

PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
04G	28703	MILL RUN

RMI	Name	Permit Number	Disc Flow (mgd)
0.13	Lake Winolo STP	PA0061077	0.0875

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
COPPER	19.415	INPUT	30.29	23.621	AFC
LEAD	5	INPUT	7.801	7.994	CFC
ZINC	26.373	INPUT	41.146	211.718	AFC

		Reviewer/Permit Engineer:	Berger
Facility:	Lake Winola WWTP		
NPDES #:	PA0061077		
Outfall No:	001		
n (Samples/Month):	4		

Parameter	Distribution Applied	Coefficient of Variation (daily)	Avg. Monthly
Lead (mg/L)	Delta-Lognormal	#DIV/0!	#DIV/0!
Copper (mg/L)	Delta-Lognormal	0.4866627	0.0194147
Zinc (mg/L)	Delta-Lognormal	0.4432000	0.0263728

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9 — Lake Winoloa STP

0.0562	= Q stream (cfs)	0.5	= CV Daily
0.0875	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	0.805	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 0.126	1.3.2.iii	WLA cfc = 0.140
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.047	5.1d	LTA_cfc = 0.081

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.058	AFC
		INST MAX LIMIT (mg/l) = 0.188	

Communication Log:

1/22/2018: Project reassigned to this reviewer.
1/26/2018: Technical Deficiency Letter Issued
2/14/2018: The Authority Chairman (Mr. Manglaviti) called.

- He indicated that he would ask for more time to address the NPDES Permit Renewal Letter. Told him to e-mail his request to me for a written response. We would likely give additional time if they needed it for some reasonable reason (need for a file review; additional sampling & analysis; selection of a new Outfall location that they can use in the next 3 years, given railroad and need for rights-of-way; etc.).
- We discussed the future Schedule of Compliance (Ammonia-N), and Letter ammonia-N feedback on Authority options. They will have time in a three-year (typical) Chapter 92a.51 Schedule of Compliance to investigate options, but should explain what they have done to resolve the problem already (including whether they removed built-up sludges in the lagoons). If they proposed a new Outfall location now, it would be addressed in the Draft NPDES Permit. Otherwise, a new location would require a major NPDES Permit amendment. He said that they were meeting with the SAGR technology providers.
- Their need to trackdown whether they installed the originally approved groundwater monitoring wells & lagoon underdrains. DEP files indicate the current applicant consultant was involved in the original 1985 permitting, and might have applicable historic information on the monitoring systems. If they needed time to arrange for groundwater sampling, that would be a reason for a time extension.
- They have options for additional ten weekly sampling to determine long-term average monthly effluent concentrations via TOXCONC for ammonia-N, lead, etc. Alternatively, they might want to take less samples to see if the lead effluent concentration was a one-time event/bad sample. They would have to commit to actual sampling to get more time now.
- A WQM Permit Application for a replacement pumping station (previously built) has been received by the Department.
- He indicated the facility had a new composite sampler.
- He thought much of the letter could be addressed.
- I noted that the technical consultant could contact me direct if they have questions regarding the Technical Deficiency Letter.

2/20/2018: Technical Consultant (Ned Slocum, Milnes Engineering) E-mail. The E-mail indicated he had called but had not left any voice-mail messages previously. The E-mail asked for a phone call and indicated the Authority would be asking for an extension for the response to the Technical Deficiency Letter.
2/21/2018: Left voice-mail to call me back when I called Mr. Slocum (unavailable per his secretary).
2/22/2018: Telephone discussion with Mr. Slocum (Milnes Engineering contact):

- Replacement Pump Station WQM Part II Application: Already built. Noted I might be asking for more information by letter or by phone in the Part II WQM Permit application completeness review stage as the reviewer.
- Groundwater/lagoon Underdrain Monitoring Points: They installed the (1985) Part II WQM Permit-required groundwater monitoring points and lagoon underdrain monitor points in the 1980s. He thought he might have as-built drawings. He will clarify this.
    - He was unaware of any actual sampling/reporting requirements. DEP will clarify groundwater/lagoon monitoring/reporting requirements in the future permits. I told him the Part II WQM Permit requirements remain in effect.
    - He indicated that the Authority might take some samples and see what the results say. Told him I would like to see that too.
- Future Time Request: They will be asking for more time to respond next week, after talking to the client. He thinks they will take groundwater monitoring and lagoon underdrain samples to see how they look (I asked to be copied on results). He might also ask time to grab some additional sampling. Told him we might grant 30, 60, 90-day extension based on what they need the time for (more time if doing TOXCONC sampling for example).
- Previous Permit Grab Sampling: He noted the grab sampling in the permit was due to the third lagoon acting like a compositing sampler (mixing due to detention time), and that previous Department reviewers had gone along with this logic for grab sampling. He also noted the new site composite sampler can do 24-hour composite samples.
    - I noted that the DEP files did not explain the logic of the grab sampling (not consistent with standard DEP requirements for that size of facility for CBOD5, TSS, etc.).
    - The general concern is that grab sampling might not be representative of the effluent for parameters requiring composite sampling in general, with the need for accurate and representative sampling.

  - It is the actual discharge that the NPDES permit is concerned with, and the ammonia-N and lead data needing to be as accurate as possible. 24-hour composite sampling will eliminate potential biasing of the effluent data. The lead issues might conceivably be partly due to biasing from grab sampling (a random lead particle in the grabbed sample, not representative of the 24-hour discharge).
- Ammonia-N: Explained the schedule of compliance process and time-frames, including need to come into compliance as soon as practicable. Mentioned anti-backsliding exceptions needed for any relief from existing limits (but relocating discharge to Susquehanna River might allow for it, if all related requirements are met). Noted would need rationale for any additional time/interim compliance steps. The compliance schedule would start on the future NPDES permit effective date.
  - He noted that he had worked with Waverly on its Amphidrome pilot project, and had some understanding of the DEP process.
  - He thought a three-year schedule reasonable for resolving the ammonia-N issues. He was unsure if future groundwater/lagoon underdrain monitoring results might impact Authority decision-making.
  - He was unsure of the reason for the summer Ammonia-N exceedances, except possibly lagoon turnover time (large lagoons taking much longer for summer heating to cause a turnover in the lagoons).
  - They can ask for PELs if they have a definite location on the River for the new discharge point. If they committed to it during NDPES permit renewal, we might be able to put in tiered limits. If no commitment, can still generate PELs (assuming anti-backsliding exception applied) either during application process or later during schedule of compliance. A request for PELs can be by letter if they have a definitive discharge point. Explained that the La Grange Island might impact river flows (does it disappear or divide river at low flow conditions) which might impact water quality modeling if the new discharge point is there.
  - They will be talking to the landowner for a potential right-of-way to the Susquehanna River.
  - He noted that they had previously replaced the aeration tubing for the lagoons.
  - He said that they had removed sludge from the lagoons.
- Application requirements: He asked about some new revised DEP Form-required information that I had asked for. Told him we ask for new (revised DEP form) application information when it looks needed (biosolids and stream hardness for example), but generally accept the older forms for the first 6 months period after the forms are revised. Here, I referenced the new biosolids informational requirements due to the nature of the site (lagoon treatment units) and site issues (sludge build-up can impact lagoon treatment efficiency).
- NPDES Permit is Administratively Extended: Told him the 180-day regulatory administrative extension was applied per DEP managerial decision.
  - Previous Reviewing Engineer had not noted any incompleteness issues, but had not marked it as complete either. Original submittal had come in >180 days prior to permit expiration date.
  - We issued a technical review letter (not a NPDES Permit Application Incompleteness letter).
  - Noted the requirement is that a complete application with all application-required information be submitted in order to allow for a technical review be submitted at least 180 days in advance of permit expiration date.
    - The Department can issue NPDES Application Incompleteness letters for incomplete application or call up the applicant to ask for missing information.
    - If not complete prior to the 180-day time-frame, the Department can issue an administrative extension letter for a complete permit application later in the process.
    - Other non-application-required information (such as groundwater monitoring data) can be requested during the technical review stage.
- Trout Reproduction Stream: Mentioned the new DO WQS for non-summer months for general informational purposes (applicable to Mill Run), which might impact future NPDES permitting and/or future WWTP Part II WQM Permit.
- PDG: He asked about the standard PDG language in the letter. Told him PDG did not apply to a NPDES permit renewal, but generally applied to new permit applications (i.e. DEP would return the application fee if we did not act on a complete and technically adequate application per the PDG time-frame, with DEP letters voiding the PDG).

2/23/2018: Authority (Milnes) E-mail asking for additional time to responde to the DEP Technical Deficiency Letter
2/26/2018: DEP (Berger) E-mail responding that a written letter request would be needed for an extension with action items.
2/28/2018: Authority (Milnes Letter) request for an additional 90 days for response to the 1/26/2018 DEP Technical Deficiency Letter
3/12/2018: DEP Letter granting extension to 5/29/2018 to allow for Authority file review, additional effluent samping (lead), and stream and influent sampling.
5/29/2018: Mr. Manglavitti (Authority Chairman) called.

  - The revised application will be submitted on Friday (6/1/2018, a few days late per the Chairman – due 5/29/2018 per extension). They were delayed due to some sampling-related problem. Told them to e-mail me if they needed any more time (with explanation of why it is needed).
  - **He said the Authority was still exploring its options (SAGR system, relocation of outfall). Mentioned future NPDES Permit Schedule of Compliance (feasibility study, final planning, permitting, construction) will give them more time to decide on what to do, but would need upfront commitment if they wanted reduced limits due to relocated outfall to the River, and they would have to address the backsliding exception requirements as part of current application (as opposed to later major NPDES permit amendment). Noted sometimes other requirements (antidegradation, Chesapeake Bay) can limit what can be granted.**
  - The Authority is looking at relocating the outfall to the Susquehanna River at one location (only reasonable place per Chairman). They will be contacting railroad for right-of-way. Referenced 40 CFR 122.44(l) requirements for a "Material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation" with need for technical consultant to identify exact discharge location and to otherwise address the 40 CFR 122.44(l) requirements as spelled out there (mirroring CWA section requirements). They have to make the case, and the Department cannot guarantee approval. EPA and public might comment on the NPDES Permit Application.
  - He noted the Authority was planning to hire an Environmental Attorney.
- **6/1/2018:** Resent 5/31/2018 Consultant E-mail indicating additional metals sampling data would be forthcoming.
- **7/6/2018:** Consultant E-mail with some additional metals sampling data
- **8/7/2018:** Consultant E-mail with some additional metals sampling data (last series)