pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0040835**
Facility Type	**Industrial**	APS ID	**985954**
Major / Minor	**Minor**	Authorization ID	**1260753**

NPDES PERMIT FACT SHEET INDIVIDUAL INDUSTRIAL WASTE (IW) AND IW STORMWATER

Applicant and Facility Information

Applicant Name	**PA Fish & Boat Commission- Fisheries Bureau**	Facility Name	**Bellefonte State Fish Hatchery**
Applicant Address	1735 Shiloh Road	Facility Address	1115 Spring Creek Road
	State College, PA 16801-8400		Bellefonte, PA 16823-8458
Applicant Contact	Mindy McClenahan	Facility Contact	John Watson
Applicant Phone	(814) 353-2229	Facility Phone	1-814-355-3371
Client ID	135455	Site ID	258872
SIC Code	0273	Municipality	Benner Township
SIC Description	Agriculture - Animal Aquaculture	County	Centre
Date Application Received	January 30, 2019	EPA Waived?	Yes
Date Application Accepted	February 13, 2019	If No, Reason	
Purpose of Application	Renewal of existing NPDES Permit		

Summary of Review

The above applicant has submitted a renewal application to renew their NPDES permit at the existing Bellefonte State Fish Hatchery. The hatchery raises brook, brown, rainbow, and golden rainbow trout using an onsite spring and 2 groundwater wells. The trout are raised from eggs to adults. They are fed a dry pellet diet and are stocked into various water bodies across the state. The design production capacity at the facility is 360,000 pounds of peak fish biomass. Peak biomass typically occurs during February and March.

Wastewater is treated by one of the two existing clarifiers (2), earthen lagoons (2), and micro-screen filters (3). The hatchery consists of 79 raceways, each 100 feet long. At the end of each raceway a quiescent zone (QZ) allows for settling of solids. Each QZ is cleaned twice per week, with solids being sent to the existing clarifier. The clarifiers only treat QZ wastewater. From the clarifier, QZ wastewater flow joins raceway overtopping water in the earthen lagoons. From the lagoons, wastewater then flows through a microscreen filter system before being discharged to Spring Creek (HQ-CWF). Sludge collected from the clarifiers and the lagoons are stored in the existing sludge storage tank and spread on area farms field.

Unless otherwise noted, all applicable Department SOPs were followed during the review of this application.

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Approve	Deny	Signatures	Date
		Chad A. Fabian / Project Manager	2/18/2020
		Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	
		Thomas M. Randis- Environmental Program Manager	

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	7.206
Latitude	40º 53' 0.37"	Longitude	-77º 47' 27.14"
Quad Name	Bellefonte	Quad Code	1123
Wastewater Description:	IW Process Effluent without ELG		
Receiving Waters	Spring Creek (HQ-CWF)	Stream Code	22966
NHD Com ID	67179338	RMI	6.1
Drainage Area	83	Yield (cfs/mi^2)	0.21
Q_{7-10} Flow (cfs)	17.6	Q_{7-10} Basis	USGS gage 01546500 (Previous analysis)
Elevation (ft)	820	Slope (ft/ft)	n/a
Watershed No.	9-C	Chapter 93 Class.	HQ-CWF
Existing Use	HQ-CWF	Existing Use Qualifier	
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Impaired		
Cause(s) of Impairment	ORGANIC ENRICHMENT		
Source(s) of Impairment	INDUSTRIAL POINT SOURCE DISCHARGE		
TMDL Status	Unknown	Name	n/a
Nearest Downstream Public Water Supply Intake	Near Milton, PA, approximately 85 miles downstream on the West Branch Susquehanna River		

Changes Since Last Permit Issuance: None

Compliance History	
Summary of DMRs:	The permittee utilizes the Department's eDMR system. There have been two violations in the past 12 months, both violations were an exceedance in the monthly mass loadings of ammonia. The monthly average permit effluent limit is 60 lbs/day. The exceedances came in January and February of 2019 with values of 68 and 66 lbs/day, respectively. A summary of the eDMR data for the past 12 months can be found in this fact sheet. Please note that "GG" for formaldehyde denotes that sampling was not required since formaldehyde was not used.
Summary of Inspections:	Clarissa Alcorn (DEP, Clean Water Program, Water Quality Specialist) performed an inspection on 11/19/19. The only violations that were noted were in regards to the two ammonia mass limitation exceedances described above. No other violations were found.

DMR Data for Outfall 001 (from December 1, 2018 to November 30, 2019)

Parameter	NOV-19	OCT-19	SEP-19	AUG-19	JUL-19	JUN-19	MAY-19	APR-19	MAR-19	FEB-19	JAN-19	DEC-18
Flow (MGD) Average Monthly	6.5532	6.61872	6.4696	6.3318	6.5681	7.2957	7.4285	7.7729	8.0124	8.9258	8.5542	8.9089
Flow (MGD) Weekly Average	6.7971	6.74114	7.0035	6.8062	6.8213	7.5262	7.7021	8.5302	8.1463	10.1368	9.6555	9.5719
pH (S.U.) Minimum	7.2	7.0	7.2	7.3	6.8	7.2	7.2	7.3	7.2	7.0	6.4	6.5
pH (S.U.) Maximum	7.4	7.5	7.4	7.4	7.4	7.6	7.4	7.6	7.3	7.3	7.5	6.8
DO (mg/L) Minimum	9.5	8.9	8.6	9.7	8.9	9.1	8.9	9.5	9.5	8.8	9.4	9.9
CBOD5 (lbs/day) Average Monthly	157	< 130	< 118	< 110	< 110	< 122	< 124	< 138	155	< 202	179	< 177
CBOD5 (lbs/day) Weekly Average	193	151	128	125	114	< 126	< 128	160	170	287	210	202
CBOD5 (mg/L) Average Monthly	2.8	< 2.3	< 2.2	< 2.1	< 2.0	< 2.0	< 2.0	< 2.1	2.3	< 2.7	2.5	< 2.4
CBOD5 (mg/L) Daily Maximum	3.4	2.7	2.4	2.2	2.0	< 2.0	< 2.0	2.5	2.5	3.4	3.1	2.8
TSS (lbs/day) Average Monthly	138	77	113	91	56	58	106	166	122	185	139	130
TSS (lbs/day) Weekly Average	165	134	164	121	97	103	141	299	156	223	201	332
TSS (mg/L) Average Monthly	2.5	1.4	2.1	1.7	1.0	1.0	1.7	2.5	1.8	2.5	1.9	1.7
TSS (mg/L) Daily Maximum	3.0	2.4	2.8	2.4	1.7	1.7	2.2	4.2	2.3	3.1	2.5	3.9
Ammonia (lbs/day) Average Monthly	36	28	31	< 18	33	14	14	28	36	66	68	49
Ammonia (lbs/day) Weekly Average	36	37	33	24	33	15	27	37	38	79	69	58
Ammonia (mg/L) Average Monthly	0.7	0.5	0.6	< 0.3	0.6	0.2	0.2	0.5	0.5	0.8	0.8	0.7
Ammonia (mg/L) Daily Maximum	0.7	0.7	0.6	0.5	0.6	0.2	0.4	0.6	0.6	0.9	0.9	0.8
Dissolved Phosphorus (lbs/day) Average Monthly	6	5	4	3	3	3	5	5	8	12	8	5
Dissolved Phosphorus (lbs/day) Weekly Average	6	6	4	4	3	3	5	6	9	13	8	6
Dissolved Phosphorus (mg/L) Average Monthly	0.1	0.1	0.1	0.1	0.05	0.05	0.1	0.1	0.1	0.2	0.1	0.1
Dissolved Phosphorus (mg/L) Daily Maximum	0.1	0.1	0.1	0.1	0.06	0.05	0.08	0.1	0.1	0.2	0.1	0.08
Formaldehyde (lbs/day) Average Monthly	< 1	< 1	< 1	GG	GG	GG	GG	GG	GG	GG	< 1	< 2
Formaldehyde (lbs/day) Weekly Average	< 1	< 1	< 1	GG	GG	GG	GG	GG	GG	GG	< 1	< 2

Existing Effluent Limitations and Monitoring Frequencies

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/week	Meter
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/week	Grab
Dissolved Oxygen	XXX	XXX	6.0	XXX	XXX	XXX	1/week	Grab
CBOD5	300	600	XXX	5.0	10.0	12.5	1/week	24-Hr Composite
Total Suspended Solids	270	540	XXX	4.5	9.0	11.2	1/week	24-Hr Composite
Ammonia-Nitrogen	60	120	XXX	1.0	2.0	2.5	2/month	24-Hr Composite
Dissolved Phosphorus	18	36	XXX	0.3	0.6	0.75	2/month	24-Hr Composite
Formaldehyde	60	120	XXX	1.0	2.0	2.5	2/month	3 Grabs per 24 Hours*

*Sampling shall be conducted to best characterize the range of effluent concentrations immediately following the therapeutic usage. Sample only when therapeutic application is being conducted.

In addition to the above limitations, Part C.IV of the existing permit has a total suspended solids annual loading of 49,430 pounds per fish production year (May through April).

Technology-Based Limitations

The existing permit implements technology based effluent limitations for TSS, DO, CBOD5, dissolved phosphorus, and NH3-N. Limitations for CBOD5, dissolved phosphorus, and NH3-N are based on a previous statistical analysis of discharge monitoring report (DMR) data for the hatchery and represent treatment levels achievable by the enhanced operation and maintenance practices at the facility. The existing technology based TSS concentration limitation of 4.5 mg/l (monthly average) was established for TSS at a similar facility (PFBC's Tylersville State Fish Hatchery in NPDES PA0112127) utilizing a 20 micron micro-screen filtration system. The existing technology-based standard of 6.0 mg/l minimum for dissolved oxygen (DO) was established per the Department's general permit (PAG-11) for CAAP (Concentrated Aquatic Animal Production) facilities.

Water Quality-Based Limitations

The facility uses therapeutic chemicals to treat fish for various diseases. In this renewal process, the Department has evaluated the use of these therapeutic chemicals using the same process that the Department evaluates the use of chemical additives. Using Material Safety Data Sheets (MSDS) for each chemical, aquatic life effect levels for each chemical were input into the Department's PENNTOXSD model. The resulting Water Quality Based Effluent Limit (WQBEL) was used in conjunction with annual average permitted flow (7.206 MGD) to back calculate the allowable usage of each chemical through a mass balance equation (WQBEL in mg/l X 7.206 MGD X 8.34 lbs/gal). All of the chemical additives aquatic life calculation spreadsheets and the PENNTOXSD model output are attached.

The following is a summary of the proposed therapeutic chemicals and their allowable usage rate:

Therapeutic Chemical	Proposed Usage Rate (lbs/day)	WQBEL (mg/l)	Allowable Usage Rate (lbs/day)
Terramycin 200	5.2 lbs	1.8	5.2
Formalin	4.2 gal/ day*	0.084	5
Chloramine-T (Halamid)	25	0.15	9
Lysol Professional(1)	2.3	0.0057	2.3
Romet TC	2.6	7.5	2.6
Florfenicol(3)	0.09	n/a	0.09
Diquat Dibromide (Reward)	1 gal/day*	0.013	0.78
35% Hydrogen Peroxide(4)	65 gal/day*	0.026	4.44
Sodium Chloride	950	250 mg/l, at PWS	n/a
Slimy Grimy(2)	5	No aquatic toxicity provided	Not Permitted

*Values must be converted and reported in lbs/day on report form

(1) Lysol Professional did not have aquatic toxicity data. However, the aquatic toxicity of the leading ingredient (Quaternary ammoinium compounds, benzyl-C12-16-alkydimethyl, chlorides) was used. The allowable usage rate was calculated based on leading ingredient at a maximum 10% of solution, per the MSDS sheet.
(2) Slimy Grimy is considered a traditional chemical additive, as it is used to clean the microscreen filter. The Department does not consider it a therapeutic chemical since it is not used to treat fish. Furthermore, the use the Slimy Grimy is not permitted until a new chemical additive request form is submitted and approved by the Department.
(3) Florfenicol was previously introduced as a new therapeutic chemical additive in 2010 (see attached email). The above allowable usage rate corresponds to a non-detectable level in the effluent.
(4) The above Hydrogen Peroxide usage rate is based on a solution of 35% hydrogen peroxide and 65% water. The aquatic toxicity data was specifically for hydrogen peroxide (minus water) and the usage rate was calculated based on the entire solution at 35% hydrogen peroxide.

In addition to the above therapeutic chemicals, PENNTOXSD was also used to verify that the existing WQBEL limitations for formaldehyde are protective of water quality standards. The results of the model show that the existing limitations for formaldehyde are adequate. No other toxics are expected to be introduced at the hatchery.

The WQM7.0 model allows the Department to evaluate point source discharges of dissolved oxygen (DO), carbonaceous BOD (CBOD5), and ammonia nitrogen (NH3-N) into free-flowing streams and rivers. To accomplish this, the model simulates two basic processes. In the NH3-N module, the model simulates the mixing and degradation of NH3-N in the stream, and compares calculated instream NH3-N concentrations to NH3-N water quality criteria. In the DO module, the model simulates the mixing and consumption of DO in the stream due to the degradation of CBOD5 and NH3-N, and compares calculated instream DO concentrations to DO water quality criteria. The previous WQM modeling output, which is attached, shows that the existing limitations are protective of water quality standards.

The existing water quality limitations for pH are established based on 25 PA Code §95.2.

The Department's 25 PA Code §95.6 provides a method for protecting lakes and impoundments and for restoring those lakes and impoundments that are in various states of water quality degradation due to excessive nutrient input (eutrophication). The Department's point source phosphorus control strategy relies on empirical lake models to estimate phosphorus loadings which will result in an appropriate level of protection or water quality improvement, considering both point and non-point sources of phosphorus. It is applicable to discharges in watersheds that flow into lakes, ponds, and impoundments that have a hydraulic residence time of 14 days or more, based on average annual flow conditions and considers sources from streams within 3 days travel time (approximately 60 miles) of the above listed impoundments. Foster Joseph Sayers Reservoir is located approximately 12 miles downstream of the PFBC Bellefonte hatchery. The reservoir has a detention time of approximately 32 days. The Department's Lake Model spreadsheet was used to determine if additional phosphorus controls are needed to protect the reservoir. The results of the Lake Model (see attached) show that no additional controls for phosphorus are recommended at this time.

TSS Annual Load Limitation

The existing permit has an allowable annual total suspended solids (TSS) load of 49,430 pounds per trout production year (May through April). The need for the existing annual TSS load is due to the segment of Spring Creek being on the *List 4b of the 2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report*. The justification for this load can be found in a Department memo written by Ron Hughey's dated 10/17/2005. In summary, the limitation is a water quality based effluent limitation established to address the impairment below the hatchery outfall.

A recent memo written by the Department on 2/18/2020 summarizes the current state of the impairment on the reach below the hatchery. Considering the aforementioned memo, the Department recommends the following changes to the existing TSS annual load limitations:

1) A 10% reduction in allowable annual TSS load limitations on annual basis (January through December). Reporting on an annual basis instead of the existing production year (May through April) will allow for the annual TSS results to be submitted through the Department's eDMR program.
2) The removal of the affirmative defense condition found in Part C.II and Part C.IV of the existing permit.

Temperature

Temperature data for the discharge currently does not exist. Therefore, monitoring and reporting for temperature is recommended during this permit cycle to characterize any potential impact from a temperature standpoint.

Best Professional Judgement

The Department recommends monitoring and reporting for Total Organic Carbon during this permit cycle. TOC monitoring is being proposed on the influent and effluent, on a quarterly basis. Monitoring for TOC will help to characterize the relationship between TSS and TOC and the PFBC's contribution of TOC through hatchery operations.

Increased monitoring for TSS, ammonia, $CBOD_5$ from 1/week to 2/week is also proposed during this permit cycle to better characterize variations in effluent quality throughout weekly operations at the facility. As per the proposed TSS sampling schedule, sampling events shall not be performed within 48 hours of each other.

The Department has determined that no compliance schedule is warranted for the new annual TSS load limitation since past results have shown that the permittee can meet the limit without using affirmative defense.

In order to better characterize the existing impairment downstream of the discharge, it is recommended that the Department perform annual biological sampling over the upcoming permit cycle.

Anti-Backsliding

No limitation established in the previous permit has been relaxed or removed within this permit.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	6.0 Inst Min	XXX	XXX	XXX	1/day	Grab
Temperature (ºF)	XXX	XXX	XXX	Report Daily Max	XXX	XXX	Continuous	I-S
CBOD5	300	600	XXX	5.0	10.0	12.5	2/week	24-Hr Composite
TSS	270	540	XXX	4.5	9.0	11.2	2/week	24-Hr Composite
Total Suspended Solids (Total Load, lbs) (lbs)	XXX	44490 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Ammonia	60	120	XXX	1.0	2.0	2.5	2/week	24-Hr Composite
Dissolved Phosphorus	18	36	XXX	0.3	0.6	0.75	1/week	24-Hr Composite
Formaldehyde	60	120	XXX	1.0	2.0	2.5	1/week	3 Grabs/24 Hours
TOC	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	24-Hr Composite
TOC (Raw Influent)	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	24-Hr Composite

Part C Conditions

-Therapeutic Chemical Usage for Aquaculture Faculties
-Hatchery Monitoring Plan
-Sampling requirements for 2/week parameters requiring minimum of 48 hours between collection
-Monitoring While Bypassing

It is recommended the permit be drafted as described above.