pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0086142**
Facility Type	**Municipal**	APS ID	**857287**
Major / Minor	**Minor**	Authorization ID	**1397637**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Washington Township Berks County**	Facility Name	**Washington Township STP**
Applicant Address	120 Barto Road Barto, PA 19504-8746	Facility Address	567 Niantic Road Barto, PA 19504
Applicant Contact	Richard Sichler, Township Manager	Facility Contact	Gary Kellon, Operator
Applicant Phone	(610) 845-7760 rsichlerwashtwp@comcast.net	Facility Phone	(610) 845-7760 gkellon@washtwpberks.org
Client ID	24191	Site ID	249587 / PF ID 256812
Ch 94 Load Status		Municipality	Washington Township
Connection Status		County	Berks
Date Application Received	May 25, 2022	EPA Waived?	Yes (unless change in limits subject to TMDL which did not occur)
Date Application Accepted	June 9, 2022	If No, Reason	
Purpose of Application	Renewal of NPDES permit for treated sewage		

Summary of Review

The facility's existing permit was issued November 8, 2017 with an effective date of December 1, 2017 and an expiration date of November 30, 2022. The existing permit's limits and conditions have been administratively extended. A permit renewal application was submitted May 25, 2022 via DEP's electronic upload system, OnBase (Reference ID # 58591). An application addendum was submitted via OnBase (Ref. ID # 130531) on November 21, 2023 with information about indirect users as requested by DEP.

The application addendum states that "the WWTP provides public sewer service to the area bounded by Old Route 100 to the West, Bally Borough to the North, County Line Road to the East, and Bechtelsville Borough to the South."

The application identified one industrial user: Longacre's Modern Dairy. The application addendum represented that an average of 1350 gpd is contributed from this indirect user which is a mixture of pre-aerated process wastewater, non-contact cooling water, and sanitary wastewater. There are federal Effluent Limitation Guidelines (ELGs) applicable to Dairy Processors but they do not include Pretreatment Standard limitations. The ELGs identify pollutants of concern as: pH, BOD5, and TSS. These parameters are already included in this facility's NPDES permit, with limits (although CBOD5 is included in the permit in place of BOD5, consistent with State regulations that allow for either parameter). In this case, the facility's compliance history has not included exceedances of pH, CBOD5, or TSS. Interference and/or pass through in the treatment plant has not been in evidence. In addition, the application addendum stated that an Industrial User permit had been issued to Longacre's Dairy by the Township and that effluent monitoring is conducted quarterly.

Design flow:
DEP's Standard Operating Procedure (SOP) Establishing Effluent Limitations for Individual Sewage Permits instructs to base the effluent limits in sewage permits on the average annual design flow. The renewal application indicates the facility's average annual design flow as 0.25 MGD as does the facility's WQM permit. The existing NPDES permit's effluent

Approve	Deny	Signatures	Date
x		*Bonnie Boylan* Bonnie Boylan / Environmental Engineering Specialist	December 21, 2023
x		*Maria D. Bebenek for* Daniel W. Martin, P.E. / Environmental Engineer Manager	January 26, 2024
x		*Maria D. Bebenek* Maria D. Bebenek, P.E./ Environmental Program Manager	January 26, 2024

limitations were based on 0.25 MGD. A review of the facility's eDMR data from January 1, 2021 through October 31, 2023 indicates that their average flow has been 0.18 MGD. The monthly average flow exceeded 0.25 MGD two months out of the 34 months of eDMRs summarized, but the 95th percentile of the monthly average flows reported was 0.245 MGD.

The NPDES permit application, submitted in May 2022, and the application addendum submitted in November 21, 2023 included this information:

> It was reported in the Township's 2020 Chapter 94 Report that the Township anticipated an expansion of the WWTP within the next few years. The proposed expansion of the WWTP would increase the hydraulic design capacity of the plant from 0.275 MGD to 0.550 MGD. The WWTP expansion project has been halted due to financial limitations of the current Developer. If an Agreement is made with the Developer and Washington Township, a PA DEP Planning Special Study will be completed and submitted to DEP. At this time, any future connections to the sanitary sewer system will be determined by the Township based on available capacity at the WWTP.

However, the facility's Chapter 94 Municipal Wasteload Annual Report for 2022, received on March 27, 2023 (OnBase Ref ID #99130), did project hydraulic overloads and included plans for an expansion in Appendix 10:

> A WWTP upgrade/ expansion is proposed that would double the existing hydraulic design capacity of the plant from 0.275 MGD to 0.550 MGD by adding two (2) SBRs and two (2) aerated sludge holding tanks. See the attached As-Built schematic showing a potential location for the SBRs and aerated sludge holding tank additions. The Sewer Agreement was signed by the Developer. As of 3/23/23, the Developer is in the process of securing the necessary funds to allow SDE to begin the design and permitting process. Once the Developer secures the necessary funds, SDE can provide DEP a proposed schedule for the WWTP Expansion Project if desired.

While the 2022 Chapter 94 Municipal Wasteload report proposed a future WWTP expansion for future development, (1) the NPDES application and November 2023 application addendum did not indicate an increase in flow, nor include their Sewage Planning Approval letter which is required for increases in flow, and (2) a WQM permit for expanding the TP has not been received.

Therefore, the renewal permit effluent limits continue to be based on a design flow of 0.25 MGD. **If the facility does move forward with an expansion of the WWTP, both a NPDES permit amendment application and a WQM permit application will be necessary, after DEP Sewage Planning approval has been secured.**

Note:
Because the 2019 AAF reported on the NPDES permit application (0.2563 MGD) was over the design flow of 0.25 MGD and because the projected AAF for 2027 (0.2535 MGD) shown in the facility's 2022 Chapter 94 Report spreadsheet (see attached) is over 0.25 MGD, permit limits using an alternative discharge flow of 0.275 MGD (the hydraulic capacity of the existing treatment plant) were also considered—in case the permittee physically allowed increased influent flows before expanding the WWTP or amending their NPDES permit as required. Assuming no regulatory changes and no changes in receiving stream designated uses or downstream designated uses were to occur, the limits in this draft renewal permit would still be protective of the receiving water although the DEP model would recommend a monitoring requirement for Total Copper in that case whereas the model did not recommend a monitoring requirement for a discharge flow of 0.25 MGD.

Hauled-In Wastes:
The facility indicated in their application that they do not anticipate accepting hauled-in wastes over the next five years.

Sludge use and disposal description and location(s):
According to their application, sewage sludge is hauled to Pottstown WWTP

Combined Sewers Outfalls: Not Applicable.

Unresolved Violations:
There are no unresolved violations for this facility according to DEP's eFacts Clean Water Program database and DEP's WMS 'Open Violations per Client' Report.

Delaware River Basin Commission:
The facility discharges to a stream within the Delaware River watershed and is thus subject to the Delaware River Basin Commission (DRBC)'s requirements. A copy of the draft permit and Fact Sheet will therefore be sent to the DRBC for their review in accordance with State regulations and an interagency agreement. Any comments from DRBC will be considered. The most recent DRBC docket D-1994-042 CP-3 was approved for this facility on March 9, 2022 with an expiration date of November 30, 2027. *The docket approved a discharge of 0.25 MGD.*

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.

Existing permit limits, outfall 001:

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 Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	52	83	XXX	25.0	40.0	50	2/month	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Suspended Solids	63	94	XXX	30.0	45.0	60	2/month	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Ammonia-Nitrogen May 1 - Oct 31	15	XXX	XXX	7.5	XXX	15	2/month	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	41	XXX	XXX	20.0	XXX	40	2/month	8-Hr Composite
Total Phosphorus	1.04	XXX	XXX	0.5	XXX	1.0	2/month	8-Hr Composite
Copper, Total	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	8-Hr Composite
Total Dissolved Solids	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.25 (Qs : Qd = 7:1)
Latitude	40º 23' 9"	Longitude	-75º 35' 27"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	West Branch Perkiomen Creek	Stream Code	01439
NHD Com ID	25971332	RMI	6.8 (per eMapPA & DRBC docket)
Drainage Area	14.4 sq.mi. per PA Stream Stats	Yield (cfs/mi^2)	0.187
Q_{7-10} Flow (cfs)	2.7 using gage correlation	Q_{7-10} Basis	Correlation w/ downstream USGS gage 01472199*
Elevation (ft)	420 per eMapPA	Slope (ft/ft)	
Watershed No.	3-E	Chapter 93 Class.	CWF, MF
Existing Use	None	Existing Use Qualifier	Not applicable
Exceptions to Use	Not applicable	Exceptions to Criteria	Not applicable
Assessment Status	impaired for aquatic life		
Cause(s) of Impairment	urban runoff, flow regime modification, agriculture, siltation (assessment # 22462)		
Source(s) of Impairment	potentially agriculture		
TMDL Status	TMDL approved 10/9/2003	Name	Green Lane Reservoir, downstream
Secondary Receiving Water: Perkiomen Creek and then into Schuylkill River			
Background/Ambient Data – Not available		Data Source- Not available	
Nearest Downstream Public Water Supply Intake		Aqua PA, Norristown	
PWS Waters	Perkiomen Creek	Flow at Intake (cfs)	
PWS RMI	Approx. 0.9	Distance from Outfall (mi)	Approx. 29 miles

*gage correlation:
Q7-10 at gage using 26 years of historic date=4.3 cfs, Drainage Area at gage = 23.0 sq.mi.,
Low Flow Yield = Q7-10 / D.A. = 0.187 cfs/sq.mi.
LFY gage x D.A. for point on stream at outfall 001 location = 0.187 cfs/sq.mi. x 14.4 sq.mi. = 2.7 cfs = Q7-10 at 001

entire length of W. Branch Perkiomen Creek is Trout Natural Reproduction (DO levels need to be protected during spawning season)

Upstream, West Branch Perkiomen Creek is designated as 'EV', Exceptional Value. The EV designation terminates at River Mile Index (RMI) 8.0, Old Route 100.

Downstream at 4.7 RMI is Bally Boro STP ….should be included in WQM 7 modeling. PA0022543.
Permitted flow of 0.50 MGD, Elev 385 per eMapPA, RMI 4.6 per permit
Location: 40.38995 / -75.5656 per eMapPA;
Permit limits = 25.0 mg/l BOD, 30 TSS, 6 NH3 summer and 12 winter Mo.Avg
Per last Fact Sheet, DA=16.3 mi2, Q7-10 = 3.1 cfs, LFY = 0.19; elev 395'

Downstream approximately 6 river miles is a USGS stream gage, 01472199, at 1.2 RMI on West Branch Perkiomen Creek. No gages upstream

[1] *Stuckey, M.H., and Roland, M.A., 2011, Selected streamflow statistics for streamgage locations in and near Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2011 – 1070, 88p.*
[1] *The 2016 Integrated Report available at http://www.depgis.state.pa.us/integratedreport/index.html*

Treatment Facility Summary

Treatment Facility Name: Washington Township STP

WQM Permit No.	Issuance Date
0609402 A-1	12/30/2021
0609402 T-1	9/30/2013
0694415 T-1	9/30/2013
0694415	10/28/1994

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Phosphorus Reduction	Chemical and Sequencing Batch Reactor	Hypochlorite	0.25

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.275	625		Aerobic Digestion	Other WWTP

The 2022 application included the following description of the treatment plant:

> Influent wastewater flows through one (1) comminutor followed by one (1) influent pump station, two (2) Sequence Batch Reactors (SBRs), one (1) flash mix tank, two (2) chlorine contact tanks, one (1) reaeration/ flow measuring channel, and two (2) aerated sludge holding tanks.
>
> SBRs are the limiting treatment unit at the STP: 0.275 MGD Hydraulic Capacity as average monthly

Changes Since Last Permit Issuance:

The WQM permit was amended in 2021 after receiving a re-rate application: the amendment increased the Design Hydraulic Capacity from 0.25 MGD to 0.275 MGD. (No amendment of the NPDES permit occurred.)

DMR Data for Outfall 001 (from November 1, 2022 to October 31, 2023)

Parameter	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22
Flow (MGD) Average Monthly	0.1613	0.1733	0.1606	0.1670	0.1528	0.1648	0.1723	0.1883	0.1673	0.2079	0.2026	0.1681
Flow (MGD) Daily Maximum	0.2209	0.3319	0.2148	0.3049	0.2099	0.2234	0.3431	0.292	0.2380	0.4036	0.393	0.2354
pH (S.U.) Minimum	7.44	7.3	7.28	7.13	7.22	7.18	7.13	7.18	7.14	7.04	7.18	7.23
pH (S.U.) Maximum	7.65	7.68	7.69	7.76	7.58	7.57	7.42	7.61	7.59	7.74	7.75	8.04
DO (mg/L) Daily Minimum	8.04	7.46	6.91	6.9	7.59	8.32	7.96	8.38	8.8	8.49	8.22	7.32
TRC (mg/L) Average Monthly	0.41	0.37	0.33	0.39	0.4	0.41	0.41	0.43	0.38	0.42	0.36	0.43
TRC (mg/L) Instantaneous Maximum	0.51	0.6	0.49	0.64	0.62	0.51	0.63	0.79	0.78	0.77	0.75	1.36
CBOD5 (lbs/day) Average Monthly	2.7	2.1	3.0	3.2	3.4	2.7	3.4	4.6	3.7	2.7	3.7	5.3
CBOD5 (lbs/day) Weekly Average	3.0	2.2	3.7	4.1	3.9	2.7	3.6	5.4	4.0	3.4	5.2	6.9
CBOD5 (mg/L) Average Monthly	2.0	2.5	2.9	2.5	2.9	2.2	2.6	2.5	3.0	2.0	2.4	3.6
CBOD5 (mg/L) Weekly Average	2.0	2.6	3.8	3.0	3.3	2.4	3.0	2.7	3.5	2.0	2.8	5.1
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	122	122	126	213	167	153	267	386	236	300	235	490
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	152	130	139	255	171	185	325	496	245	360	296	517
BOD5 (mg/L) Raw Sewage Influent Average Monthly	95	144	118	146	144	123	207	206	201	245	160	370
TSS (lbs/day) Average Monthly	1	0.9	4	1	1	2	1	7	2	6	9	2
TSS (lbs/day) Raw Sewage Influent Average Monthly	142	159	144	274	206	192	259	323	147	312	120	504
TSS (lbs/day) Raw Sewage Influent Daily Maximum	235	163	177	322	274	251	266	397	168	352	171	650

TSS (lbs/day) Weekly Average	2	0.9	4	1	1	2	1	12	3	7	11	4
TSS (mg/L) Average Monthly	1.0	1.0	3.5	1.0	1.0	1.5	1.0	3.5	2.0	4.5	6.0	1.5
TSS (mg/L) Raw Sewage Influent Average Monthly	115	188	133	189	177	153	196	173	128	251	78	416
TSS (mg/L) Weekly Average	1.0	1.0	4.0	1.0	1.0	2.0	1.0	6.0	3.0	5.0	6.0	2.0
Total Dissolved Solids (lbs/day) Daily Maximum		719			595			637			624	
Total Dissolved Solids (mg/L) Daily Maximum		613			495			379			388	
Fecal Coliform (No./100 ml) Geometric Mean	< 4	6	3	6.0	5	< 2	< 2	4	2	< 2	9	43
Fecal Coliform (No./100 ml) Instantaneous Maximum	7	13	3	8	8	3	< 2	8	3	< 2	26	183
Ammonia (lbs/day) Average Monthly	0.1	0.04	0.04	0.1	0.1	0.08	0.1	0.1	0.03	0.09	0.5	0.1
Ammonia (mg/L) Average Monthly	0.08	0.05	0.04	0.1	0.12	0.07	0.1	0.08	0.03	0.07	0.49	0.1
Total Phosphorus (lbs/day) Average Monthly	0.30	0.20	0.20	0.30	1.11	0.20	0.40	0.40	0.50	0.30	0.30	0.80
Total Phosphorus (mg/L) Average Monthly	0.25	0.27	0.19	0.23	0.89	0.16	0.3	0.21	0.35	0.27	0.20	0.56
Total Copper (lbs/day) Average Monthly	0.004	0.002	0.004	0.004	0.004	0.003	0.006	0.007	0.004	0.004	0.007	0.2
Total Copper (lbs/day) Daily Maximum	0.004	0.002	0.004	0.004	0.004	0.003	0.006	0.007	0.004	0.004	0.007	0.2
Total Copper (mg/L) Average Monthly	0.003	0.003	0.004	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.137
Total Copper (mg/L) Daily Maximum	0.003	0.003	0.004	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.137

Compliance History

Effluent Violations for Outfall 001, from: December 1, 2022 To: October 31, 2023

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Total Phosphorus	06/30/23	Avg Mo	1.11	lbs/day	1.04	lbs/day
Total Phosphorus	06/30/23	Avg Mo	1.11	lbs/day	1.04	lbs/day
Total Phosphorus	06/30/23	Avg Mo	0.89	mg/L	.5	mg/L
Total Phosphorus	06/30/23	Avg Mo	0.89	mg/L	.5	mg/L

Sanitary Sewer Overflow (SSO) on April 23, 2020 at Manhole at County Line Road

Inspections:

April 27, 2020 – Administrative File Review. No violations noted.

January 30, 2019 (Kevin Buss) – No Violations noted. Observations: all treatment units operating normally, records appear up to date, good aeration in aerobic digesters and SBR tanks, approximately 10% of SBR tanks have orange greasy foam with carryover into Chlorine Contact tanks, no foam in post-aeration, no discharge during inspection, influent sampling location prior to any treatment, effluent sampling location after disinfection and adequate for representative samples, effluent samples are flow-proportional, weir and ultrasonic flow meter and 7-day chart with flow meter in post-aeration tank, have an emergency generator which is exercised routinely, sludge disposal records available (sludge being disposed at Pottstown WWTP).

December 5, 2017 (Kevin Buss) - No Violations noted. All treatment units online and records appear up to date. Record review was conducted in township office. Samples were collected by inspector: lab analyses indicated no permit exceedances.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.25
Latitude 40º 23' 9" **Longitude** -75º 35' 27"
Wastewater Description: Sewage Effluent

Technology-Based Effluent Limitations (TBELs)

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation	DRBC Requirement
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)	
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)	
$CBOD_5$	85% removal	Average Monthly		92a.47(a)(3)	
BOD_5	85% removal	-			18 CFR Part 410
Total Suspended Solids (TSS)	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)	18 CFR Part 410
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)	18 CFR Part 410
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)	18 CFR Part 410
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)	18 CFR Part 410
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)	
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)	
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)	
Total Residual Chlorine (TRC)	0.5	Average Monthly	-	92a.47(a)(8) & 92a.48(b)	
Ammonia (NH_3-N)	20	Average Monthly			18 CFR Part 410
Total Dissolved Solids (TDS)	1000*	Average Monthly			18 CFR Part 410

*Or a concentration established by the Commission which is compatible with designated water uses and stream quality objectives and recognizes the need for reserve capacity to serve future dischargers (i.e. limit based on a TDS Determination submitted to DRBC proving that the discharge will not cause the TDS in the receiving water to exceed the lesser of 500 mg/l or 133% of background). Their DRBC docket [D-1994-042 CP-3] includes 1000 mg/l limit for TDS.

Narrative limits are imposed in NPDES permits in Part A following the limits tables. The narrative limits include: "The monthly average percent removal of BOD_5 or $CBOD_5$ and TSS must be at least 85% for WWTP facilities on a concentration basis…." Because all Chapter 94 Municipal Wasteload Annual reporting for sewage is in terms of BOD_5, the influent monitoring has continued to be required as BOD_5, as requested by DEP's regional office Sewage Planning staff. Because DEP's WQM 7.0 model uses $CBOD_5$, most NPDES permits for sewage treatment plants (STPs) include effluent limits in terms of $CBOD_5$ rather than as BOD_5.

Best Professional Judgment (BPJ) Limitations

Dissolved Oxygen

A minimum effluent limit of 5.0 mg/L for DO is derived from a state water quality criteria found in 25 Pa. Code §93.7(a). The effluent limit of 5.0 mg/L has been assigned to other sewage facilities throughout the state. The existing permit included a minimum effluent limit for DO of 5.0 mg/l and no change is recommended.

Water Quality-Based Effluent Limitations (WQBELs)

$CBOD_5$, NH_3-N and Dissolved Oxygen (DO)

DEP uses a model, WQM 7.0, to determine appropriate permit requirements for $CBOD_5$, NH_3-N and DO. A multiple discharge analysis was performed because Bally Boro Sewage Treatment Plant (STP) (NPDES Permit # PA0022543, with design flow of 0.5 MGD) is located approximately 2.0 miles downstream from Washington Twp WWTP's discharge. (See attached). The first model simulation was for summer months and used an in-stream DO target of 5.0 mg/l as a minimum. The model was re-run for salmonid early life stages protection and winter conditions (using Technical Guidance document: Implementation of Temperature Criteria) by adjusting the Q7-10 (and resultant LFY model input value) by a factor of 1.6 to estimate stream flow during November and decreasing the in-stream temperature to 7.2°C to approximate the stream temperature during November, and using an in-stream DO target of 8 mg/l, appropriate for 'Trout Natural Reproduction' streams whose early life stages occur during October through May [Pa Code Chapter 93.7(b)]. The model output indicates that the existing permit's limits for $CBOD_5$, NH3-N, and DO are still protective of water quality. No changes are therefore recommended.

Total Residual Chlorine

DEP's TRC_CALC worksheet was utilized to determine if the TBEL of 0.5 mg/L is protective of the stream (See attached). The worksheet indicated that the existing limits (TBELs), 0.5 mg/l as a Monthly Average and 1.6 mg/l as a Daily Maximum, are appropriate to protect water quality standards. No change is therefore recommended.

Toxics

DEP uses a model to calculate WQBELs and evaluate Reasonable Potential for parameters to cause in-stream exceedances of water quality criteria found in 25 Pa Code §93.8c. The model is called 'Toxics Management Spreadsheet' (TMS) and is an Excel version of the previously used model known as PENTOX. (See the attached for model inputs and outputs. Note: when there is no available data for Hardness, DEP typically uses a default value of 100 mg/l in the model. The Hardness default value was used in this case. The permittee supplied no Hardness data and there is no DEP WQN monitoring station on the waterway.)

DEP's NPDES permit application for minor sewage facilities (i.e. less than 1.0 MGD) requires at least one sample of Total Copper, Total Lead and Total Zinc if there are any industrial or commercial contributors. The application reported the result of one effluent sample for Lead and Zinc and 25 effluent samples for Total Copper. Because of the limited number of effluent sample results, the *maximum* concentrations reported in the application were input into the TMS model for Total Lead and for Total Zinc.

For Total Copper, the application represented that the average concentration of 25 samples was 0.005 mg/l and the maximum concentration was 0.009 mg/l. For this evaluation, the facility's eDMR data—which included Total Copper-- were also reviewed. From the period between January 1, 2018 and October 31, 2023, the average concentration for Total Copper was 0.0075 mg/l and the median value was 0.005 mg/l. Removing an outlier data point of 0.137 mg/l, reported for November 2022, still yielded an average of 0.0056 mg/l. DEP's SOP Establishing WQBELs and Permit Conditions for Toxic Pollutants in NPDES Permits instructs to use the median value of sample results instead of the average calculated by DEP's TOXCONC spreadsheet when there are outliers in the data. Using either 0.0056 mg/l or 0.005 mg/l as the discharge concentration in the TMS model results in no limit or monitoring requirement being recommended for Total Copper.

The TMS model did recommend a monitoring requirement for Total Zinc and it has been added to the draft renewal permit. Because the Total Zinc discharge concentration was less than 50% of the calculated WQBEL, no 'Reasonable Potential' for the discharge to cause an in-stream exceedance of water quality criteria was indicated such that no permit limit was deemed needed. Because the Total Zinc discharge concentration reported was more than 10% of the calculated WQBEL, a monitoring requirement was recommended. More sample results will allow a better Reasonable Potential evaluation.

The logic used in the model is further described in DEP's SOP Establishing WQBELs and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers and in the Technical Reference Guide (TRG) PENTOXSD for Windows [386-2000-015].

Total Maximum Daily Load (TMDL)

The facility is identified as an existing point source in the Green Lane Reservoir TMDL. The Green Lane Reservoir was listed as impaired in 1996. The TMDL was approved by EPA in 2003. The nutrient of concern in the TMDL is Total Phosphorus (TP). The TP Waste Load Allocation for Washington Township's WWTP 1.04 lbs/day and 31.27 lbs/month, based on the technologically achievable concentration of 0.5 mg/L and a design flow of 0.25 MGD (See attached).

Note: EPA has previously agreed with DEP that the cumulative monthly mass limit is redundant if the average monthly mass limit is included in the permit. The existing permit did not include a lbs./month limit for TP and this renewal permit similarly does not.

A review of the facility's eDMRs from January 1, 2021 through October 31, 2023 indicates their TP average load has been 0.40 lbs/day. For the 34 months of DMR data reviewed, there were two months in which the facility exceeded the TP average monthly load limit of 1.04 lbs/day and two months in which the facility exceeded the monthly average concentration limit of 0.5 mg/l.

Because there have been no changes to the permit limits for the parameters identified in the applicable TMDL, the draft renewal permit does not have to be reviewed by EPA.

Additional Considerations

Flow Monitoring:

The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii).

Influent BOD & TSS Monitoring:

The existing influent monitoring reporting requirement for TSS and BOD5 will be maintained in the draft permit. This requirement has been consistently assigned to all municipal wastewater treatment facilities and is necessary to verify the 85% removal permit requirement as well as to ensure process control.

Total Nitrogen Monitoring:

A monitoring requirement for Total Nitrogen has been included, consistent with DEP's SOP Establishing Effluent Limitations for Individual Sewage Permits. (Total Phosphorus monitoring is already included in the permit.)

Mass Loading Limitations:

All effluent mass loading limits have been based on the formula: design flow x concentration limit x conversion factor of 8.34.

Monitoring Frequency and Sample Type:

Monitoring frequencies have been carried forward from the existing permit consistent with DEP's SOP New and Reissuance Sewage Individual NPDES Permit Applications, except for TDS and E.Coli. For TDS, the monitoring frequency of once per quarter is consistent with the DRBC docket. For E.Coli, the monitoring frequency of once per quarter is consistent with DEP's SOP Effluent Limitations for Individual Sewage Permits.

The sample types are derived from the "NPDES Permit Writer's Manual" (362-0400-001).

Antidegradation Requirements:

All effluent limitations and monitoring requirements have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected.

Anti-Backsliding:

No permit limitations have been made less stringent.

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" (386-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instant. Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	52	83	XXX	25.0	40.0	50	2/month	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TSS	63	94	XXX	30.0	45.0	60	2/month	8-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Dissolved Solids	Report Qrtrly Avg	XXX	XXX	1000.0 Qrtrly Avg	XXX	XXX	1/quarter	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10,000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Ammonia Nov 1 - Apr 30	41	XXX	XXX	20.0	XXX	40	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	15	XXX	XXX	7.5	XXX	15	2/month	8-Hr Composite

Outfall 001, Continued (from Permit Effective Date through Permit Expiration Date)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instant. Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Total Phosphorus	1.04	XXX	XXX	0.5	XXX	1.0	2/month	8-Hr Composite
Total Nitrogen	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Zinc	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/month	8-Hr Composite

Compliance Sampling Location: after treatment

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☒	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☒	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☒	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☒	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☒	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☒	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☒	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 386-2000-010, 3/1999.
☒	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP New and Reissuance Sewage Individual NPDES Permit Applications, BCW-PMT-002, Version 2.0
☒	SOP: Establishing Effluent Limitations for Individual Sewage Permits, BCW-PMT-033, Version 1.9.
☒	SOP: Establishing WQBELs and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers, BCW-PMT-037, Version 1.5.
☒	Other: DRBC docket D-1994-042 CP-3.

Total Maximum Daily Load of Nutrients for Green Lane Reservoir

Table 4-5. Individual Wasteload allocations of total phosphorus for Green Lane Reservoir

Point Source	NPDES permit no.	Design Flow (mgd)	Total Phosphorus concentration (mg/l)	WLA (lbs/day)	WLA (lbs/month)
Main Branch Perkiomen Subwatershed					
Brown Printing	PA0051802	0.0116	0.5	0.048	1.45
East Greenville Filtration	PA0050644	0	0	0	0
Hereford Mobile Home Park	PA0041505	0.125	0.5	0.52	15.63
Knoll, Inc.	PA0011070	0.0279	0.5	0.116	3.49
Mountain Village Mobile Home Park	PA0041491	0.064	0.5	0.27	8
TTT Realty	PA0012891	0.0088	0.5	0.037	1.1
Main Branch Perkiomen subwatershed total					**29.7**
West Branch Perkiomen Subwatershed					
Bally Borough	PA0055123	0.5	0.5	2.08	62.55
Strawberry Family Restaurant	PA0053376	0.0015	0.5	0.006	0.19
Washington Township.	PA0086142	0.25	0.5	1.04	31.27
Woodland Mobile Home Park	PA0055352	0.014	0.5	0.059	1.75
West Branch Perkiomen subwatershed total					**95.8**
Direct Drainage Subwatershed					
Green Hills Mobile Home Park	PA0031887	0.03	0.5	0.13	3.75
Upper Perkiomen School District	PA0050911	0.004	0.5	0.017	0.5
Direct Drainage subwatershed total					**4.25**
Direct Drainage (Urban) Subwatershed					
Edmund Optics	PA0053864	0	0	0	0
Upper Montgomery Joint Authority	PA0020532	2	0.5	8.34	250.2
Direct Drainage (urban) subwatershed					**250.2**

StreamStats Output Report-at 001 Washington STP					
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Workspace ID	PA20231219200616178000				
Latitude	40.38565				
Longitude	-75.59062				
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Basin Characteristics					
Parameter Code	Parameter Description	Value	Unit		
BSLOPD	Mean basin slope measure	6.3423	degrees		
DRNAREA	Area that drains to a point c	14.4	square miles		
ROCKDEP	Depth to rock	5.1	feet		
URBAN	Percentage of basin with ur	0.557	percent		
Low-Flow Statistics Flov	100.0 Percent Low Flow Region 1				
Statistic	Value	Unit	SE	ASEp	
7 Day 2 Year Low Flow	5.8	ft^3/s	46	46	
30 Day 2 Year Low Flow	6.7	ft^3/s	38	38	
7 Day 10 Year Low Flow	3.27	ft^3/s	51	51	
30 Day 10 Year Low Flow	3.82	ft^3/s	46	46	
90 Day 10 Year Low Flow	4.82	ft^3/s	41	41	
USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are					
USGS Software Disclaimer: This software has been approved for release by the U.S. Geologic					
USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive					
Application Version: 4.19.2					
StreamStats Services Version: 1.2.22					
NSS Services Version: 2.3.2					

StreamStats Output Report-at Bally Boro outfall							
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Basin Characteristics							
Parameter Code	Parameter Description	Value	Unit				
BSLOPD	Mean basin slope measured in degrees	5.9388	degrees				
DRNAREA	Area that drains to a point on a stream	16.4	square miles				
ROCKDEP	Depth to rock	5	feet				
URBAN	Percentage of basin with urban develo	0.7007	percent				
Low-Flow Statistics Flow	100.0 Percent Low Flow Region 1						
Statistic	Value	Unit	SE	ASEp			
7 Day 2 Year Low Flow	5.61	ft^3/s	46	46			
30 Day 2 Year Low Flow	6.64	ft^3/s	38	38			
7 Day 10 Year Low Flow	3.05	ft^3/s	51	51			
30 Day 10 Year Low Flow	3.66	ft^3/s	46	46			
90 Day 10 Year Low Flow	4.82	ft^3/s	41	41			
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USGS Software Disclaimer: This software has been approved for release by the U.S. Geological Survey (USGS). Although the s							
USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not impl							
Application Version: 4.19.2							
StreamStats Services Version: 1.2.22							
NSS Services Version: 2.3.2							

StreamStats Output Report-confl UNT01443, RMI 4.3						
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Parameter Code	Parameter Description	Value	Unit			
BSLOPD	Mean basin slope measured in degree	5.4862	degrees			
DRNAREA	Area that drains to a point on a strear	19.5	square miles			
ROCKDEP	Depth to rock	4.9	feet			
URBAN	Percentage of basin with urban develo	2.848	percent			
Low-Flow Statistics Flow Repo	100.0 Percent Low Flow Region 1					
Statistic	Value	Unit	SE	ASEp		
7 Day 2 Year Low Flow	5.78	ft^3/s	46	46		
30 Day 2 Year Low Flow	7.04	ft^3/s	38	38		
7 Day 10 Year Low Flow	3.06	ft^3/s	51	51		
30 Day 10 Year Low Flow	3.78	ft^3/s	46	46		
90 Day 10 Year Low Flow	5.21	ft^3/s	41	41		
USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy						
USGS Software Disclaimer: This software has been approved for release by the U.S. Geological Survey (USGS). Althou						
USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does						
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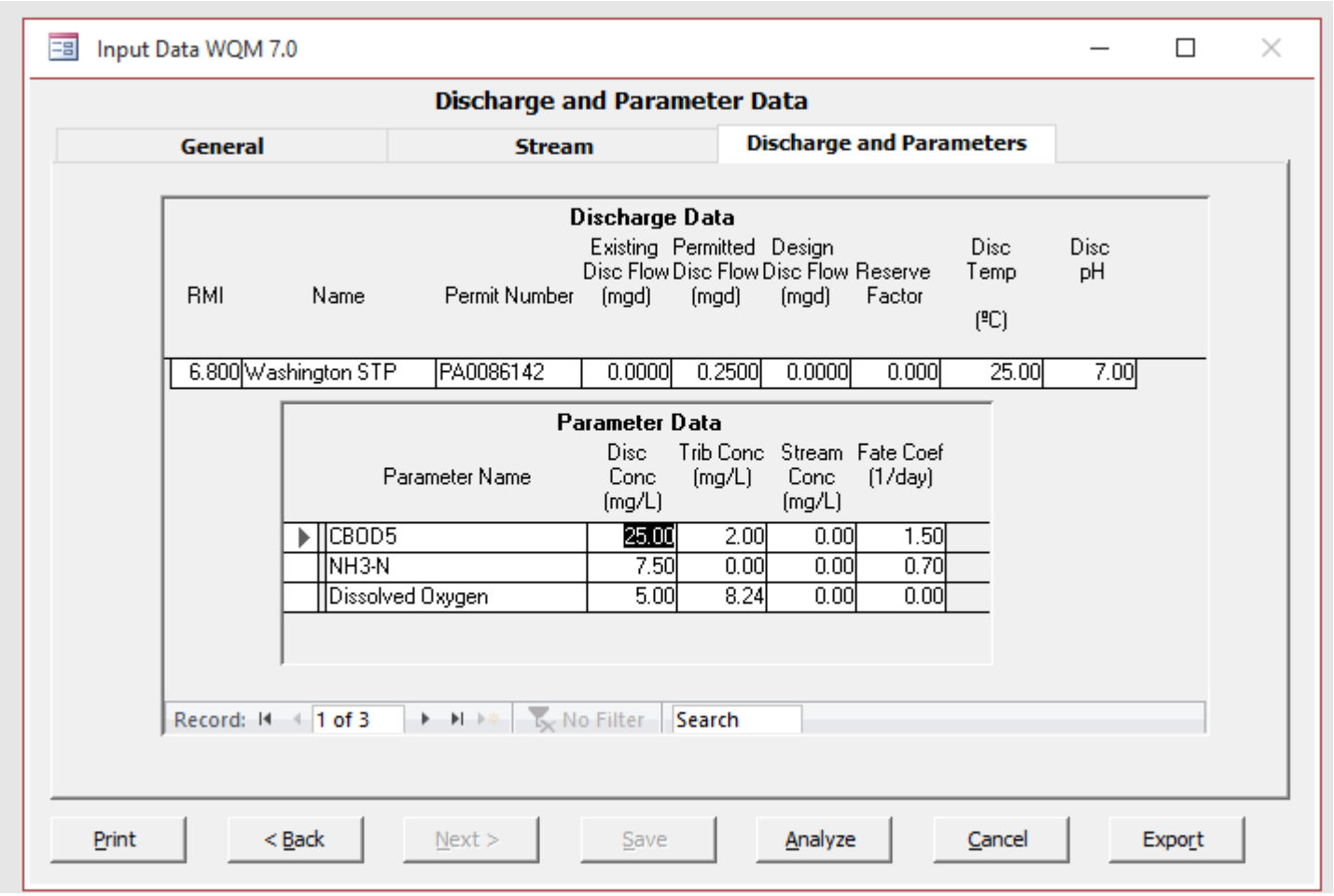
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Permitted Disc Flow (mgd)
Design Disc Flow (mgd)
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Disc pH
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Trib Conc (mg/L)
Stream Conc (mg/L)
Fate Coef (1/day)
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NH3-N
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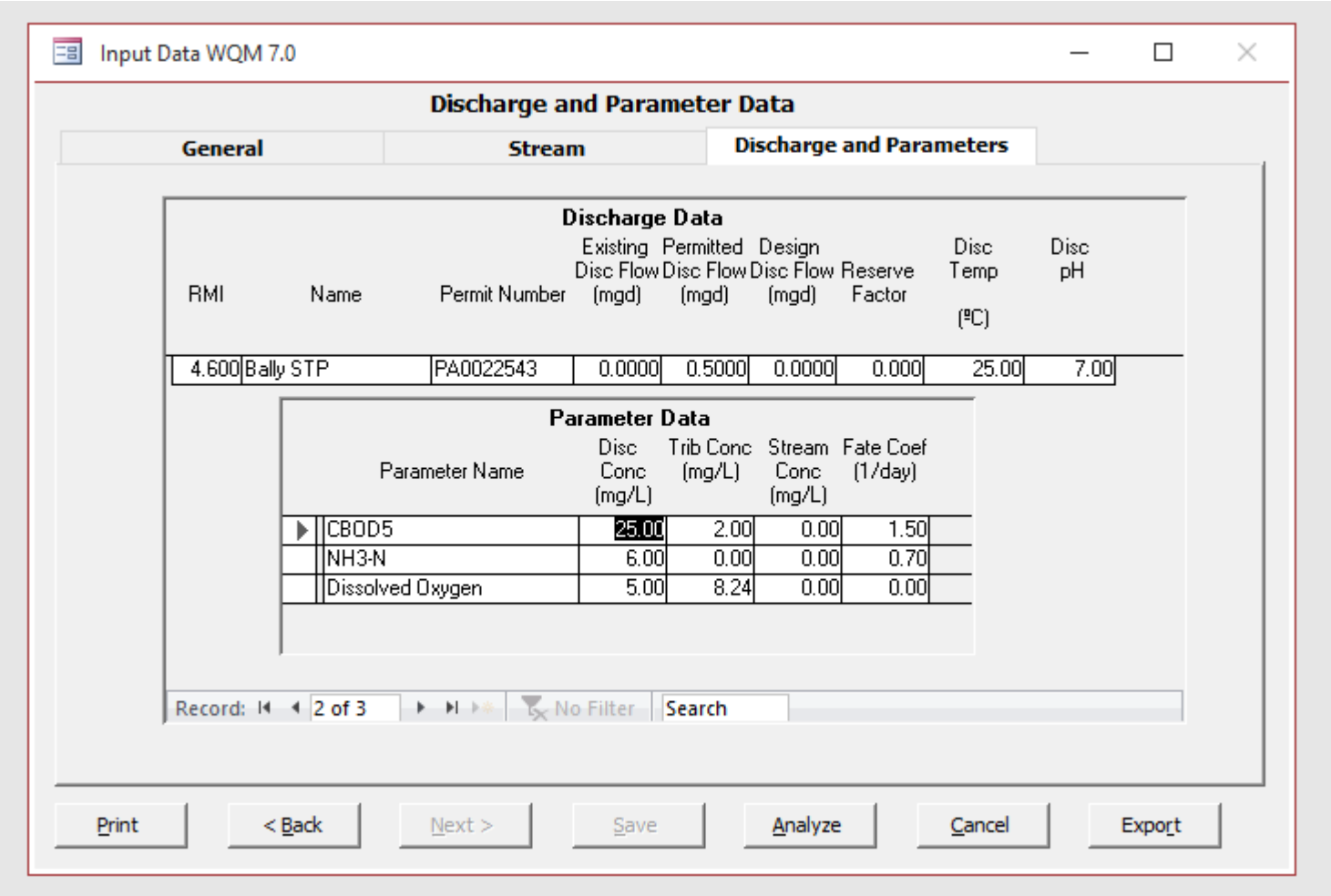
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Design Disc Flow (mgd)
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Disc Temp (°C)
Disc pH
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Trib Conc (mg/L)
Stream Conc (mg/L)
Fate Coef (1/day)
CBOD5
25.00
2.00
0.00
1.50
NH3-N
6.00
0.00
0.00
0.70
Dissolved Oxygen
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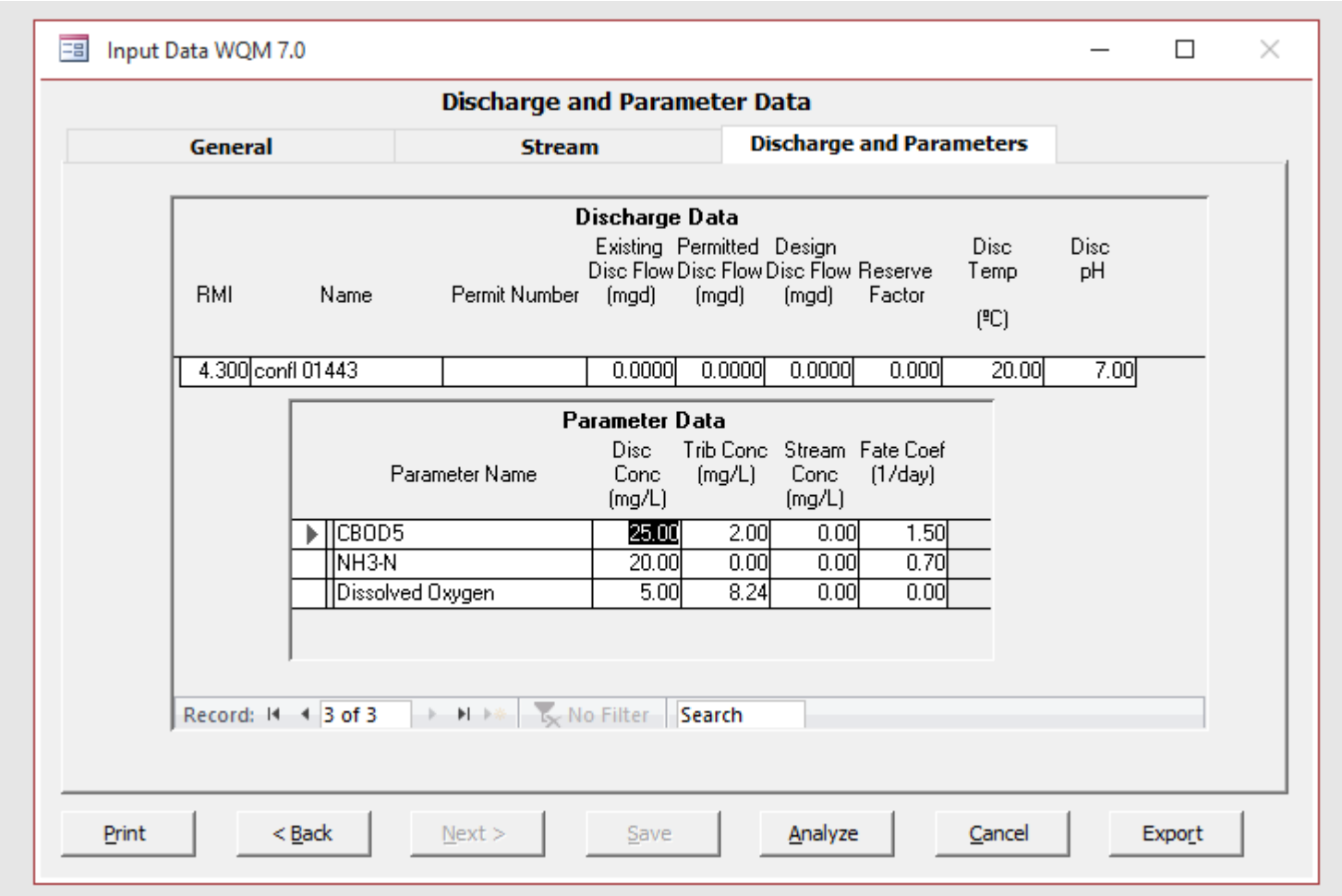
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Discharge and Parameters
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Permit Number
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Permitted Disc Flow (mgd)
Design Disc Flow (mgd)
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Disc Temp (ºC)
Disc pH
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Stream Conc (mg/L)
Fate Coef (1/day)
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NH3-N
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Dissolved Oxygen
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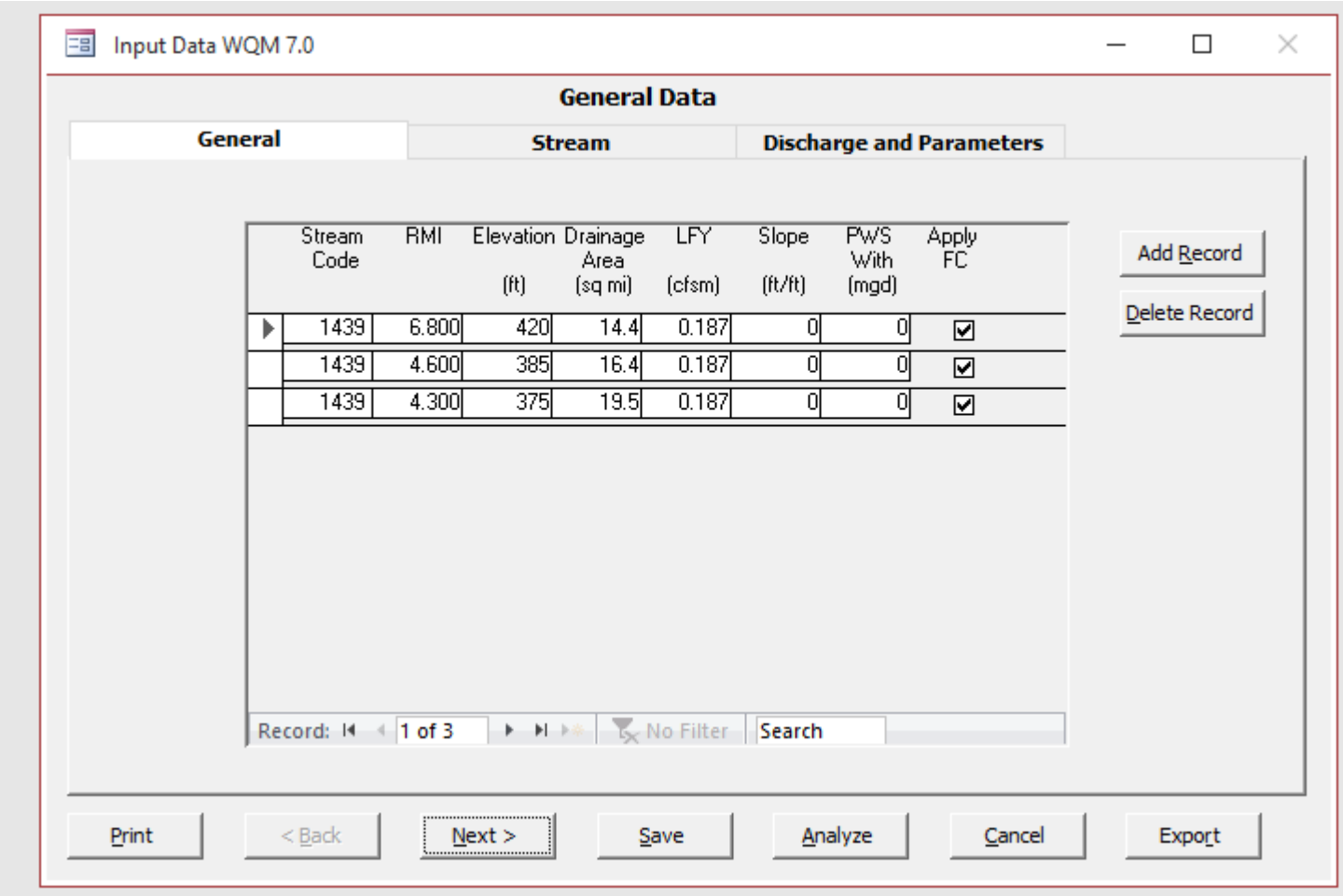
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General
Stream
Discharge and Parameters
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Drainage Area (sq mi)
LFY (cfsm)
Slope (ft/ft)
PWS With (mgd)
Apply FC
1439 6.800 420 14.4 0.187 0 0
1439 4.600 385 16.4 0.187 0 0
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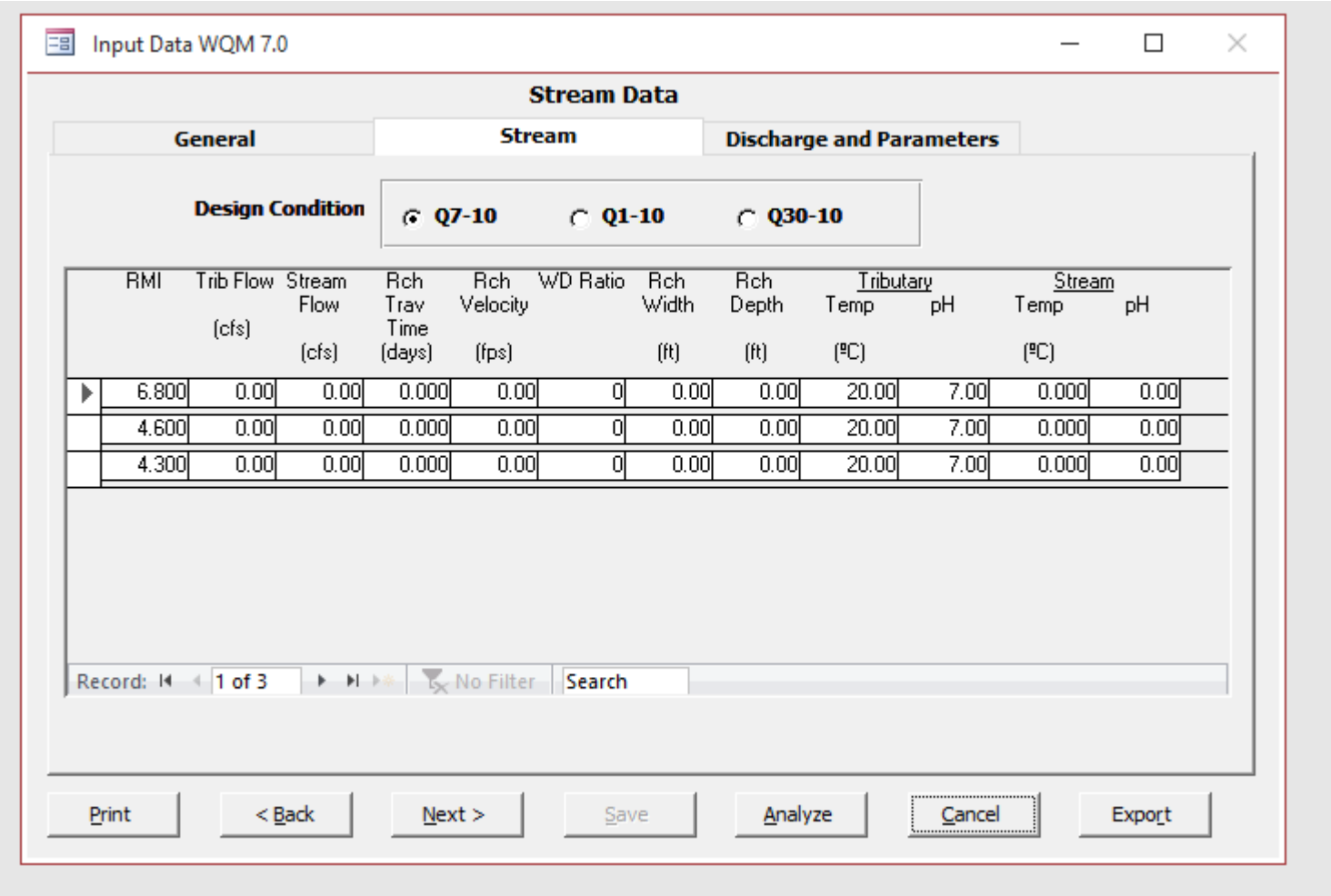

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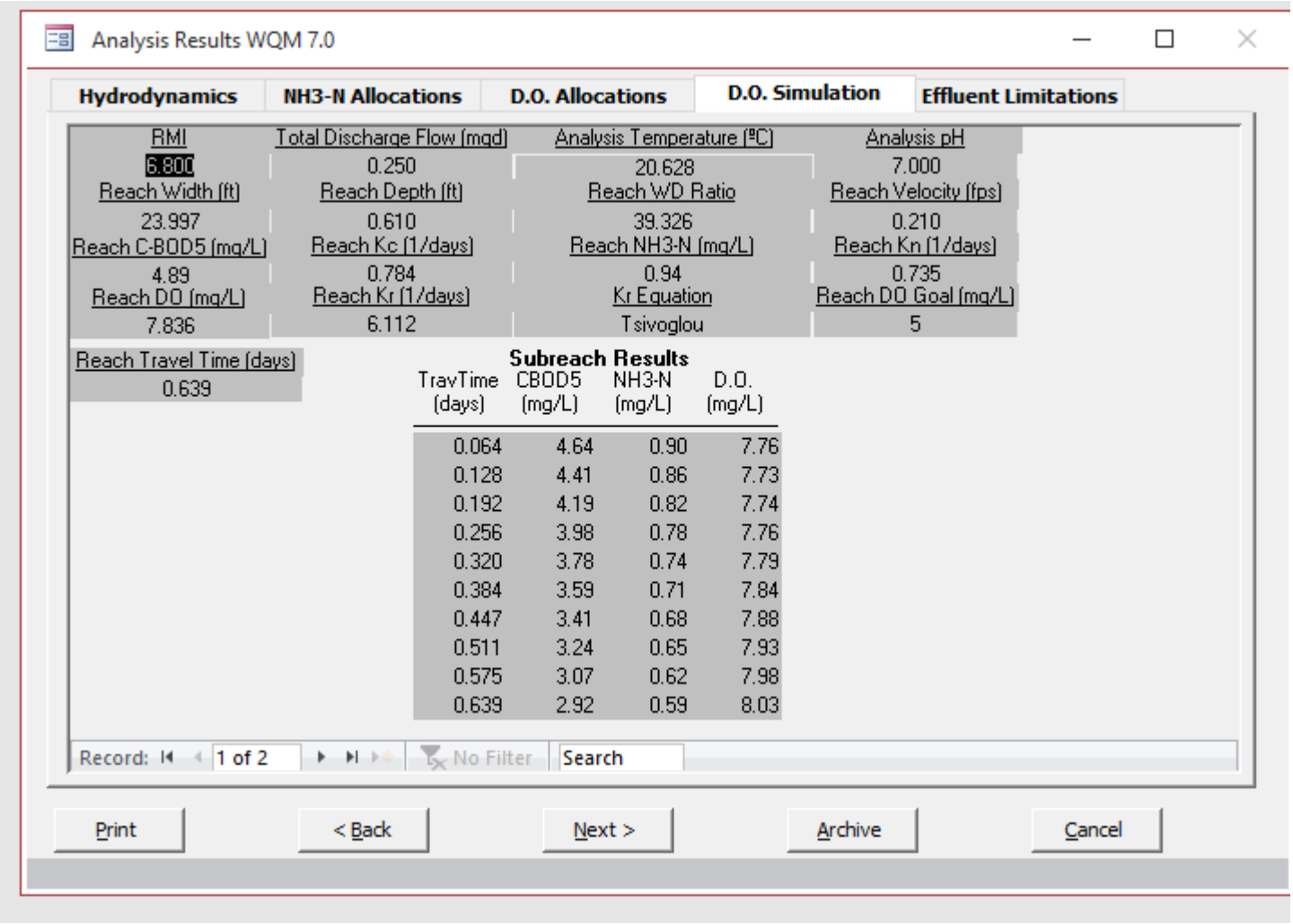
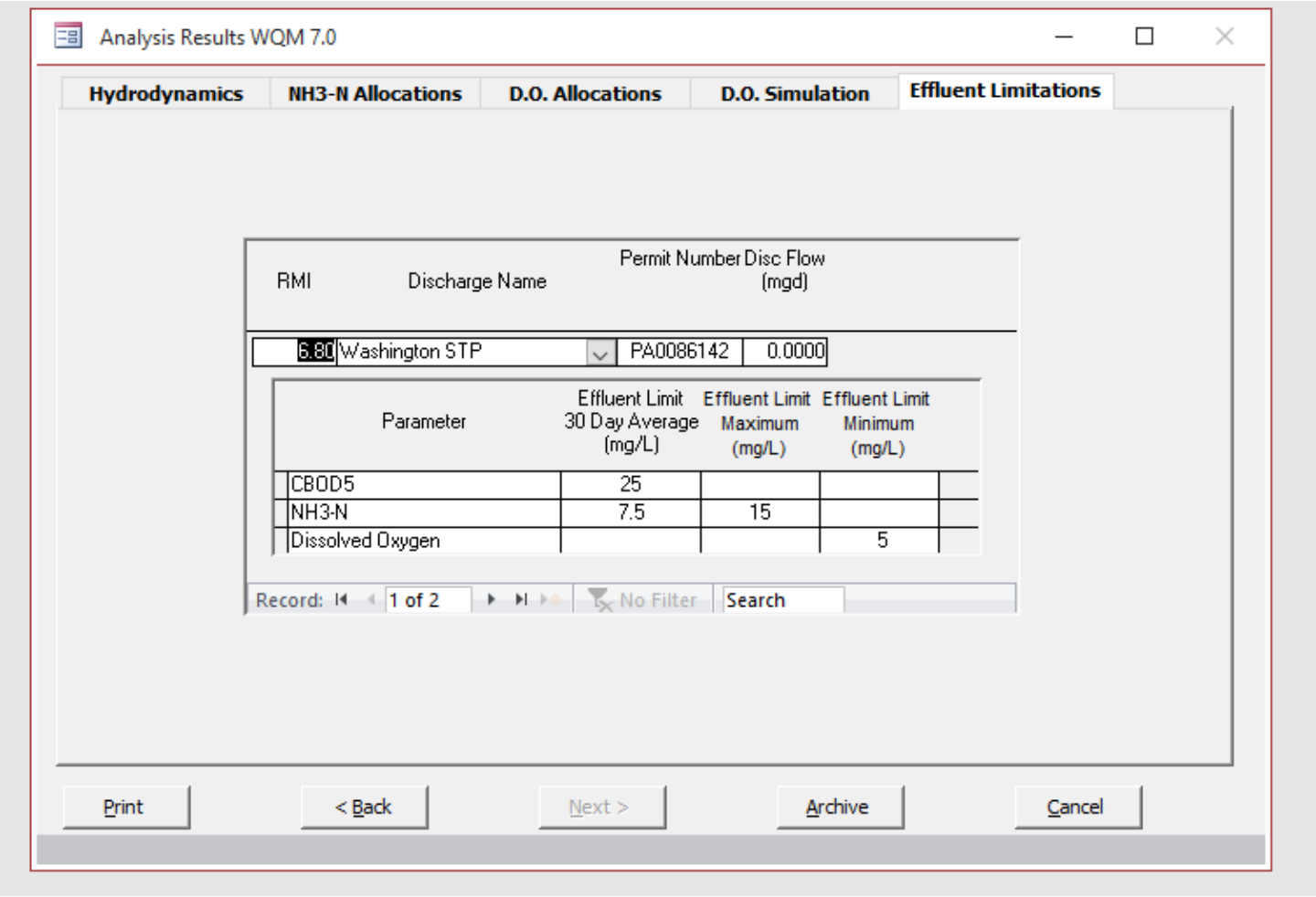
6.800	0.00	0.00	0.000	0.00	0	0.00	0.00	20.00	7.00	0.000	0.00
4.600	0.00	0.00	0.000	0.00	0	0.00	0.00	20.00	7.00	0.000	0.00
4.300	0.00	0.00	0.000	0.00	0	0.00	0.00	20.00	7.00	0.000	0.00



DO is recovering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D.O. Allocations
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Effluent Limitations
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Washington STP
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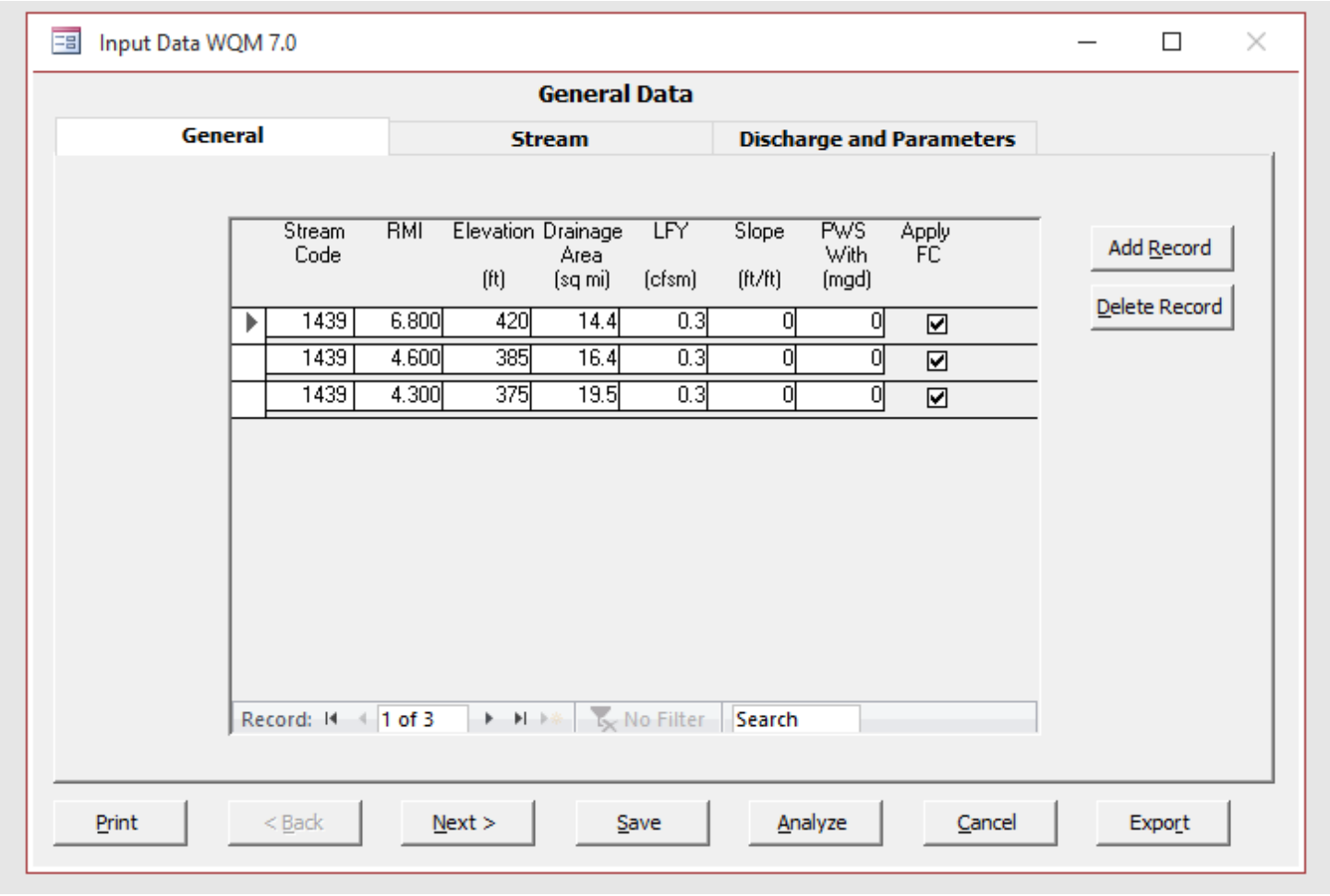
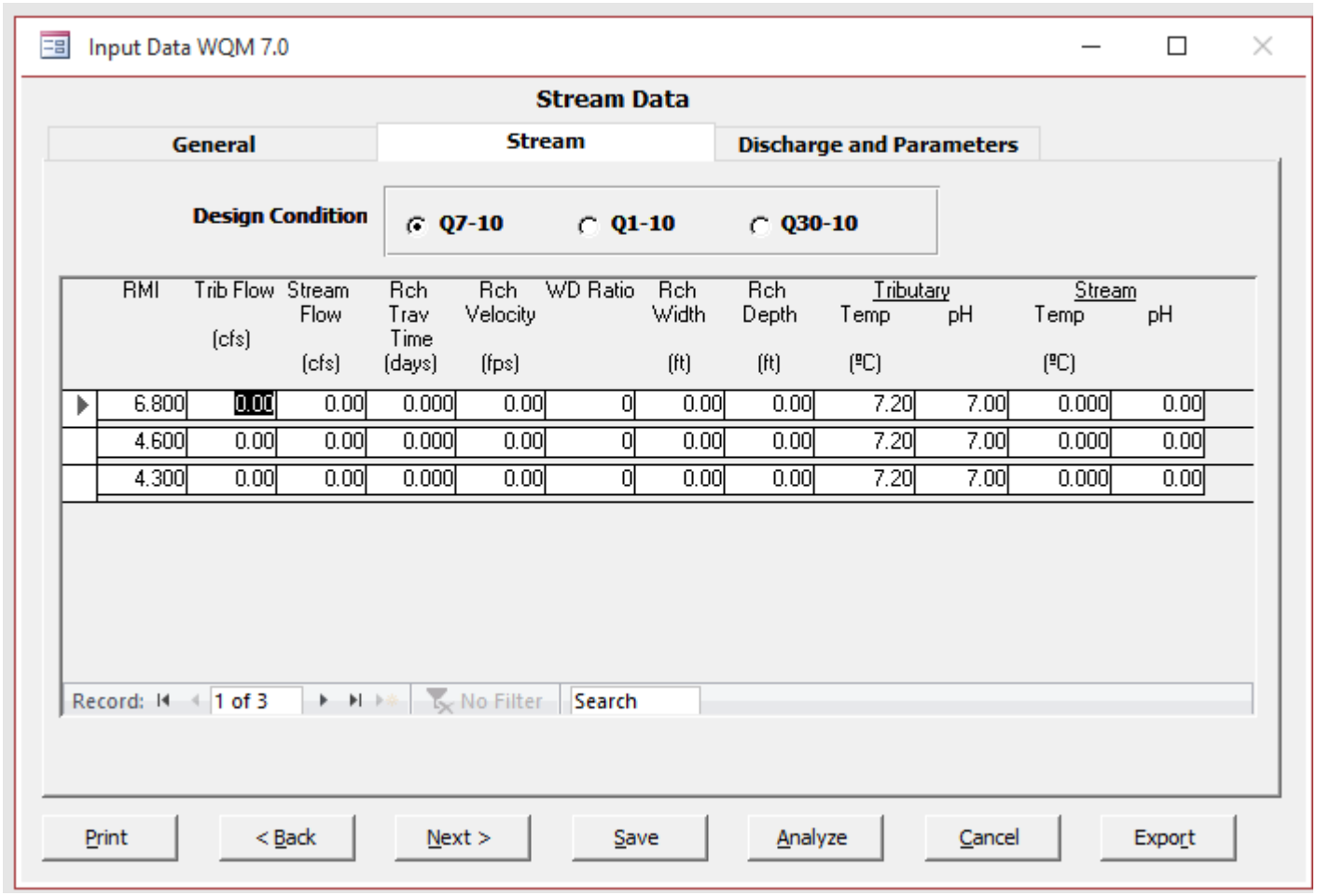
Parameter
Effluent Limit 30 Day Average (mg/L)
Effluent Limit Maximum (mg/L)
Effluent Limit Minimum (mg/L)
CBOD5
25
NH3-N
7.5
15
Dissolved Oxygen
5
Record: 1 of 2
No Filter
Search
Print
< Back
Next >
Archive
Cancel

Re-run of WQM 7.0 model for salmonid spawning season and winter conditions by adjusting the Q7-10 (and resultant LFY model input value) by a factor of 1.6 to estimate stream flow during November (0.187 LFY x 1.6 = 0.3 LFY) and decreasing the in-stream temperature to an estimated 7.2ºC (using Technical Guidance document: Implementation of Temperature Criteria), and running the model with a target DO of 8 mg/l, appropriate for 'Trout Natural Reproduction' streams whose early life stages occur during October through May [Pa Code Chapter 93.7(b)]:

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Discharge and Parameters
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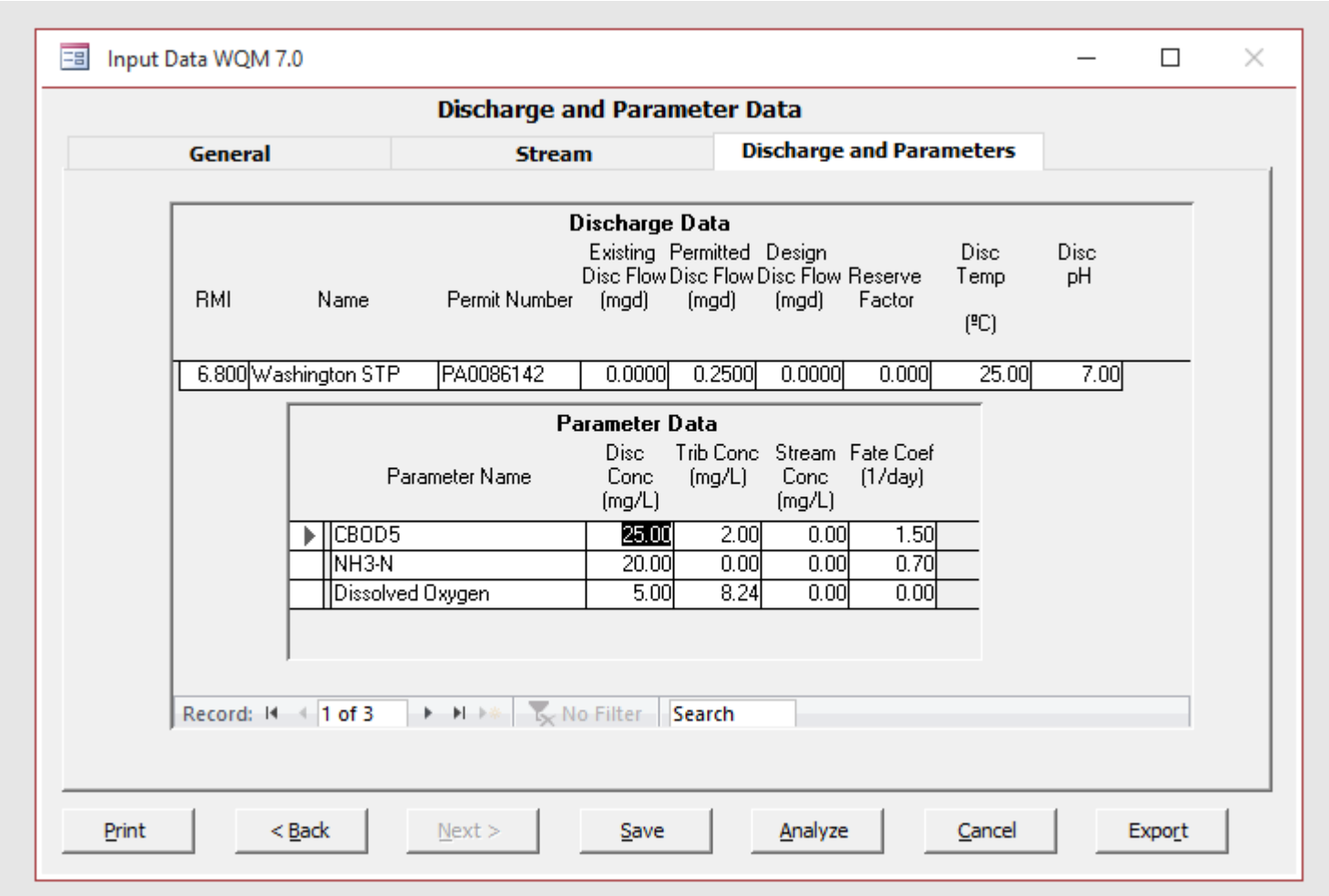
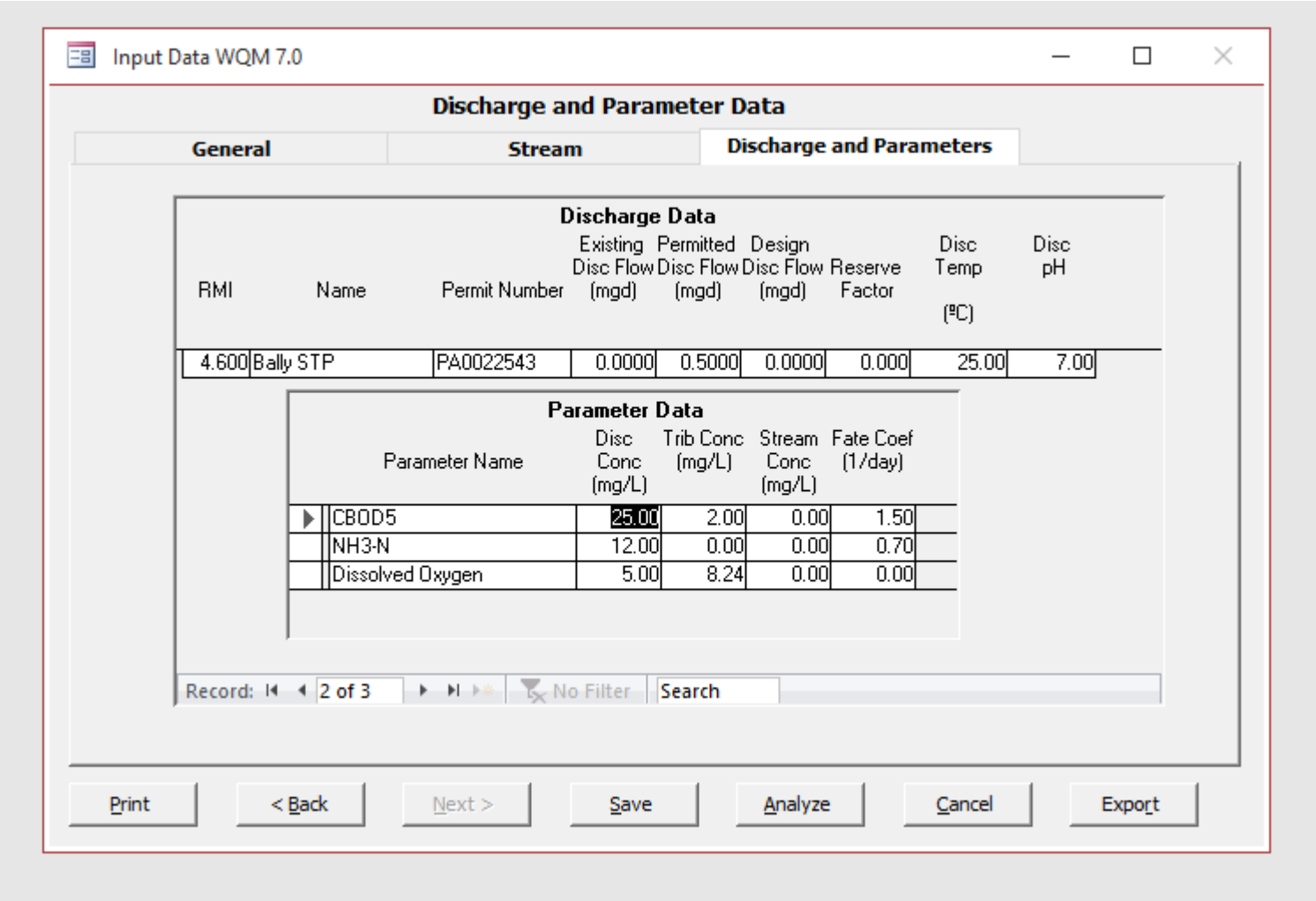
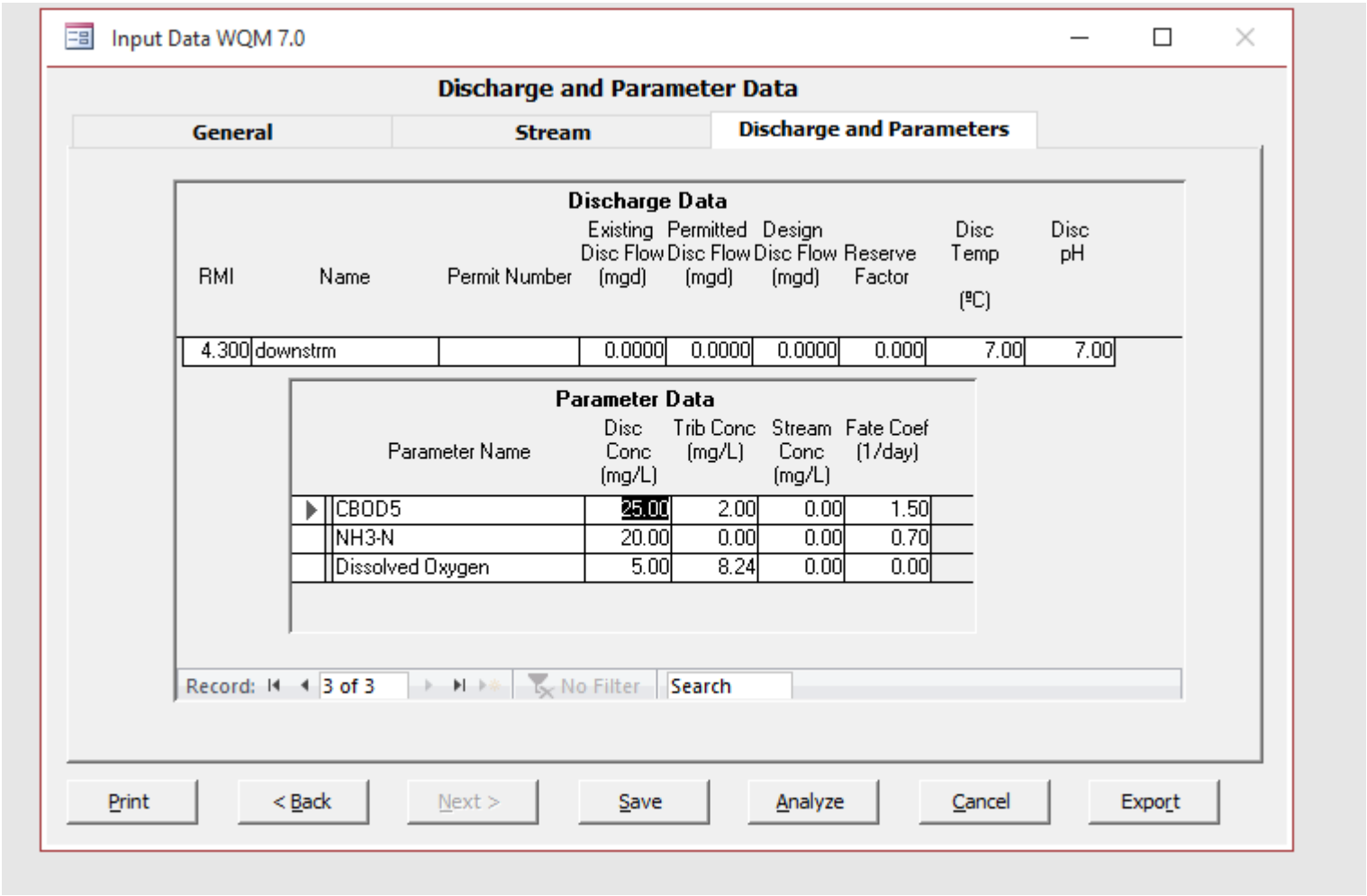
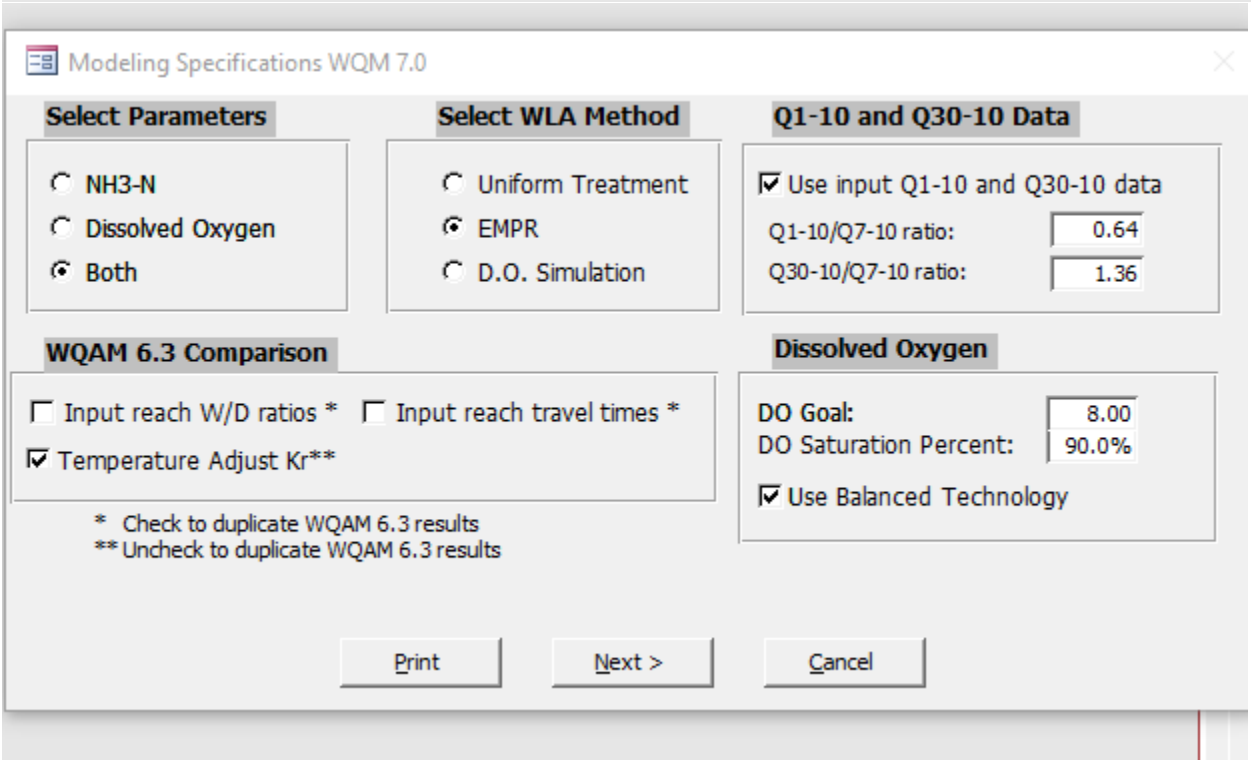
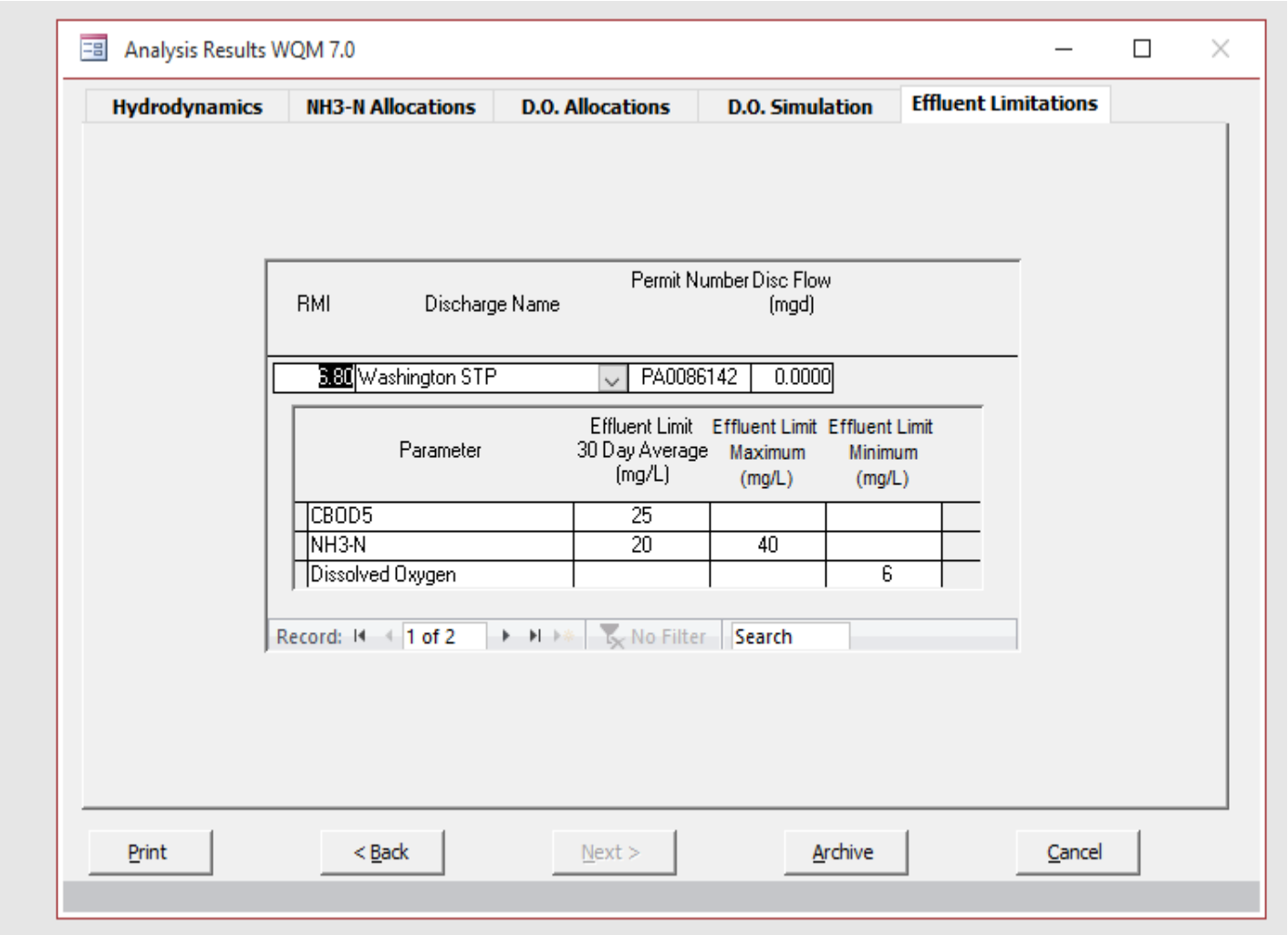
Stream Flow (cfs)
Rch Trav Time (days)
Rch Velocity (fps)
WD Ratio
Rch Width (ft)
Rch Depth (ft)
Tributary Temp (°C)
Tributary pH
Stream Temp (°C)
Stream pH
6.800 0.00 0.00 0.000 0.00 0 0.00 0.00 7.20 7.00 0.000 0.00
4.600 0.00 0.00 0.000 0.00 0 0.00 0.00 7.20 7.00 0.000 0.00
4.300 0.00 0.00 0.000 0.00 0 0.00 0.00 7.20 7.00 0.000 0.00
Record: 1 of 3
No Filter
Search
Print
< Back
Next >
Save
Analyze
Cancel
Export


Input Data WQM 7.0
Discharge and Parameter Data
General
Stream
Discharge and Parameters
Discharge Data
RMI
Name
Permit Number
Existing Disc Flow (mgd)
Permitted Disc Flow (mgd)
Design Disc Flow (mgd)
Reserve Factor
Disc Temp (ºC)
Disc pH
6.800
Washington STP
PA0086142
0.0000
0.2500
0.0000
0.000
25.00
7.00
Parameter Data
Parameter Name
Disc Conc (mg/L)
Trib Conc (mg/L)
Stream Conc (mg/L)
Fate Coef (1/day)
CBOD5
25.00
2.00
0.00
1.50
NH3-N
20.00
0.00
0.00
0.70
Dissolved Oxygen
5.00
8.24
0.00
0.00
Record: 1 of 3
No Filter
Search
Print
< Back
Next >
Save
Analyze
Cancel
Export


Input Data WQM 7.0
Discharge and Parameter Data
General
Stream
Discharge and Parameters
Discharge Data
RMI
Name
Permit Number
Existing Disc Flow (mgd)
Permitted Disc Flow (mgd)
Design Disc Flow (mgd)
Reserve Factor
Disc Temp (ºC)
Disc pH
4.600
Bally STP
PA0022543
0.0000
0.5000
0.0000
0.000
25.00
7.00
Parameter Data
Parameter Name
Disc Conc (mg/L)
Trib Conc (mg/L)
Stream Conc (mg/L)
Fate Coef (1/day)
CBOD5
25.00
2.00
0.00
1.50
NH3-N
12.00
0.00
0.00
0.70
Dissolved Oxygen
5.00
8.24
0.00
0.00
Record: 2 of 3
No Filter
Search
Print
< Back
Next >
Save
Analyze
Cancel
Export


Input Data WQM 7.0
Discharge and Parameter Data
General
Stream
Discharge and Parameters
Discharge Data
RMI
Name
Permit Number
Existing Disc Flow (mgd)
Permitted Disc Flow (mgd)
Design Disc Flow (mgd)
Reserve Factor
Disc Temp (ºC)
Disc pH
4.300 downstrm 0.0000 0.0000 0.0000 0.000 7.00 7.00
Parameter Data
Parameter Name
Disc Conc (mg/L)
Trib Conc (mg/L)
Stream Conc (mg/L)
Fate Coef (1/day)
CBOD5 25.00 2.00 0.00 1.50
NH3-N 20.00 0.00 0.00 0.70
Dissolved Oxygen 5.00 8.24 0.00 0.00
Record: 3 of 3
No Filter
Search
Print
< Back
Next >
Save
Analyze
Cancel
Export


Modeling Specifications WQM 7.0
Select Parameters
NH3-N
Dissolved Oxygen
Both
Select WLA Method
Uniform Treatment
EMPR
D.O. Simulation
Q1-10 and Q30-10 Data
Use input Q1-10 and Q30-10 data
Q1-10/Q7-10 ratio: 0.64
Q30-10/Q7-10 ratio: 1.36
WQAM 6.3 Comparison
Input reach W/D ratios *
Input reach travel times *
Temperature Adjust Kr**
Dissolved Oxygen
DO Goal: 8.00
DO Saturation Percent: 90.0%
Use Balanced Technology
* Check to duplicate WQAM 6.3 results
** Uncheck to duplicate WQAM 6.3 results
Print
Next >
Cancel


Analysis Results WQM 7.0
Hydrodynamics
NH3-N Allocations
D.O. Allocations
D.O. Simulation
Effluent Limitations
RMI
Discharge Name
Permit Number
Disc Flow (mgd)
5.80
Washington STP
PA0086142
0.0000
Parameter
Effluent Limit 30 Day Average (mg/L)
Effluent Limit Maximum (mg/L)
Effluent Limit Minimum (mg/L)
CBOD5
25
NH3-N
20
40
Dissolved Oxygen
6
Record: 1 of 2
No Filter
Search
Print
< Back
Next >
Archive
Cancel

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

2.7	= Q stream (cfs)	0.5	= CV Daily
0.25	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	1	= 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 = 2.246	1.3.2.iii	WLA cfc = 2.182
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.837	5.1d	LTA_cfc = 1.269

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.635	

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...** **...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...** **...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**

(0.011/EXP(-K*CFC_tc/1440))+(((CFC_Yc*Qs*0.011)/(1.547*Qd)....
....*EXP(-K*CFC_tc/1440)))+Xd+(CFC_Yc*Qs*Xs/1.547*Qd))*(1-FOS/100)

DEP's TMS model for Toxic parameters, version 1.4……..

Instructions | Discharge | Stream

Facility: **Washington STP** NPDES Permit No.: **PA0086142** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Sewage**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.25	100	7						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		556									
	Chloride (PWS)	mg/L		191									
	Bromide	mg/L	<	0.1									
	Sulfate (PWS)	mg/L		44.9									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L											
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	mg/L		0.0056									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	mg/L		0.053									
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

Discharge Information 12/21/2023 Page 1

No other toxic parameters in application….

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Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Washington STP, NPDES Permit No. PA0086142, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **W.Branch Perkiomen Crk**

No. Reaches to Model: 1

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	001439	6.8	420	14.4			Yes
End of Reach 1	001439	4.6	385	16.4			Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	6.8	0.187	2.7									100	7		
End of Reach 1	4.6	0.187													

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	6.8														
End of Reach 1	4.6														

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Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Washington STP, NPDES Permit No. PA0086142, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | (•) All ( ) Inputs ( ) Results ( ) Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.806 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	13.439	14.0	92.7	Chem Translator of 0.96 applied
Total Lead	0	0		0	64.581	81.6	541	Chem Translator of 0.791 applied
Total Zinc	0	0		0	117.180	120	794	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 23.104 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	8.956	9.33	74.5	Chem Translator of 0.96 applied
Total Lead	0	0		0	2.517	3.18	25.4	Chem Translator of 0.791 applied
Total Zinc	0	0		0	118.139	120	956	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 23.104 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	

Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 9.003 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Zinc	Report	Report	Report	Report	Report	mg/L	0.51	AFC	Discharge Conc > 10% WQBEL (no RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Total Copper	0.059	mg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	N/A	N/A	Discharge Conc < TQL

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PADEP Chapter 94 Spreadsheet
Sewage Treatment Plants

Reporting Year: 2022

Facility Name: Washington Township WWTP | **Permit No.:** PA0086142 | **Persons/EDU:** 2.4

Existing Hydraulic Design Capacity:	0.275	MGD		**Existing Organic Design Capacity:**	625	lbs BOD5/day
Upgrade Planned in Next 5 Years?	YES	**Year:**		**Upgrade Planned in Next 5 Years?**	YES	**Year:**
Future Hydraulic Design Capacity:	0.55	MGD		**Future Organic Design Capacity:**		lbs BOD5/day

Monthly Average Flows for Past Five Years (MGD)

Month	2018	2019	2020	2021	2022
January	0.169	0.2408	0.2376	0.1807	0.154
February	0.259	0.2514	0.2313	0.2004	0.1808
March	0.234	0.272	0.2529	0.261	0.1727
April	0.23	0.2697	0.2423	0.1887	0.2422
May	0.212	0.3495	0.2422	0.165	0.2352
June	0.169	0.2915	0.1916	0.1858	0.1718
July	0.209	0.3049	0.1929	0.1648	0.1567
August	0.315	0.2199	0.2415	0.1771	0.1459
September	0.306	0.2007	0.2051	0.2511	0.1578
October	0.203	0.2274	0.1922	0.1859	0.1927
November	0.294	0.2139	0.2281	0.1726	0.1681
December	0.249	0.2341	0.2276	0.1547	0.2026
Annual Avg	0.237	0.2563	0.2238	0.1907	0.1817
Max 3-Mo Avg	0.277	0.3153	0.2458	0.2167	0.2167
Max : Avg Ratio	1.17	1.23	1.10	1.14	1.19
Existing EDUs	905.0	959.0	992.0	1,031.0	1,045.0
Flow/EDU (GPD)	261.9	267.3	225.6	185.0	173.9
Flow/Capita (GPD)	109.1	111.4	94.0	77.1	72.4
Exist. Overload?	**NO**	**YES**	**NO**	**NO**	**NO**

Monthly Average BOD5 Loads for Past Five Years (lbs/day)

Month	2018	2019	2020	2021	2022
January	197	240	269	354	199
February	325	267	233	330	275
March	268	284	382	327	235
April	332	317	450	289	465
May	310	310	283	283	328
June	300	254	443	249	180
July	202	268	368	231	276
August	379	353	183	249	160
September	256	188	335	170	171
October	212	301	350	132	218
November	372	313	266	208	490
December	474	320	381	236	235
Annual Avg	302	285	329	255	269
Max Mo Avg	474	353	450	354	490
Max : Avg Ratio	1.57	1.24	1.37	1.39	1.82
Existing EDUs	905	959	992	1,031	1,045
Load/EDU	0.334	0.297	0.331	0.247	0.258
Load/Capita	0.139	0.124	0.138	0.103	0.107
Exist. Overload?	**NO**	**NO**	**NO**	**NO**	**NO**

Projected Flows for Next Five Years (MGD)

	2023	2024	2025	2026	2027
New EDUs	18.0	27.0	32.0	42.0	41.0
New EDU Flow	0.004	0.006	0.0071	0.0094	0.0091
Proj. Annual Avg	0.2219	0.2279	0.235	0.2444	0.2535
Proj. Max 3-Mo Avg	0.2586	0.2656	0.2738	0.2848	0.2954
Proj. Overload?	**NO**	**NO**	**NO**	**YES**	**YES**

Projected BOD5 Loads for Next Five Years (lbs/day)

	2023	2024	2025	2026	2027
New EDUs	18	27	32	42	41
New EDU Load	5.281	7.921	9.388	12.322	12.028
Proj. Annual Avg	293	301	311	323	335
Proj. Max Avg	433	445	459	477	495
Proj. Overload?	**NO**	**NO**	**NO**	**NO**	**NO**

Show Precipitation Data on Hydraulic Graph?

Total Monthly Precipitation for Past Five Years (Inches)

Month	2018	2019	2020	2021	2022
January	2.75	5.9	4.0	3.7	1.79

WWTP Expansion Anticipated in 2024-2025