Pennsylvania Department of Environmental Protection

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0028410**
Facility Type	**Municipal**	APS ID	**1067008**
Major / Minor	**Major**	Authorization ID	**1402415**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Municipal Authority of the Borough of Baden**	Facility Name	**Baden STP**
Applicant Address	149 State Street	Facility Address	Rt 65 Tevebaugh Run Road
	Baden, PA 15005-1937		Baden, PA 15005
Applicant Contact	Kevin Muntchler	Facility Contact	Kevin Mutchler
Applicant Phone	(724) 869-3701	Facility Phone	(724) 869-3701
Client ID	64999	Site ID	263554
Ch 94 Load Status	Not Overloaded	Municipality	Baden Borough
Connection Status	No Limitations	County	Beaver
Date Application Received	July 7, 2022	EPA Waived?	No
Date Application Accepted	July 23, 2022	If No, Reason	Major Facility

Purpose of Application: Renewal application to discharge treated sewage

Summary of Review

This review is in response to a renewal application received on July 7, 2022. Additional effluent sampling data was received on September 12, 2024. The Municipal Authority of the Borough of Baden (Baden) owns and operates a sewage treatment plant in Baden Borough, Beaver County. Sewage from Baden Borough, portions of Economy Borough, and portions of Harmony Township is collected and treated with flow equalization, screening, grit removal, aeration, clarification, and chlorine disinfection before discharging to the Ohio River through outfall 001.

Baden has agreed to accept sewage from Conway Borough. Conway is currently in the design phase of its project to replace its sewage plant with a pump station. Baden's application includes the anticipated flows from Conway. The added flow from Conway increases Baden's average flow by 0.5 MGD to 2.0 MGD. This permit was developed with Baden's average design flow being 2.0 MGD. Baden currently has a pending Water Quality Management (WQM) permit amendment application with the Department.

Sludge use and disposal description and location(s): sludge is sent to Seneca Landfill in Evans City, Butler County.

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

Approve	Deny	Signatures	Date
X		James Vanek James Vanek, P.E. / Environmental Engineer	September 19, 2024
X		Mahbuba Iasmin Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineering Manager	December 19, 2024

Summary of Review
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.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	2.0
Latitude	40º 38' 33"	Longitude	-80º 13' 58"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Ohio River (wwf)	Stream Code	32317
NHD Com ID	99680250	RMI	20.3
Drainage Area	19500 mi^2	Yield (cfs/mi^2)	0.25
Q_{7-10} Flow (cfs)	4800	Q_{7-10} Basis	Army Corps of Engineers, previous fact sheet
Elevation (ft)	680	Slope (ft/ft)	0.001
Watershed No.	20-G	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status			
Cause(s) of Impairment	**PCB's, Chlordane**		
Source(s) of Impairment	**Prior industrial activity**		
TMDL Status	**Final**	Name	

Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Municipal Authority of the Borough of Midland		
PWS Waters	Ohio River	Flow at Intake (cfs)	5300
PWS RMI	33	Distance from Outfall (mi)	12.7

Changes Since Last Permit Issuance:

Other Comments:

Treatment Facility Summary

Treatment Facility Name: Baden STP

WQM Permit No.	Issuance Date
0469401	6/2/1969

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Conventional Activated Sludge	Gas Chlorine	2.0

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
2.0	2,085	Not Overloaded	Aerobic digestion	Landfill

Changes Since Last Permit Issuance: average design flow is increasing from 1.5 MGD to 2.0 MGD.

Other Comments:

Compliance History

DMR Data for Outfall 001 (from August 1, 2023 to July 31, 2024)

Parameter	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23
Flow (MGD) Average Monthly	0.679	0.749	0.924	2.794	1.115	0.901	1.2592	0.832	0.75	0.705	0.689	0.903
Flow (MGD) Daily Maximum	1.02	1.123	1.293	3.94	2.009	2.094	3.257	2.044	1.527	1.19	0.910	2.315
pH (S.U.) Minimum	6.3	6.27	6.51	6.46	6.58	6.73	6.69	6.18	6.25	6.4	6.45	6.39
pH (S.U.) Maximum	7.31	7.16	7.09	7.42	7.14	7.18	7.2	7.16	7.1	7.27	7.22	7.31
DO (mg/L) Minimum	5.65	5.5	6.34	5.97	6.08	6.67	6.72	4.63	5.61	4.93	5.77	5.8
TRC (mg/L) Average Monthly	0.38	0.37	0.36	0.37	0.32	0.35	0.41	0.3	0.24	0.34	0.32	0.39
TRC (mg/L) Instantaneous Maximum	0.68	0.63	0.67	0.64	0.48	0.61	0.68	0.62	0.67	0.56	0.57	0.64
CBOD5 (lbs/day) Average Monthly	46	98	38	122	58	62	80	59	25	32	38	35
CBOD5 (lbs/day) Weekly Average	59	224	43	300	70	81	132	115	28	56	54	56
CBOD5 (mg/L) Average Monthly	8.0	15.0	5.0	8.0	6.0	8.0	8.0	7.0	4.0	6.0	7.0	5.0
CBOD5 (mg/L) Weekly Average	10.2	35.4	6.1	9.2	7.3	9.8	13.3	8.9	4.7	10.0	9.8	9.9
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	1064	691	892	1348	1235	1250	1408	1246	1113	1169	1149	1244
BOD5 (lbs/day) Raw Sewage Influent Weekly Average	1493	1018	1344	1351	1516	1344	2098	1662	1559	1402	1309	1500
BOD5 (mg/L) Raw Sewage Influent Average Monthly	175.6	105.2	123.3	128.3	127.4	173.4	138.7	163	191	206	198	194
BOD5 (mg/L) Raw Sewage Influent Weekly Average	256	148.3	202	153.5	135.2	213.5	217	175	278	254	211	272

TSS (lbs/day) Average Monthly	33	36	61	121	52	71	93	52.0	30	37	29	34
TSS (lbs/day) Raw Sewage Influent Average Monthly	1660	1249	886	1271	1326	1195	1166	1012	1090	1064	758	981
TSS (lbs/day) Raw Sewage Influent Weekly Average	3511	1610	2155	1427	1721	1697	1996	1540	1719	1500	975	1536
TSS (lbs/day) Weekly Average	37	48	127	366	69	152	156	88.0	32	40	31	40
TSS (mg/L) Average Monthly	5.0	5.0	8.0	6.0	5.0	8.0	8.0	6.0	5.0	6.0	5.0	5.0
TSS (mg/L) Raw Sewage Influent Average Monthly	275	184	122	122.2	135.2	163	102	124	187	188	131	156.1
TSS (mg/L) Raw Sewage Influent Weekly Average	598	210	308	105.5	183.5	246	130	146	307	274	157	278
TSS (mg/L) Weekly Average	6.5	6.5	17.7	11.3	5.8	11.8	15.8	7.5	5.3	7.3	5.0	5.5
Fecal Coliform (No./100 ml) Geometric Mean	6	8	12	< 16	4	2	12	77	109	8	7	6
Fecal Coliform (No./100 ml) Instantaneous Maximum	55	313	46	2420	46	53	770	2420	2420	73	350	26
Total Nitrogen (lbs/day) Daily Maximum		185			136			150			11	
Total Nitrogen (mg/L) Daily Maximum		22.86			19.91			24.88			1.75	
Ammonia (mg/L) Average Monthly	0.498	0.52	0.57	0.87	3.56	6.22	4.37	2.93	0.78	0.36	0.6	0.37
Ammonia (mg/L) Daily Maximum	1.01	0.87	1.97	1.67	6.55	8.15	9.1	4.24	1.64	0.51	0.97	0.65
Total Phosphorus (lbs/day) Daily Maximum		26			15			21			18	
Total Phosphorus (mg/L) Daily Maximum		2.91			2.25			3.56			2.85	

Other Comments:

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 2.0
Latitude 40º 38' 33.00" **Longitude** -80º 13' 58.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
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	0.5	Average Monthly	-	92a.48(b)(2)

The TSS and pH limits are the same as those in EPA's secondary treatment regulation (40 CFR § 133.102).

Average monthly and maximum daily flow must be reported pursuant to 25 Pa. Code § 92a.61(d)(1). The minimum dissolved oxygen limit of 4.0 mg/L imposed in the previous permit will be reimposed in the new permit pursuant to 25 Pa. Code § 92a.61(b) (regarding reasonable monitoring requirements) and BPJ.

In accordance with Section I of DEP's "Standard Operating Procedure for Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits" [SOP No. BCW-PMT-033, Version 1.9, March 22, 2021] and under the authority of 25 Pa. Code § 92a.61(b), annual reporting for Total Nitrogen and Total Phosphorus is required for sewage discharges with design flows greater than 2,000 gpd to help evaluate treatment effectiveness and to monitor nutrient loading to the receiving watershed (this reporting was required by the previous permit and will be reimposed in the new permit). Pursuant to that same SOP and under the authority of § 92a.61(b), an annual reporting requirement for *E. coli* will be added to Outfall 001. *E. coli* was recently added to the bacteria water quality criteria in 25 Pa. Code § 93.7(a) and the monitoring will be used to determine if *E. coli* concentrations require additional controls.

Baden STP uses chlorine for disinfection. Once the sewage plant expands to accept the flow from Conway Borough, the Baden STP will use ultraviolet light disinfection rather than chlorine. Baden will have to amend the NPDES permit once the UV is built. Until that time, TRC will be limited.

Water Quality-Based Limitations

The following limitations were determined through water quality modeling (output files attached):

Parameter	Limit (mg/l)	SBC	Model
Antimony	Report	Average Monthly	TMS
Mercury	Report	Average Monthly	TMS/ORSANCO criteria

WQM 7.0 Water Quality Modeling Program

WQM 7.0 is a water quality modeling program for Windows that determines Waste Load Allocations ("WLAs") and effluent limitations for carbonaceous biochemical oxygen demand ("$CBOD_5$"), ammonia-nitrogen, and dissolved oxygen ("DO") for single and multiple point-source discharge scenarios. To accomplish this, the model simulates two basic processes. In the ammonia-nitrogen module, the model simulates the mixing and degradation of ammonia-nitrogen in the stream and compares calculated instream ammonia-nitrogen concentrations to ammonia-nitrogen water quality criteria. In the DO module, the model simulates the mixing and consumption of DO in the stream due to the degradation of $CBOD_5$ and ammonia-nitrogen, and compares calculated instream DO concentrations to DO water quality criteria. WQM 7.0 then determines the highest pollutant loadings that the stream can assimilate while still meeting water quality criteria under design conditions.

This model was not used for the permit review. Experience has shown that a 2 MGD discharge into a 4800 cfs stream will result in straight secondary limits. Seasonal, water quality-based limits are not necessary for NH_3N or $CBOD_5$.

Total Maximum Daily Load for the Ohio River

A Total Maximum Daily Load (“TMDL”) for the Ohio River was completed on March 6, 2001, for polychlorinated biphenyls (PCB’s) and chlordane. In accordance with 40 CFR § 122.44(d)(1)(vii)(B), when developing WQBELs, the permitting authority shall ensure that effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available wasteload allocation (WLA) for the discharge prepared by the State and approved by EPA pursuant to 40 CFR § 130.7. The Baden STP was not assigned WLAs for PCB’s or chlordane. The TMDL recommends natural attenuation for the mitigation of PCB’s and chlordane. Baden does not need to sample for those parameters.

Toxics Management Spreadsheet

The Toxics Management Spreadsheet (TMS) is used to calculate a reasonable potential (RP) analysis and determine water quality-based effluent limitations for discharges of toxic pollutants. Discharge characteristics and stream characteristics are placed into the TMS. For NPDES renewals, the maximum concentration reported in the application or Discharge Monitoring Reports (DMR’s) is entered as the discharge concentration for that pollutant. That will be used to conduct the reasonable potential (RP) analysis after a WQBEL is calculated.

WQBEL’s can be based on acute fish criterion (AFC), chronic fish criterion (CFC), threshold human health criterion (THH), or carcinogen risk level (CRC). AFC is based on the mixing of stream flow and wastewater flow after 15 minutes. CFC is based on the mixing of stream flow and wastewater flow after 12 hours. THH is based on the mixing of stream flow and wastewater flow after 12 hours or at the point of a potable water intake. CRL is based on the mixing of stream flow and wastewater flow after 12 hours. CRL limits use the harmonic mean flow of the stream. AFC, CFC and THH WQBEL’s use the $Q_{7\text{-}10}$ flow of the receiving stream.

The table above lists the recommended WQBEL’s for the Baden STP. Monitoring for antimony and mercury is recommended. The TMS recommends numeric limits for pollutants whose application reported maximum discharge concentration is equal to or greater than 50% of the WQBEL. The TMS recommends monitoring for pollutants whose application reported maximum discharge concentration is greater than 10% and less than 50% of the WQBEL for conservative pollutants. The TMS recommends monitoring for pollutants whose application reported maximum discharge concentration is greater than 25% and less than 50% of the WQBEL for non-conservative pollutants. The input and output for the TMS is attached in the references section of this report.

Mass Limits

In accordance with Table 5-3 of DEP's “Technical Guidance for the Development and Specification of Effluent Limitations. and Other Permit Conditions in NPDES Permits” and Section IV of DEP’s “Standard Operating Procedure for Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits”, mass limits are calculated for $CBOD_5$ and TSS. Average monthly and average weekly mass limits in units of pounds per day are calculated using the concentration limits in Table 1 and Baden’s average design flow of 2.0 MGD with the following formula:

Design flow (average annual) (MGD) × concentration limit (mg/L) at design flow × conversion factor (8.34) = mass limit (lb/day)

Mass Limits:

Parameter	Average Monthly (ppd)	Average Weekly (ppd)
CBOD5	417	634
Total Suspended Solids	500	751

Influent Monitoring

Pursuant to Section IV.E.8 of DEP's "Standard Operating Procedure (SOP) for Clean Water Program New and Reissuance Sewage Individual NPDES Permit Applications" [SOP No. BCW-PMT-002, Version 1.9, January 6, 2020], for POTWs with design flows greater than 2,000 GPD, influent BOD_5 and TSS monitoring is established in the permit with the same minimum measurement frequency and sample type used for the effluent (2/week, 24-Hr Composite) for the Piney Fork STP. The required influent monitoring will be for BOD_5 and TSS including average monthly and average weekly influent loading and average monthly and average weekly influent concentrations.

As stated in Footnote 3 in Part A of the current NPDES permit, the organic design capacity of 6,155 lbs BOD_5 per day for the treatment facility is used to prepare the annual Municipal Wasteload Management Report to determine whether an organic overload condition exists, as defined in 25 Pa. Code Chapter 94. That is, BOD_5 is the parameter used to determine whether a sewage treatment plant is organically overloaded.

Best Professional Judgment (BPJ) Limitations

The dissolved oxygen instantaneous minimum limit of 4.0 mg/l is BPJ limit.

Anti-Backsliding

Anti-backsliding was not used in this permit renewal.

Industrial Contributors

The application states that the system does not have any industrial users. However, once Conway Borough connects to the Baden plant, the Conway rail yard will be an industrial customer. Baden should expect that the pretreatment requirements at Conway will be imposed at Baden. In anticipation of Conway connecting to Baden, Part C.II language has been added to the permit.

Fecal Coliform

The following Fecal Coliform limits were imposed in the previous NPDES permits based on past ORSANCO Bacteria discharge requirements:

Period	Avg. Monthly	Instantaneous Maximum
May 1 to Oct 31	200/100 ml, Geometric Mean	400/100 ml
Nov 1 to Apr 30	2,000/100 ml, Geometric Mean	10,000/100 ml

Changes were made to ORSANCO's Bacteria discharge requirements to include an E. coli bacteria limit of 130/100 ml as a 90-day geometric mean for the period April through October, and not to exceed 240/100 ml in more than 25% of the samples. The following correlation analysis was made to show that extending the warmer period Fecal Coliform limits to include the month of April will be adequate to meet the above E. coli limit. ORSANCO has not objected to the use of this analysis:

The equations below are taken from the Ohio Environmental Protection Agency:

Current Warmer Period Avg. Monthly limit for Fecal Coliform (FC) = 200/100 ml

Using the equation for NE area of Ohio, E. coli = 0.667 x (FC)^1.034 = 159.73/100 ml

Using the equation for rest of Ohio, E. Coli = 0.403 x (FC)^1.028 = 93.49/100 ml

Average of two values = (159.73 + 93.49)/2 = 126.61/100 ml < 130/100 ml

In summary, the discharge meets the ORSANCO E. coli effluent standard of 130/100 ml by maintaining an effluent Fecal Coliform Avg. Monthly limit of 200/100 ml from April through October, which becomes the new recreational season period. Using the same equations for a maximum Fecal Coliform count of 400/100 ml at 10% of the time exceedance is more restrictive than the 25% exceedance at 240/100 ml E. coli.

PFAS/PFOS Parameters

In February 2024, DEP implemented a new monitoring initiative for PFAS consistent with an EPA memorandum that provides guidance to states for addressing PFAS discharges. PFAS are a family of thousands of synthetic organic chemicals that contain a chain of strong carbon-fluorine bonds. Many PFAS are highly stable, water- and oil-resistant, and exhibit other properties that make them useful in a variety of consumer products and industrial processes. PFAS are resistant to biodegradation, photooxidation, direct photolysis, and hydrolysis and do not readily degrade naturally; thus, many PFAS accumulate over time. According to the United States Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR), the environmental persistence and mobility of some PFAS, combined with decades of widespread use, have resulted in their presence in surface water, groundwater, drinking water, rainwater, soil, sediment, ice caps, outdoor and indoor air, plants, animal tissue, and human blood serum across the globe. ATSDR also reported that exposure to certain PFAS can lead to adverse human health impacts Due to their durability, toxicity, persistence, and pervasiveness, PFAS have emerged as potentially significant pollutants of concern.

In accordance with Section II.I of DEP's "Standard Operating Procedure (SOP) for Clean Water Program – Establishing Effluent Limitations for Individual Industrial Permits" [SOP No. BCW-PMT-032] and under the authority of 25 Pa. Code § 92a.61(b), DEP has determined that monitoring for a subset of common/well-studied PFAS including Perfluorooctanoic acid (PFOA), Perfluorooctanesulfonic acid (PFOS), Perfluorobutanesulfonic acid (PFBS), and Hexafluoropropylene oxide dimer acid (HFPO-DA) is necessary to help understand the extent of environmental contamination by PFAS in the Commonwealth and the extent to which point source dischargers are contributors. SOP BCW-PMT-032 directs permit writers to consider special monitoring requirements for PFOA, PFOS, PFBS, and HFPO-DA in the following instances:

a. If sampling that is completed as part of the permit renewal application reveals a detection of PFOA, PFOS, HFPO-DA or PFBS (any of these compounds), the application manager will establish a quarterly monitoring requirement for PFOA, PFOS, HFPO-DA and PFBS (all of these compounds) in the permit.

b. If sampling that is completed as part of the permit renewal application demonstrates non-detect values at or below the Target QLs for PFOA, PFOS, HFPO-DA and PFBS (all of these compounds in a minimum of 3 samples), the application manager will establish an annual monitoring requirement for PFOA, PFOS, HFPO-DA and PFBS in the permit.

c. In all cases the application manager will include a condition in the permit that the permittee may cease monitoring for PFOA, PFOS, HFPO-DA and PFBS when the permittee reports non-detect values at or below the Target QL for four consecutive monitoring periods for each PFAS parameter that is analyzed. Use the following language: The permittee may discontinue monitoring for PFOA, PFOS, HFPO-DA, and PFBS if the results in 4 consecutive monitoring periods indicate non-detects at or below Quantitation Limits of 4.0 ng/L for PFOA, 3.7 ng/L for PFOS, 3.5 ng/L for PFBS and 6.4 ng/L for HFPO-DA. When monitoring is discontinued, permittees should enter a No Discharge Indicator (NODI) Code of "GG" on DMRs.

The Authority's application was submitted before the NPDES permit application forms were updated to require sampling for PFOA, PFOS, PFBS, and HFPO-DA. The authority did sample for PFAS parameters and submitted the results. None of

the samples exceeded the QL's listed for the four parameters. Therefore, annual reporting of PFOA, PFOS, PFBS, and HFPO-DA will be required consistent with Section II.G of SOP BCW-PMT-0332.

As stated in Section II.G.3 of SOP BCW-PMT-0332, if non-detect values at or below DEP's Target QLs are reported for four consecutive monitoring periods (i.e., four consecutive annual results), then the monitoring may be discontinued. Footnote (3) has been added to Part A of the NPDES Permit, which further discusses monitoring and reporting requirements.

Storm Water

Baden has a storm water outfall 011 that discharges to a tributary of the Ohio River named Tevebaugh Run. The storm water runoff is from the treatment plant yard and parking area. The standard storm water condition has been placed into Part C of the permit. There is no need for effluent limits for outfall 011.

Whole Effluent Toxicity (WET)

For Outfall 001, ☒ **Acute** ☐ **Chronic** WET Testing was completed:

☐ For the permit renewal application (4 tests).
☐ Quarterly throughout the permit term.
☐ Quarterly throughout the permit term and a TIE/TRE was conducted.
☒ Other: annually throughout the permit term

The dilution series used for the tests was: 100%, 60%, 30%, 2%, and 1%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 0.02.

Summary of Four Most Recent Test Results

TST Data Analysis

Test Date	*Ceriodaphnia* Results (Pass/Fail)		*Pimephales* Results (Pass/Fail)	
	Survival	**Reproduction**	**Survival**	**Growth**
10/14/2018	PASS	NA	PASS	NA
10/31/2019	PASS	NA	PASS	NA
10/18/2020	PASS	NA	PASS	NA
10/23/2021	PASS	NA	PASS	NA

***** *A "passing" result is that in which the replicate data for the TIWC is not statistically significant from the control condition. This is exhibited when the calculated t value ("T-Test Result") is greater than the critical t value. A "failing" result is exhibited when the calculated t value ("T-Test Result") is less than the critical t value.*

Is there reasonable potential for an excursion above water quality standards based on the results of these tests? (*NOTE – In general, reasonable potential is determined anytime there is at least one test failure in the previous four tests).*

☐ **YES** ☒ **NO**

Comments: WET data is attached in the references section of the report.

Evaluation of Test Type, IWC and Dilution Series for Renewed Permit

Acute Partial Mix Factor (PMFa): **0.081** Chronic Partial Mix Factor (PMFc): **0.564**

1. Determine IWC – Acute (IWCa):

$(Q_d \times 1.547) / ((Q_{7\text{-}10} \times PMFa) + (Q_d \times 1.547))$

[(2 MGD x 1.547) / ((4800 cfs x 0.081) + (2 MGD x 1.547))] x 100 = **0.8%**

Is IWCa < 1%? ☒ **YES** ☐ **NO**

Type of Test for Permit Renewal: **Acute**

2. Determine Target IWCa (If Acute Tests Required)

TIWCa = 0.8% / 0.3 = 2.6**%**

3. Determine Dilution Series

Dilution Series = 100%, 60%, 30%, 3%, and 1%.

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

Will WET limits be established in the permit? ☐ YES ☒ NO

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) (1)		Concentrations (mg/L)				Minimum (2) 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	Recorded
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	1/day	Measured
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	417	634	XXX	25.0	38.0	50	2/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	Report	XXX	2/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	Report	XXX	2/week	24-Hr Composite
TSS	500	751	XXX	30.0	45.0	60	2/week	24-Hr Composite
Fecal Coliform (No./100 ml) Nov 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Fecal Coliform (No./100 ml) May 1 - Oct 31	XXX	XXX	XXX	200 Geo Mean	XXX	400	2/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab
Total Nitrogen	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2)	Required
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum	Measurement Frequency	Sample Type
Ammonia-Nitrogen	XXX	XXX	XXX	Report	Report Daily Max	XXX	2/week	24-Hr Composite
Total Phosphorus	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite
Total Antimony (ug/L)	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Mercury (ng/L)	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
PFOA (ng/L)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
PFOS (ng/L)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
PFBS (ng/L)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
HFPO-DA (ng/L)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab

Compliance Sampling Location: outfall 001

Other Comments:

REFERENCES

TMS Output

Model Results

Baden STP, NPDES Permit No. PA0028410, Outfall 001

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☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.081 Analysis Hardness (mg/l): 100.67 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 Aluminum	0	0		0	750	750	96,866	
Total Antimony	0	0		0	1,100	1,100	142,071	
Total Arsenic	0	0		0	340	340	43,913	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	2,712,258	
Total Boron	0	0		0	8,100	8,100	1,046,157	
Total Cadmium	0	0		0	2.027	2.15	277	Chem Translator of 0.944 applied
Total Chromium (III)	0	0		0	572.869	1,813	234,142	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	2,104	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	12,270	
Total Copper	0	0		0	13.523	14.1	1,819	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	2,841	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	65.050	82.3	10,634	Chem Translator of 0.79 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	213	Chem Translator of 0.85 applied
Total Nickel	0	0		0	470.872	472	60,937	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	3.254	3.83	494	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	8,395	
Total Zinc	0	0		0	117.841	120	15,562	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	387	
Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	650	650	83,951	

Benzene	0	0		0	640	640	82,659	
Bromoform	0	0		0	1,800	1,800	232,479	
Carbon Tetrachloride	0	0		0	2,800	2,800	361,634	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	2,324,793	
Chloroform	0	0		0	1,900	1,900	245,395	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	1,937,327	
1,2-Dichloropropane	0	0		0	11,000	11,000	1,420,707	
Ethylbenzene	0	0		0	2,900	2,900	374,550	
Methylene Chloride	0	0		0	12,000	12,000	1,549,862	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	129,155	
Toluene	0	0		0	1,700	1,700	219,564	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	387,465	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	439,128	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	72,327	
2,4-Dichlorophenol	0	0		0	1,700	1,700	219,564	
2,4-Dimethylphenol	0	0		0	660	660	85,242	
2,4-Dinitrophenol	0	0		0	660	660	85,242	
2-Nitrophenol	0	0		0	8,000	8,000	1,033,241	
4-Nitrophenol	0	0		0	2,300	2,300	297,057	
Pentachlorophenol	0	0		0	8.718	8.72	1,126	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	59,411	
Acenaphthene	0	0		0	83	83.0	10,720	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	38,747	
Benzo(a)Anthracene	0	0		0	0.5	0.5	64.6	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	3,874,655	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	581,198	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	34,872	
Butyl Benzyl Phthalate	0	0		0	140	140	18,082	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	105,907	
1,3-Dichlorobenzene	0	0		0	350	350	45,204	
1,4-Dichlorobenzene	0	0		0	730	730	94,283	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	516,621	
Dimethyl Phthalate	0	0		0	2,500	2,500	322,888	
Di-n-Butyl Phthalate	0	0		0	110	110	14,207	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	206,648	
2,6-Dinitrotoluene	0	0		0	990	990	127,864	
1,2-Diphenylhydrazine	0	0		0	15	15.0	1,937	
Fluoranthene	0	0		0	200	200	25,831	

Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	10	10.0	1,292	
Hexachlorocyclopentadiene	0	0		0	5	5.0	646	
Hexachloroethane	0	0		0	60	60.0	7,749	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	1,291,552	
Naphthalene	0	0		0	140	140	18,082	
Nitrobenzene	0	0		0	4,000	4,000	516,621	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	2,195,638	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	38,747	
Phenanthrene	0	0		0	5	5.0	646	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	16,790	

☑ *CFC* CCT (min): 720 PMF: 0.564 Analysis Hardness (mg/l): 100.1 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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	195,555	
Total Arsenic	0	0		0	150	150	133,333	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	3,644,428	
Total Boron	0	0		0	1,600	1,600	1,422,216	
Total Cadmium	0	0		0	0.246	0.27	241	Chem Translator of 0.909 applied
Total Chromium (III)	0	0		0	74.173	86.2	76,665	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	9,240	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	16,889	
Total Copper	0	0		0	8.963	9.34	8,299	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	4,622	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	2,364,945	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.519	3.19	2,832	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	805	Chem Translator of 0.85 applied
Total Nickel	0	0		0	52.049	52.2	46,405	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4.600	4.99	4,435	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	11,556	
Total Zinc	0	0		0	118.236	120	106,590	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	2,667	
Acrylamide	0	0		0	N/A	N/A	N/A	

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Acrylonitrile	0	0		0	130	130	115,555	
Benzene	0	0		0	130	130	115,555	
Bromoform	0	0		0	370	370	328,887	
Carbon Tetrachloride	0	0		0	560	560	497,776	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	3,111,097	
Chloroform	0	0		0	390	390	346,665	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	2,755,543	
1,2-Dichloropropane	0	0		0	2,200	2,200	1,955,547	
Ethylbenzene	0	0		0	580	580	515,553	
Methylene Chloride	0	0		0	2,400	2,400	2,133,324	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	186,666	
Toluene	0	0		0	330	330	293,332	
1,1,1-Trichloroethane	0	0		0	610	610	542,220	
1,1,2-Trichloroethane	0	0		0	680	680	604,442	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	97,777	
2,4-Dichlorophenol	0	0		0	340	340	302,221	
2,4-Dimethylphenol	0	0		0	130	130	115,555	
2,4-Dinitrophenol	0	0		0	130	130	115,555	
2-Nitrophenol	0	0		0	1,600	1,600	1,422,216	
4-Nitrophenol	0	0		0	470	470	417,776	
Pentachlorophenol	0	0		0	6.689	6.69	5,945	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	80,889	
Acenaphthene	0	0		0	17	17.0	15,111	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	52,444	
Benzo(a)Anthracene	0	0		0	0.1	0.1	88.9	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	5,333,310	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	808,885	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	48,000	
Butyl Benzyl Phthalate	0	0		0	35	35.0	31,111	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	142,222	
1,3-Dichlorobenzene	0	0		0	69	69.0	61,333	
1,4-Dichlorobenzene	0	0		0	150	150	133,333	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	711,108	
Dimethyl Phthalate	0	0		0	500	500	444,442	
Di-n-Butyl Phthalate	0	0		0	21	21.0	18,667	
2,4-Dinitrotoluene	0	0		0	320	320	284,443	

2,6-Dinitrotoluene	0	0		0	200	200	177,777	
1,2-Diphenylhydrazine	0	0		0	3	3.0	2,667	
Fluoranthene	0	0		0	40	40.0	35,555	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	1,778	
Hexachlorocyclopentadiene	0	0		0	1	1.0	889	
Hexachloroethane	0	0		0	12	12.0	10,667	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	1,866,658	
Naphthalene	0	0		0	43	43.0	38,222	
Nitrobenzene	0	0		0	810	810	719,997	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	3,022,209	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	52,444	
Phenanthrene	0	0		0	1	1.0	889	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	23,111	

☑ ***THH*** CCT (min): 720 PMF: 0.564 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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	4,978	
Total Arsenic	0	0		0	10	10.0	8,889	
Total Barium	0	0		0	1,000	1,000	888,885	
Total Boron	0	0		0	3,100	3,100	2,755,543	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	1,300	1,300	1,155,550	
Free Cyanide	0	0		0	4	4.0	3,556	
Dissolved Iron	0	0		0	300	300	266,665	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	888,885	
Total Mercury	0	0		0	0.012	0.012	10.7	
Total Nickel	0	0		0	610	610	542,220	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	213	

Total Zinc	0	0		0	7,400	7,400	6,577,749	
Acrolein	0	0		0	3	3.0	2,667	
Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	
Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	5,067	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	68	68.0	60,444	
Methylene Chloride	0	0		0	N/A	N/A	N/A	
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	50,666	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	8,888,849	
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	30	30.0	26,667	
2,4-Dichlorophenol	0	0		0	10	10.0	8,889	
2,4-Dimethylphenol	0	0		0	100	100.0	88,888	
2,4-Dinitrophenol	0	0		0	10	10.0	8,889	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	N/A	N/A	N/A	
Phenol	0	0		0	4,000	4,000	3,555,540	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	62,222	
Anthracene	0	0		0	300	300	266,665	
Benzidine	0	0		0	N/A	N/A	N/A	
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	88.9	
2-Chloronaphthalene	0	0		0	800	800	711,108	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	420	420	373,332	
1,3-Dichlorobenzene	0	0		0	7	7.0	6,222	
1,4-Dichlorobenzene	0	0		0	63	63.0	56,000	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	533,331	

Dimethyl Phthalate	0	0		0	2,000	2,000	1,777,770	
Di-n-Butyl Phthalate	0	0		0	20	20.0	17,778	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	17,778	
Fluorene	0	0		0	50	50.0	44,444	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	3,556	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	30,222	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	8,889	
n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	17,778	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	62.2	

☑ *CRL* CCT (min): 720 PMF: 0.767 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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	

Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	50	50.0	154,039	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	
Acrylamide	0	0		0	0.07	0.07	216	
Acrylonitrile	0	0		0	0.051	0.051	157	
Benzene	0	0		0	0.58	0.58	1,787	
Bromoform	0	0		0	4.3	4.3	13,247	
Carbon Tetrachloride	0	0		0	0.4	0.4	1,232	
Chlorodibromomethane	0	0		0	0.4	0.4	1,232	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	0.55	0.55	1,694	
1,2-Dichloroethane	0	0		0	0.38	0.38	1,171	
1,2-Dichloropropane	0	0		0	0.5	0.5	1,540	
Ethylbenzene	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	4.6	4.6	14,172	
1,1,2,2-Tetrachloroethane	0	0		0	0.17	0.17	524	
Toluene	0	0		0	N/A	N/A	N/A	
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A	
1,1,2-Trichloroethane	0	0		0	0.55	0.55	1,694	
Vinyl Chloride	0	0		0	0.02	0.02	61.6	
2-Chlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A	
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	0.030	0.03	92.4	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.4	1.4	4,313	
Acenaphthene	0	0		0	N/A	N/A	N/A	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	0.000086	0.00009	0.26	
Benzo(a)Anthracene	0	0		0	0.001	0.001	3.08	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.31	
Benzo(k)Fluoranthene	0	0		0	0.0038	0.004	11.7	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	92.4	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	986	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	0.0038	0.004	11.7	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.31	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	

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 Aluminum	62,087	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	8,889	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	888,885	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	670,544	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	178	µg/L	Discharge Conc ≤ 10% WQBEL
Total Chromium (III)	76,665	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	1,349	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	7,864	µg/L	Discharge Conc ≤ 10% WQBEL
Free Cyanide	1,821	µg/L	Discharge Conc ≤ 25% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	266,665	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	2,364,945	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	2,832	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	888,885	µg/L	Discharge Conc ≤ 10% WQBEL
Total Nickel	39,058	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	4,435	µg/L	Discharge Conc ≤ 10% WQBEL
Total Silver	317	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	213	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	248	µg/L	Discharge Conc ≤ 25% WQBEL
Acrylamide	216	µg/L	Discharge Conc ≤ 25% WQBEL
Acrylonitrile	157	µg/L	Discharge Conc < TQL
Benzene	1,787	µg/L	Discharge Conc ≤ 25% WQBEL
Bromoform	13,247	µg/L	Discharge Conc ≤ 25% WQBEL
Carbon Tetrachloride	1,232	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorodibromomethane	1,232	µg/L	Discharge Conc ≤ 25% WQBEL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	1,490,098	µg/L	Discharge Conc < TQL
Chloroform	5,067	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	1,694	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	1,171	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-Dichloropropane	1,540	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	60,444	µg/L	Discharge Conc ≤ 25% WQBEL
Methylene Chloride	14,172	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2,2-Tetrachloroethane	524	µg/L	Discharge Conc ≤ 25% WQBEL
Toluene	50,666	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,1-Trichloroethane	248,350	µg/L	Discharge Conc ≤ 25% WQBEL

1,1,2-Trichloroethane	1,694	µg/L	Discharge Conc ≤ 25% WQBEL
Vinyl Chloride	61.6	µg/L	Discharge Conc ≤ 25% WQBEL
2-Chlorophenol	26,667	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	8,889	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	54,637	µg/L	Discharge Conc ≤ 25% WQBEL
2,4-Dinitrophenol	8,889	µg/L	Discharge Conc ≤ 25% WQBEL
2-Nitrophenol	662,266	µg/L	Discharge Conc < TQL
4-Nitrophenol	190,401	µg/L	Discharge Conc ≤ 25% WQBEL
Pentachlorophenol	92.4	µg/L	Discharge Conc < TQL
Phenol	3,555,540	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	4,313	µg/L	Discharge Conc < TQL
Acenaphthene	6,871	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	266,665	µg/L	Discharge Conc < TQL
Benzidine	0.26	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	3.08	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.31	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	11.7	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	92.4	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	986	µg/L	Discharge Conc ≤ 25% WQBEL
4-Bromophenyl Phenyl Ether	22,351	µg/L	Discharge Conc ≤ 25% WQBEL
Butyl Benzyl Phthalate	88.9	µg/L	Discharge Conc ≤ 25% WQBEL
2-Chloronaphthalene	711,108	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	11.7	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.31	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	67,882	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichlorobenzene	6,222	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dichlorobenzene	56,000	µg/L	Discharge Conc ≤ 25% WQBEL
3,3-Dichlorobenzidine	64.7	µg/L	Discharge Conc < TQL
Diethyl Phthalate	331,133	µg/L	Discharge Conc ≤ 25% WQBEL
Dimethyl Phthalate	206,958	µg/L	Discharge Conc ≤ 25% WQBEL
Di-n-Butyl Phthalate	9,106	µg/L	Discharge Conc ≤ 25% WQBEL
2,4-Dinitrotoluene	154	µg/L	Discharge Conc ≤ 25% WQBEL
2,6-Dinitrotoluene	154	µg/L	Discharge Conc ≤ 25% WQBEL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	92.4	µg/L	Discharge Conc ≤ 25% WQBEL
Fluoranthene	16,557	µg/L	Discharge Conc < TQL
Fluorene	44,444	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.00008	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	0.01	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	414	µg/L	Discharge Conc ≤ 25% WQBEL
Hexachloroethane	308	µg/L	Discharge Conc ≤ 25% WQBEL
Indeno(1,2,3-cd)Pyrene	3.08	µg/L	Discharge Conc < TQL
Isophorone	30,222	µg/L	Discharge Conc ≤ 25% WQBEL

Naphthalene	11,590	µg/L	Discharge Conc ≤ 25% WQBEL
Nitrobenzene	8,889	µg/L	Discharge Conc ≤ 25% WQBEL
n-Nitrosodimethylamine	2.13	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	15.4	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	10,167	µg/L	Discharge Conc ≤ 25% WQBEL
Phenanthrene	414	µg/L	Discharge Conc < TQL
Pyrene	17,778	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	62.2	µg/L	Discharge Conc ≤ 25% WQBEL

TMS Input

Discharge Information

Instructions | Discharge | Stream

Facility: **Baden STP** NPDES Permit No.: **PA0028410** Outfall No.: **001**

Evaluation Type **Major Sewage / Industrial Waste** Wastewater Description: **treated 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
2	186	6.93						

					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		421									
	Chloride (PWS)	mg/L		149									
	Bromide	mg/L		88.7									
	Sulfate (PWS)	mg/L		99.9									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		740									
	Total Antimony	µg/L		580									
	Total Arsenic	µg/L		10.4									
	Total Barium	µg/L		43									
	Total Beryllium	µg/L		0.031									
	Total Boron	µg/L		40000									
	Total Cadmium	µg/L		0.77									
	Total Chromium (III)	µg/L		1.64									
	Hexavalent Chromium	µg/L		77									
	Total Cobalt	µg/L		0.402									
	Total Copper	mg/L		15.6									
	Free Cyanide	µg/L		4									
	Total Cyanide	µg/L		10									
	Dissolved Iron	µg/L		343									
	Total Iron	µg/L		140000									
	Total Lead	µg/L		1.52									
	Total Manganese	µg/L		16.8									
	Total Mercury	µg/L		0.0017									
	Total Nickel	µg/L		4.06									
	Total Phenols (Phenolics) (PWS)	µg/L		28.3									
	Total Selenium	µg/L		12.3									
	Total Silver	µg/L		1.45									
	Total Thallium	µg/L		3.69									
	Total Zinc	mg/L		38800									
	Total Molybdenum	µg/L		10.8									
	Acrolein	µg/L	<	10									
	Acrylamide	µg/L	<	5									
	Acrylonitrile	µg/L	<	1									
	Benzene	µg/L	<	1									
	Bromoform	µg/L	<	1									
	Carbon Tetrachloride	µg/L	<	1									

Group 3	Chlorobenzene	µg/L											
	Chlorodibromomethane	µg/L	<	1									
	Chloroethane	µg/L	<	1									
	2-Chloroethyl Vinyl Ether	µg/L	<	5									
	Chloroform	µg/L		3.06									
	Dichlorobromomethane	µg/L	<	1									
	1,1-Dichloroethane	µg/L	<	1									
	1,2-Dichloroethane	µg/L	<	1									
	1,1-Dichloroethylene	µg/L	<										
	1,2-Dichloropropane	µg/L	<	1									
	1,3-Dichloropropylene	µg/L	<										
	1,4-Dioxane	µg/L	<	1									
	Ethylbenzene	µg/L	<	1									
	Methyl Bromide	µg/L	<										
	Methyl Chloride	µg/L	<										
	Methylene Chloride	µg/L	<	1									
	1,1,2,2-Tetrachloroethane	µg/L	<	1									
	Tetrachloroethylene	µg/L	<										
	Toluene	µg/L	<	1									
	1,2-trans-Dichloroethylene	µg/L	<										
	1,1,1-Trichloroethane	µg/L	<	1									
	1,1,2-Trichloroethane	µg/L	<	1									
	Trichloroethylene	µg/L	<										
	Vinyl Chloride	µg/L	<	1									
Group 4	2-Chlorophenol	µg/L	<	10									
	2,4-Dichlorophenol	µg/L	<	1.9									
	2,4-Dimethylphenol	µg/L		82									
	4,6-Dinitro-o-Cresol	µg/L	<										
	2,4-Dinitrophenol	µg/L	<	100									
	2-Nitrophenol	µg/L	<	10									
	4-Nitrophenol	µg/L	<	51									
	p-Chloro-m-Cresol	µg/L	<										
	Pentachlorophenol	µg/L	<	10									
	Phenol	µg/L	<	10									
	2,4,6-Trichlorophenol	µg/L	<	10									
Group 5	Acenaphthene	µg/L	<	1.9									
	Acenaphthylene	µg/L	<	1.9									
	Anthracene	µg/L	<	1.9									
	Benzidine	µg/L	<	50									
	Benzo(a)Anthracene	µg/L	<	1.9									
	Benzo(a)Pyrene	µg/L	<	1.9									
	3,4-Benzofluoranthene	µg/L	<										
	Benzo(ghi)Perylene	µg/L	<	1.9									
	Benzo(k)Fluoranthene	µg/L	<	1.9									
	Bis(2-Chloroethoxy)Methane	µg/L	<	1.9									
	Bis(2-Chloroethyl)Ether	µg/L	<	1.9									
	Bis(2-Chloroisopropyl)Ether	µg/L	<										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	100									
	4-Bromophenyl Phenyl Ether	µg/L	<	10									
	Butyl Benzyl Phthalate	µg/L	<	10									
	2-Chloronaphthalene	µg/L	<	1.9									
	4-Chlorophenyl Phenyl Ether	µg/L		10									
	Chrysene	µg/L	<	1.9									
	Dibenzo(a,h)Anthrancene	µg/L	<	1.9									
	1,2-Dichlorobenzene	µg/L		4.4									
	1,3-Dichlorobenzene	µg/L	<	10									
	1,4-Dichlorobenzene	µg/L	<	10									
	3,3-Dichlorobenzidine	µg/L	<	0.5									
	Diethyl Phthalate	µg/L	<	10									
	Dimethyl Phthalate	µg/L	<	10									
	Di-n-Butyl Phthalate	µg/L	<	10									
	2,4-Dinitrotoluene	µg/L	<	10									
	2,6-Dinitrotoluene	µg/L	<	10									
	Di-n-Octyl Phthalate	µg/L	<	10									

	1,2-Diphenylhydrazine	µg/L		0.039									
	Fluoranthene	µg/L	<	1.9									
	Fluorene	µg/L	<	1.9									
	Hexachlorobenzene	µg/L	<	1.9									
	Hexachlorobutadiene	µg/L	<	0.5									
	Hexachlorocyclopentadiene	µg/L	<	10									
	Hexachloroethane	µg/L	<	10									
	Indeno(1,2,3-cd)Pyrene	µg/L	<	1.9									
	Isophorone	µg/L	<	10									
	Naphthalene	µg/L	<	1.9									
	Nitrobenzene	µg/L	<	20									
	n-Nitrosodimethylamine	µg/L	<	0.5									
	n-Nitrosodi-n-Propylamine	µg/L	<	1.9									
	n-Nitrosodiphenylamine	µg/L		86									
	Phenanthrene	µg/L	<	1.9									
	Pyrene	µg/L	<	1.9									
	1,2,4-Trichlorobenzene	µg/L		0.377									
Group 6	Aldrin	µg/L	<										
	alpha-BHC	µg/L	<										
	beta-BHC	µg/L	<										
	gamma-BHC	µg/L	<										
	delta BHC	µg/L	<										
	Chlordane	µg/L	<										
	4,4-DDT	µg/L	<										
	4,4-DDE	µg/L	<										
	4,4-DDD	µg/L	<										
	Dieldrin	µg/L	<										
	alpha-Endosulfan	µg/L	<										
	beta-Endosulfan	µg/L	<										
	Endosulfan Sulfate	µg/L	<										
	Endrin	µg/L	<										
	Endrin Aldehyde	µg/L	<										
	Heptachlor	µg/L	<										
	Heptachlor Epoxide	µg/L	<										
	PCB-1016	µg/L	<										
	PCB-1221	µg/L	<										
	PCB-1232	µg/L	<										
	PCB-1242	µg/L	<										
	PCB-1248	µg/L	<										
	PCB-1254	µg/L	<										
	PCB-1260	µg/L	<										
	PCBs, Total	µg/L	<										
	Toxaphene	µg/L	<										
	2,3,7,8-TCDD	ng/L	<										
Group 7	Gross Alpha	pCi/L											
	Total Beta	pCi/L	<										
	Radium 226/228	pCi/L	<										
	Total Strontium	µg/L	<										
	Total Uranium	µg/L	<										
	Osmotic Pressure	mOs/kg											

Whole Effluent Toxicity Test

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Acute
Species Tested	Ceriodaphnia
Endpoint	Survival
TIWC (decimal)	0.02
No. Per Replicate	10
TST b value	0.8
TST alpha value	0.1

Facility Name

Baden STP

Permit No.

PA0028410

Test Completion Date 10/14/2018

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	5	5

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail **PASS**

Test Completion Date 10/31/2019

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	5	5

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail **PASS**

Test Completion Date 10/18/2020

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	5	5

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail **PASS**

Test Completion Date 10/23/2021

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	5	5

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail **PASS**

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Acute
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.02
No. Per Replicate	10
TST b value	0.8
TST alpha value	0.1

Facility Name: Baden STP

Permit No.: PA0028410

Test Completion Date: 10/16/2018

Replicate No.	Control	TIWC
1	1	0.9
2	1	1
3	0.9	0.9
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.975	0.950
Std Dev.	0.050	0.058
# Replicates	4	4

T-Test Result	9.8877
Deg. of Freedom	5
Critical T Value	1.4759
Pass or Fail	PASS

Test Completion Date: 10/31/2019

Replicate No.	Control	TIWC
1	1	1
2	0.9	0.8
3	1	0.7
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.975	0.875
Std Dev.	0.050	0.150
# Replicates	4	4

T-Test Result	3.2881
Deg. of Freedom	4
Critical T Value	1.5332
Pass or Fail	PASS

Test Completion Date: 10/18/2020

Replicate No.	Control	TIWC
1	0.8	0.9
2	1	1
3	1	0.9
4	0.9	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.925	0.950
Std Dev.	0.096	0.058
# Replicates	4	4

T-Test Result	7.9761
Deg. of Freedom	5
Critical T Value	1.4759
Pass or Fail	PASS

Test Completion Date: 10/23/2021

Replicate No.	Control	TIWC
1	0.8	1
2	1	1
3	1	0.9
4	1	0.9
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.950	0.950
Std Dev.	0.100	0.058
# Replicates	4	4

T-Test Result	7.3409
Deg. of Freedom	5
Critical T Value	1.4759
Pass or Fail	PASS

WET Summary and Evaluation

Facility Name	Baden STP
Permit No.	PA0028410
Design Flow (MGD)	2
Q_{7-10} Flow (cfs)	4800
PMF_a	0.081
PMF_c	0.564

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	10/14/18		10/18/20	10/23/21
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	10/16/18	10/31/19	10/18/20	10/23/21
Pimephales	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**				

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**				

Reasonable Potential? NO

Permit Recommendations

Test Type	**Acute**	
TIWC	**3**	% Effluent
Dilution Series	**1, 3, 30, 60, 100**	% Effluent
Permit Limit	**None**	
Permit Limit Species		