pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

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

Application Type	**Amendment, Major**	Application No.	**PA0005011 A-2**
Facility Type	**Industrial**	APS ID	**1015008**
Major / Minor	**Major**	Authorization ID	**1311674**

Applicant and Facility Information

Applicant Name	**Keystone-Conemaugh Projects, LLC**	Facility Name	**Conemaugh Power Plant**
Applicant Address	175 Cornell Road, Suite 1 Blairsville, PA 15717	Facility Address	1442 Power Plant Road, State Route 2008 New Florence, PA 15944-9154
Applicant Contact	John Shimshock	Facility Contact	John Shimshock
Applicant Phone	(724) 235-4500	Facility Phone	(724) 235-4500
Client ID	350861	Site ID	3349
SIC Code	4911	Municipality	West Wheatfield Township
SIC Description	Trans. & Utilities - Electric Services	County	Indiana
Date Application Received	April 10, 2020	EPA Waived?	No
Date Application Accepted	April 22, 2020	If No, Reason	Major Facility

Purpose of Application: Major permit amendment to aggregate WLAs for all facility outfalls for compliance purposes.

Summary of Review

The permittee submitted an amendment application to address Waste Load Allocations (WLAs) for total aluminum, total iron and total manganese which are in the current NPDES Permit due to inclusion in the Kiskiminetas-Conemaugh Watersheds TMDL. WLAs for these parameters are currently displayed in the permit as total yearly loading (lbs/year) at Outfalls 003, 004, 006, 007, 015, 016, 017, and 029.

The permittee proposes to achieve compliance with the NPDES Permit by aggregating each of the individual WLAs for process outfall (003, 004, 006, 007) and stormwater outfalls (015, 016, 017, 029) into one total WLA applicable to the Station for total aluminum, total iron, and total manganese.

There is currently one open violation for this permittee listed in EFACTS (11/09/2022). The violation is under the Storage Tank Program. The permittee should try to address this violation before final permit issuance.

Public Participation

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

Approve	Deny	Signatures	Date
X		Adam J. Pesek Adam J. Pesek, E.I.T. / Project Manager	November 9, 2022
X		*Vacant* / Environmental Program Manager	Okay to Draft JCD 11/9/2022

Discharge, Receiving Waters and Water Supply Information

Receiving Waters	Conemaugh River	Stream Code	43832
NHD Com ID	123721463	RMI	39.2
Drainage Area	725 mi^2	Yield (cfs/mi^2)	0.2069
Q_{7-10} Flow (cfs)	150 (during the previous 25 years)	Q_{7-10} Basis	USGS Stream Gage #03041500
Elevation (ft)	1,053	Slope (ft/ft)	0.001
Watershed No.	18-D	Chapter 93 Class.	WWF
Quad Name	New Florence	Quad Code	1513

Assessment Status	Impaired		
Cause(s) of Impairment	METALS, PH		
Source(s) of Impairment	ACID MINE DRAINAGE		
TMDL Status	Final	Name	Kiskiminetas-Conemaugh River Watersheds TMDL

Background/Ambient Data		Data Source
pH (SU)	7.0	Default
Hardness (mg/L)	243	BACKGROUND DATA COLLECTION SUMMARY REPORT – 8/2022
Total Aluminum (mg/l)	0.24	BACKGROUND DATA COLLECTION SUMMARY REPORT – 8/2022
Total Iron (mg/l)	0.89	BACKGROUND DATA COLLECTION SUMMARY REPORT – 8/2022
Total Manganese (mg/l)	0.26	BACKGROUND DATA COLLECTION SUMMARY REPORT – 8/2022

Nearest Downstream Public Water Supply Intake		Buffalo Township Municipal Authority, Freeport PA	
PWS Waters	Allegheny River	Flow at Intake (cfs)	2,390
PWS RMI	29.4	Distance from Outfall (mi)	65 miles

Changes Since Last Permit Issuance:

Other Comments: Coefficients of Variation (Stream CV) used in Toxics Modeling were also derived from the Background Data Collection Summary Report – 8/2022, which was conducted by the Permittee's consultant, and reviewed by the Department.

The Department conducted a biological survey the last week of May 2022 in the vicinity of the facility. According to the biologist, the stream is still impaired in stream segments surrounding the facility, but additional assimilative capacity is available based on background stream data provided by the permittee in August 2022 that would allow for aggregation of WLAs. The biological survey final report should be available near the end of November 2022 for reference.

Compliance History

DMR Data for Outfall 003 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD) Average Monthly	0.178	2.51	1.15	0.55	1.42	2.03	1.88	2.92	2.2	1.12	0.890	0.701
Flow (MGD) Daily Maximum	2.44	3.45	2.25	1.89	3.23	3.29	3.31	3.81	3.3	2.29	1.47	1.507
pH (S.U.) Daily Minimum	8.4	8.2	7.5	7.1	7.5	7.4	7.3	7.1	7.5	7.6	7.5	7.4
pH (S.U.) Daily Maximum	8.5	8.6	8.5	8.4	8.0	8.1	8.1	8.3	8.5	8.6	8.4	8.8
TRC (mg/L) Average Monthly	GG	< 0.02	< 0.02	< 0.04	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.3	< 0.2	< 0.02
TRC (mg/L) Daily Maximum	GG	< 0.02	< 0.02	0.08	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.7	0.4	< 0.02
Free Available Chlorine (mg/L) Average Monthly	GG	< 0.02	< 0.02	< 0.03	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.1	< 0.1	< 0.02
Free Available Chlorine (mg/L) Daily Maximum	GG	< 0.02	< 0.02	0.04	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.2	0.2	< 0.02
Temperature (ºF) Daily Maximum	79.3	84.5	86.7	84.9	79.4	74.5	72.6	69	70.6	64	69	78
TSS (mg/L) Average Monthly	GG	< 2.7	3.3	< 2.2	< 2.0	< 4.1	< 2.4	< 2.0	< 4.5	< 4.1	< 5.5	< 6.6
TSS (mg/L) Daily Maximum	GG	4.5	4.5	2.5	2.0	10.5	4.0	2.0	12.0	7.5	15.0	12.0
Total Dissolved Solids (mg/L) Average Monthly	GG	1884	1758	953	977	776	801	619	938	1296	883	1020
Total Dissolved Solids (mg/L) Daily Maximum	GG	2420	2050	1250	1090	994	1060	814	1100	1760	998	1390
Oil and Grease (mg/L) Average Monthly	GG	< 5.6	< 5.3	< 5.7	< 5.3	< 5.3	< 6.0	< 6.0	< 6.0	< 5.2	< 5.5	< 5.3
Oil and Grease (mg/L) Daily Maximum	GG	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0
Total Aluminum (lbs/mo) Total Monthly	GG	< 61	< 38	< 34	< 35	< 53	< 102	< 90	< 66	< 34	< 36	< 29

Total Aluminum (lbs/year) Total Annual									< 852		
Total Aluminum (mg/L) Average Monthly	GG	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.1	< 0.1
Total Aluminum (mg/L) Annual Average									< 0.14		
Total Aluminum (mg/L) Daily Maximum	GG	< 0.1	0.1	< 0.1	< 0.1	0.1	0.6	0.2	0.3	0.2	< 0.1	0.2
Total Iron (lbs/mo) Total Monthly	GG	< 123	< 39	< 17	< 19	< 64	343	< 188	< 188	< 89	< 25	< 181
Total Iron (lbs/year) Total Annual									< 3486		
Total Iron (mg/L) Average Monthly	GG	< 0.2	< 0.1	< 0.1	< 0.1	< 0.2	0.67	< 0.3	< 0.6	< 0.4	< 0.1	< 0.8
Total Iron (mg/L) Annual Average									< 0.61		
Total Iron (mg/L) Daily Maximum	GG	0.35	0.25	< 0.05	0.1	0.65	2.88	0.66	2.1	1.3	0.1	2.1
Total Manganese (lbs/mo) Total Monthly	GG	< 14	< 6	< 4	< 14	66	< 46	< 30	120	26	19	23
Total Manganese (lbs/year) Total Annual									< 593		
Total Manganese (mg/L) Average Monthly	GG	< 0.02	< 0.02	< 0.01	< 0.04	0.5	< 0.09	< 0.04	0.2	0.1	0.1	0.1
Total Manganese (mg/L) Annual Average									< 0.09		
Total Manganese (mg/L) Daily Maximum	GG	0.05	0.04	0.02	0.07	1.88	0.34	0.08	0.37	0.2	0.1	0.28
Sulfate (mg/L) Average Monthly	GG	977	875	520	416	317	382	252	404	610	451	474
Sulfate (mg/L) Daily Maximum	GG	1300	1040	717	542	434	487	332	491	864	563	702
Chloride (mg/L) Average Monthly	GG	192	180	112	154	142	140	125	154	178	121	129
Chloride (mg/L) Daily Maximum	GG	249	195	146	190	177	180	164	186	239	129	152

Bromide (mg/L) Average Monthly	GG	< 1.3	< 0.7	< 0.3	< 2	< 0.2	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bromide (mg/L) Daily Maximum	GG	< 2.0	< 2	< 0.4	< 2	< 0.2	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chloroform (mg/L) Average Monthly	GG	< 0.004	0.006	< 0.002	0.008	0.007	0.004	0.011	0.006	0.03	0.017	0.025
Chloroform (mg/L) Daily Maximum	GG	0.007	0.008	0.005	0.014	0.014	0.006	0.022	0.01	0.07	0.031	0.063

DMR Data for Outfall 004 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD) Average Monthly	0.874	1.01	1.10	0.97	2.04	1.60	1.17	1.36	1.5	0.58	0.78	0.64
Flow (MGD) Daily Maximum	1.53	2.15	2.63	2.49	3.23	2.61	2.19	3.09	2.7	1.92	1.71	1.61
pH (S.U.) Daily Minimum	7.1	7.1	7.1	7.3	7.7	7.2	7.2	7.0	7.4	7.3	7.0	6.7
pH (S.U.) Daily Maximum	8.5	8.5	8.7	8.5	8.6	8.5	8.0	8.0	8.3	8.1	8.5	8.7
TRC (mg/L) Average Monthly	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.03	< 0.02	< 0.02	< 0.03
TRC (mg/L) Daily Maximum	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.07	< 0.02	< 0.02	0.06
Free Available Chlorine (mg/L) Average Monthly	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05
Free Available Chlorine (mg/L) Daily Maximum	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.12
Temperature (ºF) Daily Maximum	80.1	87.4	88.5	77.5	74.8	70.7	66.6	59	56.8	56	65	73.4
TSS (mg/L) Average Monthly	< 4.4	5.9	5.1	6.1	9.4	9.9	9.0	12.3	11.9	10.2	< 7.9	< 3.4
TSS (mg/L) Daily Maximum	10.0	10.5	7.0	10.0	19.0	12.0	13.0	15.0	15.0	13.0	10.5	5.0
Total Dissolved Solids (mg/L) Average Monthly	2003	2072	2225	1980	1678	1803	1760	1617	1588	1800	1788	2043
Total Dissolved Solids (mg/L) Daily Maximum	2180	2480	2320	2250	1840	2080	1990	1660	1780	2060	1970	2130
Oil and Grease (mg/L) Average Monthly	< 6.0	< 5.6	< 5.5	< 5.7	5.8	< 5.5	< 6.0	< 6.0	< 6.0	< 5.3	< 5.5	< 5.3

Oil and Grease (mg/L) Daily Maximum	< 6.0	6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0
Total Aluminum (lbs/mo) Total Monthly	73	66	45	64	104	106	124	125	132	39	< 50	< 24
Total Aluminum (lbs/year) Total Annual										< 704		
Total Aluminum (mg/L) Average Monthly	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	< 0.2	< 0.1
Total Aluminum (mg/L) Annual Average										< 0.25		
Total Aluminum (mg/L) Daily Maximum	0.4	0.5	0.2	0.2	0.3	0.3	0.3	0.7	0.4	0.3	0.2	0.2
Total Iron (lbs/mo) Total Monthly	67	112	110	236	307	451	773	513	534	154	267	41
Total Iron (lbs/year) Total Annual										1747		
Total Iron (mg/L) Average Monthly	0.2	0.4	0.4	0.5	0.6	1.0	1.69	1.7	1.2	1.0	0.8	0.2
Total Iron (mg/L) Annual Average										0.57		
Total Iron (mg/L) Daily Maximum	0.3	0.66	0.49	0.9	0.85	1.6	2.19	3.39	1.4	1.2	1.4	0.33
Total Manganese (lbs/mo) Total Monthly	60	57	42	109	81	117	164	135	238	49	72	26
Total Manganese (lbs/year) Total Annual										1457		
Total Manganese (mg/L) Average Monthly	0.2	0.2	0.2	0.3	0.2	0.3	0.40	0.5	0.5	0.3	0.2	0.1
Total Manganese (mg/L) Annual Average										0.48		
Total Manganese (mg/L) Daily Maximum	0.3	0.35	0.29	0.3	0.28	0.34	0.45	0.84	0.7	0.4	0.5	0.17
Sulfate (mg/L) Average Monthly	1255	1314	1365	1200	1013	1160	1255	1076	1046	1144	1238	1313

Sulfate (mg/L) Daily Maximum	1350	1550	1760	1420	1200	1430	1400	1150	1110	1350	1410	1380
Chloride (mg/L) Average Monthly	116	137	127	110	102.2	128	139	150	134	134	126	136
Chloride (mg/L) Daily Maximum	123	181	139	120	122	147	148	160	154	152	140	144
Bromide (mg/L) Average Monthly	1.7	< 1.9	< 1.5	1.3	1.1	1.3	1.4	1.3	1.4	1.5	1.6	1.8
Bromide (mg/L) Daily Maximum	1.9	< 2	< 2.0	1.4	1.3	1.6	1.5	1.5	1.5	1.8	1.9	1.9
Chloroform (mg/L) Average Monthly	< 0.0005	< 0.0005	< 0.0009	0.001	0.002	0.0009	< 0.0008	0.0009	0.0008	< 0.0008	0.001	< 0.001
Chloroform (mg/L) Daily Maximum	0.0006	< 0.0005	< 0.002	0.001	0.002	0.001	0.001	0.0009	0.001	0.001	0.003	0.002

DMR Data for Outfall 006 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD) Average Monthly	0.011	0.013	0.014	0.015	0.012	0.014	0.016	0.010	0.01	0.01	0.0096	0.0096
Flow (MGD) Daily Maximum	0.016	0.013	0.025	0.027	0.015	0.015	0.020	0.012	0.01	0.02	0.0096	0.0096
pH (S.U.) Daily Minimum	7.2	6.6	6.6	6.4	6.8	6.5	6.6	6.5	6.5	6.7	6.5	6.8
pH (S.U.) Daily Maximum	8.6	8.9	8.2	8.1	8.6	8.3	8.2	8.2	8.4	8.1	8.9	8.8
DO (mg/L) Daily Minimum	6.9	6.9	6.5	5.7	5.5	6.4	7.1	6.6	6.1	6.5	5.5	5.8
TRC (mg/L) Average Monthly	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.02	< 0.03	0.2	0.5	< 0.3
TRC (mg/L) Daily Maximum	< 0.02	1.6	< 0.02	< 0.02	< 0.02	0.6	0.12	0.03	0.3	2.0	3.8	1.8
CBOD5 (mg/L) Average Monthly	< 21.0	< 2.3	3.1	< 20.9	< 6.0	4.3	6.0	8.7	4.3	< 3.5	3.1	< 2.5
CBOD5 (mg/L) Daily Maximum	< 40.0	2.6	3.3	< 36.7	< 6.0	4.61	8.9	9.4	4.9	5.0	3.7	3.0
TSS (mg/L) Average Monthly	14.0	15.5	12.5	< 5.5	< 5.0	< 5.0	< 5.0	14.5	13.0	18.5	< 5.0	< 5.5
TSS (mg/L) Daily Maximum	14.0	16.0	16.0	6.0	5.0	< 5.0	< 5.0	19.0	13.0	20.0	< 5.0	6.0
Fecal Coliform (No./100 ml) Average Monthly	2.0	16	< 1.0	194	< 1.0	< 1.5	< 6.5	< 1.0	712	57	< 3.0	3.5

Fecal Coliform (No./100 ml) Daily Maximum	3.0	26	< 1.0	387	< 1.0	2.0	12	1.0	1414	91	5	6.0
Total Nitrogen (mg/L) Daily Maximum	< 22.7	< 15.6	< 23	< 16.2	11.2	< 23	< 24.6	< 15.8	< 8.9	< 17.3	< 16.2	13.1
Total Phosphorus (mg/L) Daily Maximum	2.7	1.77	2.69	2.3	3.3	3.31	2.39	2.8	1.5	1.98	1.96	2.29
Total Aluminum (lbs/mo) Total Monthly	< 0.2	< 0.3	< 0.6	< 0.3	< 0.4	< 0.4	< 0.4	< 0.2	< 0.2	< 0.2	< 0.4	< 0.2
Total Aluminum (lbs/year) Total Annual										< 3.1		
Total Aluminum (mg/L) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1
Total Aluminum (mg/L) Annual Average										< 0.10		
Total Aluminum (mg/L) Daily Maximum	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Total Iron (lbs/mo) Total Monthly	1	1	7	0.2	< 0.3	0.3	< 0.3	1	1	0.3	< 0.2	< 0.2
Total Iron (lbs/year) Total Annual										< 4.38		
Total Iron (mg/L) Average Monthly	0.43	0.39	1.01	0.08	< 0.07	0.09	< 0.07	0.64	0.5	0.12	< 0.1	< 0.07
Total Iron (mg/L) Annual Average										< 0.12		
Total Iron (mg/L) Daily Maximum	0.47	0.46	1.13	0.1	0.09	0.09	0.08	0.75	0.7	0.15	0.1	0.09
Total Manganese (lbs/mo) Total Monthly	< 0.02	0.05	0.3	< 0.03	< 0.04	< 0.04	< 0.04	0.04	< 0.3	< 0.04	< 0.02	< 0.04
Total Manganese (lbs/year) Total Annual										< 0.36		
Total Manganese (mg/L) Average Monthly	< 0.01	0.02	0.05	< 0.01	< 0.01	< 0.01	0.01	0.02	< 0.1	< 0.02	< 0.01	< 0.02
Total Manganese (mg/L) Annual Average										< 0.01		

Total Manganese (mg/L) Daily Maximum	0.01	0.02	0.07	< 0.01	0.01	0.01	< 0.01	0.03	0.2	0.02	< 0.01	0.02
Chloroform (mg/L) Average Monthly	0.05	0.04	0.075	0.014	0.019	0.033	0.023	0.04	0.007	0.004	0.016	0.006
Chloroform (mg/L) Daily Maximum	0.05	0.04	0.087	0.027	0.027	0.039	0.029	0.04	0.01	0.005	0.016	0.011

DMR Data for Outfall 007 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD) Average Monthly	0.072	0.18	0.11	0.077	0.154	0.18	0.20	0.21	0.18	0.12	0.08	0.08
Flow (MGD) Daily Maximum	0.213	0.24	0.22	0.197	0.211	0.23	0.25	0.30	0.24	0.21	0.25	0.23
pH (S.U.) Daily Minimum	6.8	6.9	6.9	6.9	6.8	6.6	7.1	6.6	6.8	7.1	7.2	7.0
pH (S.U.) Daily Maximum	8.6	7.5	7.8	7.8	8.1	8.7	7.6	7.6	7.5	7.7	7.7	7.7
Temperature (ºF) Daily Maximum	80	85	82	80	73	68	67	68	65	64	66	75
TSS (mg/L) Average Monthly	27.2	12.5	10.8	9.7	16.8	20.1	37.7	19.6	11.8	14.0	11.0	12.0
TSS (mg/L) Daily Maximum	39.5	17.5	17.0	17.0	22.5	27.0	44.0	23.5	19.0	19.5	14.0	15.0
Total Dissolved Solids (mg/L) Average Monthly	18600.0	24920.0	21133.0	22000.0	27375.0	24000.0	22940.0	21150.0	16825.0	20425.0	16700.0	18133.0
Total Dissolved Solids (mg/L) Daily Maximum	26500.0	28600.0	24900.0	25200.0	29900.0	27600.0	24900.0	27000.0	20300.0	22200.0	19000.0	23300.0
Oil and Grease (mg/L) Average Monthly	< 5.5	< 6.2	< 5.5	< 5.7	< 6.0	< 5.8	< 6.0	< 5.5	< 6.0	< 5.0	< 5.7	< 5.3
Oil and Grease (mg/L) Daily Maximum	< 6.0	9.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 5.0	< 6.0	< 6.0
Nitrate-Nitrite (mg/L) Average Monthly	< 0.85	< 2.35	< 1.25	< 4.2	< 2.2	4.3	< 1.25	< 1.43	2.2	< 2.6	1.63	< 4.7
Nitrate-Nitrite (mg/L) Daily Maximum	< 1.25	3.69	< 1.25	10.1	5.1	5.8	< 1.25	1.95	3.5	5.8	2.09	10.0
Total Aluminum (lbs/mo) Total Monthly	80	< 9	32	< 26	87	99	296	22	< 20	11	6	18

Total Aluminum (lbs/year) Total Annual										< 282		
Total Aluminum (mg/L) Average Monthly	1.9	< 0.2	0.6	< 0.7	2.1	2.2	5.4	0.5	< 0.4	0.3	0.1	0.4
Total Aluminum (mg/L) Annual Average										< 0.46		
Total Aluminum (mg/L) Daily Maximum	2.4	0.3	1.1	1.0	3.0	3.5	7.3	0.7	< 1.0	0.4	0.2	0.8
Total Arsenic (mg/L) Average Monthly	< 0.002	0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.003	0.001	< 0.001	< 0.001
Total Arsenic (mg/L) Daily Maximum	0.002	0.002	0.002	0.001	0.002	0.001	0.001	0.003	< 0.01	0.002	0.002	0.002
Total Beryllium (mg/L) Average Monthly	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002	< 0.003	< 0.001	< 0.001	< 0.001
Total Beryllium (mg/L) Daily Maximum	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.010	< 0.001	< 0.001	< 0.001
Total Boron (mg/L) Average Monthly	55.5	73.8	46.0	39.0	43.4	55.3	76.5	93.0	66.4	75.3	82.2	64.2
Total Boron (mg/L) Daily Maximum	76.6	95.3	55.8	42.5	48.9	63.2	97.8	117.0	87.5	92.5	93.5	85.6
Total Copper (mg/L) Average Monthly	0.020	0.004	< 0.005	0.002	0.005	0.006	0.008	0.005	< 0.004	0.002	0.001	0.010
Total Copper (mg/L) Daily Maximum	0.034	0.012	0.011	0.003	0.014	0.014	0.01	0.005	< 0.01	0.002	0.002	0.027
Total Iron (lbs/mo) Total Monthly	< 2	< 3	< 3	< 2	< 3	5	6	< 2.0	< 9	< 3	4	< 5.0
Total Iron (lbs/year) Total Annual										< 177		
Total Iron (mg/L) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	0.1	< 0.1	< 0.2	< 0.1	0.1	< 0.1
Total Iron (mg/L) Annual Average										< 0.29		
Total Iron (mg/L) Daily Maximum	0.06	< 0.05	< 0.05	0.09	0.08	0.27	0.12	0.05	< 0.5	0.1	0.14	0.017
Total Lead (mg/L) Average Monthly	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002	< 0.003	< 0.001	< 0.001	< 0.001
Total Lead (mg/L) Daily Maximum	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.01	< 0.001	< 0.001	< 0.001
Total Manganese (lbs/mo) Total Monthly	4	4	6	4	5	8	7	8	4	6	5	2

Total Manganese (lbs/year) Total Annual										96		
Total Manganese (mg/L) Average Monthly	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.04
Total Manganese (mg/L) Annual Average										0.16		
Total Manganese (mg/L) Daily Maximum	0.1	0.12	0.14	0.13	0.1	0.31	0.21	0.33	0.14	0.2	0.14	0.07
Total Mercury (mg/L) Average Monthly	0.00008	0.00003	0.00003	0.00003	0.00002	0.00003	0.00004	0.00004	0.00001	0.00003	0.00002	< 0.00001
Total Mercury (mg/L) Daily Maximum	0.00012	0.00007	0.00004	0.00006	0.00002	0.00004	0.00004	0.00004	0.00001	0.00004	0.00002	0.00002
Total Selenium (mg/L) Average Monthly	0.10	0.10	0.052	0.10	0.073	0.100	0.10	0.100	0.087	0.240	0.08	0.18
Total Selenium (mg/L) Daily Maximum	0.119	0.189	0.069	0.074	0.075	0.247	0.099	0.169	0.104	0.356	0.09	0.281
Sulfate (mg/L) Average Monthly	1441	2322	1973	1997	2233	2563	3266	2860	3285	3713	3747	2827
Sulfate (mg/L) Daily Maximum	1900	2550	2230	2300	2790	3170	3730	3230	3810	3760	4420	3500
Chloride (mg/L) Average Monthly	9233	11420	8663	8730	11750	12925	11940	12225	9093	10013	8423	8347
Chloride (mg/L) Daily Maximum	12300	12400	9890	11000	12700	13600	13000	13700	11100	10800	9720	10200
Bromide (mg/L) Average Monthly	90.1	112	89.5	103.4	151	128	136	155	129	137	102	107
Bromide (mg/L) Daily Maximum	119	120	99.8	137	174	168	157	185	154	146	128	135
Chloroform (mg/L) Average Monthly	0.007	< 0.0006	0.0006	< 0.0007	0.001	0.0008	< 0.0007	0.0008	0.0007	< 0.0008	< 0.0005	< 0.002
Chloroform (mg/L) Daily Maximum	0.013	0.0009	0.0006	0.0008	0.002	0.001	0.0009	0.0009	0.0008	0.001	< 0.0005	0.005

DMR Data for Outfall 012 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD) Average Monthly	0.00086	0.0007	0.0005	0.0012	0.0008	0.001	0.00086	0.00086	0.002	0.002	0.0022	0.005
Flow (MGD) Daily Maximum	0.00086	0.0009	0.0009	0.0024	0.0009	0.002	0.00086	0.00086	0.005	0.005	0.0049	0.002

pH (S.U.) Daily Minimum	7.6	7.4	7.7	7.5	7.7	7.3	7.3	7.4	7.4	7.4	7.3	7.6
pH (S.U.) Daily Maximum	7.8	7.8	7.9	7.9	7.9	7.9	7.5	7.6	7.8	7.7	7.9	7.8
TRC (mg/L) Average Monthly	0.4	0.5	0.4	0.4	0.4	0.6	0.2	0.1	0.3	0.2	0.4	0.2
TRC (mg/L) Daily Maximum	0.7	0.8	0.5	1.4	0.5	1.2	0.44	0.1	0.5	0.3	0.7	0.3
CBOD5 (mg/L) Average Monthly	< 13.5	< 2.0	< 3.3	< 3.2	< 2.0	< 2.0	< 7.0	< 4.0	< 2.0	< 2.0	< 4.0	< 7.0
CBOD5 (mg/L) Daily Maximum	25.0	< 2.0	4.5	4.4	< 2.0	< 2.0	< 12.0	< 6.0	< 2.0	< 2.0	< 6.0	< 12.0
TSS (mg/L) Average Monthly	< 5.5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
TSS (mg/L) Daily Maximum	6.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

DMR Data for Outfall 015 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Total Flow (M Gal) Daily Maximum				0.648						0.567		
pH (S.U.) Daily Maximum				6.8						7.2		
TSS (mg/L) Daily Maximum				467						19.0		
Oil and Grease (mg/L) Daily Maximum				< 6.0						< 5.0		
Total Aluminum (lbs/year) Total Annual										42.5		
Total Aluminum (mg/L) Annual Average										0.4		
Total Aluminum (mg/L) Daily Maximum				6.9						0.7		
Total Iron (lbs/year) Total Annual										73.85		
Total Iron (mg/L) Annual Average										0.70		
Total Iron (mg/L) Daily Maximum				16.8						0.98		

Total Manganese (lbs/year) Total Annual										41.97		
Total Manganese (mg/L) Annual Average										0.40		
Total Manganese (mg/L) Daily Maximum				3.95						0.32		

DMR Data for Outfall 016 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Total Flow (M Gal) Daily Maximum				0.036						0.032		
pH (S.U.) Daily Maximum				7.2						7.0		
TSS (mg/L) Daily Maximum				17.5						16.0		
Oil and Grease (mg/L) Daily Maximum				< 5						< 5.0		
Total Aluminum (lbs/year) Total Annual										1.66		
Total Aluminum (mg/L) Annual Average										0.18		
Total Aluminum (mg/L) Daily Maximum				0.6						< 0.1		
Total Iron (lbs/year) Total Annual										36.6		
Total Iron (mg/L) Annual Average										3.9		
Total Iron (mg/L) Daily Maximum				2.1						0.58		
Total Manganese (lbs/year) Total Annual										15.35		
Total Manganese (mg/L) Annual Average										1.6		

Total Manganese (mg/L) Daily Maximum				1.3						0.32		

DMR Data for Outfall 017 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Total Flow (M Gal) Daily Maximum				0.021						0.019		
pH (S.U.) Daily Maximum				7.1						7.1		
TSS (mg/L) Daily Maximum				197						< 2.0		
Oil and Grease (mg/L) Daily Maximum				< 5.0						< 5.0		
Total Aluminum (lbs/year) Total Annual										< 16.5		
Total Aluminum (mg/L) Annual Average										< 2.0		
Total Aluminum (mg/L) Daily Maximum				1.1						< 0.1		
Total Iron (lbs/year) Total Annual										10.89		
Total Iron (mg/L) Annual Average										1.3		
Total Iron (mg/L) Daily Maximum				0.52						0.11		
Total Manganese (lbs/year) Total Annual										18.69		
Total Manganese (mg/L) Annual Average										2.3		
Total Manganese (mg/L) Daily Maximum				0.68						0.05		

DMR Data for Outfall 029 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21

Total Flow (M Gal) Daily Maximum				0.034						0.03		
pH (S.U.) Daily Maximum				7.3						7.2		
TSS (mg/L) Daily Maximum				24.5						5.0		
Oil and Grease (mg/L) Daily Maximum				< 5.0						< 5.0		
Total Aluminum (lbs/year) Total Annual										0.43		
Total Aluminum (mg/L) Annual Average										0.2		
Total Aluminum (mg/L) Daily Maximum				1.2						< 0.1		
Total Iron (lbs/year) Total Annual										0.72		
Total Iron (mg/L) Annual Average										0.33		
Total Iron (mg/L) Daily Maximum				2.1						0.2		
Total Manganese (lbs/year) Total Annual										0.34		
Total Manganese (mg/L) Annual Average										0.16		
Total Manganese (mg/L) Daily Maximum				1.07						0.14		

Development of Effluent Limitations

Monitoring Point No. 001 **Design Flow (MGD)** ---
Wastewater Description: Outfalls 003, 004, 006, 007, 015, 016, 017, and 029

The Kiskiminetas-Conemaugh River Watersheds TMDL currently assigns the following WLAs to these 0utfalls in the current NPDES Permit:

TMDL Loading Allocations					
SWS	**Outfall**	**Aluminum**	**Iron**	**Manganese**	**Units**
4060	**003**	8,454	16,908	11,272	lbs/year
4060	**004**	1,028	56	1,371	
4060	**006**	11	23	15	
4060	**016**	94	187	125	
4060	**029***	94	187	125	
4058	**007**	800	1,599	1,066	
4058	**015**	93	187	125	
4058	**017**	93	187	125	
	Cumulative WLA	10,667	21,334	14,224	

In earlier discussions with USEPA about this proposal, there was concern about localized impairment if additional loading was assigned to any one of the existing outfalls due to localized water quality. The permittee agreed to do background stream sampling to determine the background stream quality prior to the facility (See attached study entitled “Conemaugh River Surface Water – Background Data Collection Summary Report (August 2022). The findings of this report were used for input into the Department’s toxics modeling (stream concentrations and stream CVs for aluminum, iron, and manganese, and stream hardness, as well as to be used by Department Biologist to be used in a final report for a stream survey that was conducted also in May of 2022.

Toxics modeling was conducted using the Department’s Toxics Management Spreadsheet (TMS) under two scenarios resulting in four modeling runs (attached). Outfall 003, Outfall 004, and Outfall 007 were modeled separately to determine maximum allowable loading limits and concentration limits at their current design flows. A separate modeling run was done using the cumulative design flows from all three of these outfalls to determine allowable loading limits if theoretically there was just one discharge point. Please note that Outfall 006 was not modeled as it is solely a small treated sewage discharge which is not expected to have high concentrations of pollutants of concern, nor were the stormwater outfalls (015, 016, 017, and 029) which would only discharge in storm events when theoretically, stream flows would be much higher than low flow conditions that modeling is conducted under and instream concentrations of these pollutants would be expected to be less. Below is a summary of the TMS results:

		Avg Monthly (lbs/day)	Daily Max (Ibs/day)	Avg Monthly (mg/l)	Daily Max (mg/l)	lbs/yr (based on average monthly loading * 365)		
Combined (003,004, 007)								
Al		46	71.8	1.22	1.9	16,790		
Fe		559	872	14.8	23.1	204,035		
Mn		476	742	12.6	19.6	173,740		
Outfall 003								
Al		39.3	61.3	1.6	2.5	14,344		

Fe		538	840	22.2	34.7	196,370		
Mn		458	714	18.9	29.5	167,170		
Outfall 004								
Al		32.6	50.9	3	4.6	11,899		
Fe		518	809	47.8	74.6	189,070		
Mn		441	687	40.6	63.3	160,965		
Outfall 007								
Al		28.6	44.6	11.4	17.7	10,439		
Fe		512	799	204	319	186,880		
Mn		432	674	172	269	157,680		

As can be seen by the TMS results summary, if all the process discharges were discharged through one outfall pipe in theory, the assimilative capacity of the receiving stream can handle additional loadings of all WLA pollutants, especially total iron and total manganese, beyond the aggregated WLAs for all outfalls facility-wide without exceeding instream water quality criteria. This scenario is just for demonstration though, as no changes are being planned to plant operations.

The results of TMS modeling at Outfalls 003, 004, and 007 using their respective current design flows shows slight less allowance of additional loadings for all pollutants, with just total aluminum at Outfall 007 being slightly below the aggregated facility wide WLA of 10,667 mg/l. By observation, the smaller calculated loadings at individual outfalls can be attributed to their respective design flows, with the lesser design flows not allowing for as high a pollutant loading and at the same time allowing for a higher concentration to be discharged.

It is not expected that localized impairments would occur as a result of aggregating assigned WLAs for the Outfalls due to no operational changes being planned at the site. So, while some outfalls may discharge more than their originally assigned WLA for a pollutant or pollutants, the facility would need additional allocation at their respective outfalls, so no localized impairment should occur based on toxic modeling. No additional safeguards such as concentration limits are being recommended with the proposed aggregation of WLAs.

Monitoring Point 001 will be established in the proposed permit amendment for reporting of aggregated WLAs as lbs/year. No other changes to the permit are being proposed as part of this permit amendment.

Anti-Backsliding

The Department does not consider this action to be backsliding because WLAs are not being removed from the facility, just aggregated as facility wide WLAs. In the event this action is considered backsliding because a larger WLA could be discharged at an individual outfall, anti-backsliding provisions are being met under CWA section 303(d)(4)(A) because the effluent limitation(s) are based on a TMDL and attainment of water quality standards will be met, as demonstrated from toxics modeling.

Proposed Effluent Limitations and Monitoring Requirements

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

Monitoring Point 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	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Total Aluminum (lbs/year) Special Effluent Gross	XXX	10,667 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Iron (lbs/year) Special Effluent Gross	XXX	21,334 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Manganese (lbs/year) Special Effluent Gross	XXX	14,224 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Monitoring Point 001

Other Comments: The loading limits for total aluminum, total iron, and total manganese on At Monitoring Point 001 on Page 2 of this permit are aggregate, facility-wide limits applicable to the combination of total discharges for total aluminum, total iron, and total manganese from Outfalls 003, 004, 006, 007, 015, 016, 017, and 029.

Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 003, 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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	1.0	XXX	1/week	Grab
Free Available Chlorine	XXX	XXX	XXX	0.2	0.5	XXX	1/week	Grab
Temperature (ºF)	XXX	XXX	XXX	XXX	110	XXX	1/day	I-S
TSS	XXX	XXX	XXX	30.0	100.0	XXX	1/week	Grab
Total Dissolved Solids	XXX	XXX	XXX	Report	Report	XXX	1/week	Grab
Oil and Grease	XXX	XXX	XXX	15.0	20.0	XXX	1/week	Grab
Sulfate	XXX	XXX	XXX	Report	Report	XXX	1/week	Grab
Chloride	XXX	XXX	XXX	Report	Report	XXX	1/week	Grab
Bromide	XXX	XXX	XXX	Report	Report	XXX	1/week	Grab
Chloroform	XXX	XXX	XXX	Report	Report	XXX	1/week	Grab
Total Aluminum (lbs/mo)	XXX	Report Total Mo	XXX	1.1	2.2	XXX	1/week	Grab
Total Iron (lbs/mo)	XXX	Report Total Mo	XXX	1.7	3.4	XXX	1/week	Grab

Outfall 003, Continued (from 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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Manganese (lbs/mo)	XXX	Report Total Mo	XXX	1.6	3.2	XXX	1/week	Grab
Total Aluminum (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Iron (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Manganese (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 003

Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 004, 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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	1.0	XXX	1/week	Grab
Free Available Chlorine	XXX	XXX	XXX	0.2	0.5	XXX	1/week	Grab
Temperature (ºF)	XXX	XXX	XXX	XXX	110	XXX	1/day	I-S
TSS	XXX	XXX	XXX	30.0	100.0	XXX	1/week	Grab
Total Dissolved Solids	XXX	XXX	XXX	Report	Report	XXX	1/week	Grab
Oil and Grease	XXX	XXX	XXX	15.0	20.0	XXX	1/week	Grab
Sulfate	XXX	XXX	XXX	Report	Report	XXX	1/week	Grab
Chloride	XXX	XXX	XXX	Report	Report	XXX	1/week	Grab
Bromide	XXX	XXX	XXX	Report	Report	XXX	1/week	Grab
Chloroform	XXX	XXX	XXX	Report	Report	XXX	1/week	Grab
Total Aluminum (lbs/mo)	XXX	Report Total Mo	XXX	Report	Report	XXX	1/week	Grab
Total Iron (lbs/mo)	XXX	Report Total Mo	XXX	1.7	3.4	XXX	1/week	Grab
Total Manganese (lbs/mo)	XXX	Report Total Mo	XXX	1.6	3.2	XXX	1/week	Grab

Outfall 004, Continued (from 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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Aluminum (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Iron (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Manganese (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 004

Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 006, 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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0	XXX	Daily when Discharging	Grab
DO	XXX	XXX	4.0 Daily Min	XXX	XXX	XXX	Daily when Discharging	Grab
TRC	XXX	XXX	XXX	0.5	1.6	XXX	Daily when Discharging	Grab
CBOD5	XXX	XXX	XXX	25.0	50.0	XXX	2/month	Grab
TSS	XXX	XXX	XXX	30.0	60.0	XXX	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000	10000	XXX	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200	1000	XXX	2/month	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Chloroform	XXX	XXX	XXX	Report	Report	XXX	2/month	Grab
Total Aluminum (lbs/mo)	XXX	Report Total Mo	XXX	Report	Report	XXX	2/month	Grab
Total Iron (lbs/mo)	XXX	Report Total Mo	XXX	Report	Report	XXX	2/month	Grab
Total Manganese (lbs/mo)	XXX	Report Total Mo	XXX	Report	Report	XXX	2/month	Grab
Total Aluminum (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation

Outfall 006, Continued (from 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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Iron (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Manganese (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 006

Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 007, 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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0	XXX	Continuous	Recorded
Temperature (ºF)	XXX	XXX	XXX	XXX	110	XXX	1/day	I-S
TSS	XXX	XXX	XXX	30.0	100.0	XXX	1/week	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	40000.0	80000.0	100000	1/week	24-Hr Composite
Oil and Grease	XXX	XXX	XXX	15.0	20.0	XXX	1/week	Grab
Nitrate-Nitrite	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Arsenic	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Beryllium	XXX	XXX	XXX	0.008	0.016	0.02	1/week	24-Hr Composite
Total Boron	XXX	XXX	XXX	100.0	200.0	250	1/week	24-Hr Composite
Total Copper	XXX	XXX	XXX	0.045	0.09	0.113	1/week	24-Hr Composite
Total Lead	XXX	XXX	XXX	0.1	0.2	0.25	1/week	24-Hr Composite
Total Mercury	XXX	XXX	XXX	0.003	0.006	0.008	1/week	24-Hr Composite
Total Selenium	XXX	XXX	XXX	0.25	0.5	0.63	1/week	24-Hr Composite

Outfall 007, Continued (from 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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Sulfate	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Chloride	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Bromide	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Chloroform	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Aluminum (lbs/mo)	XXX	Report Total Mo	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Iron (lbs/mo)	XXX	Report Total Mo	XXX	1.7	3.4	XXX	1/week	24-Hr Composite
Total Manganese (lbs/mo)	XXX	Report Total Mo	XXX	1.6	3.2	XXX	1/week	24-Hr Composite
Total Aluminum (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Iron (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Manganese (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 007

Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 012, 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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Calculation
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0	XXX	2/month	Grab
TRC	XXX	XXX	XXX	1.4	3.3	XXX	2/month	Grab
CBOD5	XXX	XXX	XXX	25.0	50.0	XXX	2/month	Grab
TSS	XXX	XXX	XXX	30.0	60.0	XXX	2/month	Grab

Compliance Sampling Location: Internal Monitoring Point 112

Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 015, 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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Flow (M Gal)	XXX	Report Daily Max	XXX	XXX	XXX	XXX	1/6 months	Estimate
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
TSS	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Aluminum	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Iron	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Manganese	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Aluminum (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Iron (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Manganese (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 015

Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 016, 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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Flow (M Gal)	XXX	Report Daily Max	XXX	XXX	XXX	XXX	1/6 months	Calculation
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
TSS	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Aluminum	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Iron	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Manganese	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Aluminum (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Iron (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Manganese (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 016

Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 017, 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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Flow (M Gal)	XXX	Report Daily Max	XXX	XXX	XXX	XXX	1/6 months	Calculation
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
TSS	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Aluminum	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Iron	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Manganese	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Aluminum (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Iron (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Manganese (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 017

Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 029, 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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Flow (M Gal)	XXX	Report Daily Max	XXX	XXX	XXX	XXX	1/6 months	Calculation
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
TSS	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Aluminum	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Iron	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Manganese	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Aluminum (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Iron (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Manganese (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 029

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Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Conemaugh Generating Station** NPDES Permit No.: **PA0005011** Outfall No.: **003**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **IW/SEW/SW**

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
4.52	300	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											
	Chloride (PWS)	mg/L											
	Bromide	mg/L											
	Sulfate (PWS)	mg/L											
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		1000000		240			0.21				
	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	µg/L											
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L		1000000		890			0.13				
	Total Lead	µg/L											
	Total Manganese	µg/L		1000000		260			0.19				
	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	µg/L											
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										
	Carbon Tetrachloride	µg/L	<										

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

	Di-n-Octyl Phthalate	µg/L	<										
	1,2-Diphenylhydrazine	µg/L	<										
	Fluoranthene	µg/L	<										
	Fluorene	µg/L	<										
	Hexachlorobenzene	µg/L	<										
	Hexachlorobutadiene	µg/L	<										
	Hexachlorocyclopentadiene	µg/L	<										
	Hexachloroethane	µg/L	<										
	Indeno(1,2,3-cd)Pyrene	µg/L	<										
	Isophorone	µg/L	<										
	Naphthalene	µg/L	<										
	Nitrobenzene	µg/L	<										
	n-Nitrosodimethylamine	µg/L	<										
	n-Nitrosodi-n-Propylamine	µg/L	<										
	n-Nitrosodiphenylamine	µg/L	<										
	Phenanthrene	µg/L	<										
	Pyrene	µg/L	<										
	1,2,4-Trichlorobenzene	µg/L	<										
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											

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Conemaugh Generating Station, NPDES Permit No. PA0005011, Outfall 003

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Conemaugh River**

No. Reaches to Model: 1

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	043832	65	1053	738.1	0.001		Yes
End of Reach 1	043832	0	746	11200		1	Yes

Q_{7-10}

Location	RMI	LFY (cfs/mi²)*	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	65	0.2069										243	7		
End of Reach 1	0	0.2069	2390									100	7		

Q_h

Location	RMI	LFY (cfs/mi²)	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	65														
End of Reach 1	0														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Conemaugh Generating Station, NPDES Permit No. PA0005011, Outfall 003

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | ◉ All ○ Inputs ○ Results ○ Limits

☑ ***Hydrodynamics***

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

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
65	152.71		152.71	6.992	0.001	1.12	204.116	182.3	0.699	5.684	1393.671
0	2390.00	1.547	2388.453								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
65	602.14		602.14	6.992	0.001	2.018	204.116	101.152	1.479	2.686	615.604
0	6663.595	1.547	6662.05								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.104 Analysis Hardness (mg/l): 260.45 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 Aluminum	240	0.21		0	750	750	1,906	
Total Iron	890	0.13		0	N/A	N/A	N/A	
Total Manganese	260	0.19		0	N/A	N/A	N/A	

☑ ***CFC*** CCT (min): 720 PMF: 0.719 Analysis Hardness (mg/l): 246.41 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 Aluminum	240	0.21		0	N/A	N/A	N/A	
Total Iron	890	0.13		0	1,500	1,500	14,822	WQC = 30 day average; PMF = 1
Total Manganese	260	0.19		0	N/A	N/A	N/A	

☑ ***THH*** CCT (min): 720 THH PMF: 0.719 Analysis Hardness (mg/l): N/A Analysis pH: N/A PWS PMF: 1

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 Aluminum	240	0.21		0	N/A	N/A	N/A	
Total Iron	890	0.13		0	N/A	N/A	N/A	
Total Manganese	260	0.19		0	1,000	1,000	12,616	

☑ ***CRL*** CCT (min): ###### 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 Aluminum	240	0.21		0	N/A	N/A	N/A	
Total Iron	890	0.13		0	N/A	N/A	N/A	
Total Manganese	260	0.19		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

Pollutants	*Mass Limits* AML (lbs/day)	*Mass Limits* MDL (lbs/day)	*Concentration Limits* AML	*Concentration Limits* MDL	*Concentration Limits* IMAX	*Concentration Limits* Units	Governing WQBEL	WQBEL Basis	Comments
Total Aluminum	46.0	71.8	1,221	1,906	3,053	µg/L	1,221	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Iron	559	872	14,822	23,125	37,056	µg/L	14,822	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Manganese	476	742	12,616	19,683	31,541	µg/L	12,616	THH	Discharge Conc ≥ 50% WQBEL (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

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Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Conemaugh Generating Station** NPDES Permit No.: **PA0005011** Outfall No.: **003**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **IW/SEW/SW**

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
2.9	1870	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											
	Chloride (PWS)	mg/L											
	Bromide	mg/L											
	Sulfate (PWS)	mg/L											
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		1000000		240			0.21				
	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	µg/L											
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L		1000000		890			0.13				
	Total Lead	µg/L											
	Total Manganese	µg/L		1000000		260			0.19				
	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	µg/L											
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										
	Carbon Tetrachloride	µg/L	<										

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

	Di-n-Octyl Phthalate	µg/L	<										
	1,2-Diphenylhydrazine	µg/L	<										
	Fluoranthene	µg/L	<										
	Fluorene	µg/L	<										
	Hexachlorobenzene	µg/L	<										
	Hexachlorobutadiene	µg/L	<										
	Hexachlorocyclopentadiene	µg/L	<										
	Hexachloroethane	µg/L	<										
	Indeno(1,2,3-cd)Pyrene	µg/L	<										
	Isophorone	µg/L	<										
	Naphthalene	µg/L	<										
	Nitrobenzene	µg/L	<										
	n-Nitrosodimethylamine	µg/L	<										
	n-Nitrosodi-n-Propylamine	µg/L	<										
	n-Nitrosodiphenylamine	µg/L	<										
	Phenanthrene	µg/L	<										
	Pyrene	µg/L	<										
	1,2,4-Trichlorobenzene	µg/L	<										
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											

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Conemaugh Generating Station, NPDES Permit No. PA0005011, Outfall 003

Instructions | Discharge | Stream

Receiving Surface Water Name: **Conemaugh River**

No. Reaches to Model: 1

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	043832	65	1053	738	0.001		Yes
End of Reach 1	043832	0	746	11200			Yes

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

Location	RMI	LFY (cfs/mi²)*	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	65	0.2069										243	7		
End of Reach 1	0	0.2069	2390									100	7		

Q_h

Location	RMI	LFY (cfs/mi²)	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	65														
End of Reach 1	0														

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Toxics Management Spreadsheet
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Model Results

Conemaugh Generating Station, NPDES Permit No. PA0005011, Outfall 003

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | ◉ All ○ Inputs ○ Results ○ Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.103 Analysis Hardness (mg/l): 604.7 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 Aluminum	240	0.21		0	750	750	2,534	
Total Iron	890	0.13		0	N/A	N/A	N/A	
Total Manganese	260	0.19		0	N/A	N/A	N/A	

☑ ***CFC*** CCT (min): 720 PMF: 0.712 Analysis Hardness (mg/l): 307.47 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 Aluminum	240	0.21		0	N/A	N/A	N/A	
Total Iron	890	0.13		0	1,500	1,500	22,261	WQC = 30 day average; PMF = 1
Total Manganese	260	0.19		0	N/A	N/A	N/A	

☑ ***THH*** CCT (min): 720 PMF: 0.712 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 Aluminum	240	0.21		0	N/A	N/A	N/A	
Total Iron	890	0.13		0	N/A	N/A	N/A	
Total Manganese	260	0.19		0	1,000	1,000	18,935	

☑ ***CRL*** CCT (min): ###### 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 Aluminum	240	0.21		0	N/A	N/A	N/A	

Total Iron	890	0.13		0	N/A	N/A	N/A	
Total Manganese	260	0.19		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 Aluminum	39.3	61.3	1,624	2,534	4,061	µg/L	1,624	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Iron	538	840	22,261	34,731	55,654	µg/L	22,261	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Manganese	458	714	18,935	29,541	47,336	µg/L	18,935	THH	Discharge Conc ≥ 50% WQBEL (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

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Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Conemaugh Generating Station** NPDES Permit No.: **PA0005011** Outfall No.: **003**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **IW/SEW/SW**

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
1.3	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											
	Chloride (PWS)	mg/L											
	Bromide	mg/L											
	Sulfate (PWS)	mg/L											
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		1000000		240			0.21				
	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	µg/L											
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L		1000000		890			0.13				
	Total Lead	µg/L											
	Total Manganese	µg/L		1000000		260			0.19				
	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	µg/L											
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										
	Carbon Tetrachloride	µg/L	<										

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

	Di-n-Octyl Phthalate	µg/L	<										
	1,2-Diphenylhydrazine	µg/L	<										
	Fluoranthene	µg/L	<										
	Fluorene	µg/L	<										
	Hexachlorobenzene	µg/L	<										
	Hexachlorobutadiene	µg/L	<										
	Hexachlorocyclopentadiene	µg/L	<										
	Hexachloroethane	µg/L	<										
	Indeno(1,2,3-cd)Pyrene	µg/L	<										
	Isophorone	µg/L	<										
	Naphthalene	µg/L	<										
	Nitrobenzene	µg/L	<										
	n-Nitrosodimethylamine	µg/L	<										
	n-Nitrosodi-n-Propylamine	µg/L	<										
	n-Nitrosodiphenylamine	µg/L	<										
	Phenanthrene	µg/L	<										
	Pyrene	µg/L	<										
	1,2,4-Trichlorobenzene	µg/L	<										
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											

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Conemaugh Generating Station, NPDES Permit No. PA0005011, Outfall 003

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Conemaugh River**

No. Reaches to Model: 1

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	043832	65	1053	738.1	0.001		Yes
End of Reach 1	043832	0	746	11200		1	Yes

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

Location	RMI	LFY (cfs/mi²)*	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	65	0.2069										243	7		
End of Reach 1	0	0.2069	2390									100	7		

Q_h

Location	RMI	LFY (cfs/mi²)	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	65														
End of Reach 1	0														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Conemaugh Generating Station, NPDES Permit No. PA0005011, Outfall 003

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | ◉ All ○ Inputs ○ Results ○ Limits

☐ *Hydrodynamics*

☑ *Wasteload Allocations*

☑ *AFC* CCT (min): 15 PMF: 0.102 Analysis Hardness (mg/l): 226.62 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 Aluminum	240	0.21		0	750	750	4,693	
Total Iron	890	0.13		0	N/A	N/A	N/A	
Total Manganese	260	0.19		0	N/A	N/A	N/A	

☑ *CFC* CCT (min): 720 PMF: 0.705 Analysis Hardness (mg/l): 240.38 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 Aluminum	240	0.21		0	N/A	N/A	N/A	
Total Iron	890	0.13		0	1,500	1,500	47,820	WQC = 30 day average; PMF = 1
Total Manganese	260	0.19		0	N/A	N/A	N/A	

☑ *THH* CCT (min): 720 THH PMF: 0.705 Analysis Hardness (mg/l): N/A Analysis pH: N/A PWS PMF: 1

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 Aluminum	240	0.21		0	N/A	N/A	N/A	
Total Iron	890	0.13		0	N/A	N/A	N/A	
Total Manganese	260	0.19		0	1,000	1,000	40,634	

☑ *CRL* CCT (min): ###### 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 Aluminum	240	0.21		0	N/A	N/A	N/A	

Total Iron	890	0.13		0	N/A	N/A	N/A	
Total Manganese	260	0.19		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 Aluminum	32.6	50.9	3,008	4,693	7,519	µg/L	3,008	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Iron	518	809	47,820	74,607	119,551	µg/L	47,820	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Manganese	441	687	40,634	63,396	101,585	µg/L	40,634	THH	Discharge Conc ≥ 50% WQBEL (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

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Toxics Management Spreadsheet
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Discharge Information

Instructions | Discharge | Stream

Facility: **Conemaugh Generating Station** NPDES Permit No.: **PA0005011** Outfall No.: **003**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **IW/SEW/SW**

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
0.3	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											
	Chloride (PWS)	mg/L											
	Bromide	mg/L											
	Sulfate (PWS)	mg/L											
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		1000000		240			0.21				
	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	µg/L											
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L		1000000		890			0.13				
	Total Lead	µg/L											
	Total Manganese	µg/L		1000000		260			0.19				
	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	µg/L											
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										
	Carbon Tetrachloride	µg/L	<										

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

	Di-n-Octyl Phthalate	µg/L	<										
	1,2-Diphenylhydrazine	µg/L	<										
	Fluoranthene	µg/L	<										
	Fluorene	µg/L	<										
	Hexachlorobenzene	µg/L	<										
	Hexachlorobutadiene	µg/L	<										
	Hexachlorocyclopentadiene	µg/L	<										
	Hexachloroethane	µg/L	<										
	Indeno(1,2,3-cd)Pyrene	µg/L	<										
	Isophorone	µg/L	<										
	Naphthalene	µg/L	<										
	Nitrobenzene	µg/L	<										
	n-Nitrosodimethylamine	µg/L	<										
	n-Nitrosodi-n-Propylamine	µg/L	<										
	n-Nitrosodiphenylamine	µg/L	<										
	Phenanthrene	µg/L	<										
	Pyrene	µg/L	<										
	1,2,4-Trichlorobenzene	µg/L	<										
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											

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Conemaugh Generating Station, NPDES Permit No. PA0005011, Outfall 003

Instructions | Discharge | Stream

Receiving Surface Water Name: **Conemaugh River**

No. Reaches to Model: 1

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	043832	65	1053	747.1	0.001		Yes
End of Reach 1	043832	0	746	11200		1	Yes

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

Location	RMI	LFY (cfs/mi²)*	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	65	0.2069										243	7		
End of Reach 1	0	0.2069	2390									100	7		

Q_h

Location	RMI	LFY (cfs/mi²)	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	65														
End of Reach 1	0														

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Model Results

Conemaugh Generating Station, NPDES Permit No. PA0005011, Outfall 003

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | ◉ All ○ Inputs ○ Results ○ Limits

☐ *Hydrodynamics*

☑ *Wasteload Allocations*

☑ ***AFC*** CCT (min): 15 PMF: 0.101 Analysis Hardness (mg/l): 238.86 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 Aluminum	240	0.21		0	750	750	17,838	
Total Iron	890	0.13		0	N/A	N/A	N/A	
Total Manganese	260	0.19		0	N/A	N/A	N/A	

☑ ***CFC*** CCT (min): 720 PMF: 0.697 Analysis Hardness (mg/l): 242.39 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 Aluminum	240	0.21		0	N/A	N/A	N/A	
Total Iron	890	0.13		0	1,500	1,500	204,669	WQC = 30 day average; PMF = 1
Total Manganese	260	0.19		0	N/A	N/A	N/A	

☑ ***THH*** CCT (min): 720 THH PMF: 0.697 Analysis Hardness (mg/l): N/A Analysis pH: N/A PWS PMF: 1

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 Aluminum	240	0.21		0	N/A	N/A	N/A	
Total Iron	890	0.13		0	N/A	N/A	N/A	
Total Manganese	260	0.19		0	1,000	1,000	172,778	

☑ ***CRL*** CCT (min): ###### 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 Aluminum	240	0.21		0	N/A	N/A	N/A	

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Total Iron	890	0.13		0	N/A	N/A	N/A	
Total Manganese	260	0.19		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 Aluminum	28.6	44.6	11,433	17,838	28,583	µg/L	11,433	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Iron	512	799	204,669	319,317	511,673	µg/L	204,669	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Manganese	432	674	172,778	269,561	431,945	µg/L	172,778	THH	Discharge Conc ≥ 50% WQBEL (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

Conemaugh Generating Station
1442 Power Plant Road
New Florence, PA 15944

August 22, 2022

Via OnBase DEP Upload Module

Mr. Justin C. Dickey, P.E.
Environmental Program Manager - Permits Chief
Clean Water Program
Pennsylvania Department of Environmental Protection
Northwest Regional Office
230 Chestnut Street
Meadville, PA 16335

Re: Keystone-Conemaugh Projects, LLC – Conemaugh Generating Station
NPDES Permit No. PA0005011 (effective January 1, 2019)

Conemaugh River Surface Water - Background Data Collection Summary Report

Dear Mr. Dickey:

Please find enclosed the subject report that was prepared in accordance with our recent correspondence and in support of Conemaugh Station's proposed TMDL compliance plan. Conemaugh Station and our project support team – Aptim and Apex Companies – are grateful for the Department's support with this effort, and we are looking forward to receipt of the Department's comment to the report. If you have any questions or concerns regarding this submittal, then please contact me at (724) 235-4496 or jshimshock@keyconops.com.

Respectfully submitted,

John P. Shimshock

John P. Shimshock
Environmental Specialist - Conemaugh Generating Station

Attachment

Certification by a Responsible Official per 25 Pa. Code §127.402(d)

Based on the information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate and complete.

Signature: Barry J Hunt
Name: Barry J. Hunt
Official Title: General Manager – Conemaugh Station
Telephone No.: (724) 235-4500
Date Signed: 8-22-22

APTIM

CONEMAUGH RIVER
SURFACE WATER--BACKGROUND DATA COLLECTION
SUMMARY REPORT

Prepared for:

Keystone-Conemaugh Projects, LLC
Conemaugh Generating Station
New Florence, Pennsylvania

Prepared by:

Aptim Environmental & Infrastructure, LLC
Pittsburgh, Pennsylvania

August 2022

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List of Acronyms & Abbreviations

APTIM	Aptim Environmental & Infrastructure, LLC
Cb	long-term average background/ambient water quality
cfs	cubic feet per second
Conemaugh	Conemaugh Generating Station
CV_d	coefficient of variation (associated with Cb)
DO	dissolved oxygen
mg/L	milligram per liter
PADEP	Pennsylvania Department of Environmental Protection
PWS	Potable Water Supply
SAP	Sampling & Analysis Plan
Station	Conemaugh Generating Station
TMDL	Total Maximum Daily Load
TDS	total dissolved solids
TSS	total suspended solids
USGS	U.S. Geological Survey
WWF	Warm Water Fishes

1.0 Introduction

The Conemaugh Generating Station (Conemaugh or the Station) is presently subject to compliance requirements associated with Total Maximum Daily Load (TMDL) obligations for process and stormwater discharges to the Conemaugh River, specific to a number of constituents, including aluminum, iron, and manganese. In view of the TMDL obligations, Conemaugh has requested PADEP's consideration for an aggregate approach to collectively manage all of the Station's point source and non-point source discharges to the river. To assist with this decision-making process, and as agreed by PADEP, Conemaugh conducted a surface water sampling program, allowing for the collection of samples intended to characterize the "background" concentrations of the noted constituents in the river. These data collection efforts, in turn, will serve to facilitate potential refinement of the river's predicted assimilative capacity in the context of the TMDLs.

In support of a proposed two-phase data collection program, Aptim Environmental & Infrastructure, LLC (APTIM) prepared a Sampling & Analysis Plan (SAP) that was submitted on May 10, 2022 for PADEP's review. PADEP's concurrence was subsequently received on June 2, 2022 via written correspondence (see Appendix A), and which also provided a further recommendation to include the analysis of blank samples during those events involving the collection of field duplicate samples. Commensurate with the above, Apex Companies, LLC (Apex) implemented the Phase I and Phase II sampling programs over an approximate two-month period spanning early-June to early-August 2022.

Following the introductory section of this report, field and analytical summaries of the Phase I and Phase II programs are further discussed in Sections 2.0 and 3.0, respectively. Section 4.0 provides a statistical review of the Phase II analytical data relative to characterization of river background concentrations for the specific TMDL constituents of aluminum, iron, and manganese, as well as other select analytes targeted in the SAP. Section 5.0 concludes the report with a list of references.

Although not an aspect of the Phase I and II sampling efforts presented herein, an aquatic survey of the river was performed by PADEP on May 25, 2022 at locations above, between and below the Seward and Conemaugh Stations. The findings from this survey, which included collection of macroinvertebrates, documentation of water chemistry, and a habitat assessment, are being addressed by PADEP in a separate report. These findings are intended to offer additional context to the current impairment designation assigned to the river reaches adjacent to the Conemaugh Station.

2.0 Phase I Sampling Program Summary

2.1 Overview

As noted in the introductory section, the surface water sampling program was designed to encompass a two-phased approach. The first phase (Phase I) focused on initial sampling along a transect established upstream of the Conemaugh Station, corresponding to the span of the Seward Bridge as shown in the attached Figure 1. This transect is also upstream and outside the potential influence of discharges associated with the Seward Station just upriver from Conemaugh. The width of the Conemaugh River along this transect is approximately 280 feet, and thus, a total of three discrete sampling points were utilized to provide reasonable indications of any potential spatial variabilities/ influences on chemical concentrations. These points are shown on Figure 1 and represent the mid-channel ("SEWARD-MID"), and two points spaced roughly equidistant between the mid-channel and the respective right- and left-descending banks ("SEWARD-RMID" and "SEWARD-LMID"). The Seward Bridge was selected as the location for the sampling effort based on the results generated from a preliminary sampling effort conducted in April 2022 and reported in the SAP. The April 2022 results showed no discernible differences in water quality in river water samples collected at the Seward Bridge and at the New Florence Bridge located downstream of Conemaugh Station.

Per the SAP, two separate sampling events were conducted as part of the Phase I program, including sample collections on June 1, 2022 and June 13, 2022. During each event, samples were collected from the approximate mid-depth horizon of the river, and field measurements recorded for pH, temperature, specific conductance, dissolved oxygen (DO), and turbidity. Collected samples (including a field duplicate from each event) were submitted to Geochemical Testing (Somerset, PA) for laboratory analysis of the following constituents:

- pH (also field-recorded), acidity, alkalinity, sulfate, and total suspended solids (TSS)
- Total aluminum, total iron, and total manganese
- Total calcium, total magnesium, total sodium, and total hardness.

2.2 River Flow Considerations

Per the SAP, river flow conditions were monitored on the days selected for sample collection, with relevant online information obtained from the U.S. Geological Survey's (USGS) Gaging Station at Seward, Pennsylvania (Station No. 03041500; Current Conditions for USGS 03041500 Conemaugh River at Seward, PA). With consideration of sampling taking place outside the low-flow season ($Q_{7\text{-}10}$; typically July thru November), evaluation of flow conditions relied on two other metrics, including comparison of actual river flow to historical median values (50^{th} percentile) and determination of relative percentage differences in flows from the prior day.

More specifically, and on the day(s) targeted for sampling, an initial comparison was made of the Instantaneous Flow Value versus the historical Median Value for that particular date. Once confirmed that the Instantaneous Flow was less than the Median Value, then potential satisfaction of the second metric was determined via comparison of current day versus prior day river flow values. For this metric to be satisfied, the current day's flow value should not have increased by more than 25 percent compared to the prior day's flow value. If both of these metrics were satisfied, river conditions were deemed acceptable for surface water sample collection; otherwise, sample collection activities were deferred until the metrics were satisfied.

2.3 *Phase I Program Observations*

The river flow information, field data, and laboratory analytical results from the Phase I sampling program are summarized in the attached Table 1, which was also forwarded to PADEP on June 21, 2022 for review and information. As acknowledged in the SAP, the principal objective of the Phase I efforts was to demonstrate a reasonable level of chemical uniformity across the river's width, such that the Phase II sampling program could be initiated to solely focus on continued data collection from the mid-channel location only ("SEWARD-MID").

Upon further review of Table 1, the agreement in values for both field and laboratory parameters during each of the events suggests minimal spatial variability across the three sampling locations of the Seward Bridge transect. The laboratory results, in particular, provide clear evidence of tightly grouped datasets for the metals (including aluminum, iron, and manganese), as well as the general chemistry constituents. Examination of the field duplicate samples from the June 1 and June 13, 2022 events indicates verifiable laboratory accuracy and precision, while the blank sample from the June 13, 2022 event confirms the absence of any externally-introduced contamination or bias. Completed field sample collection forms and laboratory analytical reports from each of the two Phase I sampling events are contained in Appendix B of this report.

Based on the above and the achievement of the Phase I sampling program objective, the transition to the Phase II sampling program was made on June 24, 2022, as further detailed in Section 3.0.

3.0 Phase II Sampling Program Summary

3.1 Overview

Based on the successful outcome of the Phase I program, sample collection in support of the Phase II program commenced on June 24, 2022 and concluded on August 2, 2022, encompassing a total of eight separate sampling events. Samples during Phase II were only collected from the mid-channel location ("SEWARD-MID") of the Seward Bridge transect (refer to attached Figure 1), with field duplicates and blank samples jointly prepared during every other event. Field parameters and laboratory analyses remained the same as done for the Phase I program.

3.2 River Flow Considerations

Pre-requisite monitoring of the river flow conditions was again performed during the Phase II program to confirm the suitability of the days targeted for each sampling event. Both river flow metrics (Section 2.2) were satisfied for each of the eight individual sampling events conducted.

3.3 Phase II Program Observations

The river flow information, field data, and laboratory analytical results from the Phase II sampling program are summarized in the attached Table 2. Examination of the field duplicate samples from the June 24, July 1, July 15, and July 25, 2022 events indicates verifiable laboratory accuracy and precision, while the blank samples from the same four events confirm the absence of any externally-introduced contamination or bias. Completed field sample collection forms and laboratory analytical reports from all of the Phase II sampling events are contained in Appendix C of this report.

With particular regard to the TMDL constituents (i.e., aluminum, iron, and manganese), the data from Table 2 show aluminum and manganese concentrations with minimal variation and generally ranging between approximately 0.2 to 0.3 milligrams per liter (mg/L). Concentrations of iron exhibit a slightly greater degree of variability, but still fall within a generally narrow band ranging from approximately 0.7 to 1.1 mg/L. Values for pH were observed between approximately 7.5 and 7.8, and overall total hardness of the river water was calculated at values ranging between approximately 220 to 270 mg/L $CaCO_3$. As an additional point of reference, the river flows throughout the majority of the Phase II program (excluding the value from the June 24, 2022 event) were slightly more than double the documented $Q_{7\text{-}10}$ value of approximately 150 cubic feet per second (cfs) (PADEP, 2018 NPDES Permit Fact Sheet).

Utilizing the data from Table 2 (excluding the duplicate samples), Section 4.0 provides a discussion of the statistical evaluations performed to arrive at calculated background values for

each of the TMDL constituents, including aluminum, iron, and manganese. Similar statistics and calculations are also performed for alkalinity, dissolved oxygen, and total hardness.

4.0 Statistical Review

4.1 Aluminum, Iron, and Manganese

The relevant data extracted from Table 2 for aluminum, iron, and manganese is provided below for reference to facilitate the discussion of the statistics and background value calculations.

Sample Date	Total Aluminum (mg/L)	Total Iron (mg/L)	Total Manganese (mg/L)
June 24, 2022	0.3	0.92	0.32
June 29, 2022	0.2	0.91	0.30
July 1, 2022	0.2	0.76	0.32
July 11, 2022	0.2	0.79	0.26
July 15, 2022	0.2	0.80	0.23
July 21, 2022	0.3	0.86	0.22
July 25, 2022	0.3	1.14	0.21
August 2, 2022	0.2	0.95	0.21

These calculations are patterned directly from those contained in the "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" (PADEP, 2003). A complete copy of this guidance document is contained in Appendix D of this report, with an excerpt of "Appendix 2" from the guidance document included below to illustrate an example calculation. As noted in the example calculation, the dataset(s) being evaluated should first be tested to confirm that it fits a normal/log-normal distribution. Accordingly, the respective datasets from above were input to ProUCL Statistical Software (U.S. EPA, 2022), with confirmation received (via goodness-of-fit tests) that iron and manganese satisfy the criteria for normal/log-normal distribution. However, with the minimally observed variation in the reported aluminum concentrations, this dataset was found not to fit a normal/log-normal distribution, and thus was characterized as non-parametric.

For the iron and manganese datasets, the approach from the guidance document was applied to develop the necessary statistical parameters (mean and variance), and then ultimately arrive at calculated values for the long-term average background water quality (Cb, essentially the mean plus one-half of the variance of the sample data) and associated coefficient of variation (CV_d, essentially the ratio of the sample data standard deviation to its mean). Despite the non-parametric designation assigned to the aluminum dataset, there is not anticipated to be a significant degree of inaccuracy from subjecting the data to the guidance document calculational approach. These calculations are contained in Appendix E of this report.

As a supplement, ProUCL was used to additionally analyze the aluminum dataset (focusing on mean and coefficient of variation), and these results are also provided for comparison. Again, for purposes of comparison, similar supplemental application of ProUCL to the iron and manganese datasets was performed. The output from the ProUCL software is contained in Appendix F of this report.

Appendix 2

An Example to Determine the Long Term Average Background/Ambient Water Quality and its Variability

To determine the long-term average background ambient water quality, the data must be log-transformed (assuming the data are log-normally distributed):

$$Y_i = \ln(X_i) \qquad \text{where:}$$

Xi = observed data
Yi = the natural log of the observed data

Next, calculate the mean and the variance of the log-transformed data:

Example Data ug/l					
X_1	= 0.41	Y_1	= ln(0.41)	=	-0.89
X_2	= 0.92	Y_2	= ln(0.92)	=	-0.08
X_3	= 1.07	Y_3	= ln(1.07)	=	0.07
X_4	= 0.22	Y_4	= ln(0.22)	=	-1.51
X_5	= 0.09	Y_5	= ln(0.09)	=	-2.41
X_6	= 0.31	Y_6	= ln(0.31)	=	-1.17
X_7	= 0.55	Y_7	= ln(0.55)	=	-0.6
X_8	= 0.01	Y_8	= ln(0.01)	=	-4.6
X_9	= 0.49	Y_9	= ln(0.49)	=	-0.71
X_{10}	= 1.99	Y_{10}	= ln(1.99)	=	0.7
			The Sum of Yi =		-11.2

The Mean (μ_y)

$$\mu_y = \frac{\sum(Y_i)}{k} \qquad \mu_y = \frac{11.2}{10} \qquad \mu_y = \mathbf{-1.12}$$

where,
μ_y = the lognormal mean of example data
Y_i = lognormal data
k = the number of data points in example data set

The Variance (σ_y^2)

The lognormal variance is calculated.

$(Y_i \quad \mu_y)^2$		
$(-0.89-(-1.12))^2$	=	0.05
$(-0.08-(-1.12))^2$	=	1.08
$(0.07-(-1.12))^2$	=	1.42
$(-1.51-(-1.12))^2$	=	0.15
$(-2.41-(-1.12))^2$	=	1.65
$(-1.17-(-1.12))^2$	=	0.002
$(-0.6-(-1.12))^2$	=	0.27
$(-4.6-(-1.12))^2$	=	12.1
$(-0.71-(-1.12))^2$	=	0.17
$(0.7-(-1.12))^2$	=	3.28
$\sum(Y_i - \mu_y)^2$	=	20.2

$$\sigma_y^2 = \frac{\sum (Y_i - \mu_y)^2}{(k-1)} \qquad \sigma_y^2 = \frac{20.2}{10-1} \qquad = \mathbf{2.24}$$

The long term average background/ambient water quality (Cb) and associated coefficient of variation (CV_d) are then:

$$Cb = \exp\left(\mu_y + \frac{\sigma_y^2}{2}\right) \qquad Cb = \exp \quad 1.12 + \frac{2.24}{2} \qquad = 1.0$$

$$CV_d = \sqrt{\exp(\sigma_y^2) - 1} \qquad CV_d = \sqrt{\exp(2.24) - 1} \qquad = 2.9$$

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A summary of the calculated background values (Cb) and coefficients of variation (CV_d) as determined using the PADEP guidance (Appendix E) are presented below.

Parameter	Total Aluminum	Total Iron	Total Manganese
Background (Cb)	0.24 mg/L	0.89 mg/L	0.26 mg/L
Coefficient of Variation (CV_d)	0.21	0.13	0.19

For comparison, a summary of the mean and coefficient of variation values from the ProUCL Software application (Appendix F) is provided as well.

Parameter	Total Aluminum	Total Iron	Total Manganese
Mean	0.24 mg/L	0.89 mg/L	0.26 mg/L
Coefficient of Variation	0.22	0.14	0.19

In review of the above, there is obvious consistency in the calculated background and mean values provided by each evaluation approach, along with agreement in the respective coefficients of variation. It is therefore concluded that the values are reasonable and defensible relative to their potential future use in possible refinements within the context of the TMDLs, or application as part of other water quality-based determinations specific to these reaches of the Conemaugh River.

In the regulatory context and as one additional point of comparison, the water quality criteria for total aluminum, total iron, and total manganese (as cited from the relevant sections of 25 Pa. Code, Chapter 93) are tabulated below. As observed, the calculated background values for each of these constituents as determined within the scope of this report, are measurably under their respective water quality thresholds.

Parameter	Total Aluminum	Total Iron	Total Manganese
Water Quality Criterion	0.75 mg/L	1.5 mg/L	1.0 mg/L
Regulatory Citation	25 Pa. Code, §93.8c; Table 5	25 Pa. Code, §93.7; Table 3	25 Pa. Code, §93.7; Table 3
Applicability	Acute Fish Criterion	30-day average; WWF	Maximum; PWS

WWF – Warm Water Fishes; PWS – Potable Water Supply

4.2 Alkalinity, Dissolved Oxygen (DO), and Total Hardness

The relevant data extracted from Table 2 for alkalinity, DO, and total hardness is provided below for reference to facilitate the discussion of the statistics and background value calculations. These parameters offer more of an insight to the general chemistry of the river, and also represent another measure for comparison against established water quality criteria.

Sample Date	Alkalinity to pH 4.5 (mg/L $CaCO_3$)	Dissolved Oxygen (mg/L)	Total Hardness (mg/L $CaCO_3$)
June 24, 2022	36	6.62	217
June 29, 2022	38	8.71	235
July 1, 2022	37	6.46	263
July 11, 2022	49	9.90	239
July 15, 2022	44	7.01	270
July 21, 2022	44	10.1	217
July 25, 2022	50	12.1	232
August 2, 2022	50	11.4	268

Following the same approach as outlined in Section 4.1, the distributions of each of the datasets was initially evaluated using ProUCL, confirming their fit into a normal/log-normal distribution. As such, the datasets were then run through the statistical calculations contained in the PADEP guidance document, resulting in the background values (Cb) and coefficients of variation (CV_d) shown below. The detailed calculations are presented in Appendix E of this report.

Parameter	Alkalinity to pH 4.5	Dissolved Oxygen	Total Hardness
Background (Cb)	43.6 mg/L $CaCO_3$	9.06 mg/L	243 mg/L $CaCO_3$
Coefficient of Variation (CV_d)	0.14	0.25	0.09

Again, the datasets were also fully run through ProUCL to determine corresponding values for the mean and coefficient of variation for each of the constituents. These values are presented below, with detailed calculations contained in Appendix F of this report.

Parameter	Alkalinity to pH 4.5	Dissolved Oxygen	Total Hardness
Mean	43.5 mg/L $CaCO_3$	9.03 mg/L	237 mg/L $CaCO_3$
Coefficient of Variation	0.14	0.24	0.09

Very close agreement between the two statistical calculation approaches is noted, with near identical values derived for the background/mean and the coefficient of variation using the separate methodologies.

In the regulatory context and commensurate with the final comparisons made in Section 4.1, the water quality criteria for alkalinity, dissolved oxygen, and total hardness (as cited from the relevant sections of 25 Pa. Code, Chapter 93) are tabulated below. Although no criterion exists for total hardness, its comparison with the criterion for total dissolved solids (TDS) was done in proxy due to a somewhat overlapping relationship in the constituents that form the basis for these two

parameters. When compared to the below, the calculated background values for each of these constituents as determined within the scope of this report, are at acceptable levels relative to their respective water quality thresholds, including the qualitative proxy assessment for total hardness.

Parameter	Alkalinity to pH 4.5	Dissolved Oxygen	Total Hardness
Water Quality Criterion	20.0 mg/L $CaCO_3$	5.5/5.0 mg/L	500/750 mg/L*
Regulatory Citation	25 Pa. Code, §93.7; Table 3	25 Pa. Code, §93.7; Table 3	25 Pa. Code, §93.7; Table 3
Applicability	Minimum; WWF	7-day average/ minimum; WWF	Monthly average/ maximum; PWS

WWF – Warm Water Fishes; PWS – Potable Water Supply; * - criterion for Total Dissolved Solids

5.0 References

Aptim Environmental & Infrastructure, LLC, 2022, Conemaugh River Surface Water Sampling & Analysis Plan for Background Data Collection. Prepared for Keystone-Conemaugh Projects, LLC, Conemaugh Generating Station.

PADEP, 2003, 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. Document Number 391-2000-022.

PADEP, 2018, NPDES Permit Fact Sheet, PA0005011. Southwest Regional Office—Clean Water Program.

U.S. Environmental Protection Agency, 2022, ProUCL Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations, v5.2.

U.S. Geological Survey, National Water Information System: Web Interface. Current Conditions for USGS 03041500 Conemaugh River at Seward, PA.

Tables

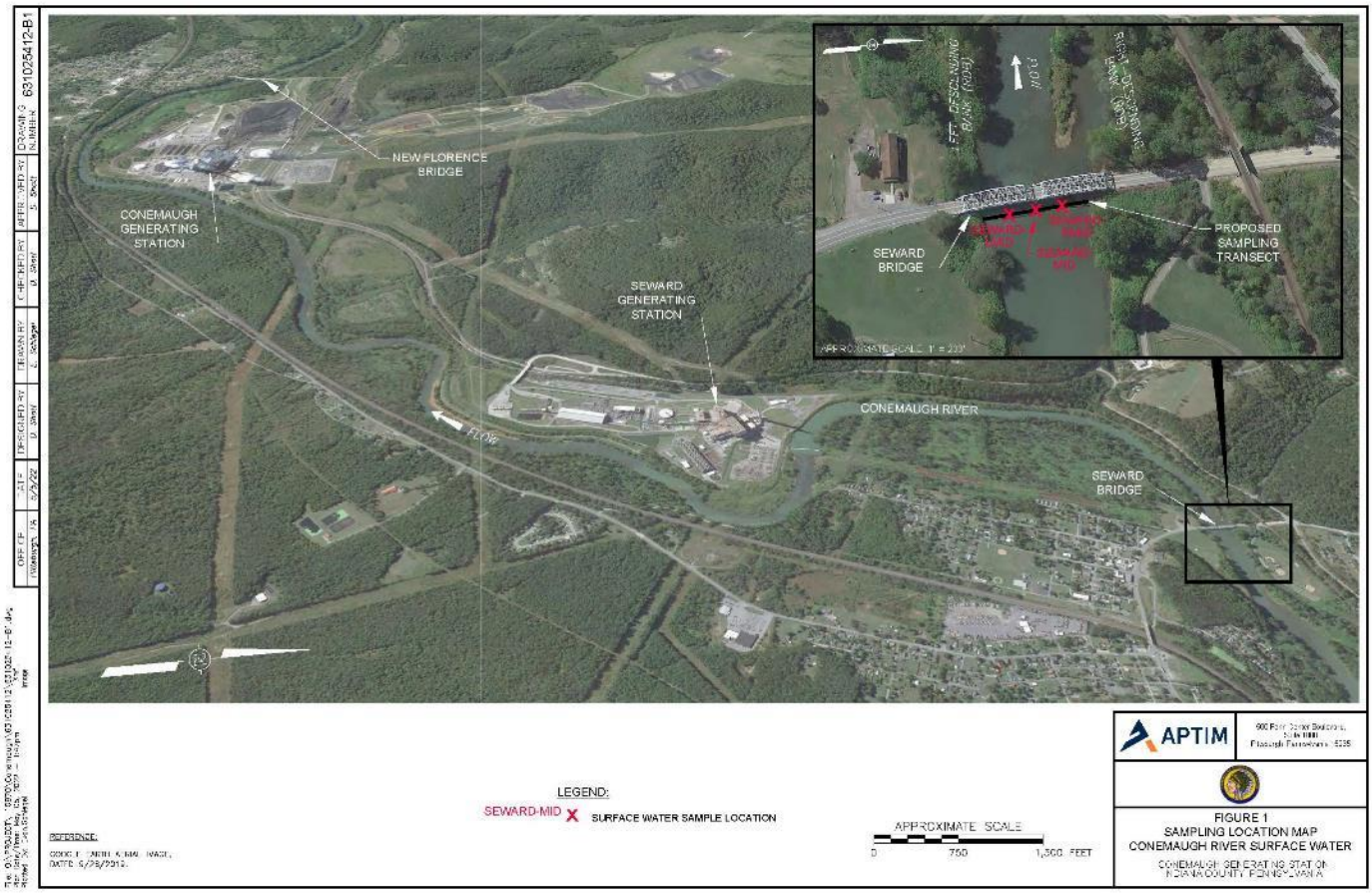
Conemaugh River Sampling Summary (Phase I)

Sample Name/Location	Date	River Flow Metrics			Field Parameters					Lab Analysis											
		Flow (cfs)	≤ 50th Percentile	≤ 25% Increase from prior day	pH (S.U.)	Temp (°F)	Spec Cond. (µS/cm)	Turbidity (NTU)	DO (mg/L)	pH (S.U.)	Acidity to pH 8.3 (mg/L $CaCO_3$)	Alkalinity to pH 4.5 (mg/L $CaCO_3$)	TSS (mg/L)	Sulfate (mg/L)	Al (mg/L)	Ca (mg/L)	Fe (mg/L)	Mg (mg/L)	Mn (mg/L)	Na (mg/L)	Hardness (mg/L $CaCO_3$)
Seward Bridge:	6/1/2022	553	YES (893 cfs)	YES (572 cfs on 5/31/22)																	
Mid-Channel (MID)					6.58	73.3	657	5.1	9.22	7.69	-27	38	5	203	0.2	61.8	0.89	19.8	0.40	21.9	236
Mid-Channel Duplicate (FD)					6.58	73.3	657	5.1	9.22	7.71	-27	40	5	203	0.3	61.6	0.90	19.8	0.40	21.9	235
Center Left-Descending (LMID)					7.34	76.6	605	5.0	5.66	7.68	-25	43	4	203	0.3	60.5	0.90	19.5	0.40	21.5	231
Center Right-Descending (RMID)					7.61	75.3	617	4.4	5.17	7.75	-25	41	3	205	0.2	62.2	0.85	20.0	0.40	22.1	238
Seward Bridge:	6/13/2022	651	YES (724 cfs)	YES (631 cfs on 6/12/22)																	
Mid-Channel (MID)					6.01	69.1	564	29.8	7.61	7.46	-25	38	16	158	0.6	48.4	1.46	15.0	0.35	18.1	183
Center Left-Descending (LMID)					6.91	68.5	514	34.7	5.68	7.43	-22	37	16	155	0.7	48.2	1.48	15.0	0.35	18.1	182
Center Right-Descending (RMID)					7.17	68.8	534	20.2	6.69	7.56	-22	38	11	165	0.4	49.6	1.28	15.5	0.33	19.2	187
Center Right Duplicate (FD)					7.17	68.8	534	20.2	6.69	7.56	-22	38	11	166	0.4	51.6	1.19	16.1	0.34	19.1	195
Trip Blank (TB)					---	---	---	---	---	5.03	11	< 10	< 2	< 2	< 0.1	< 0.1	< 0.05	< 0.1	< 0.01	< 0.2	< 1

Conemaugh River Sampling Summary (Phase II)

Sample Name/Location	Date	River Flow Metrics			Field Parameters					Lab Analysis											
		Flow (cfs)	≤ 50th Percentile	≤ 25% increase from prior day	pH (S.U.)	Temp (°F)	Spec Cond. (µS/cm)	Turbidity (NTU)	DO (mg/L)	pH (S.U.)	Acidity to pH 8.3 (mg/L $CaCO_3$)	Alkalinity to pH 4.5 (mg/L $CaCO_3$)	TSS (mg/L)	Sulfate (mg/L)	Al (mg/L)	Ca (mg/L)	Fe (mg/L)	Mg (mg/L)	Mn (mg/L)	Na (mg/L)	Hardness (mg/L $CaCO_3$)
Seward Bridge:	6/24/2022	487	YES (597 cfs)	YES (611 cfs on 6/23/22)																	
Mid-Channel (LMD)					5.98	71.6	662	11.1	6.62	7.64	-21	36	5	187	0.3	57.4	0.92	17.9	0.32	19.6	217
Mid-Channel Duplicate (FD)					5.98	71.6	662	11.1	6.62	7.74	-18	37	5	192	0.3	58.7	0.88	17.8	0.32	19.3	215
Trip Blank (TB)					---	---	---	---	---	5.19	10	< 10	< 2	< 2.0	< 0.1	< 0.1	< 0.05	< 0.1	< 0.01	< 0.2	< 1.0
Seward Bridge:	6/29/2022	387	YES (495 cfs)	YES (487 cfs on 6/28/22)																	
Mid-Channel (LMD)					7.52	72.8	741	9.6	8.71	7.62	-19	38	8	207	0.2	62.5	0.91	19.2	0.30	19.9	235
Seward Bridge:	7/3/2022	342	YES (505 cfs)	YES (361 cfs on 6/30/22)																	
Mid-Channel (LMD)					6.96	72.9	733	4.8	6.46	7.50	-21	37	6	243	0.2	70.1	0.78	21.5	0.32	21.2	269
Mid-Channel Duplicate (FD)					6.96	72.9	733	4.8	6.46	7.52	-23	36	4	239	0.2	71.4	0.81	21.7	0.32	21.7	268
Trip Blank (TB)					---	---	---	---	---	5.00	11	< 10	< 2	< 2.0	< 0.1	< 0.1	< 0.05	< 0.1	< 0.01	< 0.2	< 1.0
Seward Bridge:	7/11/2022	355	YES (457 cfs)	YES (374 cfs on 7/10/22)																	
Mid-Channel (LMD)					6.68	72.6	721	3.8	9.9	7.70	-34	49	4	214	0.2	62.9	0.79	19.8	0.26	28.4	239
Seward Bridge:	7/15/2022	317	YES (444 cfs)	YES (390 cfs on 7/14/22)																	
Mid-Channel (LMD)					8.05	75.2	731	4.0	7.01	7.82	-31	44	5	248	0.2	71.9	0.80	22.1	0.23	28.7	270
Mid-Channel Duplicate (FD)					8.05	75.2	731	4.0	7.01	7.83	-30	45	5	249	0.2	69.2	0.72	21.8	0.21	27.9	261
Trip Blank (TB)					---	---	---	---	---	5.14	12	< 10	< 2	< 2.0	< 0.1	< 0.1	< 0.05	< 0.1	< 0.01	< 0.2	< 1.0
Seward Bridge:	7/21/2022	387	YES (434 cfs)	YES (463 cfs on 7/20/22)																	
Mid-Channel (LMD)					7.64	74.2	744	0.0	10.0	7.66	-28	44	4	189	0.3	57.8	0.86	17.8	0.22	27.0	217
Seward Bridge:	7/25/2022	361	YES (408 cfs)	YES (447 cfs on 7/24/22)																	
Mid-Channel (LMD)					7.98	74.4	682	0.0	12.1	7.83	-31	50	6	192	0.3	61.8	1.14	18.9	0.21	29.3	232
Mid-Channel Duplicate (FD)					7.98	74.4	682	0.0	12.1	7.84	-29	48	6	190	0.2	60.5	1.02	18.6	0.20	28.7	228
Trip Blank (TB)					---	---	---	---	---	5.12	14	< 10	< 2	< 2.0	< 0.1	< 0.1	< 0.05	< 0.1	< 0.01	< 0.2	< 1.0
Seward Bridge:	8/2/2022	336	YES (376 cfs)	YES (336 cfs on 8/1/22)																	
Mid-Channel (LMD)					8.52	72.2	744	< 0.1	11.4	7.69	-35	50	7	234	0.2	70.5	0.95	22.3	0.21	30.6	268

Figure


NEW FLORENCE BRIDGE
CONEMAUGH GENERATING STATION
SEWARD GENERATING STATION
CONEMAUGH RIVER
FLOW
SEWARD BRIDGE
PROPOSED SAMPLING TRANSECT
LEFT DESCENDING BANK (LDB)
RIGHT DESCENDING BANK (RDB)
FLOW
SEWARD-MID
LEGEND:
SEWARD-MID SURFACE WATER SAMPLE LOCATION
APPROXIMATE SCALE
0
750
1,500 FEET
APTIM
FIGURE 1
SAMPLING LOCATION MAP
CONEMAUGH RIVER SURFACE WATER
CONEMAUGH GENERATING STATION
INDIANA COUNTY, PENNSYLVANIA

Appendix A

Sampling & Analysis Plan Approval Letter (June 2, 2022)

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

MEMO

TO	Justin Dickey Program Manager, Acting Clean Water Program
FROM	Joe Brancato Aquatic Biologist Supervisor Clean Water Program
THROUGH	Eric Kicher Environmental Group Manager Clean Water Program
DATE	June 2, 2022
RE	Keystone-Conemaugh Projects, LLC. Conemaugh Generating Station Surface Water Sampling and Analysis Plan Conemaugh River (Stream Code 43832) Indiana County, New Florence, Pennsylvania

The Conemaugh Generating Station (Conemaugh) is subject to compliance requirements associated with Total Maximum Daily Load (TMDL) obligations for various discharges to the Conemaugh River. The Conemaugh River's Aquatic Life Use is currently impaired with a source resulting in historical acid mine drainage (AMD) and the cause being metals, including aluminum, manganese, and iron. Because of the TMDL obligations, Conemaugh has requested an aggregate approach to collectively manage all point and non-point discharges to the Conemaugh River. To accomplish this and assist with decision making, Conemaugh has submitted to the Department a Surface Water Sampling and Analysis Plan (SAP) for the collection of background water chemistry data to characterize concentrations of AMD metals associated with the impairments addressed in the TMDL. The Department's Clean Water Program Aquatic Biologists have reviewed the Plan and provided comments below:

Conemaugh will be collecting surface water samples from the Conemaugh River to characterize background conditions and gain information on the river's assimilative capacity regarding the TMDL. On May 25, 2022, a Department Aquatic Biologist from the Clean Water Program conducted a survey of the Conemaugh River at three (3) stations; upstream of both the Seward and Conemaugh Generating stations at the Village of Seward, just downstream of the Seward Generating Station and upstream of the Conemaugh Generating Station, and downstream of the Conemaugh Generating Station above the bridge in New Florence (Map 1). Aquatic macroinvertebrates and water chemistry were collected, and a habitat survey occurred. The Department will provide a separate report on their findings.

Northwest Regional Office
230 Chestnut Street | Meadville, PA 16335 | 814.332.6942 | Fax. 814.332.6121 | www.dep.pa.gov

Conemaugh will be conducting a two-phased approach to water sampling. A preliminary phase of transect water samples were collected at both the Seward and New Florence Bridges to examine potential contributary and accumulative effects of the Seward and Conemaugh Generating Stations as well as any additional contributing effects to water quality. Based on preliminary results provided in the SAP, minimal spatial variability occurred between the two stations and only the Seward Bridge site will be used moving forward for the Phase 1 and Phase 2 sampling.

This two-phased approach was agreed upon previously through conversations between the Clean Water Program and Conemaugh. Based on the overall review of the SAP, Conemaugh will follow all relevant protocols from the Department's Water Quality Monitoring Protocols for Streams and Rivers (2021), specifically sections 4.1 (In-Situ Field Meter and Transect Data Collection Protocol) and 4.2 (Discrete Water Chemistry Data Collection Protocol). The Phase 1 sampling (two sampling rounds) will occur at the bridge in Seward and used to determine Conemaugh River chemistry conformity by collecting transect data at the left descending bank (LDB), mid-channel (MID) and right descending bank (RDB). Specific parameters collected will be modeled off the determined source and cause of the impairment of the Conemaugh River which is currently Acid Mine Drainage (AMD) and metals, respectively. After demonstrating river conformity, the Phase 2 sampling plan will commence.

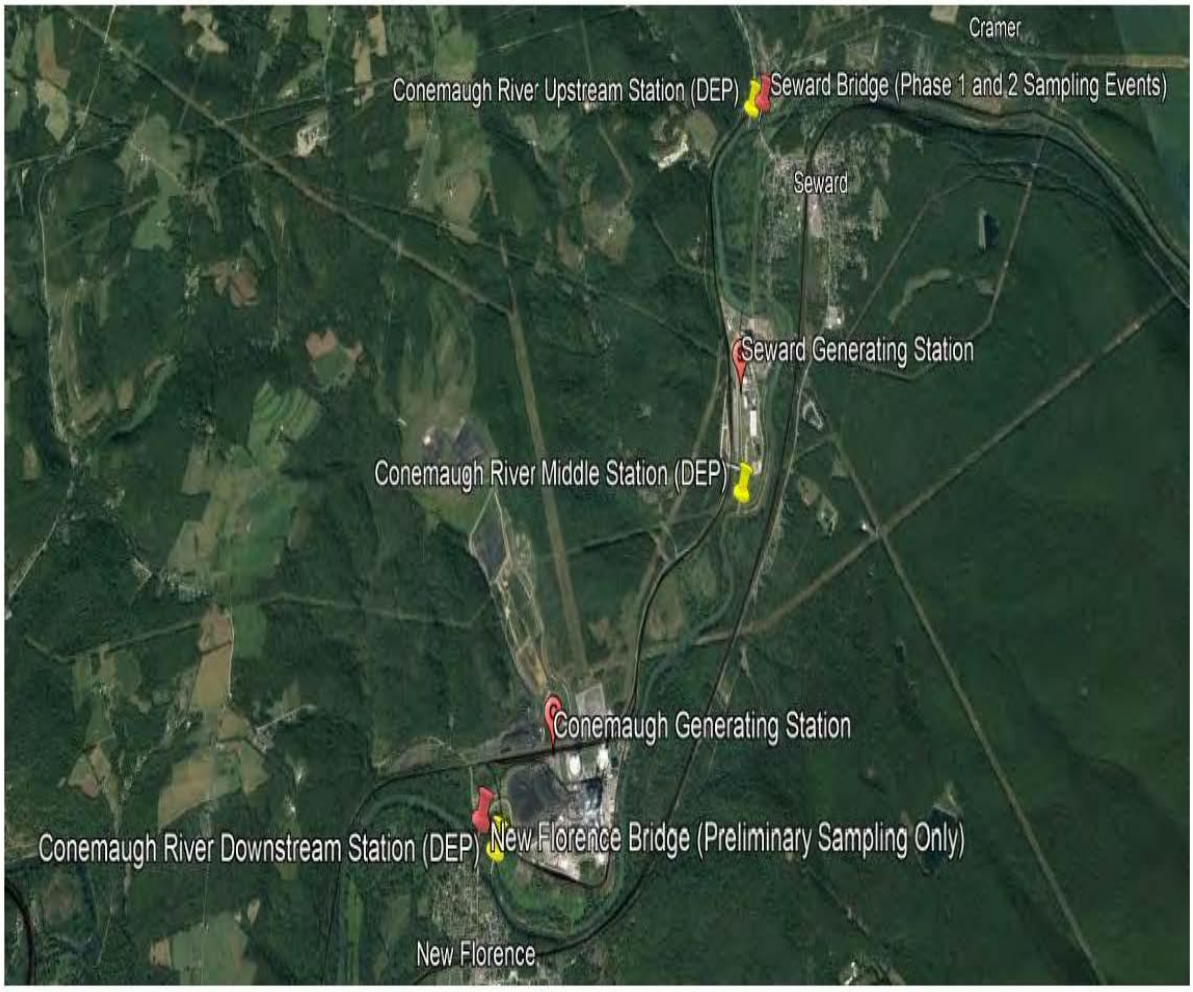
Brief overview of sampling:

- Preliminary Sampling – Precursor to Phase 1. Preliminary round of samples at Seward and New Florence Bridges (completed). Results showed similar water chemistry between stations and uniformity across river channel. Based on these results, only sampling at Seward Bridge will occur for Phase 1 and Phase 2 sampling.
- Phase 1 – two sampling rounds at Seward Bridge with collection at LDB, MID, and RDB. Gather information on if uniformity exists across river channel.
- Phase 2 – Sampling at mid-channel only with 8-10 sampling events over a 4-5-week timeframe. Mid-channel only based on Phase 1 sampling and uniformity of water chemistry demonstrated. Also used to gather sufficient dataset to represent river background conditions.

The SAP demonstrated that a robust dataset of river conditions will be achieved during the Phase 1 and Phase 2 events. The SAP also demonstrated adherence to Department protocols for sample collection, appropriate field and laboratory sample analysis, equipment calibration, sample preservation, packing, and shipment and quality assurance / quality control (QA/QC). The Department concurs with the proper timing of river samples based on river flows at the USGS Gaging Station in Seward. One suggestion is that the SAP include a blank sample when collecting duplicate samples.

Conclusion. The SAP conformed with all Department methodology and sampling protocols, QA/QC, laboratory analysis and proper timing of river sampling. Based on the SAP, the Department will allow sampling to commence immediately.

Map 1. Conemaugh River with locations of Phase I and Phase 2 and Department sampling sites.



Appendix B

Field Forms and Laboratory Reports—Phase I Sampling Program

DAILY FIELD REPORT

Sheet 1 of 3

PROJECT NAME: Conemaugh Sta
PROJECT LOCATION: Conemaugh River -TMDL
APEX PROJECT NO: 1147-5011
CONTRACTOR: —
DATE: 6/1/2022
WEATHER: P.Cloudy 84°

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365
www.apexcos.com

PURPOSE OF SITE VISIT: Conemaugh River Samples -TMDL.

ARRIVAL TIME: 1145A.

SITE DOCUMENTATION: APEX: Brantley Rice on-site

- Conemaugh River Data. - USGS website - Seward, PA Station
  - 0545A - Last Data update
  - 0630A - Instantaneous Flow - 553 cfs
  - 25th percentile - 576 cfs
  - Median - 893 cfs
  - 75th percentile - 1450 cfs.
  - 5/31/22 Discharge @ 0545A - 572 cfs

- Calibrate Horiba Multi-Meter - Auto Calibrate - OK

- Samples / Field Data.

- Seward Bridge. - Approx width of River - ~ 240'
  - Sample @ MID River - ~120'
  - Sample @ LMID River - ~ 60' Left MID
  - Sample @ RMID River - ~ 60' Right MID

DEPARTURE TIME: 1310P

COPIES TO: —

APEX REPRESENTATIVE		CONTRACTOR REPRESENTATIVE	
SIGNATURE:	Clay Walker	SIGNATURE:	
PRINT NAME:	Clay Walker	PRINT NAME:	

Daily Field Report ✓

DAILY FIELD REPORT (continued)

Sheet 2 of 3

PROJECT NAME: Conemaugh Sta.
PROJECT LOCATION: Conemaugh River - TMDL
APEX PROJECT NO: 1147-5011
DATE: 6/1/2022

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365

- Seward - MID / Seward - FD (Field DUP)
  - Water Depth - ~3.5' - Sample Depth - ~1.5'
  - LAT / LON - 40.41977755, -79.0260426
  - Sample Time - 1215p
  - Field Parameter Time - 1222p
    - Temp - 22.96
    - PH - 6.58
    - SC - 0.657
    - NTU - 5.1
    - DO - 9.22

* Note - Seward - FD Sample @ 1217p

- Seward - LMID
  - Water Depth - ~1.0' - Sample Depth ~0.5'
  - LAT / LON - 40.4200042, -79.0260409
  - Sample Time - 1230p
  - Field Parameter Time - 1234p
    - Temp - 24.80
    - PH - 7.34
    - SC - 0.605
    - NTU - 5.0
    - DO - 5.66

DAILY FIELD REPORT (continued)

Sheet 3 of 3

PROJECT NAME: Conemaugh Sta.
PROJECT LOCATION: Conemaugh River - TMDL
APEX PROJECT NO: 1147-5011
DATE: 6/1/2022

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365

- Seward - RMID
  - Water Depth ~4.0' - Sample Depth ~2.0'
  - LAT/LON - 40.4194406, -79.0260533
  - Sample Time - 1237p
  - Field Parameter Time - 1245p
    - Temp - 24.08
    - pH - 7.61
    - SC - 0.617
    - NTU - 4.4
    - DO - 5.17

- Samples on ice → TO Geochemical @ End of Day

Form F-5002, 10.20
*** Lab Work Order #

REQUEST FOR LABORATORY ANALYTICAL SERVICES

Chain of Custody (COC)

Shuttle/Cooler ID#

Billing Client

Company	Name: [illegible]		E-mail Address: [illegible]
Mailing Address	Telephone No.: 724-235-4596		Landfill Site: —
City, State, Zip	State Sampled: PA	PWS Number	Date Results Required

Special Instruction/Project ID/Analyte List/Comment:

*PC-1: Nitric acid (HNO_3)
*PC-2: Hydrochloric acid (HCL)
*PC-3: Sulfuric acid (H_2SO_4)
*PC-4: Sodium Hydroxide (NaOH)
*PC-5: Sodium Thiosulfate ($Na_2S_2O_3$)
*PC-6: Ascorbic acid ($C_6H_8O_6$)
*PC-7: Zinc acetate ($C_4H_6O_4Zn$) / Sodium Hydroxide (NaOH)
*PC-8: Ammonium chloride (NH_4CL)
*PC-9: Copper Sulfate ($CuSO_4 \cdot 5H_2O$)
*PC-I: Ice *PC-N: None *PC-O: Other

SR 1st Review: ______ CS 2nd Review: ______

ANALYSIS REQUESTED

Enter 'X' in box below to indicate request and use appropriate preservation code listed to the left

CLIENT SAMPLE ID	Lab Use Only	DATE SAMPLED	TIME (24 hr)	SAMPLE MATRIX	SAMPLE TYPE	Number of Containers	Dissolved Metals Field Filtered: Y/N Preservative*:	Hexavalent Chromium, Dissolved Field Filtered: Y/N Preservative*:	[illegible] Preservative*: [illegible]	[illegible] Preservative*: [illegible]	[illegible] Preservative*: [illegible]	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Cooler (s) Temperature on Receipt
									X	X	X													
									X	X	X													
									X	X	X													
									X	X	X													

Ice present on receipt: X Yes or ____ No

Relinquished by:	Date/Time:	Received by: [illegible]	Date/Time: 6/1/22 1502
Relinquished by:	Date/Time:	Received at lab by:	Date/Time:
Printed Sampler Name:		Logged in by:	Date/Time:

Sample Matrix: **GW** Ground Water | **ST** Storm Water | **SW** Surface Water | **PW** Potable Water | **WW** Wastewater | **SO** Soil | **SL** Sludge | **C** Coal | **PO/Quote #:**

Sample Type: **G** Grab | **C** Composite | **D** Distribution/DW | **E** Entry Point/DW | **R** Raw/DW | **S** Special/DW | **O** Other | **nHZ** Not Hazardous / **HZ** Hazardous

Please return completed form and samples to **Geochemical Testing • 2005 N Center Ave • Somerset, PA • 15501** • 814-443-1671 • (Fax: 814-445-6729)

SAMPLES MUST BE PRESERVED ON ICE.

GEOCHEMICAL TESTING
Environmental and Energy Analysis

2005 N. Center Ave.
Somerset, PA 15501

814/443-1671
814/445-6666
FAX: 814/445-6729

Monday, June 6, 2022

Shelley Wojciechowski
CONEMAUGH OPERATING, LLC
CONEMAUGH STATION
PO BOX K
NEW FLORENCE, PA 15944

RE: Conemaugh River Surface Water Order No.: G2206086

Dear Shelley Wojciechowski:

Geochemical Testing received 4 sample(s) on 6/1/2022 for the analyses presented in the following report.

There were no problems with sample receipt protocols and analyses met the TNI/NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser
Director of Technical Services

Leslie A. Nemeth
Project Manager

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306PA DEP

Geochemical Testing

Date: *06-Jun-22*

CLIENT: CONEMAUGH OPERATING, LLC
Project: Conemaugh River Surface Water
Lab Order: G2206086

CASE NARRATIVE

No problems were encountered during analysis of this workorder, except if noted in this report.

Legend:

H - Method Hold Time exceeded and is not compliant with 40CFR136 Table II.
U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.
B - Analyte detected in the associated Method Blank
Q1 - See case narrative
ND - Not Detected
MCL - Contaminant Limit
J - Indicates an estimated value.
Q - Qualifier
QL -Quantitation Limit
DF - Dilution Factor
S - Surrogate Recovery outside accepted recovery limits
T - Sample received above required temperature and is not compliant with 40CFR136 Table II.
T1 - Sample received above required temperature
MDA - Minimum Detectable Activity.
** - Value exceeds Action Limit
TICs - Tentatively Identified Compounds.
E - Value above quantitation range

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *06-Jun-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - MID
Lab Order:	G2206086		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex Companies
Lab ID:	G2206086-001	**Collection Date:**	6/1/2022 12:15:00 PM
Matrix:	SURFACE WATER	**Received Date:**	6/1/2022 3:20:45 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-27			mg/L CaCO3	1	06/02/22 10:56 AM	06/02/22 12:19 PM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	7.69		H	S.U.	1		06/02/22 10:33 AM
PHYSICAL TESTS		Analyst: **GMG**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	5	2		mg/L	1	06/02/22 2:45 PM	06/02/22 2:51 PM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	38	10		mg/L CaCO3	1		06/02/22 10:33 AM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	203	2.0		mg/L	1	06/02/22 7:20 AM	06/02/22 9:08 AM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.2	0.1		mg/L	1	06/02/22 9:25 AM	06/02/22 10:07 PM
Calcium	61.8	0.1		mg/L	1	06/02/22 9:25 AM	06/02/22 10:07 PM
Iron	0.89	0.05		mg/L	1	06/02/22 9:25 AM	06/02/22 10:07 PM
Magnesium	19.8	0.1		mg/L	1	06/02/22 9:25 AM	06/02/22 10:07 PM
Manganese	0.40	0.01		mg/L	1	06/02/22 9:25 AM	06/02/22 10:07 PM
Sodium	21.9	0.2		mg/L	1	06/02/22 9:25 AM	06/02/22 10:07 PM
Hardness (SM 2340B)	236	1.0		mg/L CaCO3	1	06/02/22 9:25 AM	06/02/22 10:07 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *06-Jun-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - FD
Lab Order:	G2206086		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex Companies
Lab ID:	G2206086-002	**Collection Date:**	6/1/2022 12:17:00 PM
Matrix:	SURFACE WATER	**Received Date:**	6/1/2022 3:20:45 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-27			mg/L CaCO3	1	06/02/22 10:56 AM	06/02/22 12:21 PM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	7.71		H	S.U.	1		06/02/22 10:37 AM
PHYSICAL TESTS		Analyst: **GMG**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	5	2		mg/L	1	06/02/22 2:45 PM	06/02/22 2:51 PM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	40	10		mg/L CaCO3	1		06/02/22 10:37 AM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	203	2.0		mg/L	1	06/02/22 7:20 AM	06/02/22 9:44 AM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.3	0.1		mg/L	1	06/02/22 9:25 AM	06/02/22 10:10 PM
Calcium	61.6	0.1		mg/L	1	06/02/22 9:25 AM	06/02/22 10:10 PM
Iron	0.90	0.05		mg/L	1	06/02/22 9:25 AM	06/02/22 10:10 PM
Magnesium	19.8	0.1		mg/L	1	06/02/22 9:25 AM	06/02/22 10:10 PM
Manganese	0.40	0.01		mg/L	1	06/02/22 9:25 AM	06/02/22 10:10 PM
Sodium	21.9	0.2		mg/L	1	06/02/22 9:25 AM	06/02/22 10:10 PM
Hardness (SM 2340B)	235	1.0		mg/L CaCO3	1	06/02/22 9:25 AM	06/02/22 10:10 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *06-Jun-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - LMID
Lab Order:	G2206086		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex Companies
Lab ID:	G2206086-003	**Collection Date:**	6/1/2022 12:30:00 PM
Matrix:	SURFACE WATER	**Received Date:**	6/1/2022 3:20:45 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-25			mg/L CaCO3	1	06/02/22 10:56 AM	06/02/22 12:23 PM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	7.68		H	S.U.	1		06/02/22 10:42 AM
PHYSICAL TESTS		Analyst: **GMG**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	4	2		mg/L	1	06/02/22 2:45 PM	06/02/22 2:51 PM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	43	10		mg/L CaCO3	1		06/02/22 10:42 AM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	203	2.0		mg/L	1	06/02/22 7:20 AM	06/02/22 9:56 AM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.3	0.1		mg/L	1	06/02/22 9:25 AM	06/02/22 10:12 PM
Calcium	60.5	0.1		mg/L	1	06/02/22 9:25 AM	06/02/22 10:12 PM
Iron	0.90	0.05		mg/L	1	06/02/22 9:25 AM	06/02/22 10:12 PM
Magnesium	19.5	0.1		mg/L	1	06/02/22 9:25 AM	06/02/22 10:12 PM
Manganese	0.40	0.01		mg/L	1	06/02/22 9:25 AM	06/02/22 10:12 PM
Sodium	21.5	0.2		mg/L	1	06/02/22 9:25 AM	06/02/22 10:12 PM
Hardness (SM 2340B)	231	1.0		mg/L CaCO3	1	06/02/22 9:25 AM	06/02/22 10:12 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *06-Jun-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - RMID
Lab Order:	G2206086		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex Companies
Lab ID:	G2206086-004	**Collection Date:**	6/1/2022 12:39:00 PM
Matrix:	SURFACE WATER	**Received Date:**	6/1/2022 3:20:45 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-25			mg/L CaCO3	1	06/02/22 10:56 AM	06/02/22 12:26 PM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	7.75		H	S.U.	1		06/02/22 10:46 AM
PHYSICAL TESTS		Analyst: **GMG**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	3	2		mg/L	1	06/02/22 2:45 PM	06/02/22 2:51 PM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	41	10		mg/L CaCO3	1		06/02/22 10:46 AM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	205	2.0		mg/L	1	06/02/22 7:20 AM	06/02/22 10:08 AM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.2	0.1		mg/L	1	06/02/22 9:25 AM	06/02/22 10:28 PM
Calcium	62.2	0.1		mg/L	1	06/02/22 9:25 AM	06/02/22 10:28 PM
Iron	0.85	0.05		mg/L	1	06/02/22 9:25 AM	06/02/22 10:28 PM
Magnesium	20.0	0.1		mg/L	1	06/02/22 9:25 AM	06/02/22 10:28 PM
Manganese	0.40	0.01		mg/L	1	06/02/22 9:25 AM	06/02/22 10:28 PM
Sodium	22.1	0.2		mg/L	1	06/02/22 9:25 AM	06/02/22 10:28 PM
Hardness (SM 2340B)	238	1.0		mg/L CaCO3	1	06/02/22 9:25 AM	06/02/22 10:28 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

DAILY FIELD REPORT

Sheet 1 of 3

PROJECT NAME: Conemaugh Sta.
PROJECT LOCATION: Conemaugh River - TMDL
APEX PROJECT NO: 1147-5011
CONTRACTOR: —
DATE: 6/13/2022
WEATHER: P.Cloudy 72°

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365
www.apexcos.com

PURPOSE OF SITE VISIT: Conemaugh River Samples - TMDL

ARRIVAL TIME: 0830A

SITE DOCUMENTATION: APEX: Brentley Rice on-site

- Conemaugh River Data - USGS Website - Seward Station
  - 0545A - Last update
  - 0630A - Instantaneous Flow - 651 cfs
  - 25th percentile - 514 cfs
  - Median - 724 cfs
  - 75th percentile - 1080 cfs
  - 6/12/22 Discharge @ 0545A - 631 cfs

- Calibrate Horiba Multi Meter - Auto Cal - OK

- Seward Bridge - Approx River width ~ 280'
  - MID River Sample ~ 125'
  - LMID River Sample ~ 63' Left MID
  - RMID River Sample ~ 63' Right MID

DEPARTURE TIME: 1030A

COPIES TO: —

APEX REPRESENTATIVE		CONTRACTOR REPRESENTATIVE	
SIGNATURE:	Clay Walker	SIGNATURE:	
PRINT NAME:	Clay Walker	PRINT NAME:	

Daily Field Report

DAILY FIELD REPORT (continued)

Sheet 2 of 3

PROJECT NAME: Conemaugh Sta.
PROJECT LOCATION: Conemaugh River - TMDL
APEX PROJECT NO: 1147-5011
DATE: 6/13/2022

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365

- Seward-MID
  - Water Depth ~4.0' - Sample Depth ~2.0'
  - LAT/LONG 40.4197142, -79.0260664
  - Sample Time - 0846
  - Field Parameter Time - 0853
    - Temp - 20.63°
    - pH - 6.01
    - SC - 0.564
    - NTU - 29.8
    - DO - 7.61

- Seward - LMID
  - Water Depth ~1.5' - Sample Depth ~1.0'
  - LAT/LONG 40.4200160, -79.0260640
  - Sample Time - 0906
  - Field Parameter Time - 0910
    - Temp - 20.26
    - pH - 6.91
    - SC - 0.514
    - NTU - 34.7
    - DO - 5.68

DAILY FIELD REPORT (continued)

Sheet 3 of 3

PROJECT NAME: Conemaugh Sta.
PROJECT LOCATION: Conemaugh River -TMDL
APEX PROJECT NO: 1147-Soil
DATE: 6/13/2022

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365

- Seward - RMID / Seward - FD (Field DUP)
  - Water Depth ~4.0' - Sample Depth ~20'
  - LAT/LONG 40.4195195, -79.0260352
  - Sample Time - RMID - 0922 - FD - 0924
  - Field Parameter Time - 0928
    - Temp - 20.44
    - pH - 7.17
    - SC - 0.534
    - NTU - 20.2
    - DO - 6.69

- Seward - TB (Trip Blank)
  - Sample Time - 0932

- Samples on ICE / To Geochemical @ End of Day

Form F-5002, 08.21	
*** Lab Work Order #	

REQUEST FOR LABORATORY ANALYTICAL SERVICES

Chain of Custody (COC)

Shuttle/Cooler ID#

Billing Client			
Company: Conemaugh Station	Name: John Shimshock		E-mail Address: jshimshock@Keyconops.com
Mailing Address: P.O. Box K, 1442 Power Plant Road	Telephone No.: 724-235-4596		Landfill Site: —
City, State, Zip: New Florence, PA	State Sampled: PA	PWS Number	Date Results Required

Special Instruction/Project ID/Analyte List/Comment:

*PC-1: Nitric acid (HNO_3)
*PC-2: Hydrochloric acid (HCL)
*PC-3: Sulfuric acid (H_2SO_4)
*PC-4: Sodium Hydroxide (NaOH)
*PC-5: Sodium Thiosulfate ($Na_2S_2O_3$)
*PC-6: Ascorbic acid ($C_6H_8O_6$)
*PC-7: Zinc acetate ($C_4H_6O_4Zn$) / Sodium Hydroxide (NaOH)
*PC-8: Ammonium chloride (NH_4CL)
*PC-9: Copper Sulfate ($CuSO_4 \cdot 5H_2O$)
*PC-I: Ice *PC-N: None *PC-O: Other

SR 1st Review: ______ CS 2nd Review: ______

ANALYSIS REQUESTED

Enter 'X' in box below to indicate request and use appropriate preservation code listed to the left

CLIENT SAMPLE ID	Lab Use Only	DATE SAMPLED	TIME (24 hr)	SAMPLE MATRIX	SAMPLE TYPE	Number of Containers	Dissolved Metals Field Filtered: Y/N Preservative*:	Acidity SM, Water PR, Acidity, Water Alk. SM2320, Water PR_TSS-2540 Preservative*: PC-N	IC 300.0-28 Preservative*: PC-N	MERCEP 200.7, TOT-metals Preservative*: PC-1	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Cooler (s) Temperature on Receipt ___
Seward - MID		6/13/22	0846	SW	G			X	X	X														
Seward - LMID		6/13/22	0906	SW	G			X	X	X														
Seward - RMID		6/13/22	0922	SW	G			X	X	X														
Seward - FD		6/13/22	0924	SW	G			X	X	X														
Seward - TB		6/13/22	0932	SW	G			X	X	X														

Ice present on receipt: X Yes or ___ No

Relinquished by: [signature]	Date/Time: 6/13/2022 / 1312	Received by: [signature]	Date/Time: 6/13/22 1312
Relinquished by:	Date/Time:	Received at lab by:	Date/Time:
Printed Sampler Name: APEX		Logged in by:	Date/Time:

Sample Matrix:	GW Ground Water	ST Storm Water	SW Surface Water	PW Potable Water	WW Wastewater	SO Soil	SL Sludge	C Coal	PO/Quote #:
Sample Type:	G Grab	C Composite	D Distribution/DW	E Entry Point/DW	R Raw/DW	S Special/DW	O Other	nHZ Not Hazardous / HZ Hazardous	

Please return completed form and samples to **Geochemical Testing • 2005 N Center Ave • Somerset, PA • 15501** • 814-443-1671 • (Fax: 814-445-6729)

SAMPLES MUST BE RECEIVED ON ICE.

GEOCHEMICAL TESTING
Environmental and Energy Analysis

2005 N. Center Ave.
Somerset, PA 15501

814/443-1671
814/445-6666
FAX: 814/445-6729

Tuesday, June 21, 2022

Shelley Wojciechowski
CONEMAUGH OPERATING, LLC
CONEMAUGH STATION
PO BOX K
NEW FLORENCE, PA 15944

RE: Conemaugh River Surface Water Order No.: G2206843

Dear Shelley Wojciechowski:

Geochemical Testing received 5 sample(s) on 6/13/2022 for the analyses presented in the following report.

There were no problems with sample receipt protocols and analyses met the TNI/NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser
Director of Technical Services

Leslie A. Nemeth
Project Manager

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306PA DEP

Geochemical Testing

Date: *21-Jun-22*

CLIENT: CONEMAUGH OPERATING, LLC
Project: Conemaugh River Surface Water
Lab Order: G2206843

CASE NARRATIVE

No problems were encountered during analysis of this workorder, except if noted in this report.

Legend:

H - Method Hold Time exceeded and is not compliant with 40CFR136 Table II.
U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.
B - Analyte detected in the associated Method Blank
Q1 - See case narrative ND - Not Detected
MCL - Contaminant Limit J - Indicates an estimated value.
Q - Qualifier QL -Quantitation Limit DF - Dilution Factor
S - Surrogate Recovery outside accepted recovery limits
T - Sample received above required temperature and is not compliant with 40CFR136 Table II.
T1 - Sample received above required temperature
MDA - Minimum Detectable Activity.
** - Value exceeds Action Limit
TICs - Tentatively Identified Compounds.
E - Value above quantitation range

ACCREDITED IN ACCORDANCE WITH nelac I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *21-Jun-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - MID
Lab Order:	G2206843		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex
Lab ID:	G2206843-001	**Collection Date:**	6/13/2022 8:46:00 AM
Matrix:	SURFACE WATER	**Received Date:**	6/13/2022 1:34:28 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				SM 2310B(4A)	SM 2310B(4A)
Acidity to pH 8.3	-25			mg/L CaCO3	1	06/14/22 11:16 AM	06/14/22 11:36 AM
PH BY SM 4500 H+B		Analyst: **LAP**					SM 4500-H+ B
Lab pH	7.46		H	S.U.	1		06/14/22 8:53 AM
PHYSICAL TESTS		Analyst: **AGF**				SM 2540 D	SM 2540 D
Total suspended solids	16	2		mg/L	1	06/14/22 1:30 PM	06/14/22 1:41 PM
INORGANIC NON-METALS		Analyst: **LAP**					ASTM D 1067-11
Alkalinity to pH 4.5	38	10		mg/L CaCO3	1		06/14/22 8:53 AM
INORGANIC NON-METALS		Analyst: **ACW**				EPA 300.0 REV 2.1	EPA 300.0 REV 2.1
Sulfate	158	2.0		mg/L	1	06/13/22 3:30 PM	06/13/22 8:51 PM
INORGANIC METALS		Analyst: **LEB**				EPA 200.2	EPA 200.7 REV 4.4
Aluminum	0.6	0.1		mg/L	1	06/15/22 9:30 AM	06/15/22 4:29 PM
Calcium	48.4	0.1		mg/L	1	06/15/22 9:30 AM	06/15/22 4:29 PM
Iron	1.46	0.05		mg/L	1	06/15/22 9:30 AM	06/15/22 4:29 PM
Magnesium	15.0	0.1		mg/L	1	06/15/22 9:30 AM	06/15/22 4:29 PM
Manganese	0.35	0.01		mg/L	1	06/15/22 9:30 AM	06/15/22 4:29 PM
Sodium	18.1	0.2		mg/L	1	06/15/22 9:30 AM	06/15/22 4:29 PM
Hardness (SM 2340B)	183	1.0		mg/L CaCO3	1	06/15/22 9:30 AM	06/15/22 4:29 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *21-Jun-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - LMID
Lab Order:	G2206843		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex
Lab ID:	G2206843-002	**Collection Date:**	6/13/2022 9:06:00 AM
Matrix:	SURFACE WATER	**Received Date:**	6/13/2022 1:34:28 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				SM 2310B(4A)	SM 2310B(4A)
Acidity to pH 8.3	-22			mg/L CaCO3	1	06/14/22 11:16 AM	06/14/22 11:39 AM
PH BY SM 4500 H+B		Analyst: **LAP**					SM 4500-H+ B
Lab pH	7.43		H	S.U.	1		06/14/22 8:57 AM
PHYSICAL TESTS		Analyst: **AGF**				SM 2540 D	SM 2540 D
Total suspended solids	16	2		mg/L	1	06/14/22 1:30 PM	06/14/22 1:41 PM
INORGANIC NON-METALS		Analyst: **LAP**					ASTM D 1067-11
Alkalinity to pH 4.5	37	10		mg/L CaCO3	1		06/14/22 8:57 AM
INORGANIC NON-METALS		Analyst: **ACW**				EPA 300.0 REV 2.1	EPA 300.0 REV 2.1
Sulfate	155	2.0		mg/L	1	06/13/22 3:30 PM	06/13/22 9:03 PM
INORGANIC METALS		Analyst: **LEB**				EPA 200.2	EPA 200.7 REV 4.4
Aluminum	0.7	0.1		mg/L	1	06/15/22 9:30 AM	06/15/22 4:32 PM
Calcium	48.2	0.1		mg/L	1	06/15/22 9:30 AM	06/15/22 4:32 PM
Iron	1.48	0.05		mg/L	1	06/15/22 9:30 AM	06/15/22 4:32 PM
Magnesium	15.0	0.1		mg/L	1	06/15/22 9:30 AM	06/15/22 4:32 PM
Manganese	0.35	0.01		mg/L	1	06/15/22 9:30 AM	06/15/22 4:32 PM
Sodium	18.1	0.2		mg/L	1	06/15/22 9:30 AM	06/15/22 4:32 PM
Hardness (SM 2340B)	182	1.0		mg/L CaCO3	1	06/15/22 9:30 AM	06/15/22 4:32 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *21-Jun-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - RMID
Lab Order:	G2206843		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex
Lab ID:	G2206843-003	**Collection Date:**	6/13/2022 9:22:00 AM
Matrix:	SURFACE WATER	**Received Date:**	6/13/2022 1:34:28 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				SM 2310B(4A)	SM 2310B(4A)
Acidity to pH 8.3	-22			mg/L CaCO3	1	06/14/22 11:16 AM	06/14/22 11:41 AM
PH BY SM 4500 H+B		Analyst: **LAP**					SM 4500-H+ B
Lab pH	7.56		H	S.U.	1		06/14/22 9:02 AM
PHYSICAL TESTS		Analyst: **AGF**				SM 2540 D	SM 2540 D
Total suspended solids	11	2		mg/L	1	06/14/22 1:30 PM	06/14/22 1:41 PM
INORGANIC NON-METALS		Analyst: **LAP**					ASTM D 1067-11
Alkalinity to pH 4.5	38	10		mg/L CaCO3	1		06/14/22 9:02 AM
INORGANIC NON-METALS		Analyst: **ACW**				EPA 300.0 REV 2.1	EPA 300.0 REV 2.1
Sulfate	165	2.0		mg/L	1	06/13/22 3:30 PM	06/13/22 9:15 PM
INORGANIC METALS		Analyst: **LEB**				EPA 200.2	EPA 200.7 REV 4.4
Aluminum	0.4	0.1		mg/L	1	06/15/22 9:30 AM	06/15/22 4:34 PM
Calcium	49.6	0.1		mg/L	1	06/15/22 9:30 AM	06/15/22 4:34 PM
Iron	1.28	0.05		mg/L	1	06/15/22 9:30 AM	06/15/22 4:34 PM
Magnesium	15.5	0.1		mg/L	1	06/15/22 9:30 AM	06/15/22 4:34 PM
Manganese	0.33	0.01		mg/L	1	06/15/22 9:30 AM	06/15/22 4:34 PM
Sodium	19.2	0.2		mg/L	1	06/15/22 9:30 AM	06/15/22 4:34 PM
Hardness (SM 2340B)	187	1.0		mg/L CaCO3	1	06/15/22 9:30 AM	06/15/22 4:34 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *21-Jun-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - FD
Lab Order:	G2206843		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex
Lab ID:	G2206843-004	**Collection Date:**	6/13/2022 9:24:00 AM
Matrix:	SURFACE WATER	**Received Date:**	6/13/2022 1:34:28 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				SM 2310B(4A)	SM 2310B(4A)
Acidity to pH 8.3	-22			mg/L CaCO3	1	06/14/22 11:16 AM	06/14/22 11:44 AM
PH BY SM 4500 H+B		Analyst: **LAP**					SM 4500-H+ B
Lab pH	7.56		H	S.U.	1		06/14/22 9:06 AM
PHYSICAL TESTS		Analyst: **AGF**				SM 2540 D	SM 2540 D
Total suspended solids	10	2		mg/L	1	06/14/22 1:30 PM	06/14/22 1:41 PM
INORGANIC NON-METALS		Analyst: **LAP**					ASTM D 1067-11
Alkalinity to pH 4.5	38	10		mg/L CaCO3	1		06/14/22 9:06 AM
INORGANIC NON-METALS		Analyst: **ACW**				EPA 300.0 REV 2.1	EPA 300.0 REV 2.1
Sulfate	166	2.0		mg/L	1	06/13/22 3:30 PM	06/13/22 9:27 PM
INORGANIC METALS		Analyst: **LEB**				EPA 200.2	EPA 200.7 REV 4.4
Aluminum	0.4	0.1		mg/L	1	06/15/22 9:30 AM	06/15/22 4:37 PM
Calcium	51.6	0.1		mg/L	1	06/15/22 9:30 AM	06/15/22 4:37 PM
Iron	1.19	0.05		mg/L	1	06/15/22 9:30 AM	06/15/22 4:37 PM
Magnesium	16.1	0.1		mg/L	1	06/15/22 9:30 AM	06/15/22 4:37 PM
Manganese	0.34	0.01		mg/L	1	06/15/22 9:30 AM	06/15/22 4:37 PM
Sodium	19.1	0.2		mg/L	1	06/15/22 9:30 AM	06/15/22 4:37 PM
Hardness (SM 2340B)	195	1.0		mg/L CaCO3	1	06/15/22 9:30 AM	06/15/22 4:37 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *21-Jun-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - TB
Lab Order:	G2206843		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex
Lab ID:	G2206843-005	**Collection Date:**	6/13/2022 9:32:00 AM
Matrix:	SURFACE WATER	**Received Date:**	6/13/2022 1:34:28 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				SM 2310B(4A)	SM 2310B(4A)
Acidity to pH 8.3	11			mg/L CaCO3	1	06/14/22 11:16 AM	06/14/22 11:46 AM
PH BY SM 4500 H+B		Analyst: **LAP**					SM 4500-H+ B
Lab pH	5.03		H	S.U.	1		06/14/22 9:11 AM
PHYSICAL TESTS		Analyst: **AGF**				SM 2540 D	SM 2540 D
Total suspended solids	< 2	2		mg/L	1	06/14/22 1:30 PM	06/14/22 1:41 PM
INORGANIC NON-METALS		Analyst: **LAP**					ASTM D 1067-11
Alkalinity to pH 4.5	< 10	10		mg/L CaCO3	1		06/14/22 9:11 AM
INORGANIC NON-METALS		Analyst: **ACW**				EPA 300.0 REV 2.1	EPA 300.0 REV 2.1
Sulfate	< 2.0	2.0		mg/L	1	06/13/22 3:30 PM	06/13/22 9:39 PM
INORGANIC METALS		Analyst: **LEB**				EPA 200.2	EPA 200.7 REV 4.4
Aluminum	< 0.1	0.1		mg/L	1	06/15/22 10:20 AM	06/17/22 4:11 PM
Calcium	< 0.1	0.1		mg/L	1	06/15/22 10:20 AM	06/17/22 4:11 PM
Iron	< 0.05	0.05		mg/L	1	06/15/22 10:20 AM	06/17/22 4:11 PM
Magnesium	< 0.1	0.1		mg/L	1	06/15/22 10:20 AM	06/17/22 4:11 PM
Manganese	< 0.01	0.01		mg/L	1	06/15/22 10:20 AM	06/17/22 4:11 PM
Sodium	< 0.2	0.2		mg/L	1	06/15/22 10:20 AM	06/17/22 4:11 PM
Hardness (SM 2340B)	< 1.0	1.0		mg/L CaCO3	1	06/15/22 10:20 AM	06/17/22 4:11 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Appendix C

Field Forms and Laboratory Reports—Phase II Sampling Program

DAILY FIELD REPORT

Sheet 1 of 2

PROJECT NAME: Conemaugh Sta.
PROJECT LOCATION: Conemaugh River - TMDL
APEX PROJECT NO: 1197-5011
CONTRACTOR: —
DATE: 6/24/2022
WEATHER: Clear 70°

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365
www.apexcos.com

PURPOSE OF SITE VISIT: Conemaugh River Samples - TMDL

ARRIVAL TIME: 0830A

SITE DOCUMENTATION: APEX: Brentley Rice on-site.

- Conemaugh River Data - USGS Website - Seward Station
  - 0545A - Last Site update
  - 0615 A - Instantaneous Flow - 487 cfs
  - 25th Percentile - 433 cfs
  - Median - 597 cfs
  - 75th Percentile - 996 cfs
  - 6/23/2022 - Discharge @ 0545A - 611 cfs

- Calibrate Horiba Multi-Meter - Auto Cal. - OK

- Seward Bridge - Approx River Width ~ 240'
  - MID River Sample @ ~ 120'

Sample Data - Phase II

- Seward - TB (Trip Blank)
  - Sample Time - 0848 A

DEPARTURE TIME: 1000 A

COPIES TO: —

APEX REPRESENTATIVE	CONTRACTOR REPRESENTATIVE
SIGNATURE: Clay Walker	SIGNATURE:
PRINT NAME: Clay Walker	PRINT NAME:

DAILY FIELD REPORT (continued)

Sheet 2 of 2

PROJECT NAME: Conemaugh Sta
PROJECT LOCATION: Conemaugh River - TMDL
APEX PROJECT NO: 1147-5011
DATE: 6/24/2022

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365

- Seward - MID / Seward - FD (Field DUP)
  - Water Depth ~ 3.0' - Sample Depth ~ 1.5'
  - LAT/LON - 40.4197615, -79.0260758
  - Sample Time - MID - 0837 A
  - Sample Time - FD - 0840 A
  - Field Parameter Time - 0845 A.
    - Temp - 22.02°C
    - pH - 5.98
    - SC - 0.662
    - NTU - 11.1
    - DO - 6.62

- Samples on ice from Station / To Geochemical

Form F-5002, 05.19
*** Lab Work Order #

REQUEST FOR LABORATORY ANALYTICAL SERVICES

Pennsylvania Chain of Custody (COC)

Shuttle/Cooler ID#

Billing Client

Company: Conemaugh Station	Name: John Shimshock	E-mail Address: JShimshock@KeyCorp.com	
Mailing Address: P.O. Box K 1442 Power Plant Road	Telephone No.: 724-235-4596	Landfill Site: —	
City, State, Zip: New Florence, PA	State Sampled: PA	PWS Number:	Date Results Required:

Special Instructions/Project ID's/Analyte List:

Conemaugh River
TMDL

*PC-1: Nitric acid (HNO_3)
*PC-2: Hydrochloric acid (HCL)
*PC-3: Sulfuric acid (H_2SO_4)
*PC-4: Sodium Hydroxide (NaOH)
*PC-5: Sodium Thiosulfate ($Na_2S_2O_3$)
*PC-6: Ascorbic acid ($C_6H_8O_6$)
*PC-7: Zinc acetate ($C_4H_6O_4Zn$)
*PC-8: Ammonium chloride (NH_4CL)
*PC9: Copper Sulfate ($CuSO4{\cdot}5H2O$)
*PC-I: Ice *PC-N: None *PC-O: Other

SR 1st Review: CS 2nd Review:

ANALYSIS REQUESTED

Enter 'X' in box below to indicate request and use appropriate preservation code listed to the left

CLIENT SAMPLE ID	Lab Use Only	DATE SAMPLED	TIME (24 hr)	SAMPLE MATRIX	SAMPLE TYPE	Number of Containers	Dissolved Metals Field Filtered: Y/N Preservative*	Hexavalent Chromium, Dissolved Field Filtered: Y/N Preservative*	Preservative* PC-N	Preservative* PC-N	Preservative* PC-N	Preservative*	Preservative*	Preservative*	Preservative*	Preservative*	Preservative*	Preservative*	Preservative*	Preservative*	Preservative*	Preservative*	Preservative*	Preservative*
Seward - MID		6/24/22	0837	SW	G	3			X	X	X													
Seward - FD		6/24/22	0840	SW	G	3			X	X	X													
Seward - TB		6/24/22	0848	SW	G	3			X	X	X													

Ice present on receipt: ___ Yes or ___ No Cooler (s) Temperature on Receipt: ___

CHAIN OF CUSTODY

Relinquished by: [signature] Date/Time: 6/24/2022 1000 Received by: [signature] Date/Time: 6.24.22 1000

Relinquished by: Date/Time: Received at lab by: Date/Time:

Sampler Name: APEX Comments:

Sample Matrix: GW Ground Water | ST Storm Water | SW Surface Water | PW Potable Water | WW Wastewater | SO Soil | SL Sludge | C Coal

Sample Type: G Grab | C Composite | D Distribution/DW | R Raw/DW | S Special/DW | O Other | nHZ Not Hazardous / HZ Hazardous

Please return completed form and samples to **Geochemical Testing • 2005 N Center Ave • Somerset, PA • 15501** • 814-443-1671 • (Fax: 814-445-6729)

SAMPLES MUST BE PRESERVED ON ICE.

GEOCHEMICAL TESTING
Environmental and Energy Analysis

2005 N. Center Ave.
Somerset, PA 15501

814/443-1671
814/445-6666
FAX: 814/445-6729

Thursday, June 30, 2022

Shelley Wojciechowski
CONEMAUGH OPERATING, LLC
CONEMAUGH STATION
PO BOX K
NEW FLORENCE, PA 15944

RE: Conemaugh River Surface Water Order No.: G2206G55

Dear Shelley Wojciechowski:

Geochemical Testing received 3 sample(s) on 6/24/2022 for the analyses presented in the following report.

There were no problems with sample receipt protocols and analyses met the TNI/NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser
Director of Technical Services

Leslie A. Nemeth
Project Manager

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306PA DEP

Geochemical Testing

Date: *30 Jun 22*

CLIENT: CONEMAUGH OPERATING, LLC
Project: Conemaugh River Surface Water
Lab Order: G2206G55

CASE NARRATIVE

No problems were encountered during analysis of this workorder, except if noted in this report.

Legend:

H - Method Hold Time exceeded and is not compliant with 40CFR136 Table II.
U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.
B - Analyte detected in the associated Method Blank
Q1 - See case narrative
ND - Not Detected
MCL - Contaminant Limit
J - Indicates an estimated value.
Q - Qualifier
QL -Quantitation Limit
DF - Dilution Factor
S - Surrogate Recovery outside accepted recovery limits
T - Sample received above required temperature and is not compliant with 40CFR136 Table II.
T1 - Sample received above required temperature
MDA - Minimum Detectable Activity.
** - Value exceeds Action Limit
TICs - Tentatively Identified Compounds.
E - Value above quantitation range

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *30-Jun-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - Mid
Lab Order:	G2206G55		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex
Lab ID:	G2206G55-001	**Collection Date:**	6/24/2022 8:37:00 AM
Matrix:	SURFACE WATER	**Received Date:**	6/24/2022 1:32:58 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-21			mg/L CaCO3	1	06/28/22 12:35 PM	06/28/22 2:42 PM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	7.64		H	S.U.	1		06/28/22 12:04 PM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	5	2		mg/L	1	06/27/22 1:45 PM	06/27/22 1:53 PM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	36	10		mg/L CaCO3	1		06/28/22 12:04 PM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	187	2.0		mg/L	1	06/27/22 9:20 AM	06/27/22 9:26 AM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.3	0.1		mg/L	1	06/27/22 10:00 AM	06/28/22 1:06 PM
Calcium	57.4	0.1		mg/L	1	06/27/22 10:00 AM	06/28/22 1:06 PM
Iron	0.92	0.05		mg/L	1	06/27/22 10:00 AM	06/28/22 1:06 PM
Magnesium	17.9	0.1		mg/L	1	06/27/22 10:00 AM	06/28/22 1:06 PM
Manganese	0.32	0.01		mg/L	1	06/27/22 10:00 AM	06/28/22 1:06 PM
Sodium	19.6	0.2		mg/L	1	06/27/22 10:00 AM	06/28/22 1:06 PM
Hardness (SM 2340B)	217	1.0		mg/L CaCO3	1	06/27/22 10:00 AM	06/28/22 1:06 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *30-Jun-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - FD
Lab Order:	G2206G55		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex
Lab ID:	G2206G55-002	**Collection Date:**	6/24/2022 8:40:00 AM
Matrix:	SURFACE WATER	**Received Date:**	6/24/2022 1:32:58 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-15			mg/L CaCO3	1	06/28/22 12:35 PM	06/28/22 2:45 PM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	7.74		H	S.U.	1		06/28/22 12:09 PM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	5	2		mg/L	1	06/27/22 1:45 PM	06/27/22 1:53 PM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	37	10		mg/L CaCO3	1		06/28/22 12:09 PM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	192	2.0		mg/L	1	06/27/22 9:20 AM	06/27/22 12:41 PM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.3	0.1		mg/L	1	06/27/22 10:00 AM	06/28/22 1:09 PM
Calcium	56.7	0.1		mg/L	1	06/27/22 10:00 AM	06/28/22 1:09 PM
Iron	0.88	0.05		mg/L	1	06/27/22 10:00 AM	06/28/22 1:09 PM
Magnesium	17.8	0.1		mg/L	1	06/27/22 10:00 AM	06/28/22 1:09 PM
Manganese	0.32	0.01		mg/L	1	06/27/22 10:00 AM	06/28/22 1:09 PM
Sodium	19.3	0.2		mg/L	1	06/27/22 10:00 AM	06/28/22 1:09 PM
Hardness (SM 2340B)	215	1.0		mg/L CaCO3	1	06/27/22 10:00 AM	06/28/22 1:09 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *30-Jun-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - TB
Lab Order:	G2206G55		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex
Lab ID:	G2206G55-003	**Collection Date:**	6/24/2022 8:48:00 AM
Matrix:	SURFACE WATER	**Received Date:**	6/24/2022 1:32:58 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	10			mg/L CaCO3	1	06/28/22 12:35 PM	06/28/22 2:47 PM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	5.19		H	S.U.	1		06/28/22 12:14 PM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	< 2	2		mg/L	1	06/27/22 1:45 PM	06/27/22 1:53 PM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	< 10	10		mg/L CaCO3	1		06/28/22 12:14 PM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	< 2.0	2.0		mg/L	1	06/27/22 9:20 AM	06/27/22 10:08 AM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	< 0.1	0.1		mg/L	1	06/27/22 10:00 AM	06/28/22 1:12 PM
Calcium	< 0.1	0.1		mg/L	1	06/27/22 10:00 AM	06/28/22 1:12 PM
Iron	< 0.05	0.05		mg/L	1	06/27/22 10:00 AM	06/28/22 1:12 PM
Magnesium	< 0.1	0.1		mg/L	1	06/27/22 10:00 AM	06/28/22 1:12 PM
Manganese	< 0.01	0.01		mg/L	1	06/27/22 10:00 AM	06/28/22 1:12 PM
Sodium	< 0.2	0.2		mg/L	1	06/27/22 10:00 AM	06/28/22 1:12 PM
Hardness (SM 2340B)	< 1.0	1.0		mg/L CaCO3	1	06/27/22 10:00 AM	06/28/22 1:12 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

DAILY FIELD REPORT

Sheet 1 of 1

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365
www.apexcos.com

PROJECT NAME: Conemaugh Sta.
PROJECT LOCATION: Conemaugh River - TMDL
APEX PROJECT NO: 1147-5011
CONTRACTOR: —
DATE: 6/29/2022
WEATHER: Clear 75°

PURPOSE OF SITE VISIT: Conemaugh River Sampling - TMDL

ARRIVAL TIME: 1115a

SITE DOCUMENTATION: Apex Carson K on-site

- Conemaugh River Data - USGS Website - Seward Station.
  - 0745A - Last site update
  - 0745A - Instantaneous flow - 387 cfs
  - 25th Percentile
  - Median - 495 cfs
  - 6/28/2022 - Discharge @ 0745A - 487 cfs
- Calibrated Horiba Multi-Meter - Auto Cal. - ok
- Seward Bridge - Approx River Width - 240'
  - MID River Sample @ 120'
- Seward MID
  - Water Depth - 3.0' - Sample Depth - 1.5'
  - LAT / LON - 40.4197615, -79.0260758
  - Sample Time - MID - 1330p
  - Field Parameters Time - 1338p
    - Temp - 22.69 °C - DO - 8.71
    - PH - 7.52
    - Sc - 0.741
    - NTU - 9.6

DEPARTURE TIME: 1250.

COPIES TO: —

APEX REPRESENTATIVE	CONTRACTOR REPRESENTATIVE
SIGNATURE: BSR	SIGNATURE:
PRINT NAME: Bartley S. Rice	PRINT NAME:

Daily Field Report

Form F-5002, 08.21
*** Lab Work Order #

REQUEST FOR LABORATORY ANALYTICAL SERVICES

Chain of Custody (COC)

Shuttle/Cooler ID#

Billing Client

Company: Conemaugh Station	Name: Jim [illegible]
Mailing Address: P.O. Box K 1442 Power Plant Road	E-mail Address: [illegible]
City, State, Zip: New Florence PA	Telephone No.: [illegible]
	Landfill Site:
	State Sampled: PA
	PWS Number:
	Date Results Required:

Special Instruction/Project ID/Analyte List/Comment: Conemaugh River TMDL

*PC-1: Nitric acid (HNO_3)
*PC-2: Hydrochloric acid (HCL)
*PC-3: Sulfuric acid (H_2SO_4)
*PC-4: Sodium Hydroxide (NaOH)
*PC-5: Sodium Thiosulfate ($Na_2S_2O_3$)
*PC-6: Ascorbic acid ($C_6H_8O_6$)
*PC-7: Zinc acetate ($C_4H_6O_4Zn$) / Sodium Hydroxide (NaOH)
*PC-8: Ammonium chloride (NH_4CL)
*PC-9: Copper Sulfate ($CuSO_4 \cdot 5H_2O$)
*PC-I: Ice *PC-N: None *PC-O: Other

SR 1st Review: CS 2nd Review:

ANALYSIS REQUESTED

Enter 'X' in box below to indicate request and use appropriate preservation code listed to the left

CLIENT SAMPLE ID	Lab Use Only	DATE SAMPLED	TIME (24 hr)	SAMPLE MATRIX	SAMPLE TYPE	Number of Containers	Dissolved Metals Field Filtered: Y/N Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Cooler (s) Temperature on Receipt
Seward MID		6/29/22	1330	SW	G	5		X	X	X													

Ice present on receipt: X Yes or ___ No

Relinquished by: [signature]	Date/Time: 6/29/2022 1425	Received by: [signature]	Date/Time: 6/29/22 1425
Relinquished by:	Date/Time:	Received at lab by:	Date/Time:
Printed Sampler Name: Bradley S Rice		Logged in by:	Date/Time:

Sample Matrix: GW Ground Water | ST Storm Water | SW Surface Water | PW Potable Water | WW Wastewater | SO Soil | SL Sludge | C Coal | PO/Quote #:

Sample Type: G Grab | C Composite | D Distribution/DW | E Entry Point/DW | R Raw/DW | S Special/DW | O Other | nHZ Not Hazardous / HZ Hazardous

Please return completed form and samples to **Geochemical Testing • 2005 N Center Ave • Somerset, PA • 15501** • 814-443-1671 • (Fax: 814-445-6729)

SAMPLES MUST BE RECEIVED ON ICE.

GEOCHEMICAL TESTING
Environmental and Energy Analysis

2005 N. Center Ave.
Somerset, PA 15501

814/443-1671
814/445-6666
FAX: 814/445-6729

Wednesday, July 6, 2022

Shelley Wojciechowski
CONEMAUGH OPERATING, LLC
CONEMAUGH STATION
PO BOX K
NEW FLORENCE, PA 15944

RE: Conemaugh River Surface Water Order No.: G2206I40

Dear Shelley Wojciechowski:

Geochemical Testing received 1 sample(s) on 6/29/2022 for the analyses presented in the following report.

There were no problems with sample receipt protocols and analyses met the TNI/NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser
Director of Technical Services

Leslie A. Nemeth
Project Manager

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306PA DEP

Geochemical Testing

Date: *06-Jul-22*

CLIENT: CONEMAUGH OPERATING, LLC
Project: Conemaugh River Surface Water
Lab Order: G2206I40

CASE NARRATIVE

No problems were encountered during analysis of this workorder, except if noted in this report.

Legend:

H - Method Hold Time exceeded and is not compliant with 40CFR136 Table II.
U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.
B - Analyte detected in the associated Method Blank
Q1 - See case narrative
ND - Not Detected
MCL - Contaminant Limit
J - Indicates an estimated value.
Q - Qualifier
QL -Quantitation Limit
DF - Dilution Factor
S - Surrogate Recovery outside accepted recovery limits
T - Sample received above required temperature and is not compliant with 40CFR136 Table II.
T1 - Sample received above required temperature
MDA - Minimum Detectable Activity.
** - Value exceeds Action Limit
TICs - Tentatively Identified Compounds.
E - Value above quantitation range

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *06-Jul-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward MID
Lab Order:	G2206I40		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex
Lab ID:	G2206I40-001	**Collection Date:**	6/29/2022 1:30:00 PM
Matrix:	SURFACE WATER	**Received Date:**	6/29/2022 2:33:03 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-19			mg/L CaCO3	1	07/01/22 9:10 AM	07/01/22 11:01 AM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	7.62		H	S.U.	1		07/01/22 8:30 AM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	8	2		mg/L	1	06/30/22 11:50 AM	06/30/22 12:00 PM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	38	10		mg/L CaCO3	1		07/01/22 8:30 AM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	207	2.0		mg/L	1	06/29/22 2:55 PM	06/29/22 9:27 PM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.2	0.1		mg/L	1	07/01/22 8:35 AM	07/05/22 9:33 AM
Calcium	62.3	0.1		mg/L	1	07/01/22 8:35 AM	07/05/22 9:33 AM
Iron	0.91	0.05		mg/L	1	07/01/22 8:35 AM	07/05/22 9:33 AM
Magnesium	19.2	0.1		mg/L	1	07/01/22 8:35 AM	07/05/22 9:33 AM
Manganese	0.30	0.01		mg/L	1	07/01/22 8:35 AM	07/05/22 9:33 AM
Sodium	19.9	0.2		mg/L	1	07/01/22 8:35 AM	07/05/22 9:33 AM
Hardness (SM 2340B)	235	1.0		mg/L CaCO3	1	07/01/22 8:35 AM	07/05/22 9:33 AM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

DAILY FIELD REPORT

Sheet 1 of 1

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365

PROJECT NAME: Conemaugh Sta.
PROJECT LOCATION: Conemaugh River - TMDL
APEX PROJECT NO: 1147-5011
CONTRACTOR: —
DATE: 7/1/22
WEATHER: Clear 72°

PURPOSE OF SITE VISIT: Conemaugh River Sampling - TMDL

ARRIVAL TIME: 0820 A

SITE DOCUMENTATION:

- Conemaugh River Data - USGS Website - Seward Station
  - 0545 A - Last Site update
  - 0630 A - Instantaneous flow - 342 cfs
  - 75th percentile - 303 cfs
  - Median - 505 cfs
  - 6/30/2022 - Discharge @ 0545 A - 361 cfs
- Calibrated Horiba Multi-Meter - Auto Cal. - ok
- Seward Bridge - Approx River Width - 250'
  - MID River Sample @ 125'
- Seward MID
  - Water Depth - 3.0' - Sample Depth - 1.5'
  - LAT / LON - 40.41976115 - 79.02660758
  - Sample Time - MID - 0840 A - FD - 0843 - Field Blank - 0850
  - Field Parameters Time - 0848 A
    - Temp - 22.70°C - DO - 6.46
    - pH - 6.36
    - SC - 0.733
    - NTU - 4.8

* Samples taken to Geo Chemical LAB

DEPARTURE TIME: 0900 A
COPIES TO: —

APEX REPRESENTATIVE		CONTRACTOR REPRESENTATIVE	
SIGNATURE:	Bradley S. Rice / Clay Walker	SIGNATURE:	
PRINT NAME:	Bradley S. Rice / Clay Walker	PRINT NAME:	

Daily Field Report

Form F-5002, 08.21
*** Lab Work Order #

REQUEST FOR LABORATORY ANALYTICAL SERVICES

Chain of Custody (COC)

Shuttle/Cooler ID#

Billing Client

Company	Conemaugh Station
Mailing Address	P.O. Box K 1442 Power Plant Rd
City, State, Zip	New Florence PA
Name	John Shimshock
Telephone No.	724-235-4596
E-mail Address	JShimshock@keycon[illegible].com
Landfill Site	—
State Sampled	PA
PWS Number	
Date Results Required	

Special Instruction/Project ID/Analyte List/Comment:

Conemaugh River TMDL

*PC-1: Nitric acid (HNO_3)
*PC-2: Hydrochloric acid (HCL)
*PC-3: Sulfuric acid (H_2SO_4)
*PC-4: Sodium Hydroxide (NaOH)
*PC-5: Sodium Thiosulfate ($Na_2S_2O_3$)
*PC-6: Ascorbic acid ($C_6H_8O_6$)
*PC-7: Zinc acetate ($C_4H_6O_4Zn$) / Sodium Hydroxide (NaOH)
*PC-8: Ammonium chloride (NH_4CL)
*PC-9: Copper Sulfate ($CuSO_4 \cdot 5H_2O$)
*PC-I: Ice *PC-N: None *PC-O: Other

SR 1st Review: CS 2nd Review:

ANALYSIS REQUESTED

Enter 'X' in box below to indicate request and use appropriate preservation code listed to the left

CLIENT SAMPLE ID	Lab Use Only	DATE SAMPLED	TIME (24 hr)	SAMPLE MATRIX	SAMPLE TYPE	Number of Containers	Dissolved Metals	Field Filtered: Y/N Preservative*: [illegible handwriting] pH, TSS, [illegible] Alk; Preservative*: PC-N	IC 300.0-28 Preservative*: PC-N	ME PREP 200.7, TOT Metals Preservative*: PC-1	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Cooler (s) Temperature on Receipt
Seward - MID		7/1/22	0840	SW	G	3		X	X	X														
Seward - FD		7/1/22	0843	SW	G	3		X	X	X														
Seward - TB		7/1/22	0850	SW	G	3		X	X	X														

Ice present on receipt: ____ Yes or ____ No

Relinquished by: [signature]	Date/Time: 7/1/2022 / 0948	Received by: [signature]	Date/Time: 7/1/22 0948
Relinquished by:	Date/Time:	Received at lab by:	Date/Time:
Printed Sampler Name: APEX		Logged in by:	Date/Time:

Sample Matrix: **GW** Ground Water | **ST** Storm Water | **SW** Surface Water | **PW** Potable Water | **WW** Wastewater | **SO** Soil | **SL** Sludge | **C** Coal | **PO/Quote #:**

Sample Type: **G** Grab | **C** Composite | **D** Distribution/DW | **E** Entry Point/DW | **R** Raw/DW | **S** Special/DW | **O** Other | **nHZ** Not Hazardous / **HZ** Hazardous

Please return completed form and samples to **Geochemical Testing • 2005 N Center Ave • Somerset, PA • 15501** • 814-443-1671 • (Fax: 814-445-6729)

SAMPLES MUST BE RECEIVED ON ICE.

GEOCHEMICAL TESTING
Environmental and Energy Analysis

2005 N. Center Ave.
Somerset, PA 15501

814/443-1671
814/445-6666
FAX: 814/445-6729

Friday, July 8, 2022

Shelley Wojciechowski
CONEMAUGH OPERATING, LLC
CONEMAUGH STATION
PO BOX K
NEW FLORENCE, PA 15944

RE: Conemaugh River Surface Water Order No.: G2207012

Dear Shelley Wojciechowski:

Geochemical Testing received 3 sample(s) on 7/1/2022 for the analyses presented in the following report.

There were no problems with sample receipt protocols and analyses met the TNI/NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser
Director of Technical Services

Leslie A. Nemeth
Project Manager

ACCREDITED IN ACCORDANCE WITH nelac I.D. 56-00306PA DEP

Geochemical Testing

Date: *08-Jul-22*

CLIENT: CONEMAUGH OPERATING, LLC
Project: Conemaugh River Surface Water
Lab Order: G2207012

CASE NARRATIVE

No problems were encountered during analysis of this workorder, except if noted in this report.

Legend:

H - Method Hold Time exceeded and is not compliant with 40CFR136 Table II.
U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.
B - Analyte detected in the associated Method Blank
Q1 - See case narrative
ND - Not Detected
MCL - Contaminant Limit
J - Indicates an estimated value.
Q - Qualifier
QL -Quantitation Limit
DF - Dilution Factor
S - Surrogate Recovery outside accepted recovery limits
T - Sample received above required temperature and is not compliant with 40CFR136 Table II.
T1 - Sample received above required temperature
MDA - Minimum Detectable Activity.
** - Value exceeds Action Limit
TICs - Tentatively Identified Compounds.
E - Value above quantitation range

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *08-Jul-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - MID
Lab Order:	G2207012		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex
Lab ID:	G2207012-001	**Collection Date:**	7/1/2022 8:40:00 AM
Matrix:	SURFACE WATER	**Received Date:**	7/1/2022 10:22:29 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-21			mg/L CaCO3	1	07/06/22 11:48 AM	07/06/22 12:32 PM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	7.50		H	S.U.	1		07/06/22 9:30 AM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	6	2		mg/L	1	07/05/22 1:00 PM	07/05/22 1:09 PM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	37	10		mg/L CaCO3	1		07/06/22 9:30 AM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	243	2.0		mg/L	1	07/01/22 10:45 AM	07/01/22 11:07 AM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.2	0.1		mg/L	1	07/05/22 9:30 AM	07/06/22 9:15 AM
Calcium	70.1	0.1		mg/L	1	07/05/22 9:30 AM	07/06/22 9:15 AM
Iron	0.76	0.05		mg/L	1	07/05/22 9:30 AM	07/06/22 9:15 AM
Magnesium	21.5	0.1		mg/L	1	07/05/22 9:30 AM	07/06/22 9:15 AM
Manganese	0.32	0.01		mg/L	1	07/05/22 9:30 AM	07/06/22 9:15 AM
Sodium	21.2	0.2		mg/L	1	07/05/22 9:30 AM	07/06/22 9:15 AM
Hardness (SM 2340B)	263	1.0		mg/L CaCO3	1	07/05/22 9:30 AM	07/06/22 9:15 AM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *08-Jul-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - FD
Lab Order:	G2207012		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex
Lab ID:	G2207012-002	**Collection Date:**	7/1/2022 8:43:00 AM
Matrix:	SURFACE WATER	**Received Date:**	7/1/2022 10:22:29 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-23			mg/L CaCO3	1	07/06/22 11:48 AM	07/06/22 12:37 PM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	7.52		H	S.U.	1		07/06/22 9:38 AM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	4	2		mg/L	1	07/05/22 1:00 PM	07/05/22 1:09 PM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	36	10		mg/L CaCO3	1		07/06/22 9:38 AM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	239	2.0		mg/L	1	07/01/22 10:45 AM	07/01/22 12:31 PM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.2	0.1		mg/L	1	07/05/22 9:30 AM	07/06/22 9:28 AM
Calcium	71.4	0.1		mg/L	1	07/05/22 9:30 AM	07/06/22 9:28 AM
Iron	0.81	0.05		mg/L	1	07/05/22 9:30 AM	07/06/22 9:28 AM
Magnesium	21.7	0.1		mg/L	1	07/05/22 9:30 AM	07/06/22 9:28 AM
Manganese	0.32	0.01		mg/L	1	07/05/22 9:30 AM	07/06/22 9:28 AM
Sodium	21.7	0.2		mg/L	1	07/05/22 9:30 AM	07/06/22 9:28 AM
Hardness (SM 2340B)	268	1.0		mg/L CaCO3	1	07/05/22 9:30 AM	07/06/22 9:28 AM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *08-Jul-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward - TB
Lab Order:	G2207012		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex
Lab ID:	G2207012-003	**Collection Date:**	7/1/2022 8:50:00 AM
Matrix:	SURFACE WATER	**Received Date:**	7/1/2022 10:22:29 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	11			mg/L CaCO3	1	07/06/22 11:48 AM	07/06/22 12:40 PM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	5.00		H	S.U.	1		07/06/22 9:42 AM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	< 2	2		mg/L	1	07/05/22 1:00 PM	07/05/22 1:09 PM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	< 10	10		mg/L CaCO3	1		07/06/22 9:42 AM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	< 2.0	2.0		mg/L	1	07/01/22 10:45 AM	07/01/22 12:45 PM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	< 0.1	0.1		mg/L	1	07/05/22 9:30 AM	07/06/22 9:31 AM
Calcium	< 0.1	0.1		mg/L	1	07/05/22 9:30 AM	07/06/22 9:31 AM
Iron	< 0.05	0.05		mg/L	1	07/05/22 9:30 AM	07/06/22 9:31 AM
Magnesium	< 0.1	0.1		mg/L	1	07/05/22 9:30 AM	07/06/22 9:31 AM
Manganese	< 0.01	0.01		mg/L	1	07/05/22 9:30 AM	07/06/22 9:31 AM
Sodium	< 0.2	0.2		mg/L	1	07/05/22 9:30 AM	07/06/22 9:31 AM
Hardness (SM 2340B)	< 1.0	1.0		mg/L CaCO3	1	07/05/22 9:30 AM	07/06/22 9:31 AM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

DAILY FIELD REPORT

Sheet 1 of 1

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365

PROJECT NAME: Conemaugh Station
PROJECT LOCATION: Conemaugh River - TMDL
APEX PROJECT NO: 1147-5011
CONTRACTOR: —
DATE: 7/11/2022
WEATHER: Clear 68°

PURPOSE OF SITE VISIT: Conemaugh River Sampling - TMDL

ARRIVAL TIME: 0830

SITE DOCUMENTATION: APEX - Brantley Rice on-site

- Conemaugh River Data - USGS website - Seward Station.
  - 0530 - Last Site update
  - 0630 - Instantaneous Flow - 355 cfs
  - 25th percentile - 341 cfs
  - Median - 457 cfs
  - 7/10/2022 Discharge @ 0530 - 374 cfs

- Auto Cal. Horiba Multi-Meter - OK

- Seward Bridge - Approx Total width ~240'
  - MID River Sample ~120'

- Seward - MID
  - Water Depth ~3.0' - Sample Depth ~1.5'
  - LAT/LON - 40.4197615, -79.0260758
  - Sample Time - 0858
  - Field Parameter Time - 0905
    - Temp: 22.54°C - DO: 9.94
    - pH: 6.68 - NTU: 3.8
    - SC: 0.721

DEPARTURE TIME: 0920A - Samples To Geochemical

COPIES TO: —

APEX REPRESENTATIVE		CONTRACTOR REPRESENTATIVE	
SIGNATURE:	Clay Walker	SIGNATURE:	
PRINT NAME:	Clay Walker	PRINT NAME:	

Daily Field Report

Form F-5002, 08.21
*** Lab Work Order #

REQUEST FOR LABORATORY ANALYTICAL SERVICES

Chain of Custody (COC)

Shuttle/Cooler ID#

Billing Client

Company Conemaugh Station		**Name** John Shimshock	**E-mail Address** jshimshock@[illegible]
Mailing Address P.O. Box K 1447 Power Plant Rd		**Telephone No.** 724-235-4596	**Landfill Site** —
City, State, Zip New Florence, PA		**State Sampled** PA / **PWS Number**	**Date Results Required**

Special Instruction/Project ID/Analyte List/Comment:

Conemaugh River
TMDL

SR 1st Review: ______ CS 2nd Review: ______

*PC-1: Nitric acid (HNO_3)
*PC-2: Hydrochloric acid (HCL)
*PC-3: Sulfuric acid (H_2SO_4)
*PC-4: Sodium Hydroxide (NaOH)
*PC-5: Sodium Thiosulfate ($Na_2S_2O_3$)
*PC-6: Ascorbic acid ($C_6H_8O_6$)
*PC-7: Zinc acetate ($C_4H_6O_4Zn$) / Sodium Hydroxide (NaOH)
*PC-8: Ammonium chloride (NH_4CL)
*PC-9: Copper Sulfate ($CuSO_4 \cdot 5H_2O$)
*PC-I: Ice *PC-N: None *PC-O: Other

ANALYSIS REQUESTED

Enter 'X' in box below to indicate request and use appropriate preservation code listed to the left

Dissolved Metals / Field Filtered: Y/N Preservative*:

CLIENT SAMPLE ID	Lab Use Only	DATE SAMPLED	TIME (24 hr)	SAMPLE MATRIX	SAMPLE TYPE	Number of Containers	Acidity, Water PR; Acidity, Water Alk; pH, TSS, Sulfate PR-TSS-2.30 Preservative*: PC-N	IL 300.0-28 Preservative*: PC-N	MEPREP 200.7, TOT_Metals Preservative*: PC-1	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Cooler (s) Temperature on Receipt
Seward - MID		7/11/22	0858	SW	G	3	X	X	X														

Ice present on receipt: ____ Yes or ____ No

Relinquished by: [signature]	**Date/Time:** 7/11/2022 / 1004	**Received by:** [signature]	**Date/Time:** [illegible]
Relinquished by:	**Date/Time:**	**Received at lab by:**	**Date/Time:**
Printed Sampler Name: APEX		**Logged in by:**	**Date/Time:**

Sample Matrix: GW Ground Water | ST Storm Water | SW Surface Water | PW Potable Water | WW Wastewater | SO Soil | SL Sludge | C Coal | **PO/Quote #:**

Sample Type: G Grab | C Composite | D Distribution/DW | E Entry Point/DW | R Raw/DW | S Special/DW | O Other | nHZ Not Hazardous / HZ Hazardous

Please return completed form and samples to **Geochemical Testing • 2005 N Center Ave • Somerset, PA • 15501** • 814-443-1671 • (Fax: 814-445-6729)

SAMPLES MUST BE RECEIVED ON ICE.

GEOCHEMICAL TESTING
Environmental and Energy Analysis

2005 N. Center Ave.
Somerset, PA 15501

814/443-1671
814/445-6666
FAX: 814/445-6729

Thursday, July 14, 2022

Shelley Wojciechowski
CONEMAUGH OPERATING, LLC
CONEMAUGH STATION
PO BOX K
NEW FLORENCE, PA 15944

RE: Conemaugh River Surface Water Order No.: G2207436

Dear Shelley Wojciechowski:

Geochemical Testing received 1 sample(s) on 7/11/2022 for the analyses presented in the following report.

There were no problems with sample receipt protocols and analyses met the TNI/NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser
Director of Technical Services

Leslie A. Nemeth
Project Manager

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306PA DEP

Geochemical Testing

Date: *14-Jul-22*

CLIENT: CONEMAUGH OPERATING, LLC
Project: Conemaugh River Surface Water
Lab Order: G2207436

CASE NARRATIVE

No problems were encountered during analysis of this workorder, except if noted in this report.

Legend:

H - Method Hold Time exceeded and is not compliant with 40CFR136 Table II.
U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.
B - Analyte detected in the associated Method Blank
Q1 - See case narrative
ND - Not Detected
MCL - Contaminant Limit
J - Indicates an estimated value.
Q - Qualifier
QL -Quantitation Limit
DF - Dilution Factor
S - Surrogate Recovery outside accepted recovery limits
T - Sample received above required temperature and is not compliant with 40CFR136 Table II.
T1 - Sample received above required temperature
MDA - Minimum Detectable Activity.
** - Value exceeds Action Limit
TICs - Tentatively Identified Compounds.
E - Value above quantitation range

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *14-Jul-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward-Mid
Lab Order:	G2207436		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex
Lab ID:	G2207436-001	**Collection Date:**	7/11/2022 8:58:00 AM
Matrix:	SURFACE WATER	**Received Date:**	7/11/2022 10:34:23 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-34			mg/L CaCO3	1	07/12/22 9:51 AM	07/12/22 11:34 AM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	7.70		H	S.U.	1		07/12/22 9:13 AM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	4	2		mg/L	1	07/12/22 11:15 AM	07/12/22 11:21 AM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	49	10		mg/L CaCO3	1		07/12/22 9:13 AM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	214	2.0		mg/L	1	07/11/22 1:20 PM	07/11/22 5:03 PM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.2	0.1		mg/L	1	07/11/22 12:00 PM	07/12/22 7:19 PM
Calcium	62.9	0.1		mg/L	1	07/11/22 12:00 PM	07/12/22 7:19 PM
Iron	0.79	0.05		mg/L	1	07/11/22 12:00 PM	07/12/22 7:19 PM
Magnesium	19.8	0.1		mg/L	1	07/11/22 12:00 PM	07/12/22 7:19 PM
Manganese	0.26	0.01		mg/L	1	07/11/22 12:00 PM	07/12/22 7:19 PM
Sodium	28.4	0.2		mg/L	1	07/11/22 12:00 PM	07/12/22 7:19 PM
Hardness (SM 2340B)	239	1.0		mg/L CaCO3	1	07/11/22 12:00 PM	07/12/22 7:19 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

DAILY FIELD REPORT

Sheet 1 of 1

PROJECT NAME: Conemaugh Station
PROJECT LOCATION: Conemaugh River TMDL
APEX PROJECT NO: 1147-5011
CONTRACTOR: —
DATE: 7/15/2022
WEATHER: Clear 75°

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365

PURPOSE OF SITE VISIT: Conemaugh River Sampling - TMDL

ARRIVAL TIME: 1030

SITE DOCUMENTATION: APEX - Carson K on-site

Conemaugh River Data - USGS Website - Seward
- 0830 - Last site update
- 0900 - Instantaneous Flow - 317 cfs
- 25th percentile - 321 cfs
- Median - 444 cfs
- 7/15/2022 discharge @ 0830 330 cfs

- Aerto Cal. Horiba Multi Meter - ok

- Seward bridge - Approx Total Width ~ 240'
- MID River Sample ~ 120'

Seward - MID / Seward - FD (Field DUP)
- Water Depth - 3.0' - Sample Depth - 1.5'
- LAT/LON - 40.7197615, -79.02607758
- Sample Time: 1040 FD: 1045 * Seward TB (Trip Blank)
- Field Parameters: - Sample Time: 1055
  - Temp: 23.99°C - DO: 7.01
  - PH: 8.05 - NTU: 4.0
  - SC: 0.731

* Sample Taken to GeoChemical

DEPARTURE TIME: 1120

COPIES TO: —

APEX REPRESENTATIVE		CONTRACTOR REPRESENTATIVE	
SIGNATURE:	BJSR	SIGNATURE:	
PRINT NAME:	Brantley S. Rice	PRINT NAME:	

Daily Field Report

Form F-5002, 08.21
*** Lab Work Order #

REQUEST FOR LABORATORY ANALYTICAL SERVICES

Chain of Custody (COC)

Shuttle/Cooler ID#

Billing Client			
Company: Conemaugh Station	Name: John Shimshock	E-mail Address: JShimshock@ [illegible].com	
Mailing Address: P.O. Box K 1447 Power Plant Rd	Telephone No.: 724-235-4596	Landfill Site	
City, State, Zip: New Florence, PA	State Sampled: PA	PWS Number	Date Results Required

Special Instruction/Project ID/Analyte List/Comment:

Conemaugh River
TMDL

*PC-1: Nitric acid (HNO_3)
*PC-2: Hydrochloric acid (HCL)
*PC-3: Sulfuric acid (H_2SO_4)
*PC-4: Sodium Hydroxide (NaOH)
*PC-5: Sodium Thiosulfate ($Na_2S_2O_3$)
*PC-6: Ascorbic acid ($C_6H_8O_6$)
*PC-7: Zinc acetate ($C_4H_6O_4Zn$) / Sodium Hydroxide (NaOH)
*PC-8: Ammonium chloride (NH_4CL)
*PC-9: Copper Sulfate ($CuSO_4 \cdot 5H_2O$)
*PC-I: Ice *PC-N: None *PC-O: Other

SR 1st Review: CS 2nd Review:

ANALYSIS REQUESTED
Enter 'X' in box below to indicate request and use appropriate preservation code listed to the left

CLIENT SAMPLE ID	Lab Use Only	DATE SAMPLED	TIME (24 hr)	SAMPLE MATRIX	SAMPLE TYPE	Number of Containers	Dissolved Metals	Field Filtered: Y/N Preservative*: pH, TSS, Acidity, water PB, Alkalinity, water Alk / PC-N	Preservative*: 10200.0-7B / PC-N	Preservative*: METREP 200.7; Tot Metals / PC-1
MID		7/15/22	1040	SW	G	3		X	X	X
MID FD		↓	1045	↓	↓	↓		X	X	X
TB		↓	1055	↓	↓	↓		X	X	X

Further columns: Preservative* (×13, blank); Cooler (s) Temperature on Receipt ____; Ice present on receipt: ____ Yes or ____ No

Relinquished by: [signature]	Date/Time: 7/15/2022 1206	Received by: [signature]	Date/Time: 7-15-22 1206
Relinquished by: [signature]	Date/Time:	Received at lab by:	Date/Time:
Printed Sampler Name: Brantley Rice		Logged in by:	Date/Time:

Sample Matrix: GW Ground Water | ST Storm Water | SW Surface Water | PW Potable Water | WW Wastewater | SO Soil | SL Sludge | C Coal | PO/Quote #:

Sample Type: G Grab | C Composite | D Distribution/DW | E Entry Point/DW | R Raw/DW | S Special/DW | O Other | nHZ Not Hazardous / HZ Hazardous

Please return completed form and samples to **Geochemical Testing • 2005 N Center Ave • Somerset, PA • 15501** • 814-443-1671 • (Fax: 814-445-6729)

SAMPLES MUST BE RECEIVED ON ICE.

GEOCHEMICAL TESTING
Environmental and Energy Analysis

2005 N. Center Ave.
Somerset, PA 15501

814/443-1671
814/445-6666
FAX: 814/445-6729

Thursday, July 21, 2022

Shelley Wojciechowski
CONEMAUGH OPERATING, LLC
CONEMAUGH STATION
PO BOX K
NEW FLORENCE, PA 15944

RE: Conemaugh River Surface Water Order No.: G2207876

Dear Shelley Wojciechowski:

Geochemical Testing received 3 sample(s) on 7/15/2022 for the analyses presented in the following report.

There were no problems with sample receipt protocols and analyses met the TNI/NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser
Director of Technical Services

Leslie A. Nemeth
Project Manager

ACCREDITED IN ACCORDANCE WITH nelac I.D. 56-00306PA DEP

Geochemical Testing

Date: *21-Jul-22*

CLIENT: CONEMAUGH OPERATING, LLC
Project: Conemaugh River Surface Water
Lab Order: G2207876

CASE NARRATIVE

No problems were encountered during analysis of this workorder, except if noted in this report.

Legend:

H - Method Hold Time exceeded and is not compliant with 40CFR136 Table II.
U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.
B - Analyte detected in the associated Method Blank
Q1 - See case narrative
ND - Not Detected
MCL - Contaminant Limit
J - Indicates an estimated value.
Q - Qualifier
QL -Quantitation Limit
DF - Dilution Factor
S - Surrogate Recovery outside accepted recovery limits
T - Sample received above required temperature and is not compliant with 40CFR136 Table II.
T1 - Sample received above required temperature
MDA - Minimum Detectable Activity.
** - Value exceeds Action Limit
TICs - Tentatively Identified Compounds.
E - Value above quantitation range

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *21-Jul-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	MID
Lab Order:	G2207876		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex Companies
Lab ID:	G2207876-001	**Collection Date:**	7/15/2022 10:40:00 AM
Matrix:	SURFACE WATER	**Received Date:**	7/15/2022 12:52:25 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **GMG**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-31			mg/L CaCO3	1	07/18/22 12:59 PM	07/18/22 3:10 PM
PH BY SM 4500 H+B		Analyst: **GMG**					**SM 4500-H+ B**
Lab pH	7.82		H	S.U.	1		07/18/22 12:28 PM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	5	2		mg/L	1	07/18/22 1:05 PM	07/18/22 1:13 PM
INORGANIC NON-METALS		Analyst: **GMG**					**ASTM D 1067-11**
Alkalinity to pH 4.5	44	10		mg/L CaCO3	1		07/18/22 12:28 PM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	248	2.0		mg/L	1	07/18/22 10:25 AM	07/18/22 10:31 AM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.2	0.1		mg/L	1	07/19/22 9:25 AM	07/19/22 7:13 PM
Calcium	71.9	0.1		mg/L	1	07/19/22 9:25 AM	07/19/22 7:13 PM
Iron	0.80	0.05		mg/L	1	07/19/22 9:25 AM	07/19/22 7:13 PM
Magnesium	22.1	0.1		mg/L	1	07/19/22 9:25 AM	07/19/22 7:13 PM
Manganese	0.23	0.01		mg/L	1	07/19/22 9:25 AM	07/19/22 7:13 PM
Sodium	28.7	0.2		mg/L	1	07/19/22 9:25 AM	07/19/22 7:13 PM
Hardness (SM 2340B)	270	1.0		mg/L CaCO3	1	07/19/22 9:25 AM	07/19/22 7:13 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *21-Jul-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	MID FD
Lab Order:	G2207876		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex Companies
Lab ID:	G2207876-002	**Collection Date:**	7/15/2022 10:45:00 AM
Matrix:	SURFACE WATER	**Received Date:**	7/15/2022 12:52:25 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **GMG**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-30			mg/L CaCO3	1	07/18/22 12:59 PM	07/18/22 3:12 PM
PH BY SM 4500 H+B		Analyst: **GMG**					**SM 4500-H+ B**
Lab pH	7.83		H	S.U.	1		07/18/22 12:32 PM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	5	2		mg/L	1	07/18/22 1:05 PM	07/18/22 1:13 PM
INORGANIC NON-METALS		Analyst: **GMG**					**ASTM D 1067-11**
Alkalinity to pH 4.5	45	10		mg/L CaCO3	1		07/18/22 12:32 PM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	249	2.0		mg/L	1	07/18/22 10:25 AM	07/18/22 11:12 AM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.2	0.1		mg/L	1	07/19/22 9:25 AM	07/19/22 7:15 PM
Calcium	69.2	0.1		mg/L	1	07/19/22 9:25 AM	07/19/22 7:15 PM
Iron	0.72	0.05		mg/L	1	07/19/22 9:25 AM	07/19/22 7:15 PM
Magnesium	21.3	0.1		mg/L	1	07/19/22 9:25 AM	07/19/22 7:15 PM
Manganese	0.21	0.01		mg/L	1	07/19/22 9:25 AM	07/19/22 7:15 PM
Sodium	27.9	0.2		mg/L	1	07/19/22 9:25 AM	07/19/22 7:15 PM
Hardness (SM 2340B)	261	1.0		mg/L CaCO3	1	07/19/22 9:25 AM	07/19/22 7:15 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *21-Jul-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	TB
Lab Order:	G2207876		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex Companies
Lab ID:	G2207876-003	**Collection Date:**	7/15/2022 10:55:00 AM
Matrix:	SURFACE WATER	**Received Date:**	7/15/2022 12:52:25 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **GMG**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	12			mg/L CaCO3	1	07/18/22 12:59 PM	07/18/22 3:15 PM
PH BY SM 4500 H+B		Analyst: **GMG**					**SM 4500-H+ B**
Lab pH	5.14		H	S.U.	1		07/18/22 12:37 PM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	< 2	2		mg/L	1	07/18/22 1:05 PM	07/18/22 1:13 PM
INORGANIC NON-METALS		Analyst: **GMG**					**ASTM D 1067-11**
Alkalinity to pH 4.5	< 10	10		mg/L CaCO3	1		07/18/22 12:37 PM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	< 2.0	2.0		mg/L	1	07/18/22 10:25 AM	07/18/22 11:26 AM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	< 0.1	0.1		mg/L	1	07/19/22 9:25 AM	07/19/22 7:18 PM
Calcium	< 0.1	0.1		mg/L	1	07/19/22 9:25 AM	07/19/22 7:18 PM
Iron	< 0.05	0.05		mg/L	1	07/19/22 9:25 AM	07/19/22 7:18 PM
Magnesium	< 0.1	0.1		mg/L	1	07/19/22 9:25 AM	07/19/22 7:18 PM
Manganese	< 0.01	0.01		mg/L	1	07/19/22 9:25 AM	07/19/22 7:18 PM
Sodium	< 0.2	0.2		mg/L	1	07/19/22 9:25 AM	07/19/22 7:18 PM
Hardness (SM 2340B)	< 1.0	1.0		mg/L CaCO3	1	07/19/22 9:25 AM	07/19/22 7:18 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

DAILY FIELD REPORT

Sheet 1 of 1

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365

PROJECT NAME: Conemaugh Station
PROJECT LOCATION: Conemaugh River TMDL
APEX PROJECT NO: 1147-5011
CONTRACTOR: —
DATE: 7/21/2022
WEATHER: Overcast 72°

PURPOSE OF SITE VISIT: Conemaugh River Sampling - TMDL

ARRIVAL TIME: 715A

SITE DOCUMENTATION: Apex Jonah L on-sit + Clay W → Completed Field Sampling

- Conemaugh River Data - USGS Website - Seward
  - 0645 Last site update
  - 0720 Instantaneous Flow 387 cfs
  - 25th percentile - 329 cfs
  - Media - 434 cfs
  - 7/20/22 discharge @ 0645 - ~~387~~ 463 cfs

- Auto Cal. Horiba Multi Meter - ok

- Seward Bridge - Approx Total Width ~ 240'
  - MID River Sample ~ 120'

Seward - MID
- Water Depth - 4.0' - Sample Depth - 2.0'
- LAT / LON -40.7197615 , -79.0260758
- Sample Time : 0733
- Field Parameters : 0740
  - Temp : 23.44 - DO : 10.00
  - PH : 7.64 - NTU : <0.0
  - SC : 0.744

DEPARTURE TIME: 745A
COPIES TO: —

APEX REPRESENTATIVE		CONTRACTOR REPRESENTATIVE	
SIGNATURE:	BK, SR	SIGNATURE:	
PRINT NAME:	Brantley S Rice	PRINT NAME:	

Daily Field Report

Form F-5002, 08.21
*** Lab Work Order #

REQUEST FOR LABORATORY ANALYTICAL SERVICES

Chain of Custody (COC)

Shuttle/Cooler ID#

Billing Client

Company	Conemaugh Station
Mailing Address	P.O. Box K. 1447 Power Plant Rd.
City, State, Zip	New Florence PA
Name	John Shimshock
Telephone No.	724-235-4596
E-mail Address	jshimshock@[illegible].com
Landfill Site	
State Sampled	PA
PWS Number	
Date Results Required	

Special Instruction/Project ID/Analyte List/Comment: Conemaugh River TMDL

*PC-1: Nitric acid (HNO_3)
*PC-2: Hydrochloric acid (HCL)
*PC-3: Sulfuric acid (H_2SO_4)
*PC-4: Sodium Hydroxide (NaOH)
*PC-5: Sodium Thiosulfate ($Na_2S_2O_3$)
*PC-6: Ascorbic acid ($C_6H_8O_6$)
*PC-7: Zinc acetate ($C_4H_6O_4Zn$) / Sodium Hydroxide (NaOH)
*PC-8: Ammonium chloride (NH_4CL)
*PC-9: Copper Sulfate ($CuSO_4 \cdot 5H_2O$)
*PC-I: Ice *PC-N: None *PC-O: Other

SR 1st Review: CS 2nd Review:

ANALYSIS REQUESTED

Enter 'X' in box below to indicate request and use appropriate preservation code listed to the left

CLIENT SAMPLE ID	Lab Use Only	DATE SAMPLED	TIME (24 hr)	SAMPLE MATRIX	SAMPLE TYPE	Number of Containers	Dissolved Metals / Field Filtered: Y/N Preservative*:	[illegible] Preservative*: PC-N	TDS 2540-C Preservative*: PC-N	MISPREP 200.7, TOT Metals Preservative*: PC-1	Cooler (s) Temperature on Receipt
Seward-MID		7/21/22	0733	SW	G	3		X	X	X	

Ice present on receipt: ____ Yes or ____ No

Relinquished by: [signature]	Date/Time: 7/21/2022 / 0800	Received by: [signature]	Date/Time: 7/22/22 0656
Relinquished by: [signature]	Date/Time: 7/22/22 0658	Received at lab by:	Date/Time:
Printed Sampler Name: APEX		Logged in by:	Date/Time:

Sample Matrix: GW Ground Water | ST Storm Water | SW Surface Water | PW Potable Water | WW Wastewater | SO Soil | SL Sludge | C Coal | PO/Quote #:

Sample Type: G Grab | C Composite | D Distribution/DW | E Entry Point/DW | R Raw/DW | S Special/DW | O Other | nHZ Not Hazardous / HZ Hazardous

Please return completed form and samples to **Geochemical Testing • 2005 N Center Ave • Somerset, PA • 15501** • 814-443-1671 • (Fax: 814-445-6729)

SAMPLES MUST BE RECEIVED ON ICE.

GEOCHEMICAL TESTING
Environmental and Energy Analysis

2005 N. Center Ave.
Somerset, PA 15501

814/443-1671
814/445-6666
FAX: 814/445-6729

Thursday, July 28, 2022

Shelley Wojciechowski
CONEMAUGH OPERATING, LLC
CONEMAUGH STATION
PO BOX K
NEW FLORENCE, PA 15944

RE: Conemaugh River Surface Water Order No.: G2207C41

Dear Shelley Wojciechowski:

Geochemical Testing received 1 sample(s) on 7/22/2022 for the analyses presented in the following report.

There were no problems with sample receipt protocols and analyses met the TNI/NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser
Director of Technical Services

Leslie A. Nemeth
Project Manager

ACCREDITED IN ACCORDANCE WITH nelac I.D. 56-00306PA DEP

Geochemical Testing

Date: *28-Jul-22*

CLIENT: CONEMAUGH OPERATING, LLC
Project: Conemaugh River Surface Water
Lab Order: G2207C41

CASE NARRATIVE

No problems were encountered during analysis of this workorder, except if noted in this report.

Glossary:

H - Method Hold Time exceeded and is not compliant with 40CFR136 Table II.
U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.
B - Analyte detected in the associated Method Blank
Q1 - See case narrative
ND - Not Detected
MCL - Contaminant Limit
J - Indicates an estimated value.
Q - Qualifier
QL -Quantitation Limit
DF - Dilution Factor
S - Surrogate Recovery outside accepted recovery limits
T - Sample received above required temperature and is not compliant with 40CFR136 Table II.
T1 - Sample received above required temperature
MDA - Minimum Detectable Activity.
** - Value exceeds Action Limit
TICs - Tentatively Identified Compounds.
E - Value above quantitation range

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Glossary (continued)

1	Spike recovery limits are not applicable when the sample concentration exceeds the spike concentration by a factor of four or greater.
B1	Dilution water blank exceeded method criterion.
C1	CCV recovery above the acceptance limits. Results may be biased high.
C2	CCV recovery below the acceptance limits. Results may be biased low.
C3	ICV recovery above the acceptance limits. Results may be biased high.
C4	ICV recovery below the acceptance limits. Results may be biased low.
C5	Positive values verified by second column confirmation.
C6	Confirmation analysis by another detector or chromatographic column was not performed.
D1	The analysis did not meet the minimum DO depletion of at least 2 mg/L.
D2	The analysis did not meet the minimum residual DO of at least 1 mg/L.
D3	Sample required dilution due to a matrix interference.
D4	Sample was diluted in the extraction steps due to marked matrix interferences.
D5	Sample required dilution due to a chloride interference.
D6	Sample was diluted and the reporting limits were raised to achieve method compliant internal standard recovery.
D7	Sample was digested at a dilution due to the formation of a post-digestion precipitate.
D8	Sample was digested at a dilution to achieve method compliant matrix spike recovery.
D9	Sample was digested at a dilution to meet method compliant digestion criteria.
E2	Unable to obtain a stable weight within specified limits due to sample matrix. Value is estimated.
F1	Fecal sample tested positive for residual chlorine.
H1	Due to under-depletion from the initial dilutions for BOD, the sample was reanalyzed outside the hold time.
H2	Due to over-depletion from the initial dilutions for BOD, the sample was reanalyzed outside the hold time.
H3	Sample was re-analyzed outside of hold time due to error during original analysis.
H4	The Nitrite result used to report Nitrate was analyzed past the 48-hour holding time.
I1	Internal standard recovery above method acceptance limits. Results are estimated.
I2	Internal standard recovery was below method acceptance limits. Results are estimated.
IP	One of the instrument performance checks ( ) did not meet the acceptance criteria.
L1	LCS above the acceptance limits. Result may be biased high.
L2	LCS below the acceptance limits. Result may be biased low.
L3	Analyte was spiked into the LCS, but was not recovered.
M1	Matrix Spike recovery above the acceptance limits.
M2	Matrix Spike recovery below the acceptance limits.
M4	The matrix spike failed high for the surrogate.
M5	The matrix spike failed low for the surrogate.
M6	The reporting limits were raised due to sample matrix interference.
M7	Recovery for matrix spike could not be quantified due to matrix interference.
M8	Analyte was spiked into the MS, but was not recovered.
N1	The lab does not hold accreditation from PA-DEP for this parameter by this method
N2	PADEP does not accredit labs for this analyte by this method.
N3	The lab is accredited for this method in West Virginia, but not in PA (its primary accrediting body).
O1	The flashpoint tester cannot detect below 50 degrees F.
O2	Result is temperature of the sample when flame observed. No flash observed. Result qualified.
O3	The reporting limits were raised due to the high concentration of non-target compounds.
O4	Sample was received with headspace.
O5	Sample was received in incorrect container and is not compliant with 40CFR136 Table II.
O6	Insufficient sample volume was received to comply with the method.
P1	The pH of the sample was >2 and is not compliant with 40CFR136 Table II.
P2	Sample contained residual chlorine and is not compliant with 40CFR136 Table II
P3	The pH of the sample was <12 and is not compliant with 40CFR136 Table II.
P4	Field preservation does not meet EPA or method recommendations for this analysis.
P5	Acid preservation may not be appropriate for the analysis of 2-Chloroethylvinyl ether.
P6	Sample required additional preservative upon receipt.
P7	The sample was received unpreserved.
P8	The pH of the sample was < 9 and is not compliant with 40 CFR136 Table II.
R	Relative Percent Difference (RPD) was above the control limit.
R1	RPD above control limits between matrix spike and MS duplicates.
R2	RPD above the control limit between duplicates.
R3	RSD above the control limit between replicates.
R4	RPD above control limits between Inorganic Carbon check and spike.
R5	RPD above control limits between control sample and control sample duplicates.
S2	Surrogate recovery in the blank was below the control limit.
S3	Surrogate recovery in the blank was above the control limit.
S4	Surrogate recovery in the LCS is above the control limit.
S5	Surrogate recovery in the LCS is below the control limit.
SR	Analyte recovery was outside the accepted recovery limits and above the control limit for RPD.
T3	Target analyte found in trip/field blank.
TC	The MS tune check (tailing factor) did not meet the acceptance criteria.

Laboratory Results

Geochemical Testing

Date: *28-Jul-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward-Mid
Lab Order:	G2207C41		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex Cos
Lab ID:	G2207C41-001	**Collection Date:**	7/21/2022 7:33:00 AM
Matrix:	SURFACE WATER	**Received Date:**	7/22/2022 8:47:29 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-28			mg/L CaCO3	1	07/25/22 12:08 PM	07/25/22 2:08 PM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	7.66		H	S.U.	1		07/25/22 11:40 AM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	4	2		mg/L	1	07/25/22 12:15 PM	07/25/22 12:23 PM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	44	10		mg/L CaCO3	1		07/25/22 11:40 AM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	189	2.0		mg/L	1	07/22/22 10:00 AM	07/22/22 10:05 AM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.3	0.1		mg/L	1	07/25/22 11:15 AM	07/26/22 8:39 AM
Calcium	57.8	0.1		mg/L	1	07/25/22 11:15 AM	07/26/22 8:39 AM
Iron	0.86	0.05		mg/L	1	07/25/22 11:15 AM	07/26/22 8:39 AM
Magnesium	17.8	0.1		mg/L	1	07/25/22 11:15 AM	07/26/22 8:39 AM
Manganese	0.22	0.01		mg/L	1	07/25/22 11:15 AM	07/26/22 8:39 AM
Sodium	27.0	0.2		mg/L	1	07/25/22 11:15 AM	07/26/22 8:39 AM
Hardness (SM 2340B)	217	1.0		mg/L CaCO3	1	07/25/22 11:15 AM	07/26/22 8:39 AM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

DAILY FIELD REPORT

Sheet 1 of 1

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365

PROJECT NAME: Conemaugh Station
PROJECT LOCATION: Conemaugh River TMDL
APEX PROJECT NO: 1147-504
CONTRACTOR: —
DATE: 7/25/2022
WEATHER: Overcast 70°

PURPOSE OF SITE VISIT:
Conemaugh River Sampling TMDL

ARRIVAL TIME: 0830A

SITE DOCUMENTATION: Apex Carson K on-site
- Conemaugh River Data - USGS Website - Seward
  - 0645 Last site update
  - 0730 Instantaneous Flow 361 cfs
  - 25th percentile - 312 cfs
  - Median - 408 cfs
  - 7/24/2022 discharge @ 0645 447 cfs

- Auto Cal. Horiba Multi Meter - ok

- Seward Bridge - Approx. Total Width ~ 240
  - MID River Sample ~ 170'

- Seward - MID / MID DUP
  - Water Depth - 4.0' - Sample Depth 2.0'
  - LAT / LON - 40.7197615 , -79.02607533
  - Sample Time : 0840
  - Field Parameters: 0845
    - Temp : 23.57 - DO: 12.09
    - pH : 7.98 - NTU: 400
    - Sc : 0.682

* TB (Trip Blank)
Time: 0835

DEPARTURE TIME: 0915A
COPIES TO: —

APEX REPRESENTATIVE	CONTRACTOR REPRESENTATIVE
SIGNATURE: Bradley S Rice	SIGNATURE:
PRINT NAME: Bradley S Rice	PRINT NAME:

Daily Field Report

Form F-5002, 08.21
*** Lab Work Order #

REQUEST FOR LABORATORY ANALYTICAL SERVICES

Chain of Custody (COC)

Shuttle/Cooler ID#

Billing Client

Company: Conemaugh Station	Name: John Shimshock	E-mail Address: jshimshock@kcgrid.com	
Mailing Address: P.O. Box K. 11497 Power Plant Rd.	Telephone No.: 724-238-4596	Landfill Site	
City, State, Zip: New Florence	State Sampled: PA	PWS Number	Date Results Required

Special Instruction/Project ID/Analyte List/Comment:

Conemaugh River

TMDL

*PC-1: Nitric acid (HNO_3)
*PC-2: Hydrochloric acid (HCL)
*PC-3: Sulfuric acid (H_2SO_4)
*PC-4: Sodium Hydroxide (NaOH)
*PC-5: Sodium Thiosulfate ($Na_2S_2O_3$)
*PC-6: Ascorbic acid ($C_6H_8O_6$)
*PC-7: Zinc acetate ($C_4H_6O_4Zn$) / Sodium Hydroxide (NaOH)
*PC-8: Ammonium chloride (NH_4CL)
*PC-9: Copper Sulfate ($CuSO_4 \cdot 5H_2O$)
*PC-I: Ice *PC-N: None *PC-O: Other

SR 1st Review: CS 2nd Review:

ANALYSIS REQUESTED

Enter 'X' in box below to indicate request and use appropriate preservation code listed to the left

CLIENT SAMPLE ID	Lab Use Only	DATE SAMPLED	TIME (24 hr)	SAMPLE MATRIX	SAMPLE TYPE	Number of Containers	Dissolved Metals Field Filtered: Y/N Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Cooler (s) Temperature on Receipt
MID		7/25/22	0840	SW	G	3		X	X	X													
MID DUP		1	0840	SW	G	3		X	X	X													
TB		1	0855	SW	G	3		X	X	X													

Ice present on receipt: ___ Yes or ___ No

Relinquished by:	Date/Time: 7/25/2022 13:52	Received by:	Date/Time: 7 25 22 13:52
Relinquished by:	Date/Time:	Received at lab by:	Date/Time:
Printed Sampler Name: Brantley Rue Apex		Logged in by:	Date/Time:

Sample Matrix: GW Ground Water | ST Storm Water | SW Surface Water | PW Potable Water | WW Wastewater | SO Soil | SL Sludge | C Coal | PO/Quote #:

Sample Type: G Grab | C Composite | D Distribution/DW | E Entry Point/DW | R Raw/DW | S Special/DW | O Other | nHZ Not Hazardous / HZ Hazardous

Please return completed form and samples to **Geochemical Testing • 2005 N Center Ave • Somerset, PA • 15501** • 814-443-1671 • (Fax: 814-445-6729)

SAMPLES MUST BE RECEIVED ON ICE.

GEOCHEMICAL TESTING
Environmental and Energy Analysis

2005 N. Center Ave.
Somerset, PA 15501

814/443-1671
814/445-6666
FAX: 814/445-6729

Thursday, July 28, 2022

Shelley Wojciechowski
CONEMAUGH OPERATING, LLC
CONEMAUGH STATION
PO BOX K
NEW FLORENCE, PA 15944

RE: Conemaugh River Surface Water Order No.: G2207D45

Dear Shelley Wojciechowski:

Geochemical Testing received 3 sample(s) on 7/25/2022 for the analyses presented in the following report.

There were no problems with sample receipt protocols and analyses met the TNI/NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser
Director of Technical Services

Leslie A. Nemeth
Project Manager

ACCREDITED IN ACCORDANCE WITH nelac I.D. 56-00306PA DEP

Geochemical Testing

Date: *28-Jul-22*

CLIENT: CONEMAUGH OPERATING, LLC
Project: Conemaugh River Surface Water
Lab Order: G2207D45

CASE NARRATIVE

No problems were encountered during analysis of this workorder, except if noted in this report.

Glossary:

H - Method Hold Time exceeded and is not compliant with 40CFR136 Table II.
U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.
B - Analyte detected in the associated Method Blank
Q1 - See case narrative
ND - Not Detected
MCL - Contaminant Limit
J - Indicates an estimated value.
Q - Qualifier
QL -Quantitation Limit
DF - Dilution Factor
S - Surrogate Recovery outside accepted recovery limits
T - Sample received above required temperature and is not compliant with 40CFR136 Table II.
T1 - Sample received above required temperature
MDA - Minimum Detectable Activity.
** - Value exceeds Action Limit
TICs - Tentatively Identified Compounds.
E - Value above quantitation range

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Glossary (continued)

1	Spike recovery limits are not applicable when the sample concentration exceeds the spike concentration by a factor of four or greater.
B1	Dilution water blank exceeded method criterion.
C1	CCV recovery above the acceptance limits. Results may be biased high.
C2	CCV recovery below the acceptance limits. Results may be biased low.
C3	ICV recovery above the acceptance limits. Results may be biased high.
C4	ICV recovery below the acceptance limits. Results may be biased low.
C5	Positive values verified by second column confirmation.
C6	Confirmation analysis by another detector or chromatographic column was not performed.
D1	The analysis did not meet the minimum DO depletion of at least 2 mg/L.
D2	The analysis did not meet the minimum residual DO of at least 1 mg/L.
D3	Sample required dilution due to a matrix interference.
D4	Sample was diluted in the extraction steps due to marked matrix interferences.
D5	Sample required dilution due to a chloride interference.
D6	Sample was diluted and the reporting limits were raised to achieve method compliant internal standard recovery.
D7	Sample was digested at a dilution due to the formation of a post-digestion precipitate.
D8	Sample was digested at a dilution to achieve method compliant matrix spike recovery.
D9	Sample was digested at a dilution to meet method compliant digestion criteria.
E2	Unable to obtain a stable weight within specified limits due to sample matrix. Value is estimated.
F1	Fecal sample tested positive for residual chlorine.
H1	Due to under-depletion from the initial dilutions for BOD, the sample was reanalyzed outside the hold time.
H2	Due to over-depletion from the initial dilutions for BOD, the sample was reanalyzed outside the hold time.
H3	Sample was re-analyzed outside of hold time due to error during original analysis.
H4	The Nitrite result used to report Nitrate was analyzed past the 48-hour holding time.
I1	Internal standard recovery above method acceptance limits. Results are estimated.
I2	Internal standard recovery was below method acceptance limits. Results are estimated.
IP	One of the instrument performance checks ( ) did not meet the acceptance criteria.
L1	LCS above the acceptance limits. Result may be biased high.
L2	LCS below the acceptance limits. Result may be biased low.
L3	Analyte was spiked into the LCS, but was not recovered.
M1	Matrix Spike recovery above the acceptance limits.
M2	Matrix Spike recovery below the acceptance limits.
M4	The matrix spike failed high for the surrogate.
M5	The matrix spike failed low for the surrogate.
M6	The reporting limits were raised due to sample matrix interference.
M7	Recovery for matrix spike could not be quantified due to matrix interference.
M8	Analyte was spiked into the MS, but was not recovered.
N1	The lab does not hold accreditation from PA-DEP for this parameter by this method
N2	PADEP does not accredit labs for this analyte by this method.
N3	The lab is accredited for this method in West Virginia, but not in PA (its primary accrediting body).
O1	The flashpoint tester cannot detect below 50 degrees F.
O2	Result is temperature of the sample when flame observed. No flash observed. Result qualified.
O3	The reporting limits were raised due to the high concentration of non-target compounds.
O4	Sample was received with headspace.
O5	Sample was received in incorrect container and is not compliant with 40CFR136 Table II.
O6	Insufficient sample volume was received to comply with the method.
P1	The pH of the sample was >2 and is not compliant with 40CFR136 Table II.
P2	Sample contained residual chlorine and is not compliant with 40CFR136 Table II
P3	The pH of the sample was <12 and is not compliant with 40CFR136 Table II.
P4	Field preservation does not meet EPA or method recommendations for this analysis.
P5	Acid preservation may not be appropriate for the analysis of 2-Chloroethylvinyl ether.
P6	Sample required additional preservative upon receipt.
P7	The sample was received unpreserved.
P8	The pH of the sample was < 9 and is not compliant with 40 CFR136 Table II.
R	Relative Percent Difference (RPD) was above the control limit.
R1	RPD above control limits between matrix spike and MS duplicates.
R2	RPD above the control limit between duplicates.
R3	RSD above the control limit between replicates.
R4	RPD above control limits between Inorganic Carbon check and spike.
R5	RPD above control limits between control sample and control sample duplicates.
S2	Surrogate recovery in the blank was below the control limit.
S3	Surrogate recovery in the blank was above the control limit.
S4	Surrogate recovery in the LCS is above the control limit.
S5	Surrogate recovery in the LCS is below the control limit.
SR	Analyte recovery was outside the accepted recovery limits and above the control limit for RPD.
T3	Target analyte found in trip/field blank.
TC	The MS tune check (tailing factor) did not meet the acceptance criteria.

Laboratory Results

Geochemical Testing

Date: *28-Jul-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Mid
Lab Order:	G2207D45		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex Companies
Lab ID:	G2207D45-001	**Collection Date:**	7/25/2022 8:40:00 AM
Matrix:	SURFACE WATER	**Received Date:**	7/25/2022 2:04:05 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-31			mg/L CaCO3	1	07/26/22 11:49 AM	07/26/22 12:58 PM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	7.82		H	S.U.	1		07/26/22 11:30 AM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	6	2		mg/L	1	07/26/22 10:45 AM	07/26/22 10:54 AM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	50	10		mg/L CaCO3	1		07/26/22 11:30 AM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	192	2.0		mg/L	1	07/26/22 8:10 AM	07/26/22 11:07 AM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.3	0.1		mg/L	1	07/26/22 10:50 AM	07/27/22 11:07 AM
Calcium	61.8	0.1		mg/L	1	07/26/22 10:50 AM	07/27/22 11:07 AM
Iron	1.14	0.05		mg/L	1	07/26/22 10:50 AM	07/27/22 11:07 AM
Magnesium	18.9	0.1		mg/L	1	07/26/22 10:50 AM	07/27/22 11:07 AM
Manganese	0.21	0.01		mg/L	1	07/26/22 10:50 AM	07/27/22 11:07 AM
Sodium	29.3	0.2		mg/L	1	07/26/22 10:50 AM	07/27/22 11:07 AM
Hardness (SM 2340B)	232	1.0		mg/L CaCO3	1	07/26/22 10:50 AM	07/27/22 11:07 AM

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I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *28-Jul-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Mid Dup
Lab Order:	G2207D45		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex Companies
Lab ID:	G2207D45-002	**Collection Date:**	7/25/2022 8:40:00 AM
Matrix:	SURFACE WATER	**Received Date:**	7/25/2022 2:04:05 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-29			mg/L CaCO3	1	07/26/22 11:49 AM	07/26/22 1:00 PM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	7.84		H	S.U.	1		07/26/22 11:35 AM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	6	2		mg/L	1	07/26/22 10:45 AM	07/26/22 10:54 AM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	48	10		mg/L CaCO3	1		07/26/22 11:35 AM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	190	2.0		mg/L	1	07/26/22 8:15 AM	07/26/22 9:16 AM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.2	0.1		mg/L	1	07/26/22 10:50 AM	07/27/22 11:09 AM
Calcium	60.5	0.1		mg/L	1	07/26/22 10:50 AM	07/27/22 11:09 AM
Iron	1.02	0.05		mg/L	1	07/26/22 10:50 AM	07/27/22 11:09 AM
Magnesium	18.6	0.1		mg/L	1	07/26/22 10:50 AM	07/27/22 11:09 AM
Manganese	0.20	0.01		mg/L	1	07/26/22 10:50 AM	07/27/22 11:09 AM
Sodium	28.7	0.2		mg/L	1	07/26/22 10:50 AM	07/27/22 11:09 AM
Hardness (SM 2340B)	228	1.0		mg/L CaCO3	1	07/26/22 10:50 AM	07/27/22 11:09 AM

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Laboratory Results

Geochemical Testing

Date: *28-Jul-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	TB
Lab Order:	G2207D45		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex Companies
Lab ID:	G2207D45-003	**Collection Date:**	7/25/2022 8:55:00 AM
Matrix:	SURFACE WATER	**Received Date:**	7/25/2022 2:04:05 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	14			mg/L CaCO3	1	07/26/22 11:49 AM	07/26/22 1:03 PM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	5.12		H	S.U.	1		07/26/22 11:40 AM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	< 2	2		mg/L	1	07/26/22 10:45 AM	07/26/22 10:54 AM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	< 10	10		mg/L CaCO3	1		07/26/22 11:40 AM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	< 2.0	2.0		mg/L	1	07/26/22 8:10 AM	07/26/22 11:55 AM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	< 0.1	0.1		mg/L	1	07/26/22 10:50 AM	07/27/22 11:12 AM
Calcium	< 0.1	0.1		mg/L	1	07/26/22 10:50 AM	07/27/22 11:12 AM
Iron	< 0.05	0.05		mg/L	1	07/26/22 10:50 AM	07/27/22 11:12 AM
Magnesium	< 0.1	0.1		mg/L	1	07/26/22 10:50 AM	07/27/22 11:12 AM
Manganese	< 0.01	0.01		mg/L	1	07/26/22 10:50 AM	07/27/22 11:12 AM
Sodium	< 0.2	0.2		mg/L	1	07/26/22 10:50 AM	07/27/22 11:12 AM
Hardness (SM 2340B)	< 1.0	1.0		mg/L CaCO3	1	07/26/22 10:50 AM	07/27/22 11:12 AM

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DAILY FIELD REPORT

Sheet 1 of 1

APEX
165 East Union Street, Suite 100
Somerset, PA 15501
814-443-3344, Fax 814-444-0365

PROJECT NAME: Conemaugh Station
PROJECT LOCATION: Conemaugh River TMDL
APEX PROJECT NO: 1147-5011
CONTRACTOR: —
DATE: 8/2/2022
WEATHER: overcast 80°

PURPOSE OF SITE VISIT: Conemaugh River Sampling TMDL

ARRIVAL TIME: 1230 p

SITE DOCUMENTATION: Apex Clay Walker on-site

- Conemaugh River Data - USGS Website - Seward
  - 1045 Last Site Update
  - 1130 Instantaneous Flow - 330 cfs
  - 25th percentile - 288 cfs
  - Median - 376 cfs
  - 8/1/2022 Discharge @ 1130 - 336 cfs
- Auto Cal. Horiba Multi-Meter - ok
- Seward Bridge - Approx. Total Width ≈ 240'
  - MID River Sample ~ 120'
- Seward - MID
  - Water Depth - 3.0' - Sample Depth 1.5'
  - LAT / LON 40.719715 , -79.026075
  - Sample Time: 1242
  - Field Parameters: 1248
    - Temp: 22.34 - DO: 11.44
    - pH: 8.52 - NTU: <0.1
    - SC: 0.744

DEPARTURE TIME: 100 p

COPIES TO: —

APEX REPRESENTATIVE	CONTRACTOR REPRESENTATIVE
SIGNATURE: BS Rice	SIGNATURE:
PRINT NAME: Brantley S. Rice	PRINT NAME:

Daily Field Report

Form F-5002, 08.21
*** Lab Work Order #

REQUEST FOR LABORATORY ANALYTICAL SERVICES

Chain of Custody (COC)

Shuttle/Cooler ID#

Billing Client

Company	Name	E-mail Address
Conemaugh Station	John Shimshock	jshimshock@keycon.com
Mailing Address	**Telephone No.**	**Landfill Site**
P.O. Box K 1447 Power Plant Rd	724-235-4596	—
City, State, Zip	**State Sampled** / **PWS Number**	**Date Results Required**
New Florence	PA	

Special Instruction/Project ID/Analyte List/Comment:

Conemaugh River TMDL

*PC-1: Nitric acid (HNO_3)
*PC-2: Hydrochloric acid (HCL)
*PC-3: Sulfuric acid (H_2SO_4)
*PC-4: Sodium Hydroxide (NaOH)
*PC-5: Sodium Thiosulfate ($Na_2S_2O_3$)
*PC-6: Ascorbic acid ($C_6H_8O_6$)
*PC-7: Zinc acetate ($C_4H_6O_4Zn$) / Sodium Hydroxide (NaOH)
*PC-8: Ammonium chloride (NH_4CL)
*PC-9: Copper Sulfate ($CuSO_4 \cdot 5H_2O$)
*PC-I: Ice *PC-N: None *PC-O: Other

SR 1st Review: ______ CS 2nd Review: ______

ANALYSIS REQUESTED

Enter 'X' in box below to indicate request and use appropriate preservation code listed to the left

CLIENT SAMPLE ID	Lab Use Only	DATE SAMPLED	TIME (24 hr)	SAMPLE MATRIX	SAMPLE TYPE	Number of Containers	Dissolved Metals / Field Filtered: Y/N Preservative*:	Alkalinity, Acidity, pH, TSS Preservative*: PC-N	IC 300.0-28 Preservative*: PC-N	METPREP 200.7, TOT Metals Preservative*: PC-1	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Preservative*:	Cooler (s) Temperature on Receipt 9
Seward - MID		8/2/2022	1242	SW	G	3		X	X	X														

Ice present on receipt: X Yes or ____ No

Relinquished by:	Date/Time: 8/2/2022 / 1258	Received by:	Date/Time: 8-2-22 1258
Relinquished by:	Date/Time:	Received at lab by:	Date/Time:
Printed Sampler Name: APEX		Logged in by:	Date/Time:

Sample Matrix: GW Ground Water | ST Storm Water | SW Surface Water | PW Potable Water | WW Wastewater | SO Soil | SL Sludge | C Coal | PO/Quote #:

Sample Type: G Grab | C Composite | D Distribution/DW | E Entry Point/DW | R Raw/DW | S Special/DW | O Other | nHZ Not Hazardous / HZ Hazardous

Please return completed form and samples to **Geochemical Testing • 2005 N Center Ave • Somerset, PA • 15501** • 814-443-1671 • (Fax: 814-445-6729)

SAMPLES MUST BE RECEIVED ON ICE.

GEOCHEMICAL TESTING
Environmental and Energy Analysis

2005 N. Center Ave.
Somerset, PA 15501

814/443-1671
814/445-6666
FAX: 814/445-6729

Friday, August 5, 2022

Shelley Wojciechowski
CONEMAUGH OPERATING, LLC
CONEMAUGH STATION
PO BOX K
NEW FLORENCE, PA 15944

RE: Conemaugh River Surface Water Order No.: G2208147

Dear Shelley Wojciechowski:

Geochemical Testing received 1 sample(s) on 8/2/2022 for the analyses presented in the following report.

There were no problems with sample receipt protocols and analyses met the TNI/NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser
Director of Technical Services

Leslie A. Nemeth
Project Manager

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306PA DEP

Geochemical Testing

Date: *05-Aug-22*

CLIENT: CONEMAUGH OPERATING, LLC
Project: Conemaugh River Surface Water
Lab Order: G2208147

CASE NARRATIVE

No problems were encountered during analysis of this workorder, except if noted in this report.

Glossary:

H - Method Hold Time exceeded and is not compliant with 40CFR136 Table II.
U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.
B - Analyte detected in the associated Method Blank
Q1 - See case narrative
ND - Not Detected
MCL - Contaminant Limit
J - Indicates an estimated value.
Q - Qualifier
QL -Quantitation Limit
DF - Dilution Factor
S - Surrogate Recovery outside accepted recovery limits
T - Sample received above required temperature and is not compliant with 40CFR136 Table II.
T1 - Sample received above required temperature
MDA - Minimum Detectable Activity.
** - Value exceeds Action Limit
TICs - Tentatively Identified Compounds.
E - Value above quantitation range

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Glossary (continued)

1	Spike recovery limits are not applicable when the sample concentration exceeds the spike concentration by a factor of four or greater.
B1	Dilution water blank exceeded method criterion.
C1	CCV recovery above the acceptance limits. Results may be biased high.
C2	CCV recovery below the acceptance limits. Results may be biased low.
C3	ICV recovery above the acceptance limits. Results may be biased high.
C4	ICV recovery below the acceptance limits. Results may be biased low.
C5	Positive values verified by second column confirmation.
C6	Confirmation analysis by another detector or chromatographic column was not performed.
D1	The analysis did not meet the minimum DO depletion of at least 2 mg/L.
D2	The analysis did not meet the minimum residual DO of at least 1 mg/L.
D3	Sample required dilution due to a matrix interference.
D4	Sample was diluted in the extraction steps due to marked matrix interferences.
D5	Sample required dilution due to a chloride interference.
D6	Sample was diluted and the reporting limits were raised to achieve method compliant internal standard recovery.
D7	Sample was digested at a dilution due to the formation of a post-digestion precipitate.
D8	Sample was digested at a dilution to achieve method compliant matrix spike recovery.
D9	Sample was digested at a dilution to meet method compliant digestion criteria.
E2	Unable to obtain a stable weight within specified limits due to sample matrix. Value is estimated.
F1	Fecal sample tested positive for residual chlorine.
H1	Due to under-depletion from the initial dilutions for BOD, the sample was reanalyzed outside the hold time.
H2	Due to over-depletion from the initial dilutions for BOD, the sample was reanalyzed outside the hold time.
H3	Sample was re-analyzed outside of hold time due to error during original analysis.
H4	The Nitrite result used to report Nitrate was analyzed past the 48-hour holding time.
I1	Internal standard recovery above method acceptance limits. Results are estimated.
I2	Internal standard recovery was below method acceptance limits. Results are estimated.
IP	One of the instrument performance checks ( ) did not meet the acceptance criteria.
L1	LCS above the acceptance limits. Result may be biased high.
L2	LCS below the acceptance limits. Result may be biased low.
L3	Analyte was spiked into the LCS, but was not recovered.
M1	Matrix Spike recovery above the acceptance limits.
M2	Matrix Spike recovery below the acceptance limits.
M4	The matrix spike failed high for the surrogate.
M5	The matrix spike failed low for the surrogate.
M6	The reporting limits were raised due to sample matrix interference.
M7	Recovery for matrix spike could not be quantified due to matrix interference.
M8	Analyte was spiked into the MS, but was not recovered.
N1	The lab does not hold accreditation from PA-DEP for this parameter by this method
N2	PADEP does not accredit labs for this analyte by this method.
N3	The lab is accredited for this method in West Virginia, but not in PA (its primary accrediting body).
O1	The flashpoint tester cannot detect below 50 degrees F.
O2	Result is temperature of the sample when flame observed. No flash observed. Result qualified.
O3	The reporting limits were raised due to the high concentration of non-target compounds.
O4	Sample was received with headspace.
O5	Sample was received in incorrect container and is not compliant with 40CFR136 Table II.
O6	Insufficient sample volume was received to comply with the method.
P1	The pH of the sample was >2 and is not compliant with 40CFR136 Table II.
P2	Sample contained residual chlorine and is not compliant with 40CFR136 Table II
P3	The pH of the sample was <12 and is not compliant with 40CFR136 Table II.
P4	Field preservation does not meet EPA or method recommendations for this analysis.
P5	Acid preservation may not be appropriate for the analysis of 2-Chloroethylvinyl ether.
P6	Sample required additional preservative upon receipt.
P7	The sample was received unpreserved.
P8	The pH of the sample was < 9 and is not compliant with 40 CFR136 Table II.
R	Relative Percent Difference (RPD) was above the control limit.
R1	RPD above control limits between matrix spike and MS duplicates.
R2	RPD above the control limit between duplicates.
R3	RSD above the control limit between replicates.
R4	RPD above control limits between Inorganic Carbon check and spike.
R5	RPD above control limits between control sample and control sample duplicates.
S2	Surrogate recovery in the blank was below the control limit.
S3	Surrogate recovery in the blank was above the control limit.
S4	Surrogate recovery in the LCS is above the control limit.
S5	Surrogate recovery in the LCS is below the control limit.
SR	Analyte recovery was outside the accepted recovery limits and above the control limit for RPD.
T3	Target analyte found in trip/field blank.
TC	The MS tune check (tailing factor) did not meet the acceptance criteria.

Laboratory Results

Geochemical Testing

Date: *05-Aug-22*

CLIENT:	CONEMAUGH OPERATING, LLC	**Client Sample ID:**	Seward-MID
Lab Order:	G2208147		
Project:	Conemaugh River Surface Water	**Sampled By:**	Apex Companies
Lab ID:	G2208147-001	**Collection Date:**	8/2/2022 12:42:00 PM
Matrix:	SURFACE WATER	**Received Date:**	8/2/2022 3:01:28 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC NON-METALS		Analyst: **LAP**				**SM 2310B(4A)**	**SM 2310B(4A)**
Acidity to pH 8.3	-35			mg/L CaCO3	1	08/03/22 10:42 AM	08/03/22 11:36 AM
PH BY SM 4500 H+B		Analyst: **LAP**					**SM 4500-H+ B**
Lab pH	7.69		H	S.U.	1		08/03/22 9:50 AM
PHYSICAL TESTS		Analyst: **AGF**				**SM 2540 D**	**SM 2540 D**
Total suspended solids	7	2		mg/L	1	08/03/22 11:20 AM	08/03/22 11:28 AM
INORGANIC NON-METALS		Analyst: **LAP**					**ASTM D 1067-11**
Alkalinity to pH 4.5	50	10		mg/L CaCO3	1		08/03/22 9:50 AM
INORGANIC NON-METALS		Analyst: **ACW**				**EPA 300.0 REV 2.1**	**EPA 300.0 REV 2.1**
Sulfate	234	2.0		mg/L	1	08/02/22 8:20 PM	08/02/22 10:46 PM
INORGANIC METALS		Analyst: **LEB**				**EPA 200.2**	**EPA 200.7 REV 4.4**
Aluminum	0.2	0.1		mg/L	1	08/03/22 10:45 AM	08/04/22 8:52 AM
Calcium	70.5	0.1		mg/L	1	08/03/22 10:45 AM	08/04/22 8:52 AM
Iron	0.95	0.05		mg/L	1	08/03/22 10:45 AM	08/04/22 8:52 AM
Magnesium	22.3	0.1		mg/L	1	08/03/22 10:45 AM	08/04/22 8:52 AM
Manganese	0.21	0.01		mg/L	1	08/03/22 10:45 AM	08/04/22 8:52 AM
Sodium	30.6	0.2		mg/L	1	08/03/22 10:45 AM	08/04/22 8:52 AM
Hardness (SM 2340B)	268	1.0		mg/L CaCO3	1	08/03/22 10:45 AM	08/04/22 8:52 AM

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I.D. 56-00306 PA DEP

Appendix D

PADEP Guidance for Background Determination (Doc No. 391-2000-022)

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Water Supply and Wastewater Management

DOCUMENT NUMBER:	391-2000-022
TITLE:	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
EFFECTIVE DATE:	March 22, 1999 Minor changes were made throughout (March 6, 2003)
AUTHORITY:	Federal Clean Water Act, Pa. Code Title 25, Chapter 92, 93, and 95. The Clean Stream Law, 35 P.S. §§691.1 *et seq.*
POLICY:	It is the policy of the Department of Environmental Protection (DEP) to use the best available data in the calculation or estimation of wasteload allocations (WLA) and NPDES effluent limitations. This often involves the use of data that can only be collected in the field. When data is not available or existing data is not adequate, other interested parties or dischargers may provide the necessary data. In the absence of site-specific data, DEP may use a default value or an empirical estimation of the data until the site-specific data becomes available.
PURPOSE:	The purpose of this document is to lay out the procedures recommended or used by DEP for field data collection and evaluation of such data. The procedures are not mandatory. DEP will consider the use of alternative procedures which interested parties or dischargers believe are more appropriate than those presented in this document.
APPLICABILITY:	DEP will use this guidance to provide technical details on how the program carries out various calculations and applies the evaluated results in preparing NPDES permits for discharges, based on water quality criteria published in Chapters 93 and 16 (Statement of Policy).
DISCLAIMER:	The policies and procedures outlined in this guidance are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements. The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of DEP to give the rules in these policies that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement if circumstances warrant.
PAGE LENGTH:	14 pages
LOCATION:	Volume 29, Tab 10

1.1 INTRODUCTION

For single discharge WLA's, background water quality is equal to the ambient water quality (as defined in Section 93.1) that is expected to occur at design flow conditions. This implementation guidance describes how to determine background/ambient water quality, and how to use it to determine single discharge WLA's and effluent limits. Guidance for collecting site-specific background/ambient data is presented in Sections 1.6. Guidance for evaluating the data is presented in Section 1.3. Figure 1 will aid in understanding the decisions and requirements one will find in this guidance.

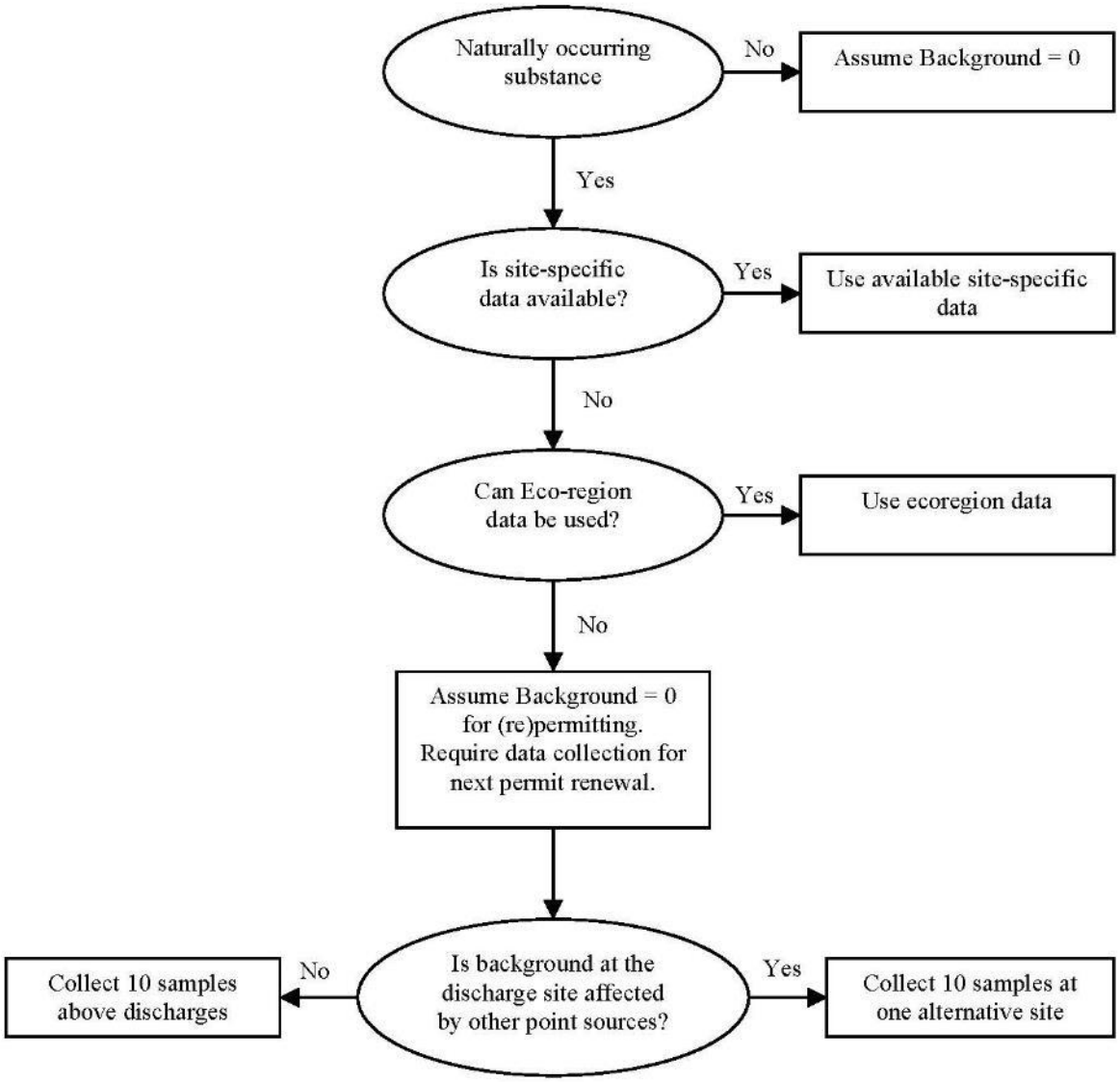
1.2 NATURALLY AND NON-NATURALLY OCCURRING SUBSTANCES

The water quality constituents that DEP regulates can be divided into two broad categories--those that occur naturally and those that do not. Table 1 lists the substances that are considered to be naturally occurring in the aquatic environment.

Table 1
Naturally Occurring Substances

Alkalinity, Total	Fluoride, Total	Methylene Blue Act Subs	Selenium, Dissolved
Aluminum, Dissolved	Hardness, Total	Nickel, Total	Selenium, Total
Aluminum, Total	Iron, Dissolved	Nitrate as Nitrogen	Specific Conductivity
Ammonia as Nitrogen	Iron, Total	Nitrite as Nitrogen	Sulfate, Total
Carbonaceous 5-day BOD	Lead, Dissolved	Osmotic Pressure	Suspended Solids
Chloride	Lead, Total	pH	Total Dissolved Solids
Copper, Dissolved	Manganese, Dissolved	Phenols	Zinc, Dissolved
Copper, Total	Manganese, Total	Phosphorus, Total	Zinc, Total
Fecal Coliforms			

Figure 1
Determination and Use of Background/Ambient



For non-naturally occurring substances, it can usually be assumed that virtually all pollutant loading at design conditions will come from controllable, continuous point source discharges. Therefore, for substances **not** listed in Table 1, WLA's should be developed based on the assumption that background/ambient concentrations are equal to zero (0), unless (a) there are site-specific data available that indicates otherwise and (b) these data also demonstrate that the pollutant source is not controllable.

While it is reasonable to assume that background/ambient concentrations are zero for non-naturally occurring substances, making this same assumption for the substances listed in Table 1 is not reasonable. Therefore, for the substances listed in Table 1, background/ambient water quality must be estimated for use in WLA calculations (using the procedure shown in Figure 1).

Sections 1.3 and 1.4 below refer to Figure 2. Note that the current version of PENTOXSD only carries out the calculations and determinations associated with Step 4.2. All other calculations and comparisons have to be carried out manually (unless and until PENTOXSD is modified).

1.3 DETERMINING THE WATER QUALITY OBJECTIVE

To determine the Water Quality Objective, the long term average background/ambient water quality (Step 1) must be transformed to the (applicable) water quality criterion duration (Step 2), and then compared with the criterion (Step 3).

Step 1: Determine the Long Term Average Background/Ambient Water Quality and its Variability

To determine the long term average background/ambient water quality, the data (see Section 1.6.2 for data collection) should be log-transformed (this assumes that the data are log-normally distributed and there are no values less than detection):

$Y_i = \ln[X_i]$ where,

X_i = observed data
Y_i = the natural log of the raw data

Next, calculate the mean and variance of the log-transformed data:

$$\mu_y = \frac{\sum(Y_i)}{k}$$

$$\sigma_y^2 = \frac{\sum(Y_i - \mu_y)^2}{(k-1)}$$ where,

μ_y = mean of log-transformed data
Y_i = log-transformed data
k = total number of data points
σ^2_y = variance of log-transformed data

The long term average background/ambient water quality and associated coefficient of variation are then:

$Cb = \exp(\mu_y + \sigma^2_y/2)$ (from TSD)
$CV_d = [\exp(\sigma^2_y)-1]^{0.5}$ (TSD)

where,

Cb = Long term average (50th percentile) background/ambient water quality
CV_d = (daily) Coefficient of Variation

An example of the calculations shown in Step 1 appears as Appendix 2.

Step 1a: Determine the Long Term Average Background/Ambient Water Quality and its Variability using the Delta Log Normal Distribution (for use when there are less than detect values in the data set)

$$\mu_y = \frac{\sum(Y_i)}{k-r}$$

$$\sigma_y^2 = \frac{\sum(Y_i - \mu_y)^2}{(k-r-1)}$$ where,

r = number of nondetect values in sample

The long term average background/ambient water quality and associated coefficient of variation are then:

$$Cb = \delta D + (1-\delta)\exp(\mu_y + 0.5\sigma_y^2)$$

$$V(x) = (1-\delta)\exp(2\mu_y + \sigma_y^2)\left[\exp(\sigma_y^2) - (1-\delta)\right] + \delta(1-\delta)D\left[D - 2\exp(\mu_y + 0.5\sigma_y^2)\right]$$

$$CVd = \frac{(V(x))^{0.5}}{Cb}$$ where,

$$\delta = \frac{r}{k}$$

D = detection limit

Step 2: Transform the LTA background/ambient water quality to the (applicable) criterion duration.

DEP regulations specify that water quality criteria should be achieved at least 99 percent of the time. Therefore, to determine if background/ambient water quality is better than the applicable criterion, the 99th percentile background/ambient water quality (at the criterion duration) must be determined.

The 99th percentile background/ambient concentration at the criteria duration is:

$$C_{b\_crit} = \frac{Cb}{\exp(0.5 \times \sigma_n^2 - z \times \sigma_n)}$$ where,

(the above formula is based on Table 5-1 of the TSD)

C_{b_crit} = 99th percentile background/ambient concentration at criteria duration n
Cb = LTA daily background/ambient concentration (from Step 1)
σ_n^2 = $\ln [CV_d^2/n + 1]$ where,

CV_d = (daily) Coefficient of Variation (from Step 1)
n = Criterion duration (1 for acute; 4 for chronic, 30 for threshold HH, and 25,260 for non-threshold HH)

z = z-score = 2.326 (99th percentile)

Step 3: Compare the Background/Ambient Water Quality at the Criterion Duration with the Water Quality Criterion.

Once the background/ambient water quality at the applicable criterion duration has been determined from Step 2, it must be compared to the water quality criterion. The water quality criterion is:

$C_x = C_c * C_m$ where,

C_x = water quality objective
C_c = water quality criterion as published or calculated from Chapter 93 or Chapter 16
C_m = Site-specific water quality criteria modifier

If $C_{b\_crit} \geq C_x$, then (1) C_{b_crit} becomes the water quality objective, and (2) there is no assimilation capacity in the receiving water body. WLA's and effluent limits for this criterion should be determined using Step 4.1 Figure 2.

If $C_{b\_crit} < C_x$, then (1) C_x is the water quality objective, and (2) there is assimilation capacity in the receiving water body. WLA's and effluent limits for this criterion should be determined using Step 4.2 (PENTOXSD) Figure 2.

1.4 DETERMINING THE WASTELOAD ALLOCATION AND EFFLUENT LIMIT

If, in step 3 above, $C_{b\_crit} \geq C_x$, follow Step 4.1. If $C_{b\_crit} < C_x$, follow Step 4.2.

Step 4.1: Determining the WLA and Effluent Limit When $C_{b\_crit} \geq Cx$

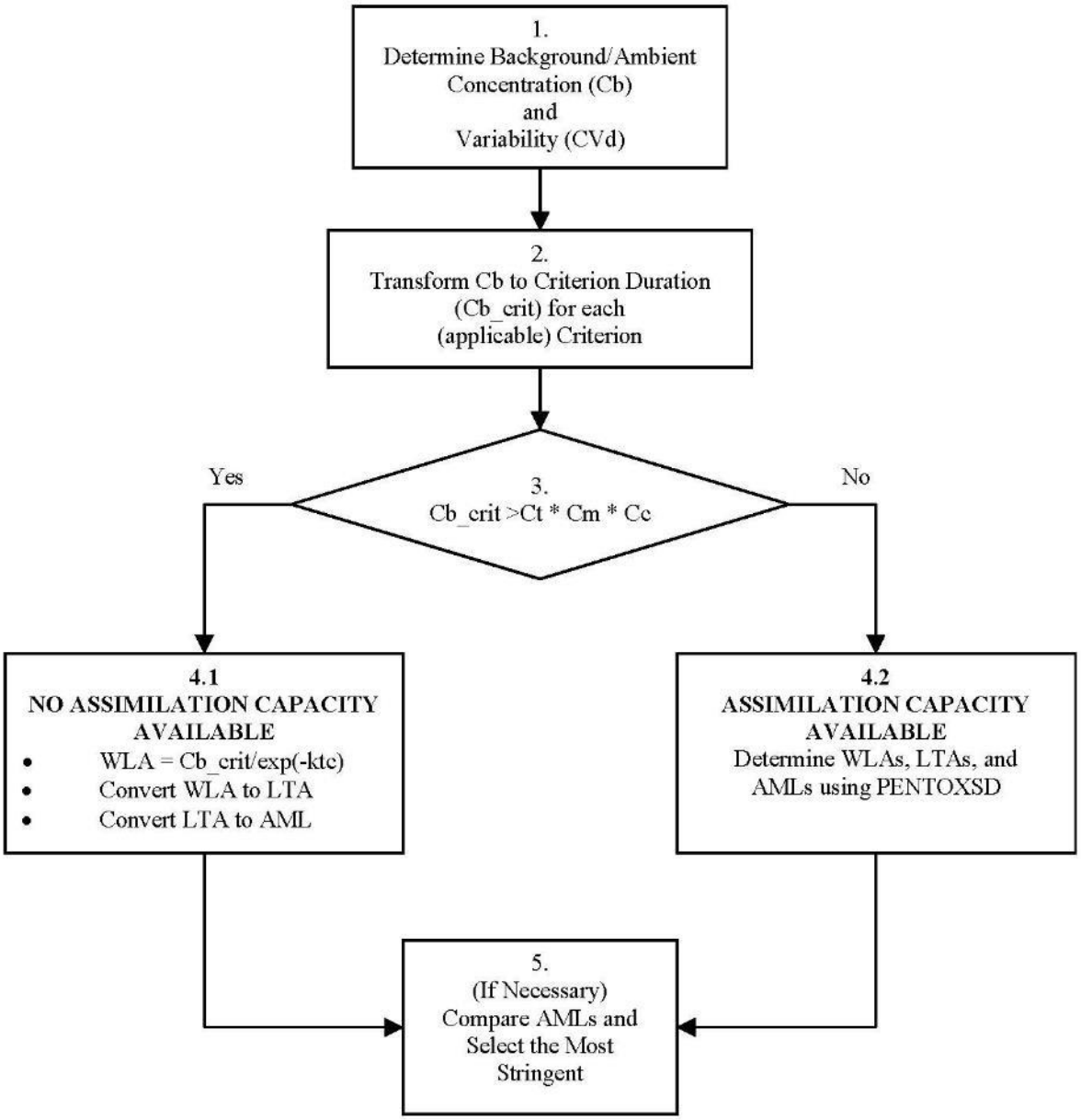
When $C_{b\_crit} \geq C_x$:

- $WLA_x = C_{b\_crit}/\exp(-kt_c)$
- $LTA_x = WLA_x * \exp(0.5 * \ln[CV_d^2/n + 1] - 2.326 * (\ln[CV_d^2/n + 1])^{.5})$
- $AML_x = LTA * \exp(2.326* \sigma_n - 0.5* \sigma_n^2)$ where,

WLA_x = Wasteload Allocation for Criterion x
LTA_x = Long Term Average for Criterion x
AML_x = Average Monthly Limit for Criterion x (based on four samples per month)
$\sigma_n^2 = \ln(CV_d^2/4 + 1)$ (four samples per month)

Figure 2

Determination and Use
of
Background/Ambient Water Quality
for
Making WLA and Effluent Limits Determination



Note that this step should be repeated for all criteria where $C_{b\_crit} > C_x$ and the most stringent WLA and AML should be selected.

Step 4.2: Determining the WLA and Effluent Limit When $C_{b\_crit} < C_x$

When $C_{b\_crit} < C_x$, there is available assimilation capacity. WLA_x, LTA_x, AML_x may therefore be determined using PENTOXSD **with an inputted Background/Ambient CV of zero (0). Note that PENTOXSD makes these determinations for all criteria and criteria duration's, and also determines which is the most stringent.**

Step 5: Determining the WLA and Effluent Limit When $C_{b\_crit} \geq C_x$ for one or more criterion and $C_{b\_crit} < C_x$ for others.

Depending on the degree of variability in the background/ambient water quality and the relative values of the different criteria for a given parameter, it is possible that assimilation capacity will exist for some criteria while there is no assimilation capacity for other criteria. Where this is the case, this step must be carried out.

When $C_{b\_crit} \geq C_x$ for one or more criterion and $C_{b\_crit} < C_x$ for others, the results from Steps 4.1 and 4.2 must be compared to determine which is the more stringent. The more stringent results are the basis for the NPDES permit.

1.5 WHEN BACKGROUND/AMBIENT DATA IS UNAVAILABLE

Background/ambient for naturally occurring substances must be based on available data from the site or from a reference site, unless that data is documented by the Region as being insufficient or inappropriate for use. If, in the judgment of the permit writer, these data are insufficient because of deficiencies in spatial or temporal coverage the permit writer may assume a value of 0 ug/l for naturally occurring substances for initial permit issuance, or to reissue an expiring permit. **However, permits issued on this basis must include a special condition that requires the discharger to collect background/ambient data for any parameters of concern so that these data are available for the next permit renewal. Sample permit language, for this special condition, is shown on Attachment 2.** If site-specific background/ambient data is unavailable, a permit writer may use available background/ambient data from upstream or within the same watershed, or data from one or more DEP reference water quality network sites located in the same ecoregion as the discharge to estimate background/ambient water quality.

1.6 SITE SPECIFIC DATA COLLECTION AND EVALUATION

The information in this and subsequent sections should be used to design a site-specific data collection program. Field data should be reported using the form provided in Attachment 1. When collecting data for Hardness consult the implementation guidance *"Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness"* (DEP ID: 391-2000-021) available on DEP's website at www.dep.state.pa.us .

1.6.1 SAMPLE SITE SELECTION

Background/ambient water quality samples should be collected immediately upstream of the existing (or proposed) discharge outfall.[1] In the case of an existing discharge, the site should be far enough upstream so that water flow and water quality are not affected by the outfall itself. In addition, the site should be (ideally) located on a straight stretch of stream that is devoid of areas of standing water, eddy currents, and backflow.

[1] Where the water quality limits for TDS, Phenols, Fluoride, and NO2-NO3 are based on THH protection at a downstream potable water supply it is not appropriate to sample background/ambient above the discharge. However, where there is a question of fish and aquatic life protection it would be appropriate to monitor background/ambient at the point of discharge.

If the site upstream of the outfall is believed to be affected by one or more upstream point source discharges, an alternative site must be sampled. The alternative site can be located:

1. on the same stream above the interfering discharge(s); or

2. on a tributary stream that is not affected by point source discharges, and which contributes a significant amount of the flow to the site where characterization of background is desired.

1.6.2 DATA COLLECTION

Sampling should be performed on days during the low flow (Q_{7-10}) season of July through November. Sampling should not be conducted when the waterbody level is rising. Measure the waterbody level and again two hours later, if the level is not rising sample. A single mid-depth grab sample should be collected between the hours of 10:00 a.m. and 2:00 p.m. This time restriction is necessary due to the variation in pH throughout the day which can affect metals data. A minimum of ten grab samples should be collected, with no more than one sample per week; samples may be taken during the three-year collection period (see Attachment 2). The data are evaluated as described in Section 1.3.

1.6.3 SAMPLE COLLECTION[2]

Obtain a representative sample in accordance with established water sample collection procedures taking care not to expose the sample or any sampling equipment or containers to contamination through contact with your skin or any of the following:

Rubber	Cigarette smoke	Dust, Dirt or Soil
Metal products	Automobile exhaust	
Painted Surfaces	Paper products	

All equipment/containers that come into contact with the sample must be certified metals free from the supplier; or washed with 0.1% reagent grade hydrochloric acid and rinsed with metals free distilled or deionized water.

Remove the sample container cap, submerge the container below the surface of the water, move the container opening towards the upstream flow, and away from the collector. Hold the lower portion of the sample container making sure that water which contacts the hands cannot enter. Never touch the container opening or the inside of the container cap. Replace the cap after the container is filled with the appropriate quantity of water.

1.6.3.1 SAMPLE VOLUME, FIELD PREP, AND FIXATIVE CHART

Standard Inorganics (includes C-BOD5)	1-500 milliliter plastic bottle	iced to 4° C
Total Metals	*1-500 or 1-125 milliliter plastic bottle	nitric acid to pH < 2 iced to 4° C
Phenols	1-500 milliliter glass bottle	Sulfuric acid to pH < 2 iced to 4° C
Cyanides	1-500 milliliter plastic bottle	Sodium hydroxide to pH > 12 iced to 4° C
Oil & Grease	1-500 milliliter glass bottle	hydrochloric acid to pH < 2 iced to 4° C
Radiological	1-500 milliliter plastic bottle	iced to 4° C

* Bottle size depends on number or metals collecting for.

[2] See *Pennsylvania's Surface Water Quality Monitoring Network*, 3800-BK-DEP0636 available on DEP's website.

1.6.4 METALS DATA COLLECTION

Note: **Existing DEP procedures translate dissolved metals water quality criteria into an equivalent total recoverable metals water quality objective. There is, therefore, no need for the collection or evaluation of dissolved metals background/ambient water quality data.**

Water samples collected to determine metals concentrations must be handled extensively in the field. Included in this field sample preparation are procedures involving acid fixation which provide numerous opportunities for sample contamination. Because of the low natural concentrations of metals in many water samples and the difficulties associated with maintaining quality control under field conditions, the procedures described in Appendix 1 should be followed. The field blanks specified in Appendix 1 must be submitted at least once every day that metals samples are collected and every time acid, distilled/deionized water, or manufacturer's sample container lots change.

1.6.5 ANALYTICAL METHODS

Analytical methods promulgated in 40 CFR Part 136 or other DEP approved test methods must be used where applicable. Typically the method with the lowest detection level should be used. If EPA has promulgated no method for a particular pollutant, use a suitable method for measuring the level of the pollutant provided that a description of the method or a reference to a published method is attached to the results. The description shall include the sample holding time, preservation technique, and quality control measures applied. DEP reserves the right to review the methodology used and require further analysis, if necessary.

In the determination of Free Cyanide (Group B, 16M), DEP's Bureau of Laboratories has developed a method to be used. Contact the Bureau of Laboratories, PO Box 1467, Harrisburg, PA 17210 (717-787-4669) for a copy of this procedure.

Appendix 1

The Collection and Field Preparation of Samples for Metals Analysis

1 COLLECT SAMPLE

Obtain a representative sample in accordance with established water sample collection procedures taking care not to expose the sample or any sampling equipment or containers to contamination through contact with your skin or any of the following:

Rubber	Cigarette smoke	Dust, Dirt or Soil
Metal products	Automobile exhaust	
Painted Surfaces	Paper products	

All equipment/containers that come into contact with the sample must be certified metals free from the supplier; or washed with 0.1% reagent grade hydrochloric acid and rinsed with metals free distilled or deionized water.

2 PRESERVE SAMPLES

Samples for metals must be immediately acidified to a pH < 2.0 to prevent precipitation or other changes in metals speciation. Use reagent grade or ultra pure 1:1 nitric acid for this process. Be careful to ensure the acid does not come in contact with any metals or other contaminants in the process of transferring it from storage to the sample

Normally 2 ml of 1:1 nitric acid is sufficient to preserve the sample. Check the pH of a small aliquot of the fixed sample to ensure pH depression below 2.0 and then discard this aliquot. Do not insert pH probes or other testing devices directly into the fixed sample. Samples to be analyzed for ferrous iron must be prepared in the same way except that they are fixed with 1:1 hydrochloric acid instead of nitric acid.

3 FIX BLANKS

Using the procedures described above, acidify a blank consisting of a 125-ml aliquot of the deionized water used in all sample preparations. This blank should be so labeled and forwarded to the laboratory along with the sample. Both bottles (sample, and unfiltered blank) should be placed on ice for storage/shipping.

4 CARE OF EQUIPMENT

All reagents, equipment and containers that come into contact with the sample must be kept as clean as possible. Distilled or deionized water and nitric acid fixative must be kept in sealed containers which are protected from dust, fumes and other contaminants by outer containers and/or sealed plastic bags. The sample bottles should be stored in closed boxes between uses to minimize the potential for contamination.

Attachment 1

STREAM PARAMETER CONCENTRATION DATA REPORT

Stream: _____ Stream Code: _____
Name of Discharge: _____ NPDES Permit Number: _____
Discharge Location (RMI): _____ Discharge Stream: ☐
Drainage Area: _____ Alternative Stream: ☐

Stream Concentration Data				
Date	Parameter Name	Sample Conc.	Stream Flow[3] (cfs)	Level Detectability Achieved

Submitted By: _____
Date: _____

[3] Stream flow is optional unless specifically required by the permit writer.

Attachment 2

Proposed Language for addition to PART A/C Background/Ambient Data Collection Requirements: (This language will eventually be integrated with the latest PART A/C language with all other data submissions)

"This permit contains water quality based effluent limits and monitoring requirements for _____, _____, and _____ . Because of the lack of available site-specific background/ambient data the water quality assessment for these parameters was based on an assumption of zero (0) background/ambient concentration.

The permittee shall collect and submit background/ambient water quality data for ____, ____, and ___ to DEP no later than 3 years after the permit issuance (or amendment date). The data must be collected and analyzed in accordance with the enclosed protocol or an alternative plan. The plan must be submitted to DEP for approval."

Appendix 2

An Example to Determine the Long Term Average Background/Ambient Water Quality and its Variability

To determine the long-term average background ambient water quality, the data must be log-transformed (assuming the data are log-normally distributed):

$$Y_i = \ln(X_i) \qquad \text{where:}$$

Xi = observed data
Yi = the natural log of the observed data

Next, calculate the mean and the variance of the log-transformed data:

Example Data ug/l					
X_1	= 0.41	Y_1	= ln(0.41)	=	-0.89
X_2	= 0.92	Y_2	= ln(0.92)	=	-0.08
X_3	= 1.07	Y_3	= ln(1.07)	=	0.07
X_4	= 0.22	Y_4	= ln(0.22)	=	-1.51
X_5	= 0.09	Y_5	= ln(0.09)	=	-2.41
X_6	= 0.31	Y_6	= ln(0.31)	=	-1.17
X_7	= 0.55	Y_7	= ln(0.55)	=	-0.6
X_8	= 0.01	Y_8	= ln(0.01)	=	-4.6
X_9	= 0.49	Y_9	= ln(0.49)	=	-0.71
X_{10}	= 1.99	Y_{10}	= ln(1.99)	=	0.7
			The Sum of Yi = -11.2		

<u>The Mean</u> (μ_y)

$$\mu_y = \frac{\sum(Y_i)}{k} \qquad \mu_y = \frac{11.2}{10} \qquad \mu_y = \mathbf{-1.12}$$

where,
μ_y = the lognormal mean of example data
Y_i = lognormal data
k = the number of data points in example data set

<u>The Variance</u> (σ_y^2)

The lognormal variance is calculated.

$$\sigma_y^2 = \frac{\sum (Y_i - \mu_y)^2}{(k-1)} \qquad \sigma_y^2 = \frac{20.2}{10-1} \qquad = \mathbf{2.24}$$

$(Y_i \quad \mu_y)^2$		
$(-0.89-(-1.12))^2$	=	0.05
$(-0.08-(-1.12))^2$	=	1.08
$(0.07-(-1.12))^2$	=	1.42
$(-1.51-(-1.12))^2$	=	0.15
$(-2.41-(-1.12))^2$	=	1.65
$(-1.17-(-1.12))^2$	=	0.002
$(-0.6-(-1.12))^2$	=	0.27
$(-4.6-(-1.12))^2$	=	12.1
$(-0.71-(-1.12))^2$	=	0.17
$(0.7-(-1.12))^2$	=	3.28
$\sum(Y_i - \mu_y)^2$	=	20.2

The long term average background/ambient water quality (Cb) and associated coefficient of variation (CV_d) are then:

$$Cb = \exp\left(\mu_y + \frac{\sigma_y^2}{2}\right) \qquad Cb = \exp \quad 1.12 + \frac{2.24}{2} \qquad = 1.0$$

$$CV_d = \sqrt{\exp(\sigma_y^2) - 1} \qquad CV_d = \sqrt{\exp(2.24) - 1} \qquad = 2.9$$

Appendix E

Background Water Quality Calculations (using PADEP Guidance)

Conemaugh River Surface Water
Long-Term Average Background Water Quality

Date	Total Aluminum (mg/L)	Total Iron (mg/L)	Total Manganese (mg/L)
6/24/2022	0.3	0.92	0.32
6/29/2022	0.2	0.91	0.30
7/1/2022	0.2	0.76	0.32
7/11/2022	0.2	0.79	0.26
7/15/2022	0.2	0.80	0.23
7/21/2022	0.3	0.86	0.22
7/25/2022	0.3	1.14	0.21
8/2/2022	0.2	0.95	0.21

Y_i	Natural Log (LN)	Natural Log (LN)	Natural Log (LN)
	-1.20	-0.08	-1.14
	-1.61	-0.09	-1.20
	-1.61	-0.27	-1.14
	-1.61	-0.24	-1.35
	-1.61	-0.22	-1.47
	-1.20	-0.15	-1.51
	-1.20	0.13	-1.56
	-1.61	-0.05	-1.56
$\Sigma(Y_i)$	-11.66	-0.98	-10.94

	Mean	Mean	Mean
μ_y	-1.46	-0.12	-1.37

	Variance	Variance	Variance
$(Y_i - \mu_y)^2$	0.064	0.002	0.052
	0.023	0.001	0.027
	0.023	0.023	0.052
	0.023	0.013	0.000
	0.023	0.010	0.011
	0.064	0.001	0.022
	0.064	0.064	0.038
	0.023	0.005	0.038
$\Sigma(Y_i - \mu_y)^2$	0.308	0.119	0.238

σ^2_y	0.044	0.017	0.034

	Long-Term Avg. Background	Long-Term Avg. Background	Long-Term Avg. Background
Cb	0.24	0.89	0.26

	Coefficient of Variation	Coefficient of Variation	Coefficient of Variation
CV_d	0.21	0.13	0.19

Conemaugh River Surface Water
Long-Term Average Background Water Quality

Date	Alkalinity to pH 4.5 (mg/L $CaCO_3$)	Dissolved Oxygen (mg/L)	Total Hardness (mg/L $CaCO_3$)
6/24/2022	36	6.62	217
6/29/2022	38	8.71	235
7/1/2022	37	6.46	263
7/11/2022	49	9.90	239
7/15/2022	44	7.01	270
7/21/2022	44	10.0	217
7/25/2022	50	12.1	232
8/2/2022	50	11.4	268
Y_i	Natural Log (LN)	Natural Log (LN)	Natural Log (LN)
	3.58	1.89	5.38
	3.64	2.16	5.46
	3.61	1.87	5.57
	3.89	2.29	5.48
	3.78	1.95	5.60
	3.78	2.30	5.38
	3.91	2.49	5.45
	3.91	2.43	5.59
$\Sigma(Y_i)$	30.12	17.39	43.90
	Mean	Mean	Mean
μ_y	3.76	2.17	5.49
	Variance	Variance	Variance
$(Y_i - \mu_y)^2$	0.033	0.080	0.012
	0.016	0.000	0.001
	0.024	0.095	0.007
	0.016	0.014	0.000
	0.000	0.051	0.012
	0.000	0.017	0.012
	0.022	0.102	0.002
	0.022	0.068	0.011
$\Sigma(Y_i - \mu_y)^2$	0.133	0.427	0.056
σ^2_y	0.019	0.061	0.008
	Long-Term Avg. Background	Long-Term Avg. Background	Long-Term Avg. Background
Cb	43.6	9.06	243
	Coefficient of Variation	Coefficient of Variation	Coefficient of Variation
CV_d	0.14	0.25	0.09

Appendix F

Output from ProUCL Software

ProUCL Statistical Output

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Uncensored Full Data Sets											
2												
3	User Selected Options											
4	Date/Time of Computation	ProUCL 5.2 8/11/2022 12:52:45 PM										
5	From File	River Stats for Al Fe Mn_ProUCL input.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
10												

ProUCL Statistical Output

	A	B	C	D	E	F	G	H	I	J	K	L
11	**Total Aluminum (mg/L)**											
12												
13						**General Statistics**						
14					Total Number of Observations	8			Number of Distinct Observations			2
15									Number of Missing Observations			0
16					Minimum	0.2			Mean			0.238
17					Maximum	0.3			Median			0.2
18					SD	0.0518			Std. Error of Mean			0.0183
19					Coefficient of Variation	0.218			Skewness			0.644
20												
21					**Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,**							
22					**refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,**							
23					**but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).**							
24					**The Chebyshev UCL often results in gross overestimates of the mean.**							
25					**Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.**							
26												
27						**Normal GOF Test**						
28					Shapiro Wilk Test Statistic	0.641			**Shapiro Wilk GOF Test**			
29					1% Shapiro Wilk Critical Value	0.749			Data Not Normal at 1% Significance Level			
30					Lilliefors Test Statistic	0.391			**Lilliefors GOF Test**			
31					1% Lilliefors Critical Value	0.333			Data Not Normal at 1% Significance Level			
32						**Data Not Normal at 1% Significance Level**						
33												
34						**Assuming Normal Distribution**						
35					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
36					95% Student's-t UCL	0.272			95% Adjusted-CLT UCL (Chen-1995)			0.272
37									95% Modified-t UCL (Johnson-1978)			0.273
38												
39						**Gamma GOF Test**						
40					A-D Test Statistic	1.558			**Anderson-Darling Gamma GOF Test**			
41					5% A-D Critical Value	0.716			Data Not Gamma Distributed at 5% Significance Level			
42					K-S Test Statistic	0.406			**Kolmogorov-Smirnov Gamma GOF Test**			
43					5% K-S Critical Value	0.294			Data Not Gamma Distributed at 5% Significance Level			
44						**Data Not Gamma Distributed at 5% Significance Level**						
45												
46						**Gamma Statistics**						
47					k hat (MLE)	25.42			k star (bias corrected MLE)			15.97
48					Theta hat (MLE)	0.00934			Theta star (bias corrected MLE)			0.0149
49					nu hat (MLE)	406.7			nu star (bias corrected)			255.5
50					MLE Mean (bias corrected)	0.238			MLE Sd (bias corrected)			0.0594
51									Approximate Chi Square Value (0.05)			219.5
52					Adjusted Level of Significance	0.0195			Adjusted Chi Square Value			211

ProUCL Statistical Output

	A	B	C	D	E	F	G	H	I	J	K	L
53												
54	**Assuming Gamma Distribution**											
55					95% Approximate Gamma UCL	0.276				95% Adjusted Gamma UCL		0.288
56												
57	**Lognormal GOF Test**											
58					Shapiro Wilk Test Statistic	0.641	**Shapiro Wilk Lognormal GOF Test**					
59					10% Shapiro Wilk Critical Value	0.851	Data Not Lognormal at 10% Significance Level					
60					Lilliefors Test Statistic	0.391	**Lilliefors Lognormal GOF Test**					
61					10% Lilliefors Critical Value	0.265	Data Not Lognormal at 10% Significance Level					
62	**Data Not Lognormal at 10% Significance Level**											
63												
64	**Lognormal Statistics**											
65					Minimum of Logged Data	-1.609				Mean of logged Data		-1.457
66					Maximum of Logged Data	-1.204				SD of logged Data		0.21
67												
68	**Assuming Lognormal Distribution**											
69					95% H-UCL	0.278				90% Chebyshev (MVUE) UCL		0.29
70					95% Chebyshev (MVUE) UCL	0.314				97.5% Chebyshev (MVUE) UCL		0.348
71					99% Chebyshev (MVUE) UCL	0.413						
72												
73	**Nonparametric Distribution Free UCL Statistics**											
74	**Data do not follow a Discernible Distribution**											
75												
76	**Nonparametric Distribution Free UCLs**											
77					95% CLT UCL	0.268				95% BCA Bootstrap UCL		N/A
78					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
79					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
80					90% Chebyshev(Mean, Sd) UCL	0.292				95% Chebyshev(Mean, Sd) UCL		0.317
81					97.5% Chebyshev(Mean, Sd) UCL	0.352				99% Chebyshev(Mean, Sd) UCL		0.42
82												
83	**Suggested UCL to Use**											
84					Recommendation cannot be provided							
85												
86	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
87	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
88	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
89												
90												

ProUCL Statistical Output

	A	B	C	D	E	F	G	H	I	J	K	L
91	Total Iron (mg/L)											
92												
93	General Statistics											
94	Total Number of Observations					8	Number of Distinct Observations					8
95							Number of Missing Observations					0
96	Minimum					0.76	Mean					0.891
97	Maximum					1.14	Median					0.885
98	SD					0.121	Std. Error of Mean					0.0429
99	Coefficient of Variation					0.136	Skewness					1.226
100												
101	Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,											
102	refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,											
103	but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).											
104	The Chebyshev UCL often results in gross overestimates of the mean.											
105	Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.											
106												
107	Normal GOF Test											
108	Shapiro Wilk Test Statistic					0.897	Shapiro Wilk GOF Test					
109	1% Shapiro Wilk Critical Value					0.749	Data appear Normal at 1% Significance Level					
110	Lilliefors Test Statistic					0.189	Lilliefors GOF Test					
111	1% Lilliefors Critical Value					0.333	Data appear Normal at 1% Significance Level					
112	Data appear Normal at 1% Significance Level											
113	Note GOF tests may be unreliable for small sample sizes											
114												
115	Assuming Normal Distribution											
116	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
117	95% Student's-t UCL					0.973	95% Adjusted-CLT UCL (Chen-1995)					0.982
118							95% Modified-t UCL (Johnson-1978)					0.976
119												
120	Gamma GOF Test											
121	A-D Test Statistic					0.336	Anderson-Darling Gamma GOF Test					
122	5% A-D Critical Value					0.715	Detected data appear Gamma Distributed at 5% Significance Level					
123	K-S Test Statistic					0.168	Kolmogorov-Smirnov Gamma GOF Test					
124	5% K-S Critical Value					0.293	Detected data appear Gamma Distributed at 5% Significance Level					
125	Detected data appear Gamma Distributed at 5% Significance Level											
126	Note GOF tests may be unreliable for small sample sizes											
127												
128	Gamma Statistics											
129	k hat (MLE)					65.7	k star (bias corrected MLE)					41.14
130	Theta hat (MLE)					0.0136	Theta star (bias corrected MLE)					0.0217
131	nu hat (MLE)					1051	nu star (bias corrected)					658.3
132	MLE Mean (bias corrected)					0.891	MLE Sd (bias corrected)					0.139
133							Approximate Chi Square Value (0.05)					599.8
134	Adjusted Level of Significance					0.0195	Adjusted Chi Square Value					585.6
135												

ProUCL Statistical Output

	A	B	C	D	E	F	G	H	I	J	K	L
136	**Assuming Gamma Distribution**											
137					95% Approximate Gamma UCL	0.978				95% Adjusted Gamma UCL		1.002
138												
139	**Lognormal GOF Test**											
140					Shapiro Wilk Test Statistic	0.926	**Shapiro Wilk Lognormal GOF Test**					
141					10% Shapiro Wilk Critical Value	0.851	Data appear Lognormal at 10% Significance Level					
142					Lilliefors Test Statistic	0.166	**Lilliefors Lognormal GOF Test**					
143					10% Lilliefors Critical Value	0.265	Data appear Lognormal at 10% Significance Level					
144	**Data appear Lognormal at 10% Significance Level**											
145	**Note GOF tests may be unreliable for small sample sizes**											
146												
147	**Lognormal Statistics**											
148					Minimum of Logged Data	-0.274				Mean of logged Data		-0.123
149					Maximum of Logged Data	0.131				SD of logged Data		0.13
150												
151	**Assuming Lognormal Distribution**											
152					95% H-UCL	0.978				90% Chebyshev (MVUE) UCL		1.014
153					95% Chebyshev (MVUE) UCL	1.07				97.5% Chebyshev (MVUE) UCL		1.147
154					99% Chebyshev (MVUE) UCL	1.299						
155												
156	**Nonparametric Distribution Free UCL Statistics**											
157	**Data appear to follow a Discernible Distribution**											
158												
159	**Nonparametric Distribution Free UCLs**											
160					95% CLT UCL	0.962				95% BCA Bootstrap UCL		0.974
161					95% Standard Bootstrap UCL	0.958				95% Bootstrap-t UCL		1.003
162					95% Hall's Bootstrap UCL	1.039				95% Percentile Bootstrap UCL		0.964
163					90% Chebyshev(Mean, Sd) UCL	1.02				95% Chebyshev(Mean, Sd) UCL		1.078
164					97.5% Chebyshev(Mean, Sd) UCL	1.159				99% Chebyshev(Mean, Sd) UCL		1.319
165												
166	**Suggested UCL to Use**											
167					95% Student's-t UCL	0.973						
168												
169	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
170	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
171	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
172												
173												

ProUCL Statistical Output

	A	B	C	D	E	F	G	H	I	J	K	L
174	**Total Manganese (mg/L)**											
175												
176						**General Statistics**						
177					Total Number of Observations	8			Number of Distinct Observations			6
178									Number of Missing Observations			0
179					Minimum	0.21			Mean			0.259
180					Maximum	0.32			Median			0.245
181					SD	0.0482			Std. Error of Mean			0.0171
182					Coefficient of Variation	0.186			Skewness			0.367
183												
184					**Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,**							
185					**refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,**							
186					**but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).**							
187					**The Chebyshev UCL often results in gross overestimates of the mean.**							
188					**Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.**							
189												
190						**Normal GOF Test**						
191					Shapiro Wilk Test Statistic	0.841			**Shapiro Wilk GOF Test**			
192					1% Shapiro Wilk Critical Value	0.749			Data appear Normal at 1% Significance Level			
193					Lilliefors Test Statistic	0.224			**Lilliefors GOF Test**			
194					1% Lilliefors Critical Value	0.333			Data appear Normal at 1% Significance Level			
195					**Data appear Normal at 1% Significance Level**							
196					**Note GOF tests may be unreliable for small sample sizes**							
197												
198						**Assuming Normal Distribution**						
199					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
200					95% Student's-t UCL	0.291			95% Adjusted-CLT UCL (Chen-1995)			0.289
201									95% Modified-t UCL (Johnson-1978)			0.291
202												
203						**Gamma GOF Test**						
204					A-D Test Statistic	0.585			**Anderson-Darling Gamma GOF Test**			
205					5% A-D Critical Value	0.716			Detected data appear Gamma Distributed at 5% Significance Level			
206					K-S Test Statistic	0.229			**Kolmogorov-Smirnov Gamma GOF Test**			
207					5% K-S Critical Value	0.294			Detected data appear Gamma Distributed at 5% Significance Level			
208					**Detected data appear Gamma Distributed at 5% Significance Level**							
209					**Note GOF tests may be unreliable for small sample sizes**							
210												
211						**Gamma Statistics**						
212					k hat (MLE)	33.54			k star (bias corrected MLE)			21.04
213					Theta hat (MLE)	0.00772			Theta star (bias corrected MLE)			0.0123
214					nu hat (MLE)	536.6			nu star (bias corrected)			336.7
215					MLE Mean (bias corrected)	0.259			MLE Sd (bias corrected)			0.0564
216									Approximate Chi Square Value (0.05)			295.2
217					Adjusted Level of Significance	0.0195			Adjusted Chi Square Value			285.3
218												

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ProUCL Statistical Output

	A	B	C	D	E	F	G	H	I	J	K	L
219	**Assuming Gamma Distribution**											
220					95% Approximate Gamma UCL	0.295				95% Adjusted Gamma UCL		0.305
221												
222	**Lognormal GOF Test**											
223					Shapiro Wilk Test Statistic	0.848	**Shapiro Wilk Lognormal GOF Test**					
224					10% Shapiro Wilk Critical Value	0.851	Data Not Lognormal at 10% Significance Level					
225					Lilliefors Test Statistic	0.212	**Lilliefors Lognormal GOF Test**					
226					10% Lilliefors Critical Value	0.265	Data appear Lognormal at 10% Significance Level					
227	**Data appear Approximate Lognormal at 10% Significance Level**											
228	**Note GOF tests may be unreliable for small sample sizes**											
229												
230	**Lognormal Statistics**											
231					Minimum of Logged Data	-1.561				Mean of logged Data		-1.367
232					Maximum of Logged Data	-1.139				SD of logged Data		0.184
233												
234	**Assuming Lognormal Distribution**											
235					95% H-UCL	0.297				90% Chebyshev (MVUE) UCL		0.309
236					95% Chebyshev (MVUE) UCL	0.332				97.5% Chebyshev (MVUE) UCL		0.364
237					99% Chebyshev (MVUE) UCL	0.427						
238												
239	**Nonparametric Distribution Free UCL Statistics**											
240	**Data appear to follow a Discernible Distribution**											
241												
242	**Nonparametric Distribution Free UCLs**											
243					95% CLT UCL	0.287				95% BCA Bootstrap UCL		0.286
244					95% Standard Bootstrap UCL	0.285				95% Bootstrap-t UCL		0.296
245					95% Hall's Bootstrap UCL	0.28				95% Percentile Bootstrap UCL		0.286
246					90% Chebyshev(Mean, Sd) UCL	0.31				95% Chebyshev(Mean, Sd) UCL		0.333
247					97.5% Chebyshev(Mean, Sd) UCL	0.365				99% Chebyshev(Mean, Sd) UCL		0.428
248												
249	**Suggested UCL to Use**											
250					95% Student's-t UCL	0.291						
251												
252	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
253	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
254	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
255												

ProUCL Statistical Output

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Uncensored Full Data Sets											
2												
3	User Selected Options											
4	Date/Time of Computation	ProUCL 5.2 8/18/2022 9:54:08 AM										
5	From File	River Stats for Alk DO Hard_ProUCL input.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
10												

ProUCL Statistical Output

11	**Alkalinity to pH 4.5 (mg/L CaCO3)**										
12											
13						**General Statistics**					
14					Total Number of Observations	8			Number of Distinct Observations		6
15									Number of Missing Observations		0
16					Minimum	36			Mean		43.5
17					Maximum	50			Median		44
18					SD	5.904			Std. Error of Mean		2.087
19					Coefficient of Variation	0.136			Skewness		-0.136
20											
21					**Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,**						
22					**refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,**						
23					**but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).**						
24					**The Chebyshev UCL often results in gross overestimates of the mean.**						
25					**Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.**						
26											
27						**Normal GOF Test**					
28					Shapiro Wilk Test Statistic	0.862			**Shapiro Wilk GOF Test**		
29					1% Shapiro Wilk Critical Value	0.749			Data appear Normal at 1% Significance Level		
30					Lilliefors Test Statistic	0.199			**Lilliefors GOF Test**		
31					1% Lilliefors Critical Value	0.333			Data appear Normal at 1% Significance Level		
32					**Data appear Normal at 1% Significance Level**						
33					**Note GOF tests may be unreliable for small sample sizes**						
34											
35						**Assuming Normal Distribution**					
36					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
37					95% Student's-t UCL	47.45			95% Adjusted-CLT UCL (Chen-1995)		46.83
38									95% Modified-t UCL (Johnson-1978)		47.44
39											
40						**Gamma GOF Test**					
41					A-D Test Statistic	0.546			**Anderson-Darling Gamma GOF Test**		
42					5% A-D Critical Value	0.715			Detected data appear Gamma Distributed at 5% Significance Level		
43					K-S Test Statistic	0.214			**Kolmogorov-Smirnov Gamma GOF Test**		
44					5% K-S Critical Value	0.293			Detected data appear Gamma Distributed at 5% Significance Level		
45					**Detected data appear Gamma Distributed at 5% Significance Level**						
46					**Note GOF tests may be unreliable for small sample sizes**						
47											
48						**Gamma Statistics**					
49					k hat (MLE)	60.94			k star (bias corrected MLE)		38.17
50					Theta hat (MLE)	0.714			Theta star (bias corrected MLE)		1.14
51					nu hat (MLE)	975			nu star (bias corrected)		610.7
52					MLE Mean (bias corrected)	43.5			MLE Sd (bias corrected)		7.041
53									Approximate Chi Square Value (0.05)		554.4
54					Adjusted Level of Significance	0.0195			Adjusted Chi Square Value		540.7
55											

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ProUCL Statistical Output

	A	B	C	D	E	F	G	H	I	J	K	L
56	**Assuming Gamma Distribution**											
57					95% Approximate Gamma UCL	47.92				95% Adjusted Gamma UCL		49.13
58												
59	**Lognormal GOF Test**											
60					Shapiro Wilk Test Statistic	0.861	**Shapiro Wilk Lognormal GOF Test**					
61					10% Shapiro Wilk Critical Value	0.851	Data appear Lognormal at 10% Significance Level					
62					Lilliefors Test Statistic	0.197	**Lilliefors Lognormal GOF Test**					
63					10% Lilliefors Critical Value	0.265	Data appear Lognormal at 10% Significance Level					
64	**Data appear Lognormal at 10% Significance Level**											
65	**Note GOF tests may be unreliable for small sample sizes**											
66												
67	**Lognormal Statistics**											
68					Minimum of Logged Data	3.584				Mean of logged Data		3.765
69					Maximum of Logged Data	3.912				SD of logged Data		0.138
70												
71	**Assuming Lognormal Distribution**											
72					95% H-UCL	48.04				90% Chebyshev (MVUE) UCL		49.87
73					95% Chebyshev (MVUE) UCL	52.75				97.5% Chebyshev (MVUE) UCL		56.75
74					99% Chebyshev (MVUE) UCL	64.61						
75												
76	**Nonparametric Distribution Free UCL Statistics**											
77	**Data appear to follow a Discernible Distribution**											
78												
79	**Nonparametric Distribution Free UCLs**											
80					95% CLT UCL	46.93				95% BCA Bootstrap UCL		46.5
81					95% Standard Bootstrap UCL	46.73				95% Bootstrap-t UCL		47.35
82					95% Hall's Bootstrap UCL	46.15				95% Percentile Bootstrap UCL		46.75
83					90% Chebyshev(Mean, Sd) UCL	49.76				95% Chebyshev(Mean, Sd) UCL		52.6
84					97.5% Chebyshev(Mean, Sd) UCL	56.54				99% Chebyshev(Mean, Sd) UCL		64.27
85												
86	**Suggested UCL to Use**											
87					95% Student's-t UCL	47.45						
88												
89	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
90	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
91	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
92												
93	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
94	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
95												
96												

ProUCL Statistical Output

	A	B	C	D	E	F	G	H	I	J	K	L
97	**Dissolved Oxygen (mg/L)**											
98												
99						**General Statistics**						
100					Total Number of Observations	8			Number of Distinct Observations			8
101									Number of Missing Observations			0
102					Minimum	6.46			Mean			9.025
103					Maximum	12.1			Median			9.305
104					SD	2.182			Std. Error of Mean			0.772
105					Coefficient of Variation	0.242			Skewness			0.0929
106												
107	**Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,**											
108	**refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,**											
109	**but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).**											
110	**The Chebyshev UCL often results in gross overestimates of the mean.**											
111	**Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.**											
112												
113						**Normal GOF Test**						
114					Shapiro Wilk Test Statistic	0.912			**Shapiro Wilk GOF Test**			
115					1% Shapiro Wilk Critical Value	0.749			Data appear Normal at 1% Significance Level			
116					Lilliefors Test Statistic	0.197			**Lilliefors GOF Test**			
117					1% Lilliefors Critical Value	0.333			Data appear Normal at 1% Significance Level			
118	**Data appear Normal at 1% Significance Level**											
119	**Note GOF tests may be unreliable for small sample sizes**											
120												
121						**Assuming Normal Distribution**						
122				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
123					95% Student's-t UCL	10.49			95% Adjusted-CLT UCL (Chen-1995)			10.32
124									95% Modified-t UCL (Johnson-1978)			10.49
125												
126						**Gamma GOF Test**						
127					A-D Test Statistic	0.395			**Anderson-Darling Gamma GOF Test**			
128					5% A-D Critical Value	0.716			Detected data appear Gamma Distributed at 5% Significance Level			
129					K-S Test Statistic	0.212			**Kolmogorov-Smirnov Gamma GOF Test**			
130					5% K-S Critical Value	0.294			Detected data appear Gamma Distributed at 5% Significance Level			
131	**Detected data appear Gamma Distributed at 5% Significance Level**											
132	**Note GOF tests may be unreliable for small sample sizes**											
133												
134						**Gamma Statistics**						
135					k hat (MLE)	19.17			k star (bias corrected MLE)			12.06
136					Theta hat (MLE)	0.471			Theta star (bias corrected MLE)			0.748
137					nu hat (MLE)	306.7			nu star (bias corrected)			193
138					MLE Mean (bias corrected)	9.025			MLE Sd (bias corrected)			2.599
139									Approximate Chi Square Value (0.05)			161.9
140					Adjusted Level of Significance	0.0195			Adjusted Chi Square Value			154.6
141												

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ProUCL Statistical Output

	A	B	C	D	E	F	G	H	I	J	K	L
142	**Assuming Gamma Distribution**											
143					95% Approximate Gamma UCL	10.76				95% Adjusted Gamma UCL		11.26
144												
145	**Lognormal GOF Test**											
146					Shapiro Wilk Test Statistic	0.903	**Shapiro Wilk Lognormal GOF Test**					
147					10% Shapiro Wilk Critical Value	0.851	Data appear Lognormal at 10% Significance Level					
148					Lilliefors Test Statistic	0.195	**Lilliefors Lognormal GOF Test**					
149					10% Lilliefors Critical Value	0.265	Data appear Lognormal at 10% Significance Level					
150	**Data appear Lognormal at 10% Significance Level**											
151	**Note GOF tests may be unreliable for small sample sizes**											
152												
153	**Lognormal Statistics**											
154					Minimum of Logged Data	1.866				Mean of logged Data		2.174
155					Maximum of Logged Data	2.493				SD of logged Data		0.247
156												
157	**Assuming Lognormal Distribution**											
158					95% H-UCL	10.92				90% Chebyshev (MVUE) UCL		11.4
159					95% Chebyshev (MVUE) UCL	12.47				97.5% Chebyshev (MVUE) UCL		13.96
160					99% Chebyshev (MVUE) UCL	16.89						
161												
162	**Nonparametric Distribution Free UCL Statistics**											
163	**Data appear to follow a Discernible Distribution**											
164												
165	**Nonparametric Distribution Free UCLs**											
166					95% CLT UCL	10.29				95% BCA Bootstrap UCL		10.24
167					95% Standard Bootstrap UCL	10.21				95% Bootstrap-t UCL		10.53
168					95% Hall's Bootstrap UCL	10.27				95% Percentile Bootstrap UCL		10.27
169					90% Chebyshev(Mean, Sd) UCL	11.34				95% Chebyshev(Mean, Sd) UCL		12.39
170					97.5% Chebyshev(Mean, Sd) UCL	13.84				99% Chebyshev(Mean, Sd) UCL		16.7
171												
172	**Suggested UCL to Use**											
173					95% Student's-t UCL	10.49						
174												
175	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
176	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
177	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
178												
179												

ProUCL Statistical Output

	A	B	C	D	E	F	G	H	I	J	K	L
180	Total Hardness (mg/L CaCO3)											
181												
182	General Statistics											
183					Total Number of Observations	8				Number of Distinct Observations		7
184										Number of Missing Observations		0
185					Minimum	217				Mean		242.6
186					Maximum	270				Median		237
187					SD	21.73				Std. Error of Mean		7.683
188					Coefficient of Variation	0.0896				Skewness		0.185
189												
190	Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,											
191	refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,											
192	but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).											
193	The Chebyshev UCL often results in gross overestimates of the mean.											
194	Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.											
195												
196	Normal GOF Test											
197					Shapiro Wilk Test Statistic	0.877				Shapiro Wilk GOF Test		
198					1% Shapiro Wilk Critical Value	0.749				Data appear Normal at 1% Significance Level		
199					Lilliefors Test Statistic	0.201				Lilliefors GOF Test		
200					1% Lilliefors Critical Value	0.333				Data appear Normal at 1% Significance Level		
201	Data appear Normal at 1% Significance Level											
202	Note GOF tests may be unreliable for small sample sizes											
203												
204	Assuming Normal Distribution											
205					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
206					95% Student's-t UCL	257.2				95% Adjusted-CLT UCL (Chen-1995)		255.8
207										95% Modified-t UCL (Johnson-1978)		257.3
208												
209	Gamma GOF Test											
210					A-D Test Statistic	0.479				Anderson-Darling Gamma GOF Test		
211					5% A-D Critical Value	0.715				Detected data appear Gamma Distributed at 5% Significance Level		
212					K-S Test Statistic	0.218				Kolmogorov-Smirnov Gamma GOF Test		
213					5% K-S Critical Value	0.294				Detected data appear Gamma Distributed at 5% Significance Level		
214	Detected data appear Gamma Distributed at 5% Significance Level											
215	Note GOF tests may be unreliable for small sample sizes											
216												
217	Gamma Statistics											
218					k hat (MLE)	143.1				k star (bias corrected MLE)		89.5
219					Theta hat (MLE)	1.696				Theta star (bias corrected MLE)		2.711
220					nu hat (MLE)	2289				nu star (bias corrected)		1432
221					MLE Mean (bias corrected)	242.6				MLE Sd (bias corrected)		25.65
222										Approximate Chi Square Value (0.05)		1345
223					Adjusted Level of Significance	0.0195				Adjusted Chi Square Value		1324
224												

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ProUCL Statistical Output

	A	B	C	D	E	F	G	H	I	J	K	L
225	**Assuming Gamma Distribution**											
226					95% Approximate Gamma UCL	258.3				95% Adjusted Gamma UCL		262.5
227												
228	**Lognormal GOF Test**											
229					Shapiro Wilk Test Statistic	0.88	**Shapiro Wilk Lognormal GOF Test**					
230					10% Shapiro Wilk Critical Value	0.851	Data appear Lognormal at 10% Significance Level					
231					Lilliefors Test Statistic	0.202	**Lilliefors Lognormal GOF Test**					
232					10% Lilliefors Critical Value	0.265	Data appear Lognormal at 10% Significance Level					
233	**Data appear Lognormal at 10% Significance Level**											
234	**Note GOF tests may be unreliable for small sample sizes**											
235												
236	**Lognormal Statistics**											
237					Minimum of Logged Data	5.38				Mean of logged Data		5.488
238					Maximum of Logged Data	5.598				SD of logged Data		0.0894
239												
240	**Assuming Lognormal Distribution**											
241					95% H-UCL	N/A				90% Chebyshev (MVUE) UCL		265.6
242					95% Chebyshev (MVUE) UCL	276				97.5% Chebyshev (MVUE) UCL		290.5
243					99% Chebyshev (MVUE) UCL	318.9						
244												
245	**Nonparametric Distribution Free UCL Statistics**											
246	**Data appear to follow a Discernible Distribution**											
247												
248	**Nonparametric Distribution Free UCLs**											
249					95% CLT UCL	255.3				95% BCA Bootstrap UCL		255.1
250					95% Standard Bootstrap UCL	254.8				95% Bootstrap-t UCL		258.8
251					95% Hall's Bootstrap UCL	254				95% Percentile Bootstrap UCL		254.6
252					90% Chebyshev(Mean, Sd) UCL	265.7				95% Chebyshev(Mean, Sd) UCL		276.1
253					97.5% Chebyshev(Mean, Sd) UCL	290.6				99% Chebyshev(Mean, Sd) UCL		319.1
254												
255	**Suggested UCL to Use**											
256					95% Student's-t UCL	257.2						
257												
258	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
259	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
260	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
261												