pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0216160**
Facility Type	**Non-Municipal**	APS ID	**1028181**
Major / Minor	**Minor**	Authorization ID	**1335687**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**The Washington County Coal Co.**	Facility Name	**Washington County Mine**
Applicant Address	46226 National Road	Facility Address	331 Beagle Club Road
	Saint Clairsville, OH 43950-8742		Washington, PA 15301-7184
Applicant Contact	Jon Nagel	Facility Contact	Jon Nagel
Applicant Phone	(740) 338-3100	Facility Phone	(740) 338-3100
Client ID	310093	Site ID	257787
Ch 94 Load Status	Not Overloaded	Municipality	South Strabane Township
Connection Status	No Limitations	County	Washington
Date Application Received	December 4, 2020	EPA Waived?	Yes
Date Application Accepted	December 8, 2020	If No, Reason	---

Purpose of Application: Renew and transfer NPDES permit simultaneously.

Summary of Review

There are no open violations currently listed in EFACTS for the permittee as of 10/20/2021.

This facility is currently registered to use the eDMR system for reporting.

No changes were proposed to the permit in the renewal application.

Facility is idle with zero effluent flow most of the time.

Sludge use and disposal description and location(s): Sludge hauled offsite for disposal.

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		Jordan A. Frey, E.I.T. Jordan A. Frey, E.I.T. / Civil Engineer Trainee	October 22, 2021
X		Justin C. Dickey Justin C. Dickey, P.E. / Environmental Engineer Manager	October 25, 2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.02
Latitude	40º 6' 50.85"	Longitude	-80º 1' 11.24"
Quad Name	Ellsworth	Quad Code	40080A1
Wastewater Description:	Sewage Effluent		

Receiving Waters	Pigeon Creek (WWF)	Stream Code	36937
NHD Com ID	99410394	RMI	12.50
Drainage Area	21.4	Yield (cfs/mi^2)	0.034
Q_{7-10} Flow (cfs)	0.72	Q_{7-10} Basis	Previous WQPR
Elevation (ft)	952	Slope (ft/ft)	---
Watershed No.	19-C	Chapter 93 Class.	WWF
Existing Use	**---**	Existing Use Qualifier	---
Exceptions to Use	---	Exceptions to Criteria	---
Assessment Status	Impaired		
Cause(s) of Impairment	SULFATE		
Source(s) of Impairment	SOURCE UNKNOWN		
TMDL Status	**---**	Name	**---**

Background/Ambient Data		Data Source
pH (SU)	7.0	Default
Temperature (°F)	20	Default
Hardness (mg/L)	100	Default
Other:	---	---

Nearest Downstream Public Water Supply Intake		PA American Water Co – Aldritch Station	
PWS Waters	Monongahela River	Flow at Intake (cfs)	550
PWS RMI	23.5	Distance from Outfall (mi)	19.7

Changes Since Last Permit Issuance: None.

Other Comments: None.

Treatment Facility Summary

Treatment Facility Name: Livingston Portal STP

WQM Permit No.	Issuance Date
6379410-T1	Oct 27, 1993
6379410	April 2, 1980

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia Reduction	Extended Aeration	Chlorine	0.01

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.02	33.4	Not Overloaded	Sludge Holding Tank	

Changes Since Last Permit Issuance: None.

Other Comments: Part II permit amendment currently pending and in-progress.

Compliance History	
Summary of DMRs:	DMRs show the plant has zero discharge except for small quantities on rare occasion. Most recent discharge was December, 2019.
Summary of Inspections:	Inspection occurred and Notice of Violation issued February 24, 2020.

Other Comments: No open violations as of October 20, 2021.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .02
Latitude 40º 6' 51.00" **Longitude** -80º 1' 12.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

The NPDES permit application was evaluated based on applicable regulations, policies, procedures and guidelines.

WQM 7.0 model is attached and did not calculate any water quality based effluent limitations for CBOD5, DO, and NH3-N (see attached model printout).

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

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Total Residual Chlorine (TRC):

The Average Monthly and Instantaneous Maximum TRC effluent limitations imposed in the previous NPDES permit were 0.5 mg/l and 1.6 mg/l, respectively. An average monthly limitation of 0.5 mg/l for TRC is now a regulatory standard under §§92a.47(a)(8) and 92a.48(b). The TRC spreadsheet model has determined these limits are appropriate.

Water Quality-Based Limitations

Comments: There are no water quality-based effluent limitations.

Best Professional Judgment (BPJ) Limitations

Dissolved Oxygen:

According to current policy, a minimum BPJ Dissolved Oxygen requirement of 4 mg/l applies. The SWRO applies this limit for activated sludge plants. Monitoring is consistent with current guidelines. Monitoring for E. Coli will be placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

Anti-Backsliding

N/A

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Average Monthly	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	0.02	XXX	XXX	XXX	XXX	XXX	2/month	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	0.5	XXX	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	25.0	XXX	XXX	50.0	2/month	Grab
TSS	XXX	XXX	30.0	XXX	XXX	60.0	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	2000	XXX	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	200	XXX	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	Grab
Ammonia	XXX	XXX	Report	XXX	XXX	Report	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	Grab

Compliance Sampling Location: Outfall 001, after disinfection.

Other Comments: None.

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19C	39637	PIGEON CREEK	**12.500**	952.00	21.40	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.034	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Wash Co Mine	PA0216160	0.0200	0.0200	0.0200	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19C	39637	PIGEON CREEK	**0.001**	730.00	59.50	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.034	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19C	39637	PIGEON CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
12.500	0.73	0.00	0.73	.0309	0.00336	.517	16.52	31.93	0.09	8.605	24.80	7.00
Q1-10 Flow												
12.500	0.47	0.00	0.47	.0309	0.00336	NA	NA	NA	0.07	10.909	24.69	7.00
Q30-10 Flow												
12.500	0.99	0.00	0.99	.0309	0.00336	NA	NA	NA	0.10	7.288	24.85	7.00

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19C	39637	PIGEON CREEK

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
12.500	Wash Co Mine	11.36	50	11.36	50	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
12.500	Wash Co Mine	1.38	25	1.38	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
12.50	Wash Co Mine	25	25	25	25	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19C	39637	PIGEON CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
12.500	0.020	24.796	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
16.519	0.517	31.931	0.089
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.94	0.036	1.02	1.013
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.070	16.244	Owens	5
Reach Travel Time (days)			
8.605			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.861	2.83	0.43	7.56
1.721	2.72	0.18	7.56
2.582	2.62	0.07	7.56
3.442	2.52	0.03	7.56
4.303	2.42	0.01	7.56
5.163	2.33	0.01	7.56
6.024	2.24	0.00	7.56
6.884	2.16	0.00	7.56
7.745	2.08	0.00	7.56
8.605	2.00	0.00	7.56

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19C	39637	PIGEON CREEK

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
12.500	Wash Co Mine	PA0216160	0.020	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			4

1A	B	C	D	E	F	G
2	**TRC EVALUATION**					
3	Input appropriate values in B4:B8 and E4:E7					
4	0.72	= Q stream (cfs)		0.5	= CV Daily	
5	0.02	= Q discharge (MGD)		0.5	= CV Hourly	
6	30	= no. samples		1	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
	0	= % Factor of Safety (FOS)		0	=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.iii	WLA afc = 7.442		1.3.2.iii	WLA cfc = 7.248
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 2.773		5.1d	LTA_cfc = 4.214
14						
15	Source		Effluent Limit Calculations			
16	PENTOXSD TRG	5.1f	AML MULT = 1.231			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500		BAT/BPJ	
18			INST MAX LIMIT (mg/l) = 1.635			

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

Q7-10 FLOW CALCULATIONS FROM MARCH 17, 2016 WQPR

With approx. 0.25 MGD of mine drainage before these are discharged to Pigeon Creek.

Estimate the total dilution available for the Livingston STP discharge to Pigeon Creek, including the Q_{7-10} flow and the mine drainage:

Determine the drainage area at the discharge point on Pigeon Creek

From the PA Gazetteer of Streams

South Branch Pigeon Creek -	11.2 M_i^2
Center Branch Pigeon Creek -	6.93 M_i^2
Remainder of Area (Planimeter) -	8.85 M_i^2
Total	26.98 M_i^2 - use 27.0 M_i^2

The following stations from PA Water Resources Bull. No. 12 were chosen for comparison to estimate the Q_{7-10} flow. These have similar geological and land use characteristics as the drainage area above the Livingston Portal STP

Station	Name	Drainage Area	Q_{7-10} Flow	Q_{7-10} Yield
03085300	Little Chartiers Ck. at Linden	37.0 M_i^2	1.26 CFS	0.034 CFS/M_i^2 (See attached)
03075040	Pigeon Ck at Monongahela	58.4 M_i^2	3.8 CFS	0.065 CFS/M_i^2

Use the Q_{7-10} Yield from the Little Chartiers Ck. Station. The other Station has a larger drainage area in comparison to that at the Livingston STP discharge point, and is probably affected by mine related discharges.

Q7-10 FLOW CALCULATIONS FROM MARCH 17, 2016 WQPR (continued)

1-25-88

Determination of Q_{7-10} for Little Chartiers Creek

According to U.S.G.S. Quad 8-3.4, Washington East, PA, Opossum Run which is a tributary to Little Chartiers Creek and Little Chartiers Creek are shown to be full flowing perennial streams. On January 12, 1988, Norma English of DER investigated the two streams and it was her opinion that each stream was full flowing year-around due to well established stream channels. According to Bulletin 12, pg 404, Little Chartiers Creek at Linden, PA indicates that there is no flow at times. The U.S.G.S. uses a small Price current meter which will measure with a high degree of accuracy velocities ranging from 0.1 feet/sec to more than 20 feet/sec.* Since Little Chartiers Creek has a very gradual slope, it is likely that the stream is full flowing year around but at times has a velocity lower than 0.1 Ft/sec, therefore a Q_{7-10} flow of zero will not be used. The following calculation will verify that a yield of 0.034 cfs/mi² (Yield used for Chartiers Creek) is justified.

EPA Velocity Equation where drainage area is less than 500 sq miles

$V = 2.62 \times Q^{.56} \times S^{.083} \times DA^{-.22}$ where V = velocity (mpd)

Q = stream flow (cfs) = 1.258 cfs

$S = \frac{7 \text{ ft}}{4800 \text{ ft}} \quad \frac{7 \text{ ft}}{0.909 \text{ mi}} \quad 7.70 \text{ ft/mi}$ ** S = stream slope (ft/mi) at Linden, Pa.

DA = drainage area of Little Chartiers Creek at Linden, PA = 37.0 mi² (Bul 12, pg 404)

$V = 2.62 \times 1.258^{.56} \times 7.70^{.022} \times 37^{-.22} =$

$2.62 \times 1.137 \times 1.18 \times 0.45 = 1.58$ mpd

$\frac{1.58 \text{ miles}}{\text{day}} \times \frac{1 \text{ day}}{24 \text{ hr}} \times \frac{1 \text{ hr}}{60 \text{ min}} \times \frac{1 \text{ min}}{60 \text{ sec}} \times \frac{5280 \text{ ft}}{1 \text{ mile}} = 0.097 \text{ ft/sec} < 0.1 \text{ ft/sec}$

*Calibration and Maintenance of Vertical-Axis Type Current Meters, Book 8, Ch. B2

**Slope measurement taken from where 940' contour intersects Little Chartiers Creek to elev. of creek at gauging station.