pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0205761**
Facility Type	**Non-Municipal**	APS ID	**1055568**
Major / Minor	**Minor**	Authorization ID	**1383053**

Applicant and Facility Information

Applicant Name	**Jones Estates Harshbarger PA LLC**	Facility Name	**Harshbarger MHP**
Applicant Address	2310 S Miami Boulevard Suite 238	Facility Address	4695 State Route 151
	Durham, NC 27703-4900		Aliquippa, PA 15001
Applicant Contact	Kellen Buss	Facility Contact	John M. Foris
Applicant Phone	(419) 357-9091	Facility Phone	412-445-9145
Client ID	367190	Site ID	250307
Ch 94 Load Status	Not Overloaded	Municipality	Hanover Township
Connection Status		County	Beaver
Date Application Received	January 23, 2022	EPA Waived?	Yes
Date Application Accepted	February 11, 2022	If No, Reason	

Purpose of Application: Renewal and transfer of existing NPDES minor permit for treated sewage

Summary of Review

The applicant has applied for the simultaneous renewal and transfer for NPDES Permit No. PA0205761. The previous permit was issued February 10, 2017. It was last transferred on April 23, 2021. It expired on February 28, 2022. The previous permittee was Jones Estates PA LLC. Ownership was transferred from Jones Estates PA LLC to Jones Estates Harshbarger PA LLC on August 17, 2021.

Sewage from this facility is treated with an extended aeration system with a sand filter. Chlorination and dechlorination are also utilized.

The applicant is currently enrolled in and will continue to use eDMR.

The Act 14-PL 834 Municipal Notification was provided by the January 11, 2021 letters and no comments were received.

Below is a summary of changes to effluent limitations that have occurred in this permit cycle:

- Per current DEP policy and 25 PA Code §92a.47(a)(2), weekly average concentrations of $CBOD_5$ and TSS are being imposed. Instantaneous Maximum concentrations of $CBOD_5$ and TSS have been removed.
- A yearly monitoring requirement for E. Coli has been imposed.
- More stringent winter limits for ammonia-nitrogen have been imposed.
- More stringent total residual chlorine limits have been imposed.
- Annual monitoring for aluminum, iron, and manganese have been imposed.

Approve	Deny	Signatures	Date
X		Grace Polakoski Grace Polakoski, E.I.T. / Environmental Engineering Specialist	March 23, 2022
X		Mahbuba Iasmin Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineer Manager	April 1, 2022

Summary of Review
Sludge use and disposal description and location(s): Dalton's Sanitary Service Sludge Hauling 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.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.0125
Latitude	40º 33' 32"	Longitude	-80º 24' 52"
Quad Name	Hookstown	Quad Code	40080E4
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to Little Traverse Creek (WWF)	Stream Code	33699
NHD Com ID	99683968	RMI	0.53
Drainage Area	0.0456 sq. mi.	Yield (cfs/mi^2)	0.00408
Q_{7-10} Flow (cfs)	0.000186	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	1171	Slope (ft/ft)	
Watershed No.	20-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	**Metals; pH; aluminum; iron; manganese; pH, low**		
Source(s) of Impairment	**abandoned mine drainage (AMD) sites**		
TMDL Status	Final	Name	Raccoon Creek Watershed

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

Nearest Downstream Public Water Supply Intake	Duquesne Light C. – BUPS #1		
PWS Waters	Ohio River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	33.51

Changes Since Last Permit Issuance:

Other Comments:

Raccoon Creek Watershed TMDL
A TMDL for the Raccoon Creek Watershed was approved on April 7, 2005 for the control of abandoned mine drainage pollutants (iron manganese, and aluminum) and pH, This TMDL applies to segments of the watershed where there are active mining permits. In accordance with 40 CFR § 122.44(d)(1)(vii)(B), when developing WQBELs, the permitting authority shall ensure that effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available wasteload allocation (WLA) for the discharge prepared by the State and approved by the EPA pursuant to 40 CFR § 130.7. The Harshbarger MHP was not assigned wasteload allocations for abandoned mine drainage pollutants or pH. The DEP will impose annual monitoring for aluminum, iron, and manganese to collect data for future permit cycles.

Treatment Facility Summary

Treatment Facility Name: Harshbarger MHP STP

WQM Permit No.	Issuance Date
0421471 T-1	4/23/21
0421471 T-2	Under DEP review

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia Reduction	Extended Aeration	Chlorine With Dechlorination	0.0125

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.0125	21	Not Overloaded	Holding Tank	Other WWTP

Changes Since Last Permit Issuance: N/A

Other Comments:

Compliance History

Facility: Harshbarger MHP STP
NPDES Permit No.: PA0205761
Compliance Review Period: 02/2017 – 02/2022

Inspection Summary:

INSP ID	INSPECTED DATE	INSP TYPE	AGENCY	INSPECTION RESULT DESC
3245517	09/07/2021	Compliance Evaluation	PA Dept of Environmental Protection	Violation(s) Noted

Violation Summary:

VIOL ID	VIOLATION DATE	VIOLATION TYPE	VIOLATION TYPE DESC	RESOLVED DATE
928587	09/07/2021	92A.41(A)5	NPDES - Failure to properly operate and maintain all facilities which are installed or used by the permittee to achieve compliance	09/16/2021
928588	09/07/2021	92A.41(A)5	NPDES - Failure to properly operate and maintain all facilities which are installed or used by the permittee to achieve compliance	09/16/2021

Open Violations by Client ID: No CW violations for client ID 354413.

Enforcement Summary:

ENF ID	ENF TYPE	EXECUTED DATE	VIOLATIONS	ENF FINALSTATUS	ENF CLOSED DATE
397240	NOV	09/16/2021	92A.41(A)5		

DMR Violation Summary:

MONITORING END DATE	OUTFALL	PARAMETER	STATISTICAL BASE CODE	PERMIT VALUE	SAMPLE VALUE	UNIT OF MEASURE
12/31/2020	1	Ammonia-Nitrogen	Instantaneous Maximum	5.6	13.1	mg/L
12/31/2020	1	Ammonia-Nitrogen	Average Monthly	2.8	6.8	mg/L
9/30/2021	1	Ammonia-Nitrogen	Average Monthly	1.9	4.3	mg/L
9/30/2021	1	Ammonia-Nitrogen	Instantaneous Maximum	3.8	8.5	mg/L

Compliance Status: Open enforcement action will need to be closed prior to permit issuance.
Completed by: John Murphy
Completed date: 2/22/2022
Note: Open enforcement action closed by John Murphy on 2/24/22

Compliance History

DMR Data for Outfall 001 (from February 1, 2021 to January 31, 2022)

Parameter	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21
Flow (MGD) Average Monthly		0.0090	0.0100	0.0100	0.0105	0.0103	0.0085	0.0090	0.0103	0.0095	0.0091	0.0090
Flow (MGD) Daily Maximum		0.018	0.016	0.0120	0.0120	0.0012	0.0110	0.0120	0.0130	0.0115	0.0112	0.0110
pH (S.U.) Instantaneous Minimum		6.78	6.81	7.11	6.73	6.46	7.01	6.89	6.46	6.49		
pH (S.U.) Minimum											6.71	6.46
pH (S.U.) Instantaneous Maximum		7.18	7.21	7.46	7.01	6.89	7.46	7.62	7.10	7.26		
pH (S.U.) Maximum											7.38	7.3
DO (mg/L) Instantaneous Minimum		6.48	6.55	6.31	6.07	6.02	6.01	5.86	6.09	6.11		
DO (mg/L) Minimum											6.16	7.18
TRC (mg/L) Average Monthly		0.04	0.05	0.04	0.04	0.07	0.05	0.04	0.04	0.03	0.04	0.03
TRC (mg/L) Instantaneous Maximum		0.08	0.07	0.07	0.06	0.14	0.09	0.06	0.09	0.06	0.09	0.05
CBOD5 (mg/L) Average Monthly		4.4	< 2.0	4.9	< 2.0	< 2.0	< 2.0	< 2.0	0.04	2.4	< 2.0	< 2.0
CBOD5 (mg/L) Instantaneous Maximum		6.7	< 2.0	7.7	< 2.0	< 5.0	< 2.0	< 2.0	0.06	2.8	< 2.0	< 2.0
TSS (mg/L) Average Monthly		< 5.0	< 5.0	5.5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	5.5	< 5.0	< 5.0
TSS (mg/L) Instantaneous Maximum		< 5.0	< 5.0	0.46	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	6.0	< 5.0	< 5.0
Fecal Coliform (No./100 ml) Geometric Mean		< 1	< 1	1	< 1	< 1	1	1	< 1	1.41	< 1	< 1

Fecal Coliform (No./100 ml) Instantaneous Maximum		< 1	< 1	1	< 1	< 1	1	1	< 1	2	< 1	< 1
Total Nitrogen (mg/L) Daily Maximum		13.4										
Ammonia (mg/L) Average Monthly		1.6	< 0.1	0.9	4.3	< 0.1	< 0.1	0.3	0.15	0.15	0.4	0.3
Ammonia (mg/L) Instantaneous Maximum		3.0	< 0.1	1.6	8.5	< 0.1	< 0.1	0.4	0.2	0.2	0.6	0.4
Total Phosphorus (mg/L) Daily Maximum		0.6										

Compliance History

Effluent Violations for Outfall 001, from: March 1, 2021 To: January 31, 2022

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Ammonia	09/30/21	Avg Mo	4.3	mg/L	1.9	mg/L
Ammonia	09/30/21	IMAX	8.5	mg/L	3.8	mg/L

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .0125
Latitude 40º 33' 32.00" **Longitude** -80º 24' 52.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

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

Water Quality-Based Limitations

The discharge was evaluated using WQM7.0 to analyze the $CBOD_5$, ammonia nitrogen, and dissolved oxygen parameters. The model results show technology-based effluent limitations for $CBOD_5$ are appropriate. The model results for dissolved oxygen, ammonia nitrogen, and total residual chlorine are in the table below. The model output files are attached (Attachments B, C, D). The ammonia-nitrogen winter limits and total residual chlorine limits have become more stringent. Because the facility uses tablet chlorination, the permittee has agreed to a compliance schedule of 8 months from the permit effective date. For the first 8 months, the permittee will adhere to TRC limits from the previous permit cycle while conducting trials to determine the correct dosage to meet the new TRC limits. After the initial 8-month period, the permittee will be required to meet the more stringent TRC limits as modeled in this permit cycle.

Parameter	Limit (mg/l)	SBC	Model
Dissolved Oxygen	5	Minimum	WQM7.0
Ammonia Nitrogen (Nov 1 – Apr 30)	2.62	Average Monthly	WQM7.0
Ammonia Nitrogen (May 1 – Oct 31)	1.9	Average Monthly	WQM7.0
Total Residual Chlorine	0.01	Average Monthly	TRC_CALC

Best Professional Judgment (BPJ) Limitations

Typically, a dissolved oxygen minimum limitation of 4.0 mg/L will be implemented based on the standard in 25 PA Code Chapter 93 and best professional judgment. However, since the WQM7.0 suggested the more stringent value of 5.0 mg/L, the more stringent of the two will be imposed during this permit cycle.

Anti-Backsliding

Section 402(o) of the Clean Water Act (CWA), enacted in the Water Quality Act of 1987, establishes anti-backsliding rules governing two situations. The first situation occurs when a permittee seeks to revise a Technology-Based effluent limitation based on BPJ to reflect a subsequently promulgated effluent guideline which is less stringent. The second situation addressed by Section 402(o) arises when a permittee seeks relaxation of an effluent limitation which is based upon a State treatment standard of water quality standard.

Previous limits can be used pursuant to EPA's anti-backsliding regulation 40 CFR 122.44 **(l) Reissued permits. (1) Except as provided in paragraph (l)(2) of this section when a permit is renewed or reissued. Interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under §122.62). (2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.**

The facility is not seeking to revise the previously permitted effluent limits.

Additional Considerations

Sewage discharges will include monitoring, at a minimum, for *E. coli*, in new and reissued permits, with a monitoring frequency of 1/year for design flows 0.002-0.05 MGD.

The receiving stream is not impaired for nutrients, therefore, annual sampling for nitrogen and phosphorus will be imposed per 25 PA Code §92.61b.

Monitoring frequency for the proposed effluent limits are based upon Table 6-3, Self-Monitoring Requirements for Sewage Dischargers, from the Department's Technical Guidance for the Development and Specification of Effluent Limitations.

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: Beginning of 9th Month 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	Maximum	Instant. Maximum		
TRC	XXX	XXX	XXX	0.01	XXX	0.033	1/day	Grab

Compliance Sampling Location: Outfall 001

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 End of 8th Month from Permit Effective 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		
TRC	XXX	XXX	XXX	0.08	XXX	0.18	1/day	Grab

Compliance Sampling Location: Outfall 001

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	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	0.0125	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Inst Min	XXX	XXX	XXX	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	40.0	50	2/month	Grab
TSS	XXX	XXX	XXX	30.0	45.0	60	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	2.62	XXX	5.24	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	1.9	XXX	3.8	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Total Aluminum	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Total Iron	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Total Manganese	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab

Compliance Sampling Location: Outfall 001

APPENDIX A:
USGS StreamStats Report

StreamStats Report

Region ID: PA
Workspace ID: PA20220301175559460000
Clicked Point (Latitude, Longitude): 40.55871, -80.41398
Time: 2022-03-01 12:56:19 -0500

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.0456	square miles
ELEV	Mean Basin Elevation	1244	feet

Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0456	square miles	2.26	1400

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
ELEV	Mean Basin Elevation	1244	feet	1050	2580

Low-Flow Statistics Disclaimers [Low Flow Region 4]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report [Low Flow Region 4]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.000858	ft^3/s
30 Day 2 Year Low Flow	0.00192	ft^3/s
7 Day 10 Year Low Flow	0.000186	ft^3/s
30 Day 10 Year Low Flow	0.000504	ft^3/s
90 Day 10 Year Low Flow	0.00121	ft^3/s

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

APPENDIX B:
WQM7.0 Modeling Results (Summer)

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
20D	33699	Trib 33699 to Little Traverse Creek	**0.530**	1171.00	0.05	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	0.004	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
Harshbarger STP	PA0205761	0.0000	0.0000	0.0125	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
20D	33699	Trib 33699 to Little Traverse Creek	**0.430**	1135.00	0.09	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	0.005	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 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 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
20D	33699	Trib 33699 to Little Traverse 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												
0.530	0.00	0.00	0.00	.0193	0.06818	.311	1.11	3.56	0.06	0.108	20.05	7.00
Q1-10 Flow												
0.530	0.00	0.00	0.00	.0193	0.06818	NA	NA	NA	0.06	0.108	20.03	7.00
Q30-10 Flow												
0.530	0.00	0.00	0.00	.0193	0.06818	NA	NA	NA	0.06	0.107	20.06	7.00

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20D	33699	Trib 33699 to Little Traverse Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.530	0.012	20.048	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.107	0.311	3.563	0.057
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
24.78	1.499	1.89	0.703
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.031	27.657	Owens	5
Reach Travel Time (days)			
0.108			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.011	24.38	1.87	5.52
0.022	23.99	1.86	5.89
0.032	23.61	1.84	6.18
0.043	23.23	1.83	6.40
0.054	22.86	1.82	6.57
0.065	22.49	1.80	6.70
0.075	22.13	1.79	6.81
0.086	21.78	1.77	6.90
0.097	21.43	1.76	6.97
0.108	21.08	1.75	7.04

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20D	33699	Trib 33699 to Little Traverse 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
0.530	Harshbarger STP	16.72	16.82	16.72	16.82	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
0.530	Harshbarger STP	1.88	1.9	1.88	1.9	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)		
0.53	Harshbarger STP	25	25	1.9	1.9	5	5	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20D	33699	Trib 33699 to Little Traverse 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)
0.530	Harshbarger STP	PA0205761	0.000	CBOD5	25		
				NH3-N	1.9	3.8	
				Dissolved Oxygen			5

APPENDIX C:
WQM7.0 Modeling Results (Winter)

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
20D	33699	Trib 33699 to Little Traverse Creek	**0.530**	1171.00	0.05	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	0.008	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
Harshbarger STP	PA0205761	0.0000	0.0000	0.0125	0.000	15.00	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	12.51	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
20D	33699	Trib 33699 to Little Traverse Creek	**0.430**	1135.00	0.09	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	0.009	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 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 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
20D	33699	Trib 33699 to Little Traverse 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												
0.530	0.00	0.00	0.00	.0193	0.06818	.311	1.11	3.56	0.06	0.108	15.10	7.00
Q1-10 Flow												
0.530	0.00	0.00	0.00	.0193	0.06818	NA	NA	NA	0.06	0.108	15.06	7.00
Q30-10 Flow												
0.530	0.00	0.00	0.00	.0193	0.06818	NA	NA	NA	0.06	0.107	15.13	7.00

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20D	33699	Trib 33699 to Little Traverse Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.530	0.012	15.095	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.107	0.311	3.563	0.057
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
24.78	1.499	2.59	0.480
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.072	24.592	Owens	5
Reach Travel Time (days)			
0.108			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.011	24.46	2.58	5.77
0.022	24.15	2.57	6.30
0.032	23.84	2.55	6.72
0.043	23.54	2.54	7.05
0.054	23.24	2.53	7.31
0.065	22.94	2.51	7.51
0.075	22.65	2.50	7.67
0.086	22.36	2.49	7.80
0.097	22.07	2.47	7.90
0.108	21.79	2.46	7.98

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20D	33699	Trib 33699 to Little Traverse 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
0.530	Harshbarger STP	24.1	24.25	24.1	24.25	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
0.530	Harshbarger STP	2.58	2.62	2.58	2.62	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)		
0.53	Harshbarger STP	25	25	2.62	2.62	5	5	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20D	33699	Trib 33699 to Little Traverse 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)
0.530	Harshbarger STP	PA0205761	0.000	CBOD5	25		
				NH3-N	2.62	5.24	
				Dissolved Oxygen			5

APPENDIX D:
TRC_CALC Modeling Results

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.000186	= Q stream (cfs)	0.5	= CV Daily
0.0125	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	1	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 0.022	1.3.2.iii	WLA cfc = 0.014
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.008	5.1d	LTA_cfc = 0.008

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.010	CFC
		INST MAX LIMIT (mg/l) = 0.033	

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)**