pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0218464**
Facility Type	**Industrial**	APS ID	**991499**
Major / Minor	**Minor**	Authorization ID	**1270121**

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

Applicant and Facility Information

Applicant Name	**Gans Energy, LLC**	Facility Name	**Gans Generating Facility**
Applicant Address	581 Gans Road	Facility Address	SR 3002 Gans Road
	Lake Lynn, PA 15451		Gans, PA 15439
Applicant Contact	Kathy French	Facility Contact	Anthony Miles
Applicant Phone	(724) 727-3628	Facility Phone	(724) 725-6005
Client ID	336060	Site ID	531375
SIC Code	4911	Municipality	Springhill Township
SIC Description	Electric Services	County	Fayette
Date Application Received	April 3, 2019	EPA Waived?	Yes
Date Application Accepted	April 22, 2019	If No, Reason	

Purpose of Application: Renewal of NPDES permit for the discharge of non-contact cooling water, industrial wastewater, and industrial stormwater from the electric generating facility.

Summary of Review

The Department received an NPDES permit renewal application from Gans Energy, LLC on April 3, 2019 for coverage of the discharge from its Gans Generating Facility in Springhill Township of Fayette County. The facility is an 88-megawatt capacity natural gas simple-cycle combustion turbine electric generating facility with an SIC Code 4911 (Electric Services). The current NPDES permit was renewed on October 1, 2014 and expired on September 30, 2019. The permit was transferred from Allegheny Energy Supply Company, LLC to Gans Energy, LLC on April 12, 2019. Water Quality Management (WQM) Permit 2600201 was approved on September 27, 2000.

Allegheny Energy Supply Company, LLC (AES) submitted a Phase I Toxics Reduction Evaluation (TRE) to the Department on March 28, 2016. The TRE details AES's efforts to identify the source(s) of arsenic, zinc, bromoform, and chlorodibromomethane in its discharges as well as an evaluation of best management practices (BMPs) and structural modifications designed to ensure AES's discharges comply with the permit's Final Water Based Effluent Limitations. The TRE was approved on January 27, 2017 and the Department determined that the BMPs and capital improvements were already implemented.

Gans Generating Facility (Gans) produces electricity during periods of peak demand. Operation of the facility is based upon energy demand and economic dispatch. While the station can be operated remotely and has the potential to be called on line at any time, its air permit limits operation to a total of 4875 unit-operating hours during any rolling 12-month period. Operation of the combustion turbines is most typically for several hours per day during peak heating and cooling seasons (December through February and June through August). There have been no changes to the operations at this facility since the last permit review.

Approve	Deny	Signatures	Date
X		Lauren Nolfi, E.I.T. / Environmental Engineering Specialist	April 10, 2020
X		Michael E. Fifth, P.E. / Environmental Engineer Manager	April 22, 2020

Summary of Review

The facility contains two identical parallel trains, each equipped with a generator building, condensing structures, emissions control equipment, a 75-foot stack, and a cooling tower. Other site features include a water treatment building/ office, a gas regulator building, a maintenance/ storage building, step-up and step-down electrical transformers, a switchyard, and a gravel/ paved lot.

The facility has one outfall, Outfall 001, which discharges to an Unnamed Tributary (UNT) to Grassy Run, designated in 25 PA Code Chapter 93 as a Warm Water Fishery (WWF). Outfall 001 discharges wastewater from internal monitoring points (IMP) 101 and 201. IMP 101 discharges non-contact cooling tower blowdown at a design flow of 0.057 MGD and maximum flow of 0.045 MGD. IMP 201 discharges stormwater and low-volume wastewater after treatment through an oil/ water separator at a design flow of 0.1067 MGD and maximum flow of 0.011 MGD.

A stream assessment to determine the point of first use (POFU) of the UNT to Grassy Run was conducted on January 14, 2020 by the Department. Results from the study suggest that the stream has an aquatic life use at the point where it exhibits define bed and bank ((Latitude:39.74678, Longitude: -79.84247), and this use should be protected. However, the Department also flagged the stream as not attaining its protective use under Section 303d of the Clean Water Act. The causes of the impairment are iron, sulfate, strontium, total dissolved solids, and specific conductivity and the source of the impairment is acid mine drainage. Because of the receiving stream's impairment, the water quality for Outfall 001 is modeled 1.5 miles downstream of the outfall, where the UNT to Grassy Run confluences with Grassy Run.

The facility's laboratory did not meet the Department's Target quantification limits (QLs) for all parameters in its sample analyses. The maximum reported value for Total Cadmium at IMP 201 was reported as "non-detect" using a QL that failed to achieve the Department's minimum Target QL. Gans will be collecting an additional sample for the parameter Total Cadmium and having it analyzed using the Target QL. If the additional sample indicates that Total Cadmium is not a pollutant of concern, those effluent limits may be removed from the final permit.

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)	0.1092
Latitude	39º 44' 51"	Longitude	-79º 50' 33"
Quad Name	Lake Lynn	Quad Code	2107
Wastewater Description:	Non-contact cooling tower blowdown from IMP 101 and oil/ water separation for stormwater from IMP 102.		

Receiving Waters	Grassy Run (WWF)	Stream Code	41891
NHD Com ID	64191454	RMI	1.6527
Drainage Area	4.49 mi^2	Yield (cfs/mi^2)	0.001116
Q_{7-10} Flow (cfs)	0.0501	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	894	Slope (ft/ft)	0.0174
Watershed No.	19-G	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Metals, pH		
Source(s) of Impairment	Acid Mine Drainage		
TMDL Status		Name	

Nearest Downstream Public Water Supply Intake	Point Marion Borough		
PWS Waters	Cheat River	Flow at Intake (cfs)	0.78
PWS RMI	1.07	Distance from Outfall (mi)	5.37

Other Comments:

No changes have been made to Outfall 001 since last permit issuance.

The USGS Stream Stats Data for the drainage area is displayed in Attachment A. The water quality for Outfall 001 is modeled 1.5 miles downstream of the outfall, where the Unnamed Tributary (UNT) to Grassy Run (Stream Code 41892) confluences with Grassy Run (Stream Code 41891). The Unnamed Tributary to Grassy Run has no aquatic use to support due to severe impairment caused by abandoned main drainage.

Compliance History

DMR Data for Outfall 101 (from October 1, 2018 to September 30, 2019)

Parameter	SEP-19	AUG-19	JUL-19	JUN-19	MAY-19	APR-19	MAR-19	FEB-19	JAN-19	DEC-18	NOV-18	OCT-18
Flow (MGD) Average Monthly	0.007	0.004	0.003	0.002	0.0023	0.0003	0.0003			0.0040	0.0185	0.0014
Flow (MGD) Daily Maximum	0.012	0.012	0.01	0.008	0.0109	0.00349	0.0035			0.0042	0.0453	0.0038
pH (S.U.) Daily Minimum	8.75	7.78	8.83	8.84	7.04	8.24						
pH (S.U.) Minimum							7.69			6.68	6.4	6.35
pH (S.U.) Daily Maximum	8.87	8.91	8.88	8.84	8.58	8.41						
pH (S.U.) Maximum							8.30			7.53	7.34	6.47
TRC (mg/L) Average Monthly	< 0.01	0.01	0.06	0.02	0.09	< 0.01	0.05			0.205	0.2	0.11
TRC (mg/L) Instantaneous Maximum	< 0.01	0.01	0.10	0.03	0.17	< 0.01	0.07			0.39	0.39	0.12
Free Available Chlorine (mg/L) Average Monthly	0.02	< 0.01	0.055	0.06	0.08	0.015	0.035			0.135	0.015	0.06
Free Available Chlorine (mg/L) Instantaneous Maximum	0.04	< 0.01	0.06	0.06	0.09	0.03	0.04			0.25	0.02	0.06
Temperature (ºF) Instantaneous Maximum	80.7	79.08	74.81	79.73	70.22	57.2	53.78			51.44	55.76	70.88
Total Arsenic (mg/L) Average Monthly	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005			< 0.0050	0.005	0.006
Total Arsenic (mg/L) Daily Maximum	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005			< 0.0050	0.005	0.007
Total Chromium (mg/L) Average Monthly	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02			< 0.02	0.02	0.02
Total Chromium (mg/L) Daily Maximum	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02			< 0.02	0.02	0.02

Total Zinc (mg/L) Average Monthly	0.11	0.03	0.04	0.03	0.03	0.12	0.05			0.03	0.04	0.02
Total Zinc (mg/L) Daily Maximum	0.16	0.03	0.06	0.03	0.03	0.19	0.06			0.03	0.06	0.02

DMR Data for Outfall 201 (from October 1, 2018 to September 30, 2019)

Parameter	SEP-19	AUG-19	JUL-19	JUN-19	MAY-19	APR-19	MAR-19	FEB-19	JAN-19	DEC-18	NOV-18	OCT-18
Flow (MGD) Average Monthly	0.00087	0.00069	0.0004	0.00034	0.0005	0.000115	0.0001	0.0014	0.0006	0.0009	0.0008	0.0011
Flow (MGD) Daily Maximum	0.00093	0.00094	0.002	0.00086	0.0009	0.00118	0.0012	0.0014	0.0006	0.0012	0.0011	0.0022
pH (S.U.) Daily Minimum	7.15	6.50	7.29	6.58	8.60	6.96						
pH (S.U.) Minimum							8.27	7.11	7.15	7.01	6.88	7.68
pH (S.U.) Daily Maximum	8.51	7.42	7.33	7.97	8.65	7.02						
pH (S.U.) Maximum							8.44	7.11	7.15	8.29	7.89	8.80
TSS (mg/L) Average Monthly	6	9.5	4	< 3	4	3.5	4	< 3	7	< 3	3.5	3
TSS (mg/L) Daily Maximum	8	16	5	< 3	5	4	6	< 3	7	< 3	4	3
Oil and Grease (mg/L) Average Monthly	< 5.0	< 5.0	< 5	< 5.0	< 5	< 5.0	< 5.0	5.5	5	< 5.0	5.0	5
Oil and Grease (mg/L) Daily Maximum	< 5.0	< 5.0	< 5	< 5.0	< 5	< 5.0	< 5.0	5.5	5	< 5.0	5.0	5
Bromoform (mg/L) Average Monthly	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0005	0.0005
Bromoform (mg/L) Daily Maximum	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0005	0.0005
Chlorodibromo-methane (mg/L) Average Monthly	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0006	< 0.0005	< 0.0005	< 0.0005	0.0005	0.0005
Chlorodibromo-methane (mg/L) Daily Maximum	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0008	< 0.0005	< 0.0005	< 0.0005	0.0005	0.0005

Summary of Inspections: The last inspection conducted by the Department was on November 29, 2011 by Zachary Flannigan as a compliance evaluation. No violations were noted. A stream assessment of the UNT to Grassy Run was conducted on January 14, 2020 by the permit engineer and aquatic biologist. The UNT to Grassy Run was determined to be impaired resulting from acid mine drainage.

Other Comments:

Monitoring data from the past three years shows one effluent violation for the parameter chlorodibromomethane at IMP 201. Gans reported a maximum chlorodibromomethane concentration of 0.0072 $^{mg}/_{L}$ and an average concentration of 0.0039 $^{mg}/_{L}$ during September 2018.

Gans also exceeded the permit effluent limits for zinc at IMP 101 during the months April 2019, September 2019, December 2019 and January 2020. Because of an eDMR error, the effluent limits listed in eDMR for arsenic, bromoform, chlorodibromomethane and zinc erroneously reverted back to those effluent limits in the permit's first effective period in April of 2019. The zinc concentration exceedances at IMP 101 were therefore not shown as effluent violations since the concentrations were compared to the wrong limits.

The client has no open violations

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Development of Effluent Limitations

Outfall No.	001	**Design Flow (MGD)**	0.1092
Latitude	39º 44' 51"	**Longitude**	-79º 50' 33"

Wastewater Description: Non-contact cooling tower blowdown from IMP 101 and oil/ water separation for stormwater from IMP 102.

Outfall 001 discharges wastewater from internal monitoring points (IMP) 101 and 201. There are no monitoring requirements at this outfall since the wastewater sources are monitoring at IMPs 101 and 201.

Development of Effluent Limitations

Outfall No.	101	**Design Flow (MGD)**	0.057
Latitude	39º 44' 50.00"	**Longitude**	-79º 50' 20.77"

Wastewater Description: Non-contact cooling tower blowdown

IMP 101 discharges non-contact cooling tower blowdown from cooling towers 1 & 2 when the plant is in operation.

Technology-Based Limitations

Gans Generating Facility is a simple-cycle combustion turbine generation plant and not a steam electric generating facility. While fees do not reflect Federal Effluent Guidelines (ELGs), anti-backsliding and BPJ support the continued use of technology-based effluent limitation established in 40 CFR § 423 – Steam Electric Power Generating Point Source Category (NSPS).

Regulatory Effluent Standards and Monitoring Requirements

Flow monitoring is required pursuant to 25 Pa. Code § 92a.61(d)(1) as indicated in Table 1.

Effluent standards for pH pursuant to 25 Pa. Code §§ 95.2(1), as indicated in Table 1, are also imposed on all industrial wastes.

Pennsylvania regulations at 25 Pa. Code § 92a.48(b) require the imposition of technology-based TRC limits for facilities that use chlorination and that are not already subject to TRC limits based on applicable federal ELGs or a facility-specific BPJ evaluation as indicated in Table 1.

Table 1: Regulatory Effluent Standards

Parameter	Monthly Average	Daily Maximum	IMAX
Flow (MGD)	Monitor	Monitor	----
pH (S.U.)	Not less than 6.0 nor greater than 9.0 at all times		----
TRC ($^{mg}/_{L}$)	0.5	1.0	1.6

Best Practicable Control Technology Currently Achievable (BPT)

BPT for discharges from non-contact cooling tower blowdown are subject to effluent limits in accordance with the regulations in 40 CFR § 423 – Steam Electric Power Generating Point Source Category (NSPS). The technology-based effluent limits from 40 CFR § 423.15 (a)(10) proposed at IMP 101 are listed in Table 2.

Table 2: Technology Effluent Limitations for Cooling Tower Blowdown

Parameters	Average Monthly ($^{mg}/_{L}$)	Maximum Daily ($^{mg}/_{L}$)
Chromium, total*	0.2	0.2
Zinc, total*	1.0	1.0
Free Available Chlorine*	0.2	0.5
pH (S.U.) *	Between 6.0 – 9.0	

*From 40 CFR § 423.15 (a)(10)

Water Quality-Based Effluent Limitations (WQBELs)

Toxics Screening Analysis – Procedures for Evaluating Reasonable Potential and Developing WQBELs

DEP's procedures for evaluating reasonable potential are as follows:

1. For IW discharges, the design flow to use in modeling is the average flow during production or operation and may be taken from the permit application.

2. Perform a Toxics Screening Analysis to identify toxic pollutants of concern. All toxic pollutants whose maximum concentrations, as reported in the permit application or on past DMRs, that are greater than the most stringent applicable water quality criterion are evaluated as pollutants of concern. [This includes pollutants reported as "Not Detectable" or as "<MDL" where the method detection limit for the analytical method used by the applicant is greater than the most stringent water quality criterion]. List all toxic pollutants of concern in a Toxics Screening Analysis section of the Fact Sheet (see Attachment B).

3. For any outfall with an applicable design flow, perform PENTOXSD modeling for all pollutants of concern. Use the maximum reported value from the application form or from DMRs as the input concentration for the PENTOXSD model run.

4. Compare the actual WQBEL from PENTOXSD with the maximum concentration reported on DMRs or the permit application. Use WQN data or another source to establish the existing or background concentration for naturally occurring pollutants, but generally assume zero background concentration for non-naturally occurring pollutants.

    - Establish limits in the draft permit where the maximum reported concentration equals or exceeds 50% of the WQBEL. Use the average monthly and maximum daily limits for the permit as recommended by PENTOXSD. Establish an IMAX limit at 2.5 times the average monthly limit.

    - For non-conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL.

    - For conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 10% - 50% of the WQBEL.

The information described above including the maximum reported discharge concentrations, the most stringent water quality criteria, the pollutant-of-concern (reasonable potential) determinations, the calculated WQBELs, and the WQBEL/monitoring recommendations are collected on a spreadsheet titled "Toxics Screening Analysis" (Attachment B).

PENTOXSD Water Quality Modeling Program

PENTOXSD Version 2.0 for Windows is a single discharge, mass-balance water quality modeling program that includes consideration for mixing, first-order decay and other factors to determine recommended WQBELs for toxic substances and several non-toxic substances. Required input data including stream code, river mile index, elevation, drainage area, discharge name, NPDES permit number and discharge flow rate are entered into PENTOXSD to establish site-specific discharge conditions. Other data such as low flow yield, reach dimensions and partial mix factors may also be entered to further characterize the conditions of the discharge and receiving water. Pollutants are then selected for analysis based on those present or likely to be present in a discharge at levels that may cause, have the reasonable potential to cause, or contribute to excursions above state water quality standards (i.e., a reasonable potential analysis). Discharge concentrations for the selected pollutants are chosen to represent the "worst case" quality of the discharge (i.e., maximum reported discharge concentrations). PENTOXSD then evaluates each pollutant by computing a Waste Load Allocation for each applicable criterion, determining a recommended maximum WQBEL and comparing that recommended WQBEL with the input discharge concentration to determine which is more stringent. Based on this evaluation, PENTOXSD recommends average monthly and maximum daily WQBELs.

Reasonable Potential Analysis and WQBEL Development for IMP 101

Table 3: PENTOXSD Inputs

Parameter	**Value**
River Mile Index	1.65
Discharge Flow (MGD)	0.045
Basin/Stream Characteristics	
Parameter	**Value**
Area in Square Miles	4.49
Q_{7-10} (cfs)	0.0501
Low-flow yield ($^{cfs}/_{mi^2}$)	0.00112
Elevation (ft)	894
Slope	0.011

Discharges from IMP 101 are evaluated based on concentrations reported on the application and on DMRs; data from those sources are used for toxics screening as described above. The PENTOXSD model is run with the discharge and receiving stream characteristics shown in Table 3. Since the nearest downstream public water supply intake is 5.37 miles downstream of Outfall 001, the intake flow was not included in the PENTOXSD model run. Effluent limits are therefore not necessary for PWS parameters.

The pollutants selected for analysis include those identified as candidates for modeling by the Toxics Screening Analysis spreadsheet (in accordance with Step 2 of the Toxics Screening Analysis procedure discussed above). Pollutants for which water quality standards have not been promulgated (e.g., TSS, oil and grease) are excluded from the analysis.

Based on the recommendations of the Toxics Screening Analysis, Total Dissolved Solids, Fluoride, Total Arsenic and Total Zinc were candidates for PENTOXSD modeling. Total Dissolved Solids and Fluoride are discussed further below. The

WQBELs calculated using PENTOXSD are compared to the maximum reported effluent concentrations as described in the Toxics Screening Analysis section above to evaluate the need to impose WQBELs or monitoring requirements in the permit. Output from the PENTOXSD model runs is included in Attachment C.

Based on PENTOXSD modeling and the Toxics Screening Analysis, WQBELs are to be imposed for the parameters Arsenic and Zinc. PENTOXSD modeling and Toxics Screening Analysis for the parameters Arsenic and Zinc were evaluated based on maximum concentrations reported on DMRs. The recommended effluent limits from PENTOXSD are shown below in Table 4.

Table 4: Water Quality Based Effluent Limits

Parameter	Maximum DMR Discharge Concentration		Monthly Average (µg/L)	Daily Maximum (µg/L)
	Monthly Average (µg/L)	Daily Maximum (µg/L)		
Arsenic, total	9.42	12.00	17.20	26.83
Zinc, total	159.5	203	282.55	440.83

Total Dissolved Solids (TDS)

The Total Dissolved Solids (TDS) concentration at Outfall 101 is 530 $^{mg}/_{L}$. Per *Policy and Procedure for NPDES Permitting of Discharges of Total Dissolved Solids (TDS) – 25 Pa. Code §95.10 (DEP-ID: 385-2100-002)*, a monitoring requirement for TDS for any discharge that exceeds 1,000 $^{mg}/_{L}$ TDS should be applied at minimum. Since the TDS discharge concentration is below 1,000 $^{mg}/_{L}$, no monitoring/limit requirements will be applied for TDS or its constituent parameters.

Fluoride

The Fluoride concentration in Outfall 101 at 1080 µg/L. The Toxics Screening Analysis spreadsheet recommended Fluoride as a candidate for PENTOXSD modeling. Since however the discharge is below Water Quality criteria and the nearest downstream Public Water Supply Intake is more than 5 miles downstream, impacts are not expected. No monitoring/ limit requirement will be applied for Fluoride.

Total Residual Chlorine (TRC)

To determine if WQBELs are required for discharges containing Total Residual Chlorine, a discharge evaluation is performed using a DEP program called TRC_CALC created with Microsoft Excel for Windows. TRC_CALC calculates TRC Waste Load Allocations (WLAs) through the application of a mass balance model which considers TRC losses due to stream and discharge chlorine demands and first-order chlorine decay. Input values for the program include flow rates and chlorine demands for the receiving stream and the discharge, the number of samples taken per month, coefficients of TRC variability, partial mix factors, and an optional factor of safety. The mass balance model calculates WLAs for acute and chronic criteria that are then converted to long term averages using calculated multipliers. The multipliers are functions of the number of samples taken per month and the TRC variability coefficients (normally kept at default values unless site specific information is available). The most stringent limitation between the acute and chronic long-term averages is converted to an average monthly limit for comparison to the BAT average monthly limit of 0.5 $^{mag}/_{L}$ from 25 Pa. Code § 92a.48(b)(2). The more stringent of these average monthly TRC limitations is imposed in the permit. The results of the modeling, included in Attachment E, indicate that WQBELs will be imposed for TRC. The recommended effluent limits for TRC are shown below in Table 5.

Table 5: TRC WQBELs

Parameter	Monthly Average ($^{mg}/_{L}$)	IMAX ($^{mg}/_{L}$)
Total Residual Chlorine	0.159	0.373

Anti-Backsliding

The effluent limitations and monitoring requirements in Table 6 below are from the current permit, issued on September 26, 2014. The proposed effluent limits are less stringent than those imposed in current permit for the parameters Arsenic

and Zinc, since the water quality for Outfall 101 is modeled 1.5 miles downstream of the outfall because of abandoned mine drainage impairment. PENTOXSD modeling and Toxics Screening Analysis for the parameters Arsenic and Zinc were evaluated based on maximum concentrations reported on DMRs.

Table 6: Current Permit Effluent Limits – IMP 101

Parameter	Mass Limits ($^{lbs.}/_{day}$)		Concentration Limits ($^{mg}/_{L}$)			Monitoring Frequency
	Average Monthly	Maximum Daily	Average Monthly	Maximum Daily	Instantaneous Maximum	
Flow (MGD)	Monitor & Report		-	-	-	2/month
Free Available Chlorine	-	-	0.2	-	0.5	2/month
Temperature (°F)	-	-	-	-	110	2/month
Arsenic, total	-	-	0.014	0.02	-	2/month
Chromium, total	-	-	0.2	0.2	-	2/month
Zinc, total	-	-	0.1	0.16	-	2/month
Total Residual Chlorine	-	-	0.5	-	1.0	2/month
pH (S.U.)	-	-	Between 6.0 and 9.0		-	2/month

Temperature Evaluation

IMP 101 discharges heated non-contact cooling wastewaters. The cooling water intake is a treated public water supply. The current permit contains a temperature limitation of 110 °F at IMP 101 for the protection of human health in accordance with the Department's temperature guidance.

The Department used the Thermal Discharge Limit Calculation Spreadsheet to evaluate the thermal impact of this discharge to Grassy Run. The spreadsheet is designed to calculate the appropriate thermal discharge limits for a facility discharging effluent above ambient temperature, assuming complete-mix between the discharge flow and the receiving stream flow. The design stream flow for temperature analysis is based on the $Q_{7\text{-}10}$ flow of the receiving stream, adjusted for each monthly or semimonthly time period. The total projected discharge volume from IMP 101 (as provided in the NPDES permit application) is 0.011 MGD.

Bimonthly temperature monitoring was imposed in the current permit. The DEP Technical Guidance for the Development and Specification of Effluent Limitations (October 1997) recommends 1/month monitoring of flow, pH and temperature for non-contact discharges with flows under 20,000 GPD. Since some of the proposed temperature limits vary within the same month, the outfall will be subject to the 2/month monitoring requirements shown below in Table 7. The results of the thermal analysis are included in Attachment D of this report.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below in Table 7 are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. The current permit's effluent limits are more stringent than the recommended WQBELs from PENTOXSD for the parameters Arsenic and Zinc. Since the water quality for Outfall 101 is modeled 1.5 miles downstream of the outfall because of abandoned mine drainage impairment, the recommended WQBELs from PENTOXSD are proposed for Arsenic and Zinc. Monitoring frequencies will remain twice per month for all parameters.

Outfall 101, Effective Period: Permit Effective Date through Permit Expiration Date.

Table 7: Proposed Temperature Limits – IMP 101

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Daily Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	2/month	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	2/month	Grab
Total Residual Chlorine (TRC)*	XXX	XXX	XXX	0.159	XXX	0.373	2/month	Grab
Free Available Chlorine	XXX	XXX	XXX	0.2	XXX	0.5	2/month	Grab
Temperature (ºF) Jan 1 - 31	XXX	XXX	XXX	XXX	XXX	87.1	2/month	I-S
Temperature (ºF) Feb 1 - 29	XXX	XXX	XXX	XXX	XXX	91.5	2/month	I-S
Temperature (ºF) Mar 1 - Sep 30	XXX	XXX	XXX	XXX	XXX	110	2/month	I-S
Temperature (ºF) Oct 1 - 15	XXX	XXX	XXX	XXX	XXX	110	1/month	I-S
Temperature (ºF) Oct 16 - 31	XXX	XXX	XXX	XXX	XXX	108.4	1/month	I-S
Temperature (ºF) Nov 1 - 15	XXX	XXX	XXX	XXX	XXX	105.1	1/month	I-S
Temperature (ºF) Nov 16 - 30	XXX	XXX	XXX	XXX	XXX	87.7	1/month	I-S
Temperature (ºF) Dec 1 - 31	XXX	XXX	XXX	XXX	XXX	77.3	2/month	I-S
Total Arsenic	XXX	XXX	XXX	0.017	0.027	XXX	2/month	Grab

Table 7: Proposed Temperature Limits – IMP 101								
Parameter	**Effluent Limitations**						**Monitoring Requirements**	
	Mass Units (lbs/day) (1)		**Concentrations (mg/L)**				**Minimum (2) Measurement Frequency**	**Required Sample Type**
	Average Monthly	**Daily Maximum**	**Daily Minimum**	**Average Monthly**	**Daily Maximum**	**Instant. Maximum**		
Total Chromium	XXX	XXX	XXX	0.2	0.2	XXX	2/month	Grab
Total Zinc	XXX	XXX	XXX	0.283	0.441	XXX	2/month	Grab

*Compliance schedule may be developed for final permit based on Pre-Draft Permit Survey responses.

Compliance Sampling Location: Outfall 101

Development of Effluent Limitations

Outfall No.	201	**Design Flow (MGD)**	0.1034
Latitude	39º 44' 50.00"	**Longitude**	-79º 50' 20.77"

Wastewater Description: Stormwater associated with industrial activity and low volume wastewater after treatment through an oil/ water separator.

IMP 201 discharges stormwater runoff from diked areas around the equipment skids and oil storage tank and low volume process wastewater after treatment through an oil/ water separator.

Technology-Based Limitations

Gans Generating Facility is a simple-cycle combustion turbine generation plant and not a steam electric generating facility. While fees do not reflect Federal Effluent Guidelines (ELGs), anti-backsliding and BPJ support the continued use of technology-based effluent limitation established in 40 CFR § 423 – Steam Electric Power Generating Point Source Category (NSPS).

Regulatory Effluent Standards and Monitoring Requirements

Flow monitoring is required pursuant to 25 Pa. Code § 92a.61(d)(1) as indicated in Table 8.

Effluent standards for pH pursuant to 25 Pa. Code §§ 95.2(1), as indicated in Table 8, are also imposed on all industrial wastes.

Table 8: Regulatory Effluent Standards

Parameter	Monthly Average	Daily Maximum	IMAX
Flow (MGD)	Monitor	Monitor	----
pH (S.U.)	Not less than 6.0 nor greater than 9.0 at all times		----

Best Practicable Control Technology Currently Achievable (BPT)

BPT for discharges from low volume process wastewater are subject to effluent limits in accordance with the regulations in 40 CFR § 423 – Steam Electric Power Generating Point Source Category (NSPS). The technology-based effluent limits from 40 CFR § 423.15 (a)(3) proposed at IMP 201 are listed in Table 9.

Table 9: Technology Effluent Limitations for Low Volume Waste Sources

Parameters	Average Monthly ($^{mg}/_{L}$)	Maximum Daily ($^{mg}/_{L}$)
Total Suspended Solids*	30.0	100.0
Oil and Grease	15.0	20.0
pH (S.U.)*	Between 6.0 – 9.0	

*From 40 CFR § 423.15 (a)(3)

Water Quality-Based Effluent Limitations (WQBELs)

Toxics Screening Analysis – Procedures for Evaluating Reasonable Potential and Developing WQBELs

DEP's procedures for evaluating reasonable potential are as follows:

1. For IW discharges, the design flow to use in modeling is the average flow during production or operation, and may be taken from the permit application.

2. Perform a Toxics Screening Analysis to identify toxic pollutants of concern. All toxic pollutants whose maximum concentrations, as reported in the permit application or on past DMRs, that are greater than the most stringent applicable water quality criterion are evaluated as pollutants of concern. [This includes pollutants reported as "Not Detectable" or as "<MDL" where the method detection limit for the analytical method used by the applicant is greater

than the most stringent water quality criterion]. List all toxic pollutants of concern in a Toxics Screening Analysis section of the Fact Sheet (see Attachment F).

3. For any outfall with an applicable design flow, perform PENTOXSD modeling for all pollutants of concern. Use the maximum reported value from the application form or from DMRs as the input concentration for the PENTOXSD model run.

4. Compare the actual WQBEL from PENTOXSD with the maximum concentration reported on DMRs or the permit application. Use WQN data or another source to establish the existing or background concentration for naturally occurring pollutants, but generally assume zero background concentration for non-naturally occurring pollutants.

    - Establish limits in the draft permit where the maximum reported concentration equals or exceeds 50% of the WQBEL. Use the average monthly and maximum daily limits for the permit as recommended by PENTOXSD. Establish an IMAX limit at 2.5 times the average monthly limit.

    - For non-conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL.

    - For conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 10% - 50% of the WQBEL.

The information described above including the maximum reported discharge concentrations, the most stringent water quality criteria, the pollutant-of-concern (reasonable potential) determinations, the calculated WQBELs, and the WQBEL/monitoring recommendations are collected on a spreadsheet titled "Toxics Screening Analysis." (Attachment F).

PENTOXSD Water Quality Modeling Program

PENTOXSD Version 2.0 for Windows is a single discharge, mass-balance water quality modeling program that includes consideration for mixing, first-order decay and other factors to determine recommended WQBELs for toxic substances and several non-toxic substances. Required input data including stream code, river mile index, elevation, drainage area, discharge name, NPDES permit number and discharge flow rate are entered into PENTOXSD to establish site-specific discharge conditions. Other data such as low flow yield, reach dimensions and partial mix factors may also be entered to further characterize the conditions of the discharge and receiving water. Pollutants are then selected for analysis based on those present or likely to be present in a discharge at levels that may cause, have the reasonable potential to cause, or contribute to excursions above state water quality standards (i.e., a reasonable potential analysis). Discharge concentrations for the selected pollutants are chosen to represent the "worst case" quality of the discharge (i.e., maximum reported discharge concentrations). PENTOXSD then evaluates each pollutant by computing a Waste Load Allocation for each applicable criterion, determining a recommended maximum WQBEL and comparing that recommended WQBEL with the input discharge concentration to determine which is more stringent. Based on this evaluation, PENTOXSD recommends average monthly and maximum daily WQBELs.

Reasonable Potential Analysis and WQBEL Development for IMP 201

Table 10: PENTOXSD Inputs

Parameter	**Value**
River Mile Index	1.65
Discharge Flow (MGD)	0.011
Basin/Stream Characteristics	
Parameter	**Value**
Area in Square Miles	4.49
Q_{7-10} (cfs)	0.0501
Low-flow yield ($^{cfs}/_{mi^2}$)	0.00112
Elevation (ft)	894
Slope	0.011

Discharges from IMP 201 are evaluated based on concentrations reported on the application and on DMRs; data from those sources are used for toxics screening as described above. The PENTOXSD model is run with the discharge and receiving stream characteristics shown in Table 10. Since the nearest downstream public water supply intake is 5.37 miles downstream of Outfall 001, the intake flow was not included in the PENTOXSD model run. Effluent limits are therefore not necessary for PWS parameters.

The pollutants selected for analysis include those identified as candidates for modeling by the Toxics Screening Analysis spreadsheet (in accordance with Step 2 of the Toxics Screening Analysis procedure discussed above). Pollutants for which water quality standards have not been promulgated (e.g., TSS, oil and grease) are excluded from the analysis.

Based on the recommendations of the Toxics Screening Analysis, Total Cadmium and Chlorodibromomethane were candidates for PENTOXSD modeling. The maximum reported value for Total Cadmium was reported as “non-detect” using a quantitation limit (QL) that exceeds the Department’s Target QL.

The WQBELs calculated using PENTOXSD are compared to the maximum reported effluent concentrations as described in the Toxics Screening Analysis section above to evaluate the need to impose WQBELs or monitoring requirements in the permit. Output from the PENTOXSD model runs is included in Attachment G.

Based on PENTOXSD modeling and the Toxics Screening Analysis, WQBELs are to be imposed for the parameters and Cadmium and Chlorodibromomethane. The recommended effluent limits from PENTOXSD are shown below in Table 11. Gans will be collecting additional samples for the parameter Total Cadmium using the Target QL. If the additional sample indicates that Total Cadmium is not a pollutant of concern, those effluent limits may be removed from the final permit.

Table 11: Water Quality Based Effluent Limits

Parameter	Maximum DMR Discharge Concentration		Monthly Average (µg/L)	Daily Maximum (µg/L)
	Monthly Average (µg/L)	Daily Maximum (µg/L)		
Cadmium, total	-	-	0.915	1.43
Chlorodibromomethane	3.9	7.2	13.16	20.53

Total Dissolved Solids (TDS)

The total dissolved solids (TDS) concentration at Outfall 201 is 85 $^{mg}/_{L}$. Per *Policy and Procedure for NPDES Permitting of Discharges of Total Dissolved Solids (TDS) – 25 Pa. Code §95.10 (DEP-ID: 385-2100-002)*, a monitoring requirement for TDS for any discharge that exceeds 1,000 $^{mg}/_{L}$ TDS should be applied at minimum. Since the TDS discharge concentration is below 1,000 $^{mg}/_{L}$, no monitoring/limit requirements will be applied for TDS or its constituent parameters.

Anti-Backsliding

The effluent limitations and monitoring requirements in Table 12 below are from the current permit, issued on September 26, 2014. The DMRs and NPDES permit application sample analysis results were reviewed and it was determined that Bromoform and Chlorodibromomethane are no longer pollutants of concern. While Chlorodibromomethane exceeded the daily maximum and average monthly effluent limits during September 2018, the reported concentrations are well within the recommended WQBELS from PENTOXSD using the new downstream water quality modeling location. Effluent limits for Bromoform and Chlorodibromomethane will be removed from the permit.

Table 12: Current Permit Effluent Limits – IMP 201

Parameter	Mass Limits ($^{lbs.}/_{day}$)		Concentration Limits ($^{mg}/_{L}$)			Monitoring Frequency
	Average Monthly	Maximum Daily	Average Monthly	Maximum Daily	Instantaneous Maximum	
Flow (MGD)	Monitor & Report		-	-	-	2/month
Total Suspended Solids	-	-	30	100	-	2/month
Oil and Grease	-	-	15	20	-	2/month
Bromoform	-	-	0.016	0.025	-	2/month
Chlorodibromomethane	-	-	0.0015	0.0023	-	2/month
pH (S.U.)	-	-	Between 6.0 and 9.0		-	2/month

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below in Table 13 are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Monitoring frequencies will remain twice per month for all parameters.

Outfall 201, Effective Period: Permit Effective Date through Permit Expiration Date.

Table 13: Proposed Permit Effluent Limits – IMP 201

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Daily Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	2/month	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	2/month	Grab
TSS	XXX	XXX	XXX	30	100	XXX	2/month	Grab
Oil and Grease	XXX	XXX	XXX	15	20	XXX	2/month	Grab
Total Cadmium*	XXX	XXX	XXX	0.271	0.353	XXX	2/month	Grab

*New samples are being collected using Target QLs. Parameters will potentially be removed from the final permit.

Compliance Sampling Location: Outfall 201

Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☒	PENTOXSD for Windows Model (see Attachment **C, G**)
☒	TRC Model Spreadsheet (see Attachment **E**)
☒	Temperature Model Spreadsheet (see Attachment **D**)
☒	Toxics Screening Analysis Spreadsheet (see Attachment **B, F**)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☒	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☒	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☐	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☒	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☐	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP:
☐	Other:

Attachments

Attachment A: StreamStats Report

Attachment B: Toxics Screening Analysis Results for IMP 101

Attachment C: PENTOXSD Modeling Results for IMP 101

Attachment D: Thermal Discharge Limit Calculation for IMP 101

Attachment E: TRC Modeling Results for IMP 101

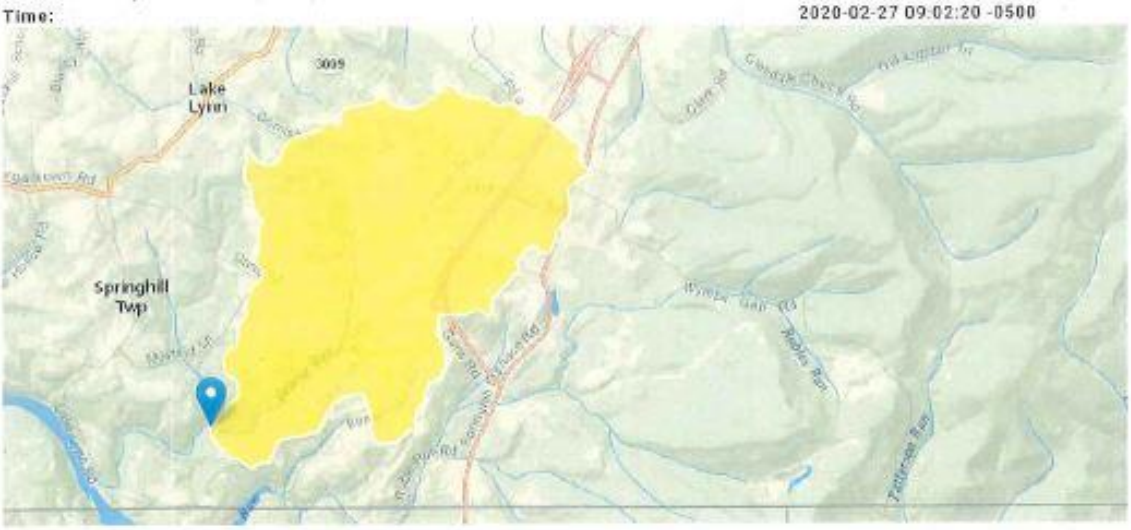
Attachment F: Toxics Screening Analysis Results for IMP 201

Attachment G: PENTOXSD Modeling Results for IMP 201

ATTACHMENT A:
StreamStats Report

StreamStats Report

Region ID: PA
Workspace ID: PA20200227140203845000
Clicked Point (Latitude, Longitude): 39.72938, -79.84348
Time: 2020-02-27 09:02:20 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	4.49	square miles
ELEV	Mean Basin Elevation	1110.6	feet

Low Flow Statistics Parameters[Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	4.49	square miles	2.26	1400
ELEV	Mean Basin Elevation	1110.6	feet	1050	2580

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

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
7 Day 2 Year Low Flow	0.146	ft^3/s	43	43
30 Day 2 Year Low Flow	0.261	ft^3/s	38	38
7 Day 10 Year Low Flow	0.0501	ft^3/s	66	66
30 Day 10 Year Low Flow	0.0952	ft^3/s	54	54
90 Day 10 Year Low Flow	0.178	ft^3/s	41	41

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/)

ATTACHMENT B:

Toxics Screening Analysis Results for IMP 101

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.7

CLEAR FORM

Facility: **Gans Generating Facility**
NPDES Permit No.: **PA0218464**
Outfall: **101**
Analysis Hardness (mg/L): **350**
Discharge Flow (MGD): **0.045**
Analysis pH (SU): **8.6**
Stream Flow, Q_{7-10} (cfs): **0.0501**

	Parameter	Maximum Concentration in Application or DMRs (µg/L)		Most Stringent Criterion (µg/L)	Candidate for PENTOXSD Modeling?	Most Stringent WQBEL (µg/L)	Screening Recommendation
Group 1	Total Dissolved Solids		530000	500000	Yes		
	Chloride		86200	250000	No		
	Bromide		4540	N/A	No		
	Sulfate		74100	250000	No		
	Fluoride		1080	2000	Yes	2000	Establish Limits
Group 2	Total Aluminum			750			
	Total Antimony			5.6			
	Total Arsenic		12	10	Yes	17.197	Establish Limits
	Total Barium			2400			
	Total Beryllium			N/A			
	Total Boron			1600			
	Total Cadmium			0.271			
	Total Chromium		20	N/A	No		
	Hexavalent Chromium			10.4			
	Total Cobalt			19			
	Total Copper			9.3			
	Total Cyanide			N/A			
	Total Iron			1500			
	Dissolved Iron			300			
	Total Lead			3.2			
	Total Manganese			1000			
	Total Mercury			0.05			
	Total Molybdenum			N/A			
	Total Nickel			52.2			
	Total Phenols (Phenolics)			5			
	Total Selenium			5.0			
	Total Silver			3.8			
	Total Thallium			0.24			
	Total Zinc		203	119.8	Yes	282.552	Establish Limits

ATTACHMENT C:

PENTOXSD Modeling Results for IMP 101

PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
41891	1.65	894.00	4.49	0.00000	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.00112	0	0.0501	0	0	0	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
		(mgd)	(mgd)	(mgd)						(mg/L)	
Gans Gen 101	PA0218464	0.045	0	0	0	1	1	0	0	350	8.6

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
ARSENIC	120	0	0.5	0.5	0	0	0	0	1	0
ZINC	2030	0	0.5	0.5	0	0	0	0	1	0

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
41891	1.15	865.00	6.19	0.00000	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.01204	0	0.0745	0	0	0	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
		(mgd)	(mgd)	(mgd)						(mg/L)	
		0	0	0	0	0	0	0	0	100	7

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
ARSENIC	0	0	0.5	0.5	0	0	0	0	1	0
ZINC	0	0	0.5	0.5	0	0	0	0	1	0

PENTOXSD Analysis Results

Hydrodynamics

SWP Basin	Stream Code:	Stream Name:
19G	41891	GRASSY RUN

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	CMT (min)
Q7-10 Hydrodynamics											
1.653	0.0501	0	0.0501	0.06961	0.011	0.3668	6.6483	18.127	0.0491	0.6223	.455
1.153	0.0745	0	0.0745	NA	0	0	0	0	0	0	NA
Qh Hydrodynamics											
1.653	0.5428	0	0.5428	0.06961	0.011	0.7521	6.6483	8.8391	0.1225	0.2495	.696
1.153	0.7678	0	0.7678	NA	0	0	0	0	0	0	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
1.65	Gans Gen 101	PA0218464

AFC

Q7-10: CCT (min) 0.455 PMF 1 Analysis pH 7.363 Analysis Hardness 245.376

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
ARSENIC	0	0	0	0	340	340	584.689
	Dissolved WQC. Chemical translator of 1 applied.						
ZINC	0	0	0	0	250.704	256.343	440.826
	Dissolved WQC. Chemical translator of 0.978 applied.						

CFC

Q7-10: CCT (min) 0.455 PMF 1 Analysis pH 7.363 Analysis Hardness 245.376

Parameter	Stream Conc. (µg/L)	Stream CV	Trib Conc. (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
ARSENIC	0	0	0	0	150	150	257.951
	Dissolved WQC. Chemical translator of 1 applied.						
ZINC	0	0	0	0	252.754	256.343	440.826
	Dissolved WQC. Chemical translator of 0.986 applied.						

THH

Q7-10: CCT (min) 0.455 PMF 1 Analysis pH NA Analysis Hardness NA

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
ARSENIC	0	0	0	0	10	10	17.197
ZINC	0	0	0	0	NA	NA	NA

CRL

Qh: CCT (min) 0.696 PMF 1

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
ARSENIC	0	0	0	0	NA	NA	NA
ZINC	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
19G	41891	GRASSY RUN

RMI	Name	Permit Number	Disc Flow (mgd)
1.65	Gans Gen 101	PA0218464	0.0450

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
ARSENIC	17.197	THH	26.83	17.197	THH
ZINC	282.552	AFC	440.826	282.552	AFC

ATTACHMENT D:

Thermal Discharge Limit Calculation for IMP 101

Facility:	**Gans Generating Facility**
Permit Number:	PA0218464
Stream Name:	UNT to Grassy Run
Analyst/Engineer:	Lauren Nolfi
Stream Q7-10 (cfs):	0.0501

	Facility Flows[1]				Stream Flows	
	Stream (Intake) (MGD)	External (Intake) (MGD)	Consumptive (Loss) (MGD)	Discharge (MGD)	Adj. Q7-10 Stream Flow (cfs)	Downstream[2] Stream Flow (cfs)
Jan 1-31	0	0.011	0	0.011	0.2	0.2
Feb 1-29	0	0.011	0	0.011	0.2	0.2
Mar 1-31	0	0.011	0	0.011	0.4	0.4
Apr 1-15	0	0.011	0	0.011	0.5	0.5
Apr 16-30	0	0.011	0	0.011	0.5	0.5
May 1-15	0	0.011	0	0.011	0.3	0.3
May 16-30	0	0.011	0	0.011	0.3	0.3
Jun 1-15	0	0.011	0	0.011	0.2	0.2
Jun 16-30	0	0.011	0	0.011	0.2	0.2
Jul 1-31	0	0.011	0	0.011	0.1	0.1
Aug 1-15	0	0.011	0	0.011	0.1	0.1
Aug 16-31	0	0.011	0	0.011	0.1	0.1
Sep 1-15	0	0.011	0	0.011	0.1	0.1
Sep 16-30	0	0.011	0	0.011	0.1	0.1
Oct 1-15	0	0.011	0	0.011	0.1	0.1
Oct 16-31	0	0.011	0	0.011	0.1	0.1
Nov 1-15	0	0.011	0	0.011	0.1	0.1
Nov 16-30	0	0.011	0	0.011	0.1	0.1
Dec 1-31	0	0.011	0	0.011	0.1	0.1

[1] Facility flows are not required (and will not affect the permit limits) if all intake flow is from the receiving stream (Case 1), consumptive losses are small, and permit limits will be expressed as Million BTUs/day.

[2] Downstream Stream Flow includes the discharge flow.

Please forward all comments to Tom Starosta at 717-787-4317, tstarosta@state.pa.us.

Version 1.0 -- 08/01/2004 Reference: Implementation Guidance for Temperature Criteria, DEP-ID: 391-2000-017

NOTE: The user can only edit fields that are blue.

NOTE: MGD x 1.547 = cfs.

Facility:	**Gans Generating Facility**						
Permit Number:	PA0218464						
Stream:	UNT to Grassy Run						
	WWF			**WWF**		**WWF**	
	Ambient Stream	Ambient Stream	Target Maximum	Daily		Daily	
	Temperature (ºF)	Temperature (ºF)	Stream Temp.[1]	WLA[2]		WLA[3]	at Discharge
	(Default)	(Site-specific data)	(ºF)	(Million BTUs/day)		(ºF)	Flow (MGD)
Jan 1-31	35	0	40	N/A -- Case 2		87.1	0.011
Feb 1-29	35	0	40	N/A -- Case 2		91.5	0.011
Mar 1-31	40	0	46	N/A -- Case 2		110.0	0.011
Apr 1-15	47	0	52	N/A -- Case 2		110.0	0.011
Apr 16-30	53	0	58	N/A -- Case 2		110.0	0.011
May 1-15	58	0	64	N/A -- Case 2		110.0	0.011
May 16-30	62	0	72	N/A -- Case 2		110.0	0.011
Jun 1-15	67	0	80	N/A -- Case 2		110.0	0.011
Jun 16-30	71	0	84	N/A -- Case 2		110.0	0.011
Jul 1-31	75	0	87	N/A -- Case 2		110.0	0.011
Aug 1-15	74	0	87	N/A -- Case 2		110.0	0.011
Aug 16-31	74	0	87	N/A -- Case 2		110.0	0.011
Sep 1-15	71	0	84	N/A -- Case 2		110.0	0.011
Sep 16-30	65	0	78	N/A -- Case 2		110.0	0.011
Oct 1-15	60	0	72	N/A -- Case 2		110.0	0.011
Oct 16-31	54	0	66	N/A -- Case 2		108.4	0.011
Nov 1-15	48	0	58	N/A -- Case 2		105.1	0.011
Nov 16-30	42	0	50	N/A -- Case 2		87.7	0.011
Dec 1-31	37	0	42	N/A -- Case 2		77.3	0.011

[1] This is the maximum of the WWF WQ criterion or the ambient temperature. The ambient temperature may be either the design (median) temperature for WWF, or the ambient stream temperature based on site-specific data entered by the user. A minimum of 1ºF above ambient stream temperature is allocated.

[2] The WLA expressed in Million BTUs/day is valid for Case 1 scenarios, and disabled for Case 2 scenarios.

[3] The WLA expressed in ºF is valid only if the limit is tied to a daily discharge flow limit (may be used for Case 1 or Case 2). WLAs greater than 110ºF are displayed as 110ºF.

ATTACHMENT E:

TRC Modeling Results for IMP 101

TRC EVALUATION

0.0501	= Q stream (cfs)	0.5	= CV Daily
0.045	= Q discharge (MGD)	0.5	= CV Hourly
4	= no. samples	1	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	0	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	0	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)	0	=Decay Coefficient (K)

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	**1.3.2.iii**	WLA afc =	0.249	**1.3.2.iii**	WLA cfc =	0.235
PENTOXSD TRG	**5.1a**	LTAMULT afc =	0.373	**5.1c**	LTAMULT cfc =	0.581
PENTOXSD TRG	**5.1b**	LTA_afc=	0.093	**5.1d**	LTA_cfc =	0.137

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.720	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.159	AFC
		INST MAX LIMIT (mg/l) =	0.373	

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)**

ATTACHMENT F:

Toxics Screening Analysis Results for IMP 201

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.7

CLEAR FORM

Facility: **Gans Generating Facility**
NPDES Permit No.: **PA0218464**
Outfall: **201**
Analysis Hardness (mg/L): **26**
Discharge Flow (MGD): **0.011**
Analysis pH (SU): **7.6**
Stream Flow, Q_{7-10} (cfs): **0.0501**

	Parameter	Maximum Concentration in Application or DMRs (µg/L)		Most Stringent Criterion (µg/L)	Candidate for PENTOXSD Modeling?	Most Stringent WQBEL (µg/L)	Screening Recommendation
Group 1	Total Dissolved Solids		85000	500000	No		
	Chloride		14900	250000	No		
	Bromide	<	500	N/A	No		
	Sulfate		13800	250000	No		
	Fluoride		180	2000	No		
Group 2	Total Aluminum	<	30	750	No		
	Total Antimony		1.8	5.6	No		
	Total Arsenic		0.28	10	No		
	Total Barium		21	2400	No		
	Total Beryllium	<	1	N/A	No		
	Total Boron		45	1600	No		
	Total Cadmium	<	1	0.271	Yes	0.915	Establish Limits
	Total Chromium	<	2	N/A	No		
	Hexavalent Chromium	<	0.01	10.4	No (Value < QL)		
	Total Cobalt		0.29	19	No		
	Total Copper		1.8	9.3	No		
	Total Cyanide	<	0.01	N/A	No		
	Total Iron		550	1500	No		
	Dissolved Iron			300			
	Total Lead	<	1	3.2	No (Value < QL)		
	Total Manganese		39	1000	No		
	Total Mercury	<	0.2	0.05	No (Value < QL)		
	Total Molybdenum	<	5	N/A	No		
	Total Nickel		1.8	52.2	No		
	Total Phenols (Phenolics)	<	0.01	5	No (Value < QL)		
	Total Selenium	<	5	5.0	No (Value < QL)		
	Total Silver	<	1	3.8	No		
	Total Thallium	<	1	0.24	No (Value < QL)		
	Total Zinc		31	119.8	No		
	Acrolein	<		3			
	Acrylamide	<		0.07			
	Acrylonitrile	<		0.051			
	Benzene	<		1.2			
	Bromoform		1.9	4.3	No		
	Carbon Tetrachloride	<		0.23			
	Chlorobenzene	<		130			
	Chlorodibromomethane		7.2	0.4	Yes	13.159	Establish Limits

ATTACHMENT G:

PENTOXSD Modeling Results for Outfall 201

PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
41891	1.65	894.00	4.49	0.00000	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.00112	0	0.0501	0	0	0	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
		(mgd)	(mgd)	(mgd)						(mg/L)	
Gans Gen 201	PA0218464	0.011	0	0	0	1	1	0	0	26	7.6

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
CADMIUM	1	0	0.5	0.5	0	0	0	0	1	0
CHLORODIBROMOMETHANE	72	0	0.5	0.5	0	0	0	0	1	0

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
41891	1.15	865.00	6.19	0.00000	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.01204	0	0.0745	0	0	0	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
		(mgd)	(mgd)	(mgd)						(mg/L)	
		0	0	0	0	0	0	0	0	100	7

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
CADMIUM	0	0	0.5	0.5	0	0	0	0	1	0
CHLORODIBROMOMETHANE	0	0	0.5	0.5	0	0	0	0	1	0

PENTOXSD Analysis Results

Hydrodynamics

SWP Basin	Stream Code:	Stream Name:
19G	41891	GRASSY RUN

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	CMT (min)
Q7-10 Hydrodynamics											
1.653	0.0501	0	0.0501	0.01701	0.011	0.3361	5.6245	16.736	0.0355	0.8605	1.183
1.153	0.0745	0	0.0745	NA	0	0	0	0	0	0	NA
Qh Hydrodynamics											
1.653	0.5428	0	0.5428	0.01701	0.011	0.8546	5.6245	6.5813	0.1165	0.2624	.492
1.153	0.7678	0	0.7678	NA	0	0	0	0	0	0	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
1.65	Gans Gen 201	PA0218464

AFC

Q7-10: CCT (min) 1.183 PMF 1 Analysis pH 7.091 Analysis Hardness 81.237

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
CADMIUM	0	0	0	0	1.645	1.727	6.811
	Dissolved WQC. Chemical translator of 0.953 applied.						
CHLORODIBROMOMETHANE	0	0	0	0	NA	NA	NA

CFC

Q7-10: CCT (min) 1.183 PMF 1 Analysis pH 7.091 Analysis Hardness 81.237

Parameter	Stream Conc. (µg/L)	Stream CV	Trib Conc. (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
CADMIUM	0	0	0	0	0.213	0.232	0.915
	Dissolved WQC. Chemical translator of 0.918 applied.						
CHLORODIBROMOMETHANE	0	0	0	0	NA	NA	NA

THH

Q7-10: CCT (min) 1.183 PMF NA Analysis pH NA Analysis Hardness NA

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
CADMIUM	0	0	0	0	NA	NA	NA
CHLORODIBROMOMETHANE	0	0	0	0	NA	NA	NA

CRL

Qh: CCT (min) 0.492 PMF 1

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
CADMIUM	0	0	0	0	NA	NA	NA
CHLORODIBROMOMETHANE	0	0	0	0	0.4	0.4	13.159

PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
19G	41891	GRASSY RUN

RMI	Name	Permit Number	Disc Flow (mgd)
1.65	Gans Gen 201	PA0218464	0.0110

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
CADMIUM	0.915	CFC	1.428	0.915	CFC
CHLORODIBROMOMETHANE	13.159	CRL	20.53	13.159	CRL