pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0009920**
Facility Type	**Industrial**	APS ID	**780559**
Major / Minor	**Major**	Authorization ID	**926487**

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

Applicant and Facility Information

Applicant Name	**Exelon Generation Co. LLC**	Facility Name	**Exelon Three Mile Island Nuclear Station**
Applicant Address	PO Box 480 Route 441 South	Facility Address	PO Box 480 Route 441 South
	Middletown, PA 17057-0480		Middletown, PA 17057-0480
Applicant Contact	T Haaf	Facility Contact	Scott Cogley
Applicant Phone	(717) 948-8881	Facility Phone	(717) 948-8881
Client ID	147686	Site ID	450833
SIC Code	4911	Municipality	Londonderry Township
SIC Description	Trans. & Utilities - Electric Services	County	Dauphin
Date Application Received	May 3, 2012	EPA Waived?	No
Date Application Accepted	May 8, 2012	If No, Reason	Major Facility

Adobe Acrobat Document

Purpose of Application: This is an application for NPDES renewal.

Summary of Review

Approve	Deny	Signatures	Date
X		Nicholas Hong, P.E. / Environmental Engineering Specialist	June 28, 2019
		Daniel W. Martin, P.E. / Environmental Engineer Manager	
		Maria Bebenek, P.E. / Environmental Program Manager	

Summary of Review

THIS FACT SHEET HAS BEEN PREPARED FOR INTERNAL PURPOSES ONLY.

This Fact Sheet was precipitated by the applicant's notification to PA DEP for anticipated increased boron concentration at the Excelon Generation Company, LLC- Three Mile Island Nuclear Station (TMINS) located at Route 441 South, Middletown, PA 17057 in Dauphin County, municipality of Londonderry. The current NPDES expired on October 31, 2012. The application for renewal was received by DEP Southcentral Regional Office (SCRO) on May 3, 2012.

A meeting with TMINS on June 14, 2019 confirmed that the facility will begin decommissioning on September 30, 2019. Since the facility anticipates that the amount of process water and cooling water to be either reduced or diminished, a full 5-year NPDES renewal has been postponed until the facility has stabilized flow streams and flow rates. The facility stated that the current NPDES limits should be able to be attained with the shutdown/decommissioning with the exception of their boron levels. In the facility's current permit, Part A, Section III.D requires the facility to notify DEP if the discharge will exceed certain thresholds.

The purpose of this Fact Sheet is to present the basis of information used for confirming no potential adverse impacts to the receiving waters should the facility increase the discharge concentration for boron to 5 mg/l. The Fact Sheet includes a description of the facility, a description of the facility's receiving waters, a description of the receiving water's attainment/non-attainment assessment status, and a description of any recommended changes to current monitoring/sampling frequencies for boron. Section 6 provides the support to the facility's request for proposed increased boron concentration.

Utilizing the DEP's web-based Emap-PA information system, the receiving waters has been determined to be the Susquehanna River. The Susquehanna River discharges into the Chesapeake Bay. No Class A Wild Trout fisheries are impacted by this discharge. The absence of high quality and/or exceptional value surface waters removes the need for an additional evaluation of anti-degradation requirements.

The Susquehanna River is a Category 5 stream listed in the 2016 Integrated List of All Waters (formerly 303d Listed Streams). This stream is an attaining stream that supports recreational purposes. The receiving stream is also (a) a non-attaining stream impaired for aquatic life due to pH from an unknown source and (b) an impaired stream for fish consumption due to PCBs from an unknown source.

Due to anticipation for the increase in boron concentration being discharged, the recommended sampling requirements are as follows.

- 1x/wk sampling for boron as a grab sample utilizing the facility's lab

For the full NPDES renewal, DEP has elected to defer the renewal application process until the decommissioning phases is at a time when all of the fuel is in Dry Fuel Storage (scheduled December 2022). At that point there will be no active cooling water systems in service and other plant wastewater treatment systems (industrial and sanitary) will be shut down or scheduled for shut down. In SAFSTOR the facility NPDES discharges will be limited to site stormwater management and periodic batch releases from building plant sumps and drains. Sumps and drains are expected to require periodic pumping to remove groundwater infiltration and other rainwater.

Public review of documents associated with the discharge or facility may be available at PA DEP Southcentral Regional Office (SCRO), 909 Elmerton Avenue, Harrisburg, PA 17110. To make an appointment for file review, contact the SCRO File Review Coordinator at 717.705.4700.

1.0 Applicant

1.1 General Information

This fact sheet summarizes PA Department of Environmental Protection's review for the following subject facility.

Facility Name: Excelon Generation Company, LLC- Three Mile Island Nuclear Station (TMINS)

NPDES Permit # PA0009920

Physical Address: Route 441 South
Middletown, PA 17057

Mailing Address: Route 441 South
Middletown, PA 17057

Contact: Scott Cogley
Senior Environmental Chemist
Scott.cogley@exceloncorp.com
717-948-8881

1.2 Permit History

Description of Facility

The Three Mile Island Nuclear Station (TMINS) is located in the Londonderry Township of Dauphin County approximately 10 miles southest of Harrisburg, Pennsylvania. The TMINS site includes Three Mile Island Unit 1 (TMI-1) and Unit 2 (TMI-2) and encompasses approximately 440 acres including Three Mile Island and adjacent islands on the north end, a strip of land on the mainland along the eastern shore of the river, and the area on the eastern shore of Shelley Island that is within the exclusion area (a 2,000-foot radius from a point equidistant between the centers of the Reactor Buildings).

TMI-1 is a single unit Babcock and Wilcox Pressurized Water Reactor (PWR) owned and operated by Excelon. TMI-1 is licensed to generate 2568 megawatts-thermal (MWt). The current facility operating license for TMI-1 expires on April 19, 2034. TMI-1 structures are located on the northern most section of Three Mile Island.

TMI-2 is owned by FirstEnergy Corporation (FirstEnergy). TMI-2 has been shut down since the accident in 1979 and since 1993 has been in a SAFSTOR condition known as "post-defueling monitored storage" pending decommisioning at some future time. The TMI-2 structures are intermingled with those of TMI-1; however the decommissioning of TMI-2 and TMI-1 are independent actions.

On June 20, 2017, Excelon informed the U.S. Nuclear Regulatory Commission (NRC) that TMI-1 will permanently cease power operations on or about September 30, 2019. A Decommissioning Schedule and Plant Status Summary is provided in this Fact Sheet.

Excelon is currently planning to decommision TMI-1 using the SAFSTOR method. SAFSTOR is a method of decomissioning in which a nuclear facility is placed and maintained in a condition that allows the facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use. Use of SAFSTOR method will require the management of spent fuel because of DOE's failure to perform its spent fuel removal obligations under its contract with Excelon.

The initial decommissioning activities to be performed after plant shutdown will entail preparing the plant for a period of safe-storage (also referred to as dormancy). This will entail de-fueling the reactor and transferring the fuel into spent fuel pool, draining fluids from and de-energizing systems that are no longer required, reconfiguring the electrical distribution, ventilation, heating, and fire protection systems, and minor deconstruction activities. Systems temporarily needed for continued operation of the spent fuel pool may be reconfigured for operational efficiency.

An outline of the schedule of the decommisisoning phases and a description of the decommisioning phases is summarized on the Decommisioning Phases chart.

Decommissioning Phases

Decommissioning Phase 1 – the period from permanent shutdown until permanent fuel removal Ends w/ Fuel In Fuel Pool Oct 2018

Activities include:

- Defuel reactor vessel.
- Implement work processes for decommissioning.
- Reduce staffing to reflect reduced emergency and security plan requirements from reduced reactor risk.

Decommissioning Phase 2 - the period from permanent fuel removal until end of the Zirconium (Zr) Fire Analysis Period Oct 1, 2018 → 16 mos. (Feb 2021)

Activities include:

- Implement defueled License and Technical Specifications.
- Implement defined plant configuration for SAFSTOR; reduce operating footprint.
- Establish configuration for spent fuel pool as part of Spent Fuel Pool Configuration Plan.

Decommissioning Phase 3 – the period from the end of the Zr Fire Analysis Period until fuel pool empty (fuel is in the ISFSI). → Dec. 2022

Activities include:

- Spent fuel pool operations and maintenance.
- Implement post Zr fire Emergency Plan and corresponding Emergency Response Organization (ERO) staffing reduction, eliminate offsite emergency response facilities.
- Transfer remaining fuel from wet to dry storage (ISFSI).

Decommissioning Phase 4 - the period from fuel in the ISFSI until License Termination.

Activities include: → 2075

- Complete fuel transfer to the Department of Energy (DOE), when available.
- Decontamination and dismantlement of contaminated structures and components.
- License Terminated (site released for unrestricted use).

Decommissioning Phase 5 - the period of Site Restoration following License Termination.

Activities include: → 2079

- Restore site to green-field

2.0 Treatment Facility Summary

2.1 Site location

The physical address for the facility is Route 441 South, Middletown, PA 17057. A topographical, an aerial photograph, and a site map of the facility are depicted as Figures 1 to 3.

Figure 4 depicts the current process diagram for the facility.

Figure 1: Topographical map of the subject facility

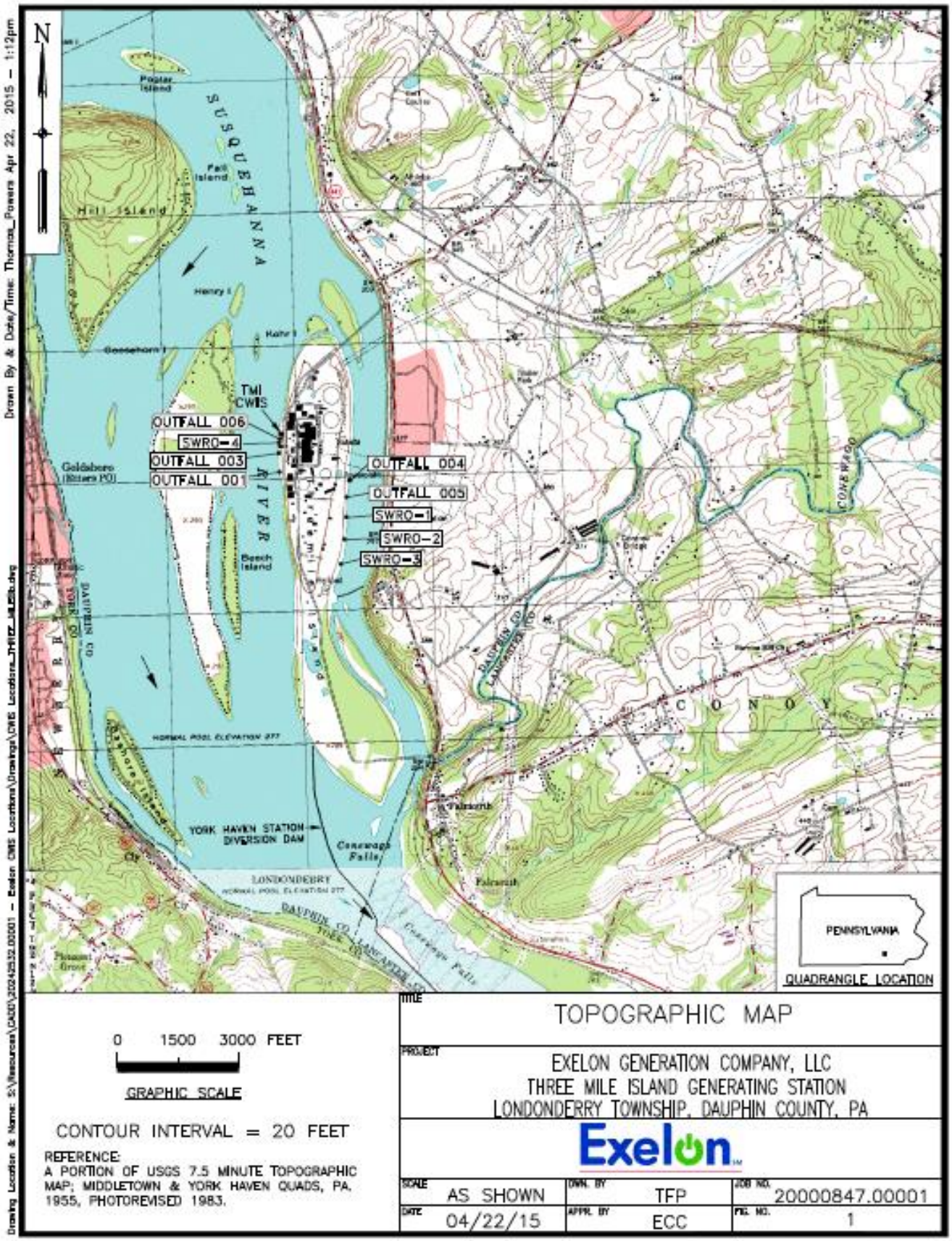


Figure 2: Aerial Photograph of the subject facility

Figure 3: Site Map

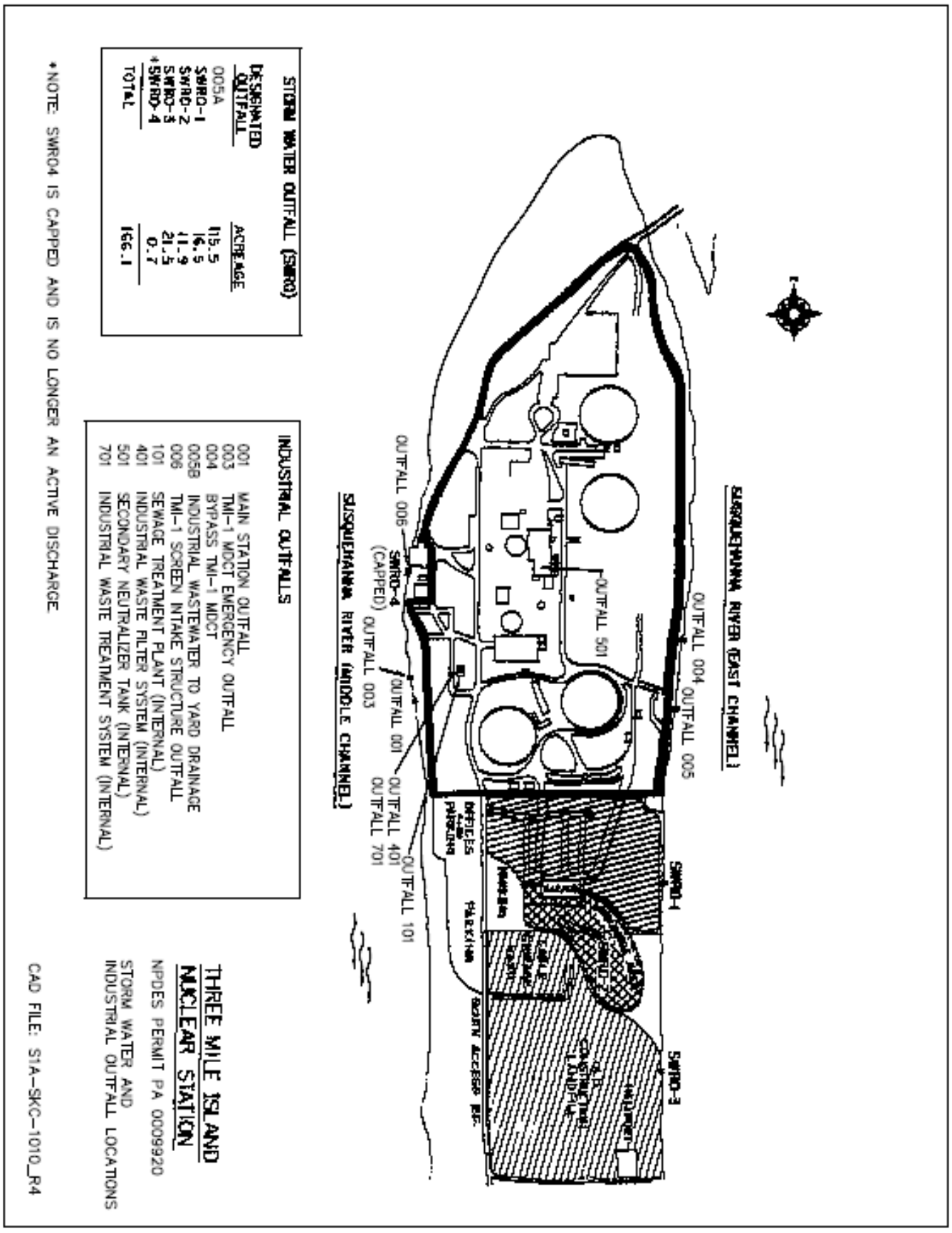
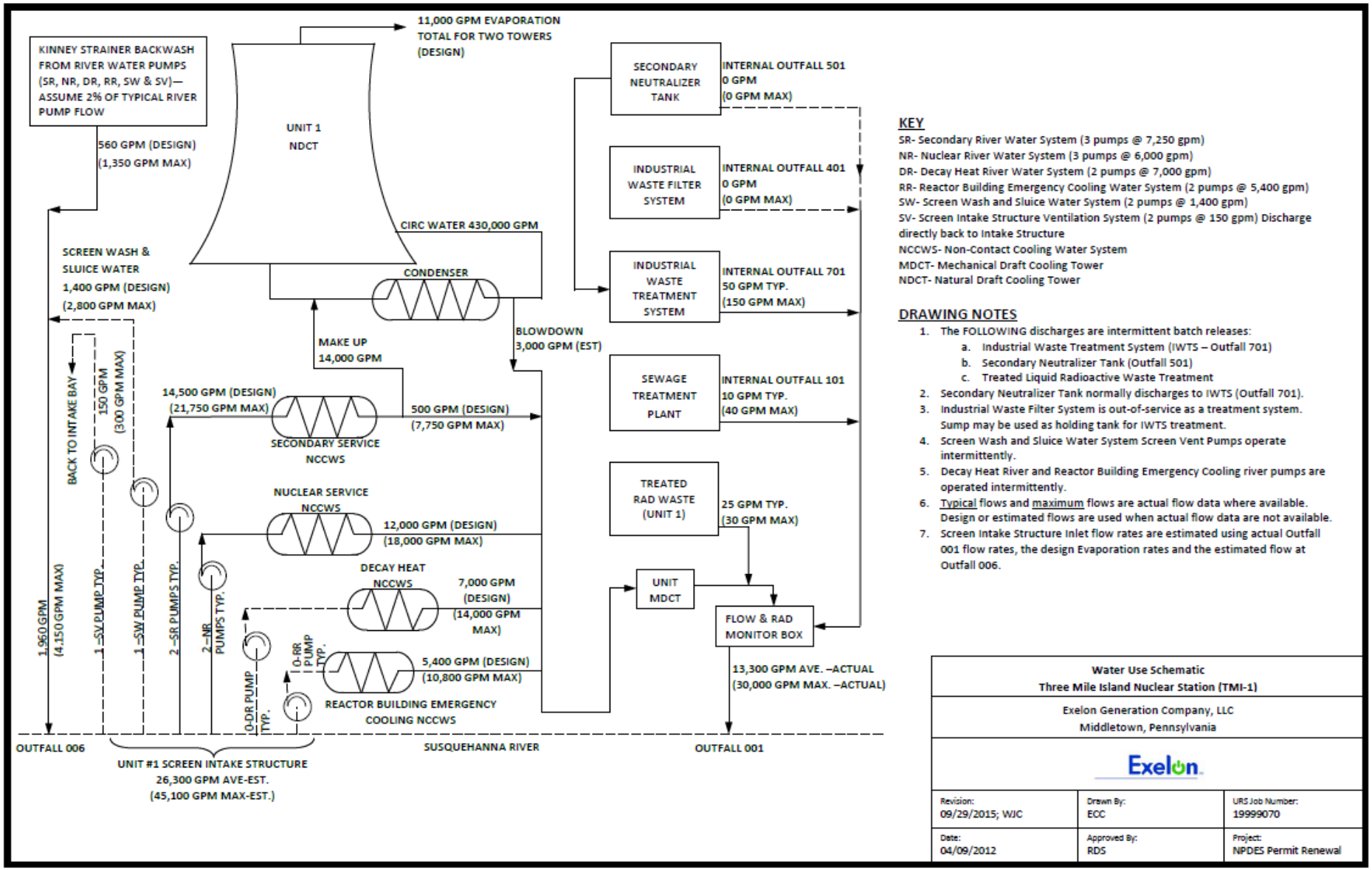


Figure 4- Current Flow Diagram For the Facility



2.2 Description of Wastewater Treatment Process

A process flow diagram that depicts the proposed flow diagram during the earlier phases of plant decommissioning is enclosed as Figure 4.

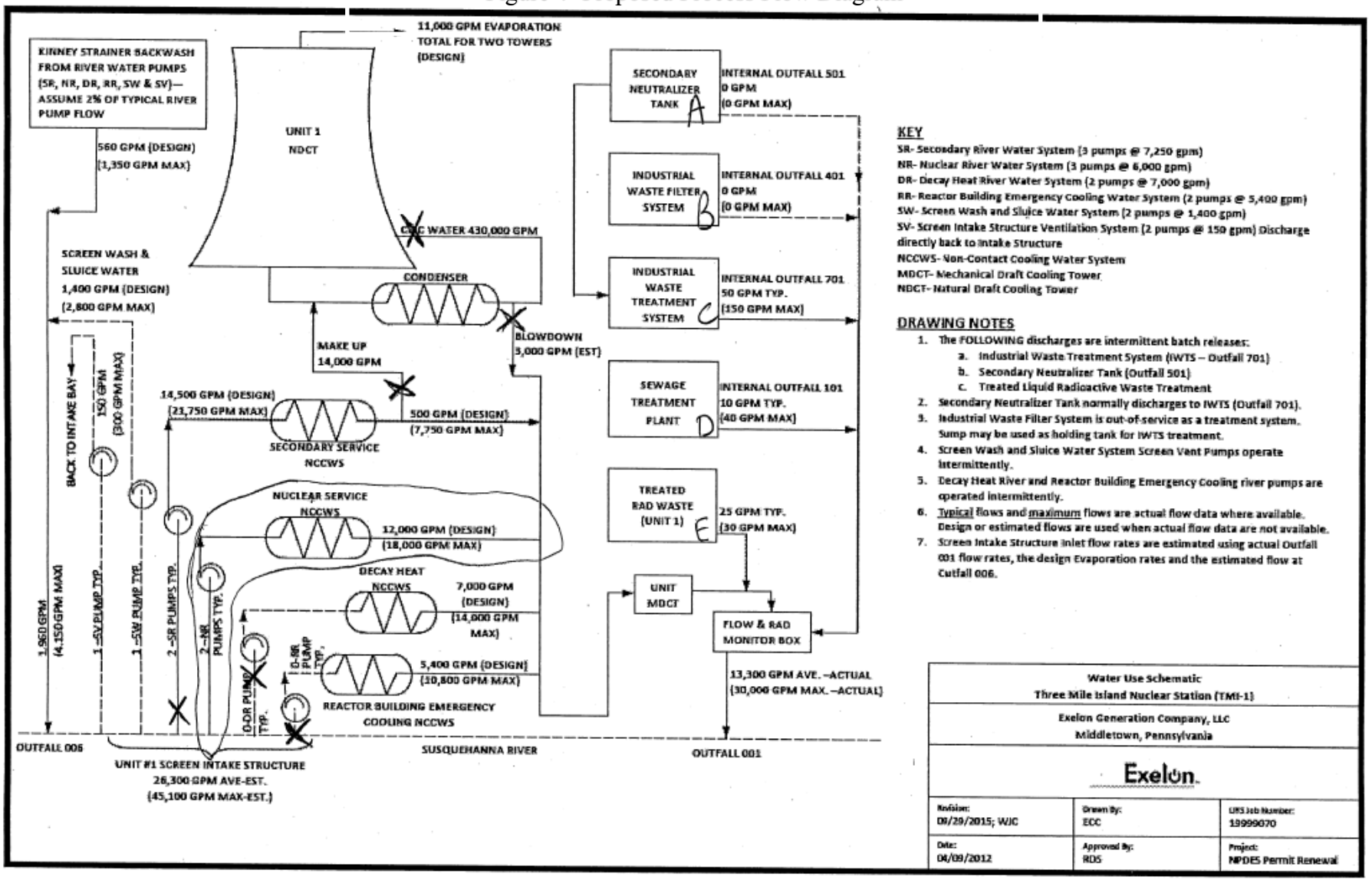
Concentrations of boron are anticipated to increase once TMI Unit-1 shuts down (approximately Sept 30, 2019) because the plant liquid waste treatment system will no longer have evaporators available. The evaporators operate using plant steam which is generated during power plant operation. The other steam sources for the evaporators are the TMI Auxiliary Boilers which are scheduled for decommissioning early in the overall plant decommissioning process.

The available option for treating plant wastewater containing boron is demineralization using ion exchange. In order to efficiently treat the plant wastewater containing radioactive materials the ion exchange media is designed to selectively remove radioactive material while passing boron through the media. The facility anticipates that during the decommisioning phase of TMI Unit-1 boron discharge concentration could increase to 5 mg/l.

The Nuclear Service Station will be the unit where process wastewater is generated. The flow rate generated for this waste stream is 12,000 gpm (17.28 MGD).

On the diagram, an “X” represents, flow streams that will no longer exist. Units labelled “A” and “B” were flow streams that existed in the mid-1990s are no longer actively utilized. Units “C” and “E” will be used during Phase 2 decommissioning. Unit “D” will have reduced flows as staffing personnel will be decreasing.

Figure 4- Proposed Process Flow Diagram



A, B – NOT USED SINCE MID 1990s

C – WILL BE USED DURING PHASE 2

D – WILL HAVE REDUCED FLOW

E – WILL BE USED DURING PHASE 2

X – FLOW NO LONGER CONTINUED

ANTICIPATED AS OF JUNE 2019

2.3 Facility Outfall Information

The facility has the following outfall information.

Outfall No.	001	**Design Flow (MGD)**	43
Latitude	40º 9' 8.00"	**Longitude**	-76º 43' 40.00"
Wastewater Description:	IW Process Effluent without ELG		

2.4 Existing NPDES Permits Limits

The existing NPDES permit limits effective June 1, 2010 and expiring October 31, 2012 for toxics is summarized in the table.

PART A

D. Specific Toxic Pollutant Notification Levels (for Manufacturing, Commercial, Mining, and Silvicultural Direct Dischargers) - The permittee shall notify the Department as soon as it knows or has reason to believe the following:

1. That any activity has occurred, or will occur, which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge on a routine or frequent basis will exceed the highest of the following "notification levels."

   a. One hundred micrograms per liter.

   b. Two hundred micrograms per liter for acrolein and acrylonitrile.

   c. Five hundred micrograms per liter for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol.

   d. One milligram per liter for antimony.

   e. Five times the maximum concentration value reported for that pollutant in the permit application.

   f. Any other notification level established by the Department.

2. That any activity has occurred or will occur which would result in any discharge, on a nonroutine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

   a. Five hundred micrograms per liter.

   b. One milligram per liter for antimony.

   c. Ten times the maximum concentration value reported for that pollutant in the permit application.

   d. Any other notification level established by the Department.

3.0 Facility NPDES Compliance History

3.1 Non-Compliance

3.1.1 Non-Compliance- NPDES Effluent

A summary of the non-compliance to the permit limits for the existing permit cycle is as follows.

From the DMR data beginning in March 1, 2018 to June 15, 2019, the following were the observed effluent non-compliances.

Summary of Non-Compliance NPDES Effluent Violations
Study Period- March 1, 2018 to June 15, 2019

OUTFALL	STAGE	NON COMPLIANCE DATE	NON COMPLIANCE TYPE	NON COMPLIANCE CATEGORY	PARAMETER	SAMPLE VALUE	VIOLATION CONDITION	PERMIT VALUE	UNIT OF MEASURE	STATISTICAL BASE CODE
001	Final Effluent	05/16/2018	Violation of permit	Concentration 3	Hydrazine	0.106	>	0.010	mg/L	Instantaneous Maximum

3.1.2 Non-Compliance- Enforcement Actions

A summary of the non-compliance enforcement actions for the current permit cycle is as follows:

No enforcement actions were observed in WMS from the time frame beginning March 1, 2018 to June 15, 2019.

3.2 Open Violations

No open violations existed as of June 2019.

4.0 Receiving Waters and Water Supply Information Detail Summary

4.1 Receiving Waters

The receiving waters has been determined to be the Susquehanna River. The Susquehanna River discharges into the Chesapeake Bay.

4.2 Public Water Supply (PWS) Intake

The closest PWS to the subject facility is PP&L Bruner Island (PWS ID #7670802) located approximately 4.5 miles downstream of the subject facility on the Susquehanna River. Based upon the distance and the flow rate of the facility, the PWS should not be impacted.

4.3 Class A Wild Trout Streams

Class A Wild Trout Streams are waters that support a population of naturally produced trout of sufficient size and abundance to support long-term and rewarding sport fishery. DEP classifies these waters as high-quality coldwater fisheries.

The information obtained from EMAP suggests that no Class A Wild Trout Fishery will be impacted by this discharge.

4.4 2016 Integrated List of All Waters (303d Listed Streams)

Section 303(d) of the Clean Water Act requires States to list all impaired surface waters not supporting uses even after appropriate and required water pollution control technologies have been applied. The 303(d) list includes the reason for impairment which may be one or more point sources (i.e. industrial or sewage discharges) or non-point sources (i.e.

abandoned mine lands or agricultural runoff and the pollutant causing the impairment such as metals, pH, mercury or siltation).

States or the U.S. Environmental Protection Agency (EPA) must determine the conditions that would return the water to a condition that meets water quality standards. As a follow-up to listing, the state or EPA must develop a Total Maximum Daily Load (TMDL) for each waterbody on the list. A TMDL identifies allowable pollutant loads to a waterbody from both point and non-point sources that will prevent a violation of water quality standards. A TMDL also includes a margin of safety to ensure protection of the water.

The water quality status of Pennsylvania's waters uses a five-part categorization (lists) of waters per their attainment use status. The categories represent varying levels of attainment, ranging from Category 1, where all designated water uses are met to Category 5 where impairment by pollutants requires a TMDL for water quality protection.

The receiving waters is listed in the 2016 Pennsylvania Integrated Water Quality Monitoring and Assessment Report as a Category 2, 3 and 5 waterbody. This stream is an attaining stream that supports recreational purposes. The receiving stream is also (a) a non-attaining stream impaired for aquatic life due to pH from an unknown source and (b) an impaired stream for fish consumption due to PCBs from an unknown source. The designated use has been classified as protected waters for warm water fishes and migratory fishes.

4.5 Low Flow Stream Conditions

Water quality modeling estimates are based upon conservative data inputs. The data are typically estimated using either a stream gauge or through USGS web based StreamStats program. The NPDES effluent limits are based upon the combined flows from both the stream and the facility discharge.

A conservative approach to estimate the impact of the facility discharge using values which minimize the total combined volume of the stream and the facility discharge. The volumetric flow rate for the stream is based upon the seven-day, 10-year low flow (Q710) which is the lowest estimated flow rate of the stream during a 7 consecutive day period that occurs once in 10 year time period.

The two gauge stations utilized to estimate Q710 are the Susquehanna River station at Harrisburg, PA and the Susquehanna River station at Marietta, PA. The facility is located approximately midway between the two gauge stations. The facility discharge is based upon a known design capacity of the subject facility.

The closest upstream WQN and gauge stations to the subject facility is the Susquehanna River station at Harrisburg, PA (WQN202 or USGS station number 1570500). This WQN station is located approximately 11 miles upstream of the subject facility while the gauge station is located 11 miles upstream of the subject facility.

The closest downstream WQN and gauge stations to the subject facility is the Susquehanna River station at Marietta, PA (WQN201 or USGS station number 1576000). This WQN station is located approximately 16 miles downstream of the subject facility while the gauge station is located 14 miles downstream of the subject facility.

For WQM modeling, the following data input assumptions were made:

- Three Mile Island is located in between the Susquehanna River at Harrisburg, PA and the Susquehanna River at Marietta, PA. The lowest Q710 between the two stations and the average drainage area between the two stations was utilized for low flow field.

- A report entitled Study of *Travel Time and Mixing Characteristics for the Susquehanna River Below Three Mile Island, Final Report, 1982* summarized the division of flow in each of the three channels. The east channel has 0% of the total flow during low flow conditions. The middle channel has 45% of the total flow during the low flow conditions. (Fact Sheet 05/12/1997, Page 16). The worst case drainage area for Three Mile Island was estimated to be 10,845 sq mi between the two gauge stations (24,100 sq mi * 0.45 = 10,845 sq mi).

The low flow yield and the Q710 for the subject facility was estimated as shown below.

Gauge Station Data		
USGS Station Number	01570500	
Station Name	Susquehanna River at Harrisburg, PA	
Q710	2440	ft^3/sec
Drainage Area (DA)	24,100	mi^2

Gauge Station Data		
USGS Station Number	01576000	
Station Name	Susquehanna River at Marietta, PA	
Q710	2420	ft^3/sec
Drainage Area (DA)	25,990	mi^2

Calculations

The low flow yield of the gauge station is:

Low Flow Yield (LFY) = Q710 / DA

LFY = (2420 ft^3/sec / ((24,100 + 25,990 mi^2)/2)

LFY = 0.0966 $ft^3/sec/mi^2$

The low flow at the subject site is based upon the DA of 10,845 mi^2

Q710 = (LFY@gauge station)(DA@Subject Site)

Q710 = (0..0966 $ft^3/sec/mi^2$)(10,845 mi^2)

Q710 = 1,047.9 ft^3/sec

5.0: Overview of Presiding Water Quality Standards

5.1 General

Effluent performance limits for the NPDES permit for toxics can be derived from water quality modeling.

5.2 Water Quality-Based Limitations

WQBEL are based on the need to attain or maintain the water quality criteria and to assure protection of designated and existing uses (PA Code 25, Chapter 92a.2). The subject facility that is typically enforced is the more stringent limit of either the TBEL or the WQBEL.

Determination of WQBEL is calculated by spreadsheet analysis or by a computer modeling program developed by DEP. DEP permit engineers utilize PENTOXSD for Windows 2.0 (PENTOXSD) for Toxics pollutants computing programs for WQBEL permit limitations

5.3.1 PENTOXSD Modeling

The PENTOXSD model is a computer model that is used to determine effluent limitations for toxics (and other substances) for single discharge wasteload allocations. This computer model uses a mass-balance water quality analysis that includes consideration for mixing, first-order decay, and other factors used to determine recommended water quality-based effluent limits. PENTOXSD does not assume that all discharges completely mix with the stream. The point of compliance with water quality criteria are established using criteria compliance times (CCTs). The available CCTs are either acute fish criterion (AFC), chronic fish criterion (CFC), or human health criteria (THH & CRL).

Acute Fish Criterion (AFC) measures the criteria compliance time as either the maximum criteria compliance time (i.e.15 minutes travel time downstream of the current discharge) or the complete mix time whichever comes first. AFC is evaluated at Q710 conditions.

Chronic Fish Criterion (CFC) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the complete mix time whichever comes first. CFC is evaluated at Q710 conditions.

Threshold Human Health (THH) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the estimated travel time downstream to the nearest potable water supply intake whichever comes first. THH is evaluated at Q710 conditions.

Cancer Risk Level (CRL) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the complete mix time whichever comes first. CRL is evaluated at Qh (harmonic mean or normal flow) conditions.

The PENTOXSD Model requires several input values for calculating output values. The source of data originates from either EMAP, the National Map, or Stream Stats. Data for stream gauge information, if any, was abstracted from USGS Low-Flow, Base-Flow, and Mean-Flow Regression Equations for Pennsylvania Streams authored by Marla H. Stuckey (Scientific Investigations Report 2006-5130).

Assumptions Made for PENTOXSD Modeling

The input values utilized for the modeling are summarized in the table which can be found in Attachment B. The assumption for the inputs are as follows.

- pH and stream water temperature data from the water quality network station was used.
  - pH was estimated to be 8.17 ((8.1 + 8.25) / 2 = 8.17)
  - Stream water temperature was estimated to be 24.6 C ((25.5 C + 23.75 C) / 2 = 24.6 C).
- Hardness was abstracted from the average of the two WQN stations
- Ratios for Q1-10, Q7-10, and Q30-10 were abstracted from the Susquehanna River at Harrisburg, PA (years 1974 - 2008)
- Number of samples collected per month is 4.

6.0 NPDES Parameter Details

6.1 PENTOXSD Modeling Results

To determine if PENTOXSD modeling is necessary, DEP has developed a Toxics Screening Analysis worksheet to identify toxics of concern. Toxic pollutants whose maximum concentrations as reported by the facility are greater than the most stringent applicable water quality criterion are pollutants of concern. A Reasonable Potential Analysis was utilized to determine (a) if the toxic parameters modeled would require monitoring or (b) if permit limitations would be required for the parameters.

The Toxics Screening Analysis- Water Quality Pollutants of Concern worksheet indicated PENTOXSD modeling was required since the concentrations measured in the effluent sample were not within the normal range for safe water quality protection.

The table below summarizes the screening recommendation for toxics. The results tabulated below are for a flow rate of 12,000 gpm (17.28 MGD).

Summary of PENTOXSD Screening Recommendations for Toxics

Parameter	Max Concentration in Application or DMR (µg/L)	Most Stringent WQBEL (µg/L)	Governing Criterion (AFC, CFC, THH, or CRL)	Screening Recommendation
Boron	5000	11,223.04	AFC	Monitor
Notes:				
- Assumes a flow rate up to 12,000 gpm				

6.2 Recommended Monitoring Requirements and Effluent Limitations

PENTOXSD modeling was run at both 6,000 gpm (8.64 MGD) and 12,000 gpm (17.28 MGD). Modeling suggests that boron may be discharged up to 17 mg/l for 6,000 gpm. Modeling suggests that boron may be discharged up to 11 mg/l for 12,000 gpm.

Based upon Table 6-4- Self Monitoring Requirements for Industrial Dischargers in the *Technical Guidance for the Development and Specifications of Effluent Limitations and Other Permit Conditions in NPDES Permits*, the recommended sampling frequency is 1/week as a grab sample. DEP concurs with the facility's request to utilize the facility's lab for the boron laboratory analysis.

Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☒	PENTOXSD for Windows Model (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Toxics Screening Analysis Spreadsheet (see Attachment)
☐	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:

Attachment A

Stream Stats/Gauge Data

14 **Selected Streamflow Statistics for Streamgage Locations in and near Pennsylvania**

Table 1. List of U.S. Geological Survey streamgage locations in and near Pennsylvania with updated streamflow statistics.—Continued

[Latitude and Longitude in decimal degrees; mi², square miles]

Streamgage number	Streamgage name	Latitude	Longitude	Drainage area (mi²)	Regulated[1]
01561000	Brush Creek at Gapsville, Pa.	39.956	-78.254	36.8	N
01562000	Raystown Branch Juniata River at Saxton, Pa.	40.216	-78.265	756	N
01562500	Great Trough Creek near Marklesburg, Pa.	40.350	-78.130	84.6	N
01563200	Raystown Branch Juniata River below Rays Dam nr Huntingdon, Pa.	40.429	-77.991	960	Y
01563500	Juniata River at Mapleton Depot, Pa.	40.392	-77.935	2,030	Y
01564500	Aughwick Creek near Three Springs, Pa.	40.213	-77.925	205	N
01565000	Kishacoquillas Creek at Reedsville, Pa.	40.655	-77.583	164	N
01565700	Little Lost Creek at Oakland Mills, Pa.	40.605	-77.311	6.52	N
01566000	Tuscarora Creek near Port Royal, Pa.	40.515	-77.419	214	N
01566500	Cocolamus Creek near Millerstown, Pa.	40.566	-77.118	57.2	N
01567000	Juniata River at Newport, Pa.	40.478	-77.129	3,354	Y
01567500	Bixler Run near Loysville, Pa.	40.371	-77.402	15.0	N
01568000	Sherman Creek at Shermans Dale, Pa.	40.323	-77.169	207	N
01568500	Clark Creek near Carsonville, Pa.	40.460	-76.751	22.5	LF
01569000	Stony Creek nr Dauphin, Pa.	40.380	-76.907	33.2	N
01569800	Letort Spring Run near Carlisle, Pa.	40.235	-77.139	21.6	N
01570000	Conodoguinet Creek near Hogestown, Pa.	40.252	-77.021	470	LF
01570500	Susquehanna River at Harrisburg, Pa.	40.255	-76.886	24,100	Y
01571000	Paxton Creek near Penbrook, Pa.	40.308	-76.850	11.2	N
01571500	Yellow Breeches Creek near Camp Hill, Pa.	40.225	-76.898	213	N
01572000	Lower Little Swatara Creek at Pine Grove, Pa.	40.538	-76.377	34.3	N
01572025	Swatara Creek near Pine Grove, Pa.	40.533	-76.402	116	N
01572190	Swatara Creek near Inwood, Pa.	40.479	-76.531	167	N
01573000	Swatara Creek at Harper Tavern, Pa.	40.403	-76.577	337	N
01573086	Beck Creek near Cleona, Pa.	40.323	-76.483	7.87	N
01573160	Quittapahilla Creek near Bellegrove, Pa.	40.343	-76.562	74.2	N
01573500	Manada Creek at Manada Gap, Pa.	40.397	-76.709	13.5	N
01573560	Swatara Creek near Hershey, Pa.	40.298	-76.668	483	N
01574000	West Conewago Creek near Manchester, Pa.	40.082	-76.720	510	N
01574500	Codorus Creek at Spring Grove, Pa.	39.879	-76.853	75.5	Y
01575000	South Branch Codorus Creek near York, Pa.	39.921	-76.749	117	Y
01575500	Codorus Creek near York, Pa.	39.946	-76.755	222	Y
01576000	Susquehanna River at Marietta, Pa.	40.055	-76.531	25,990	Y
01576085	Little Conestoga Creek near Churchtown, Pa.	40.145	-75.989	5.82	N
01576500	Conestoga River at Lancaster, Pa.	40.050	-76.277	324	N
01576754	Conestoga River at Conestoga, Pa.	39.946	-76.368	470	N
01578310	Susquehanna River at Conowingo, Md.	39.658	-76.174	27,100	Y
01578400	Bowery Run near Quarryville, Pa.	39.895	-76.114	5.98	N
01580000	Deer Creek at Rocks, Md.	39.630	-76.403	94.4	N
01581500	Bynum Run at Bel Air, Md.	39.541	-76.330	8.52	N
01581700	Winters Run near Benson, Md.	39.520	-76.373	34.8	N
01582000	Little Falls at Blue Mount, Md.	39.604	-76.620	52.9	N
01582500	Gunpowder Falls at Glencoe, Md.	39.550	-76.636	160	Y
01583000	Slade Run near Glyndon, Md.	39.495	-76.795	2.09	N
01583100	Piney Run at Dover, Md.	39.521	-76.767	12.3	N

Table 2. Selected low-flow statistics for streamgage locations in and near Pennsylvania.—Continued

[ft³/s; cubic feet per second; —, statistic not computed; <, less than]

Streamgage number	Period of record used in analysis[1]	Number of years used in analysis	1-day, 10-year (ft³/s)	7-day, 10-year (ft³/s)	7-day, 2-year (ft³/s)	30-day, 10-year (ft³/s)	30-day, 2-year (ft³/s)	90-day, 10-year (ft³/s)
01565000	1941–2008	37	17.6	18.6	28.6	20.3	32.4	24.4
01565700	1965–1981	17	.4	.4	.9	.5	1.1	.8
01566000	1913–2008	52	4.3	7.9	18.8	12.4	25.6	19.2
01566500	1932–1958	27	1.7	2.4	4.0	3.2	5.7	4.9
01567000	[2]1974–2008	35	504	534	725	589	857	727
01567000	[3]1901–1972	72	311	367	571	439	704	547
01567500	1955–2008	54	2.0	2.2	3.3	2.6	3.8	3.1
01568000	1931–2008	78	12.7	15.5	25.5	19.2	32.0	26.0
01568500	[2]1943–1997	55	1.8	2.3	4.3	2.7	5.0	3.1
01569000	1939–1974	14	2.6	4.0	7.4	5.1	9.4	7.8
01569800	1978–2008	31	15.9	17.0	24.4	18.4	26.1	20.3
01570000	[3]1913–1969	35	—	63.1	110	76.1	124	95.3
01570000	[2]1971–2008	38	63.1	69.3	109	78.3	125	97.8
01570500	[3]1901–1972	72	2,310	2,440	4,000	2,830	4,950	3,850
01570500	[2]1974–2008	35	3,020	3,200	5,180	3,690	6,490	4,960
01571000	1941–1995	16	.1	.2	.6	.3	1.2	.8
01571500	1911–2008	62	81.6	86.8	115	94.0	124	105
01572000	1921–1984	14	2.1	2.3	4.8	3.0	6.5	4.5
01572025	1990–2008	17	15.2	16.4	26.7	18.5	34.6	27.7
01572190	1990–2008	17	19.1	20.5	36.2	23.9	45.8	35.3
01573000	1920–2008	89	18.0	22.0	52.0	30.8	69.2	50.9
01573086	1965–1981	17	.5	.6	2.6	.8	3.3	1.1
01573160	1977–1994	18	26.9	29.6	46.4	33.6	51.9	39.5
01573500	1939–1958	20	1.3	1.4	2.5	1.8	3.2	2.6
01573560	1977–2008	30	50.3	62.0	104	76.9	131	108
01574000	1930–2008	79	8.0	11.1	32.0	17.7	47.0	33.9
01574500	[2]1968–2008	41	14.2	24.0	35.9	29.4	42.0	33.3
01574500	[3]1930–1966	34	2.3	7.1	11.5	9.3	14.8	12.7
01575000	[2]1973–1995	23	.7	1.4	6.7	3.2	12.0	9.3
01575000	[3]1929–1971	43	.1	.6	10.3	2.3	15.0	6.1
01575500	[2]1948–1996	49	12.1	18.7	41.3	23.9	50.0	33.8
01576000	[3]1933–1972	40	2,100	2,420	4,160	2,960	5,130	4,100
01576000	[2]1974–2008	35	2,990	3,270	5,680	3,980	7,180	5,540
01576085	1984–1995	12	.4	.5	.8	.7	1.2	1.2
01576500	1931–2008	78	27.2	38.6	79.4	49.1	97.3	66.1
01576754	1986–2008	23	74.2	84.9	151	106	189	147
[4]01578310	1969–2008	40	549	2,820	5,650	4,190	7,380	6,140
01578400	1964–1981	18	1.4	1.5	2.7	1.9	3.2	2.5
[4]01580000	1928–2008	81	19.7	22.8	48.1	28.1	51.8	35.4
[4]01581500	1946–2008	28	.2	.3	1.2	.8	1.7	1.5
[4]01581700	1969–2008	40	4.7	5.5	17.5	8.1	18.3	12.0
[4]01582000	1946–2008	63	11.3	12.5	25.0	15.5	28.0	20.3
[4]01582500	1979–2008	27	41.2	43.9	78.8	53.8	90.6	74.1
[4]01583000	1949–1981	33	.3	.3	.7	.3	1.0	.6
[4]01583100	1984–2008	15	2.1	2.4	5.5	3.2	6.0	4.2

Attachment B

Modeling Input Values (Run #1- 6,000 GPM)

Modeling Input Values (Run #2- 12,000 GPM)

Toxics Screening Analysis

PENTOXSD Modeling Output Values