pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

SOUTHWEST REGIONAL OFFICE
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0005037**
Facility Type	**Industrial**	APS ID	**805959**
Major / Minor	**Major**	Authorization ID	**966662**

NPDES PERMIT FACT SHEET ADDENDUM

Applicant and Facility Information

Applicant Name	**NRG Homer City Services LLC**	Facility Name	**Homer City Generating Station**
Applicant Address	211 Carnegie Center	Facility Address	1750 Power Plant Road
	Princeton, NJ 08540		Homer City, PA 15748-8009
Applicant Contact	Gary Cline	Facility Contact	***same as applicant***
Applicant Phone	724-479-6255	Facility Phone	***same as applicant***
Client ID	299819	Site ID	236714
SIC Code	4911	Municipality	Center Township
SIC Description	Trans. & Utilities - Electric Services	County	Indiana
Date Published in PA Bulletin	July 26, 2014	EPA Waived?	No
Comment Period End Date	September 9, 2014	If No, Reason	Major Facility / TMDL
Purpose of Application	NPDES permit renewal for a coal-fired power generating station		

Internal Review and Recommendations

At the request of Sierra Club, the public comment period for the draft permit was extended by 15 days from August 25, 2014 to September 9, 2014. Responses to comments on the 2014 draft permit are provided in this document. Outfall-specific revisions to requirements in the 2014 draft permit are provided after the comment responses.

By email dated August 14, 2014, EPA submitted the following comments on the draft permit. DEP's responses are provided following each comment.

EPA Comment 1: Section 316(b) of the Clean Water Act (CWA) requires that the location, design, construction and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. Some CWA § 316(b) requirements have been proposed in Part C.II. EPA has finalized standards on CWA § 316(b). Any facility not covered by these national rules will continue to be subject to section 316(b) requirements set by the EPA, state or territorial NPDES Permitting Director on a case-by-case, best professional judgment basis. According to Part B.I.B.1., this permit once [it] is issued may be modified to incorporate any requirements regarding, but not limited to, CWA § 316(b).

Response to EPA Comment 1: Conditions applicable to existing cooling water intake structures were added to Part C of the permit.

EPA Comment 2: EPA is proposing to amend the effluent limitations guidelines (ELGs) and standards for the Steam Electric Power Generating Category set forth in 40 CFR Part 423. A proposed rule was published on June 7, 2013. The proposed rule would establish new or additional requirements for wastewater streams from the following processes and byproducts associated with steam electric power generation: FGDs, fly ash, bottom ash, flue gas mercury control, and gasification of fuels such as coal and petroleum coke. The proposed rule as written identifies certain pollutants of concern expected to be present in the effluent of this category, and also assigns technology-based effluent limitations (TBELs) in addition to those already required by federal regulations. These pollutants have been identified as, but are not limited to, Total Suspended Solid, Oil and Grease, Copper, Iron, Arsenic, Nitrate Nitrite as N, Mercury, Selenium, Total Dissolved Solid, Total Residual Chlorine, Free Available Chlorine, Chromium, Zinc, and Bromide.

Approve	Return	Deny	Signatures	Date
✓			Ryan C Decker Ryan C. Decker, P.E. / Environmental Engineer	6/29/18
✓			Michael E. Fifth Michael E. Fifth, P.E. / Environmental Engineer Manager	6/29/18

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In preparation for these revisions, EPA conducted a detailed study to review discharges from this category and to determine whether the current effluent guidelines should be revised. Findings indicated that wastewater streams contain pollutants that can have detrimental impacts to the environment. Hence, the need for the current ELGs to be revised due to the identification of new processes and byproducts associated with this category, including pollutants expected to be present in effluents. To assist in the development of effluent limits while the ELGs are being revised, EPA issued the NPDES Permitting of Wastewater Discharges from Flue Gas Desulfurization (FGD) and Coal Combustion Residuals (CCR) Impoundment at Steam Electric Power Plants guidance, dated June 7, 2010 (hereinafter referred to as "the guidance"). The guidance was forwarded to all EPA Region III permitting authorities.

The Permitting Authority should consider the guidance and the obligations under CWA § 301 in this and future permit reissuance, or modifications to this permit, and establish/document appropriate effluent limitations for these waste streams. Facilities covered under 40 CFR Part 423 Steam Electric Power Point Source Category, and use FGD systems and CCR Impoundments or will use them in the future should use the procedures in the guidance to permit these systems until EPA has revised related ELGs.

The Permitting Authority shall determine final effluent limitations that meet technology and water quality standards and anti-backsliding requirements. For the [pollutants] expected to be present in effluent, the Permitting Authority, at a minimum, should use the information from the effluent and receiving water characterization to assess the need for water quality-based effluent limitations (WQBELs) until the proposed rule has been finalized and then issued. EPA also recommends that the Permitting Authority incorporate monitoring and reporting requirements as set forth in 40 CFR § 122.21(g)(7) for facilities to identify the presence of these pollutants in effluent in the draft permit, including internal monitoring points and main outfalls.

The Permitting Authority should work with permitted entities to determine if the pollutants expected to be present in effluent have been quantified in the regulated waste streams, and if not, develop procedures in the permitting process to develop the required information. The quantification of these pollutants will strengthen overall development of potential water quality limits and prepare dischargers to comply with the revised ELGs.

EPA expects, at a minimum, that these pollutants or any other relevant pollutant be quantified in the regulated wastestreams, and/or have been taken into account by using the permitting process to develop the required information.

Parameters of concern expected to be present in effluent: Aluminum; Arsenic; Barium; Bromide; Cadmium; Chloride; Chromium; Copper; Iron; Lead; Manganese; Mercury; Nickel; Nitrate/Nitrite; Oil and Grease; Selenium; Silver; Sulfate; Thallium; Total Dissolved Solid; Total Residual Chlorine; Total Residual Chlorine; Total; Suspended Solids, and; Zinc.

Response to EPA Comment 2: After EPA submitted comments in 2014, updated ELGs for the Steam Electric Power Generating Point Source Category were finalized on November 3, 2015 (2015 Rule). The 2015 Rule was amended in 2017 to extend BAT compliance dates for certain waste streams, including FGD wastewater. The 2015 Rule, with the 2017 amendments, remains in effect including BAT determinations for FGD wastewater and combustion residual leachate. EPA considered the identified pollutants as part of establishing BAT in the 2015 Rule, so DEP will not consider additional technology-based effluent limits for those pollutants. Also, DEP already performed a reasonable potential analysis for the identified pollutants and imposed the necessary WQBELs at Outfall 027. However, that analysis will be done again using different inputs as described later in this Fact Sheet Addendum.

EPA Comment 3: The draft permit as written proposes some effluent limits either as short-term or long term limits only. According to 40 CFR § 122.45(d)(1), effluent limits for continuous discharges shall, unless impracticable, be stated as maximum daily and average monthly discharge limitations. This requirement for short and long-term limits should also be applied to these parameters.

Response to EPA Comment 3: Presuming that EPA is referring to effluent limits for TMDL parameters, the draft permit imposed both average monthly and maximum daily concentration limits for aluminum, iron, and manganese at outfalls with continuous discharges. Cumulative annual loads also were imposed for those parameters. The Kiskiminetas-Conemaugh River Watershed TMDL does not impose cumulative annual load limits as average monthly and maximum daily limits and it is impracticable to do so. In previous discussions with EPA regarding TMDL implementation, it was determined that calculating monthly limits and daily limits by dividing an annual load by 12 and 365, respectively, was technically incorrect. Consider: if a facility was authorized to discharge 365 pounds per year and a maximum daily load limit was calculated by dividing the annual load by 365 days per year, then the facility would only be allowed to discharge one pound per day. However, for any subset of days within that year, the facility could discharge more load on one or more days and less load on other days and still comply with the annual load. Provided that the days of increased loading in excess of one pound per day did not violate

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water quality standards (as confirmed by a reasonable potential analysis), water quality standards would be achieved locally and watershed-wide.

EPA Comment 4: The draft permit as written proposes schedules of compliance to provide the permittee with time frames to achieve compliance with terms and conditions of this draft permit. Schedules of compliance developed under regulations set forth in 40 CFR 122.47 must require compliance by the permittee as soon as possible, but shall not extend the date for final compliance beyond compliance dates established by the CWA. If a permit establishes a schedule of compliance which exceeds 1 year from the date of permit issuance, the schedule shall set forth interim requirements and the dates for their achievement. Please revise all schedules of compliance proposed in this draft permit, including their rationale, if applicable.

Response to EPA Comment 4: All schedules of compliance in the draft NPDES permit exceeding one year included interim requirements. Outfall 003 was eliminated, so the schedule of compliance for temperature limits at that outfall no longer applies.

EPA Comment 5: This facility is affected by the Kiski-Conemaugh TMDL. The fact sheet explains that the facility requested PADEP to determine whether WLAs assigned to outfalls can be transferred to other outfalls. Based on our mutually [sic] understanding, PADEP is allowing the transfer of loading subject to certain rules. However, it is unclear where these rules/requirements have been address [sic] in the draft permit.

Response to EPA Comment 5: The rules DEP developed for transferring TMDL wasteload allocations at this facility were not stated in the permit, but the draft permit's TMDL effluent limits reflect the implementation of those rules as documented in the Fact Sheet. The revised draft permit—discussed later in this Fact Sheet Addendum—documents deviations from the previously established TMDL wasteload allocation transfer rules and the basis for those deviations.

By letter dated September 9, 2014, NRG Homer City Services LLC (NRG HCS) submitted the following comments on the draft permit. DEP's responses are provided following each comment.

Comment II.A.1: Effluent flow should correspond to the water quality criteria for the parameters being modeled.

Response to Comment II.A.1: The PENTOXSD analyses will be redone using average flows.

Comment II.A.2: It is unreasonable and inappropriate for the Department to apply effluent limits developed for continuous discharge process outfalls to associated non-continuous outfalls that discharge infrequently as a result of storm or other infrequent discharge events.

Response to Comment II.A.2: With a few exceptions—including federally-regulated coal pile runoff discharging from the Station's coal desilting ponds and other semi-regular overflows—emergency overflow outfalls will be removed from the permit. DEP has decided that it will not presume that emergency overflows constitute bypasses under 40 CFR § 122.41(m) and that rare, infrequent discharges associated with greater-than-design-basis storm events should not be authorized by the NPDES permit. See DEP's Response to Comment II.F.2 for further discussion.

The emergency overflows that remain in the permit will be subject to TBELs and/or WQBELs based on the specific discharge circumstances of each overflow and not the circumstances associated with the outfalls where overflowing water would have discharged under design conditions.

Comment II.B.1: Annual Mass Loading Limits should be reported on a subwatershed basis.

Response to Comment II.B.1: The problem with TMDL load limits imposed on a sub-watershed basis is that any one outfall contributing to the sub-watershed's total load could violate water quality criteria. That is, the net loading in the sub-watershed may not increase, but any one discharge contributing to the discharge loading in the sub-watershed could still violate water quality criteria locally if the discharges are not individually capped at specific loads that don't result in excursions above criteria and/or if all the facility's discharges in that sub-watershed are not subject to concentration limits equivalent to water quality criteria.

Sub-watershed wasteload allocations may be appropriate for TMDLs that limit parameters without numeric water quality criteria, such as sediment, but sub-watershed wasteload allocations are not appropriate for TMDL parameters that do have numeric water quality criteria (i.e., aluminum, iron, and manganese).

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Comment II.B.2: Annual Mass Loading Limits for intermittent outfalls should be reported on a subwatershed basis.

Response to Comment II.B.2: See Response to Comment II.B.1.

Comment II.B.3: Stormwater runoff should be adjusted for infiltration and other factors.

Response to Comment II.B.3: A condition will be added to Part C of the permit requiring the use of the SCS Runoff Curve Number Method described in USDA Natural Resources Conservation Service's Technical Release 55. Use of that method would apply in instances where the preferred alternative—flow meters/totalizers—are impracticable for a storm water discharge.

Comment II.B.4: Source Reduction Evaluations (SRE) should not be required at emergency overflow or emergency bypass outfalls.

Response to Comment II.B.4: The permit will be modified to eliminate interim requirements from emergency overflow outfalls, including the TRE requirements. See DEP's Response to Comment II.C.2 for additional discussion of TRE requirements.

Comment II.B.5: The conditions warranting submittal of a WQM Part II permit application are ambiguous and should be clarified.

Response to Comment II.B.5: Non-structural alternatives, for the purposes of Part C, Section V the 2014 draft permit, are any alternatives that do not require a Water Quality Management Permit as defined in 25 Pa. Code § 91.1:

> *Water quality management permit*—A permit or equivalent document (Part II Permit) issued by the Department to authorize one of the following:
>
> (i) The construction, erection and location of a wastewater collection, conveyance or treatment facility.
>
> (ii) A discharge of wastewater to groundwaters of this Commonwealth.

Non-structural alternatives would include management practices and operational changes that do not involve the construction of wastewater collection, conveyance, or treatment facilities.

Comment II.C.1: Toxicity Reduction Evaluation requirements on process outfalls should be deferred for 1 year.

Response to Comment II.C.1: Outfalls 003 and 004 were re-routed to the Cooling Tower Clarifier and are no longer subject to WQBELs or the TRE condition. Outfalls 001 and 027 will be subject to a schedule of compliance (not a TRE) and final compliance with WQBELs will be required by the final month of the forthcoming five-year permit term in consideration of NRG HCS's proposed schedule for elimination of FGD discharges as discussed later in this Fact Sheet Addendum.

Comment II.C.2: TREs should not be imposed on outfalls that discharge infrequently as a result of substantial storm events or equipment malfunctions.

Response to Comment II.C.2: Outfall 015 and IMPs 126 and 226 were eliminated and Outfalls 020, 029 (as the L-1 emergency overflow in the 2014 draft), 113, 413, and 913 are being removed from the permit. The remaining outfalls addressed in NRG HCS's comment, 016 and 018, will not be subject to interim requirements or the TRE. WQBELs for those outfalls will take effect immediately. As NRG HCS states, there are no reasonable corrective measures that can be applied to the emergency overflow outfalls (other than increasing storage capacity), so whether NRG HCS is given time to comply would have no bearing on whether WQBELs at those outfalls can be achieved.

Comment II.C.3: The TRE condition in the Draft Permit, Part C.IV, needs to identify specific parameters to be evaluated at each outfall requiring a TRE.

Response to Comment II.C.3: The TRE condition will be modified to identify which parameters are subject to the TRE requirements.

Comment II.C.4: TRE condition in the Draft Permit, Part C.IV.D.2., needs to be revised.

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Response to Comment II.C.4: The language of the TRE condition comes from Appendix A of DEP's *Water Quality Toxics Management Strategy*. All facilities subject to a TRE are subject to the same condition. Replacing "all available" with "practicable" could result in NRG HCS's exclusion of pollution control options that DEP may consider to be practicable without affording DEP the opportunity to review those available options and NRG HCS's justification for considering them impracticable.

Comment II.D.1: Stormwater diversion channels are not surface waters for NPDES permitting.

Response to Comment II.D.1: As artificial channels of conveyance of surface water, the storm water diversion channels are "waters of the Commonwealth" as defined in the Pennsylvania Clean Streams Law (35 P.S. § 691.1).

Comment II.D.2: Outfalls 013 and 029 (in expired permit) should be reinstated and "outfalls" discharging to the stormwater channels should be eliminated or re-designated as IMPs to Outfall 013 or Outfall 029, as appropriate.

Response to Comments II.D.1 and II.D.2: Recognizing potential interference with Solid Waste Permit #300491 requirements, Outfall 013 will be reinstated in the permit. Monitoring locations for emergency overflows from Leachate Storage Impoundments L-2, L-3, and L-4 and Sedimentation Basins SB-1, SB-2, and SB-3 (113, 313, 413, 513, 713, and 913) will be removed from the permit. The remaining principal spillway discharges from Sedimentation Basins SB-1, SB-3, and SB-3 (213, 613, and 813) will be re-designated at internal monitoring points.

Outfall 029 will be reinstated in the permit as the discharge location for storm water in the western drainage channel. IMP 129 for emergency overflows from Leachate Storage Impoundment L-1 will be removed from the permit.

DEP reserves its right to regulate discharges to the eastern and western channels of the ash landfill as either discharges of industrial waste or other sources of pollution to waters of the Commonwealth pursuant to Sections 307, 401, and/or 402 of the Clean Streams Law.

Comment II.E.1: The requirement to monitor for TDS, Chloride, Bromide and Sulfate at intermittent outfalls is unreasonable, unduly burdensome and will not add to information about these parameters in the receiving watersheds.

Response to Comment II.E.1: TDS, chloride, bromide, and sulfate are conservative pollutants; they do not readily settle out of the water column and would consequently persist in downstream receiving waters. Therefore, useful information pertaining to the outfalls' contributions of TDS, chloride, bromide, and sulfate to the watershed would still be provided by monitoring for those pollutants, even for intermittent discharges.

Outfalls/IMPs 003, 004, 015, 020, 126, 226, 026, 029 (as 129), 113, 413, and 913 will be removed from the permit as explained in other comment responses. The monitoring points that remain of those listed in Comment II.E.1—Outfalls 001, 016, 027—will still be subject to TDS, chloride, bromide, and sulfate monitoring. Outfalls 001 and 027 are continuous discharges and should be monitored for TDS, chloride, bromide, and sulfate. Outfall 016 is an intermittent discharge, but if it discharges as infrequently as NRG HCS suggests (historically, not very often), then monitoring for TDS, chloride, bromide, and sulfate at those location is not unreasonable or unduly burdensome.

Comment II.F.1: Effluent limits should not be applied to emergency overflow outfalls.

Response to Comment II.F.1: Most of the Station's emergency overflow outfalls will be removed from the permit. See DEP Responses to II.A.2 and II.F.2.

DEP notes that there are justifiable bases for imposing water quality-based limits on discharges from emergency overflow outfalls. Specifically, as stated in the Fact Sheet (pp. 70-71), the Kiskiminetas-Conemaugh River Watershed TMDL requires the imposition of TMDL limits to control excursions that may occur during high flow conditions as well as low flow conditions because the TMDL was developed with consideration for both. Some abandoned mine discharges only discharge during high flow events and can cause critical loading in waters of the Commonwealth at those times. If there is an overflow from one of the Station's ponds to a critically-loaded stream during those high flow events, then TMDL-based water quality limits apply at those times consistent with the requirements of 40 CFR § 122.44(d)(1)(vii)(B) and independent of DEP's $Q_{7\text{-}10}$ design flow conditions for water quality modeling in 25 Pa. Code § 96.4(g).

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Furthermore, even if critical loading does not occur at high flows, an overflow with high pollutant concentrations that discharges frequently could still violate water quality criteria more than 1% of the time (in violation of 25 Pa. Code § 96.3(c)) if the overflow discharges to the headwaters of a stream where the availability of assimilative capacity is low even during heavy rainfall events.

40 CFR Part 423's TSS effluent limit exemption for discharges of coal pile runoff exceeding the 10-year, 24-hour storm water runoff volume appears to be a recognition on the part of EPA that there is volume of coal pile runoff that can economically be treated as part of Best Practicable Control Technology, but the coal pile runoff effluent limit exemption applies to TBELs and not WQBELs. The exemption also does not apply broadly to any overflow.

Unlike TBELs, the difficulty of achieving WQBELs is not a factor in the development of WQBELs. However, the difficulty of economically treating wet weather flows to achieve applicable WQBELs would be recognized by 25 Pa. Code § 92a.51 – Schedules of Compliance and 25 Pa. Code § 95.4 — Extensions of time to achieve water quality based effluent limitations.

Comment II.F.2: Emergency Overflows are Not Bypasses

Response to Comment II.F.2: The following monitoring locations for emergency overflows will be removed from the permit:

- IMP 506 – Lime Storage Area Stormwater Basin Overflow
- Outfall 009 – Greenhouse Pond Overflow
- Outfall 014 – Dredge Pond Overflow
- IMP 020 – Ash Landfill Surge Pond Overflow
- IMP 129 – Leachate Storage Pond L-1 Overflow
- IMP 113 – Leachate Storage Pond L-2 Overflow
- IMP 313 – Sedimentation Basin SB-1 Overflow
- IMP 413 – Leachate Storage Pond L-3 Overflow
- IMP 513 – Sedimentation Basin SB-2 Overflow
- IMP 713 – Sedimentation Basin SB-3 Overflow
- IMP 913 – Leachate Storage Pond L-4 Overflow
- Outfall 031 – Sedimentation Basin SB-5 Overflow
- Outfall 033 – Sedimentation Basin SB-4 Overflow
- Homer City Coal Cleaning Plant (Proposed Outfall 004) – Coal Processing Recirculation Pond Overflow

DEP has decided that it will not presume that emergency overflows from any of the above-identified monitoring locations constitute bypasses under 40 CFR § 122.41(m). DEP cannot assign, upfront, an intent-to-divert (or lack of intent-to-divert) to all overflows that may occur from these facilities. Whether any specific overflow event is intentional depends on the circumstances of the specific overflow event. Overflows from the facilities listed above would be expected to occur under circumstances so infrequent that compliance with water quality criteria will nonetheless be maintained 99% of the time as required by 25 Pa. Code § 96.3(c). In support of that claim, DEP reviewed DMR data dating back to January 2012. With the exception of Outfalls 031 and 033, which do not exist yet, no discharges have been reported at any of the overflow outfalls listed above.

The deauthorization of discharges from these locations as part of the renewed permit means that any overflow from the associated facilities would result in non-compliance. The burden of proof is on NRG HCS to explain why an overflow occurred and, if applicable, to justify that the overflow was allowable as a bypass and not subject to potential enforcement action pursuant to either 40 CFR § 122.41(m)(2) or (m)(4). As NRG HCS proposed in Comment II.F.3, a condition will be included in the permit requiring NRG HCS to submit a written report to DEP within 15 days of an overflow from one of the facilities listed above. The report shall include the location of the discharge, the approximate discharge duration, approximate volume of water discharged, the meteorological conditions preceding and during the overflow, and an explanation of why the overflow occurred (whether attributable to storm events exceeding the design basis of the facility or other reason). The condition also will require follow-up analytical results for TSS, pH, aluminum, iron, and manganese.

Notwithstanding the removal of most overflow outfalls from the permit, DEP notes that there are justifiable bases for imposing water quality-based limits on discharges from emergency overflow outfalls if the overflows occur with regularity and would consequently risk violation of water quality criteria more than 1% of the time. Specifically, as stated in the Fact Sheet, the Kiskiminetas-Conemaugh River Watershed TMDL requires the imposition of TMDL limits to control excursions that may occur during high flow conditions as well as low flow conditions because the TMDL was developed with consideration for both. Some abandoned mine discharges only discharge during high flow events and can cause critical loading at those times. If there is

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an overflow from one of NRG HCS's basins during those high flow events, then TMDL-based water quality limits apply at those times consistent with the requirements of 40 CFR § 122.44(d)(1)(vii)(B) and independent of DEP's Q_{7-10} design flow conditions for water quality modeling in 25 Pa. Code § 96.4(g).

Comment II.F.3: Infrequent discharges from emergency overflow outfalls should be subject to monitoring and reporting conditions only.

Response to Comment II.F.3: See the preceding Responses to Comments II.F.1 and II.F.2. DEP is removing most of the Station's emergency overflow outfalls from the permit.

EPA's handling of coal pile runoff in 40 CFR Part 423 does not inform DEP's handling of basin overflows in all circumstances. Even if the exemption for discharges from facilities designed, constructed, and operated to treat the volume of runoff associated with the 10-year, 24-hour rainfall event were applied generally to any similarly designed facility, that exemption would only apply to TBELs and not to WQBELs.

NRG HCS's suggested permit condition regarding the reporting of emergency overflows will be included in Part C of the permit and will apply to emergency spillway discharges from outfalls/monitoring locations that will be removed from the permit as listed in the Response to Comment II.F.2.

Comment II.F.4: Modeled effluent limits for process outfalls should not be applied to emergency overflow outfalls.

Response to Comment II.F.4: See DEP's Response to Comment II.A.2.

Comment II.F.5: TMDL Limits

Response to Comment II.F.5: See DEP's Responses to Comments II.B.2 and II.B.4.

Comment II.F.6: TRE Requirements

Response to Comment II.F.6: Refer to the Response to Comment II.C.2.

Comment II.F.7: Stormwater Diversion Channels

Response to Comment II.F.7: Refer to the Response to Comments II.D.1 and II.D.2.

Comment II.G.1: Stormwater Sampling requirements are unwarranted and unduly burdensome.

Response to Comment II.G.1: The monthly monitoring at Outfalls 017, 019, 021, 022, and 025 was imposed to track compliance with TMDL load limits. However, DEP will instead require semi-annual reporting of TMDL parameter effluent concentrations and annual reporting of the total loads of TMDL metals at those outfalls using the SCS Runoff Curve Number method if more direct measurements (flow totalizing) are infeasible. A Part C condition will be included in the permit explaining the use of that method.

The 2/month sampling frequencies at Outfalls 023, 030, 032, 213, 613, and 813 are based on the imposition of average monthly and maximum daily effluent limits at those locations with at least two samples needed each month to calculate a monthly average.

Storm water monitoring requirements previously imposed at Outfall 006 will be imposed at IMPs 106 and 406 based on the most recent version of DEP's PAG-03 NPDES General Permit for Discharges of Stormwater Associated with Industrial Activity.

The permit condition requiring storm water samples within the first 30 minutes of a discharge will remain in the permit. DEP would consider allowing time for NRG HCS to install the necessary equipment to ensure that storm water sampling captures the first flush. However, NRG HCS did not indicate the time needed to comply, so no schedule will be included in the revised draft permit.

Comment II.G.2: Part A, Footnote 1 needs to be revised.

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Response to Comment II.G.2: Footnote 1 will be changed to read: "When sampling to determine compliance with mass effluent limitations, the discharge flow at the time of sampling must be measured/estimated and recorded consistent with the specified sample type for flow at each outfall."

Comment II.G.3: Stormwater Sampling at the Ash Landfill.

Response to Comment II.G.3: Refer to the Response to Comments II.D.1 and II.D.2.

Comment II.H.1: The two NPDES permits issued to Homer City should be consolidated.

Response to Comment II.H.1: As stated in NRG HCS's January 2, 2018 memo documenting changes to the Homer City Generating Station that occurred after draft permit limits were published in the *Pennsylvania Bulletin* on July 26, 2014, Outfall 004 was eliminated due to the reuse of treated ash landfill leachate as makeup water in the recirculating water system. NRG HCS requested in the same January 2nd memo that the Homer City Coal Cleaning Plant's sole remaining outfall—Outfall 001 in NPDES Permit PA0043648 consisting of overflows from a coal processing recirculation/holding pond—be authorized using the Outfall 004 designation in the NPDES permit for the Homer City Generating Station.

DEP will incorporate the Homer City Coal Cleaning Plant into NPDES Permit PA0005037. However, as explained in the Response to Comment II.F.1, overflows from the recirculation pond will not be authorized due to the infrequency with which overflows have occurred (never since at least November 2010) and are likely to occur. All other conditions in NPDES PA0005037 such as the storm water condition requiring, among other things, the use of best management practices and the condition requiring NRG HCS to report emergency overflows discussed in the Response to Comment II.F.1 would extend to the Coal Cleaning Plant. NPDES Permit PA0043648 will be terminated when PA0005037 is renewed.

Comment II.H.2: Compliance Schedule deadlines must be revised to exclude time when PADEP is reviewing the submittals.

Response to Comment II.H.2: The deadlines already incorporated DEP's review time consistent with Permit Decision Guarantee review timeframes.

Comment II.H.3: The ELG exemption for non-chemical metal cleaning wastes should be specified in the Fact Sheet and Draft Permit.

Response to Comment II.H.3: Under the 2015 Final Rule for the Steam Electric Power Generating Point Source Category, regulatory requirements for non-chemical metal cleaning wastes continue to be reserved (40 CFR § 423.13(f)). Since the proposed exemption was not promulgated in the final rule, no documentation of exemption eligibility is required in the permit.

Comment III.1: Outfall 001 (Cooling Tower Blowdown). Two Lick Creek flow used for modeling in the Draft Permit is not representative of stream flow in the vicinity of the Station.

Response to Comment III.1: DEP agrees that it is appropriate to account for additive and subtractive flows downstream of USGS's Graceton gaging station to better represent the Q_{7-10} of Two Lick Creek at Outfall 001. NRG HCS's January 2, 2018 memo identified additional flows, which are discussed in the Revised WQBELs section of this Fact Sheet Addendum for Outfall 001.

Comment III.2 - Outfall 001 (Cooling Tower Blowdown): A Partial Mix Factor (PMF) is not warranted for Outfall 001.

Response to Comment III.2 - Outfall 001 (Cooling Tower Blowdown): DEP will run PENTOXSD again due to other input changes (e.g., a more representative Q_{7-10}) and will remove manually-entered partial mix factors in favor of PMFs calculated by the model.

The use of manually-entered PMFs is a site-specific determination. If use of a PMF is justifiable for a water quality analysis (and not solely for the reasons NRG HCS cites from the PENTOXSD technical reference guide), then DEP will use a manually-entered PMF. For example, for multiple-discharge scenarios, Section III.C.3.d (p.11) of DEP's *Water Quality Toxics Management Strategy* states:

> If an overlapping effect between multiple discharges for a given pollutant is known or suspected, the analyst should evaluate key variables to determine how to proceed. These variables would include whether or not complete-mix

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> occurs in the receiving stream between discharges; consideration of inflows to the receiving stream between discharges; which of the four criteria (CMC, CCC, THH, or CRL) are likely to govern; and whether it is reasonable to treat the pollutant as a conservative substance, based primarily on the distance between discharges.

One way to account for overlapping effects from multiple discharges is to limit the amount of stream flow available to mix with a discharge, which can be done using a partial mix factor.

At Outfall 001, DEP agrees that it is not necessary to reserve assimilative capacity for other discharges to Two Lick Creek downstream of Outfall 001, so DEP will allow PENTOXSD to calculate PMFs based on the amount of mixing at the criteria compliance time. However, for other discharges, reserving assimilative capacity by using PMFs may be reasonable.

Comment III.3 - Outfall 001 (Cooling Tower Blowdown): Total Chromium Limits are not warranted.

Response to Comment III.3 - Outfall 001 (Cooling Tower Blowdown): Technology-based effluent limits for chromium are imposed on discharges of cooling tower blowdown pursuant to 40 CFR § 423.13(d)(1).

Comment III.4 - Outfall 001 (Cooling Tower Blowdown): The Compliance Schedule is too short.

Response to Comment III.4 - Outfall 001 (Cooling Tower Blowdown): The three-year compliance deadline for aluminum, iron, and manganese WQBELs at Outfall 001 has passed, including both the three years allotted in the 2012 amendment and the five-year maximum (from the 2012 permit amendment effective date) allowed by 25 Pa. Code § 92a.51(a). Therefore, TMDL WQBELs will take effect immediately at Outfall 001 pursuant to 25 Pa. Code § 92a.51(a):

> … Any schedule of compliance specified in the permit must require compliance with final enforceable effluent limitations as soon as practicable, but in no case longer than 5 years, unless a court of competent jurisdiction issues an order allowing a longer time for compliance.

WQBELs for thallium at Outfall 001 will take effect on the last month of the forthcoming five-year permit term in response to NRG HCS's strategy for FGD blowdown discharge elimination and the corresponding impacts to the cooling tower recirculating water system.

Comment III.1 - Outfall 002 (Intake Screen Backwash): Monitoring requirements are not warranted.

Response to Comment III.2 - Outfall 002 (Intake Screen Backwash): DEP acknowledges that NRG HCS does not add chemicals or other substances at Outfall 002 and DEP stated as such in the Fact Sheet. However, the monitoring requirements will remain in the permit pursuant to 25 Pa. Code § 92a.61(b) and § 96.4(i). DEP agrees that data collected at Outfall 002 would be representative of stream water quality and that data collection is permissible under §§ 92a.61(b) and 96.4(i) and would serve the purpose described in § 96.4(i).

Comment III.1 - Outfall 003 (Industrial Waste Treatment - IWT): Effluent modeling should be done at the First Point of Use.

Response to Comment III.1 - Outfall 003 (Industrial Waste Treatment - IWT): NRG HCS re-routed IWT effluent to the cooling tower recirculating water system. Therefore, Outfall 003 will be removed from the permit and applicable effluent limits for those wastewaters will be transferred to Outfall 001 as the final discharge location for recycled IWT effluent.

Comment III.2 - Outfall 003 (Industrial Waste Treatment - IWT): Proposed Temperature limits are not consistent with PADEP Guidance.

Response to Comment III.2 - Outfall 003 (Industrial Waste Treatment - IWT): NRG HCS re-routed IWT effluent to the cooling tower recirculating water system. Therefore, Outfall 003 and its associated effluent limits will be removed from the permit.

However, to clarify, the ambient stream temperature allowance was not intended to be implemented as NRG HCS suggests. Consistent with DEP's *Implementation Guidance Design Conditions*, and as explained on Page 9 of DEP's *Implementation Guidance for Temperature Criteria*, the recommended design ambient temperature would be either the median temperature (50 percent value), derived from site-specific historical data, for each monthly or semi-monthly period; or, if temperature distributions are approximately normal, the mean monthly or semi-monthly temperatures derived from historical data.

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Essentially, the design ambient temperatures are the long-term average temperatures of the receiving stream for each monthly or semi-monthly period and those design ambient temperatures would be used by DEP to derive temperature limits for the discharge.

Comment III.3 - Outfall 003 (Industrial Waste Treatment - IWT): The Compliance Schedule is too Short.

Response to Comment III.3 - Outfall 003 (Industrial Waste Treatment - IWT): NRG HCS re-routed IWT effluent to the cooling tower recirculating water system. Therefore, Outfall 003 and its associated effluent limits will be removed from the permit.

Comment III.4 - Outfall 003 (Industrial Waste Treatment - IWT): Oil and Grease sample type is incorrect.

Response to Comment III.4 - Outfall 003 (Industrial Waste Treatment - IWT): Since Outfall 003 was re-routed to the cooling tower clarifier, effluent limits that apply to Outfall 003's effluent will be imposed at Outfall 001 with appropriate modifications to account for other wastewaters at that outfall.

Comment III.1 - Outfall 004 (Treated Ash Landfill Leachate): Hexavalent Chromium Limits are not warranted.

Response to Comment III.1 - Outfall 004 (Treated Ash Landfill Leachate): Outfall 004 was eliminated as described in the Response to Comment II.H.1.

Comment III.2 - Outfall 004 (Treated Ash Landfill Leachate): Hardness Value for Modeling must be clarified.

Response to Comment III.2 - Outfall 004 (Treated Ash Landfill Leachate): Outfall 004 was eliminated as described in the Response to Comment II.H.1.

However, to clarify DEP's use of hardness values: the hardness values reported on the Toxics Screening Analysis Spreadsheets in Appendix A of the Fact Sheet are the hardness values of the receiving streams. The spreadsheet uses that hardness to calculate the "Most Stringent Criterion" values for all hardness-dependent criteria. A hardness of 100 mg/L is used as the default stream hardness in PENTOXSD and the Toxics Screening Analysis Spreadsheet when site-specific stream data are unavailable.

The 933 mg/L hardness value is the hardness of the discharge as reported on the permit application. A hardness of 100 mg/L is used as the default discharge hardness in PENTOXSD when discharge hardness is not reported. Stream hardness and discharge hardness are both optional input values in PENTOXSD.

Comment III.3 - Outfall 004 (Treated Ash Landfill Leachate): Total Iron Discharge Limits are not carried into the Draft Permit from the Fact Sheet.

Response to Comment III.3 - Outfall 004 (Treated Ash Landfill Leachate): Outfall 004 was eliminated as described in the Response to Comment II.H.1.

Comment III.1 - Outfall 006 (Stormwater and Coal Pile Runoff): Sampling Stormwater IMPs is not warranted.

Response to Comment III.1 - Outfall 006 (Stormwater and Coal Pile Runoff): Pursuant to NRG HCS's January 2, 2018 update memo, WQBELs will be imposed at IMPs 106, 206, 306, and 406, which contribute to discharges at Outfall 006, rather than Outfall 006. IMP 506 is for an emergency overflow that is being removed from the permit.

Upon further review, NRG HCS appears to have determined that imposing effluent limits at the IMPs is preferable to imposing limits at Outfall 006. As NRG HCS stated in the January 2, 2018 memo:

> Since overflows (IMP-206, -306, and 506) could comingle with stormwater discharges that are subject to TMDL WLAs (IMP 106 and IMP 406) during storms greater than the 10-year, 24-hour storm, it is the Station's preference to change the WLAs from Outfall 006 to reporting only and impose the TMDLs at IMP 106 (Plant entrance and parking area) and IMP 406 ([Railroad Unloading Basin]). […] This would allow the Station to maintain control of the source area.

This rationale, in part, is consistent with DEP's basis for imposing limits at each IMP pursuant to 40 CFR § 122.45(h)—monitoring the commingled waste sources at Outfall 006 does not allow for an independent determination of effluent limit/permit

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compliance for each source. For example, storm water monitoring is used to gauge the effectiveness of storm water best management practices. Outfall 006 receives storm water from the coal desilting ponds and from other storm water runoff areas. While the collective implementation of storm water BMPs in the areas contributing to IMPs 106 through 406 would be represented by samples at Outfall 006, elevated results at Outfall 006 could be attributed to overflows from coal desilting ponds when another runoff area is the cause of the elevated results.

NRG HCS's January 2, 2018 memo also proposed that TMDL requirements be imposed only at IMPs 106 and 406, but, as explained in the Comment II.F.1, precipitation-induced discharges from the coal desilting basins at IMPs 206 and 306 are not exempt from TMDL requirements. Discharges with high concentrations of TMDL metals would contribute to excursions above water quality criteria even during high stream flow conditions and if those discharges occur more than 1% of the time, then they would be in violation of 25 Pa. Code § 96.3(c).

With limits on each contributing waste source, no limits or monitoring will be imposed at Outfall 006. The outfall will only be identified in the permit as a final discharge location for the internally controlled sources.

Comment III.2 - Outfall 006 (Stormwater and Coal Pile Runoff): Twice Monthly Sampling Frequency is unwarranted.

Response to Comment III.2 - Outfall 006 (Stormwater and Coal Pile Runoff): WQBELs, TBELs, and/or monitoring requirements for sources discharging at Outfall 006 are imposed at IMPs 106, 206, 306, and 406. Therefore, the monitoring requirements for Outfall 006 are eliminated.

Comment III.3 - Outfall 006 (Stormwater and Coal Pile Runoff): Associated IMPs 106, 406 and 506 Effective Dates.

Response to Comment III.3 - Outfall 006 (Stormwater and Coal Pile Runoff): The effluent limit effective periods will be modified to ensure that all outfalls and internal monitoring points are authorized for the duration of the permit term.

Comment III.4 - Outfall 006 (Stormwater and Coal Pile Runoff): Associated IMP 406 Description.

Response to Comment III.4 - Outfall 006 (Stormwater and Coal Pile Runoff): The IMP 406 description will be modified to state: "Storm water from a basin collecting lime unloading area and railroad siding runoff."

Comment III.5 - Outfall 006 (Stormwater and Coal Pile Runoff): Associated IMP 506 Sampling Frequency.

Response to Comment III.5 - Outfall 006 (Stormwater and Coal Pile Runoff): IMP 506 will be removed from the permit. The Limestone Storage Area Pond will be subject to the Part C condition described in the Response to Comment II.F.3 pertaining to reporting requirements for unauthorized emergency overflows.

Comment III.1 - Outfall 017 (Stormwater from Substation Area): Total Suspended Solids.

Response to Comment III.1 - Outfall 017 (Stormwater from Substation Area): The interim TSS load monitoring was an error. The intent was for NRG HCS to calculate aluminum, iron, and manganese loading during the interim period as listed in Table 55 of the Fact Sheet, but the effluent limits were incorrectly coded in the permit. The revised draft permit corrects the error.

Comment III.1 - Outfall 018 (Overflow of Cooling Tower Clearwell): Composite Sampling.

Response to Comment III.1 - Outfall 018 (Overflow of Cooling Tower Clearwell): Eight-hour composite sampling was required because the permit application indicated that Outfall 018 discharges eight hours per day, seven days per week, 310 days per year. However, based on the revised discharge frequency and duration given in NRG HCS's comment, grab sampling will be required.

Comment III.2 - Outfall 018 (Overflow of Cooling Tower Clearwell): Typographic Error.

Response to Comment III.2 - Outfall 018 (Overflow of Cooling Tower Clearwell): DEP acknowledges the error.

Comment III.2 - Outfall 023 (Stormwater from Coal Truck Gate Entrance): Typographic Error.

Response to Comment III.2 - Outfall 023 (Stormwater from Coal Truck Gate Entrance): DEP acknowledges the error.

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Comment III.1 - Outfall 027 (Unit 3 FGD Blowdown): Partial Mix Factor (PMF).

Response to Comment III.1 - Outfall 027 (Unit 3 FGD Blowdown): DEP has performed additional calculations to determine whether it is necessary to reserve assimilative capacity for other dischargers downstream of Outfall 027.

Reservation of assimilative capacity would be warranted if the mixing zone established by the criteria compliance time or complete mix time for discharges from Outfall 027 overlaps with the mixing zone of any other discharge. Assuming a portion of Blacklick Creek's assimilative capacity is already consumed (as represented by an upstream background concentration), the assimilative capacity that remains would need to be apportioned between Outfall 027's discharge and any overlapping discharge plumes from other outfalls. These calculations are discussed in the Revised WQBELs section of this Fact Sheet Addendum for Outfall 027.

Comment III.2 - Outfall 027 (Unit 3 FGD Blowdown): Streamflow Values for Modeling.

Response to Comment III.2 - Outfall 027 (Unit 3 FGD Blowdown): DEP has revised the water quality analysis for Outfall 027 using a revised value for $Q_{7\text{-}10}$. The revisions are described in Section 027.B of this Fact Sheet Addendum.

Comment III.3 - Outfall 027 (Unit 3 FGD Blowdown): The Compliance Schedule is too short.

Response to Comment III.3 - Outfall 027 (Unit 3 FGD Blowdown): Based on NRG HCS's commitment to eliminate discharges of FGD blowdown, the compliance schedule for new WQBELs will be in effect from the permit effective date until one month prior to permit expiration. Schedules of compliance for WQBELs are limited to a maximum of five years (per 25 Pa. Code § 92a.51(a)) and NRG HCS is tying the compliance schedule for Outfall 027's WQBELs to the elimination of FGD blowdown discharges, which must be done by December 31, 2023 if NRG HCS is not pursuing treatment to comply with more stringent voluntary BAT TBELs. If final permit issuance is delayed past December 31, 2018, then new WQBELs at Outfall 027 will take effect on January 1, 2024 to coincide with the elimination of FGD blowdown discharges by December 31, 2023.

Comment III.4 - Outfall 027 (Unit 3 FGD Blowdown): Oil and Grease sample type is incorrect.

Response to Comment III.4 - Outfall 027 (Unit 3 FGD Blowdown): The sample type for oil and grease at Outfall 027 will be changed to 'grab'.

Comment III.5 - Outfall 027 (Unit 3 FGD Blowdown): pH sample type is incorrect.

Response to Comment III.5 - Outfall 027 (Unit 3 FGD Blowdown): The sample type for pH at Outfall 027 will be changed to 'grab'.

By letter dated September 9, 2014, Sierra Club, Environmental Integrity Project, and Earthjustice submitted the following comments on the draft permit. DEP's responses are provided following each comment.

Sierra Club Comment I: The BPJ Analyses and resulting BAT Determinations for the coal combustion waste outfalls in the draft permit are inadequate.

Response to Sierra Club Comment I.A.1 – I.A.3: After Sierra Club, et. al., submitted comments in 2014, updated Effluent Limitations Guidelines for the Steam Electric Power Generating Point Source Category were finalized on November 3, 2015 (2015 Rule). The 2015 Rule was amended in 2017 to extend BAT compliance dates for certain waste streams, including FGD wastewater. The 2015 Rule, with the 2017 amendments, remains in effect including BAT determinations for FGD wastewater and combustion residual leachate. Since EPA promulgated national BAT performance standards for those wastewaters and considered new pollutants of concern associated with those wastewaters, DEP will not develop BPJ TBELs for either FGD wastewater or combustion residual leachate. This is consistent with the 2015 Rule (80 FR 67852):

> Finally, EPA decided not to establish a requirement that would direct permitting authorities to establish limitations for FGD wastewater using site-specific Best Professional Judgment (BPJ). Public commenters representing industry, state, and environmental group interests urged EPA not to establish any requirement that would leave BAT effluent limitations for FGD wastewater to be determined on a BPJ basis. Sections 301 and 304 of the CWA require EPA to develop nationally applicable ELGs based on the BAT, taking certain factors into account. EPA decided that it would not be appropriate to leave FGD wastewater requirements in the final rule to be determined on a BPJ basis because

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there are sufficient data to set uniform, nationally applicable limitations on FGD wastewater at plants across the nation. Given this, BPJ permitting of FGD wastewater would place an unnecessary burden on permitting authorities, including state and local agencies, to conduct a complex technical analysis that they may not have the resources or expertise to complete. BPJ permitting of FGD wastewater would also unnecessarily burden the regulated industry because of associated delays and uncertainty with respect to permits.

Neither IMP 106 nor Outfall 006 discharge FGD wastewater; that internal monitoring point and downstream outfall discharge storm water runoff from areas around the Unit 1 and 2 dry scrubbers (i.e., the "FGD areas" identified in the IMP 106 wastewater description). Outfall 027 is the only discharge location for FGD wastewater.

Sierra Club Comment I.B: DEP's BAT Determinations for Outfalls that Discharge Leachate are Inadequate.

Response to Sierra Club Comment I.B: Pursuant to the 2015 Rule, chemical precipitation with mechanical evaporation is not BAT for combustion residual leachate. No BPJ analysis will be performed because EPA has promulgated national BAT performance standards for combustion residual leachate.

Sierra Club Comment C: DEP Failed to Provide Waste Details or Conduct a BPJ Analysis for Ash Handling Wastewaters for the Post-Modification Discharges of Greenhouse Pond Emergency Overflow from New Outfall 009.

Response to Sierra Club Comment I.C: Discharges from Outfall 009 are no longer authorized by the permit. See DEP's Response to Comment II.F.2 from NRG HCS.

Sierra Club Comment II: DEP MUST MAINTAIN THE MORE STRINGENT THERMAL EFFLUENT LIMITATIONS FOR OUTFALL 001 WHICH WERE IMPOSED IN THE 2012 NPDES PERMIT AMENDMENT.

Response to Sierra Club Comment II: Although not stated in the Fact Sheet, the relaxation of temperature limits in the 2014 draft permit at Outfall 001 was consistent with allowable exceptions to anti-backsliding; specifically, 40 CFR § 122.44(l)(2)(i)(B)(1) or § 122.44(l)(2)(i)(B)(2). Paragraph (B)(1) of the anti-backsliding exceptions refers to the availability of information which was not available at the time of permit issuance which justify the application of less stringent effluent limits. Paragraph (B)(2) refers to technical mistakes.

With respect to exception (B)(1), the 'information' was a more representative (higher) $Q_{7\text{-}10}$ stream flow as explained on pp. 46 and 47 of the Fact Sheet. Presuming that the identified stream flow information was available at the time the previous permit was issued, but merely overlooked, backsliding would be allowable under paragraph (B)(2) due to the technical mistake of using an incorrect value for $Q_{7\text{-}10}$. In either case, backsliding from the 2012 NPDES Permit Amendment's temperature limits was justified.

DEP's *Implementation Guidance for Temperature Criteria* (p.4) directs permit writers to assume instantaneous complete mixing. This assumption applies only to water quality analyses designed to produce thermal effluent limits and when adverse factors do not exist. DEP's statement in the Fact Sheet: "to the extent that a partial mix factor has not been applied for the thermal analysis" was an acknowledgement that, on the preceding pages of the Fact Sheet, DEP used partial mix factors when evaluating water quality limits for toxics, but DEP was not using a partial mix factor for the thermal analysis. This was explained on p.49 of the Fact Sheet:

> The *Implementation Guidance for Temperature Criteria* [Document No. 391-2000-017] directs permit writers to assume instantaneous complete mixing of the discharge with the receiving stream when calculating thermal effluent limits unless adverse factors exist such as the possibility for incomplete mixing across large streams or rivers. DEP considered the need to apply a partial mix factor for the thermal analysis; however, none of the adverse factors listed in the Implementation Guidance for Temperature Criteria are known to exist that would make the complete mixing assumption for thermal limits invalid. Notably, Outfall 001 is located immediately upstream of a low-head dam, so effective mixing/dispersion of the effluent's thermal load should be accomplished below the dam (note that the complete mixing assumption does not apply to the PENTOXSD analysis for toxic and non-conventional pollutants).

The 2012 NPDES Permit Amendment used a smaller $Q_{7\text{-}10}$ flow than what DEP used for the 2014 draft permit, but neither the flow used for the 2012 thermal analysis nor the flow used for the 2014 thermal analysis were derived using partial mix factors.

Based on input from NRG HCS, Outfall 001 temperature limits will be modified further (discussed later in this Fact Sheet Addendum) using a more refined value of $Q_{7\text{-}10}$ stream flow in Two Lick Creek.

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The use of a closed-cycle recirculating water system with natural draft cooling towers already represents BAT for the control of thermal pollution from the Station. WQBELs for temperature are more stringent.

Sierra Club Comment III: THE DRAFT PERMIT SHOULD NOT PROVIDE FOR A COMPLIANCE SCHEDULE FOR TEMPERATURE LIMITS AT OUTFALLS 003, 015, AND 016. AT MOST, THE TIME PERIOD TO WHICH INTERIM TEMPERATURE RATES APPLY SHOULD BE ONE YEAR.

Response to Sierra Club Comment III: Outfall 003 was eliminated, so WQBELs no longer apply.

Sierra Club Comment IV: DEP MUST REVISE THE COMPLIANCE SCHEDULES SET FORTH IN THE DRAFT PERMIT IN ORDER TO ENSURE ALL APPLICABLE EFFLUENT LIMITATIONS ARE ACHIEVED AS QUICKLY AS POSSIBLE.

Response to Sierra Club Comment IV: When WQBELs are imposed on a discharge, DEP has already determined that the discharge has a reasonable potential to violate water quality criteria. That is, existing effluent quality already indicates that WQBELs may not be achieved. The Toxics Reduction Evaluation for toxic pollutants in the 2014 draft NPDES permit was consistent with established policy described in DEP's *Water Quality Toxics Management Strategy*. Three years is the minimum amount of time to complete the Toxics Reduction Evaluation (TRE) process described in that guidance document. If, as part of the TRE process, DEP determines that WQBELs can be achieved sooner than three years, then the permit can be modified accordingly at that time. Outfalls 016 and 018 are no longer subject to a schedule of compliance as explained in DEP's Response to Comment II.C.2 from NRG HCS. Outfall 001 is not subject to a TRE, but is subject to a schedule of compliance as explained below in the Outfall 001-specific section of this Fact Sheet Addendum.

The compliance schedule for temperature limits at Outfall 003 no longer applies.

Sierra Club Comment V: THE FACT SHEET FOR THE DRAFT PERMIT FAILS TO INCLUDE CERTAIN NECESSARY INFORMATION.

Response to Sierra Club Comment V: Discharges from Outfalls 015 and 016 are/were bypasses of or overflows from one or more of the Industrial Wastewater Treatment (IWT) facility's unit treatment processes. Those discharges are composed of the same wastewaters as those discharged from Outfall 003, so the pollutants of concern at those outfalls are the same as those at Outfall 003. This was explained on pp. 91 and 94 of the Fact Sheet as follows:

> Any discharge resulting from a bypass of or overflow from one of the IWT facility's unit processes would be composed of the same federal ELG-covered wastewaters that are discharged at the IWT facility's final discharge point, Outfall 003.

Further explanation of the pollutants at Outfalls 015 and 016 is unnecessary because wastewater characterization and evaluation was already conducted at Outfall 003 and the wastewaters at Outfalls 015 and 016 would contain the same pollutants. No new sources are introduced to the raw wastewater stream once the wastewaters are directed to the IWT facility starting with the IWT facility's flow equalization ponds. NRG HCS has since eliminated Outfalls 003 and 015.

The characteristics of the waste streams discharged from the IWT facility would be relevant for establishing effluent limits at Outfall 025 if storm water runoff is cross-contaminated with process wastewater. Such cross-contamination is not observed or expected. Outfall 025 effluent quality was reported on Table 80 of the Fact Sheet.

The new FGD scrubber system for Units 1 and 2—employing Alstom's Novel Integrated Desulphurization System technology or "NIDS"—is classified as a dry scrubber that consumes/evaporates water. If wastewaters are generated by the NIDS under certain plant operating scenarios, then those wastewaters will discharge with Unit No. 3's wet scrubber FGD blowdown through Outfall 027 until Outfall 027's discharges are eliminated.

The reference to IMP 606 was an error. As explained on p. 69 of the Fact Sheet, Outfall 008 was going to be renamed IMP 606 because that outfall would have discharged into the 42" pipeline that discharges through Outfall 006, but the sanitary wastewater discharge from Outfall 008 was tied into the local sanitary sewer system, so references to IMP 606 will be removed from the permit.

The Fact Sheet provides sufficient information to describe the basis for the permit's effluent limits. Additional information is available in the NPDES permit application, which is available for public review.

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By letter dated September 9, 2014, Citizens for Pennsylvania's Future (PennFuture) submitted comments on the draft permit. DEP's responses are provided below.

Comment 1.A. The mass and concentration effluent limits for aluminum, iron, and manganese at Outfall 027 are needlessly excessive. At least in a situation where all nonpoint source pollutant load reductions assumed by a TMDL have not been achieved, an NPDES permittee should not be permitted to "bank" unused WLAs, and should be allowed to transfer WLAs from one outfall to another only where it demonstrates that it must release additional pollutant load at the transferee outfall in order to continue performing its permitted operations or activities.

Response to Comment 1.A: DEP agrees that increases in allowable discharge concentrations should not coincide with an increase in allowable load—unless there is a demonstration that assimilative capacity is available in the receiving water so as not to cause excursions above criteria.

Increased discharge flows to the Kiskiminetas-Conemaugh River Watersheds can be accommodated if the discharges are subject to concentration limits equivalent to water quality criteria. The increased discharge flow will increase the loading to the watershed, but the increased flow also adds assimilative capacity. The concentration limits for TMDL parameters at Outfall 027 in the 2014 draft permit allowed for increased loading without a concurrent increase in assimilative capacity. The revised permit corrects this by imposing concentration limits at criteria levels subject to a schedule of compliance. The schedule of compliance will coincide with NRG HCS's schedule for FGD discharge elimination.

Comment 1.B. PADEP should correct the excessive WLAs assigned to Outfall 005 in the K-C TMDL.

Response to Comment 1.B: DEP is not recalculating the TMDL's baseline loads. Outfall 005 may have discharged less load than the TMDL's baseline load for that outfall prior to elimination of the discharge, but the final TMDL allows as much load as Outfall 005's baseline load to be discharged in sub-watershed 4002 without contributing to the impairment.

Comment 1.C. The proposed concentration limitations for Outfall 027 are inconsistent with the assumptions and requirements of the WLAs assigned to Outfall 027 in the K-C TMDL.

Response to Comment 1.C: DEP is modifying Outfall 027's TMDL WLAs and WQBELs. However, intra-plant TMDL load trading is allowed by EPA provided that water quality standards are attained. The TMDL WLAs assigned to Outfall 027 in the permit, in combination with the effluent concentrations in the revised draft permit, meet these criteria.

Comment 1.D. The PENTOXSD modeling for Outfall 027 erroneously assumes that at the design Q7-10 flow condition, the background concentrations of aluminum, iron, and manganese in Blacklick Creek will be zero.

Responses to Comment 1.D: DEP agrees that background concentrations of aluminum, iron, and manganese would not be zero in an impaired watershed. However, DEP's PENTOXSD modeling for Outfall 027 included assumptions that would reduce the available assimilative capacity of Blacklick Creek at Outfall 027 similar to entering background concentrations.

DEP manually input a partial mix factor (PMF) of 33% for Chronic Fish Criteria (CFC), Threshold Human Health (THH), and Cancer Risk Level (CRL) water quality criteria. PENTOXSD also calculated a PMF of about 0.33 for Acute Fish Criteria (AFC). These PMFs represent the portion of stream flow available for mixing at the criteria compliance times. A PMF of 0.33 reduces the $Q_{7\text{-}10}$ flow available for mixing to one third of the full $Q_{7\text{-}10}$ flow. While the stream's pollutant concentrations in DEP's modeling were zero, the available assimilative capacity was nonetheless reduced by the manually-entered PMFs similarly to how background concentrations would reduce assimilative capacity if there was no partial mixing (i.e., if the PMF = 1). Consider the following example:

Available assimilative capacity [lb/day] = $Q_{7\text{-}10}$ of Blacklick Creek [MGD] × Water Quality Criterion [mg/L] × 8.34

For aluminum, where the $Q_{7\text{-}10}$ of Blacklick Creek is 37.07 cfs and the Water Quality Criterion for aluminum is 0.75 mg/L:

Available assimilative capacity = 37.07 cfs × (0.646 MGD / 1 cfs) × 0.75 mg/L × 8.34 unit conversion ≈ 150 lb/day

Available assimilative capacity calculated using a PMF of 33%:

0.33(37.07 cfs) × (0.646 MGD / 1 cfs) × 0.75 mg/L × 8.34 unit conversion ≈ 50 lb/day

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Available assimilative capacity calculated using an estimated aluminum background concentration of 0.5 mg/L and a PMF=1:

37.07 cfs × (0.646 MGD / 1 cfs) × (0.75 mg/L - 0.50 mg/L) × 8.34 unit conversion ≈ 50 lb/day

Presuming that an aluminum background concentration of 0.5 mg/L is appropriate in this example, DEP's use of partial mix factors is generally equivalent to inputting a background concentration with no partial mixing (PMF = 1). Therefore, background concentrations are not explicitly necessary provided DEP has considered factors that reduce assimilative capacity.

DEP has redone the PENTOXSD analysis for Outfall 027, which is discussed later in this Fact Sheet Addendum.

Comment E. PADEP must perform a BPJ analysis of BAT for aluminum, iron, and manganese

Response to Comment E: Pursuant to 40 CFR §§ 125.3(c)(2) and (c)(3), DEP considers case-by-case technology-based treatment requirements to the extent that EPA-promulgated effluent limits are inapplicable or when they only apply to certain aspects of the discharger's operation, or to certain pollutants. The revised Steam Electric Power Generating Point Source Category Effluent Limitations Guidelines were finalized on November 3, 2015. As part of establishing BAT requirements for FGD wastewater in the November 3, 2015 rule, EPA considered aluminum, iron, and manganese and chose not to include limits for them in the final regulation because they are either added as treatment chemicals or because they are directly regulated or controlled by regulation of another parameter.

Since EPA already considered aluminum, iron, and manganese as part of final promulgated effluent limits, DEP will not establish case-by-case BAT effluent limits for those pollutants using best professional judgement. If DEP did evaluate BAT TBELs for aluminum, iron, and manganese, then DEP would reasonably arrive at the same conclusions as EPA.

Comment E.2. Certain effluent limitations established pursuant to the "policy for 'permitting at criteria' levels" must be more stringent than those proposed in the Draft Permit.

Response to Comment E.2: The methods used to implement water quality criteria are described in 25 Pa. Code §§ 96.3 and 96.4. In addition, DEP's *Water Quality Toxics Management Strategy* (Doc. No. 361-2000-003) addresses design conditions in detail (Table 1 in that document), including the appropriate durations to assign to water quality criteria. The design duration for Criteria Maximum Concentration (CMC) criteria is 1 hour (acute). The design duration for Criteria Continuous Concentration (CCC) criteria is 4 days (chronic). The design duration for Threshold Human Health (THH) criteria is 30 days (chronic). The design duration for Cancer Risk Level (CRL) criteria is 70 years (chronic).

The 750 µg/L aluminum criterion in 25 Pa. Code § 93.8c is a CMC (acute) criterion. Therefore, 750 µg/L is imposed as a maximum daily effluent limit. There is no CCC criterion for aluminum necessitating the imposition of a more stringent average monthly limit. Imposing 750 µg/L as both a maximum daily and average monthly limit is protective of water quality uses.

The 1.5 mg/L iron criterion is given as a 30-day average in 25 Pa. Code § 93.7(a). Therefore, 1.5 mg/L is imposed as an average monthly limit and the maximum daily effluent limit is calculated using a multiplier of two times the average monthly limit based on DEP's *Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits* (Doc. No. 362-0400-001, Chapter 3, pp. 15 – 16).

The 1 mg/L potable water supply criterion for manganese in 25 Pa. Code § 93.7(a) is a human health criterion (chronic). Per Table 1 of the *Water Quality Toxics Management Strategy*, the duration for a THH criterion is 30 days. Therefore, an average monthly effluent limit of 1 mg/L is imposed and the maximum daily effluent limit is calculated using a multiplier of two times the average monthly limit consistent with the technical guidance cited above for iron.

The 2012 NPDES permit amendment incorrectly applied these criteria. DEP is correcting the WQBELs for aluminum, iron, and manganese pursuant to 40 CFR § 122.44(l)(2)(i)(B)(2) regarding exceptions to anti-backsliding due to technical mistakes.

Clean Water Act Section 316(b) – Best Technology Available for Cooling Water Intake Structures

On August 15, 2014, EPA promulgated Clean Water Act Section 316(b) regulations applicable to cooling water intake structures. The regulations established best technology available (BTA) standards to reduce impingement mortality and entrainment of all life stages of fish and shellfish at existing power generating and manufacturing facilities. The Final Rule took effect on October 14, 2014. Regulations implementing the 2014 Final Rule (and the previously promulgated Phase I Rule) are provided in 40 CFR part 125, Subparts I and J for new facilities and existing facilities, respectively. Associated NPDES permit application requirements for facilities with cooling water intake structures are provided in 40 CFR Part 122, Subpart B – Permit Application and Special NPDES Program Requirements (§ 122.21(r)).

The Station operates one intake structure on Two Lick Creek that, among other uses, provides makeup water for the Station's cooling towers. Since NRG HCS operates a "cooling water intake structure" as defined in § 125.92(f), the applicability of Section 316(b) of the Clean Water Act and its implementing regulations must be evaluated.

Applicability Criteria for Existing Facilities

The Station is an "existing facility" as defined in 40 CFR § 125.92(k).[1] As an existing facility, the Station is subject to 40 CFR part 125, Subpart J – Requirements Applicable to Cooling Water Intake Structures for Existing Facilities Under Section 316(b) of the Clean Water Act (§§ 125.90 – 125.99). Pursuant to the applicability criteria given by § 125.91(a), the Station would be subject to the requirements of §§ 125.94 – 125.99 if:

(1) The facility is a point source;

(2) The facility uses or proposes to use one or more cooling water intake structures with a cumulative design intake flow (DIF) of greater than 2 million gallons per day (mgd) to withdraw water from waters of the United States; and

(3) Twenty-five percent or more of the water the facility withdraws on an actual intake flow basis is used exclusively for cooling purposes.

The Station is a point source as defined in 40 CFR § 122.2; the DIF of the intake structure is 28.8 MGD, which is greater than the 2 MGD applicability threshold; and the Station uses 95% of the withdrawn water for cooling purposes, which exceeds the 25% applicability threshold. Therefore, the Station is subject to the requirements of 40 CFR §§125.94 – 125.99.

Pursuant to 40 CFR § 125.94(a), "On or after October 14, 2014, the owner or operator of an existing facility with a cumulative design intake flow (DIF) greater than 2 mgd is subject to the BTA (best technology available) standards for impingement mortality under paragraph (c) of this section, and entrainment under paragraph (d) of this section including any measures to protect Federally-listed threatened and endangered species and designated critical habitat established under paragraph (g) of this section."

Since the permit that is the subject of this Fact Sheet will expire after July 14, 2018, the owner or operator of the facility must submit the information required by the applicable provisions of 40 CFR § 122.21(r) when applying for a subsequent permit pursuant to 40 CFR § 125.95(a)(1).

As required by 40 CFR § 125.98(b)(5), DEP will consider the operation of the existing closed-cycle recirculating system as meeting interim BTA requirements for impingement and entrainment. Since the primary method of compliance with impingement BTA standards is the use of a closed-cycle system, the facility is not required to submit an impingement technology performance optimization study. The permittee must conduct daily monitoring of intake flows as required by 40 CFR § 125.94(c)(1). Requirements regarding compliance with the CWA § 316(b) will be included in a condition in Part C of the permit.

Additional Information

According to 40 CFR § 125.94(d), the Director must establish BTA standards for entrainment on a "site-specific basis." 79 FR 48342 explains that "EPA decided not to establish closed-cycle cooling as a presumptive BTA entrainment standard, pending a site-specific demonstration of the limitations." 79 FR 48348 further explains that the Director may require

[1] *Existing facility* means any facility that commenced construction as described in 40 CFR 122.29(b)(4) on or before January 17, 2002 (or July 17, 2006 for an offshore oil and gas extraction facility) and any modification of, or any addition of a unit at such a facility. A facility built adjacent to another facility would be a new facility while the original facility would remain as an existing facility for purposes of this subpart. A facility cannot both be an existing facility and a new facility as defined at §125.83.

additional information for facilities at or under the 125 mgd Actual Intake Flow threshold including some or all of the studies at § 122.21(r)(9)-(13) if there is reasonable concern regarding entrainment impacts at the facility.

Under 40 CFR § 125.94(d), the Director must establish BTA standards for entrainment for each intake on a site-specific basis (no threshold). The standards must reflect the Director's determination of the maximum reduction in entrainment warranted after consideration of the relevant factors as specified in § 125.98(f). According to § 125.98(f)(2), a Director's proposed determination must be based on consideration of any additional information required by the Director at § 125.98(i) and the following factors: (i) numbers and types of organisms entrained; (ii) impact of changes in particulate emissions or other pollutants associated with entrainment technologies; (iii) land availability as it relates to the feasibility of entrainment technology; (iv) remaining useful life of the plant; and (v) quantified and qualitative social benefits and costs of available entrainment technologies when such information on both factors is of sufficient rigor to make a decision. DEP supports the use of closed cycle cooling in minimizing entrainment mortality. However, since there are no existing entrainment data for this facility's intake structure, DEP is requiring 1-year (peak season) of entrainment sampling during this permit cycle.

Development of Effluent Limitations

Outfall No.	001	**Design Flow (MGD)**	4.32
Latitude	40° 30' 40.00"	**Longitude**	-79° 10' 58.00"

Wastewater Description: Cooling tower blowdown from cooling towers #1, #2 and #3; cooling tower make-up water is composed of treated river water, leachate from the Homer City Coal Cleaning Plant, filtrate from dewatering operations, recycled storm water from the Greenhouse Pond, and treated leachate from the Ash Valley Landfill

001.A. Revised Technology-Based Effluent Limitations (TBELs)

Reuse of Outfall 003 Wastewater

Effluent limits for total suspended solids and oil and grease will be added to Outfall 001. As explained in the Response to Comment III.1, NRG HCS redirected treated effluent from the Industrial Waste Treatment plant (IWT) to the cooling tower clarifier for use as makeup water in the recirculating water system. Pursuant to 40 CFR § 423.12(b)(13) and § 423.13(n), a waste stream that is subject to BPT and/or BAT limits in 40 CFR Part 423 is subject to those limits even when the waste stream is combined with another waste stream prior to discharge. Even though low volume wastes treated by the IWT are reused in another process, the low volume wastewaters are still subject to limits on low volume wastewaters from 40 CFR § 423.12(b)(3).

BPT Limits for Low Volume Waste Sources (40 CFR § 423.12(b)(3))

	BPT Effluent limitations	
Pollutant or pollutant property	**Maximum for any 1 day (mg/l)**	**Average of daily values for 30 consecutive days shall not exceed (mg/l)**
TSS	100.0	30.0
Oil and Grease	20.0	15.0

The options for imposing effluent limits on the IWT's effluent would include imposing limits at an internal monitoring point prior to mixing with other waters or imposing flow-weighted concentration limits at the final discharge point. NRG HCS requested the latter because the sand filters at the end of the IWT process were removed from service and compliance isn't expected at the end of the IWT process anymore. The treatment previously accomplished by the sand filters is now duplicated by the cooling tower clarifier and the filtration system installed to filter cooling tower blowdown prior to discharge at Outfall 001. Using expected maximum flow rates from IWT and Outfall 001, TSS and oil and grease limits are calculated as follows:

$$(Q_{IWT} \times C_{IWT}) = (Q_{001} \times C_{001})$$

where Q = flow rate
C = concentration

In these calculations, TSS and oil & grease contributions from other sources are conservatively assumed to be zero.

2.16 MGD (30 mg/L TSS) = 4.32 MGD ($C_{001\text{-}AML}$)
$C_{001\text{-}AML}$ = 15 mg/L TSS Avg. Mo.

2.16 MGD (100 mg/L TSS) = 4.32 MGD ($C_{001\text{-}MDL}$)
$C_{001\text{-}MDL}$ = 50 mg/L TSS Max. Daily

2.16 MGD (15 mg/L O&G) = 4.32 MGD ($C_{001\text{-}AML}$)
$C_{001\text{-}AML}$ = 7.5 mg/L O&G Avg. Mo.

2.16 MGD (20 mg/L O&G) = 4.32 MGD ($C_{001\text{-}MDL}$)
$C_{001\text{-}MDL}$ = 10 mg/L O&G Max. Daily

Reuse of Other Wastewaters

NRG HCS rerouted other wastewaters to the cooling tower recirculating water system (either directly or by way of the Greenhouse Pond) for reuse as makeup water including:

- Overflows from Cooling Tower Basin #1 previously monitored at IMP 126 and discharged at Outfall 026 were redirected to the Greenhouse Pond
- Overflows from Cooling Tower Basin #2 previously monitored at IMP 226 and discharged at Outfall 026 were redirected to the Greenhouse Pond
- Treated combustion residual leachate monitored at Outfall 004 was redirected to the cooling tower recirculating water system

The reuse of those wastewaters as cooling tower makeup water resulted in the dual benefit of eliminating point source discharges from Outfalls 004 and 026 and reducing the Station's water withdrawals from Two Lick Creek.

No further modifications to Outfall 001's TBELs will be made in response to the rerouting of these other wastewaters. Rather than modify Outfall 001's effluent limits to accommodate 40 CFR Part 423 limits on reused combustion residual leachate from Outfall 004, the combustion residual leachate limits will be imposed at Internal Monitoring Point 101. IMP 101 will be the monitoring point for treated effluent from NRG HCS's landfill leachate treatment system prior to that effluent's combination with other sources in the cooling tower recirculating water system.

The TBELs imposed at IMPs 126 and 226 in the 2014 draft permit were the same as the TBELs imposed at Outfall 001. Cooling Tower Basin overflows consist of the same recirculating cooling water as Outfall 001, so Outfall 001's TBELs will control the rerouted cooling tower basin water from Outfall 026. Outfalls 004 and 026 and IMPs 126 and 226 will be removed from the permit.

001.B. Revised Water Quality-Based Effluent Limitations (WQBELs)

Q_{7-10} Stream Flow of Two Lick Creek

DEP previously evaluated the need for WQBELs at Outfall 001 using a Q_{7-10} stream flow of 40 cfs for Two Lick Creek. That stream flow was determined using EPA's DFLOW 4.0 analysis tool (a plugin for EPA's BASINS program) and daily flow data from USGS Gage 03042500 – Two Lick Creek at Graceton, PA between the years 1993-2013.

DFLOW is one of the methods DEP uses to determine Q_{7-10}, which is the design stream flow DEP uses to develop WQBELs per 25 Pa. Code § 96.4(g). Another method at DEP's disposal is USGS StreamStats, which is a web application with a GIS interface that allows for the determination of stream flow statistics at any point on any stream. DEP chose to use DFLOW because, when performing regression analyses to determine Q_{7-10} at ungaged locations, USGS StreamStats uses all historical stream data from USGS gages statewide. Data specific to Two Lick Creek would consequently be preferred where available. Stream flow in Two Lick Creek was augmented due to flow regulation by the Two Lick Creek Reservoir in December 1968 and Yellow Creek Lake in July 1971, so data predating 1968 is not representative of existing flow conditions.

NRG HCS provided information to further refine the Q_{7-10} stream flow of Two Lick Creek with an accounting for the following flow contributions and deductions between the Graceton gage and Outfall 001:

- 42 cfs: Q_{7-10} of Two Lick Creek at Graceton using flow data from USGS Gage 03042500 between 2007 and 2016 (inclusive).

- +0.20 cfs: estimated flow contribution from tributaries emptying into Two Lick Creek downstream of the Graceton gage and upstream of Outfall 001; calculated from the difference in USGS StreamStats Q_{7-10} estimate for Two Lick Creek at Graceton (13.6 cfs) and the Q_{7-10} estimate for Two Lick Creek at the lower dam near Outfall 001 (13.4 cfs). As explained above, USGS StreamStats's regression-based Q_{7-10} estimates may have different magnitudes than those derived from an analysis using data from the Graceton gage, but the difference in flow between two points on Two Lick Creek should be comparable between the two methods.

- +0.12 cfs (0.0754 MGD): average flow from Central Indiana County Water Authority treatment plant

- -21.55 cfs (13.9 MGD): Homer City's anticipated intake flow rate from Two Lick Creek (upstream of Outfall 001)

The resulting Q_{7-10} flow is: 42 cfs + 0.20 cfs + 0.12 cfs - 21.55 cfs = 20.77 cfs

Revised Reasonable Potential Analysis

Discharge concentrations input in the Toxic Screening Analysis spreadsheet are updated to NRG HCS's revised discharge concentrations. The new discharge concentrations for some pollutants are a result of NRG HCS's reuse of treated wastewaters as makeup water for the cooling towers.

The PENTOXSD analysis for Outfall 001 is modified to include updated input information including:

- Q_{7-10} flow of 20.77 cfs (low-flow yield of 0.11047) instead of 40.0 cfs (low-flow yield of 0.213)
- an average discharge flow of 1.69 MGD instead of 3.00 MGD. This revision is consistent with DEP guidance directing the use of average discharge flows instead of maximum discharge flows

- removal of manually-entered partial mix factors of 0.25 for CFC, THH, and CRL criteria; DEP agrees with NRG HCS that reservation of assimilative capacity is unnecessary since there are no existing or proposed downstream discharges to Two Lick Creek that require assimilative capacity

All other PENTOXSD inputs (river mile index, drainage area, elevation, slope) remain unchanged from the 2014 analysis.

The revised reasonable potential analysis results in less stringent thallium WQBELs than those calculated for the 2014 draft permit. Other water quality-based monitoring requirements for TDS, chloride, bromide, and sulfate are unaffected.

Thallium WQBELs for Outfall 001

WQBELs developed for	Concentration (mg/L)	
	Average Monthly	Daily Maximum
2014 Draft Permit	0.0008	0.0012
2018 Revised Draft Permit	0.0021	0.0033

NRG HCS requested that the new thallium effluent limits take effect at a time that coincides with the elimination of FGD wastewater discharges at Outfall 027 (see Section 027.A of this Fact Sheet Addendum). NRG HCS provided the following explanation of the interrelationship between Outfall 001 and the zero-liquid discharge (ZLD) Strategy for FGD wastewater discharges:

> Wastewater discharges from the Unit #3 FGD will be directed to the Unit #1 and Unit #2 Novel Integrated Desulfurization Systems (NIDS) as part of the ZLD strategy for FGD wastewater (Outfall 027). FGD wastewater will be evaporated in the NIDS as part of the ZLD strategy, but will likely need to be supplemented with cooling tower blowdown (Outfall 001) water to maintain proper flow volumes and water quality within the NIDS. The amount of water being consumed from Outfall 001 under this strategy is not currently understood and will vary under different operating scenarios (e.g. Only Units 1 & 2 in operation versus only Unit 3 in operation). Time is needed to evaluate the impact of eliminating Outfall 027 on the overall plant water balance and water quality. Flow equalization and water quality limitations for various equipment under varying operational conditions must be fully understood.
>
> Water reuse strategies at the cooling tower clarifier will be a key part of managing the water quality entering the NIDs for the various operational conditions (full or partial loads), which will in turn impact the water quality basis at Outfall 001. The Station is requesting time to understand the cycle limits and the water quality and quantity impacts at Outfall 001 as the Station manages the FGD wastewater from Outfall 027. Once this is understood, a plan for the necessary water treatment system needed to maintain compliance at Outfall 001 can be developed.
>
> A block diagram sketch [see Attachment D] has been provided to assist you with understanding the interrelationship of cooling tower blowdown and the ZLD strategy proposed by HCG. The location indicated with asterisks (*) on the sketch are points were the flows and water quality impacts of the ZLD strategy need to be studied and quantified prior to developing a design basis for treatment and equalization. Therefore, it is request that the compliance schedule for Outfall 001 be tied directly to the compliance schedule for Outfall 027.

Essentially, the water chemistry of the Station will be in flux while the ZLD Strategy is implemented, so whether treatment will be needed to comply with the thallium WQBELs at Outfall 001 will be unknown until NRG HCS has evaluated the impacts of implementing the ZLD Strategy.

In consideration of NRG HCS's rationale and 25 Pa. Code § 92a.51, a schedule of compliance will be included in the permit for the new thallium WQBELs at Outfall 001. The schedule will require compliance with the new thallium WQBELs by the last month of the forthcoming permit term.

At the time of this writing, the December 31, 2023 compliance date for 40 CFR Part 423's voluntary incentive program TBELs on FGD wastewater may exceed the five-year term of the permit. Since 25 Pa. Code § 92a.51(a) limits schedules of compliance to five years, the compliance date for both voluntary TBELs on FGD wastewater and the Outfall 001 WQBELs that are tied to the ZLD Strategy's implementation schedule will be identified as one month before permit expiration. If final permit issuance is delayed past December 31, 2018, then the WQBELs will take effect on January 1, 2024.

Revised Thermal WQBELs for Heated Discharges

The temperature limits at Outfall 001 are modified based on updated information provided by NRG HCS. The new information includes the revised Q_{7-10} flow described above; a revised discharge flow rate of 4.32 MGD for most of the year rather than 3.00 MGD as proposed in the 2014 draft permit; a revised discharge flow rate of 2.736 MGD (versus 1.69 MGD in the 2014 draft permit) for the Station's temperature-critical month of July; and information on stream intake flows and external intake flows. The modified inputs are as follows:

- Q_{7-10} stream flow upstream of the Station's intake on Two Lick Creek is revised to 42.32 cfs. The Q_{7-10} flow is not entered as 20.77 cfs because stream intake flows are subtracted by the spreadsheet and the 20.77 cfs Q_{7-10} flow already accounts for the Station's 21.55 cfs withdrawal.

- A stream intake of 13.9 MGD (21.55 cfs) is included in the spreadsheet for each monthly/semi-monthly period.

- An external intake of 2.16 MGD is included in the spreadsheet to account for flow contributions from the IWT (former Outfall 003). That water is not supplied by the Station's intake on Two Lick Creek, so it is classified as an external intake. Other externally-sourced flows (e.g., treated landfill leachate) contribute to Outfall 001, but accounting for external flow contributors is not necessary to derive temperature limits at Outfall 001 because NRG HCS has already proposed maximum discharge flow rates and it is not necessary to calculate discharge flows based on intake flows and consumptive losses.[2]

- Consumptive loses are entered at values necessary for the spreadsheet to calculate discharge flows equivalent to NRG HCS's proposed maximum flow limits.

The revised analysis results in a lower temperature limit for July. The temperature limits for all other months remain at 110°F with discharge flows from Outfall 001 limited to 4.32 MGD.

Outfall 001 Monthly and Semi-Monthly Flow Rates and Thermal WQBELs

Limiting Period		Outfall 001 Discharge Flow Rate (MGD)	Maximum Daily Discharge Temperature (°F)
Begin	**End**		
Jan 1	Jan 31	4.32	110
Feb 1	Feb 29	4.32	110
Mar 1	Mar 31	4.32	110
Apr 1	Apr 15	4.32	110
Apr 16	Apr 30	4.32	110
May 1	May 15	4.32	110
May 16	May 31	4.32	110
Jun 1	Jun 15	4.32	110
Jun 16	Jun 30	4.32	110
Jul 1	Jul 31	2.736	85.9
Aug 1	Aug 15	4.32	110
Aug 16	Aug 31	4.32	110
Sept 1	Sept 15	4.32	110
Sept 16	Sept 30	4.32	110
Oct 1	Oct 15	4.32	110
Oct 16	Oct 31	4.32	110
Nov 1	Nov 15	4.32	110
Nov 16	Nov 30	4.32	110
Dec 1	Dec 31	4.32	110

Since NRG HCS has identified flow limits that result in temperature WQBELs that can already be achieved by the Station, the temperature WQBELs will take effect immediately.

[2] The importance of NRG HCS's external sources for the thermal analysis is that discharges are modeled as Case 2 scenarios when there are external intakes. For Case 2 scenarios, thermal WQBELs are expressed as temperatures and not heat rejection rates. See p.40 of the 2014 draft NPDES permit Fact Sheet for an explanation of the temperature spreadsheet and Case 1 and Case 2 thermal modeling scenarios.

Total Maximum Daily Load for Streams Impaired by Acid Mine Drainage in the Kiskiminetas-Conemaugh River Watershed

NRG HCS requested that allowable discharge loadings at Outfall 001 be increased due to the reuse of IWT effluent and treated landfill leachate as makeup water for the cooling towers. NRG HCS proposed to redistribute TMDL wasteload allocations (WLAs) from sub-watershed 4002 (Outfalls 003 and 005) to sub-watershed 4351 (Outfall 001). The reallocation of WLAs from other sub-watersheds deviates from the rules DEP established for the intra-facility WLA transfers in the 2014 draft permit. However, the transfers are still consistent with the TMDL because:

1) the imposition of concentration limits at criteria levels for TMDL pollutants will ensure that discharges at Outfall 001 will not cause excursions above water quality criteria in Two Lick Creek
2) the increased load allowance will allow for higher discharge flow rates, but the increased flow will also add assimilative capacity such that criteria are achieved at the outfall
3) the Station will still be operating within its facility-wide WLAs

The revised WLAs for Outfall 001 are summarized in the table below.

TMDL Effluent Limits for Outfall 001

Pollutant	TMDL Allocated Load (lb/yr)	TMDL Allocated Concentration (mg/L)	Modified Allocated Load (lb/yr)	TMDL WQBELs (mg/L)		
				Average Monthly	Daily Maximum	Instant Maximum
Aluminum, Total	7,997	0.75	9,869	0.75	0.75	0.75
Iron, Total	15,994	1.50	19,739	1.5	3.0	3.75
Manganese, Total	10,663	1.00	13,159	1.0	2.0	2.5

The 2012 NPDES Permit Amendment imposed concentration limits for aluminum, iron, and manganese with a three-year compliance schedule. In the 2014 draft permit, DEP proposed to extend that schedule by two years to give NRG HCS a total five years from the 2012 amendment effective date to comply with TMDL limits. The compliance dates for the three-year schedule in the 2012 amendment and the two-year extension proposed in the 2014 draft permit have both passed. Pursuant to 25 Pa. Code § 92a.51(a), "Any schedule of compliance specified in the permit must require compliance with final enforceable effluent limitations as soon as practicable, but in no case longer than 5 years, unless a court of competent jurisdiction issues an order allowing a longer time for compliance." The maximum five-year allowance from the initial date of imposition would have expired on or about July 31, 2017. Therefore, TMDL WQBELs will take effect immediately in the renewed permit.

001.C. Revised Effluent Limitations and Monitoring Requirements for Outfall 001

Effluent limits applicable at Outfall 001 are the more stringent of TBELs, WQBELs, regulatory effluent standards and monitoring requirements as summarized in the table below.

Effluent Limits and Monitoring Requirements for Outfall 001

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Monthly	Total Annual	Average Monthly	Daily Maximum	Instant Maximum	
Flow (MGD) Jul 1 – 31	Report (Avg Mo)	2.736 (Daily Max)	—	—	—	for Temperature WQBELs
Flow (MGD) Aug 1 – Jun 30	Report (Avg Mo)	4.32 (Daily Max)	—	—	—	for Temperature WQBELs
Temperature (°F) Jul 1 – 31	—	—	—	85.9	—	WQBEL
Temperature (°F) Aug 1 – Jun 30	—	—	—	110	—	Effluent Standard
Total Suspended Solids	—	—	15.0	50.0	—	40 CFR § 423.13(b)(3)
Oil and Grease	—	—	7.5	10.0	—	40 CFR § 423.13(b)(3)
Free Available Chlorine	—	—	0.2	0.5	—	40 CFR § 423.13(d)(1)
Chromium, Total	—	—	0.2	0.2	—	40 CFR § 423.13(d)(1)
Zinc, Total	—	—	1.0	1.0	—	40 CFR § 423.13(d)(1)
Thallium, Total (Interim)	—	—	Report	Report	Report	Compliance Schedule

Effluent Limits and Monitoring Requirements for Outfall 001 (continued)

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Monthly	Total Annual	Average Monthly	Daily Maximum	Instant Maximum	
Thallium, Total (Final)	—	—	0.0021	0.0033	0.0053	WQBELs
Aluminum, Total	Report	9,869	0.75	0.75	0.75	Kiski-Conemaugh TMDL
Iron, Total	Report	19,739	1.5	3.0	3.75	Kiski-Conemaugh TMDL
Manganese, Total	Report	13,159	1.0	2.0	2.5	Kiski-Conemaugh TMDL
Total Dissolved Solids	—	—	Report	Report	—	25 Pa. Code § 92a.61
Chloride	—	—	Report	Report	—	25 Pa. Code § 92a.61
Bromide	—	—	Report	Report	—	25 Pa. Code § 92a.61
Sulfate	—	—	Report	Report	—	25 Pa. Code § 92a.61
pH	within the range of 6.0 to 9.0					40 CFR § 423.12(b)(1) & 25 Pa. Code § 95.2(1)

Monitoring frequencies and samples types will remain the same as those specified in the 2014 draft permit. The added parameters, TSS and Oil and Grease, will require 24-hour composite sampling 1/week and grab sampling 1/week, respectively.

Development of Effluent Limitations

IMP No.	101 (old Outfall 004)	**Design Flow (MGD)**	0.62
Latitude	40° 31' 6.00"	**Longitude**	-79° 12' 45.00"

Wastewater Description: Treated coal combustion waste landfill leachate from leachate ponds L-1, L-2, L-3 and L-4 and contaminated storm water runoff collected in a sedimentation/surge pond

In 2015, NRG HCS re-routed wastewaters from Outfall 004 to the cooling tower clarifier for use as makeup water in the recirculating water system for Units 1 and 2. Outfall 004's effluent is now discharged as part of the cooling tower blowdown that discharges at Outfall 001. NRG HCS still operates its leachate treatment system prior to recycling treated leachate to the cooling tower clarifier. Unlike the reuse of Outfall 003's effluent, effluent limits at Outfall 001 are not modified to account for limits on reused combustion residual leachate. Applicable limits for that wastewater are imposed at new Internal Monitoring Point 101 pursuant to 40 CFR § 122.45(h).[3] Outfall 004 will be retired from the permit.

101.A. Technology-Based Effluent Limitations (TBELs)

As explained in the comment responses at the beginning of this Fact Sheet Addendum, the 2015 Rule amending 40 CFR Part 423 separated combustion residual leachate and other wastewaters from the definition of low volume waste sources. Applicable BPT and BAT requirements for discharges of combustion residual leachate are now given by 40 CFR §§ 423.12(b)(1), 423.12(b)(11), and 423.13(l).

For BPT under 40 CFR § 423.12(b)(1):

> The pH of all discharges, except once through cooling water, shall be within the range of 6.0 to 9.0.

and § 423.12(b)(11):

> The quantity of pollutants discharged in FGD wastewater, flue gas mercury control wastewater, combustion residual leachate, or gasification wastewater shall not exceed the quantity determined by multiplying the flow of the applicable wastewater times the concentration listed in the following table:

	BPT Effluent limitations	
Pollutant or pollutant property	**Maximum for any 1 day (mg/l)**	**Average of daily values for 30 consecutive days shall not exceed (mg/l)**
TSS	100.0	30.0
Oil and Grease	20.0	15.0

For BAT under 40 CFR § 423.13(l):

> *Combustion residual leachate.* The quantity of pollutants discharged in combustion residual leachate shall not exceed the quantity determined by multiplying the flow of combustion residual leachate times the concentration for TSS listed in §423.12(b)(11).

Effluent limits will be imposed as concentration limits instead of mass limits pursuant to 40 CFR § 423.12(b)(12).

Other Limits and Monitoring Requirements

TBELs for dissolved iron and total manganese imposed at Outfall 004 in the 2012 permit amendment will be maintained at IMP 101 based on anti-backsliding (40 CFR § 122.44(l)). The 30 mg/L instantaneous maximum oil and grease limit proposed in the 2014 draft permit will be removed because the 20 mg/L maximum daily limit for oil and grease from § 423.12(b)(11) already limits maximum oil and grease concentrations. Flow monitoring will be required in accordance with 25 Pa. Code § 92a.61(d)(1). TBELs are summarized in the table below.

[3] 40 CFR § 122.45(h)(1): "When permit effluent limitations or standards imposed at the point of discharge are impractical or infeasible, effluent limitations or standards for discharges of pollutants may be imposed on internal waste streams before mixing with other waste streams or cooling water streams."

TBELs for IMP 101

Pollutant	Monthly Average (mg/L)	Maximum Daily (mg/L)
Total Suspended Solids	30.0	100.0
Oil and Grease	15.0	20.0
Dissolved Iron	2.0	4.0
Manganese, Total	2.0	4.0
pH	within the range of 6.0 to 9.0	

101.B. Water Quality-Based Effluent Limitations (WQBELs)

New WQBELs proposed in the 2014 draft permit will be removed because treated combustion residual leachate is used in another process and does not discharge directly to waters of Commonwealth prior to that reuse.

101.C. Effluent Limits and Monitoring Requirements for Internal Monitoring Point 101

Effluent limits applicable at IMP 101 are the more stringent of TBELs, regulatory effluent standards, and monitoring requirements as summarized in the table below.

Flow monitoring will be required in accordance with 25 Pa. Code § 92a.61(d)(1).

Effluent Limits and Monitoring Requirements for IMP 101

Parameter	Mass (pounds/day)		Concentration (mg/L)			Basis
	Average Monthly	Daily Maximum	Average Monthly	Daily Maximum	Instant Maximum	
Flow (MGD)	Report	Report	—	—	—	25 Pa. Code § 92a.61(d)(1)
Total Suspended Solids	—	—	30.0	100.0	—	40 CFR § 423.12(b)(11) & 423.13(l)
Oil and Grease	—	—	15.0	20.0	—	40 CFR § 423.12(b)(11)
Iron, Dissolved	—	—	2.0	4.0	—	40 CFR § 122.44(l)
Manganese, Total	—	—	2.0	4.0	—	40 CFR § 122.44(l)
pH	within the range of 6.0 to 9.0					40 CFR § 423.12(b)(1)

Monitoring frequencies and sample types are imposed in accordance with Chapter 6, Table 6-4 of DEP's *Technical Guidance for the Development and Specification of Effluent Limitations* and those imposed in the previous permit. For process wastewaters, the technical guidance recommends 1/week sampling using 24-hour composite samples for TSS and metals; 1/week grab sampling for oil and grease and pH; and continuous recording for flow.

Development of Effluent Limitations

IMP No.	201 (old Outfall 003)	**Design Flow (MGD)**	2.08
Latitude	40° 30' 50.00"	**Longitude**	-79° 11' 34.00"

Wastewater Description: Water from coal pile desilting basins 1, 2, and 3; water treatment wastes, plant drains, roof and parking lot drains, cooling tower drains for Units 1, 2, and 3, and storm water collected in the secondary containment areas for the fuel oil storage and truck loading pad

In 2016, NRG HCS re-routed wastewaters from Outfall 003 to the cooling tower clarifier for use as makeup water in the circulating water system for Units 1 and 2. Outfall 003's effluent is now discharged as part of the cooling tower blowdown that discharges at Outfall 001. Outfall 003 no longer exists as a standalone discharge to waters of the Commonwealth and will consequently be retired from the permit.

When Outfall 003's effluent was recycled for reuse, the sand filters used as part of the industrial wastewater treatment plant (IWT) were removed from service. Comparable treatment of IWT effluent is now accomplished by the cooling tower clarifier and the end-of-pipe filtration system that treats Outfall 001's effluent.

To ensure compliance with 40 CFR § 423.12(b)(13) regarding effluent limits for combined waste streams[4], the effluent limits at Outfall 001 were modified using mass balance calculations to reflect the effluent limits applicable to low volume wastes. Effluent limits for low volume wastes cannot be imposed on the IWT's effluent before that effluent is reused because the sand filters that were used to comply with limits for low volume wastes are no longer in service. The limits are imposed after the wastewater is treated, which would be downstream of the Outfall 001 filtration system. Outfall 001 limits are discussed on pp.19 - 24 of this Fact Sheet Addendum.

Continuous recording and reporting of the IWT's effluent flow rate will be required at a point designated as Internal Monitoring Point 201 to facilitate future determinations of Outfall 001's effluent limits by mass balance. Continuous flow recording was already required at former Outfall 003 from the IWT.

[4] § 423.12(b)(13): "In the event that wastestreams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (b)(1) through (b)(12) of this section attributable to each controlled waste source shall not exceed the specified limitations for that waste source."

Development of Effluent Limitations

Outfall/IMP Nos. 006, 106, 206, 306, 406, & 506 **Design Flow (MGD)** Variable
Wastewater Description: Coal pile runoff and storm water runoff

As explained in the Fact Sheet for the 2014 draft permit, Outfall 006 is the new designation for the outlet from the 42" pipeline located on the western side of the Station. Discharges to the 42" pipeline that were previously identified as outfalls were re-designated as internal monitoring points in the 2014 draft permit as follows: former Outfall 006 was changed to IMP 106 – storm water runoff from the plant entrance and parking area south of the Unit #3 and FGD areas; Outfall 011 was changed to IMP 206 – overflows from coal desilting basin #1; Outfall 012 was changed to IMP 306 - overflows from coal desilting basin #2; and Outfall 028 was changed to IMP 506 – overflows from the limestone storage area storm water pond. IMP 406 is a new discharge from the Station's Railroad Unloading Basin.

NRG HCS requested that TMDL limits be imposed at the IMPs rather than Outfall 006. That request may be the result of a misunderstanding regarding the applicability of TMDL limits to the overflow discharges at IMPs 206, 306, and 506. The absence of TMDL limits on those discharges and on discharges at IMPs 106 and 406 in the 2014 draft permit did not represent a determination by DEP that TMDL limits do not apply to those discharges; rather, the rationale was that internal monitoring points are generally not subject to WQBELs because water quality criteria compliance evaluations would not be conducted for internally monitored sources until they discharge to waters of the Commonwealth.

All sources contributing to Outfall 006 are subject to TMDL wasteload allocations. Those wasteload allocations can either be assigned in the aggregate at Outfall 006 where they discharge to waters of the Commonwealth or individually at each IMP. Either option would be equivalent. In its January 2, 2018 update memo, NRG HCS opted for limits at each IMP.

Storm Water (IMPs 106 and 406)

Monitoring requirements at IMPs 106 and 406 are updated to be consistent with Appendix H of the most recent version of DEP's PAG-03 General Permit for Discharges of Stormwater Associated with Industrial Activity from September 2016. As a result, proposed monitoring requirements for copper, nickel, and zinc are removed. However, the monitoring frequencies for TSS, oil and grease, and pH are changed to 1/6 months.

As described in the 2014 draft permit Fact Sheet, reporting of Nitrate+Nitrite as N, Total Kjeldahl Nitrogen, and Ammonia-Nitrogen also will be required due to elevated concentrations reported on the permit application.

Since TMDL limits are being imposed at the IMPs, WLAs for IMPs 106 and 406 are calculated by applying the same methodology that was applied to calculate WLAs for other storm water discharges:

- Calculate the annual storm water runoff volume by multiplying the runoff area contributing to each storm water outfall by an average annual rainfall of 46.5 inches.
- Calculate an estimated maximum daily flow rate by dividing the annual storm water runoff volume by 365 and multiplying the result (an average) by two to get a maximum.
- Annual WLAs can then be calculated using the estimated maximum daily flow rate and the TMDL's concentration endpoints (i.e., criteria: 0.75 mg/L aluminum, 1.5 mg/L iron, and 1.0 mg/L manganese).

Pollutant	TMDL Allocation (lb/yr)		Modified Allocated Load (lb/yr)	
	IMP 106	IMP 406	IMP 106	IMP 406
Aluminum, Total	69	0	321	323
Iron, Total	139	0	641	646
Manganese, Total	92	0	427	431

Coal Desilting Ponds (IMPs 206 and 306)

Technology-Based Effluent Limits (TBELs)

The coal desilting ponds discharge intermittently when coal pile runoff volumes exceed the volume of the 10-year, 24-hour design storm. 40 CFR § 423.12(b)(10) states that "[a]ny untreated overflow from facilities designed, constructed, and operated to treat the volume of coal pile runoff which is associated with a 10 year, 24 hour rainfall event shall not be subject to the limitations in paragraph (b)(9) of this section."

Since the coal desilting ponds were designed to hold the 10-year, 24-hour runoff volume, untreated overflows exceeding that volume are exempt from the 50 mg/L TSS limit of § 423.12(b)(9). Discharges are still subject to pH limits and flow reporting as imposed in the previous permit.

Water-Quality Based Effluent Limits (WQBELs)

As explained in the Response to Comment II.F.1 on pp. 5 and 6 of this Fact Sheet Addendum and pp. 70 and 71 of the Fact Sheet, discharges from the coal desilting ponds are subject to TMDL WQBELs. Even though the ponds would not overflow during the $Q_{7\text{-}10}$ design conditions that DEP uses for mathematical modeling, the Kiskiminetas-Conemaugh River Watershed TMDL accounts for critical loading during both low-flow and high-flow conditions. The 40 CFR § 423.12(b)(10) exemption does not extend to WQBELs because WQBELs are not addressed by Federal Effluent Limitations Guidelines. WQBELs are a site-specific and watershed-specific determination.

Also, even if TMDL WQBELs were not applicable to overflows from the coal desilting basins, the overflows still exhibit—based on currently available information—a reasonable potential to cause, or contribute to an excursion above water quality criteria. That conclusion is based on the following:

- Analytical data included with the application shows that the coal desilting pond overflows have total iron concentrations of 12.8 mg/L and total manganese concentrations of 6.99 mg/L
- The most stringent water quality criteria for iron and manganese are 1.5 mg/L and 1.0 mg/L, respectively.
- 25 Pa. Code § 96.3(c) requires that "the water quality criteria described in Chapter 93 (relating to water quality standards), including the criteria in §§ 93.7 and 93.8a(b) (relating to specific water quality criteria; and toxic substances) shall be achieved in all surface waters at least 99% of the time."
- Outfall 006—the final discharge location for IMPs 206 and 306—discharges to the headwaters of a small unnamed tributary.

Unlike other overflows at the Station that go years without discharging, the coal desilting ponds discharge semi-regularly. NRG HCS does not have information on overflow durations, but DMR data suggests that overflows occur more than 1% of the time. Stream flow in the headwaters of the unnamed tributary would be effluent-dominated even during high flow conditions. The receiving stream would have little assimilative capacity to facilitate compliance with water quality criteria 99% of the time when every overflow exceeds water quality criteria and those overflows are essentially the stream. Coal desilting pond overflows would benefit from mixing with concurrent discharges of storm water from IMPs 106 and 406 prior to discharge at Outfall 006, but whether that mixing would result in compliance with water quality criteria is unknown.

Pursuant to 40 CFR § 122.44(d)(1)(i): "Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Based on the preceding, TMDL WQBELs will be imposed at IMPs 206 and 306. NRG HCS is unable to comply with the WQBELs (concentrations or load), so the permit will include a schedule of compliance pursuant to 25 Pa. Code § 92a.51.

Annual Load Limits for Aluminum, Iron, and Manganese

Outfall 006 and its contributing sources are in TMDL sub-watershed (SWS) 4002. NRG HCS has rerouted Outfall 003 for use as cooling tower makeup water. Since the Industrial Wastewater Treatment plant's flow is still present in the watershed, the TMDL's WLAs for Outfall 003 can be reused elsewhere in the watershed as with former Outfall 005. WLA transfers in SWS 4002 are summarized in the tables below including a transfer from SWS 4002 to SWS 4351 as explained in the Outfall 001 section of this Fact Sheet Addendum.

WLAs for Continuous Discharges

WLA Description	Aluminum (lb/yr)	Iron (lb/yr)	Manganese (lb/yr)
WLAs Available from Outfalls 003 & 005	9,436	18,873	12,582
WLAs for Outfalls 018 and 027	275	549	367
Continuous Discharge WLAs Available to Allocate	9,711	19,422	12,949

There are enough WLAs available from the TMDL's WLAs for continuous discharges in SWS 4002 to allocate more load to the remaining continuous discharges: Outfalls 018 and 027.

Outfall	Wasteloads Allocated by TMDL (lb/yr)			NRG HCS Requested WLAs (lb/yr)		
	Aluminum	Iron	Manganese	Aluminum	Iron	Manganese
018	1	1	1	914	1,828	1,218
027	274	548	366	4,045	8,091	5,395
Total	275	549	367	4,959	9,919	6,613

WLAs for Storm Water and Non-Continuous Discharges Remaining in the Permit

Outfall / IMP	Wasteloads Allocated by TMDL (lb/yr)			Proposed WLAs (lb/yr)		
	Aluminum	Iron	Manganese	Aluminum	Iron	Manganese
106	69	139	92	321	641	427
406	0	0	0	323	646	431
016	1,645	3,290	2,193	8	16	11
017	69	138	92	327	655	436
019	4	8	6	34	68	45
022	50	101	67	232	465	310
025	6	12	8	27	54	36
Total	1,843	3,688	2,458	1,273	2,545	1,697

With the exception of Outfall 016, WLAs for other monitoring points are calculated using water quality criteria and flow rates derived from estimated yearly precipitation (46.5 inches) and outfall drainage areas. Outfall 016's wasteload allocations are calculated using the most stringent water quality criteria for TMDL parameters, the average of the maximum flow rates reported for Outfall 016's overflows in the year with the most reported overflows (0.41 MGD average of maximum flows from 2012), and the historical number of days with reported discharges in that year (3 days).

Avg. Flow = (0.05 MGD (May 2012) + 1.05 MGD (Jun 2012) + 0.12 MGD (Oct. 2012)) / 3 ≈ 0.41 MGD

Avg. Discharge Flow [MGD] × Water Quality Criterion [mg/L] × 8.34 × No. of discharging days/year = WLA [pounds/year]

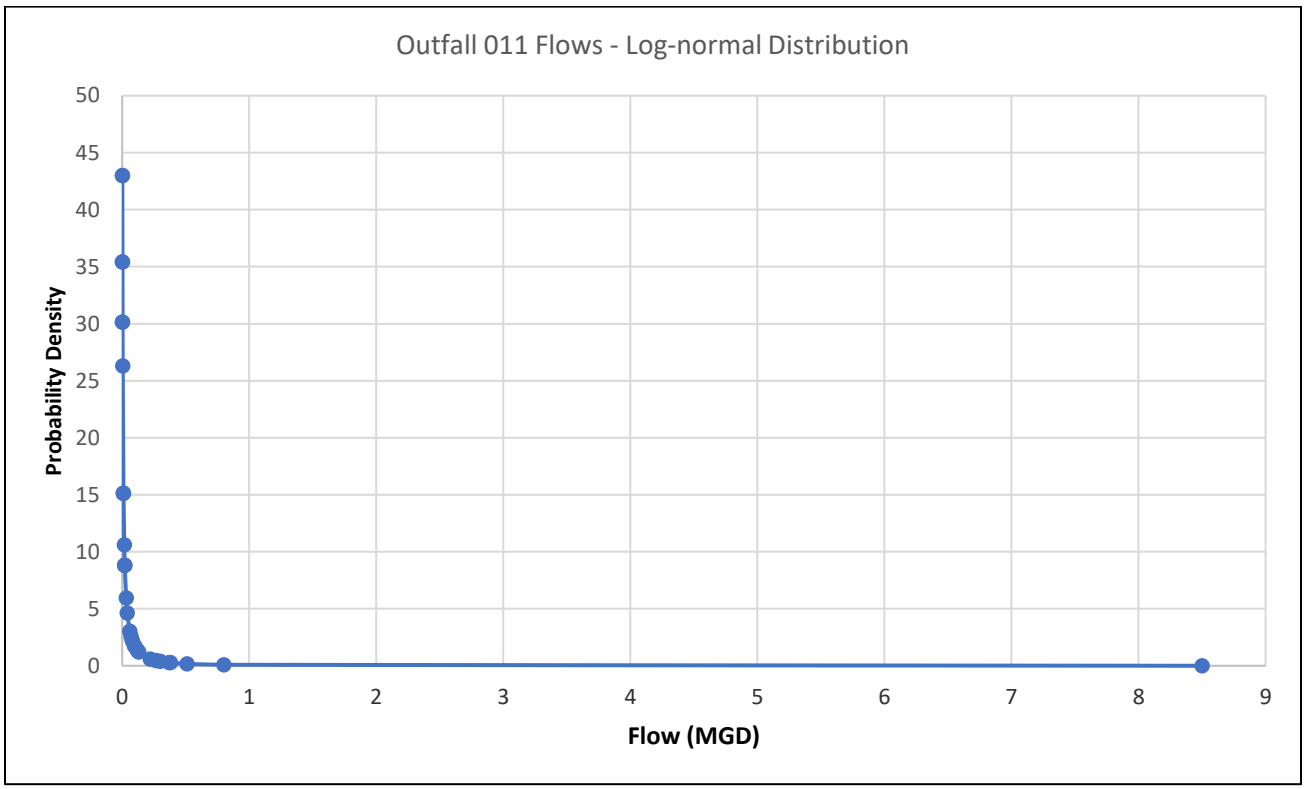
0.41 MGD × 0.75 mg/L × 8.34 × 3 days/year = 8 pounds/year of Aluminum (rounded up)
0.41 MGD × 1.5 mg/L × 8.34 × 3 days/year = 16 pounds/year of Iron (rounded up)
0.41 MGD × 1.0 mg/L × 8.34 × 3 days/year = 11 pounds/year of Manganese (rounded up)

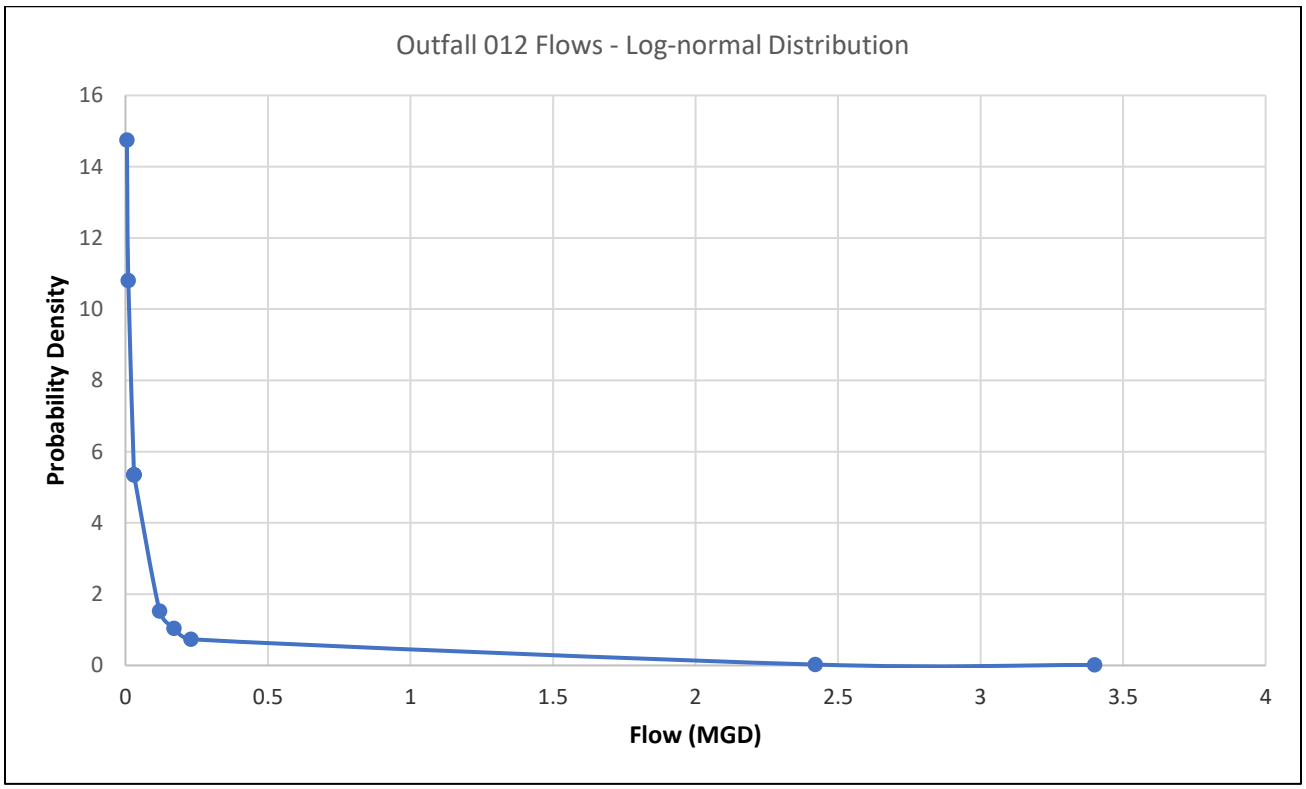
The remaining WLAs available for IMPs 206 and 306 are calculated as follows:

WLA Description	Aluminum (lb/yr)	Iron (lb/yr)	Manganese (lb/yr)
Total WLAs in SWS 4348	13,177	26,358	17,574
Retired WLAs from Outfalls 007 & 008	-20	-41	-27
Continuous Discharge WLAs for 018 & 027	-4,959	-9,919	-6,613
WLAs Transferred to SWS 4351 (001)	-1,872	-3,745	-2,496
WLAs for Storm Water and Non-Continuous	-1,273	-2,545	-1,697
Total WLAs Remaining for IMPs 206 & 306	5,053	10,109	6,741

Determination of WLAs Available for IMPs 206 and 306

DEP's analysis of flow rates reported on DMRs from September 2012 through April 2018 shows that Outfall 011's (IMP 206) and Outfall 012's (IMP 306) discharge flows are log-normally distributed. Since TMDL WLAs for IMPs 206 and 306 are being apportioned from the Station's remaining available WLAs in SWS 4002 and aren't being calculated directly like Outfall 016's WLAs, average flow rates are used for the analysis.





Consistent with storm recurrence intervals, the distributions above show that there is a high probability of low-to-moderate precipitation-induced overflows from the coal desilting basins and a low probability of high precipitation-induced overflows. The distributions are skewed significantly to the right by a few high flow rates (e.g., the highest average flow rate reported at Outfall 011 is 8.5 MGD and the next highest is 0.8 MGD). Outfall 011 discharges more often than Outfall 012, so there are fewer data points to evaluate Outfall 012.

The mean flow rates for Outfalls 011 (IMP 206) and 012 (IMP 306) based on the distributions above are 0.3967 MGD and 0.9758 MGD, respectively. The mean flow rate for Outfall 012 is higher than Outfall 011's because, with fewer data points, the skewness of the distribution is more sensitive to high flow data points and the skewness affects the mean. To apportion the available WLAs, total yearly discharge volumes are estimated using the mean flow rates and the number of days each outfall discharged per year (for the year with the most reported overflows—2015). Outfall 011 discharged on twelve days in 2015 and Outfall 012 discharged six days in 2015. The duration of those discharges is unknown, but DEP will assume that the discharges occurred for 24 hours on those days.

The most discharges from Outfall 011 were reported in 2015: April, May, June, July, August, September, November, and December. The most discharges from Outfall 012 were reported in 2017, three months: March, June, and September. Assuming at least one full day of discharge in each of those months, estimated yearly discharge volumes are calculated as follows:

Outfall 011 (IMP 206): 0.3967 MGD × 12 days per year = 4.7604 million gallons per year

Outfall 012 (IMP 306): 0.9758 MGD × 6 discharge days per year = 5.8548 million gallons per year

Total Discharge Volume from Coal Desilting Basins #1 and #2 = 10.6152 million gallons

The actual discharge volume in 2015 is likely different based on actual discharge durations, but the proportion of the discharge volume attributable to Outfalls 011 and 012 is what DEP is using for the annual WLA calculation. IMP 206's discharge volume represents 44.8% of the yearly total and IMP 306's discharge volume represents 55.2%. Applying these same percentages to the Total WLAs Remaining for IMPs 206 and 306 yields the following:

WLA Description	Aluminum (lb/year)	Iron (lb/year)	Manganese (lb/year)
Total WLAs Remaining for IMPs 206 & 306	5,053	10,109	6,741
WLAs for IMP 206	2,264	4,529	3,020
WLAs for IMP 306	2,789	5,580	3,721

Other Monitoring Requirements

NRG HCS already estimates storm water discharge flows using the SCS Runoff Curve Number method and precipitation data from an on-site rain gauge. As part of NRG HCS's demonstration of TMDL compliance, reporting of monthly and yearly precipitation will be required. For simplicity, precipitation reporting representing rainfall totals for the Station will be required at an existing monitoring location: IMP 106.

Effluent Limits and Monitoring Requirements for IMP 106

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Semi-Annual	Total Annual	Semi-Annl. Average	Daily Maximum	Instant Maximum	
Flow (MGD)	—	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(h)
Total Flow (Total Volume, million gallons)	Report	Report	—	—	—	TMDL; 25 Pa. Code 96.4(i)
Total Precipitation (in)	Report (Total Mo.)	Report	—	—	—	TMDL; 25 Pa. Code 96.4(i)
Oil and Grease	—	—	—	Report	—	PAG-03, Appendix H
Total Suspended Solids	—	—	—	Report	—	PAG-03, Appendix H
Nitrate-Nitrite as N	—	—	—	Report	—	WQ Analysis
Ammonia-Nitrogen	—	—	—	Report	—	WQ Analysis
Total Kjeldahl Nitrogen	—	—	—	Report	—	WQ Analysis
Aluminum, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Aluminum, Total (Final)	Report	321	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Final)	Report	641	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Final)	Report	427	Report	Report	—	Kiski-Conemaugh TMDL
pH	—	—	—	Report	—	PAG-03, Appendix H

Effluent Limits and Monitoring Requirements for IMP 206

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Monthly	Total Annual	Average Monthly	Daily Maximum	Instant Maximum	
Flow (MGD)	Report (Avg Mo)	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(b)
Total Flow (Total Volume, million gallons)	Report	Report	—	—	—	TMDL; 25 Pa. Code 96.4(i)
Total Suspended Solids	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
Total Dissolved Solids	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
Aluminum, Total	Report	2,264	0.75	0.75	0.75	Kiski-Conemaugh TMDL
Iron, Total	Report	4,529	1.5	3.0	3.75	Kiski-Conemaugh TMDL
Manganese, Total	Report	3,020	1.0	2.0	2.5	Kiski-Conemaugh TMDL
pH	within the range of 6.0 to 9.0					25 Pa. Code § 95.2(1); 40 CFR § 423.12(b)(1)

Effluent Limits and Monitoring Requirements for IMP 306

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Monthly	Total Annual	Average Monthly	Daily Maximum	Instant Maximum	
Flow (MGD)	Report (Avg Mo)	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(b)
Total Flow (Total Volume, million gallons)	Report	Report	—	—	—	TMDL; 25 Pa. Code 96.4(i)
Total Suspended Solids	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
Total Dissolved Solids	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
Aluminum, Total	Report	2,789	0.75	0.75	0.75	Kiski-Conemaugh TMDL
Iron, Total	Report	5,580	1.5	3.0	3.75	Kiski-Conemaugh TMDL
Manganese, Total	Report	3,721	1.0	2.0	2.5	Kiski-Conemaugh TMDL
pH	within the range of 6.0 to 9.0					25 Pa. Code § 95.2(1); 40 CFR § 423.12(b)(1)

Effluent Limits and Monitoring Requirements for IMP 406

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Semi-Annual	Total Annual	Semi-Annl. Average	Daily Maximum	Instant Maximum	
Flow (MGD)	—	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(h)
Total Flow (Total Volume, million gallons)	Report	Report	—	—	—	TMDL; 25 Pa. Code 96.4(i)
Oil and Grease	—	—	—	Report	—	PAG-03, Appendix H
Total Suspended Solids	—	—	—	Report	—	PAG-03, Appendix H
Nitrate-Nitrite as N	—	—	—	Report	—	WQ Analysis
Ammonia-Nitrogen	—	—	—	Report	—	WQ Analysis
Total Kjeldahl Nitrogen	—	—	—	Report	—	WQ Analysis
Aluminum, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Aluminum, Total (Final)	Report	323	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Final)	Report	646	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Final)	Report	431	Report	Report	—	Kiski-Conemaugh TMDL
pH	—	—	—	Report	—	PAG-03, Appendix H

Development of Effluent Limitations

Outfall No.	013 and 029	Design Flow (MGD)	Variable
Latitude	40° 31' 5.00"	Longitude	-79° 12' 46.00"
Quad Name	Indiana	Quad Code	1412
Wastewater Description:	Coal combustion waste landfill storm water runoff diversion ditch; Internal Monitoring Points 020 and 113 – 913 (Outfall 013); and Internal Monitoring Point 129 (Outfall 029)		

Receiving Waters	Unnamed tributary of Blacklick Creek	Stream Code	44071
NHD Com ID	123719956	RMI	0.67
Drainage Area		Yield (cfs/mi^2)	
Q_{7-10} Flow (cfs)		Q_{7-10} Basis	
Elevation (ft)		Slope (ft/ft)	
Watershed No.		Chapter 93 Class.	
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status			
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status	Final, 01/29/2010	Name	Kiskiminetas-Conemaugh River Watersheds TMDL

Nearest Downstream Public Water Supply Intake	Buffalo Township Municipal Authority – Freeport Plant		
PWS Waters	Allegheny River	Flow at Intake (cfs)	
PWS RMI	29.4	Distance from Outfall (mi)	

Based on the definition of "waters of the Commonwealth" in 35 P.S. § 691.1 of the Pennsylvania Clean Streams Law[5], the ash landfill's eastern and western diversion channels are waters of the Commonwealth. However, DEP recognizes that the diversion channels are subject to regulation and modification under the Solid Waste Permit given that they are artificial channels of conveyance constructed as part of the ash landfill. Therefore, Outfalls 013 and 029 will be reinstated as final discharge points and discharges to the diversion channels will be identified as internal monitoring points. DEP reserves its right to regulate wastewaters at the IMPs as discharges to waters of the Commonwealth.

Technology-Based Effluent Limitations (TBELs)

Regulatory Effluent Standards and Monitoring Requirements

Flow monitoring will be required in accordance with 25 Pa. Code § 92a.61(d)(1). Limits for pH (6.0 minimum and 9.0 maximum) will be imposed pursuant to 25 Pa. Code § 95.2(1).

TBELs that apply to wastewaters at Outfalls 013 and 029 are imposed at internal monitoring points for each contributing source that remains (213, 613, and 813) after the elimination of overflow monitoring locations, so no additional TBELs are imposed at the final outfalls.

In the 2012 NPDES permit amendment, DEP imposed TDS monitoring requirements at Outfalls 013 and 029 to evaluate the facility's TDS discharge load contribution to waters of the Commonwealth. Those monitoring requirements will be re-imposed at Outfalls 013 and 029 pursuant to 25 Pa. Code § 92a.61(b).

[5] "Waters of the Commonwealth" shall be construed to include any and all rivers, streams, creeks, rivulets, impoundments, ditches, water courses, storm sewers, lakes, dammed water, ponds, springs and all other bodies or channels of conveyance of surface and underground water, or parts thereof, whether natural or artificial, within or on the boundaries of this Commonwealth.

Water Quality-Based Effluent Limitations (WQBELs)

As explained in the comment responses, DEP is removing emergency overflow outfalls from the permit based on historical reporting data and impoundment and sedimentation basin design bases, which show that no overflows have occurred to date and indicate that overflows are unlikely to occur.

Other than storm water runoff entering the eastern and western diversion channels on the perimeter of the ash landfill (with effluent characterizations shown in the table below), most of the contributing sources to Outfalls 013 and 029 would be from emergency overflow discharges. The combined discharge of these sources at Outfalls 013 and 029 to an unnamed tributary of Blacklick Creek should not occur at Q_{7-10} conditions because overflows from each impoundment or pond should not occur at Q_{7-10} conditions. Therefore, DEP concludes that discharges at Outfalls 013 and 029 have no reasonable potential to cause or contribute to excursions above water quality criteria. The exception to this determination relates to the TMDL for acid mine drainage-based impairment of the Kiskiminetas-Conemaugh River Watershed.

As explained in the Fact Sheet for the 2014 draft permit and the comment responses at the beginning of this Fact Sheet Addendum, critical loading occurs in the watershed during low flows and high flows. Precipitation-induced discharges from NRG HCS's facilities at the ash landfill are not expected to occur at the Q_{7-10} design stream flow conditions that DEP uses for mathematical modeling pursuant to 25 Pa. Code § 96.4(g). However, those precipitation-induced discharges may contribute to impairments during high stream flow conditions when other precipitation-induced discharges from abandoned mine lands in the watershed result in elevated metals concentrations in Two Lick Creek, Blacklick Creek, and the tributaries to those streams.

The overflows that are being removed from the permit are not subject to this rationale because they are not regular discharges and are not expected to occur with a frequency that would violate water quality criteria more than 1% of the time (25 Pa. Code § 96.3(c)) requires the achievement of water quality criteria 99% of the time).

Analytical Results Reported on the Application for Outfalls 013 and 029

Parameter	Outfall 013 Maximum Concentration (mg/L)	Outfall 029 Maximum Concentration (mg/L)	No Exposure Thresholds (mg/L)
Oil and Grease	<5.0	<5.0	≤ 5.0
Biochemical Oxygen Demand (5-day)	5.3	5.3	≤ 10.0
Chemical Oxygen Demand	53.6	53.6	≤ 30.0
Total Suspended Solids	13	13	≤ 30.0
Total Kjeldahl Nitrogen	0.3	0.6	≤ 2.0 (Tot. N)
Nitrate-Nitrite Nitrogen	1.25	1.25	≤ 2.0 (Tot. N)
Total Phosphorus	0.16	0.16	≤ 1.0
pH (s.u.)	6.03	7.01	6.0 – 9.0 s.u.
Aluminum	0.436	0.436	0.75
Iron	0.216	0.216	1.5
Manganese	0.145	0.145	1.0

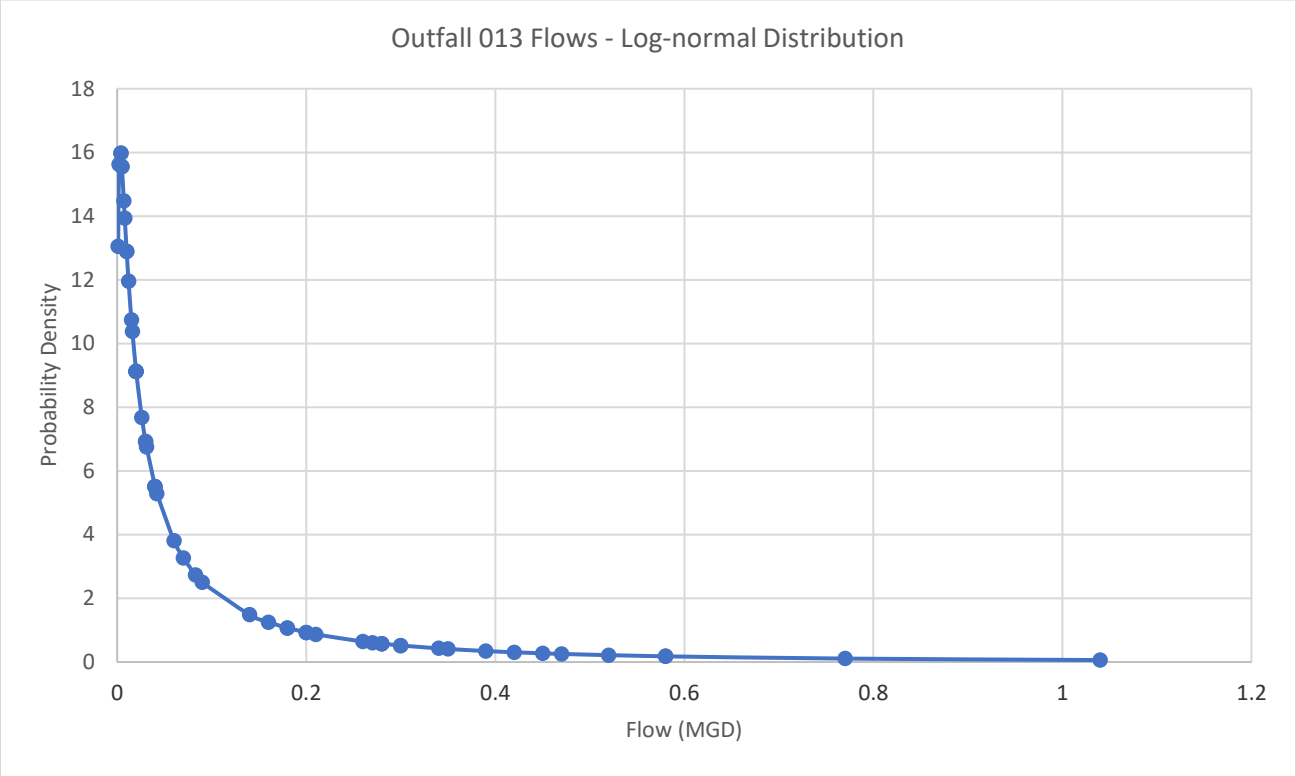
Since Outfalls 013 and 029 discharge precipitation-induced runoff and the discharges from those outfalls occur regularly, TMDL WQBELs will be imposed.

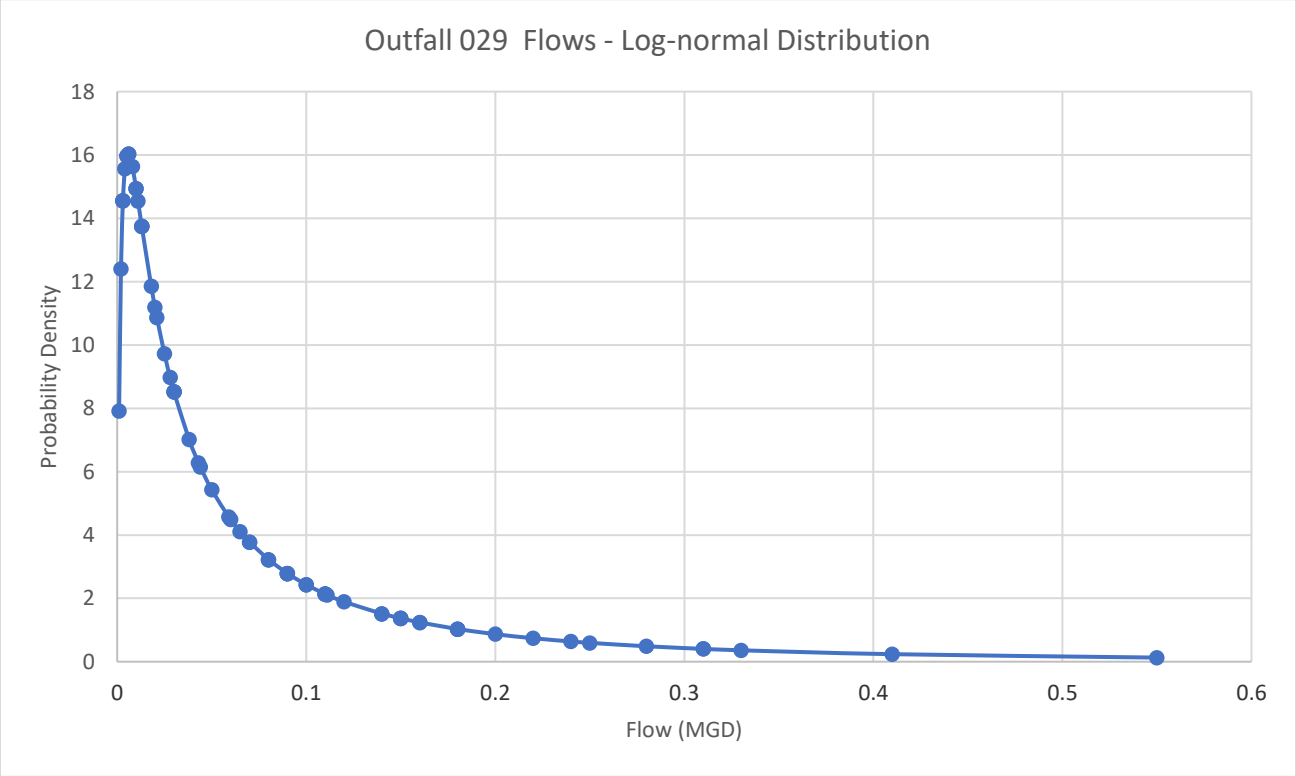
Total Maximum Daily Load for Streams Impaired by Acid Mine Drainage in the Kiskiminetas-Conemaugh River Watershed

TMDL WQBELs apply to Outfalls 013 and 029 pursuant to 40 CFR § 122.44(d)(1)(vii)(B), which requires that permits be consistent with any available TMDL wasteload allocation. In the 2014 draft permit, DEP considered principal and/or emergency spillways from the leachate storage impoundments and sedimentation basins to be outfalls and TMDL WLAs were allocated to those sources. Since the permit will revert to outfall locations at Outfalls 013 and 029, the WLAs previously assigned to internally monitored sources will be reallocated to Outfalls 013 and 029.

Unlike other storm water outfalls, TMDL WLAs cannot calculated at Outfalls 013 and 029 using an estimated yearly precipitation and the outfalls' drainage areas. There are sedimentation basins that capture part of the runoff and retain it for treatment. Therefore, the load that was not allocated to Outfall 023 using yearly rainfall and Outfall 023's drainage area will be apportioned based on weighting using estimated long-term average flow rates at Outfalls 013 and 029.

DEP's analysis of flow rates reported on DMRs from September 2012 through April 2018 shows that Outfall 013's and 029's discharge flows are log-normally distributed.





The mean flow rates for Outfalls 013 and 029 based on these distributions are 0.295 MGD and 0.147 MGD, respectively. As a percentage of the total flow discharging at river mile index 0.67 of unnamed tributary 44071 of Blacklick Creek, Outfall 013 is allocated 66.7% of the available TMDL WLAs in sub-watershed 4348 and Outfall 029 is allocated 33.3%.

Wasteload Allocation (WLA)	Aluminum (lb/year)	Iron (lb/year)	Manganese (lb/year)
Total WLAs in SWS 4348	2,848	5,697	3,798
WLA for Outfall 023	-228	-457	-305
WLA Available for 013/029	2,620	5,240	3,493
Allocation of Available Wasteload Allocation			
WLAs for Outfall 013	1,748	3,495	2,330
WLAs for Outfall 029	872	1,745	1,163

As a TMDL pollutant of concern, monitoring for Total Suspended Solids also will be required at Outfalls 013 and 029 pursuant to 25 Pa. Code § 92a.61(b) and § 96.4(i).

Compliance Plan and Schedule

DEP imposed TMDL-based concentration limits for aluminum, iron, and manganese at Outfalls 013 and 029 in the 2012 NPDES permit amendment. Since August 2015, NRG HCS reported numerous violations of those limits. To address the violations, DEP and NRG HCS entered into a Consent Order and Agreement on September 29, 2016. NRG HCS completed sampling of surface water, groundwater, and precipitation from multiple locations in the drainage areas for Outfalls 013 and 029 as part of an approved Evaluation Plan and Schedule. On May 7, 2018, NRG HCS submitted a Compliance Plan and Schedule describing corrective actions that will be taken to achieve compliance with effluent limits. Since Outfalls 013 and 029 were already subject to TMDL WQBELs in the 2012 draft permit and more than five years have lapsed without an extension of time to meet WQBELs, the TMDL load limits will take effect immediately.

Effluent Limitations and Monitoring Requirements for Outfalls 013 and 029

The revised effluent limits applicable at Outfalls 013 and 029 are summarized in the table below.

Effluent Limits and Monitoring Requirements for Outfall 013

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Monthly	Total Annual	Average Monthly	Daily Maximum	Instant Maximum	
Flow (MGD)	Report (Avg Mo)	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(b)
Total Flow (Total Volume, million gallons)	Report	Report	—	—	—	TMDL; 25 Pa. Code 96.4(i)
Total Suspended Solids	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
Total Dissolved Solids	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
Aluminum, Total	Report	1,748	0.75	0.75	0.75	Kiski-Conemaugh TMDL
Iron, Total	Report	3,495	1.5	3.0	3.75	Kiski-Conemaugh TMDL
Manganese, Total	Report	2,330	1.0	2.0	2.5	Kiski-Conemaugh TMDL
pH	within the range of 6.0 to 9.0					25 Pa. Code § 95.2(1); 40 CFR § 423.12(b)(1)

Effluent Limits and Monitoring Requirements for Outfall 029

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Monthly	Total Annual	Average Monthly	Daily Maximum	Instant Maximum	
Flow (MGD)	Report (Avg Mo)	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(b)
Total Flow (Total Volume, million gallons)	Report	Report	—	—	—	TMDL; 25 Pa. Code 96.4(i)
Total Suspended Solids	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
Total Dissolved Solids	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
Aluminum, Total	Report	872	0.75	0.75	0.75	Kiski-Conemaugh TMDL
Iron, Total	Report	1,745	1.5	3.0	3.75	Kiski-Conemaugh TMDL
Manganese, Total	Report	1,163	1.0	2.0	2.5	Kiski-Conemaugh TMDL
pH	within the range of 6.0 to 9.0					25 Pa. Code § 95.2(1); 40 CFR § 423.12(b)(1)

Monitoring frequencies and sample types are imposed in accordance with Chapter 6, Table 6-4 of DEP's *Technical Guidance for the Development and Specification of Effluent Limitations* and those imposed in the previous permit. In the 2012 permit amendment, DEP required 1/week grab sampling for all parameters with flow measured concurrently. Those requirements will be maintained in addition to monthly and annual reporting of TMDL loads using the SCS Runoff Curve Number method.

Development of Effluent Limitations

Outfall No. 016 **Design Flow (MGD)** Variable
Latitude 40° 30' 48.00" **Longitude** -79° 11' 33.00"
Wastewater Description: Emergency overflows from the Industrial Wastewater Treatment plant's equalization pond #2

Even though Outfall 016 is an emergency overflow outfall, the outfall will be maintained in the permit because discharges have occurred more frequently than discharges at other overflow outfalls. NRG HCS has not recorded any overflows at Outfall 016 since January 2013, but there were three months in 2012 with reported overflows (May, June, and October).

Effluent limits and monitoring frequencies will remain unchanged from those proposed in the 2014 draft permit except that 1) annual TMDL loads are recalculated as discussed in the Outfall 006 section of this Fact Sheet Addendum, and 2) the previously proposed compliance schedule will be removed and effluent limits will take effect immediately. As NRG HCS states in its comments on the 2014 draft permit (Comment II.C.2), there are no reasonable corrective measures that can be applied to emergency overflow outfalls (other than increasing storage capacity), so whether NRG HCS is given time to comply would have no bearing on whether WQBELs at those outfalls can be achieved.

Effluent Limits and Monitoring Requirements for Outfall 016

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Monthly	Total Annual	Average Monthly	Daily Maximum	Instant Maximum	
Flow (MGD)	Report (Avg Mo)	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(d)(1)
Total Suspended Solids	—	—	30	50	50	40 CFR § 122.41(m)(2)
Oil and Grease	—	—	15	20	30	40 CFR § 122.41(m)(2)
Temperature (°F) (Final) Jan 1 – Feb 29	—	—	—	38	—	40 CFR § 122.41(m)(2)
Temperature (°F) (Final) Mar 1 – 31	—	—	—	42	—	40 CFR § 122.41(m)(2)
Temperature (°F) (Final) Apr 1 – 15	—	—	—	48	—	40 CFR § 122.41(m)(2)
Temperature (°F) (Final) Apr 16 – 30	—	—	—	53	—	40 CFR § 122.41(m)(2)
Temperature (°F) May 1 – 15	—	—	—	56	—	40 CFR § 122.41(m)(2)
Temperature (°F) (Final) May 16 – 31	—	—	—	60	—	40 CFR § 122.41(m)(2)
Temperature (°F) (Final) Jun 1 – Jun 15	—	—	—	64	—	40 CFR § 122.41(m)(2)
Temperature (°F) (Final) Jun 16 – Jun 30	—	—	—	68	—	40 CFR § 122.41(m)(2)
Temperature (°F) (Final) July 1 – July 31	—	—	—	72	—	40 CFR § 122.41(m)(2)
Temperature (°F) (Final) Aug 1 – Aug 31	—	—	—	71	—	40 CFR § 122.41(m)(2)
Temperature (°F) Sept 1 – 15	—	—	—	67	—	40 CFR § 122.41(m)(2)
Temperature (°F) Sept 16 – 30	—	—	—	61	—	40 CFR § 122.41(m)(2)
Temperature (°F) Oct 1 – 15	—	—	—	56	—	40 CFR § 122.41(m)(2)
Temperature (°F) Oct 16 – 31	—	—	—	52	—	40 CFR § 122.41(m)(2)
Temperature (°F) Nov 1 – 15	—	—	—	47	—	40 CFR § 122.41(m)(2)
Temperature (°F) Nov 16 – 30	—	—	—	42	—	40 CFR § 122.41(m)(2)
Temperature (°F) Dec 1 – 31	—	—	—	40	—	40 CFR § 122.41(m)(2)

Effluent Limits and Monitoring Requirements for Outfall 016 (continued)

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Monthly	Total Annual	Average Monthly	Daily Maximum	Instant Maximum	
Thallium, Total	—	—	0.00024	0.00038	0.0006	40 CFR § 122.41(m)(2)
Aluminum, Total	Report	8	0.75	0.75	0.75	Kiski-Conemaugh TMDL
Iron, Total	Report	16	1.5	3.0	3.75	Kiski-Conemaugh TMDL
Manganese, Total	Report	11	1.0	2.0	2.5	Kiski-Conemaugh TMDL
Total Dissolved Solids	—	—	Report	Report	—	40 CFR § 122.41(m)(2)
Chloride	—	—	Report	Report	—	40 CFR § 122.41(m)(2)
Bromide	—	—	Report	Report	—	40 CFR § 122.41(m)(2)
Sulfate	—	—	Report	Report	—	40 CFR § 122.41(m)(2)
pH	within the range of 6.0 to 9.0					40 CFR § 122.41(m)(2)

Effluent limits for total thallium are less than DEP's target quantitation limit of 2.0 µg/L. Therefore, the actual WQBELs will be listed in the permit and the target quantitation limit will be used for compliance determinations in eDMR.

The monitoring frequency and sample type for temperature will be 1/discharge immersion stabilization. All other pollutants will require 2/discharge grab sampling except flow, which should be estimated.

Development of Effluent Limitations

Outfall Nos. 017, 019, 021, 022, and 025 **Design Flow (MGD)** Variable
Wastewater Description: Storm water runoff from various areas of the plant

Monitoring requirements at Outfalls 017, 019, 021, 022, and 025 are updated to be consistent with Appendix H of the most recent version of DEP's PAG-03 General Permit for Discharges of Stormwater Associated with Industrial Activity from September 2016. As a result, proposed monitoring requirements for copper, nickel, and zinc are removed. However, the monitoring frequencies for TSS, oil and grease, and pH are increased to 1/6 months.

Table ##. PAG-03 Appendix H – Minimum Monitoring Requirements

Discharge Parameter	Units	Sample Type	Appendix H Measurement Frequency
pH	mg/L	Grab	1/6 months
Total Suspended Solids	mg/L	Grab	1/6 months
Oil and Grease	mg/L	Grab	1/6 months
Total Iron	mg/L	Grab	1/6 months

As described in the 2014 draft permit Fact Sheet, Outfalls 017, 021, 022, and 025 also will require reporting of Nitrate+Nitrite as N concentrations due to elevated levels reported at those outfalls.

MSGP Benchmark Values

Based on the reported storm water concentrations, no TBELs will be imposed at Outfalls 017, 019, 021, 022, and 025. However, TBELs may be warranted in the future if pollutant concentrations in storm water consistently exceed the benchmark values from EPA's Multi-Sector General Permit (MSGP), which are listed in the table above. EPA's MSGP is the federal equivalent of DEP's PAG-03 General Permit for Discharges of Storm Water Associated with Industrial Activity. EPA uses benchmark monitoring in the MSGP as an indicator of the effectiveness of a facility's best management practices. DEP uses benchmark values for the same purpose. Benchmark values will be listed in Part C of the permit based, in part, on EPA's Multi-Sector General Permit benchmark values (see Attachment E). A benchmark of 5.0 mg/L will be included for oil and grease based on DEP's minimum target quantitation limit for oil and grease (oil and grease generally should not be present in storm water) and benchmarks of 6.0 to 9.0 for pH, 100 mg/L for TSS, and 0.68 mg/L for Nitrate+Nitrite Nitrogen will be included based on the MSGP benchmark values.

The benchmark values are not effluent limitations and exceedances do not constitute permit violations. However, if sampling demonstrates exceedances of benchmark values for two consecutive monitoring periods, NRG HCS must submit a corrective action plan within 90 days of the end of the monitoring period triggering the plan. The corrective action plan requirement and the benchmark values will be specified in a condition in Part C of the permit.

Total Maximum Daily Load for Streams Impaired by Acid Mine Drainage in the Kiskiminetas-Conemaugh River Watershed

The permit will require semi-annual reporting of aluminum, iron, and manganese concentrations and loads. A condition will be included in Part C of the permit allowing use of the SCS Runoff Curve Number (CN) method described in USDA Natural Resources Conservation Service's Technical Release 55 (TR-55) to calculate discharge flow volumes for precipitation-based discharges. Reporting of the semi-annual average will be included in the event that NRG HCS takes more than the minimum one sample per six months to better approximate average concentrations when calculating semi-annual or annual loads.

Effluent Limits and Monitoring Requirements for Outfall 017

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Semi-Annual	Total Annual	Semi-Annl. Average	Daily Maximum	Instant Maximum	
Flow (MGD)	—	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(h)
Total Flow (Total Volume, million gallons)	Report	Report	—	—	—	TMDL; 25 Pa. Code 96.4(i)
Oil and Grease	—	—	—	Report	—	PAG-03, Appendix H
Total Suspended Solids	—	—	—	Report	—	PAG-03, Appendix H

Effluent Limits and Monitoring Requirements for Outfall 017 (continued)

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Semi-Annual	Total Annual	Semi-Annl. Average	Daily Maximum	Instant Maximum	
Nitrate-Nitrite as N	—	—	—	Report	—	WQ Analysis
Aluminum, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Aluminum, Total (Final)	Report	327	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Final)	Report	655	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Final)	Report	436	Report	Report	—	Kiski-Conemaugh TMDL
pH	—	—	—	Report	—	PAG-03, Appendix H

Effluent Limits and Monitoring Requirements for Outfall 019

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Semi-Annual	Total Annual	Semi-Annl. Average	Daily Maximum	Instant Maximum	
Flow (MGD)	—	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(h)
Total Flow (Total Volume, million gallons)	Report	Report	—	—	—	TMDL; 25 Pa. Code 96.4(i)
Oil and Grease	—	—	—	Report	—	PAG-03, Appendix H
Total Suspended Solids	—	—	—	Report	—	PAG-03, Appendix H
Aluminum, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Aluminum, Total (Final)	Report	34	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Final)	Report	68	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Final)	Report	45	Report	Report	—	Kiski-Conemaugh TMDL
pH	—	—	—	Report	—	PAG-03, Appendix H

Effluent Limits and Monitoring Requirements for Outfall 021

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Semi-Annual	Total Annual	Semi-Annl. Average	Daily Maximum	Instant Maximum	
Flow (MGD)	—	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(h)
Total Flow (Total Volume, million gallons)	Report	Report	—	—	—	TMDL; 25 Pa. Code 96.4(i)
Oil and Grease	—	—	—	Report	—	PAG-03, Appendix H
Total Suspended Solids	—	—	—	Report	—	PAG-03, Appendix H
Nitrate-Nitrite as N	—	—	—	Report	—	WQ Analysis
Aluminum, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Aluminum, Total (Final)	Report	192	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Final)	Report	383	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Final)	Report	256	Report	Report	—	Kiski-Conemaugh TMDL
pH	—	—	—	Report	—	PAG-03, Appendix H

Effluent Limits and Monitoring Requirements for Outfall 022

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Semi-Annual	Total Annual	Semi-Annl. Average	Daily Maximum	Instant Maximum	
Flow (MGD)	—	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(h)
Total Flow (Total Volume, million gallons)	Report	Report	—	—	—	TMDL; 25 Pa. Code 96.4(i)
Oil and Grease	—	—	—	Report	—	PAG-03, Appendix H
Total Suspended Solids	—	—	—	Report	—	PAG-03, Appendix H
Nitrate-Nitrite as N	—	—	—	Report	—	WQ Analysis
Aluminum, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Aluminum, Total (Final)	Report	232	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Final)	Report	465	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Final)	Report	310	Report	Report	—	Kiski-Conemaugh TMDL
pH	—	—	—	Report	—	PAG-03, Appendix H

Effluent Limits and Monitoring Requirements for Outfall 025

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Semi-Annual	Total Annual	Semi-Annl. Average	Daily Maximum	Instant Maximum	
Flow (MGD)	—	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(h)
Total Flow (Total Volume, million gallons)	Report	Report	—	—	—	TMDL; 25 Pa. Code 96.4(i)
Oil and Grease	—	—	—	Report	—	PAG-03, Appendix H
Total Suspended Solids	—	—	—	Report	—	PAG-03, Appendix H
Nitrate-Nitrite as N	—	—	—	Report	—	WQ Analysis
Aluminum, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Aluminum, Total (Final)	Report	27	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Final)	Report	54	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Final)	Report	36	Report	Report	—	Kiski-Conemaugh TMDL
pH	—	—	—	Report	—	PAG-03, Appendix H

Development of Effluent Limitations

Outfall No. 018 **Design Flow (MGD)** 2.14
Latitude 40° 30' 52.00" **Longitude** -79° 11' 18.00"
Wastewater Description: Clearwell overflow of treated cooling tower make-up water including treated river water, leachate from the Homer City Coal Cleaning Plant, filtrate from dewatering operations, recycled storm water from the Greenhouse Pond, and treated leachate from the Ash Valley Landfill

Even though Outfall 018 is an emergency overflow outfall, the outfall will be maintained in the permit because discharges have occurred more frequently than discharges at other overflow outfalls. Discharges were reported in January, February, April, May, June, and December of 2012; January September, and November of 2013, February and May of 2017, July of 2015, and April of 2017.

Effluent limits and monitoring frequencies will remain unchanged from those proposed in the 2014 draft permit except that the previously proposed compliance schedule will be removed and effluent limits will take effect immediately. As NRG HCS states in its comments on the 2014 draft permit (Comment II.C.2), there are no reasonable corrective measures that can be applied to emergency overflow outfalls (other than increasing storage capacity), so whether NRG HCS is given time to comply would have no bearing on whether WQBELs at those outfalls can be achieved.

Effluent Limits and Monitoring Requirements for Outfall 018

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Monthly	Total Annual	Average Monthly	Daily Maximum	Instant Maximum	
Flow (MGD)	Report (Avg Mo)	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(d)(1)
Total Suspended Solids	—	—	30.0	70.0	—	40 CFR § 423.12(b)(3) & 40 CFR § 434.22(a)
Oil and Grease	—	—	15.0	20.0	30.0	40 CFR § 423.12(b)(3) & 25 Pa. Code § 95.2(2)
Thallium, Total	—	—	0.00024	0.00038	0.0006	WQBELs
Aluminum, Total	Report	914	0.75	0.75	0.75	Kiski-Conemaugh TMDL
Iron, Total (Final)	Report	1,828	1.5	3.0	3.75	Kiski-Conemaugh TMDL
Manganese, Total	Report	1,218	1.0	2.0	2.5	Kiski-Conemaugh TMDL
pH	within the range of 6.0 to 9.0					40 CFR § 423.12(b)(1) & 25 Pa. Code § 95.2(1)

Effluent limits for total thallium are less than DEP's target quantitation limit of 2.0 µg/L. Therefore, the actual WQBELs will be listed in the permit and the target quantitation limit will be used for compliance determinations in eDMR.

Development of Effluent Limitations

Outfall No. 023 **Design Flow (MGD)** Variable
Latitude 40° 31' 6.00" **Longitude** -79° 12' 24.00"
Wastewater Description: Storm water runoff from the coal truck gate entrance and dust control water runoff

Monitoring requirements at Outfall 023 are updated to be consistent with Appendix H of the most recent version of DEP's PAG-03 General Permit from September 2016. As a result, proposed monitoring requirements for copper, nickel, and zinc are removed. However, the monitoring frequency for oil and grease is increased to 1/6 months. TSS, iron, and pH are subject to TBELs, WQBELs, and regulatory effluent standards, respectively.

PAG-03 Appendix H – Minimum Monitoring Requirements

Discharge Parameter	Units	Sample Type	Appendix H Measurement Frequency
pH	mg/L	Grab	1/6 months
Total Suspended Solids	mg/L	Grab	1/6 months
Oil and Grease	mg/L	Grab	1/6 months
Total Iron	mg/L	Grab	1/6 months

Of the Appendix H minimum monitoring requirements listed above, oil and grease is the only parameter with a monitoring requirement that is not superseded by another requirement—either TMDL-based monitoring or anti-backsliding TBELs.

The TMDL wasteload allocations previously specified for Outfall 023 will remain unchanged from the 2014 draft permit. NRG HCS already uses the SCS Runoff Curve Number method to calculate discharge flow volumes at this outfall. As part of tracking those values, reporting requirements for total monthly and total annual flow will be imposed at Outfall 023.

Effluent limits and monitoring requirements are summarized in the following table.

Effluent Limits and Monitoring Requirements for Outfall 023

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Monthly	Total Annual	Average Monthly	Daily Maximum	Instant Maximum	
Flow (MGD)	Report (Avg. Mo)	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(h)
Total Flow (Total Volume, million gallons)	Report	Report	—	—	—	TMDL; 25 Pa. Code 96.4(i)
Total Suspended Solids	—	—	35	70	90	BPJ; 40 CFR § 122.44(l)
Oil and Grease	—	—	—	Report	—	PAG-03, Appendix H
Aluminum, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Aluminum, Total (Final)	Report	228	0.75	0.75	0.75	Kiski-Conemaugh TMDL
Iron, Total (Interim)	Report	Report	1.5	3.0	3.75	40 CFR § 122.44(l); Kiski-Conemaugh TMDL
Iron, Total (Final)	Report	457	1.5	3.0	3.75	40 CFR § 122.44(l); Kiski-Conemaugh TMDL
Manganese, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Final)	Report	305	1.0	2.0	2.5	Kiski-Conemaugh TMDL
pH	within the range of 6.0 to 9.0					25 Pa Code § 95.2(1) & 40 CFR § 122.44(l)

Oil and grease will require 1/6 months grab sampling. All other pollutants will require 2/month grab sampling. Flow should be measured at the time of sampling.

Development of Effluent Limitations

Outfall No.	027	**Design Flow (MGD)**	0.15
Latitude	40° 28' 55.00"	**Longitude**	-79° 11' 35.00"

Wastewater Description: Unit 3 flue gas desulfurization scrubber blowdown

027.A. Technology-Based Effluent Limitations (TBELs)

NRG HCS has committed to eliminating FGD wastewater discharges at Outfall 027 by achieving zero liquid discharge ("ZLD"). In the context of the Steam Electric Power Generating Point Source Category Federal Effluent Limitations Guidelines, this course of action would fall under 40 CFR § 423.13(g)(3)(i) whereby NRG HCS will voluntarily comply with more stringent effluent limits on FGD wastewaters summarized in the table below. Compliance will be achieved by eliminating the discharges rather than treating the discharges to within acceptable effluent limits. Pursuant to § 423.13(g)(3)(i) and the Voluntary Incentives Program described in the 2015 Final Rule, NRG HCS must meet the new effluent limits listed in § 423.13(g)(3)(i) by December 31, 2023.

Voluntary BAT Limits for FGD wastewater (40 CFR § 423.13(g)(3)(i))

	BAT Effluent limitations	
Pollutant or pollutant property	**Maximum for any 1 day (mg/l)**	**Average of daily values for 30 consecutive days shall not exceed (mg/l)**
Arsenic, total (µg/L)	4	
Mercury, total (ng/L)	39	24
Selenium, total (µg/L)	5	
TDS (mg/L)	50	24

FGD wastewaters will be routed to the Station's FGD scrubber system for Units 1 and 2. The scrubber system for Units 1 and 2 employs Alstom's Novel Integrated Desulphurization System technology or "NIDS", which is a "dry" scrubber in which FGD wastewaters from Unit 3 and cooling tower blowdown will be evaporated. The evaporation of FGD wastewaters and achievement of ZLD is consistent with EPA's anti-circumvention provision in the 2015 Final Rule. Under certain plant operating scenarios, all wastewaters may not be consumed by the NIDS, so supplementary evaporation technologies may be needed to ensure that FGD wastewaters are eliminated and not discharged elsewhere. If the FGD wastewaters were to discharge elsewhere, then that effluent would be subject to the effluent limits in § 423.13(g)(3)(i).

NRG HCS proposed the following schedule to implement its ZLD Strategy:

Proposed Milestone Schedule for Outfall 027

Milestone	Task	Duration
end of 3Q 2018	Initiate studies and pilot testing	1 year
end of 3Q 2019	Begin Engineering Design and Permitting	1.5 years
end of 1Q 2021	Bid, Award, and Procure Equipment	1 Year
end of 1Q 2022	Begin Construction	1.5 year
end of 4Q 2023	Complete Start-up and Commissioning	

At the time of this writing, the December 31, 2023 compliance date for voluntary BAT limits may exceed the five-year term of the permit, so the new limits theoretically would not appear in the permit. However, new WQBELs—described below—will force an earlier compliance date of one month before permit expiration because schedules of compliance (excluding those in promulgated ELGs) are limited to a maximum of five years. If the permit renewal is delayed past December 31, 2018, then the December 31, 2023 compliance date will apply in the final permit. Until NRG HCS achieves ZLD at Outfall 027, FGD wastewaters will be subject to existing effluent limits maintained based on anti-backsliding (40 CFR § 122.44(l)).

Reopener Provision

The EPA Administrator signed a letter on August 11, 2017 announcing his decision to conduct a rulemaking to potentially revise the new, more stringent BAT effluent limitations and pretreatment standards for existing sources in the 2015 Final Rule that apply to flue gas desulfurization wastewater and bottom ash transport water. After reflecting on the time it typically takes the Agency to propose and finalize revised effluent limitations guidelines and standards, and in light of the characteristics of this industry and the anticipated scope of the next rulemaking, EPA projects that it will take approximately three years to propose and finalize a new rule (i.e., by autumn 2020). Thus, EPA has issued an amended rulemaking in September 2017 postponing the earliest compliance dates for the Best Available Technology (BAT) effluent limitations for FGD wastewater in the 2015 Rule from November 1, 2018 to November 1, 2020.

A reopener provision will be included in the permit in the event that EPA rescinds, revokes, or modifies the ELGs.

027.B. Water Quality-Based Effluent Limitations (WQBELs)

Commenters raised various issues with DEP's PENTOXSD analysis for Outfall 027 including the use of maximum discharge flow instead of average discharge flow and the lack of background stream concentrations for TMDL metals. Consequently, DEP is modeling Outfall 027 using more reasonable input values for discharge flow and background stream concentrations of TMDL parameters in addition to other refinements to the receiving stream's characteristics.

Discharge Flow and Characteristics

The discharge flow rate used for modeling will be the average discharge flow rate rather than the maximum discharge flow rate. This change is consistent with calculations in EPA's *Technical Support Document for Water Quality-Based Toxics Control*. DEP previously used a maximum discharge flow rate of 0.202 MGD in PENTOXSD. The revised discharge flow is 0.14 MGD, which is the average of the maximum flows reported on Outfall 027 DMRs for the last three years (April 2015 – April 2018).

Q_{7-10} Flow of Blacklick Creek

The Q_{7-10} flow of Blacklick Creek is estimated by adding the Q_{7-10} flow of Two Lick Creek—as discussed in the Outfall 001 section of this Fact Sheet Addendum—to the Q_{7-10} flow of Blacklick Creek estimated from USGS StreamStats at an ungaged location immediately above the mouth of Two Lick Creek.

20.77 cfs [Two Lick Creek] + 16.3 cfs [Blacklick Creek] = 37.07 cfs

Stream Characteristics

The width and depth of Blacklick Creek at Q_{7-10} conditions are estimated to be 150 feet and 1.5 feet, respectively. PENTOXSD models streams as rectangular cross-sections, so 150 feet is estimated from topographic maps and satellite imagery to be the average width of Blacklick Creek at Q_{7-10} conditions downstream of Outfall 027. Similarly, 1.5 feet is estimated to be the average depth at Q_{7-10} conditions.

Background Concentrations

Background concentrations of TMDL pollutants are estimated using analytical data reported in the Kiskiminetas-Conemaugh River Watershed TMDL. There are no extant water quality sampling points on Blacklick Creek and EPA did not identify any stream sampling locations on Blacklick Creek as part of its existing stream quality characterization for the TMDL. Therefore, DEP has selected data from a nearby sampling point to represent the background stream quality of Blacklick Creek. The chosen sampling location is Station UNTBLK01 with analytical data reported in Tables B-5, B-6, and B-7 in Appendix B (pp. B5 - B7) of the Kiskiminetas-Conemaugh River Watershed TMDL.

DEP recognizes that there are temporal and spatial deficiencies associated with the UNTBLK01 data (the data are from 2007/2008 and were taken on a downstream tributary), but it is reasonable that background concentrations for pollutants contributing to a watershed's impairment would not be zero and the UNTBLK01 data are reasonable approximations in the absence of site-specific data and with expected improvements in stream quality resulting from TMDL implementation over the last ten years. The reported concentrations of aluminum, iron, and manganese at UNTBLK01 are summarized in the following table:

TMDL Stream Data Summary for UNTBLK01 Station

Parameter	Minimum	Mean	Maximum
pH (standard units)	6.60	7.64	8.22
Aluminum, Total	500 µg/L	512 µg/L	559 µg/L
Iron, Total	323 µg/L	482 µg/L	573 µg/L
Manganese, Total	52 µg/L	82 µg/L	109 µg/L

The mean concentrations are used as the stream concentrations in PENTOXSD.

Partial Mix Factors

DEP explained in the comment-response section of this Fact Sheet Addendum (Response to Comment D from PennFuture) that DEP's use of partial mix factors made up for a lack of background concentrations in the previous PENTOXSD model run for Outfall 027. However, the use of manually-entered partial mix factors as 1) surrogates for background concentrations and 2) a means to reserve assimilative capacity for other discharges is being reconsidered.

To determine whether Outfall 027's discharges overlap with another discharge and whether a partial mix factor would be warranted to apportion available assimilative capacity among overlapping discharges, DEP has calculated the distance downstream of Outfall 027 over which mixing is allowed before water quality criteria are applied. This distance is calculated by multiplying the velocity of Blacklick Creek by the complete mix time. Stream velocity and complete mix time are calculated by PENTOXSD and reported on the Hydrodynamics output from the model.

Velocity (feet per second) × Complete Mix Time (seconds) = Distance (feet)
0.1656 fps × 262.35 minutes (60 seconds / minute) = 2,607 feet ≈ 0.5 miles

Manually entering a partial mix factor to reserve assimilative capacity for other discharges may be appropriate if downstream discharges are located within 0.5 river miles of Outfall 027. Pollutant contributions to Blacklick Creek from Outfall 027 would become part of the instream concentration for any modeling conducted further downstream.

Outfall 027 is located at river mile 10.72 on Blacklick Creek. The nearest downstream discharges are industrial storm water discharges from C&J Energy Services, Inc. (PAR316109) and William Penn Auto Inc. (PAR606176), which are located near river mile 9.5—over one mile downstream of Outfall 027. Given that complete mixing will occur before any other facilities discharge to Blacklick Creek, no partial mix factors will be entered in PENTOXSD.

WQBELs for Outfall 027 and Compliance Dates

WQBELs and Monitoring Requirements for Outfall 027

Pollutant	Concentration (mg/L)	
	Average Monthly	Daily Maximum
Total Dissolved Solids	Report	Report
Chloride	Report	Report
Bromide	Report	Report
Sulfate	Report	Report
Boron, Total	217.0	339.0
Cyanide, Free Available	0.59	0.92
Osmotic Pressure (mOs/kg)	Report	Report
Selenium, Total	0.85	1.33

With the exception of selenium, which already has more stringent BPJ TBELs in the existing permit, the new WQBELs at Outfall 027 will be imposed in the permit subject to a schedule of compliance. Since NRG HCS is planning to eliminate point source discharges at Outfall 027, it is appropriate that the schedule of compliance for new WQBELs at Outfall 027 coincide with the schedule for the elimination of those discharges. Discharge elimination will satisfy both technology and water quality-based requirements and is consistent with the goals of the NPDES program.

The deadline for compliance with voluntary TBELs in § 423.13(g)(3)(i) is December 31, 2023. At the time of this writing, the December 31, 2023 compliance date may exceed the five-year term of the permit. Since § 92a.51(a) limits schedule of compliance for new WQBELs to five years and discharge elimination be used to comply with both TBELs and WQBELs, the compliance date for both the voluntary TBELs and the new WQBELs will be identified as one month before permit expiration. If the effective date of the permit renewal is extended past December 31, 2018, then the December 31, 2023 date would be used as the compliance date.

Total Maximum Daily Load for Streams Impaired by Acid Mine Drainage in the Kiskiminetas-Conemaugh River Watershed

As explained in the Response to Comment 1.A from PennFuture, the concentration limits for TMDL parameters at Outfall 027 will be changed so that they are equivalent to water quality criteria. The annual TMDL WLAs imposed in the 2014 draft permit will remain unchanged. However, the TMDL annual load limits, as annual totals, will take effect beginning on January 1, 2023. NRG HCS would begin tracking for annual load compliance at the beginning of 2023 as the last full calendar year

of the permit (compliance schedules for WQBELs cannot exceed five years per 25 Pa. Code § 92a.51(a)), but would not report annual loads until the end of that calendar year.

027.C. Effluent Limitations and Monitoring Requirements for Outfall 027

The modified effluent limits at Outfall 027 are summarized in the table below.

Effluent Limits and Monitoring Requirements for Outfall 027

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Monthly	Total Annual	Average Monthly	Daily Maximum	Instant Maximum	
Flow (MGD)	Report (Avg Mo)	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(d)(1)
Temperature (°F)	—	—	—	110	—	Effluent Standard
Total Suspended Solids	—	—	30	100	—	40 CFR § 423.12(b)(3)
Oil and Grease	—	—	15	20	30	40 CFR § 423.12(b)(3) & 25 Pa. Code § 95.2(2)
CBOD5	—	—	25	50	—	BPJ; 40 CFR § 122.44(l)
Osmotic Pressure (mOs/kg)	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
Arsenic, Total (Interim)	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
Arsenic, Total (Final)	—	—	Report	0.004	—	40 CFR § 423.13(g)(3)(i)
Beryllium, Total	—	—	0.8	1.6	—	BPJ; 40 CFR § 122.44(l)
Boron, Total (Interim)	—	—	Report	Report	—	40 CFR § 423.13(d)(1)
Boron, Total (Final)	—	—	217.0	339.0	542.5	WQBELs
Cyanide, Free Available (Interim)	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
Cyanide, Free Available (Final)	—	—	0.59	0.92	1.48	WQBELs
Lead, Total	—	—	0.1	0.2	—	BPJ; 40 CFR § 122.44(l)
MBAS	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
Selenium, Total (Interim)	—	—	0.8	1.6	—	BPJ; 40 CFR § 122.44(l)
Selenium, Total (Final)	—	—	Report	0.005	—	40 CFR § 423.13(g)(3)(i)
Aluminum, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Aluminum, Total (Final)	Report	4,045	0.75	0.75	0.75	Kiski-Conemaugh TMDL
Iron, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Iron, Total (Final)	Report	8,091	1.5	3.0	3.75	Kiski-Conemaugh TMDL
Manganese, Total (Interim)	Report	Report	Report	Report	—	Kiski-Conemaugh TMDL
Manganese, Total (Final)	Report	5,395	1.0	2.0	2.5	Kiski-Conemaugh TMDL
Mercury, Total (Interim) (ng/L)	—	—	Report	Report	—	25 Pa. Code § 92a.61
Mercury, Total (Final) (ng/L)	—	—	24	39	—	40 CFR § 423.13(g)(3)(i)
Total Dissolved Solids (Interim)	—	—	Report	Report	—	25 Pa. Code § 92a.61
Total Dissolved Solids (Final)	—	—	24	50	—	40 CFR § 423.13(g)(3)(i)
Chloride	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
Bromide	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
Sulfate	—	—	Report	Report	—	25 Pa. Code § 92a.61(b)
pH	within the range of 6.0 to 9.0					40 CFR § 423.12(b)(1) & 25 Pa. Code § 95.2(1)

Flow should be recorded continuously. Oil and grease and pH will require 1/week grab sampling. Temperature should be measured 1/week using immersion stabilization. All other parameters require 1/week, 24-hour composite sampling except

mercury, which will require four grab samples in a 24-hour period 1/week as recommended by EPA in Section 14.1.8, p.14-29 of the *Technical Development Document for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category* (September 2015). According to EPA, grab sampling for mercury reduces the potential for contamination compared to composite sampling.

Schedule of Compliance

25 Pa. Code § 92a.51(a) requires that:

> If the period of time for compliance specified in subsection (a) exceeds 1 year, a schedule of compliance will be specified in the permit that will set forth interim requirements and the dates for their achievement. If the time necessary for completion of the interim requirement such as the construction of a treatment facility is more than 1 year and is not readily divided into stages for completion, interim dates will be specified for the submission of reports of progress towards completion of the interim requirement. The time between interim dates may not exceed 1 year. For each NPDES permit schedule of compliance, interim dates and the final date for compliance must, to the extent practicable, fall on the last day of the months of March, June, September and December.

Since NRG HCS will be allotted up to four years and eleven months to comply with voluntary BAT limits and new WQBELs on FGD wastewaters through implementation of the proposed ZLD Strategy, a condition will be included in Part C of the permit identifying scheduled milestones for progress reports and completion of work.

Development of Effluent Limitations

IMP No. 213, 613, & 813 **Design Flow (MGD)** Variable

Wastewater Description: Principal spillway discharges of storm water runoff from non-waste-contact areas at the coal combustion waste landfill collected in Sedimentation Basin Nos. 1, 2, & 3

Monitoring requirements at these discharge locations are updated to be consistent with Appendix H of the most recent version of DEP's PAG-03 General Permit from September 2016. As a result, proposed monitoring requirements for copper, nickel, and zinc are removed. However, the monitoring frequency for oil and grease is increased to 1/6 months. TSS, iron, and pH are subject to TBELs, WQBELs, and regulatory effluent standards, respectively.

PAG-03 Appendix H – Minimum Monitoring Requirements

Discharge Parameter	Units	Sample Type	Appendix H Measurement Frequency
pH	mg/L	Grab	1/6 months
Total Suspended Solids	mg/L	Grab	1/6 months
Oil and Grease	mg/L	Grab	1/6 months
Total Iron	mg/L	Grab	1/6 months

Of the Appendix H minimum monitoring requirements listed above, oil and grease is the only parameter with a monitoring requirement that is not superseded by another requirement—either TMDL-based monitoring or anti-backsliding TBELs.

The TMDL wasteload allocations previously specified for each of the sources contributing to discharges at Outfall 013 will be transferred to Outfall 013. Effluent limits and monitoring requirements are summarized in the following table.

Effluent Limits and Monitoring Requirements for IMPs 213, 613, & 813

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Average Monthly	Daily Maximum	Average Monthly	Daily Maximum	Instant Maximum	
Flow (MGD)	Report	Report	—	—	—	25 Pa. Code § 92a.61(h)
Total Suspended Solids	—	—	30	60	—	BPJ; 40 CFR § 122.44(l)
Oil and Grease	—	—	—	Report	—	PAG-03, Appendix H
Aluminum, Total	—	—	—	Report	—	Kiski-Conemaugh TMDL
Iron, Total	—	—	—	Report	—	PAG-03, Appendix H; Kiski-Conemaugh TMDL
Manganese, Total	—	—	—	Report	—	Kiski-Conemaugh TMDL
pH	within the range of 6.0 to 9.0					25 Pa Code § 95.2(1) & 40 CFR § 122.44(l)

Oil and grease will require 1/6 months grab sampling. All other pollutants will require 2/month grab sampling. Flow should be measured at the time of sampling.

Development of Effluent Limitations

Outfall Nos. 030, 032 **Design Flow (MGD)** Variable

Wastewater Description: Principal spillway discharges of storm water runoff from non-waste-contact areas at the coal combustion waste landfill collected in Sedimentation Basin Nos. 4 and 5

As with Sedimentation Basin Nos. 1, 2, and 3, monitoring requirements are updated at Outfalls 030 and 032 to be consistent with Appendix H of the PAG-03 General Permit. As a result, proposed monitoring requirements for copper, nickel, and zinc are removed. However, the monitoring frequency for oil and grease is increased to 1/6 months. TSS, iron, and pH are subject to TBELs, WQBELs, and regulatory effluent standards, respectively. As standalone outfalls, TMDL WQBELs remain unchanged.

Sedimentation Basins SB-4 and SB-5 have not been built yet because NRG HCS is currently in the process of permitting an expansion of the ash landfill. Preliminary planning includes an additional four sedimentation basins (SB-6, SB-7, SB-8, and SB-9) with possible changes to the locations of SB-4 and SB-5 and their associated discharges.

A schedule of compliance for TMDL WQBELs will not be applicable to Outfalls 030 and 032. 25 Pa. Code § 92a.51(a) regarding schedules of compliance applies to "existing discharge[s] that [are] not in compliance with the water quality standards and effluent limitations". Since the sedimentation basins and their discharges do not exist yet, they are not eligible for a schedule of compliance. NRG HCS would be expected to design new facilities—such as the proposed sedimentation basins—so that the discharges comply with effluent limits upon startup of those facilities.

Effluent limits and monitoring requirements are summarized in the following table.

Effluent Limits and Monitoring Requirements for Outfalls 030 and 032

Pollutant	Mass (pounds)		Concentration (mg/L)			Basis
	Total Monthly	Total Annual	Average Monthly	Daily Maximum	Instant Maximum	
Flow (MGD)	Report (Avg Mo)	Report (Daily Max)	—	—	—	25 Pa. Code § 92a.61(h)
Total Suspended Solids	—	—	30	60	—	BPJ; 40 CFR § 122.44(l)
Oil and Grease	—	—	—	Report	—	PAG-03, Appendix H
Aluminum, Total	Report	Report	0.75	0.75	0.75	Kiski-Conemaugh TMDL
Iron, Total	Report	Report	1.5	3.0	3.75	PAG-03, Appendix H; Kiski-Conemaugh TMDL
Manganese, Total	Report	Report	1.0	2.0	2.5	Kiski-Conemaugh TMDL
pH	within the range of 6.0 to 9.0					25 Pa Code § 95.2(1) & 40 CFR § 122.44(l)

Oil and grease will require 1/6 months grab sampling. All other pollutants will require 2/month grab sampling. Flow should be measured at the time of sampling.

ATTACHMENTS

ATTACHMENT A: Toxics Screening Analysis Spreadsheets

ATTACHMENT B: PENTOXSD Modeling Results

ATTACHMENT C: Temperature Modeling Results for Outfall 001

ATTACHMENT D: Block Sketch Diagram for ZLD Strategy Implementation

ATTACHMENT E: EPA 2015 Multi-Sector General Permit Benchmark Values

ATTACHMENT F: Data Supporting the Statistical Analyses for Outfalls 013 and 029 and IMPs 206 and 306

ATTACHMENT G: Kiskiminetas-Conemaugh River Watershed TMDL Wasteload Allocations

ATTACHMENT A

Toxics Screening Analysis Spreadsheets

TOXICS SCREENING ANALYSIS – OUTFALL 001
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.5

Facility: **Homer City Generating Station** NPDES Permit No.: **PA0005037** Outfall: **001**

Analysis Hardness (mg/L): **100** Discharge Flow (MGD): **1.69** Analysis pH (SU): **7**

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
Pollutant Group 1						
Total Dissolved Solids		1793000	500000	Yes		Monitor
Chloride		6400	250000	No		Monitor
Bromide		2160	N/A	No		Monitor
Sulfate		794000	250000	Yes		Monitor
Fluoride		900	2000	No		
Pollutant Group 2 – Metals						
Total Aluminum		1790	750	Yes		
Total Antimony	<	1	5.6	No (Value < QL)		
Total Arsenic	<	1	10	No (Value < QL)		
Total Barium		101	2400	No		
Total Beryllium	<	0.3	N/A	No (Value < QL)		
Total Boron		1020	1600	No		
Total Cadmium	<	0.2	0.271	No (Value < QL)		
Total Chromium		2	N/A	No		
Hexavalent Chromium	<	4.1	10.4	No		
Total Cobalt		1.8	19	No		
Total Copper	<	0.4	9.3	No (Value < QL)		
Free Available Cyanide	<	5	5.2	No		
Total Cyanide	<	5	N/A	No (Value < QL)		
Total Iron		5460	1500	Yes		
Dissolved Iron		45	300	No		
Total Lead	<	1	3.2	No (Value < QL)		
Total Manganese		801	1000	No		
Total Mercury	<	0.04	0.05	No (Value < QL)		
Total Molybdenum		5.5	N/A	No		
Total Nickel		13	52.2	No		

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
Total Phenols (Phenolics)	<	75	5	Yes		
Total Selenium		3.5	5.0	No		
Total Silver	<	0.2	3.8	No (Value < QL)		
Total Thallium		1.2	0.24	Yes	2.146	Establish Limits
Total Zinc		4.3	119.8	No		
Pollutant Group 3 – Volatiles						
Acrolein	<	0.85	3	No (Value < QL)		
Acrylamide			0.07			
Acrylonitrile	<	5	0.051	No (Value < QL)		
Benzene	<	0.13	1.2	No (Value < QL)		
Bromoform	<	0.36	4.3	No (Value < QL)		
Carbon Tetrachloride	<	0.31	0.23	No (Value < QL)		
Chlorobenzene	<	0.33	130	No (Value < QL)		
Chlorodibromomethane	<	1	0.4	Yes	16.509	No Limits/Monitoring
Chloroethane	<	1	N/A	No		
2-Chloroethyl Vinyl Ether	<	1.87	3500	No (Value < QL)		
Chloroform	<	0.27	5.7	No (Value < QL)		
Dichlorobromomethane	<	0.31	0.55	No (Value < QL)		
1,1-Dichloroethane	<	0.21	N/A	No (Value < QL)		
1,2-Dichloroethane	<	0.19	0.38	No (Value < QL)		
1,1-Dichloroethylene	<	0.25	33	No (Value < QL)		
1,2-Dichloropropane	<	0.25	2200	No (Value < QL)		
1,3-Dichloropropylene	<	1	0.34	Yes	14.033	No Limits/Monitoring
Ethylbenzene	<	0.24	530	No (Value < QL)		
Methyl Bromide	<	0.4	47	No (Value < QL)		
Methyl Chloride	<	0.25	5500	No (Value < QL)		
Methylene Chloride	<	1	4.6	No		
1,1,2,2-Tetrachloroethane	<	0.2	0.17	No (Value < QL)		
Tetrachloroethylene	<	0.32	0.69	No (Value < QL)		
Toluene	<	0.17	330	No (Value < QL)		
1,2-trans-Dichloroethylene	<	1	140	No		
1,1,1-Trichloroethane	<	0.2	610	No (Value < QL)		
1,1,2-Trichloroethane	<	0.23	0.59	No (Value < QL)		
Trichloroethylene	<	0.21	2.5	No (Value < QL)		
Vinyl Chloride	<	0.43	0.025	No (Value < QL)		

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
Pollutant Group 4 – Acid Compounds						
2-Chlorophenol	<	5	81	No (Value < QL)		
2,4-Dichlorophenol	<	5	77	No (Value < QL)		
2,4-Dimethylphenol	<	5	130	No (Value < QL)		
4,6-Dinitro-o-Cresol	<	10	13	No (Value < QL)		
2,4-Dinitrophenol	<	10	69	No (Value < QL)		
2-Nitrophenol	<	5	1600	No (Value < QL)		
4-Nitrophenol	<	5	470	No (Value < QL)		
p-Chloro-m-Cresol	<	5	30	No (Value < QL)		
Pentachlorophenol	<	5	0.27	No (Value < QL)		
Phenol	<	5	10400	No (Value < QL)		
2,4,6-Trichlorophenol	<	5	1.4	No (Value < QL)		
Pollutant Group 5 – Base Compounds						
Acenaphthene	<	1.45	17	No (Value < QL)		
Acenaphthylene	<	1.92	N/A	No (Value < QL)		
Anthracene	<	1.93	8300	No (Value < QL)		
Benzidine	<	3.45	0.000086	No (Value < QL)		
Benzo(a)Anthracene	<	2.02	0.0038	No (Value < QL)		
Benzo(a)Pyrene	<	1.92	0.0038	No (Value < QL)		
3,4-Benzofluoranthene	<	2.03	0.0038	No (Value < QL)		
Benzo(ghi)Perylene	<	2.73	N/A	No		
Benzo(k)Fluoranthene	<	2.03	0.0038	No (Value < QL)		
Bis(2-Chloroethoxy)Methane	<	1.87	N/A	No (Value < QL)		
Bis(2-Chloroethyl)Ether	<	1.95	0.03	No (Value < QL)		
Bis(2-Chloroisopropyl)Ether	<	1.85	1400	No (Value < QL)		
Bis(2-Ethylhexyl)Phthalate	<	52.33	1.2	Yes	49.528	~~Establish Limits~~
4-Bromophenyl Phenyl Ether	<	1.46	54	No (Value < QL)		
Butyl Benzyl Phthalate	<	2.65	35	No (Value < QL)		
2-Chloronaphthalene	<	1.6	1000	No (Value < QL)		
4-Chlorophenyl Phenyl Ether	<	1.68	N/A	No (Value < QL)		
Chrysene	<	2.13	0.0038	No (Value < QL)		
Dibenzo(a,h)Anthrancene	<	2.73	0.0038	Yes	0.157	~~Establish Limits~~
1,2-Dichlorobenzene	<	1.91	160	No		
1,3-Dichlorobenzene	<	1.8	69	No		
1,4-Dichlorobenzene	<	2.03	150	No		
3,3-Dichlorobenzidine	<	2	0.021	No (Value < QL)		

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
Diethyl Phthalate	<	2.01	800	No (Value < QL)		
Dimethyl Phthalate	<	1.66	500	No (Value < QL)		
Di-n-Butyl Phthalate	<	2.3	21	No (Value < QL)		
2,4-Dinitrotoluene	<	2.08	0.05	No (Value < QL)		
2,6-Dinitrotoluene	<	1.92	0.05	No (Value < QL)		
1,4-Dioxane	<		N/A			
Di-n-Octyl Phthalate	<	2.055	N/A	No (Value < QL)		
1,2-Diphenylhydrazine	<	5	0.036	No (Value < QL)		
Fluoranthene	<	2.31	40	No (Value < QL)		
Fluorene	<	1.61	1100	No (Value < QL)		
Hexachlorobenzene	<	1.71	0.00028	No (Value < QL)		
Hexachlorobutadiene	<	1.56	0.44	Yes	17.887	No Limits/Monitoring
Hexachlorocyclopentadiene	<	1.35	1	No (Value < QL)		
Hexachloroethane	<	1.86	1.4	No (Value < QL)		
Indeno(1,2,3-cd)Pyrene	<	2.63	0.0038	Yes	0.157	~~Establish Limits~~
Isophorone	<	1.56	35	No (Value < QL)		
Naphthalene	<	1.91	43	No		
Nitrobenzene	<	1.81	17	No (Value < QL)		
n-Nitrosodimethylamine	<	1.3	0.00069	No (Value < QL)		
n-Nitrosodi-n-Propylamine	<	1.58	0.005	No (Value < QL)		
n-Nitrosodiphenylamine	<	3.56	3.3	No (Value < QL)		
Phenanthrene	<	1.94	1	No (Value < QL)		
Pyrene	<	2.1	830	No (Value < QL)		
1,2,4-Trichlorobenzene	<	1.83	26	No		

TOXICS SCREENING ANALYSIS – OUTFALL 027
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.5

Facility: **Homer City Generating Station** NPDES Permit No.: **PA0005037** Outfall: **027**

Analysis Hardness (mg/L): **100** Discharge Flow (MGD): **0.14** Analysis pH (SU): **7.64**

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
Pollutant Group 1						
Total Dissolved Solids		36645000	500000	Yes		Monitor
Chloride		50000	10000	Yes		
Bromide			250000			Monitor
Sulfate		1720000	N/A	No		Monitor
Fluoride		2500000	250000	Yes		Monitor
Pollutant Group 2 – Metals						
Total Aluminum		29.4	750	No	7036.019	
Total Antimony	<	0.5	5.6	No (Value < QL)		
Total Arsenic	<	1	10	No (Value < QL)		
Total Barium		137	2400	No		
Total Beryllium		100	N/A	#N/A		
Total Boron		479000	1600	Yes	217583.4	Establish Limits
Total Cadmium		0.6	0.246	Yes	78.523	No Limits/Monitoring
Total Chromium		4	74.1	No		
Hexavalent Chromium		0.011	10	No		
Total Cobalt		10.8	19	No		
Total Copper		1.7	8.96	No		
Total Cyanide	<	10	N/A	No (Value < QL)		
Total Iron	<	10	1500	No (Value < QL)		
Dissolved Iron		0.029	300	No		
Total Lead		100	2.52	Yes	1343.442	No Limits/Monitoring
Total Manganese		176000	1000	Yes	158057.8	Establish Limits
Total Mercury	<	0.2	0.05	No (Value < QL)		
Total Molybdenum		48.7	N/A	No		
Total Nickel		63.3	52	Yes	16299.66	No Limits/Monitoring

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
Total Phenols (Phenolics)	<	500	5	Yes		
Total Selenium		3900	4.6	Yes	858.568	Establish Limits
Total Silver	<	0.2	3.22	No (Value < QL)		
Total Thallium		1.9	0.24	Yes	41.301	No Limits/Monitoring
Total Zinc	<	4	117.2	No (Value < QL)		
Pollutant Group 3 – Volatiles						
Acrolein	<	0.85	3	No (Value < QL)		
Acrylamide	<	5	0.051	No (Value < QL)		
Acrylonitrile	<	0.13	1.2	No (Value < QL)		
Benzene	<	0.36	4.3	No (Value < QL)		
Bromoform	<	0.31	0.23	No (Value < QL)		
Carbon Tetrachloride	<	0.33	130	No (Value < QL)		
Chlorobenzene	<	1	0.4	Yes	322.947	No Limits/Monitoring
Chlorodibromomethane	<	1	N/A	No		
Chloroethane	<	1.87	3500	No (Value < QL)		
2-Chloroethyl Vinyl Ether	<	0.27	5.7	No (Value < QL)		
Chloroform	<	0.31	0.55	No (Value < QL)		
Dichlorobromomethane	<	0.21	N/A	No (Value < QL)		
1,1-Dichloroethane	<	0.19	0.38	No (Value < QL)		
1,2-Dichloroethane	<	0.25	33	No (Value < QL)		
1,1-Dichloroethylene	<	0.25	2200	No (Value < QL)		
1,2-Dichloropropane	<	1	0.34	Yes	274.505	No Limits/Monitoring
1,3-Dichloropropylene	<	1.24	530	No		
Ethylbenzene	<	0.4	47	No (Value < QL)		
Methyl Bromide	<	0.25	5500	No (Value < QL)		
Methyl Chloride	<	1	4.6	No		
Methylene Chloride	<	0.2	0.17	No (Value < QL)		
1,1,2,2-Tetrachloroethane	<	0.32	0.69	No (Value < QL)		
Tetrachloroethylene	<	0.17	330	No (Value < QL)		
Toluene	<	1	140	No		
1,2-trans-Dichloroethylene	<	0.2	610	No (Value < QL)		
1,1,1-Trichloroethane	<	0.23	0.59	No (Value < QL)		
1,1,2-Trichloroethane	<	0.21	2.5	No (Value < QL)		
Trichloroethylene	<	0.43	0.025	No (Value < QL)		
Vinyl Chloride	<	0.85	3	No (Value < QL)		

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
Pollutant Group 4 – Acid Compounds						
2-Chlorophenol	<	10	81	No (Value < QL)		
2,4-Dichlorophenol	<	10	77	No (Value < QL)		
2,4-Dimethylphenol	<	10	130	No (Value < QL)		
4,6-Dinitro-o-Cresol	<	10	13	No (Value < QL)		
2,4-Dinitrophenol	<	20	69	No		
2-Nitrophenol	<	10	1600	No (Value < QL)		
4-Nitrophenol	<	10	470	No (Value < QL)		
p-Chloro-m-Cresol	<	5	30	No (Value < QL)		
Pentachlorophenol	<	10	0.27	No (Value < QL)		
Phenol	<	10	10400	No (Value < QL)		
2,4,6-Trichlorophenol	<	10	1.4	No (Value < QL)		
Pollutant Group 5 – Base Compounds						
Acenaphthene	<	1.45	17	No (Value < QL)		
Acenaphthylene	<	1.92	N/A	No (Value < QL)		
Anthracene	<	1.93	8300	No (Value < QL)		
Benzidine	<	3.45	0.000086	No (Value < QL)		
Benzo(a)Anthracene	<	2.02	0.0038	No (Value < QL)		
Benzo(a)Pyrene	<	1.92	0.0038	No (Value < QL)		
3,4-Benzofluoranthene	<	2.03	0.0038	No (Value < QL)		
Benzo(ghi)Perylene	<	2.73	N/A	No		
Benzo(k)Fluoranthene	<	2.03	0.0038	No (Value < QL)		
Bis(2-Chloroethoxy)Methane	<	1.87	N/A	No (Value < QL)		
Bis(2-Chloroethyl)Ether	<	1.95	0.03	No (Value < QL)		
Bis(2-Chloroisopropyl)Ether	<	1.85	1400	No (Value < QL)		
Bis(2-Ethylhexyl)Phthalate		9.22	1.2	Yes	968.84	No Limits/Monitoring
4-Bromophenyl Phenyl Ether	<	1.46	54	No (Value < QL)		
Butyl Benzyl Phthalate	<	2.65	35	No (Value < QL)		
2-Chloronaphthalene	<	1.6	1000	No (Value < QL)		
4-Chlorophenyl Phenyl Ether	<	1.68	N/A	No (Value < QL)		
Chrysene	<	2.13	0.0038	No (Value < QL)		
Dibenzo(a,h)Anthrancene	<	2.73	0.0038	Yes	3.068	~~Establish Limits~~
1,2-Dichlorobenzene	<	1.91	160	No		
1,3-Dichlorobenzene	<	1.8	69	No		
1,4-Dichlorobenzene	<	2.03	150	No		
3,3-Dichlorobenzidine	<	2	0.021	No (Value < QL)		

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
Diethyl Phthalate	<	2.01	800	No (Value < QL)		
Dimethyl Phthalate	<	1.66	500	No (Value < QL)		
Di-n-Butyl Phthalate	<	2.3	21	No (Value < QL)		
2,4-Dinitrotoluene	<	2.08	0.05	No (Value < QL)		
2,6-Dinitrotoluene	<	1.92	0.05	No (Value < QL)		
1,4-Dioxane	<	2.05	N/A	No (Value < QL)		
Di-n-Octyl Phthalate	<	5	0.036	No (Value < QL)		
1,2-Diphenylhydrazine	<	2.31	40	No (Value < QL)		
Fluoranthene	<	1.61	1100	No (Value < QL)		
Fluorene	<	1.71	0.00028	No (Value < QL)		
Hexachlorobenzene	<	1.56	0.44	Yes	268.622	No Limits/Monitoring
Hexachlorobutadiene	<	1.35	1	No (Value < QL)		
Hexachlorocyclopentadiene	<	1.86	1.4	No (Value < QL)		
Hexachloroethane	<	2.63	0.0038	Yes	3.068	Establish Limits
Indeno(1,2,3-cd)Pyrene	<	1.56	35	No (Value < QL)		
Isophorone	<	1.91	43	No		
Naphthalene	<	1.81	17	No (Value < QL)		
Nitrobenzene	<	1.3	0.00069	No (Value < QL)		
n-Nitrosodimethylamine	<	1.58	0.005	No (Value < QL)		
n-Nitrosodi-n-Propylamine	<	3.56	3.3	No (Value < QL)		
n-Nitrosodiphenylamine	<	1.94	1	No (Value < QL)		
Phenanthrene	<	2.1	830	No (Value < QL)		
Pyrene	<	1.83	26	No		
1,2,4-Trichlorobenzene	<	2.01	800	No (Value < QL)		

ATTACHMENT B

PENTOXSD Modeling Results

Outfall 001

PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
44073	3.28	975.00	188.00	0.00150	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	0.11047	0	0	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)	
Outfall 001	PA0005037a	1.69	0	0	0	0	0	0	0	769.3	7.8

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)
1,3-DICHLOROPROPYLENE	1	0	0.5	0.5	0	0	0	0	1	0
BIS(2-ETHYLHEXYL) PHTHALATE	52.33	0	0.5	0.5	0	0	0	0	1	0
CHLORODIBROMOMETHANE	1	0	0.5	0.5	0	0	0	0	1	0
DIBENZO(a,h) ANTHRACENE	2.73	0	0.5	0.5	0	0	0	0	1	0
HEXACHLOROBUTA-DIENE	1.56	0	0.5	0.5	0	0	0	0	1	0
INDENO(1,2,3-cd)PYRENE	2.63	0	0.5	0.5	0	0	0	0	1	0
MERCURY	0.009	0	0.5	0.5	0	0	0	0	1	0
SILVER	0.2	0	0.5	0.5	0	0	0	0	1	0
THALLIUM	100000	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
44073	2.28	965.00	189.00	0.00150	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	0.11047	0	0	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 (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard (mg/L)	Disc pH
		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)
1,3-DICHLOROPROPYLENE	0	0	0.5	0.5	0	0	0	0	1	0
BIS(2-ETHYLHEXYL) PHTHALATE	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
DIBENZO(a,h) ANTHRACENE	0	0	0.5	0.5	0	0	0	0	1	0
HEXACHLOROBUTA-DIENE	0	0	0.5	0.5	0	0	0	0	1	0
INDENO(1,2,3-cd)PYRENE	0	0	0.5	0.5	0	0	0	0	1	0
MERCURY	0	0	0.5	0.5	0	0	0	0	1	0
SILVER	0	0	0.5	0.5	0	0	0	0	1	0
THALLIUM	0	0	0.5	0.5	0	0	0	0	1	0

PENTOXSD Analysis Results

Hydrodynamics

SWP Basin	Stream Code:	Stream Name:
18D	44073	TWO LICK CREEK

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											
3.280	20.768	0	20.768	2.61443	0.0015	0.8814	75.582	85.747	0.351	0.1741	192.721
2.280	20.879	0	20.879	NA	0	0	0	0	0	0	NA
Qh Hydrodynamics											
3.280	105.29	0	105.29	2.61443	0.0015	1.7275	75.582	43.751	0.8264	0.0739	84.775
2.280	105.78	0	105.78	NA	0	0	0	0	0	0	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
3.28	**Outfall 001**	**PA0005037a**

AFC

Q7-10: **CCT (min)** 15 **PMF** 0.278 **Analysis pH** 7.131 **Analysis Hardness** 308.103

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
MERCURY	0	0	0	0	1.4	1.647	5.297
Dissolved WQC. Chemical translator of 0.85 applied.							
SILVER	0	0	0	0	22.283	26.215	84.314
Dissolved WQC. Chemical translator of 0.85 applied.							
THALLIUM	0	0	0	0	65	65	209.052
CHLORODIBROMOMETHANE	0	0	0	0	NA	NA	NA
1,3-DICHLOROPROPYLENE	0	0	0	0	310	310	997.017
BIS(2-ETHYLHEXYL) PHTHALATE	0	0	0	0	4500	4500	14472.83
DIBENZO(a,h) ANTHRACENE	0	0	0	0	NA	NA	NA
HEXACHLOROBUTA-DIENE	0	0	0	0	10	10	32.162
INDENO(1,2,3-cd)PYRENE	0	0	0	0	NA	NA	NA

CFC

Q7-10: **CCT (min)** 192.721 **PMF** 1 **Analysis pH** 7.042 **Analysis Hardness** 174.834

Parameter	Stream Conc. (µg/L)	Stream CV	Trib Conc. (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
MERCURY	0	0	0	0	0.77	0.906	8.102
Dissolved WQC. Chemical translator of 0.85 applied.							
SILVER	0	0	0	0	NA	NA	NA
THALLIUM	0	0	0	0	13	13	116.269
CHLORODIBROMOMETHANE	0	0	0	0	NA	NA	NA
1,3-DICHLOROPROPYLENE	0	0	0	0	61	61	545.568
BIS(2-ETHYLHEXYL) PHTHALATE	0	0	0	0	910	910	8138.806
DIBENZO(a,h) ANTHRACENE	0	0	0	0	NA	NA	NA
HEXACHLOROBUTA-DIENE	0	0	0	0	2	2	17.887

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
3.28	**Outfall 001**	**PA0005037a**						
INDENO(1,2,3-cd)PYRENE			0	0	0	0	NA	NA	NA

THH

Q7-10: **CCT (min)** 192.721 **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)
MERCURY	0	0	0	0	0.05	0.05	0.447
SILVER	0	0	0	0	NA	NA	NA
THALLIUM	0	0	0	0	0.24	0.24	2.146
CHLORODIBROMOMETHANE	0	0	0	0	NA	NA	NA
1,3-DICHLOROPROPYLENE	0	0	0	0	NA	NA	NA
BIS(2-ETHYLHEXYL) PHTHALATE	0	0	0	0	NA	NA	NA
DIBENZO(a,h) ANTHRACENE	0	0	0	0	NA	NA	NA
HEXACHLOROBUTA-DIENE	0	0	0	0	NA	NA	NA
INDENO(1,2,3-cd)PYRENE	0	0	0	0	NA	NA	NA

CRL

Qh: **CCT (min)** 84.775 **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)
MERCURY	0	0	0	0	NA	NA	NA
SILVER	0	0	0	0	NA	NA	NA
THALLIUM	0	0	0	0	NA	NA	NA
CHLORODIBROMOMETHANE	0	0	0	0	0.4	0.4	16.509
1,3-DICHLOROPROPYLENE	0	0	0	0	0.34	0.34	14.033
BIS(2-ETHYLHEXYL) PHTHALATE	0	0	0	0	1.2	1.2	49.528

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
3.28	**Outfall 001**	**PA0005037a**						
DIBENZO(a,h) ANTHRACENE			0	0	0	0	0.004	0.004	0.157
HEXACHLOROBUTA-DIENE			0	0	0	0	0.44	0.44	18.16
INDENO(1,2,3-cd)PYRENE			0	0	0	0	0.004	0.004	0.157

PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
18D	44073	TWO LICK CREEK

RMI	Name	Permit Number	Disc Flow (mgd)
3.28	Outfall 001	PA0005037a	1.6900

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
1,3-DICHLOROPROPYLENE	1	INPUT	1.56	14.033	CRL
BIS(2-ETHYLHEXYL) PHTHALATE	49.528	CRL	77.272	49.528	CRL
CHLORODIBROMOMETHANE	1	INPUT	1.56	16.509	CRL
DIBENZO(a,h) ANTHRACENE	0.157	CRL	0.245	0.157	CRL
HEXACHLOROBUTA-DIENE	1.56	INPUT	2.434	17.887	CFC
INDENO(1,2,3-cd)PYRENE	0.157	CRL	0.245	0.157	CRL
MERCURY	0.009	INPUT	0.014	0.447	THH
SILVER	0.2	INPUT	0.312	54.042	AFC
THALLIUM	2.146	THH	3.349	2.146	THH

Outfall 027

PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
43979	10.72	960.00	194.00	0.00400	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	0.191	0	0	0	150	1.5	0	0	100	7.64	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)	
Outfall 027	PA0005037f	0.14	0	0	0	0	0	0	0	17723	6.53

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)
1,3-DICHLOROPROPYLENE	1000000	0	0.5	0.5	0	0	0	0	1	0
ALUMINUM	1000000	0	0.5	0.5	500	0	0	0	1	0
BERYLLIUM	1000000	0	0.5	0.5	0	0	0	0	1	0
BIS(2-ETHYLHEXYL) PHTHALATE	1000000	0	0.5	0.5	0	0	0	0	1	0
BORON	1000000	0	0.5	0.5	0	0	0	0	1	0
CADMIUM	1000000	0	0.5	0.5	0	0	0	0	1	0
CHLORODIBROMOMETHANE	1000000	0	0.5	0.5	0	0	0	0	1	0
CYANIDE, FREE	1000000	0	0.5	0.5	0	0	0	0	1	0
DIBENZO(a,h) ANTHRACENE	1000000	0	0.5	0.5	0	0	0	0	1	0
HEXACHLOROBUTA-DIENE	1000000	0	0.5	0.5	0	0	0	0	1	0
INDENO(1,2,3-cd)PYRENE	1000000	0	0.5	0.5	0	0	0	0	1	0
LEAD	1000000	0	0.5	0.5	0	0	0	0	1	0
MANGANESE	1000000	0	0.5	0.5	82	0	0	0	1	0
NICKEL	1000000	0	0.5	0.5	0	0	0	0	1	0
OSMOTIC PRESSURE	1000000	0	0.5	0.5	0	0	0	0	1	0
SELENIUM	1000000	0	0.5	0.5	0	0	0	0	1	0
THALLIUM	1000000	0	0.5	0.5	0	0	0	0	1	0
TOTAL IRON	1000000	0	0.5	0.5	482	0	0	0	1	0

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
43979	10.00	959.50	390.00	0.00400	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	0.191	0	0	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 (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard (mg/L)	Disc pH
		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)
1,3-DICHLOROPROPYLENE	0	0	0.5	0.5	0	0	0	0	1	0
ALUMINUM	0	0	0.5	0.5	0	0	0	0	1	0
BERYLLIUM	0	0	0.5	0.5	0	0	0	0	1	0
BIS(2-ETHYLHEXYL) PHTHALATE	0	0	0.5	0.5	0	0	0	0	1	0
BORON	0	0	0.5	0.5	0	0	0	0	1	0
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
CYANIDE, FREE	0	0	0.5	0.5	0	0	0	0	1	0
DIBENZO(a,h) ANTHRACENE	0	0	0.5	0.5	0	0	0	0	1	0
HEXACHLOROBUTA-DIENE	0	0	0.5	0.5	0	0	0	0	1	0
INDENO(1,2,3-cd)PYRENE	0	0	0.5	0.5	0	0	0	0	1	0
LEAD	0	0	0.5	0.5	0	0	0	0	1	0
MANGANESE	0	0	0.5	0.5	0	0	0	0	1	0
NICKEL	0	0	0.5	0.5	0	0	0	0	1	0
OSMOTIC PRESSURE	0	0	0.5	0.5	0	0	0	0	1	0
SELENIUM	0	0	0.5	0.5	0	0	0	0	1	0
THALLIUM	0	0	0.5	0.5	0	0	0	0	1	0
TOTAL IRON	0	0	0.5	0.5	0	0	0	0	1	0

PENTOXSD Analysis Results

Hydrodynamics

SWP Basin	Stream Code:	Stream Name:
18D	43979	BLACKLICK CREEK

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											
10.720	37.054	0	37.054	0.21658	0.004	1.5	150	100	0.1656	0.2656	262.35
10.000	74.49	0	74.49	NA	0	0	0	0	0	0	NA
Qh Hydrodynamics											
10.720	174.64	0	174.64	0.21658	0.004	2.9612	150	50.654	0.3937	0.1118	95.453
10.000	321.52	0	321.52	NA	0	0	0	0	0	0	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
10.72	**Outfall 027**	**PA0005037f**

AFC

Q7-10: **CCT (min)** 15 **PMF** 0.239 **Analysis pH** 7.531 **Analysis Hardness** 520.503

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
BERYLLIUM	0	0	0	0	NA	NA	NA
CADMIUM	0	0	0	0	9.985	11.412	478.25
	Dissolved WQC. Chemical translator of 0.875 applied.						
LEAD	0	0	0	0	367.112	666.711	27941.36
	Dissolved WQC. Chemical translator of 0.551 applied.						
NICKEL	0	0	0	0	1890.424	1894.212	79385.05
	Dissolved WQC. Chemical translator of 0.998 applied.						
SELENIUM	0	0	0	0	NA	NA	NA
THALLIUM	0	0	0	0	65	65	2724.103
CYANIDE, FREE	0	0	0	0	22	22	922.004
CHLORODIBROMOMETHANE	0	0	0	0	NA	NA	NA
1,3-DICHLOROPROPYLENE	0	0	0	0	310	310	12991.88
BIS(2-ETHYLHEXYL) PHTHALATE	0	0	0	0	4500	4500	188591.8
DIBENZO(a,h) ANTHRACENE	0	0	0	0	NA	NA	NA
HEXACHLOROBUTA-DIENE	0	0	0	0	10	10	419.093
INDENO(1,2,3-cd)PYRENE	0	0	0	0	NA	NA	NA
ALUMINUM	500	0	0	0	750	750	10977.32
TOTAL IRON	482	0	0	0	NA	NA	NA
MANGANESE	82	0	0	0	NA	NA	NA
BORON	0	0	0	0	8100	8100	339465.1
OSMOTIC PRESSURE	0	0	0	0	NA	NA	NA

CFC

Q7-10: **CCT (min)** 262.35 **PMF** 1 **Analysis pH** 7.611 **Analysis Hardness** 202.407

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
10.72	**Outfall 027**	**PA0005037f**

Parameter	Stream Conc. (µg/L)	Stream CV	Trib Conc. (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
BERYLLIUM	0	0	0	0	NA	NA	NA
CADMIUM	0	0	0	0	0.401	0.456	78.523
	Dissolved WQC. Chemical translator of 0.88 applied.						
LEAD	0	0	0	0	5.373	7.807	1343.442
	Dissolved WQC. Chemical translator of 0.688 applied.						
NICKEL	0	0	0	0	94.433	94.718	16299.66
	Dissolved WQC. Chemical translator of 0.997 applied.						
SELENIUM	0	0	0	0	4.6	4.989	858.568
	Dissolved WQC. Chemical translator of 0.922 applied.						
THALLIUM	0	0	0	0	13	13	2237.13
CYANIDE, FREE	0	0	0	0	5.2	5.2	894.852
CHLORODIBROMOMETHANE	0	0	0	0	NA	NA	NA
1,3-DICHLOROPROPYLENE	0	0	0	0	61	61	10497.3
BIS(2-ETHYLHEXYL) PHTHALATE	0	0	0	0	910	910	156599.1
DIBENZO(a,h) ANTHRACENE	0	0	0	0	NA	NA	NA
HEXACHLOROBUTA-DIENE	0	0	0	0	2	2	344.174
INDENO(1,2,3-cd)PYRENE	0	0	0	0	NA	NA	NA
ALUMINUM	500	0	0	0	NA	NA	NA
TOTAL IRON	482	0	0	0	1500	1500	175666.5
	WQC = 30 day average. PMF = 1.						
MANGANESE	82	0	0	0	NA	NA	NA
BORON	0	0	0	0	1600	1600	275339
OSMOTIC PRESSURE	0	0	0	0	50	50	8604.345
	Units for WLA and Effluent Limit = Milliosmoles per kilogram.						

THH

Q7-10:	**CCT (min)**	262.35	**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)
BERYLLIUM	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
10.72	**Outfall 027**	**PA0005037f**						
	CADMIUM	0	0	0	0	NA	NA	NA
	LEAD	0	0	0	0	NA	NA	NA
	NICKEL	0	0	0	0	610	610	104973
	SELENIUM	0	0	0	0	NA	NA	NA
	THALLIUM	0	0	0	0	0.24	0.24	41.301
	CYANIDE, FREE	0	0	0	0	140	140	24092.17
	CHLORODIBROMOMETHANE	0	0	0	0	NA	NA	NA
	1,3-DICHLOROPROPYLENE	0	0	0	0	NA	NA	NA
	BIS(2-ETHYLHEXYL) PHTHALATE	0	0	0	0	NA	NA	NA
	DIBENZO(a,h) ANTHRACENE	0	0	0	0	NA	NA	NA
	HEXACHLOROBUTA-DIENE	0	0	0	0	NA	NA	NA
	INDENO(1,2,3-cd)PYRENE	0	0	0	0	NA	NA	NA
	ALUMINUM	500	0	0	0	NA	NA	NA
	TOTAL IRON	482	0	0	0	NA	NA	NA
	MANGANESE	82	0	0	0	1000	1000	158057.8
	BORON	0	0	0	0	3100	3100	533469.4
	OSMOTIC PRESSURE	0	0	0	0	NA	NA	NA

CRL

Qh: **CCT (min)** 95.453 **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)
BERYLLIUM	0	0	0	0	NA	NA	NA
CADMIUM	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
10.72	**Outfall 027**	**PA0005037f**						
	LEAD	0	0	0	0	NA	NA	NA
	NICKEL	0	0	0	0	NA	NA	NA
	SELENIUM	0	0	0	0	NA	NA	NA
	THALLIUM	0	0	0	0	NA	NA	NA
	CYANIDE, FREE	0	0	0	0	NA	NA	NA
	CHLORODIBROMOMETHANE	0	0	0	0	0.4	0.4	322.947
	1,3-DICHLOROPROPYLENE	0	0	0	0	0.34	0.34	274.505
	BIS(2-ETHYLHEXYL) PHTHALATE	0	0	0	0	1.2	1.2	968.84
	DIBENZO(a,h) ANTHRACENE	0	0	0	0	0.004	0.004	3.068
	HEXACHLOROBUTA-DIENE	0	0	0	0	0.44	0.44	355.241
	INDENO(1,2,3-cd)PYRENE	0	0	0	0	0.004	0.004	3.068
	ALUMINUM	500	0	0	0	NA	NA	NA
	TOTAL IRON	482	0	0	0	NA	NA	NA
	MANGANESE	82	0	0	0	NA	NA	NA
	BORON	0	0	0	0	NA	NA	NA
	OSMOTIC PRESSURE	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
18D	43979	BLACKLICK CREEK

RMI	Name	Permit Number	Disc Flow (mgd)
10.72	Outfall 027	PA0005037f	0.1400

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
1,3-DICHLOROPROPYLENE	274.505	CRL	428.271	274.505	CRL
ALUMINUM	7036.019	AFC	10977.32	7036.019	AFC
BERYLLIUM	1000000	INPUT	1560000	NA	NA
BIS(2-ETHYLHEXYL) PHTHALATE	968.84	CRL	1511.545	968.84	CRL
BORON	217583.4	AFC	339465.1	217583.4	AFC
CADMIUM	78.523	CFC	122.508	78.523	CFC
CHLORODIBROMOMETHANE	322.947	CRL	503.848	322.947	CRL
CYANIDE, FREE	590.967	AFC	922.004	590.967	AFC
DIBENZO(a,h) ANTHRACENE	3.068	CRL	4.787	3.068	CRL
HEXACHLOROBUTA-DIENE	268.622	AFC	419.093	268.622	AFC
INDENO(1,2,3-cd)PYRENE	3.068	CRL	4.787	3.068	CRL
LEAD	1343.442	CFC	2095.986	1343.442	CFC
MANGANESE	158057.8	THH	246595.5	158057.8	THH
NICKEL	16299.66	CFC	25430.08	16299.66	CFC
OSMOTIC PRESSURE	8604.345	CFC	13424.16	8604.345	CFC
SELENIUM	858.568	CFC	1339.504	858.568	CFC
THALLIUM	41.301	THH	64.436	41.301	THH
TOTAL IRON	175666.5	CFC	274067.9	175666.5	CFC

ATTACHMENT C

Temperature Modeling Results for Outfall 001

Facility: **Homer City Generating Station**
Permit Number: PA0005037 **PMF**
Stream Name: Two Lick Creek 1.00
Analyst/Engineer: Ryan Decker
Stream Q7-10 (cfs): 42.32

	Facility Flows				Stream Flows		
	Intake (Stream) (MGD)	Intake (External) (MGD)	Consumptive Loss (MGD)	Discharge Flow (MGD)	Upstream Stream Flow (cfs)	Adjusted Stream Flow (cfs)	Downstream Stream Flow (cfs)
Jan 1-31	13.9	2.16	11.74	4.32	135.42	113.92	120.60
Feb 1-29	13.9	2.16	11.74	4.32	148.12	126.62	133.30
Mar 1-31	13.9	2.16	11.74	4.32	296.24	274.74	281.42
Apr 1-15	13.9	2.16	11.74	4.32	393.58	372.07	378.76
Apr 16-30	13.9	2.16	11.74	4.32	393.58	372.07	378.76
May 1-15	13.9	2.16	11.74	4.32	215.83	194.33	201.01
May 16-30	13.9	2.16	11.74	4.32	215.83	194.33	201.01
Jun 1-15	13.9	2.16	11.74	4.32	126.96	105.46	112.14
Jun 16-30	13.9	2.16	11.74	4.32	126.96	105.46	112.14
Jul 1-31	13.9	2.16	13.324	2.736	71.94	50.44	54.67
Aug 1-15	13.9	2.16	11.74	4.32	59.25	37.74	44.43
Aug 16-31	13.9	2.16	11.74	4.32	59.25	37.74	44.43
Sep 1-15	13.9	2.16	11.74	4.32	46.55	25.05	31.73
Sep 16-30	13.9	2.16	11.74	4.32	46.55	25.05	31.73
Oct 1-15	13.9	2.16	11.74	4.32	50.78	29.28	35.96
Oct 16-31	13.9	2.16	11.74	4.32	50.78	29.28	35.96
Nov 1-15	13.9	2.16	11.74	4.32	67.71	46.21	52.89
Nov 16-30	13.9	2.16	11.74	4.32	67.71	46.21	52.89
Dec 1-31	13.9	2.16	11.74	4.32	101.57	80.06	86.75

Version 2.0 -- 07/01/2005 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: **Homer City Generating Station**
Permit Number: PA0005037
Stream: Two Lick Creek

	WWF Criteria (ºF)	CWF Criteria (ºF)	TSF Criteria (ºF)	316 Criteria (ºF)	Q7-10 Multipliers (Used in Analysis)	Q7-10 Multipliers (Default - Info Only)
Jan 1-31	40	38	40	0	3.2	3.2
Feb 1-29	40	38	40	0	3.5	3.5
Mar 1-31	46	42	46	0	7	7
Apr 1-15	52	48	52	0	9.3	9.3
Apr 16-30	58	52	58	0	9.3	9.3
May 1-15	64	54	64	0	5.1	5.1
May 16-31	72	58	68	0	5.1	5.1
Jun 1-15	80	60	70	0	3	3
Jun 16-30	84	64	72	0	3	3
Jul 1-31	87	66	74	0	1.7	1.7
Aug 1-15	87	66	80	0	1.4	1.4
Aug 16-31	87	66	87	0	1.4	1.4
Sep 1-15	84	64	84	0	1.1	1.1
Sep 16-30	78	60	78	0	1.1	1.1
Oct 1-15	72	54	72	0	1.2	1.2
Oct 16-31	66	50	66	0	1.2	1.2
Nov 1-15	58	46	58	0	1.6	1.6
Nov 16-30	50	42	50	0	1.6	1.6
Dec 1-31	42	40	42	0	2.4	2.4

Notes:
WWF = Warm water fishes
CWF = Cold water fishes
TSF = Trout stocking

Facility: **Homer City Generating Station**
Permit Number: PA0005037 **PMF**
Stream: Two Lick Creek 1.00

	TSF Ambient Stream Temperature (ºF) (Default)	Ambient Stream Temperature (ºF) (Site-specific data)	Target Maximum Stream Temp.[1] (ºF)	**TSF** Daily WLA[2] (Million BTUs/day)	**TSF** Daily WLA[3] (ºF)	at Discharge Flow (MGD)
Jan 1-31	34	0	40	N/A -- Case 2	110.0	4.32
Feb 1-29	35	0	40	N/A -- Case 2	110.0	4.32
Mar 1-31	39	0	46	N/A -- Case 2	110.0	4.32
Apr 1-15	46	0	52	N/A -- Case 2	110.0	4.32
Apr 16-30	52	0	58	N/A -- Case 2	110.0	4.32
May 1-15	56	0	64	N/A -- Case 2	110.0	4.32
May 16-31	60	0	68	N/A -- Case 2	110.0	4.32
Jun 1-15	65	0	70	N/A -- Case 2	110.0	4.32
Jun 16-30	69	0	72	N/A -- Case 2	110.0	4.32
Jul 1-31	73	0	74	N/A -- Case 2	85.9	2.736
Aug 1-15	72	0	80	N/A -- Case 2	110.0	4.32
Aug 16-31	70	0	87	N/A -- Case 2	110.0	4.32
Sep 1-15	68	0	84	N/A -- Case 2	110.0	4.32
Sep 16-30	62	0	78	N/A -- Case 2	110.0	4.32
Oct 1-15	57	0	72	N/A -- Case 2	110.0	4.32
Oct 16-31	53	0	66	N/A -- Case 2	110.0	4.32
Nov 1-15	47	0	58	N/A -- Case 2	110.0	4.32
Nov 16-30	41	0	50	N/A -- Case 2	110.0	4.32
Dec 1-31	36	0	42	N/A -- Case 2	110.0	4.32

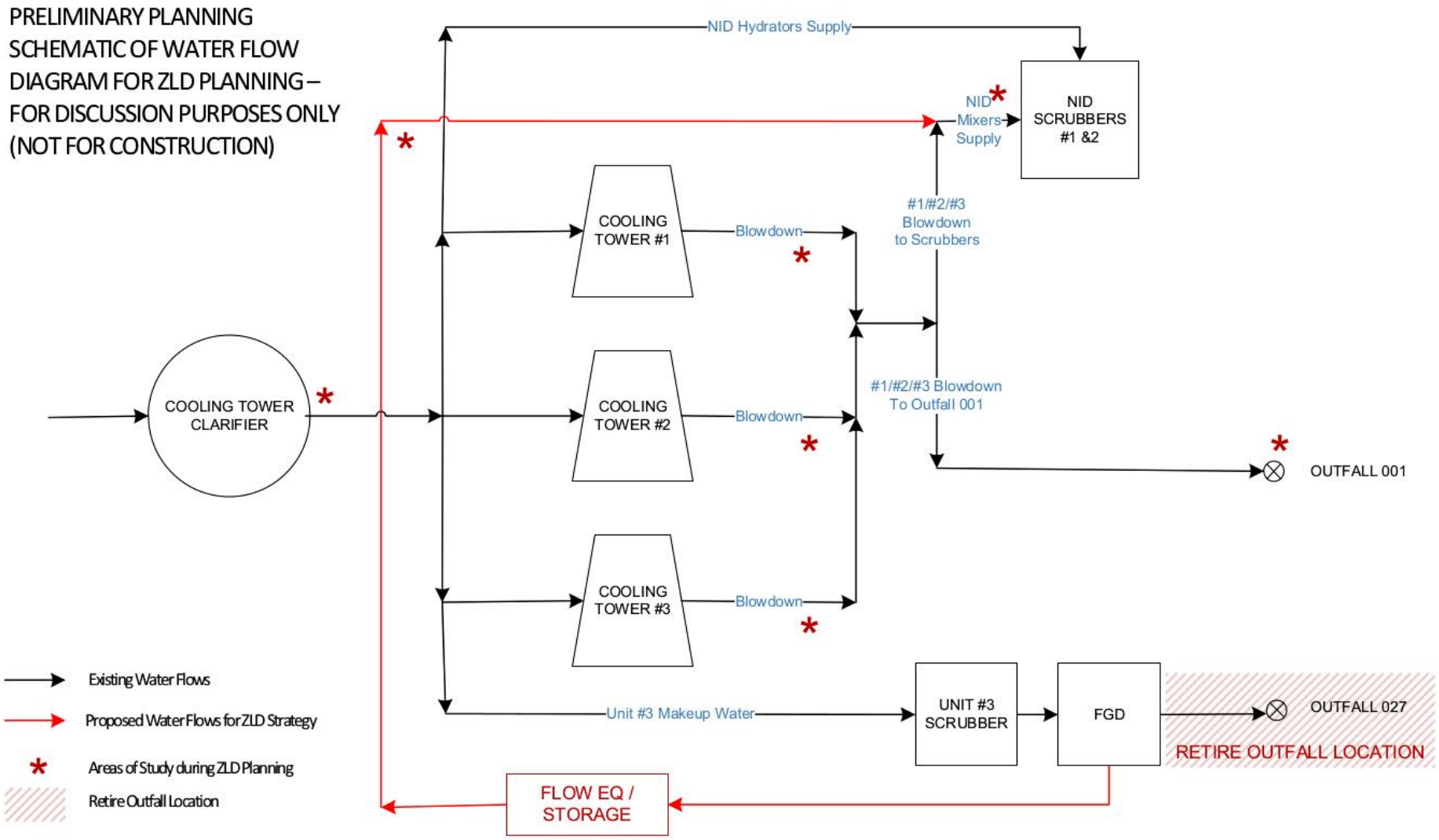
[1] This is the maximum of the WWF WQ criterion or the ambient temperature. The ambient temperature may be either the design (median) temperature for WWF, or the ambient stream temperature based on site-specific data entered by the user. A minimum of 1ºF above ambient stream temperature is allocated.

[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 D

Block Sketch Diagram for ZLD Strategy Implementation


PRELIMINARY PLANNING SCHEMATIC OF WATER FLOW DIAGRAM FOR ZLD PLANNING – FOR DISCUSSION PURPOSES ONLY (NOT FOR CONSTRUCTION)
NID Hydrators Supply
NID Mixers Supply
NID SCRUBBERS #1 &2
COOLING TOWER #1
Blowdown
#1/#2/#3 Blowdown to Scrubbers
COOLING TOWER CLARIFIER
COOLING TOWER #2
Blowdown
#1/#2/#3 Blowdown To Outfall 001
OUTFALL 001
COOLING TOWER #3
Blowdown
Unit #3 Makeup Water
UNIT #3 SCRUBBER
FGD
OUTFALL 027
RETIRE OUTFALL LOCATION
FLOW EQ / STORAGE
Existing Water Flows
Proposed Water Flows for ZLD Strategy
Areas of Study during ZLD Planning
Retire Outfall Location

ATTACHMENT E

EPA 2015 Multi-Sector General Permit Benchmark Values

available acute ambient water quality criteria for priority toxic and non-priority pollutants in saltwater. These benchmark values reflect the toxicity of these metals in saline waters and replace the freshwater-based benchmark values in the 2008 permit. In some cases, the saltwater values represent significant changes in the benchmarks for facilities discharging into saline waters. The values for arsenic, copper, cyanide, and nickel are lowered by an order of magnitude. The values for cadmium and lead are increased by an order of magnitude, while the value for selenium is increased two orders of magnitude. Benchmark values for the other metals increase (mercury) or decrease (silver, and zinc) by smaller amounts.

The following table presents the permit's freshwater and saltwater benchmark values, and the source of those values. In most cases, EPA has not revised benchmarks since they were first published in the 1995 MSGP. However, eight of the ten benchmarks that were assigned the freshwater acute water quality criterion value as differentiated from the 2000 MSGP's value that was based on the method detection limit (MDL) (i.e., arsenic, cadmium, copper, cyanide, mercury, nickel, selenium, and silver) were lowered in the 2008 MSGP based on CWA section 302(a) EPA-recommended criteria. Excluding mercury and nickel, the benchmark values were changed from 3.18 times the MDL to the ambient acute water quality criteria value. Mercury and nickel benchmarks were revised based on EPA's updated acute aquatic life recommended criteria. In each case, at least one EPA-approved 40 CFR Part 136 analytical method exists with detection limits below these benchmark values.

MSGP Benchmark Values and Sources			
Pollutant	**MSGP Benchmark**	**MSGP Source**	**Different**
Aluminum (T) (pH 6.5 - 9)	00.75 mg/L	1	No
Beryllium (T)	0.13 mg/L	2	No
Iron (T)	1.0 mg/L	3	No
Biochemical Oxygen Demand (5 day)	30 mg/L	4	No
pH	6.0 – 9.0 s.u.	4	No
Chemical Oxygen Demand	120 mg/L	5	No
Total Phosphorus	2.0 mg/L	6	No
Total Suspended Solids	100 mg/L	7	No
Nitrate + Nitrite Nitrogen	0.68 mg/L	7	No
Magnesium (T)	0.064 mg/L	8	No
Turbidity	50 NTU	9	Yes
Antimony (T)	0.64 mg/L	12	No
Ammonia*	2.14 mg/L	13	No
Cadmium (T) Freshwater)† (Saltwater)	0.0021 mg/L 0.04 mg/L	1 14	Yes
Copper (T)* (Freshwater)† (Saltwater)	0.014 mg/L 0.0048 mg/L	1 14	Yes NA

MSGP Benchmark Values and Sources			
Pollutant	**MSGP Benchmark**	**MSGP Source**	**Different**
Cyanide (Freshwater) (Saltwater)	0.022 mg/L 0.001 mg/L	1 14	Yes
Mercury (T) (Freshwater) (Saltwater)	0.0014 mg/L 0.0018 mg/L	1 14	No; criteria updated^
Nickel (T) (Freshwater)† (Saltwater)	0.47 mg/L 0.074 mg/L	1 14	No; criteria updated^
Selenium (T)* (Freshwater) (Saltwater)	0.005 mg/L 0.29 mg/L	3 14	Yes
Silver (T)* (Freshwater)† (Saltwater)	0.0038 mg/L 0.0019 mg/L	1 14	Yes
Zinc (T) (Freshwater)† (Saltwater)	0.12 mg/L 0.09 mg/L	1 14	No; criteria updated^
Arsenic (T) (Freshwater) (Saltwater)	0.15 mg/L 0.069 mg/L	3 14	Yes NA
Lead (T)* Freshwater)† (Saltwater)	0.082 mg/L 0.21 mg/L	3 14	No

(T) Total recoverable

* New criteria are currently under development, but values are based on existing criteria.

† These pollutants are dependent on water hardness where discharged into freshwaters. The freshwater benchmark value listed is based on a hardness of 100 mg/L. When a facility analyzes receiving water samples for hardness, the permittee must use the hardness ranges provided in Table 1 in Appendix J of the 2015 MSGP and in the appropriate tables in Part 8 of the 2015 MSGP to determine applicable benchmark values for that facility. Benchmark values for discharges of these pollutants into saline waters are not dependent on receiving water hardness and do not need to be adjusted.

^ The values for these pollutants do not have a new basis. They are still based on the water quality criteria, but the "National Recommended Water Quality Criteria" was updated in 2002.

Sources:

1. "National Recommended Water Quality Criteria." Acute Aquatic Life Freshwater (EPA-822-F-04-010 2006-CMC)
2. "EPA Recommended Ambient Water Quality Criteria for Beryllium." LOEL Acute Freshwater (EPA-440-5-80-024 October 1980)
3. "National Recommended Water Quality Criteria." Chronic Aquatic Life Freshwater (EPA-822-F-04-010 2006-CCC)
4. Secondary Treatment Regulations (40 CFR 133)
5. Factor of 4 times BOD5 (5 day biochemical oxygen demand) concentration - North Carolina Benchmark
6. North Carolina stormwater Benchmark derived from NC Water Quality Standards
7. National Urban Runoff Program (NURP) median concentration
8. Minimum Level (ML) based upon highest Method Detection Limit (MDL) times a factor of 3.18

ATTACHMENT F

Data Supporting the Statistical Analyses for Outfalls 013 and 029 and IMPs 206 and 306

Outfall 011 (IMP 206) Data for Log-Normal Distribution

Month/Year	Flow (Avg)	Flow (Max)
February 2012	0.01	0.21
March 2012	0.001	0.001
May 2012	0.02	0.75
June 2012	0.8	0.8
July 2012	0.1	2.8
October 2012	8.5	11.6
December 2012	0.016	0.42
July 2013	0.07	0.15
August 2013	0.3	0.4
December 2013	0.02	0.29
May 2014	0.003	0.023
June 2014	0.002	0.002
April 2015	0.08	0.77
May 2015	0.22	0.35
June 2015	0.27	0.57
July 2015	0.031	0.05
August 2015	0.004	0.004
September 2015	0.094	0.18
November 2015	0.003	0.05
December 2015	0.001	0.006
January 2016	0.01	0.03
February 2016	0.06	0.36
March 2016	0.002	0.03
August 2016	0.04	1.24
October 2016	0.13	0.25
January 2017	0.02	0.55
March 2017	0.51	0.51
June 2017	0.38	5.79
September 2017	0.12	3.62
November 2017	0.37	0.68
February 2018	0.12	1.81
April 2018	0.01	0.24

Rank	Flow (Avg) Sorted	LN(Flow)	PDF
1	0.001	-6.90776	43.01329
2	0.001	-6.90776	43.01329
3	0.002	-6.21461	35.44685
4	0.002	-6.21461	35.44685
5	0.003	-5.80914	30.16305
6	0.003	-5.80914	30.16305
7	0.004	-5.52146	26.32437
8	0.01	-4.60517	15.14182
9	0.01	-4.60517	15.14182
10	0.01	-4.60517	15.14182
11	0.016	-4.13517	10.62514
12	0.02	-3.91202	8.8312
13	0.02	-3.91202	8.8312
14	0.02	-3.91202	8.8312
15	0.031	-3.47377	5.951791
16	0.04	-3.21888	4.641589
17	0.06	-2.81341	3.03602
18	0.07	-2.65926	2.559506
19	0.08	-2.52573	2.198462
20	0.094	-2.36446	1.82024
21	0.1	-2.30259	1.690524
22	0.12	-2.12026	1.353068
23	0.12	-2.12026	1.353068
24	0.13	-2.04022	1.224273
25	0.22	-1.51413	0.612849
26	0.27	-1.30933	0.460603
27	0.3	-1.20397	0.396262
28	0.37	-0.99425	0.291612
29	0.38	-0.96758	0.280268
30	0.51	-0.67334	0.179066
31	0.8	-0.22314	0.087009
32	8.5	2.140066	0.000958

Mean	-2.36775
Std. Dev.	2.164848
Variance	4.686567
CV	10.36726
LTA	0.975829

Outfall 012 (IMP 306) Data for Log-Normal Distribution

Month/Year	Flow (Avg)	Flow (Max)
June 2012	2.42	3.73
July 2012	0.03	0.81
October 2012	3.4	4.9
March 2015	0.23	0.37
April 2015	0.005	0.16

Rank	Flow (Avg) Sorted	LN(Flow)	PDF
1	0.005	-5.29831737	14.74302152
2	0.01	-4.60517019	10.80271304
3	0.03	-3.5065579	5.348990187
4	0.03	-3.5065579	5.348990187
5	0.03	-3.5065579	5.348990187

June 2015	0.12	0.21
March 2017	0.17	0.17
June 2017	0.03	0.63
September 2017	0.01	0.31
February 2018	0.03	0.25

6	0.12	-2.12026354	1.525679965
7	0.17	-1.77195684	1.043726019
8	0.23	-1.46967597	0.735164693
9	2.42	0.88376754	0.024649446
10	3.4	1.223775432	0.013687964

Mean	-3.23299
Std. Dev.	2.148691
Variance	4.616875
CV	10.00886
LTA	0.396708

Outfall 013 Data for Log-Normal Distribution

Month/Year	Flow (Avg)	Flow (Max)
August 2012	0.004	0.009
September 2012	0.02	0.05
October 2012	0.031	0.14
November 2012	0.002	0.003
December 2012	0.083	0.18
January 2013	0.01	0.03
February 2013	0.02	0.05
March 2013	0.005	0.009
April 2013	0.016	0.051
May 2013	0.015	0.051
June 2013	0.007	0.018
July 2013	0.01	0.05
August 2013	0.04	0.14
September 2013	0.008	0.032
October 2013	0.001	0.006
November 2013	0.005	0.0132
December 2013	0.03	0.051
January 2014	0.012	0.04
February 2014	0.02	0.05
March 2014	0.02	0.074
April 2014	0.07	0.14
May 2014	0.04	0.14
June 2014	0.04	0.1
July 2014	0.004	0.009
August 2014	0.042	0.16
September 2014	0.026	0.078
October 2014	0.2	0.8
December 2014	0.27	2.2
March 2015	0.52	3.66
April 2015	0.47	0.87
June 2015	1.04	6.8
July 2015	0.3	1.22
September 2015	0.58	6.67
November 2015	0.18	1.72

Rank	Flow (Avg) Sorted	LN(Flow)	PDF
1	0.001	-6.90776	13.0496291
2	0.002	-6.21461	15.6263516
3	0.004	-5.52146	15.9717481
4	0.004	-5.52146	15.9717481
5	0.005	-5.29832	15.5516757
6	0.005	-5.29832	15.5516757
7	0.007	-4.96185	14.4826603
8	0.008	-4.82831	13.9342228
9	0.01	-4.60517	12.8934828
10	0.01	-4.60517	12.8934828
11	0.012	-4.42285	11.9545954
12	0.015	-4.19971	10.736752
13	0.016	-4.13517	10.3764425
14	0.02	-3.91202	9.12428276
15	0.02	-3.91202	9.12428276
16	0.02	-3.91202	9.12428276
17	0.02	-3.91202	9.12428276
18	0.026	-3.64966	7.68098638
19	0.03	-3.50656	6.92590804
20	0.03	-3.50656	6.92590804
21	0.031	-3.47377	6.75719532
22	0.04	-3.21888	5.51140929
23	0.04	-3.21888	5.51140929
24	0.04	-3.21888	5.51140929
25	0.042	-3.17009	5.2876342
26	0.06	-2.81341	3.81343158
27	0.07	-2.65926	3.26838883
28	0.083	-2.48891	2.73123324
29	0.09	-2.40795	2.49942044
30	0.14	-1.96611	1.48291301
31	0.16	-1.83258	1.25053782
32	0.18	-1.7148	1.07075301
33	0.18	-1.7148	1.07075301
34	0.2	-1.60944	0.9283436

Month/Year	Flow (Avg)	Flow (Max)
December 2015	0.34	1.46
February 2016	0.28	0.73
June 2016	0.21	0.52
August 2016	0.45	0.54
October 2016	0.39	1.33
January 2017	0.28	0.91
February 2017	0.03	0.13
March 2017	0.26	0.59
April 2017	0.16	0.59
May 2017	0.42	1.37
June 2017	0.58	1.74
July 2017	0.35	0.4
August 2017	0.2	0.93
September 2017	0.28	2.31
October 2017	0.3	0.91
November 2017	0.18	1.16
December 2017	0.06	0.09
January 2018	0.09	0.52
February 2018	0.77	3.85
March 2018	0.14	0.36

Rank	Flow (Avg) Sorted	LN(Flow)	PDF
35	0.2	-1.60944	0.9283436
36	0.21	-1.56065	0.86789798
37	0.26	-1.34707	0.64041758
38	0.27	-1.30933	0.60597964
39	0.28	-1.27297	0.5742924
40	0.28	-1.27297	0.5742924
41	0.28	-1.27297	0.5742924
42	0.3	-1.20397	0.51803989
43	0.3	-1.20397	0.51803989
44	0.34	-1.07881	0.42796188
45	0.35	-1.04982	0.40914041
46	0.39	-0.94161	0.34505807
47	0.42	-0.8675	0.30638069
48	0.45	-0.79851	0.27383422
49	0.47	-0.75502	0.25491562
50	0.52	-0.65393	0.21531191
51	0.58	-0.54473	0.17873878
52	0.58	-0.54473	0.17873878
53	0.77	-0.26136	0.10825845
54	1.04	0.039221	0.06178859

Mean	-2.73794
Std. Dev.	1.741948
Variance	3.034384
CV	4.44839
LTA	0.295009

Outfall 029 Data for Log-Normal Distribution

Month/Year	Flow (Avg)	Flow (Max)
August 2012	0.003	0.009
September 2012	0.002	0.003
October 2012	0.01	0.07
November 2012	0.001	0.002
December 2012	0.025	0.05
January 2013	0.03	0.07
February 2013	0.03	0.06
March 2013	0.011	0.018
April 2013	0.006	0.009
May 2013	0.003	0.003
June 2013	0.021	0.051
July 2013	0.33	1.5
August 2013	0.028	0.104
September 2013	0.013	0.051
October 2013	0.004	0.009
November 2013	0.003	0.005
December 2013	0.065	0.104

Rank	Flow (Avg) Sorted	LN(Flow)	PDF
1	0.001	-6.90776	7.91673819
2	0.002	-6.21461	12.4048068
3	0.003	-5.80914	14.5526018
4	0.003	-5.80914	14.5526018
5	0.003	-5.80914	14.5526018
6	0.004	-5.52146	15.5638341
7	0.005	-5.29832	15.969741
8	0.006	-5.116	16.0327614
9	0.006	-5.116	16.0327614
10	0.008	-4.82831	15.6360138
11	0.01	-4.60517	14.9360497
12	0.01	-4.60517	14.9360497
13	0.011	-4.50986	14.5442539
14	0.013	-4.34281	13.7421573
15	0.013	-4.34281	13.7421573
16	0.013	-4.34281	13.7421573
17	0.018	-4.01738	11.856742

Month/Year	Flow (Avg)	Flow (Max)
January 2014	0.043	0.1
February 2014	0.044	0.139
March 2014	0.006	0.009
April 2014	0.018	0.032
May 2014	0.013	0.032
June 2014	0.008	0.009
July 2014	0.005	0.009
August 2014	0.038	0.13
September 2014	0.013	0.041
October 2014	0.1	0.42
November 2014	0.09	0.36
December 2014	0.14	1.18
January 2015	0.12	0.51
February 2015	0.09	0.7
March 2015	0.28	1.93
April 2015	0.25	0.46
June 2015	0.111	0.198
July 2015	0.55	3.6
August 2015	0.16	0.64
September 2015	0.08	0.38
October 2015	0.31	3.52
November 2015	0.15	0.57
December 2015	0.1	0.9
January 2016	0.18	0.77
February 2016	0.07	0.17
March 2016	0.15	0.38
April 2016	0.059	0.28
May 2016	0.06	0.06
June 2016	0.11	0.19
July 2016	0.11	0.28
August 2016	0.11	0.24
September 2016	0.24	0.28
October 2016	0.09	0.31
November 2016	0.2	0.7
December 2016	0.02	0.04
January 2017	0.18	1.2
February 2017	0.15	0.48
March 2017	0.01	0.07
April 2017	0.14	0.31
May 2017	0.08	0.31
June 2017	0.22	0.72
July 2017	0.31	0.92
August 2017	0.18	0.21
September 2017	0.11	0.49
October 2017	0.15	1.22
November 2017	0.16	0.48
December 2017	0.09	0.61
January 2018	0.03	0.05

Rank	Flow (Avg) Sorted	LN(Flow)	PDF
18	0.02	-3.91202	11.1855281
19	0.021	-3.86323	10.8687866
20	0.025	-3.68888	9.72057167
21	0.028	-3.57555	8.97220813
22	0.03	-3.50656	8.52029661
23	0.03	-3.50656	8.52029661
24	0.03	-3.50656	8.52029661
25	0.038	-3.27017	7.01943664
26	0.043	-3.14656	6.27807962
27	0.044	-3.12357	6.144307
28	0.05	-2.99573	5.42655037
29	0.059	-2.83022	4.56872986
30	0.06	-2.81341	4.48641474
31	0.065	-2.73337	4.10692088
32	0.07	-2.65926	3.77425902
33	0.07	-2.65926	3.77425902
34	0.08	-2.52573	3.22067259
35	0.08	-2.52573	3.22067259
36	0.09	-2.40795	2.78107303
37	0.09	-2.40795	2.78107303
38	0.09	-2.40795	2.78107303
39	0.1	-2.30259	2.42570921
40	0.1	-2.30259	2.42570921
41	0.11	-2.20727	2.13406501
42	0.11	-2.20727	2.13406501
43	0.11	-2.20727	2.13406501
44	0.11	-2.20727	2.13406501
45	0.111	-2.19823	2.10780549
46	0.12	-2.12026	1.89158992
47	0.14	-1.96611	1.51458829
48	0.14	-1.96611	1.51458829
49	0.15	-1.89712	1.36629174
50	0.15	-1.89712	1.36629174
51	0.15	-1.89712	1.36629174
52	0.15	-1.89712	1.36629174
53	0.16	-1.83258	1.23827162
54	0.16	-1.83258	1.23827162
55	0.18	-1.7148	1.0296297
56	0.18	-1.7148	1.0296297
57	0.18	-1.7148	1.0296297
58	0.2	-1.60944	0.86823342
59	0.22	-1.51413	0.74085627
60	0.24	-1.42712	0.63861252
61	0.25	-1.38629	0.59491411
62	0.28	-1.27297	0.48667647
63	0.31	-1.17118	0.4043083
64	0.31	-1.17118	0.4043083
65	0.33	-1.10866	0.35992869

Month/Year	Flow (Avg)	Flow (Max)
February 2018	0.05	0.28
March 2018	0.41	2.03
April 2018	0.07	0.19

Rank	Flow (Avg) Sorted	LN(Flow)	PDF
66	0.41	-0.8916	0.2370298
67	0.55	-0.59784	0.1300819
68	0.09	-2.40795	2.78107303

Mean	-2.99858
Std. Dev.	1.470332
Variance	2.161876
CV	2.77262
LTA	0.146953

ATTACHMENT G

Kiskiminetas-Conemaugh River Watershed TMDL Wasteload Allocations

Outfall or IMP	Description	Continuous Discharge?	Sub-Watershed	Area (Ac)	Flow (MGD)	SBC	Concentration Limit			Allocated Annual Mass Loading			Δ Mass Loading			Modified Annual Mass Loading		
							Fe (mg/L)	Al (mg/L)	Mn (mg/L)	Fe (lb/yr)	Al (lb/yr)	Mn (lb/yr)	Fe (lb/yr)	Al (lb/yr)	Mn (lb/yr)	Fe (lb/yr)	Al (lb/yr)	Mn lb/yr)
003	IWT Effluent (REDIRECTED) (8)	Yes	4002	N/A	2.080	Avg	1.50	0.75	1.00	6,626	3,313	4,417	**-6,626**	**-3,313**	**-4,417**	**0**	**0**	**0**
						Max	3.00	0.75	2.00									
005	Bottom Ash Recycle Discharge (MONITORING POINT ELIMINATED) (7,8)	Yes	4002	N/A	N/A	Avg	----	----	----	12,247	6,123	8,165	**-12,247**	**-6,123**	**-8,165**	**0**	**0**	**0**
						Max	----	----	----									
006	42" Pipe Discharge (Old 006, 008, 009, 011, 012, 024, and 028) (7)	No	4002	**40.71**	**0.477**	Avg	1.50	0.75	1.00	0	0	0	**0**	**0**	**0**	**0**	**0**	**0**
						Max	3.00	0.75	2.00									
007	Unit 1 and 2 Sewer (RETIRED WLAs) (9)	Yes	4002	N/A	0.014	Avg	----	----	----	18	9	12	**-18**	**-9**	**-12**	**0**	**0**	**0**
						Max	----	----	----									
008	Unit 3 Sewer (RETIRED WLAs) (9)	Yes	4002	N/A	0.037	Avg	----	----	----	23	11	15	**-23**	**-11**	**-15**	**0**	**0**	**0**
						Max	----	----	----									
009	Greenhouse Pond Overflow (7)	No	4002	N/A	N/A	Avg	1.50	0.75	1.00	7	3	5	**-7**	**-3**	**-5**	**0**	**0**	**0**
						Max	3.00	0.75	2.00									
015	IWT Filter Bypass	No	4002	N/A	N/A	Avg	1.50	0.75	1.00	2,513	1,257	1,676	**-2,513**	**-1,257**	**-1,676**	**0**	**0**	**0**
						Max	3.00	0.75	2.00									
016	IWT Influent Pond Overflow	No	4002	N/A	N/A	Avg	1.50	0.75	1.00	3,290	1,645	2,193	**-3,274**	**-1,637**	**-2,182**	**16**	**8**	**11**
						Max	3.00	0.75	2.00									
017	Substation Area Stormwater (7)	No	4002	20.71	0.143	Avg	1.50	0.75	1.00	138	69	92	**517**	**258**	**344**	**655**	**327**	**436**
						Max	3.00	0.75	2.00									
018	CTC Clearwell Overflow	**Yes**	4002	N/A	0.400	Avg	1.50	0.75	1.00	1	1	1	**1,827**	**913**	**1,217**	**1,828**	**914**	**1,218**
						Max	3.00	0.75	2.00									
019	Filter House Area Stormwater (7)	No	4002	2.14	0.015	Avg	1.50	0.75	1.00	8	4	6	**60**	**30**	**39**	**68**	**34**	**45**
						Max	3.00	0.75	2.00									
022	Power Plant Road Stormwater (7)	No	4002	14.71	0.102	Avg	1.50	0.75	1.00	101	50	67	**364**	**182**	**243**	**465**	**232**	**310**
						Max	3.00	0.75	2.00									
024	Bottom Ash Area Stormwater (MONITORING POINT ELIMINATED) (7,8)	No	4002	14.71	0.102	Avg	1.50	0.75	1.00	87	43	58	**-87**	**-43**	**-58**	**0**	**0**	**0**
						Max	3.00	0.75	2.00									
025	IWT Area Stormwater (7)	No	4002	1.72	0.012	Avg	1.50	0.75	1.00	12	6	8	**42**	**21**	**28**	**54**	**27**	**36**
						Max	3.00	0.75	2.00									
026	Cooling Tower Area Stormwater (7)	No	4002	5.56	0.038	Avg	1.50	0.75	1.00	36	18	24	**-36**	**-18**	**-24**	**0**	**0**	**0**
						Max	3.00	0.75	2.00									
027	Unit 3 FGD Blowdown	No	4002	N/A	0.210	Avg	13.1	6.57	8.77	548	274	366	**7,543**	**3,771**	**5,029**	**8,091**	**4,045**	**5,395**
						Max	26.3	13.1	17.5									
106	(old 006) Parking Lot Stormwater	No	4002	20.28	0.140	Avg	1.50	0.75	1.00	139	69	92	**502**	**252**	**335**	**641**	**321**	**427**
						Max	3.00	0.75	2.00									
206	(old 011) Desilting Pond 1 Overflow	No	4002	NA	NA	Avg	1.50	0.75	1.00	154	77	103	**4,375**	**2,187**	**2,917**	**4,529**	**2,264**	**3,020**
						Max	3.00	0.75	2.00									
306	(old 012) Desilting Pond 2 Overflow	No	4002	NA	NA	Avg	1.50	0.75	1.00	403	202	269	**5,177**	**2,587**	**3,452**	**5,580**	**2,789**	**3,721**
						Max	3.00	0.75	2.00									
406	Lime Loading Area Stormwater	No	4002	20.43	0.141	Avg	1.50	0.75	1.00	0	0	0	**646**	**323**	**431**	**646**	**323**	**431**
						Max	3.00	0.75	2.00									
506	(old 028) Limestone Storage Overflow	No	4002	NA	NA	Avg	1.50	0.75	1.00	7	3	5	**-7**	**-3**	**-5**	**0**	**0**	**0**
						Max	3.00	0.75	2.00									
										Total Allocated Mass Loading in SWS			**Δ Total Mass Loading in SWS ('-' indicates retired/unused load)**			**Modified Total Mass Loading in SWS**		
										26,358	**13,177**	**17,574**	**-3,786**	**-1,893**	**-2,523**	**22,572**	**11,284**	**15,051**

Outfall or IMP	Description	Continuous Discharge?	Sub-Watershed	Area (Ac)	Flow (MGD)	SBC	Concentration Limit			Allocated Annual Mass Loading			Δ Mass Loading			Modified Annual Mass Loading		
							Fe (mg/L)	Al (mg/L)	Mn (mg/L)	Fe (lb/yr)	Al (lb/yr)	Mn (lb/yr)	Fe (lb/yr)	Al (lb/yr)	Mn (lb/yr)	Fe (lb/yr)	Al (lb/yr)	Mn lb/yr)
004	Ash Landfill Discharge (REDIRECTED) (8)	Yes	4348	N/A	0.62	Avg	1.50	0.75	1.00	1,462	731	975	**-1,462**	**-731**	**-975**	**0**	**0**	**0**
						Max	3.00	0.75	2.00									
013	Ash Landfill Stormwater East (MONITORING POINT ELIMINATED) (8)	No	4348	N/A	0.00	Avg	0.00	0.00	0.00	642	321	428	**2,853**	**1,427**	**1,902**	**3,495**	**1,748**	**2,330**
						Max	0.00	0.00	0.00									
020	Ash Landfill Pond Overflow (7)	No	4348	N/A	N/A	Avg	1.50	0.75	1.00	3,290	1,645	2,193	**-3,290**	**-1,645**	**-2,193**	**0**	**0**	**0**
						Max	3.00	0.75	2.00									
023	Coal Truck Entrance Stormwater (7)	No	4348	11.34	0.10	Avg	1.50	0.75	1.00	303	151	202	**154**	**77**	**103**	**457**	**228**	**305**
						Max	3.00	0.75	2.00									
029	Leachate Pond L-1 Overflow	No	4348	N/A	N/A	Avg	1.50	0.75	1.00	0	0	0	**1,745**	**872**	**1,163**	**1,745**	**872**	**1,163**
						Max	3.00	0.75	2.00									
										Total Allocated Mass Loading in SWS			**Δ Total Mass Loading in SWS ('-' indicates retired/unused load)**			**Modified Total Mass Loading in SWS**		
										5,697	2,848	3,798	**0**	**0**	**0**	**5,697**	**2,848**	**3,798**

Outfall or IMP	Description	Continuous Discharge?	Sub-Watershed	Area (Ac)	Flow (MGD)	SBC	Concentration Limit			Allocated Annual Mass Loading			Δ Mass Loading			Modified Annual Mass Loading		
							Fe (mg/L)	Al (mg/L)	Mn (mg/L)	Fe (lb/yr)	Al (lb/yr)	Mn (lb/yr)	Fe (lb/yr)	Al (lb/yr)	Mn (lb/yr)	Fe (lb/yr)	Al (lb/yr)	Mn lb/yr)
001	Cooling Tower Blowdown	Yes	4351	N/A	**3.00**	Avg	1.50	0.75	1.00	15,994	7,997	10,663	**3,745**	**1,872**	**2,496**	**19,739**	**9,869**	**13,159**
						Max	3.00	0.75	2.00									
										Total Allocated Mass Loading in SWS			**Δ Total Mass Loading in SWS ('-' indicates retired/unused load)**			**Modified Total Mass Loading in SWS**		
										15,994	7,997	10,663	**3,745**	**1,872**	**2,496**	**19,739**	**9,869**	**13,159**

Outfall or IMP	Description	Continuous Discharge?	Sub-Watershed	Area (Ac)	Flow (MGD)	SBC	Concentration Limit			Allocated Annual Mass Loading			Δ Mass Loading			Modified Annual Mass Loading		
							Fe (mg/L)	Al (mg/L)	Mn (mg/L)	Fe (lb/yr)	Al (lb/yr)	Mn (lb/yr)	Fe (lb/yr)	Al (lb/yr)	Mn (lb/yr)	Fe (lb/yr)	Al (lb/yr)	Mn lb/yr)
030	Sediment Pond SB-4 Discharge	No	4347	26.65	0.184	Avg	1.50	0.75	1.00	0	0	0	0	0	0	0	0	0
						Max	3.00	0.75	2.00									
032	Sediment Pond SB-5 Discharge	No	4347	14.22	0.098	Avg	1.50	0.75	1.00	0	0	0	0	0	0	0	0	0
						Max	3.00	0.75	2.00									
										Total Allocated Mass Loading in SWS			**Δ Total Mass Loading in SWS ('-' indicates retired/unused load)**			**Modified Total Mass Loading in SWS**		
										0	0	0	0	0	0	0	0	0

Outfall or IMP	Description	Continuous Discharge?	Sub-Watershed	Area (Ac)	Flow (MGD)	SBC	Concentration Limit			Allocated Annual Mass Loading			Δ Mass Loading			Modified Annual Mass Loading		
							Fe (mg/L)	Al (mg/L)	Mn (mg/L)	Fe (lb/yr)	Al (lb/yr)	Mn (lb/yr)	Fe (lb/yr)	Al (lb/yr)	Mn (lb/yr)	Fe (lb/yr)	Al (lb/yr)	Mn lb/yr)
002	Intake Screen Wash Water (6)	Yes	4352	N/A	0.24	Avg	NA	0.75	1.00	457	228	305	0	0	0	457	228	305
						Max	3.00	0.75	2.00									
014	Intake Dredge Pond Overflow	No	4352	N/A	N/A	Avg	1.50	0.75	1.00	3,199	1,599	2,133	**-3,199**	**-1,599**	**-2,133**	**0**	**0**	**0**
						Max	3.00	0.75	2.00									
021	Makeup Water Area Stormwater (7)	No	4352	12.13	0.084	Avg	1.50	0.75	1.00	41	20	27	**342**	**172**	**229**	**383**	**192**	**256**
						Max	3.00	0.75	2.00									
										Total Allocated Mass Loading in SWS			**Δ Total Mass Loading in SWS ('-' indicates retired/unused load)**			**Modified Total Mass Loading in SWS**		
										3,697	1,847	2,465	-2,857	-1,427	-1,904	**3,697**	**1,847**	**2,465**
										Total Mass Loading for PA0005037			**-2,898**	**-1,447**	**-1,932**	**48,848**	**24,422**	**32,568**
										51,746	25,869	34,500						

LEGEND

= Outfall is giving up allocation

= Outfall is receiving allocation

= Implement BMPs - monitor and report concentration/load semi-annually; impose annual WLAs as annual limits with semi-annual tracking for compliance

Notes:

(1) **Bold** items indicate revisions to the TMDL's WLAs or outfalls added to permit which were not included in the original Kiskiminetas-Conemaugh River Watershed TMDL.

(2) Storm water flows are based on annual rainfall of 46.5 inches averaged over the year multiplied by a factor of 2 to produce a maximum daily flow value to calculate annual WLAs.

(3) The outfall configuration in this appendix reflects the modified outfall and internal monitoring point numbering discussed in the Fact Sheet.

(4) No WLAs were given to NPDES Permit PA0005037 in sub-watershed 4347.

(5) Internal monitoring points receive zero WLAs (unless otherwise indicated).

(6) Outfall 002 is returned water from Two Lick Creek returned to the receiving stream; the TMDL's WLAs are not imposed as effluent limits because the Station does not contribute to the discharge loading.

(7) NRG HCS proposes to use environmentally sound and cost-effective BMPs to demonstrate that stormwater runoff will protect existing quality and water uses of the receiving surface waters.

(8) Eliminated monitoring points do not correlate to eliminated flow (e.g., if flow is redirected to another outfall). Therefore, WLAs for these monitoring locations are still available to the permittee.

(9) WLAs for retired outfalls are no longer available to the permittee because the discharge flow is eliminated and no longer present in the sub-watershed.