

Industrial Fact Sheet

Treatment Plant Description

The United Water New York (UWNY) Haverstraw Water Supply Project is a proposed water treatment plant. The proposed project includes construction and operation of a water intake, intake pumping station, water treatment plant, and transmission and distribution mains, located in the Town of Haverstraw, Rockland County.

The proposed project would draw and treat water from the Hudson River and deliver up to 7.5 million gallons per day (MGD) of potable water to the existing UWNY distribution system serving Rockland County. The proposed project would allow UWNY to increase the capacity of its water supply system to meet the projected future demands for the water supply and to diversify its sources of water supply.

The proposed project would draw water through an intake structure located in Haverstraw Bay in the Hudson River, through an intake pumping station to a water treatment plant via a raw water transmission main. At the water treatment plant, water would be treated to remove impurities and salinity and would then be chlorinated. The water treatment process would consist of pretreatment (coagulation, flocculation, and sedimentation) to remove particles that are suspended in the water (i.e., turbidity); filtration including microfiltration/ultra-filtration to remove the remaining particulate matter and provide a barrier to bacteria and viruses; Reverse Osmosis (RO) which forces the water under high pressure through semi-permeable membranes to remove dissolved constituents, such as salts and most organic constituents, from the filtered water; and disinfection. The potable water would be transmitted from the plant via a new underground water transmission mains that would connect to UWNY's existing water distribution network. The residual water produced by the RO process known as RO concentrate would be discharged back to the Hudson River through an existing outfall pipe for the Haverstraw Joint Regional Sewage Treatment Plant (HJRSTP). Other process and sanitary wastewater generated by the water treatment process would be discharged to the HJRSTP for treatment.

The proposed project would be implemented in three separate phases to meet growth in water demand as Rockland County's population increases. When the facility opens for operation in 2015, it would initially treat and deliver up to 2.5 MGD of potable water. As Rockland County's water demand increases, the proposed project would be expanded to meet that demand, with the ultimate capacity at 7.5 MGD. The subject application is in reference to the full Phase 3 finished water production capacity of 7.5 MGD.

This draft SPDES permit is for the UWNY Haverstraw Water Supply Project discharge of RO concentrate to the Hudson River. Upon completion of the full scale build out of this project, this discharge is expected to have a maximum flow of 2.44 MGD. Although this proposed discharge will share the same outfall pipe and diffusers used by the HJRSTP, this discharge will have its own separate SPDES permit and will be required to monitor the RO concentrate discharge prior to any mixing with the HJRSTP discharge.

Background Information

The proposed SPDES permit NY0280364 for the UWNY Haverstraw Water Supply Project is based upon a SPDES Permit Application Form NY-2C and sampling data submitted to this Department on September 29, 2011. The sampling data that was submitted reflects operation of a pilot study/test, the UWNY Haverstraw Pilot Project, of the water treatment processes including the discharge of the Reverse Osmosis (RO) concentrate

which is the wastewater process that is the focus of this draft SPDES permit. The sampling data reflects conventional parameters, 126 priority pollutants, PCBs, radionuclides and other inorganic parameters.

Discharge Composition

Table 1 in Appendix B presents the existing effluent quality of the RO concentrate discharge based upon the pilot test of the water treatment processes. The average and maximum concentrations are based on 8 months of sampling data submitted by the permittee.

Outfall and Receiving Water Information

The facility would discharge RO concentrate through the Haverstraw Joint Regional STP (HJRSTP) discharge outfall 001, located at latitude 41°12' 53" and longitude 73° 57' 31", into the Hudson River. The Hudson River is classified as Class SB by the Department with the following beneficial uses:

The best usages of Class SB waters are primary and secondary contact recreation and fishing. These waters shall be suitable for fish, shellfish, and wildlife propagation and survival.

The facility will share the existing discharge pipe maintained by the HJRSTP:

Outfall No.	Design Flow Rate (MGD)	Latitude	Longitude	Receiving Water	Water Class	Water Index Number
01A	2.44	41° 12' 53"	73° 57' 31"	Hudson River	SB	H

Critical flow and Dilution/Mixing Analysis:

The MA7CD10 flow at the Bear Mountain Bridge/ Haverstraw Bay for Hudson River is 3200 cfs. The proposed discharge is to the tidal portion of the Hudson River and mixing processes are mainly facilitated by the tidal action and wind. The Haverstraw Bay is described as a shallow waterbody and is an area where Hudson River is the widest. The DEC ran a CORMIX model under critical tidal velocity, mean low water depth, designed flow of 8 mgd for the Haverstraw STP. The modeling analysis results are indicated below. The current Haverstraw STP discharge is around 4 mgd and the combined flow from the STP and UWNY is around 6.5 mgd which is less than 8.0 mgd used in computed the dilutions. In view of the above, DEC did not run new simulation as the new flow from UWNY would pre-mix in the outfall pipe with the Haverstraw STP flow and it would be further dispersed in the ambient waters through a efficient multiport diffuser. In the future, the DEC may require the UWNY to conduct a dye dilution study and a running of the NY-NJ Harbor water quality model to verify the indicated dilutions.

Outfall No.	Receiving Water	Dilution/Mixing	pH (SU)	Temp (°C)	Salinity, ppt
001	Hudson River	46:1 Acute 131:1 Chronic	7.6	15.6	2.8

303(d) Impaired Waterbody Information

Year Listed	Cause/Pollutant	Suspected Source	TMDL Status
1998	PCBs, other toxics	Contaminated Sediments	mercury, copper, lead & nickel

The 303(d) list identifies waters that do not support appropriate uses and that require development of a Total Maximum Daily Load (TMDL) or other restoration strategy. The NJ-NY Harbor waters are listed in 303(d) list for mercury, PCBs, dioxins/furans, PAHs, pesticides and heavy metals. The department of health has issued a health advisory for eating fish taken from the Hudson River.

A TMDL was developed in 1994 for the NY-NJ Harbor for copper, mercury, nickel and lead. Although TMDL limits have been applied to the Haverstraw Joint Regional STP discharge, the application of TMDL limits for the UWNY Haverstraw Water Supply Project has not been applied because the water is being removed from and returned to the Hudson River without any net increase in copper, mercury, nickel and lead loadings. Instead the water quality evaluation is primarily concerned with the near field dilution of the RO concentrate discharge through the outfall diffuser system and comparison to ambient water quality standards. In the future, possibly when the plant is operating at full capacity or as determined by the DEC, UWNY may be required to assess the biological impact of the discharge in the nearfield and farfield areas of the discharge. The permittee may also be required to submit a proposal for biological monitoring similar to the 301(h) application requirements for DEC review and approval.

Effluent Limitations

The NYSDEC followed the Clean Water Act, state and federal regulations, and the Division of Waters Technical and Operational Guidance Series documents for developing the effluent limits. In general, the Clean Water Act requires that the effluent limits for a particular pollutant are the more stringent of either the technology-based or water quality-based limits. A technology-based effluent limit requires a minimum level of treatment for industrial point sources based on currently available treatment technologies. A water quality-based effluent limit (WQBEL) is designed to ensure that the water quality standards of receiving waters are being met. The table detailing the effluent limits is included in the draft permit. More information on the derivation of technology- and water quality-based effluent limits is presented in Appendix B.

Monitoring Requirements

Section 308 of the Clean Water Act and federal regulations 40 CFR 122.44(i) require that monitoring be included in permits to determine compliance with effluent limitations. Additional effluent monitoring may also be required to gather data to determine if effluent limitations may be required. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs) to NYSDEC.

The draft permit contains the monitoring requirements for the facility. Monitoring frequency is based on the minimum sampling necessary to adequately monitor the facility's performance. For industrial facilities, sampling frequency is based on guidance provided in TOGS 1.2.1.

Other Permit Conditions

Special Conditions

Water Intakes - The permittee shall install, maintain and operate a ½ mm slot width cylindrical-shaped wedge-wire screen to minimize potential adverse effects to aquatic resources related to potential impingement (in which aquatic resources are pulled against the screen) or entrainment (in which they are drawn into the intake) with a maximum through slot velocity of 0.5 feet per second.

Shared Outfall and Diffuser – The calculated dilution/mixing zone for the diffuser system associated with this discharge is based upon the design flow from the HJRSTP. If at some future time, the flow from the HJRSTP was discontinued, the Permittee shall reevaluate the dilution/mixing calculations through the diffuser system without the HJRSTP discharge and submit a permit modification request to address any changes in applicable limits or action levels. This evaluation and request must be received at least 6 months prior to the actual discontinuation of that discharge.

Compliance Schedule

A compliance schedule item has been added to the draft SPDES permit to require additional discharge sampling to be conducted following the start up of the water treatment plant. One year of quarterly discharge sampling will be required for conventional parameters, 126 priority pollutants and PCB congeners. This analysis will be evaluated by the Department to determine if any modifications to the SPDES permit are necessary based upon the actual operating conditions of the treatment plant.

Best Management Practices

The permittee is required to implement a Best Management Practices (BMP) plan that prevents, or minimizes the potential for, the release of significant amounts of toxic or hazardous pollutants to state waters. The BMP plan requires annual review by the permittee.

Water Treatment Chemicals

The use of water treatment chemicals (WTCs) in wastewater treatment systems requires the review and authorization by the NYSDEC. In most cases, a permit modification is not necessary. WTC usage must be logged and detailed in an annual report sent to the NYSDEC. At this time, the actual dosage of WTCs has not been determined. The permittee is required to submit completed Water Treatment Chemical Usage Notification Forms for review and authorization by this Department prior to use.

Additional Permit Provisions

The draft permit contains standard regulatory language that is/are required to be in all SPDES permits. These permit provisions are based largely upon 40 CFR 122, subpart C and include requirements pertaining to monitoring, recording, reporting, and compliance responsibilities.

Other Legal Requirements

Discharge Notification Act

In accordance with Discharge Notification Act (ECL 17-0815-a), the permittee is required to post a sign at each point of wastewater discharge to surface waters. The permittee is also required to provide a public repository for DMRs as required by the SPDES permit.

Antidegradation Policy

New York State implements the antidegradation portion of the CWA based upon two documents:

1. Organization and Delegation Memorandum #85-40, entitled "Water Quality Antidegradation Policy," signed by the Commissioner of NYSDEC, dated September 9, 1985.
2. TOGS 1.3.9, entitled "Implementation of the NYSDEC Antidegradation Policy – Great Lakes Basin (Supplement to Antidegradation Policy dated September 9, 1985)."

A SPDES permit cannot be issued that would result in the water quality criteria being violated. The draft permit for the facility contains effluent limits which ensure that the existing beneficial uses of the Hudson River will be maintained.

Appendix A

Basis for Effluent Limitations

Statutory and Regulatory Basis for Limits

Sections 101, 301(b), 304, 308, 401, 402, and 405 of the CWA provide the basis for the effluent limitations and other conditions in the draft permit. The NYSDEC evaluates discharges with respect to these sections of the CWA and the relevant SPDES regulations to determine which conditions to include in the draft permit.

In general, the permit writer does a statistical analysis of the monitoring data provided in permittee-submitted discharge monitoring reports (DMRs). Pollutant screening data as required in the Request for Information is also reviewed to determine the presence of additional contaminants that should be considered for inclusion in the permit. The permit writer determines the technology-based limits that must be incorporated into the permit in accordance with federal and state rules, regulations, and technical guidance. The Department then evaluates the water quality expected to result from these controls to determine if any exceedances of water quality standards in the receiving water would result. If there is a reasonable potential for exceedances to occur, water quality-based limits must be included in the permit. The draft permit limits reflect whichever requirements, technology or water quality, are more stringent. The proposed limits are located on page 3 of the draft permit. This Appendix describes the technology-based and water quality-based evaluation for the facility.

Technology-Based Evaluation

Section 301(b) and 402 of the CWA require technology-based controls on effluents. This section of the CWA requires that, by March 31, 1989, all permits contain effluent limitations which: (1) control toxic pollutants and non-conventional pollutants through the use of "best available technology economically achievable" (BAT), and (2) represent "best conventional pollutant control technology" (BCT) for conventional pollutants. In no case may BCT or BAT be less stringent than "best practical control technology currently available" (BPT), which is the minimum level of control required by Section 301(b)(1)(A) of the CWA. After March 31, 1989, all permits for new sources are required to contain effluent limitations for all categories of point sources which control toxic pollutants through the use of best available demonstrated technology (BADT). BADT is specifically applied through New Source Performance Standards (NSPS).

For certain industrial sectors, Effluent Guidelines have not been promulgated by USEPA. In other instances, facilities that are subject to federal regulations may have substances in their discharges that are not explicitly limited by the regulations. To determine if these substances require technology-based effluent limits, the permit writer must apply Best Professional Judgment (BPJ). The authority for BPJ is contained in Section 402(a)(1) of the CWA, which authorizes the Department to issue a permit containing "such conditions as the Administrator determines are necessary to carry out the provisions of the Act." The NPDES regulations in 40 CFR 125.3 state that permits developed on a case-by-case basis under Section 402(a)(1) of the CWA must consider:

1. Reviewing Effluent Guidelines for sectors with similar pollutants,
2. Reviewing limitations developed at similar facilities, and
3. Any unique factors relating to the applicant.

Water Quality-Based Evaluation

In addition to the technology-based limits previously discussed, the NYSDEC evaluated the discharge to determine compliance with Section 301(b)(1)(C) of the CWA. This section requires the establishment of limitations in permits necessary to meet water quality standards by July 1, 1977.

The regulations in 40 CFR 122.44(d)(1) implement Section 301(b)(1)(C) of the CWA. These regulations require that SPDES permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." The limits must be stringent enough to ensure that water quality standards are met and must be consistent with any available wasteload allocation (WLA).

Water Quality Criteria

Water quality regulations detailed in 6 NYCRR Parts 700-706 and ambient water quality standards and guidance values specified in TOGS 1.1.1 were applied to the facility's proposed discharge. Specific application of the regulations and standards is detailed in Table 1 of Appendix B.

Reasonable Potential Evaluation

Reasonable potential analysis is the process for determining whether a discharge causes, has the reasonable potential to cause, or contributes to an excursion above New York State water quality criteria for toxic pollutants. When conducting a reasonable potential analysis for each pollutant of concern, factors such as receiving water classification and corresponding water quality criteria and guidance values, pollutant concentration in the effluent, dilution available in the receiving water, background concentrations and additional upstream and downstream dischargers containing the pollutant of concern are used to quantify the receiving water quality. If the expected concentration of the pollutant of concern in the receiving water exceeds the ambient water quality criteria or guidance value then there is reasonable potential that the discharge may cause or contribute to a violation of the water quality standard, and a water quality-based effluent limit or load allocation for the pollutant is required. Calculations performed specifically for the effluent of this facility can be found at the end of this Appendix.

Procedure for Deriving Water Quality-Based Effluent Limits (WQBELs)

The total maximum daily load (TMDL) process is a water quality based approach to implementing water quality standards. It is applied to an entire watershed or drainage basin whenever possible, but may also be applied to waterbody segments with individual or multiple pollutant sources. The TMDL analysis is carried out separately for each pollutant. It allows for the consideration of all sources of the pollutant including point sources, non-point sources, atmospheric deposition and natural background. Depending on the complexity of the issue and the amount of data available, the analysis can be relatively simple such as a desk-top, mass-balance calculation or it can be exacting and detailed by using complex, multidimensional water quality models. The TMDL process serves a dual function in the permit development process. It provides the basis for the reasonable potential analysis. If the reasonable potential analysis indicates that the pollutant of concern has the potential to cause or contribute to an excursion of water quality standards, the TMDL process is then used to determine the WQBELs for all sources of the pollutant to assure compliance with the standards.

Pollutant-Specific Analysis

This section outlines the basis for each of the effluent limitations in the permittee's draft permit.

DEVELOPMENT OF WATER QUALITY BASED EFFLUENT LIMITS (WQBEL)

1) General

Ambient Water Quality Criteria (AWQC) and guidance values specified in "Water Quality Regulations" New York State Codes, Rules and Regulations Title 6, Chapter X, Parts 700-705 and TOGS 1.1.1 have been applied for developing water quality based effluent limits for numerous pollutants for the protection of the best usages of a water body including: Sources of drinking water -H(WS); Human consumption of fish -H(FC); Fish propagation -A(C); Fish survival -A(A); Wildlife protection -(W); and, Aesthetics -(E). For each pollutant identified in the facility's SPDES Permit Fact Sheet, water quality based effluent limits (WQBEL's) are developed for the specified "best usage protections". The WQBEL review includes various calculations that take into consideration: dilution/mixing, discharge flow and load, background level of the waterbody (if available), use of water quality models (as applicable), the water quality standard/guidance value and a translator (if applicable). The most stringent of water quality based effluent limits (developed for the "best usage protections") is included in the SPDES permit fact sheet for each of the specified pollutants.

2) Pollutant-Specific Analysis

This section outlines the development of water quality based effluent limits for the pollutants listed in the SPDES Permit Fact Sheet. The water quality based effluent limits for the noted pollutants listed below are indicated in Table 1 of the Appendix B of this fact sheet.

Total Ammonia (as NH₃)

Due to high dilution of the discharge, a water quality based effluent limit for total ammonia has not been developed. The ammonia discharge will be assigned an action level of 10 mg/l (BPJ) to control localized eutrophication in the ambient water. An ammonia TMDL for NY Harbor has not been assigned but past data indicate that current discharges in NJ-NY Harbor and below Bear Mountain Bridge may be causing eutrophication problem in Raritan Bay, and NY Bight. In view of the above, the discharge of total ammonia from this facility should be monitored and assigned an action level of 10 mg/l.

Low concentration of ammonia can be toxic to freshwater fish. Un-ionized ammonia (NH₃) is the principal toxic form of ammonia. The ammonium ion (NH₄⁺) is less toxic. The relative percentage of these forms of ammonia in the water varies as the temperature and pH vary. As the pH and temperature increases, the percentage of un-ionized ammonia (NH₃) increases, causing increased toxicity. The site specific pH and temperature data for the receiving waterbody is not available. However, the following values for pH and temperature and salinity have been used in developing the applicable water quality standards for warm weather season.

Season	pH	Temp.-°C	WQ Std. as NH ₃ , mg/l
Warm - (1 June - 31 Oct.)	8.2	25	0.43

Total Residual Chlorine

A water quality based effluent limit of 0.062 mg/l as “Daily Maximum” has been developed. The effluent limit is calculated by multiplying the acute ambient water quality standard of 0.013 mg/l, a dilution ratio of 46:1 and considering TRC losses in the outfall pipe and ambient waters.

Arsenic, Copper, Silver, Zinc, Lead and Nickel

The water quality based effluent limit for arsenic, copper silver and zinc have been developed by multiplying acute ambient water quality standard, a nearfield dilution of 46:1 and a translator. For lead and nickel, chronic dilution of 131:1 has been in conjunction with applicable translators. A translator converts the dissolved to total form of a toxic pollutant/metal. These translators are indicated below. The QBELs for these pollutants are expressed as a “Daily Maximum”.

Pollutant	Translator
Arsenic	1.0
Copper	1.2048
Lead	1.0515
Nickel	1.010
Silver	1.1765
Zinc	1.0571

Boron

The water quality based effluent limits for boron has been developed by multiplying water quality standard and a chronic dilution of 131:1. The QBEL for boron is expressed as a “Daily Maximum”.

Mercury, PCB

Mercury is water quality limited parameter where as there is a fish advisory of PCB for the waters of NJ-NY Harbor. Therefore, effluent limits for both chemicals equal to water quality standards are recommended. Both effluent limits are expressed as a “Monthly Average”.

Methylene Chloride and Xylenes

The water quality based effluent limits for each of the noted pollutants has been developed by multiplying water quality standard and a farfield dilution of 131:1. The QBEL for methylene chloride is expressed as “Monthly Average”, where as QBELs for xylenes has been expressed as “Daily Maximum”.

Aluminum, Antimony, Barium, Iron, Magnesium, Manganese, Strontium, Vanadium, Sodium, Potassium, Calcium, Bromide, Chloride, Fluoride, Silica, Sulfate, Sulfide, Bromodichloromethane, Bromoform, Chloroform, Dibromochloromethane and Styrene

The water quality based effluent for the noted pollutants have not been developed due to lack of water quality standards/guidance values. The technology based effluent limits for these parameters may be appropriate for maintaining the environmental quality of the receiving waters.

DEVELOPMENT OF TECHNOLOGY BASED EFFLUENT LIMITS (TBEL)

1) General

There are no point source technology based federal regulations addressing wastewater discharges from the Water Supply Industry. SPDES permit effluent limitations are based upon best professional judgment and applicable water quality standards. The Division of Water has developed a Guidance Package for SPDES

Preparation and Plan Review for the Water Supply Category to assist permitting staff in developing SPDES permits for the water supply category. The Technical and Operational Guidance Series (TOGS) 1.2.1 – Industrial Permit Writing is also used and includes Appendix C – Model Technology BPJ limits which list expected treatment levels for a variety of wastewater treatment processes.

2) Pollutant-Specific Analysis

This section outlines the development of technology based effluent limits. The technology based effluent limits for the noted pollutants listed below are indicated in Table 1 of the Appendix B of this Fact Sheet.

Total Suspended Solids

The total suspended solids (TSS) effluent limitation is outlined in the Guidance Package for SPDES Preparation and Plan Review for the Water Supply Category. The TSS limit to be assessed is 20 (mg/l) average and 40 (mg/l) maximum. These can be assessed as net limitations in cases where the wastewater is returned to the same waters from which the raw water is taken. These limit reflects Best Conventional Technology and is based on Best Professional Judgement (BPJ).

Settleable Solids

The settleable solids effluent limitation is outlined in the Guidance Package for SPDES Preparation and Plan Review for the Water Supply Category and is to be assessed at 0.1 ml/l. This limitation has traditionally been employed to enable quick assessments of treatment system performance and is considered useful in water plant operations. This is a Best Available Treatment limitation (BAT) based upon BPJ.

pH

The pH limits provided in the Guidance Package for SPDES Preparation and Plan Review for the Water Supply Category. The upper pH range limitation to be assessed is 9.0 standard pH units (s.u.). This limitation is the upper limit of the range that is considered BCT for most wastewaters. The lower BCT limitation is 6.0 s.u.

All Other Technology Based Limits Listed in Table 1 of Appendix B

All other technology based effluent limits listed on Table 1 of Appendix B are based upon Appendix C – Model Technology BPJ limits in the Technical and Operational Guidance Series (TOGS) 1.2.1 – Industrial Permit Writing. It must be emphasized that for this application the Appendix C – Model Technology BPJ limits are intended as an estimate of the expected pollution concentrations prior to the R.O. concentrate discharge. The listed technology based limits reflect lime addition, sedimentation and filtration. Although this is similar to the proposed treatment process of coagulation, flocculation, sedimentation and filtration, use of these technology based limits are not recommended until more information can be obtained. Additionally, it should be noted that sampling conducted by the Permittee during the pilot scale testing from December 2010–June 2011 indicates that the R.O. concentrate are typically below these levels.

DEVELOPMENT OF PERMIT LIMITS, ACTION LEVELS OR MONITORING

Flow

A flow limit of 2.44 MGD has been applied based upon the maximum design flow of the RO concentrate discharge based upon the SPDES permit application.

pH

A pH range limit of 6.0 - 9.0 s.u. has been applied based upon the Technology Based Limits for the Water Supply Category.

Total Suspended Solids (TSS)

TSS limits of 20 mg/l as a monthly average and 40 mg/l as a daily maximum have been applied as net limits based upon the Technology Based Limits for the Water Supply Category.

Settleable Solids

A settleable solids limit of 0.1 ml/l has been applied based upon the Technology Based Limits for the Water Supply Category. This limit is in agreement with the treatment plant process which utilizes microfiltration/ultra-filtration prior to the RO unit.

Chemical Oxygen Demand (COD)

Monitoring of COD is recommended to identify the presence of oxygen depleting compounds in the discharge.

Oil & Grease

An oil and grease limit of 15 mg/l is included in the draft permit. The 15 mg/l limit is based upon the concentration of oil and grease at which a sheen becomes visible. This is related to the narrative water quality standard that a discharge should not cause a visible oil film nor globules of grease.

Ammonia, Total

An action level of 10 mg/l has been applied to this discharge. Exceedance of an action level is not a permit violation but will trigger more frequent monitoring to gain additional information and determine if modification to the permit is necessary.

Total Residual Chlorine

A total residual chlorine limit 0.06 mg/l has been applied as a water quality based effluent limit.

Antimony

An action level for antimony of 36 ug/l has been applied to this discharge. Sampling conducted by the Permittee during the pilot scale testing from December 2010–June 2011 indicates that the RO concentrate to be well below both the WQBEL and the TBEL. The action levels have been set at the concentration levels which correspond to the mass based action level for the HJRSTP discharge. Exceedance of an action level is not a permit violation but will trigger more frequent monitoring to gain additional information and determine if modification to the permit is necessary.

Arsenic

An action level for arsenic of 15 ug/l has been applied to this discharge. Sampling conducted by the Permittee during the pilot scale testing from December 2010–June 2011 indicates that the RO concentrate to be well below both the WQBEL and the TBEL. The action levels have been set at the concentration levels which correspond to the mass based action level for the HJRSTP discharge. Exceedance of an action level is not a permit violation but will trigger more frequent monitoring to gain additional information and determine if modification to the permit is necessary.

Boron

An action level for boron of 5.0 mg/l has been applied to this discharge. Boron is naturally occurring in saline waters and can be expected to concentrate in the RO discharge. The permittee has requested that the Department implement net limits for boron, but the water quality based limit is an aquatic chronic toxicity limit and therefore cannot be considered as a net limit. Sampling results reported under the UWNY Haverstraw Pilot Project indicate concentrations well below the WQBEL of 131 mg/l is value. The technology based limit of 1800 ug/l reflects the expected effluent quality for lime addition, sedimentation and filtration. This is not an accurate depiction of the RO discharge quality because it does not consider the concentration of boron in the RO discharge. Exceedance of an action level is not a permit violation but will trigger more frequent monitoring to gain additional information and determine if modification to the permit is necessary.

Copper

An action level for copper of 66 ug/l has been applied to this discharge. Sampling conducted by the Permittee during the pilot scale testing from December 2010–June 2011 indicates that the RO concentrate to be well below both the WQBEL and the TBEL. The action levels have been set at the concentration levels which correspond to the mass based limit (TMDL) for the Haverstraw Joint Regional STP discharge. As indicated on page 3 of this fact sheet, the TMDL limits for the UWNY Haverstraw Water Supply Project has not been applied because the water is being removed from and returned to the Hudson River without any net increase in copper loadings. Exceedance of an action level is not a permit violation but will trigger more frequent monitoring to gain additional information and determine if modification to the permit is necessary.

Lead

An action level for lead of 21 ug/l has been applied to this discharge. Sampling conducted by the Permittee during the pilot scale testing from December 2010–June 2011 indicates that the RO concentrate to be well below both the WQBEL and the TBEL. The action levels have been set at the concentration levels which correspond to the mass based action level for the Haverstraw Joint Regional STP discharge. Exceedance of an action level is not a permit violation but will trigger more frequent monitoring to gain additional information and determine if modification to the permit is necessary.

Nickel

An action level for nickel of 48 ug/l has been applied to this discharge. Sampling conducted by the Permittee during the pilot scale testing from December 2010–June 2011 indicates that the RO concentrate to be well below both the WQBEL and the TBEL. The action levels have been set at the concentration levels which correspond to the mass based action level for the Haverstraw Joint Regional STP discharge. Exceedance of an action level is not a permit violation but will trigger more frequent monitoring to gain additional information and determine if modification to the permit is necessary.

Silver

An action level for silver of 43 ug/l has been applied to this discharge. Sampling conducted by the Permittee during the pilot scale testing from December 2010–June 2011 indicates that the RO concentrate to be below both the WQBEL and the TBEL. The action levels have been set at the concentration levels which correspond to the mass based action level for the Haverstraw Joint Regional STP discharge. Exceedance of an action level is not a permit violation but will trigger more frequent monitoring to gain additional information and determine if modification to the permit is necessary.

Zinc

An action level for zinc of 60 ug/l has been applied to this discharge. Sampling conducted by the Permittee during the pilot scale testing from December 2010–June 2011 indicates that the RO concentrate to be well below both the WQBEL and the TBEL. The action levels have been set at the concentration levels which correspond to the mass based action level for the HJRSTP discharge. Exceedance of an action level is not a permit violation but will trigger more frequent monitoring to gain additional information and determine if modification to the permit is necessary.

Methylene Chloride

No limit or action level has been applied to methylene chloride. Although this pollutant was detected, the pilot scale testing from December 2010–June 2011 indicates that the RO concentrate is well below the WQBEL and there is no TBEL. The permit will require quarterly monitoring during the first year of operation of the water treatment plant. Results of this sampling will be evaluated to determine whether additional parameters such as this one should be included in the permit.

Xylene

No limit or action level has been applied to xylene. Although this pollutant was detected, the pilot scale testing from December 2010–June 2011 indicates that the RO concentrate is well below the WQBEL and there is no TBEL. The permit will require quarterly monitoring during the first year of operation of the water treatment plant. Results of this sampling will be evaluated to determine whether additional parameters such as this one should be included in the permit.

Mercury

Mercury was detected in the effluent at a level of 8 ng/L, which exceeds the water quality standard of 0.7 ng/L. Mercury is believed to be present in this discharge solely due to one or more of the following factors: presence in rainfall; water supply; and/or low level societal use of mercury. Considering the very low levels detected in this effluent, their likely source, and that the ubiquitous nature of mercury contamination currently makes it impractical for any dischargers to achieve the calculated water quality based effluent limit, it has been determined that no meaningful reductions in mercury can be achieved by this permittee. Therefore, no mercury effluent limits or action levels have been included in the permit. The permit will require quarterly monitoring during the first year of operation of the water treatment plant. Results of this sampling will be evaluated to determine whether additional parameters such as this one should be included in the permit.

PCBs

PCBs were detected in the pilot study effluent at levels which exceeds the water quality standard of 1×10^{-6} ug/l. PCBs are present in this discharge solely due to their presence in the Hudson River. No PCBs are added to the discharge as part of the water treatment process. The detected PCB congeners in the RO concentrate are consistent with PCB congeners detected in the Hudson River intake water as part of the UWNY Haverstraw Pilot Project. Therefore, no PCB effluent limits have been included in the permit. The permit will require quarterly monitoring during the first year of operation of the water treatment plant. Results of this sampling will be evaluated to determine whether additional parameters such as this one should be included in the permit.

Appendix B

Individual Outfall Data Summaries and Permit Limit Development

Existing Effluent Quality and Technology Based Effluent Limits (TBEL)

Technology Based Effluent Limit (TBEL) is set based upon an evaluation of Best Available Technology Economically Achievable (BAT), Best Conventional Pollutant Control Technology (BCT), Best Practicable Technology Currently Available (BPT), and Best Professional Judgment (BPJ). BPJ limits may be set using any reasonable method that takes into consideration the criteria set forth in 40 CFR 125.3.

For the Existing Effluent Quality, the statistical methods utilized are in accordance with TOGS 1.2.1 and the USEPA, Office of Water, Technical Support Document For Water Quality-based Toxics Control, March 1991, Appendix E. Statistical calculations were not performed for parameters with insufficient data. Generally, ten or more data points are needed to calculate percentiles (See TOGS 1.2.1 Appendix D). Two or more data points are necessary to calculate an average and a maximum. Non-detects were excluded in the statistical calculations.

Monitoring data collected during the following time period of December 2010 – June 2011 was used to calculate statistics and these data were taken from sampling conducted by the permittee as part of the pilot study.

Water Quality Based Effluent Limits (WQBEL)

Ambient Water Quality Criteria (AWQC) and guidance values specified in “Water Quality Regulations” New York State Codes, Rules and Regulations Title 6, Chapter X, Parts 700-705 and TOGS 1.1.1 were applied to the following pollutants identified in the facilities discharge. Water Quality Based Effluent Limits (WQBEL’s) were calculated by applying the TMDL process for each pollutant.

Note:

The water quality based effluent for the toxic pollutants with the exception of total residual chlorine, are not included in the permit as there is no introduction of pollutant levels onto the receiving waters than what exists in the receiving waters. The saline water is taken from the Haverstraw Bay and purified for water supply purposes. The residue from reverse osmosis (RO) process concentrates contaminants, which existed in the saline waters before the taking of the water from Haverstraw Bay; is mixed with the Haverstraw STP discharge and then disposed through a high rate multiport diffuser back onto Haverstraw Bay. The available dilutions are in the range of 46:1 and 131:1 for nearfield and farfield areas, respectively. As previously noted this document, the DEC ran CORMIX model under critical tidal velocity, mean low water depth, designed flow of 8 mgd for the Haverstraw STP. The current Haverstraw STP discharge is around 4 mgd and the combined flow from the STP and UWNY is around 6.5 mgd which is less than 8.0 mgd used in computed the dilutions.

As noted above, UWNY would be pre-mixed with the Haverstraw STP flow and it would be further dispersed in the ambient waters through a efficient multiport diffuser. This would minimize any adverse impact on the receiving water. DEC may, at a later date, request the UWNY to undertake a biological study to assess the impact of the discharge in the nearfield and farfield areas of the of the discharge disposal site. If requested, the UWNY should follow the biological requirements similar to the 301(h) application¹. It is anticipated that this type of study would be requested at a future time, possibly when the plant is operating at full capacity or as determined by the DEC.

1. Revised Section 301 (h) Technical Support Document, USEPA, 430/9-82-011

TABLE 1 – Outfall 001

ANALYTE	HWSP PILOT RO CONCENTRATE DATA (Dec. 2010 - June 2011)					Technology Based Effluent Limits				Water Quality Based Effluent Limit				Permit Basis (T or WQ)
	# Samp.	# Detect.	Avg	Max	95%-ile	conc.	mass	Type	Basis	AWQC conc.	Effluent conc. mass		Type	
Flow (MGD)			1.24	2.44		2.44 MGD			NA					
pH (s.u.)	Min.	5.4	Max.	8.1		6.0 - 9.0		Range						T
TSS (mg/l)	10	4	24	35		20 net / 40 net			BPJ, Water Supply Guidance (WSG)	narr. stnd tech okay				T
Settleable Solids (ml/l)	no available data					0.10			* BPJ, WSG	narr. stnd tech okay				T
TDS (mg/l)	33	33	5940	28800		monitor				No SB Stnd				T
COD (mg/l)	6	6	251	676		monitor				No Stnd				T
TOC (mg/l)	25	25	11	34.5						No Stnd				na
DOC (mg/l)	6	6	10.8	14.3						No Stnd				na
Conductivity (umhos/cm)	16	16	5810	21300						No Stnd				na
Ammonia (mg/l)	10	10	0.61	1.7		130/59			BPJ	0.429*	10 +		MA	WQ
Nitrate (mg/l)	9	9	2.5	3.1						No SB Stnd				na
Nitrite (mg/l)	9	9	0.059	0.13						No SB Stnd				na
Ortho P, Total (mg/l)	6	1	0.0084	0.0084						No SB Stnd				na
P, Total (mg/l)	7	5	0.13	0.41		11000/460			TOGS 1.2.1, Att C	No SB Stnd				na
Chlorine, Total Residual (mg/l)	no available data								*HJRSTP Limit, BPJ	0.005	0.062		DM	WQ
Cryptosporidium (Cysts/L)	13	1	1	1						No Stnd				na
Total Coliform (cfu/100ml)	12	8	120	550					703.4	2400 medi				na
Fecal Coliform (colf/100ml)	19	1	1	1					703.4	200				na
HPC (cfu/ml)	24	24	1900	4900						No Stnd				na

RO Concentrate data and 95%-ile calculations submitted by UWNY as part of NY-2A SPDES Permit Application.

Tech. based standards reflect lime addition, sedimentation and filtration. It is intended to provide estimated treatment quality prior to RO concentration.

Total ammonia standard has been computed using pH=8.2, salinity=4.4ppt and temperature= 25°C-default value.

+ - Total ammonia is limited based upon the best professional judgment of the water quality engineer, even though there is plenty of dilution available in the receiving waters. The proposed effluent limit shall be an action level of 10 mg/l.

TABLE 1 – Outfall 001 (continued)

ANALYTE	HWSP PILOT RO CONCENTRATE DATA (Dec. 2010 - June 2011)					Technology Based Effluent Limits				Water Quality Based Effluent Limit				Permit Basis (T or WQ)
	# Samp.	# Detect.	Avg	Max	95%-ile	conc.	mass	Type	Basis	AWQC	Effluent		Type	
										conc.	conc.	mass		
Aluminum (ug/l)	59	45	140	367	300.4	6100		Max	TOGS 1.2.1, Att C	No Stnd/guid. value			T	
Antimony (ug/l)	16	4	4.2	4.7	4.685	1900		Max	TOGS 1.2.1, Att C*	No Stnd/guid. value			T	
Arsenic (ug/l)	16	4	5.4	6.9	6.84	1400		Max	TOGS 1.2.1, Att C*	120 A(A)	5500		DM	T
Barium (ug/l)	16	16	106	139	136	1200		Max	TOGS 1.2.1, Att C	No Stnd/guid. value			na	
Boron (ug/l)	25	21	432	1810	780	1800		Max	TOGS 1.2.1, Att C	1000 A(C)	131,000		DM	T
Calcium (ug/l)	16	16	198000	468000	418500					No Stnd/guid. value			Na	
Copper (ug/l)	16	7	6.54	12	10.35	1300		Max	TOGS 1.2.1, Att C*	7.9 A(A)	437		DM	WQ
Iron (ug/l)	59	5	621	937	898	1200		Max	TOGS 1.2.1, Att C	No Stnd/guid. value			na	
Lead (ug/l)	16	4	11	14	13.985	280		Max	TOGS 1.2.1, Att C*	8 A(C)	1102		DM	T
Magnesium (ug/l)	14	14	187000	784000	561050					No Stnd/guid. value			na	
Manganese (ug/l)	59	59	55	168	107.7	300		Max	TOGS 1.2.1, Att C	No Stnd/guid. value				
Mercury (ng/l)	5	5	4.7	8	7.46			Max	TOGS 1.3.10	0.70 H(FC)	0.82		MA	MDV
Nickel (ug/l)	16	1	4.8	4.8	4.8	550		Max	TOGS 1.2.1, Att C*	8.2 A(C)	1085		DM	T
Potassium (ug/l)	14	14	56900	234000	165100					No Stnd/guid. Value			Na	
Silver (ug/l)	16	2	0.85	0.99	0.976	290		Max	TOGS 1.2.1, Att C*	2.3 A(A)	124.5		DM	WQ
Sodium (ug/l)	14	14	1420000	6360000	4436000					No Stnd/guid. value			na	
Strontium (ug/l)	5	5	2410	7800	6608					No Stnd/guid. value			na	
Vanadium (ug/l)	14	5	3.6	4.3	4.2	100		Max	TOGS 1.2.1, Att C	No Stnd/guid. value			na	
Zinc (ug/l)	16	4	10.1	14.7	14.19	1000		Max	TOGS 1.2.1, Att C*	95 A(A)	4620		DM	T

RO Concentrate data and 95%-ile calculations submitted by UWNY as part of NY-2A SPDES Permit Application.

Tech. based standards reflect lime addition, sedimentation and filtration. It is intended to provide estimated treatment quality prior to RO concentration.

A(A) – Aquatic Acute Standard; A(C) – Aquatic Chronic Standard; H(FC) – Human Consumption of Fish;

TABLE 1 – Outfall 001 (continued)

ANALYTE	HWSP PILOT RO CONCENTRATE DATA (Dec. 2010 - June 2011)					Technology Based Effluent Limits				Water Quality Based Effluent Limit				Permit Basis (T or WQ)
	# Samp.	# Detect.	Avg	Max	95%-ile	conc.	mass	Type	Basis	AWQC conc.	Effluent conc. mass		Type	
Bromide (mg/l)	10	10	13.8	41	38.795					No Stnd/guid. value			na	
Chloride (mg/l)	27	27	3200	16700	10271					No Stnd/guid. value			na	
Fluoride (mg/l)	10	7	1	3	2.91					No Stnd/guid. value			na	
Oil & Grease (mg/l)	6	6	3.2	4.4	4.15	15		Max	TOGS 1.2.1, Att C	narr stnd no sheen			T	
Perchlorate (ug/l)										No Stnd/guid. value			na	
Silica (mg/l)	6	5	50.3	80.5	77.68					No Stnd/guid. value			na	
Sulfate (mg/l)	10	10	899	2440	2255.5					No Stnd/guid. value			na	
Sulfide (mg/l)	6	2	1.3	1.8	1.748					No Stnd/guid. value			na	
Bromodichloromethane (ug/l)	16	3	0.2	0.46	0.247					No Stnd/guid. value			na	
Bromoform (ug/l)	16	2	0.13	0.15	0.148					No Stnd/guid. value			na	
Chloroform (ug/l)	16	15	0.61	2.4	1.322					No Stnd/guid. value			na	
Dibromochloromethane (ug/l)	16	3	0.18	0.21	0.21					No Stnd/guid. value			na	
Methylene Chloride (ug/l)	16	2	0.64	0.9	0.8735					200 H(FC)	26200	MA	na	
Styrene (ug/l)	21	1	0.28	0.28	NA					No Stnd/guid. value			na	
Xylenes, Total (ug/l)	21	2	0.82	1	NA					19 A(C)	2489	DM	na	

RO Concentrate data and 95%-ile calculations submitted by UWN Y as part of NY-2A SPDES Permit Application.

TABLE 1 – Outfall 001 (continued)

ANALYTE	HWSP PILOT RO CONCENTRATE DATA (Dec. 2010 - June 2011)					Technology Based Effluent Limits				Water Quality Based Effluent Limit				Permit Basis (T or WQ)
	# Samp.	# Detect.				conc.	mass	Type	Basis	AWQC	Effluent		Type	
			Avg	Max	95%-ile					conc.	conc.	mass		
gamma-BHC (ug/l)	12	1	0.025	0.025	0.025				BPJ, TOGS 1.2.1	0.008 H(FC)	1.05			na
delta-BHC (ug/l)	12	1	0.018	0.018	0.018					0.008 H(FC)	1.05			na
PCB 18 (BZ) (ng/l)	8	4	4.1	6.1	NA					1.0E-6 *				na
PCB 28 (BZ) (ng/l)	8	5	4.3	19	NA					1.0E-6 *				na
PCB 44 (BZ) (ng/l)	8	4	0.89	1.6	NA					1.0E-6 *				na
PCB 49 (BZ) (ng/l)	8	2	1.7	3	NA					1.0E-6 *				na
PCB 52(BZ) (ng/l)	8	4	0.74	0.98	NA					1.0E-6 *				na
PCB 8 (BZ) (ng/l)	8	5	1.7	3.9	NA					1.0E-6 *				na
PCB 66 (BZ) (ng/l)	8	1	0.55	0.55	NA					1.0E-6 *				na
PCB 90 (BZ) (ng/l)	8	1	0.39	0.39	NA					1.0E-6 *				na
PCB 101 (BZ) (ng/l)	8	1	1.9	1.9	NA					1.0E-6 *				na
PCB 105 (BZ) (ng/l)	8	1	0.59	0.59	NA					1.0E-6 *				na
Gross Beta (pci/l)	3	2	74.1	142	NA					No Std/guid. value				na
Radium-228 (pci/l)	3	1	0.46	0.46	NA					No Std/guid. value				na
Strontium-89 (pci/l)										No Std/guid. value				na
Strontium-90 (pci/l)	1	0	ND	ND	NA					No Std/guid. value				na
Tritium (pci/l)	3	0	ND	ND	NA					No Std/guid. value				na
Uranium (ug/l)	2	1	1.2	1.2	NA					No Std/guid. value				na

RO Concentrate data and 95%-ile calculations submitted by UWN Y as part of NY-2A SPDES Permit Application.

* * PCB standard applies to the sum of these substances.