REQUEST FOR EXPRESSIONS OF INTEREST

PUBLICLY-OWNED HYDROELECTRIC POWER PLANTS ON WATERSHED DAMS

1. Introduction

The New York City Department of Environmental Protection ("DEP"), in conjunction with the City of New York ("City"), is issuing this Request for Expressions of Interest ("RFEI") to gather information from entities interested in designing, building, financing, and/or operating hydroelectric plants on four of the New York City-owned dams and reservoirs in upstate New York.

DEP manages the City's water supply system, which provides more than one billion gallons of water each day to more than nine million residents, including eight million in New York City, and over one million residents of Ulster, Orange, Putnam and Westchester counties. The City's water supply system is comprised of three watersheds: Croton, Catskill, and Delaware.

The City holds a preliminary permit issued by the Federal Energy Regulatory Commission ("FERC") to allow it, in conjunction with DEP, to further evaluate the development of hydroelectric facilities at the dams on three of the Delaware watershed reservoirs (Cannonsville, Pepacton, and Neversink) and one of the Catskill watershed reservoirs (Schoharie). DEP manages the dams and reservoirs to maximize water supply to consumers and to provide pure drinking water to the City and upstate consumers.

Water is released from the reservoirs for conservation purposes and to comply with downstream flow targets in the main stem of the Delaware River, as prescribed under a 1954 U.S. Supreme Court Decree.[1] This water, along with water that would otherwise spill, is available for hydroelectric energy production. In accordance with its preliminary permit, DEP has been evaluating different designs and configurations for the hydroelectric facilities, and the City is prepared to move forward with seeking a license for the project. Consistent with the general City policy of encouraging collaboration between government and the private sector, however, DEP has decided to investigate the potential for a private developer to become involved in the project and is desirous of receiving input from persons and entities that may be interested in working with the City in developing the project.

2. Purposes of RFEI

The primary purposes of this RFEI are to:

- Inform interested parties of the potential business opportunity to participate in the design, construction, operation, and/or financing of the hydroelectric plants contemplated by the preliminary permit;
- Solicit private sector interest in this business opportunity, and understand under the terms and conditions developers would require to participate in the project;

[1] *New Jersey v. New York et al.*, 347 U.S. 995 (1954).

- To provide input and a different perspective on DEP's design plans for the project and on ways to optimize the production of energy within the existing operating regime for the water supply system;[2]
- To examine possible modifications to the operating regime in order to increase energy production without negatively impacting DEP's operation of the water supply system for its paramount water supply purposes or conflicting with any regulatory obligations or agreements;
- Gather information on the qualifications of interested developers and their preferred business models (e.g., a long-term power purchase agreement, or selling the power into the wholesale energy markets administered by the New York Independent System Operator, Inc. ("NYISO")); and
- Gather input that can be used to determine the next steps for the City and DEP to consider with respect to pursuing an arrangement with a private company relating to this project, and, if deemed advisable by the City and DEP in their sole discretion, to develop an RFP process regarding same.

3. Objectives

The primary objectives of the project are to:

- Generate renewable energy from the City's existing infrastructure, while maintaining the priority of the use of the water supply system to provide the City's drinking water supply, and not materially deviating from the existing operating regime;
- Reduce the City's carbon footprint;
- Encourage the development of renewable energy and the reduction of greenhouse gas emissions to be consistent with the goals of PlaNYC (see http://www.nyc.gov/html/planyc2030/html/plan/energy.shtml);
- Avoid the expenditure of public funds to finance the development of hydroelectric facilities at the City's existing infrastructure; and
- Encourage private investment in the City's energy infrastructure.

4. Description of Existing Dams and Reservoirs

The City's water supply system consists of three watersheds with an area of approximately 2,000 square miles located within parts of eight upstate New York State counties. It is comprised of 19 reservoirs and three controlled lakes. Relevant to this RFEI the Catskill watershed is located in Ulster, Greene, Delaware, and Schoharie counties and is comprised of two reservoirs and the Delaware watershed is located in Delaware, Sullivan, Greene, Schoharie, and Ulster counties and is comprised of four reservoirs.

Attachment A provides the following information related to the Cannonsville, Pepacton, Neversink, and Schoharie dams and reservoirs:

- Boundary conditions;
- Dam specifications;
- Spillway specifications;
- Outlet works specifications; and

[2] See Attachment "A", paragraph 1 for description of boundary conditions and limitations.

- The hydroelectric facilities design features being considered by the City based upon the feasibility analysis completed to date.

5. Contents of Submittals

Please provide the following information in your submittal:

- Name of your company and contact information
- Descriptions of hydroelectric energy projects that your company has developed
- Hydroelectric projects in New York State with which your company has been involved and the nature of that involvement
- Any public-private partnerships in which your company has been involved, and the details of those partnerships
- Description of financing approaches your company has used to develop small hydroelectric power projects
- Description of your company's business strategy and pricing concept for other similar hydroelectric projects
- Descriptions of data that your company will need to evaluate the hydroelectric energy business opportunity described herein. These descriptions should provide as much detail as possible about the type and level of data desired
- Identification of any economic, regulatory or other hurdles that may affect the feasibility of a public-private partnership with respect to these projects and how your company would propose to address such hurdles
- Responses to questions of interest to the City, as listed in Section 6

6. Questions of Interest to the City

Respondents are requested to address the following questions in their submittals:

Process

Q1. Considering FERC regulatory requirements and other salient factors, how long will the project take to develop, design, permit, and construct, starting from invitation to bid through project in-service?

Q2. Considering the project's status with the feasibility study nearing completion and a license application due in the spring of 2012, what timeline would you suggest the City follow in the event it were to determine to proceed with the solicitation and procurement of design, construction, operating, and/or financing bids from a private party or consortium?

Q3. What critical information should be in an RFP used to procure a partner or partners for designing, building, operating, and/or financing the project?

Design, Construction & Operations

Q4. Leveraging the existing release works do you have design ideas that you believe would make the hydroelectric facilities more efficient and/or larger producers of power than currently being considered in the City's hydroelectric design plans without significant impacts on the safety of the dam infrastructure or the primary purpose of the water system operations which is to supply high quality drinking water in quantities sufficient to meet current and future City needs.

Q5. Would it be preferable to have a long-term power purchase agreement with the City or another entity? Are there other options you would consider for these projects? If so, please describe each such option and the relative merits thereof.

Q6. What are your greatest concerns regarding the viability of hydroelectric facilities on the four upstate dams under consideration (See Attachment A, Section 3)?

Financing

Q7. Given that the City will continue its ownership of the dams and reservoirs and the hydropower license, what type of partnership or contractual arrangement would you recommend to enable a private partner to design, construct, operate, and/or finance the hydroelectric facilities?

Q8. In general, what sources of capital would you foresee being available to finance these projects? Please consider grants, incentives, tax rebates, low-cost financing available to private entities versus municipal entities.

Q9. What special arrangements would be needed to attract private interest in this business opportunity, such as City financing, long-term off-take contracts, property lease arrangements, etc.?

Q10. What State or Federal programs or other incentives might be available in financing this project?

Q11. What potential issues or barriers do you foresee that could limit private sector interest in this project?

Additional Information

Q12. What information (such as engineering assessments of existing facilities, electric load profiles, engineering drawings and site plans, etc.) would you require to be able to make an informed proposal to the City?

Q13. Following the RFEI process, what additional investigations, site visits, meetings, and due diligence would you need to conduct in order to make an informed proposal to the City?

7. Submission Requirements

All submittals must be typed and delivered by hand, regular mail, or by a nationally recognized express mail carrier to DEP at the address listed below. Information provided by Respondents in their submittals will not be deemed confidential by the City and will likely be shared with other governmental entities. Therefore, please do not submit anything that you deem proprietary information. Furthermore, all submittals become the property of DEP and the City and will not be returned.

Please submit (2) copies of your submittal in hard copy and (1) electronic copy on CD by Friday, January 14th, 2010 at 4:00 PM. Submittals must be delivered to the following address:

New York City Department of Environmental Protection
59-17 Junction Boulevard, 19th Floor
Flushing, NY 11373
Attn: Anthony J. Fiore, Chief of Staff, Operations

8. Questions/Clarifications

Questions and comments pertaining to this RFEI may be sent to afiore@dep.nyc.com by Wednesday, December 14th, 2010 at 4:00 PM. Answers to questions that DEP believes may be of general interest may be posted posted on http://www.nyc.gov/html/dep/html/public_notices/upstate_hydroelectric_generation.shtml and periodically revised, modified, or deleted. This RFEI may be found at: http://www.nyc.gov/html/dep/html/public_notices/index.shtml.

9. Conditions, Terms, and Limitations

This document is not intended as a formal offering for the award of a contract or for participation in any future solicitation. The City is under no legal, monetary, or contractual obligation to respondents to this RFEI. DEP and the City reserve the right, at their sole discretion, to alter and/or withdraw the RFEI at any time and/or not issue an RFP; to choose to discuss various approaches with one or more respondents (including those not responding to the RFEI); to use the ideas or proposals submitted in any manner deemed to be in the best interests of DEP and the City, including but not limited to soliciting competitive submissions relating to such ideas or proposals; and/or undertake the prescribed work in a manner other than that which is set forth herein. Each respondent is solely responsible for its own costs and expenses in preparing and submitting a response to this RFEI and participating in the RFEI process, including the provision of any additional information or attendance at meetings or interviews.

ATTACHMENT A

1. Operating Regime:

Conservation Releases (vol, temp, D.O.)
DEP is required to make certain minimum releases downstream of the reservoirs for conservation purposes. The amount of these releases varies with hydrological conditions. The details of these release requirements can be found in Chapter X – Division of Water, Part 671 of the New York State Department of Environmental Conservation (NYSDEC) regulations (http://www.dec.ny.gov/regs/4608.html).

The intake structures are in deep water and range from 126 to 174 feet deep at full pool level. Somewhat unusual to the three Delaware reservoirs, the hypolimnion stays well oxygenated throughout the year. These characteristics help maintain world class coldwater fisheries in the downstream tributaries. Any hydroelectric development must be consistent with sustaining these downstream habitats.

Supreme Court Decree and Flexible Flow Management Program (FFMP) Requirements
During normal hydrologic conditions when the Delaware River Master directs releases according to provisions of the 1954 U.S. Supreme Court decree ("1954 Decree"), the City must make releases at the direction of the Delaware River Master to increase the flow above that indicated in Part 671, Table 1 on the West Branch, East Branch and Neversink Rivers, provided that the total amount of additional water above the flows indicated in Table 1 shall not exceed the amount of releases directed by the Delaware River Master.

The FFMP is a set of principles, rules, and procedures for the management of storage, diversions, conservation releases, and flow targets relating to the apportioning of water from the Delaware River Basin in a manner consistent with the 1954 Decree. The FFMP is intended to provide a more adaptive means for managing multiple and competing uses of storage with sustainable sources of water, while protecting the water supply rights of the Decree Parties. The Delaware River Master orders directed releases on a daily basis for the purpose of meeting the applicable flow objective at Montague, NJ. The City must comply with these directives but may use any of its three upper Delaware River Basin reservoirs to meet the flow target.

For more general information of the FFMP please review the City's Pre-Application Document (PAD) located at http://www.nyc.gov/html/dep/html/dep_projects/woh_hydroelectric_project.shtml. For detailed information on the FFMP including storage level curves based on varying hydrological conditions, please see the Flexible Flow Management Plan on the Delaware River Master website (http://water.usgs.gov/osw/odrm/).

This operating regime will govern and take priority over a release program that may maximize hydroelectric generation and revenues.

Water Flow Modeling

To evaluate operational changes associated with the FFMP, DEP developed a simulation model of its water supply system (*i.e.*, all 21 impoundments including the Cannonsville, Pepacton, Neversink and Schoharie Reservoirs). The model, called the New York City Water Supply OASIS (a proprietary version of the publicly available OASIS model and herein further referred to as OASIS), simulates the water supply demands, conservation releases, water level drawdowns, release mitigation needs, and other requirements as stipulated in the FFMP. Output from the OASIS model includes daily water levels, total discharge, hydropower discharge, conservation releases, water supply withdrawals, and spillage. The rules of the FFMP were incorporated into the model to simulate the estimated discharges from the three Delaware River Basin reservoirs using the historic inflow hydrology. Historic inflow to each of the reservoirs was computed using existing USGS gage flow data for the projects - there are USGS gages on the main tributaries inflowing to each reservoir. The model's period of record is from 1948 to 2008 (*i.e.*, 61 years). Note that some of the reservoirs were constructed after 1948. The purpose of the modeling effort was to determine how the reservoirs would operate under conditions in the FFMP based on using historic inflow information. The general premise is that the previous 61 years of inflow will be representative of future inflows. The OASIS model was used to simulate the FFMP and to determine flows available for hydropower generation. Table 3 Schedule of Releases (cfs) with 0 mgd Available in the FFMP (http://water.usgs.gov/osw/odrm/) were used to develop conservative flow duration curves. *See* volume 2 of the PAD for the site specific flow duration curves (http://www.nyc.gov/html/dep/html/dep_projects/woh_hydroelectric_project.shtml).

2. Project Locations and Facilities:[3]

   a. Cannonsville:

      The Cannonsville Dam is located on the West Branch of the Delaware River in the Town of Deposit, Delaware County, New York. The impoundment, known as the Cannonsville Reservoir, is approximately 12 miles long and has a normal storage capacity of 300,000 acre-feet, a surface area of 4,800 acres at a spillway crest elevation of 1,150 feet above mean sea level (msl), and an average depth of approximately 61 feet.

      Dam

      The Cannonsville dam is a zoned earthen embankment with a 2,800-foot long, 45-foot wide crest rising 175 feet above the valley floor to an elevation of 1,175 feet above msl. The dam is orientated in a north-south direction and is formed by two embankment sections.

      Spillway

      The spillway (ungated), located at the right abutment on the north side of the valley, is a stone masonry side channel spillway. The overflow weir is a two-section split-level spillway with a total length of 800 feet. The lower section is 240 feet long with a

[3] For more detailed information please refer to the (PAD.

crest elevation of 1,150 feet above msl. The upper section is 560 feet long with a crest elevation of 1,158.1 feet above msl.

Outlet Works
Low-level outlet works provide conservation releases to the West Branch of the Delaware River downstream of the dam and are located in a separate chamber at the southerly end of the dam. Conservation releases are made through a concrete intake structure and then through a 17.6-foot diameter concrete diversion conduit that necks down to a 11.9-foot release water conduit. The invert elevation of the outlet works is at elevation 999 feet. The release water conduit, a cement mortar-lined steel pipe encased in reinforced concrete, terminates in an 8.8-foot diameter manifold. The manifold feeds five primary release lines, ranging in size from 54 to 72 inches in diameter, and three smaller release lines, ranging in size from 12 to 18 inches in diameter. Discharges are directed into a downstream stilling pool.

b. Pepacton:
The Downsville Dam is located on the East Branch of the Delaware River, in the Town of Colchester, Delaware County, New York. The impoundment, known as the Pepacton Reservoir, is approximately 18 miles long, has a normal storage capacity of 441,000 acre-feet, a surface area of 5,700 acres at the spillway crest elevation of 1,280 feet above msl, and an average depth of 67 feet. By volume (140.2 billion gallons), this reservoir is the largest of the City's water supplies.

Dam
The Downsville Dam is a zoned earth embankment structure with a concrete core wall and an embankment height of 204 feet. The dam is approximately 2,450 feet long with a maximum height of 204 feet.

Spillway
The major spillway is located near the north end of the dam. It is an uncontrolled side channel spillway with an ogee crest. The channel discharges into a 40-foot diameter concrete-lined tunnel. The crest of the weir is approximately 800 feet long and the tunnel is approximately 1,530 feet long. The spillway crest is at an elevation of 1,280 feet above msl.

Outlet Works
Water is released to the channel downstream (East Branch of the Delaware River), which eventually meets the main stem of the Delaware River. An 8-foot diameter tunnel approximately 140 feet long carries water from a diversion conduit to the valve chamber. Before entering the chamber, the 8-foot diameter tunnel bifurcates into two 5-foot diameter tunnels. Each tunnel connects to a short pipeline, a butterfly valve, a venturi, a cone valve, and a polyjet valve. Each line discharges into circular stilling chambers that are maintained full of water due to the presence of a siphon at the end of each chamber. There is also a 20-inch conservation release line running from a tee in the north conduit into the north stilling chamber. The siphons located at the end of

each stilling chamber join together to form a common 8-foot diameter tunnel. The intake elevation of the diversion tunnel is approximately 1,100 feet above msl.

c. Neversink:
The Neversink Dam is located on the Neversink River, the longest tributary to the Delaware River, in the Town of Neversink, Sullivan County, New York. The impoundment, known as the Neversink Reservoir, is approximately five miles long, has a normal storage capacity of 112,000 acre-feet, a surface area of 1,477.8 acres at the spillway crest elevation of 1,440 feet above msl, and an average depth of 72 feet.

Dam
The Neversink dam is an earth embankment with a concrete cutoff wall. The structure is approximately 2,830 feet long and 195 feet high.

Spillway
The major spillway is located near the northeast end of the dam and is an uncontrolled side channel spillway with an ogee crest. The side channel discharges into a 30-foot diameter concrete-lined tunnel. The crest of the waste weir is approximately 600 feet long, and the tunnel is approximately 1,435 feet long. The spillway elevation is 1,440 feet above msl. The tunnel then leads to a stilling basin located on the east side of the river channel downstream from the dam.

Outlet Works
Water is withdrawn from the impoundment and is directed either through the Neversink Tunnel for water supply or through control valves and passed downstream. Releases made to the channel downstream of the Neversink Dam are controlled by three regulating valves located in an underground vault adjacent to the intake. Water that is withdrawn for release downstream is taken from a location at the bottom of the intake structure, upstream from the four-level opening arrangement for the tunnel. The intake elevation for water released to the Neversink River is 1,285 feet above msl.

d. Schoharie:
The Gilboa Dam is located on the Schoharie Creek in the Town of Gilboa, Schoharie County, New York. The impoundment, known as the Schoharie Reservoir, is approximately six miles long, has a storage capacity of approximately 58,800 acre-feet, a surface area of 1,150 acres at the spillway crest elevation of 1,130 feet above msl, and an average depth of approximately 57 feet.

Dam
The Gilboa Dam is a mixed earthen, cyclopean concrete, and masonry dam approximately 2,273 feet long and 183 feet high with an overflow spillway to Schoharie Creek. The dam is orientated in an east-west direction. The dam and associated structures are currently undergoing rehabilitation. Construction is expected to last through 2016 and development of hydroelectric facilities at Gilboa

Dam would best be accomplished as a coordinated component of this rehabilitation effort.

Spillway
The spillway is constructed of cyclopean masonry and faced with cut stone which will be replaced with concrete during rehabilitation. The spillway is 1,326 feet long with a crest elevation of 1,130 feet above msl.

Outlet Works
New outlet works are proposed as part of the dam rehabilitation. The intake structure will be located at elevation 1,000 southwest of the lakeshore line and east spillway abutment. From the intake, a 108-inch tunnel will extend 900 feet northeast to a gate shaft. A second 108-inch diameter tunnel will extend 1200 feet northwest from the gate shaft toward Schoharie Creek where it will bifurcate into two 78-inch diameter tunnels each with a control valve and guard gate. Upstream of this bifurcation will be a wye connection to the 108-inch tunnel stubbed at the end for potential hydroelectric penstock connection. The Valve Chamber will be located approximately 200 feet from the top of the bank of the Schoharie Creek approximately 1300 feet downstream from the dam. It is designed to enclose the control valves and guard gates, dissipate the energy from the flow control valves, provide a means for access into the downstream end of the tunnel and also includes the control room for operation of the valves and gates.

3. Proposed Facilities:

   a. Cannonsville:
   A tap into the 11.9-foot diameter conduit will be made upstream of the existing release water chamber to provide a penstock to convey flow to a new powerhouse at or adjacent to the existing release works. The powerhouse will house four turbine-generator units with a total flow capacity of 1,445 cfs. Three of the turbines would be of equal size; each having a hydraulic capacity of 440 cfs, and the fourth will be a unit having a hydraulic capacity of 125 cfs. Total station capacity is estimated at 12.6 MW with an annual estimated generation of 38,923 MWh.

   b. Pepacton:
   One of two release valves in the existing outlet works will be replaced with a turbine-generator set with a total flow capacity of approximately 162 cfs, a station capacity of 1.7 MW and an estimated annual generation of 9,225 MWh. This option will require the installation of a bypass line to maintain release flows when the turbine is out of service.

   c. Neversink:
   One of two release valves in the existing outlet works will be replaced with a turbine-generator set with a total flow capacity of approximately 100 cfs, a station capacity of 0.94 MW and an estimated annual generation of 6,091 MWh. This option will

require the installation of a bypass line to maintain release flows when the turbine is out of service.

d. Schoharie:
Based on preliminary evaluations, the hydroelectric plant could be fed by a 108-inch by 108-inch wye, which could be split into multiple penstocks leading to a new powerhouse located adjacent to the new release works. To date, DEP has not identified an economically feasible set of turbine-generator combinations for this location.