KEYSPAN
ENERGY

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Brian T. McCabe
Plant Manager

November 17, 1999

Ms. Debra Renner
Secretary
NYS Department of Public Service
3 Empire State Plaza, 14th Floor
Albany, NY 12223

Subject: KeySpan Energy – Ravenswood 250 MW Cogeneration Project
Article X Pre-Application Report

Dear Ms. Renner:

KeySpan Energy proposes to construct a 250 MW cogeneration project at the existing Ravenswood Generating Station in Long Island City, Queens, New York. The proposed project would be fired primarily with clean-burning natural gas and would incorporate state-of-the-art combined-cycle technology to generate electricity for the local distribution grid and steam for potential sale into the Con Edison steam distribution system in Manhattan. By displacing older, oil-fired electric and steam generation facilities, the proposed project would result in net environmental benefits in terms of lower air emissions. The project will also improve the efficiency and reliability of the electricity supply in New York City, optimize the use of existing infrastructure at the Ravenswood facility, and produce economic benefits including additional jobs during construction.

In accordance with the requirements of Article X of the Public Service Law, the enclosed Pre-Application Report is provided to you for your review and comment. This Pre-Application Report initiates formal consultation with the New York State Department of Public Service, the New York State Department of Environmental Conservation and other involved agencies regarding the scope of studies to be conducted in support of a future application by KeySpan Energy to the Siting Board on Electric Generation Siting and the Environment.

Please submit any comments you may have regarding the enclosed document to my attention at the letterhead address. We look forward to working with you to bring this project to fruition for the benefit of all New Yorkers.

Sincerely,

Brian T. McCabe
KeySpan Energy Project Manager

Enclosure

NEW YORK STATE
PUBLIC SERVICE COMMISSION

KeySpan Energy	)	Case No. _____

CERTIFICATE OF SERVICE

I hereby certify that I have, on this 17th day of November, 1999, served the Pre-Application Report for Keyspan Energy's Ravenswood 250 MW Cogeneration Project by first class mail, postage prepaid upon the following persons:

Ms. Ruth Beck
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Long Island City, NY 11101-7604

Honorable Joseph Boardman
Commissioner
NYS Department of Transportation
5 Governor Harriman State Campus
Albany, NY 12232

Honorable Denis J. Butler
NYS Assembly
43-08 30th Ave
Long Island City, NY 11103

Honorable John P. Cahill
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NYS Department of Environmental Conservation
50 Wolf Road
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Honorable Bernadette Castro
Commissioner
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Honorable Joseph Crowley
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Office of the Mayor
New York, NY 10007

Honorable Roy M. Goodman
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Honorable George Pataki
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Sharon M. Hoffman

SHARON M. HOFFMAN
Notary Public of New Jersey
My Commission Expires July 16, 2004

Article X

Pre-Application Report

KeySpan Energy - Ravenswood 250 MW Cogeneration Facility
Long Island City, Borough of Queens
New York, NY

Submitted to:
New York State Department of Public Service
Three Empire State Plaza
Albany, New York 12223

Applicant:
KeySpan Energy
175 E. Old Country Road
Hicksville, New York 11801

Prepared by:
TRC Environmental Corporation
1099 Wall Street West
Lyndhurst, NJ 07071

Submitted:
November, 1999

Article X

Pre-Application Report

KeySpan Energy - Ravenswood 250 MW Cogeneration Facility
Long Island City, Borough of Queens
New York, NY

Submitted to:
New York State Department of Public Service
Three Empire State Plaza
Albany, New York 12223

Applicant:
KeySpan Energy
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Prepared by:
TRC Environmental Corporation
1099 Wall Street West
Lyndhurst, NJ 07071

Submitted:
November, 1999

The following KeySpan Energy consultants assisted in the preparation of this document:

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1.0 INTRODUCTION

The project discussed in this Pre-Application Report is a proposed 250 megawatt (MW), cogeneration, combustion turbine electric generating facility to be developed by KeySpan Energy (KeySpan) on a 2.5-acre parcel of land at its existing Ravenswood Generating Station in Long Island City, Queens. (see Figure 1-1). This Pre-Application Report initiates formal consultation with the New York State Department of Public Service (NYSDPS), the New York State Department of Environmental Conservation (NYSDEC), and other involved agencies regarding the scope of studies to be conducted in support of a future application by KeySpan to the Siting Board on Electric Generation Siting and the Environment in accordance with Article X of the New York State Public Service Law.

1.1 Project Purpose, Need and Benefits

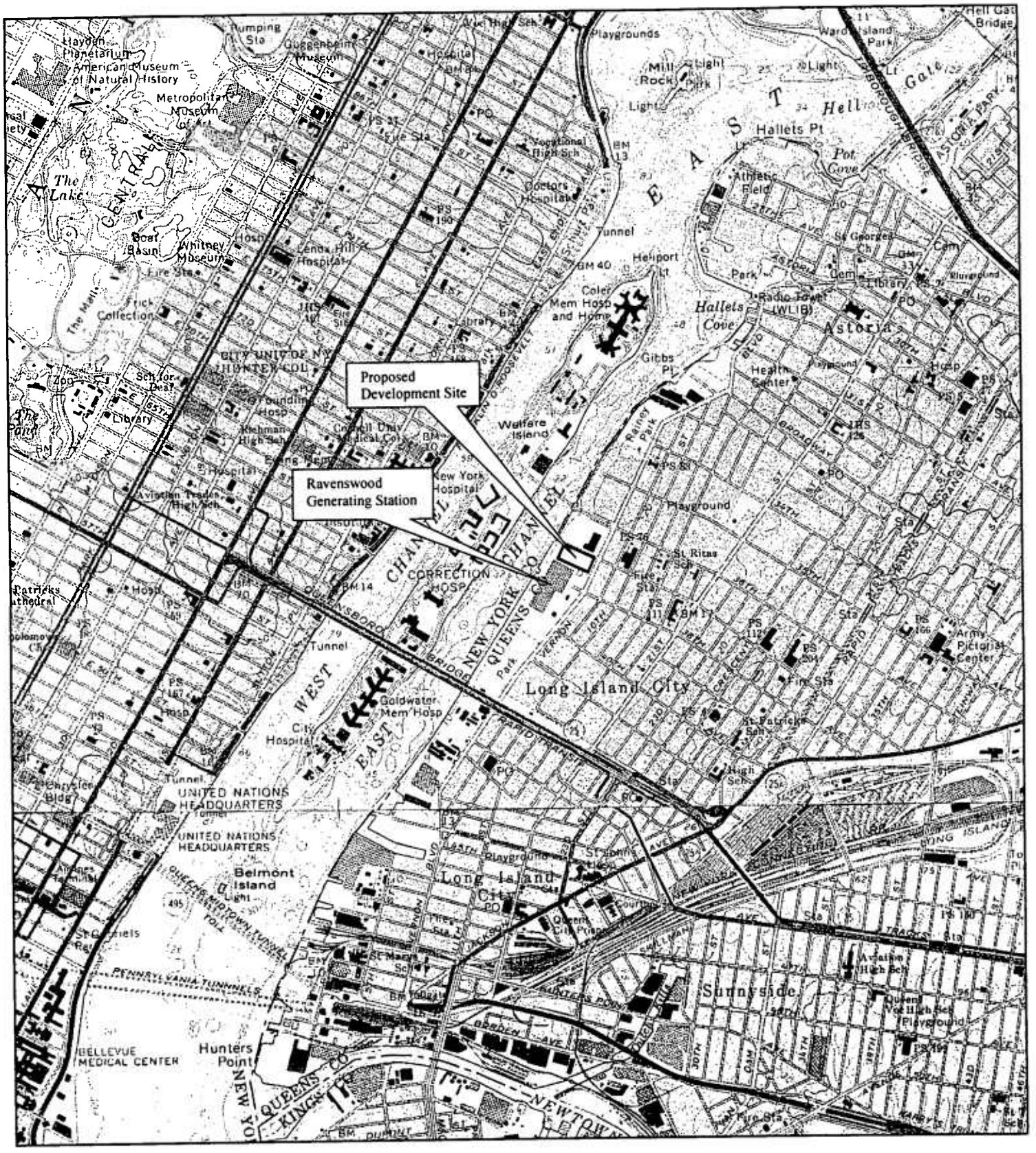
KeySpan's proposed cogeneration project will:

- ***Improve the efficiency of the State and City's electricity supply***

The proposed plant would use a combined-cycle process, incorporating a combustion turbine generator operating in conjunction with a heat recovery steam generator and a steam turbine generator to generate electricity and steam. By using the waste heat from the combustion turbine to produce steam and generate additional electricity, the plant would operate with a higher thermal efficiency than other types of generating facilities. As a result, the new facility will be dispatched on a near continuous basis, displacing older, less efficient generating facilities.

- ***Provide a more efficient source of commercial steam resulting in a potential reduction of air emissions***

In addition to the generation of electricity, the proposed project would operate as a cogeneration facility with the potential export of steam to Con Edison's Manhattan steam distribution system. This steam would displace the existing oil-fired Boiler "A" house owned by Con Edison at the Ravenswood Generating Station. The displacement of this oil-fired facility with a cleaner, natural gas-fired facility would result in a potential reduction in air emissions from the site. In addition, during periods of steam export, cooling water requirements for the new facility will be significantly reduced, resulting in decreased withdrawals from the East River.



KeySpan Energy
250 MW Cogeneration Facility
Long Island City, Queens, NY

Figure 1-1. Regional Location Map
Scale: 1" = 2000'

Source: USGS Topographical Survey Maps
Central Park N.Y. - N.J. Quadrangle, Photorevised 1979
Brooklyn, N.Y., Photorevised 1979

TRC

- ***Optimize the use of existing KeySpan property and available infrastructure and interconnections***

The proposed project site is a 2.5-acre, paved parking area located next to KeySpan's existing Ravenswood Generating Station. The proposed site is located within KeySpan's 27.6 acres of property, including an area leased by Con Edison upon which their steam generating plant, Boiler "A" House, is located. This property has been used by Con Edison since the early 1960's for the generation of electricity and steam. KeySpan completed acquisition of Con Edison's electric generating facilities at Ravenswood, including the 1,753 MW Ravenswood Units 1, 2 and 3, and the 415 MW gas turbine complex, in mid-1999. The proposed project will take advantage of the unique opportunities provided by the existing facilities and interconnections at the Ravenswood Generating Station including natural gas supply, electric transmission, steam transmission, fuel storage, and water intake and discharge facilities.

- ***Result in an overall net air quality benefit through use of Lowest Achievable Emission Rate (LAER) control techniques, the procurement of emission offsets, and the use of clean burning fuels***

The Clean Air Act Amendments of 1990 imposed stringent air quality requirements on electric generating facilities, particularly in areas such as New York City where the ambient air quality standard for ozone (O_3) is not being met. As a result, to address the ozone problem in New York and the Northeast, the proposed project will be required to incorporate LAER technology to reduce the emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOCs). In addition, KeySpan will obtain emission offsets (reductions) equal to 1.3 times the facility's maximum permitted annual NO_x and VOC emissions. If required, LAER technology will also be used to control CO emissions, and emission offsets equal to the facility's maximum CO emissions will be obtained. Emissions of sulfur dioxide (SO_2) and particulate matter (PM) will be controlled through the use of clean fuels, primarily natural gas with low sulfur distillate as backup fuel, primarily when natural gas is not available. In addition, due to the inherent efficiency of the proposed plant, it will undoubtedly be dispatched more frequently than older, less efficient plants with higher emissions per kilowatt-hour. The export of steam to Con Edison's steam distribution system will result in the displacement of Con Edison's oil-fired Boiler "A" House (also existing at the Ravenswood site), likely resulting in a further net reduction in air emissions.

- ***Provide direct economic benefits to Queens and New York City***

During construction, 200 to 250 local construction jobs, on average, will be created, and the local economy will accrue secondary benefits from the purchase of construction materials and other supplies. Construction of the proposed 250 MW cogeneration project will take approximately 18 months.

1.2 Project Location and Site History

The site for the proposed cogeneration project is located at KeySpan's Ravenswood Generating Station in Long Island City, New York. The proposed project will occupy 2.5 acres of the 27.6-acre parcel presently owned by KeySpan along the East River in Queens, opposite Roosevelt Island. The project site is north of and adjacent to the Ravenswood Unit 3 ("Big Allis"), just west of Vernon Avenue and approximately between 37th and 38th Avenues.

Historical Sanborn maps show the project site developed in 1898 with a gas manufacturing plant owned by the East River Gas Light Co. The area nearest Vernon Avenue was occupied by a single gas holder and the area closer to the East River was occupied by two smaller gas holders and other buildings and ancillary facilities associated with the manufacture of gas from coal. By 1915, the gas plant had expanded to occupy the entire area between Webster Avenue (37th Avenue) and Freeman Avenue (38th Avenue), from Vernon Avenue to the East River, and the area closest to Vernon Avenue was occupied by two gas holders. Ownership in 1915 was shown as the New Amsterdam Gas Co. These gas plant facilities remained intact for several decades with only minor changes, as shown on 1936 and 1947 Sanborn maps. The 1947 map shows the ownership change to the Consolidated Edison Co. of New York.

The 1950 Sanborn map shows a boiler house that would eventually become the Con Edison boiler "A" house steam plant. Over the next two decades, the gas plant facilities were removed and the Ravenswood Generating Station was developed to the south of the proposed project site. Ravenswood Unit 1 was installed in 1961, Unit 2 was installed in 1962, and Unit 3 ("Big Allis") was added in 1965. Originally constructed as a coal-fired facility, coal operations at Ravenswood ceased by 1969 and the facility was modified to burn oil and natural gas. By 1980 the project site was cleared of all gas plant facilities and the surrounding properties were occupied by the Ravenswood Unit 3, the Boiler "A" House steam plant, and the gas turbine complex. In 1998 Con Edison began the divestiture of their electric generation assets, and KeySpan Energy (created by the merger

of the Long Island Lighting Company (Lilco) and the Brooklyn Union Gas Company) acquired the Ravenswood Generating Station in 1999.

1.3 Public Involvement Plan Overview

This project is designed to contribute a maximum benefit to New York City by providing a more cost effective and environmentally friendly process to produce both electricity and steam to area providers and consumers. It is the goal of KeySpan to upgrade the Ravenswood facility while having a minimum impact on surrounding local communities. In Phase I of the Ravenswood Public Involvement Program, KeySpan has initiated an extensive plan of consumer outreach and education targeting the general public, community groups, business leaders and government officials. KeySpan's efforts in this area are aided by its long standing history of work with local communities and support for over 50 programs and organizations designed to enhance the quality of life for local residents.

1.3.1 Planning Phase

The objectives of this Public Involvement Program are the following:

- Provide information to local stakeholders on proposed project plans;
- Establish a process that provides a forum for public comment and feedback;
- Address concerns and questions posed by local stakeholders;
- Build support for project objectives.

To ensure a comprehensive outreach and facilitate a readily understandable method of communicating with the public, KyeSpan has developed a program utilizing special consumer friendly resources designed to gain maximum public feedback for factoring into project plans. These resources include:

- a specially designed, independently conducted telephone survey to determine public opinion on issues related to energy and the environment. (Queens and Roosevelt Island);
- a color brochure for general use and distribution that addresses specific project details, plans and benefits;
- a Web Site linked to KSE detailing project objectives and milestones (http://www.keyspanenergy.com);
- a special 24-hour bilingual Hot Line (718) 403-2777 updating callers on project plans and providing a mechanism for public questions and comment. Responses receive timely response;

- a specially prepared four-minute video designed to clearly communicate KeySpan's purpose and plans for the Ravenswood upgrade. This video is available for general presentation and distribution purposes;
- An extensive process has been undertaken to identify key resources that will assist in identifying local stakeholders groups that will be instrumental to KeySpan in communicating the Ravenswood message for plant expansion. As a result, meetings were held with the public for the purpose of addressing the following topics, issues and concerns:

  Energy Costs and Availability- Steam and Electric
  Improved Air Quality - Reduced Emissions
  Service and Reliability
  Economic Impacts- Job Creation
  Community Benefits
  Impact on Housing

1.3.2 Pre-Application Phase

In September of 1999, KeySpan began its outreach to public officials, regulators and potential stakeholders. Prior to initiation of this program KeySpan met with NYSDPS staff to discuss Article X requirements and plans for moving ahead with PIP plans for Ravenswood. At that time, and at subsequent meetings, KeySpan project management has maintained a regular dialog with NYSDPS staff on project developments and PIP evolution.

The following meetings have been conducted to date as part of the Pre-Application phase of the project:

Queens Chamber of Commerce	September 24, 1999
Speaker of the City Council, Peter Vallone and Staff	October 5, 1999
A. Grannis, NYS Assembly	October 12, 1999
Community Board 1	October 14, 1999
Senator G. Onorato	October 18, 1999
NYS Assemblywoman C. Nolan	October 19, 1999
Councilmember G. Miller and Staff	October 20, 1999
Natural Resources Defense Council	October 20, 1999
Community Board 8	October 20, 1999
Ravenswood Senior Center	October 25, 1999
Ravenswood Residents Assoc.	October 25, 1999
Congressmembers Crowley & Maloney	October 25, 1999

R. Poveromo, President-United Community Civic Association	October 26, 1999
Roosevelt Island Residents Association	October 27, 1999
Assemblywoman Markey	October 27, 1999
Town Hall Meeting in Woodside	October 27, 1999
Roseanne Porazzo ombudsman for non-English speaking residents	October 27, 1999
Ravenswood Public Meeting	November 1, 1999
LIC Business Development Corporation	November 16, 1999
LIC Good Will Industrial Council	November 17, 1999

As a result of the preliminary outreach a number of concerns have been raised with KeySpan about the Ravenswood expansion specifically, and with New York City in general. These concerns include:

- Need and time frames associated with more modern power generation methods.
- Noise and odor issues associated with power generation in general, and Ravenswood specifically.
- Effect of plant operation on fish and wildlife.
- Issues associated with Electro-Magnetic fields.
- Concerns regarding the potential use of oil versus natural gas for future power generation.
- Air quality of NYC and effect of Ravenswood plant expansion on current levels of pollution.
- Effects on future electric rates.

All of the above issues raised by the public during the initial project outreach are being addressed by KeySpan in the post pre-application phase of outreach, and issues will be factored into project plans for Ravenswood expansion.

Upon filing of the Article X pre-application, KeySpan will continue to meet with community, government, environmental and business groups to make project information available. Copies of the pre-application will be mailed to principles representing stakeholder organizations and constituencies.

1.3.3 Study and Application Preparation Phase

During the preparation of the Article X application and the planning and implementation of required studies, KeySpan will continue to consult with agency representatives and others through meetings, correspondence and other methods that facilitate consultation, including field visits and telephone conferences. KeySpan will continue to schedule and respond to requests for meetings and presentations from local government officials,

interest groups, stakeholders and interested citizens. This activity during the preparation of the studies and the Application will continue to provide information about the proposed project and facilitate the receipt of comments and suggestions from interested parties. Specific activities during this phase of the project will include the following:

- Convene a Citizens Advisory Board to solicit input
- Brief Community Board #2- general meeting
- Meet with Roosevelt Island Residents Association
- Meet with Community Board #2 Environmental Committee
- Conduct two independent focus groups of local residents
- Conduct presentations/ informational forums at:
  - Queensview Houses
  - Astoria Houses
  - Ravenswood Houses
  - Queensbridge Houses
- Conduct at least three more public meetings (Jan/Feb/March 2000) similar to the Nov. 1st meeting at Astoria Manor. Based on direct mailing of 40,000 to surrounding area.
- Continue outreach to interested environmental organizations (i.e. Riverkeepers, NRDC, INFORM, NYPIRG and Sierra Club)
- Utilize KeySpan Speakers Bureau to outreach to smaller local groups as requested
  - local senior centers
  - church groups
  - fraternal organizations
- Conduct briefings to NYC Offices and Agencies:
  - Mayor's Office
  - Borough President's Office-Queens
  - Borough President's Office- Manhattan
  - NYC Dept. of City Planning
  - NYC Office of Environmental Coordination
  - NYC Office of Economic Development
  - NYC - DEP
  - NYC - Police Department
  - NYC - Fire Department
  - NYC Council
  - NYC Comptrollers Office
  - NYC - Public Advocate
  - NYC – DOT

- Conduct briefings to NYS Offices Agencies
  NYS – DEC
  NYSDPS
  Governor's Office
  NYS Assembly Speaker Silver
  NYS Senate Majority Leader Bruno
  NYS – DOT
  NYS – Dept. of Health
  Empire State Development Corp.
  The Central Labor Council
- As deemed appropriate, tours conducted by plant management of the Ravenswood Facility will be made Available to public interest groups.

The following media tools will continue to be used to extend public outreach and enhance public feedback:

- Ravenswood Project Video Tape
- Local weekly / daily newspaper print media for project milestones
- Periodic Ravenswood Newsletter for general distribution
- Radio advertisements as deemed appropriate
- Color information brochures for general distribution

1.3.4 Application and Certification Phase

Filing of the Application with the Siting Board and with parties that have indicated an interest in receiving the Application will begin the formal application review process. The review process will include formal notification, opportunities for parties to formally exchange information and public hearing sessions to receive comments, statements and testimony about the Project. KeySpan will ensure that all notice and filing requirements are complied with. Through the submittal of its application fee, KeySpan will provide financial resources to be allocated by the presiding examiner designated by the Board to municipal and local parties to review and understand the studies, information and issues addressed in the Application. These activities will ensure that effective public involvement continues throughout the Application review and certification process.

1.3.5 Compliance and Implementation Phase

During the construction, commissioning and operation of the plant, KeySpan will continue to maintain relationships established with regulatory agency staff, local officials, stakeholders, and interested citizens. During construction and commissioning, KeySpan will schedule meetings to report on the Project's status, and KeySpan representatives will be available to attend meetings, give presentations, and answer questions as requested. KeySpan will continue to participate and support community activities during the life of the facility.

Agency consultations and updates will continue throughout start-up operations and testing. During construction and commissioning, there will be meetings and filings with agencies to document the completion of mitigation projects and the certification of equipment. Compliance filings and reports will be filed and noticed to all parties to the certification proceedings for subsequent approval by the Siting Board. These compliance filings will provide formal documentation and verification that the requirements imposed by the Article X certificate are adhered to and implemented through the course of the design, construction and operation of the project.

1.3.6 Notices and Filing

This Pre-Application Report contains the elements described in the regulations implementing Article X to facilitate understanding and discussion about the proposed Project. The elements are:

- information about the Project;
- information about the environmental setting at the Project site;
- identification of potential significant adverse impacts of the Project;
- information and background studies needed;
- anticipated mitigation measures;
- summary of public involvement efforts; and
- issues raised during informal consultations and responses to those issues.

The Pre-Application Report will be provided to the following entities and to others who have demonstrated an interest in the Project:

- New York State Board on Electric Generation Siting and the Environment

- New York State Public Service Commission
- New York State Department of Agriculture and Markets
- New York State Department of Environmental Conservation
- New York State Department of Health
- New York State Energy Research and Development Authority
- New York State Department of Transportation
- Empire State Development Corporation
- New York State Attorney General Eliot L. Spitzer
- New York State Secretary of State Alexander F. Treadwell
- United States Senator Daniel Patrick Moynihan
- United States Senator Charles E. Schumer
- Members of Congress from Congressional Districts in the project vicinity
- Members of New York State Assembly and Senate from Queens County
- Queens Borough President
- Community Board No. 1, Borough of Queens
- Community Board No. 8, Borough of Manhattan
- New York City Council
- New York City Mayor's Office
- New York City Department of Environmental Protection
- U. S. Environmental Protection Agency Region II
- U. S. Army Corps of Engineers, New York District

The completed Application, when filed, will be sent to the same service list plus any parties that participated in the pre-application consultation process and who requested copies of the Application. In addition, notice of the Article X application will be published in newspapers in accordance with the regulations implementing Article X. Copies of the Application will be provided to area libraries for review by the general public. The Application package will include the Application, pre-filed testimony supporting the Application, the notice, the service list, affidavits of service and other relevant information.

1.3.7 Issues Raised During Informal Consultation with Agencies

On October 13, 1999, a pre-application meeting was held in Albany with representatives from the NYSDEC and NYSDPS to discuss issues related to air quality. The technical discussion focused on the required information and modeling methodologies to be used in preparing the PSD permit application. Minutes of the meetings were prepared and distributed to meeting participants.

Comments and issues that were raised at the meeting regarding the PSD permit are summarized as follows:

- The existing and new facilities at Ravenswood can be permitted under two Title V permits: an "A" house Title V (signed by KeySpan, Con Ed, and any third party); and another Title V for all other sources on the site.
- The pre-application report should include a discussion of how the Title V permitting will be handled.
- Lowest Achievable Emission Rates (LAER) for NO_x are now at 2.0 ppm for natural gas firing and 10.0 ppm for oil firing.
- With regard to the ongoing re-designation of the New York City Metropolitan area as in attainment for CO, the application should assume two scenarios: 1) re-designation occurs and CO catalyst controls are considered under a Best Available Control Technology (BACT) review; and 2) re-designation does not occur and CO is addressed under New Source Review.
- The pre-application report should indicate the proposed number of days of oil firing.
- The quantity of required offsets needs to be identified in the application; NO_x and VOC offsets will need to be obtained at a 1.3 to 1 ratio; CO offsets (if required) will be needed at a 1.0 to 1 ratio.
- Article X requirements may go above and beyond the PSD requirements (i.e., cumulative modeling of nearby sources, even if project emissions are shown to be insignificant).
- Auxiliary equipment must be modeled and their emissions included in the facility's potential-to-emit (PTE) estimates, including offset requirements.
- For cogeneration facilities with supplemental Heat Recovery Steam Generator (HRSG) duct firing, dual permits limits (i.e., with and without duct burner firing) are often allowed.

The issues raised during the pre-application meetings with NYSDEC and NYSDPS staff are reflected in the technical discussions presented in this Pre-Application Report and will be addressed in the Article X application.

1.4 Description of Pre-Application Report Format

This Pre-Application Report is organized as follows:

Section 1.0 is the Introduction which contains an overview of the project's purpose, needs, and benefits; an overview of the proposed Public Involvement Program; a brief description of the proposed project location and site history; and this description of the Pre-Application Report format.

Section 2.0 is the Project Description which provides a more detailed site description, including a discussion of the site's existing character, natural features, and the nature of the surrounding area. The major project features are also described in this section of the report.

Section 3.0 is the Environmental Setting and Potential Impacts and Mitigation that provides a discussion of specific environmental study areas (e.g. Air Quality, Water Resources, Noise, Cultural Resources, etc.). Each environmental resource area will be addressed with a discussion of existing conditions; a preliminary identification of potential impacts; study methodologies necessary for impact evaluations; and identification of potential mitigation measures.

Section 4.0 is the Alternatives Evaluation which contains a discussion of reasonable alternatives to the proposed cogeneration project. Alternatives addressed include the No Action alternative, alternative site layouts, alternate site(s), and alternate technologies.

2.0 PROJECT DESCRIPTION

2.1 Ravenswood Generating Station Property Description

KeySpan's Ravenswood Generating Station occupies approximately 27.6 acres along the East River in Queens, located between the bridge to Roosevelt Island (36th Avenue) and the Queensboro Bridge. KeySpan's facilities, which were recently acquired from Con Edison, include the 1,753 MW Ravenswood Units 1, 2 and 3, and the 415 MW gas turbine complex. Units 1, 2 and 3 are indoor units in a common brick and metal clad powerhouse building which houses the boilers, turbine generators, administration offices, and maintenance shops.

Units 1 and 2 are essentially identical (twin) units and are conventional cross compound steam electric generation units consisting of 385 MW General Electric (GE) turbine-generators and Combustion Engineering (CE), controlled circulation, gas and oil-fired boilers. The units are connected to the 138 kV bus at the Vernon Substation.

Unit 3 is a conventional cross compound steam electric generator unit, consisting of a 972 MW Allis Chalmers steam turbine generator (a.k.a., Big Allis) and two half-sized CE, controlled circulation, gas and oil-fired boilers. This unit is connected to the 345 kV bus at the Rainey Substation via oil-cooled underground feeders.

The Ravenswood Generating Station also includes the 11 MW GT-1 combustion turbine unit which provides the station with limited "black start" capability. This combustion turbine also serves as a "satellite" generating unit to meet peak demands within the Con Edison electric system.

The gas turbine complex includes a total installed capacity of approximately 415 MW. The gas turbine complex includes an administration building, a retired gas compressor house, a 2 million gallon kerosene storage tank, and a retired 105,000 gallon No. 2 fuel oil storage tank.

Gas supply to the generating station is from the New York Facilities high pressure main. Other ancillary facilities at the Ravenswood Generating Station include:

- Barge (fuel oil) unloading and transfer facility
- Captive barge for storage of No. 6 and light fuel oil
- Gas Metering and regulator facility (to Units 1, 2 and 3)

- Rainey Tank Farm, consisting of a 1.5 million gallon No. 6 fuel oil storage and pumping facility.
- Coal and ash handling facilities (no longer in use)
- Guard house
- Water intake and discharge facilities

The location and layout of KeySpan's existing facilities are shown on Figure 2-1.

In addition to KeySpan's facilities, Con Edison has retained ownership of certain other facilities located at the Ravenswood Generating Station. These facilities include:

- Rainey 345 kV substation, located to the north of the gas turbine complex and the Roosevelt Island Bridge;
- Vernon 138 kV substation, located immediately to the south of the Ravenswood Generating Station;
- Boiler "A" House, which provides steam to Con Edison's Manhattan Island steam distribution system; and
- Gas, electric and steam interconnections to Manhattan and associated control facilities.

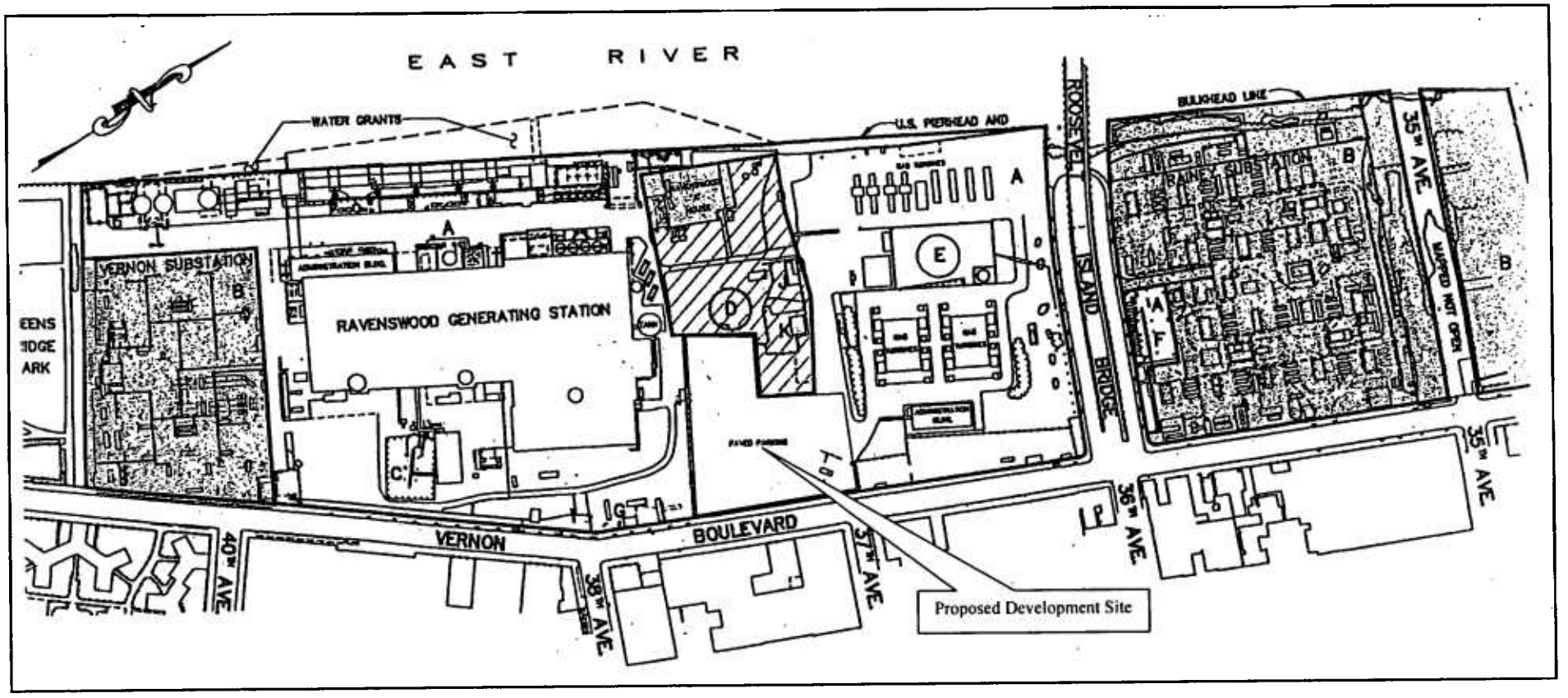
The property retained by Con Edison totals 15.2 acres. In addition, Con Edison leases a 2.1-acre area from KeySpan which includes the Boiler "A" House, the freshwater reservoir, and other facilities related to the operation of the steam plant. Con Edison's facilities at Ravenswood are also shown on Figure 2-1.

2.2 Proposed Facility Location

The site for the proposed 250 MW cogeneration plant is shown on Figure 2-1; the proposed layout of the project is shown on Figure 2-2. The proposed site for the new plant is paved and is used for general parking. The approximately 2.5-acre site is north of and adjacent to Ravenswood Unit 3 (i.e., Big Allis) and immediately west of Vernon Boulevard, between 37th and 38th Avenues. The proposed site is shown in several photographs provided as Figure 2-3.

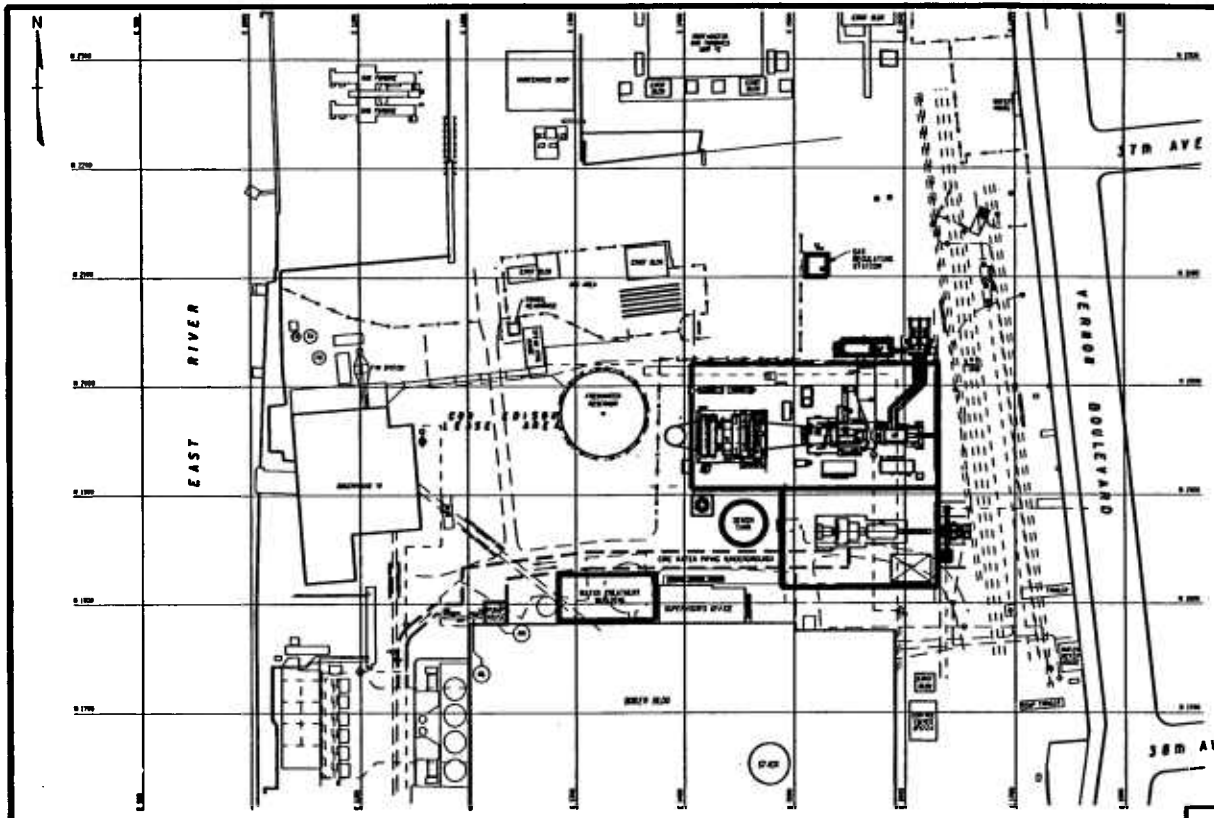
2.3 Primary Components of the Proposed Cogeneration Project

The proposed power plant is a nominal 250 MW cogeneration facility based on a single General Electric 7FA gas turbine generator package. The facility will be designed with supplemental firing and export steam capability. Natural gas will be the primary fuel with



KeySpan Energy **250 MW Cogeneration Facility** **Long Island City, Queens, NY**
Figure 2-1. Ravenswood Generating Station: Site Plan
Source: KeySpan Energy

TRC



KEYSPAN ENERGY
250 MW COGENERATION FACILITY
LONG ISLAND CITY QUEENS, NY

FIGURE 2-2 SITE PLAN
GENERAL LAYOUT

SOURCE: BURNS AND ROE

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Figure 2-2: Proposed Site Plan and General Layout

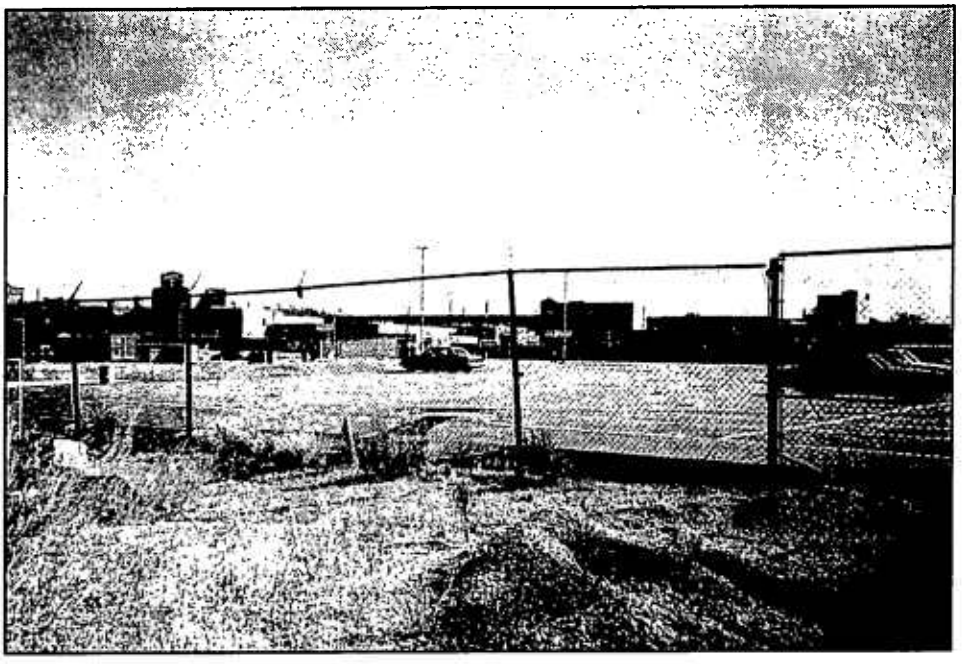


Photo A. Proposed cogeneration facility development site looking northeast towards Vernon Boulevard.

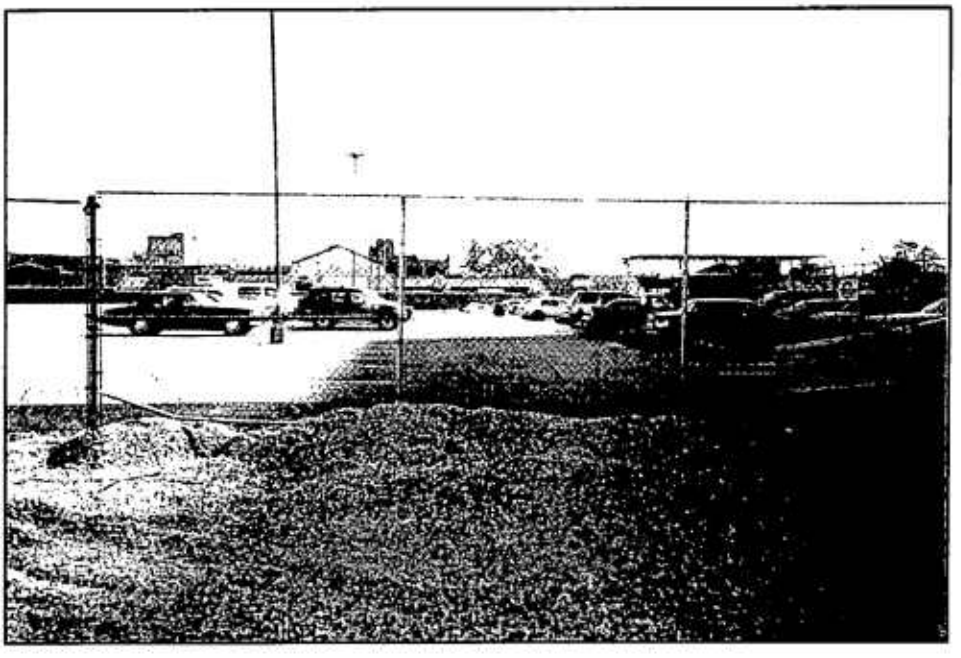


Photo B. Proposed cogeneration facility development site looking east.

KeySpan Energy
250 MW Cogeneration Facility
Long Island City, Queens, NY

Figure 2-3. Site Photographs

Source: TRC Site Visit, August 1999

TRC

low sulfur distillate as a backup fuel. The major components of the plant include a single combustion turbine generator (CTG), a supplementary fired heat recovery steam generator (HRSG), a single steam turbine generator (STG) with condenser, kettle boilers for steam cogeneration and a water treatment facility with associated storage tanks. Condenser cooling will be provided by once-through cooling using East River water. Improvement of the existing East River intake is being studied.

The combustion turbine generator produces electricity and exhausts hot gas into the heat recovery steam generator. The steam produced in the heat recovery steam generator will be used to drive the steam turbine generator to produce additional electricity and to supply steam for Con Edison's steam distribution system. The overall thermal efficiency of the system approaches 56 percent compared to approximately 35 percent for a conventional fossil fuel fired plant or a common simple cycle combustion turbine alone (without the HRSG and steam turbine).

The facility support systems and equipment will include the following:

- Water cooled condenser
- Circulating once-through cooling water system
- Water treatment system including storage tank
- Selective catalytic reduction (SCR) system
- Chemical storage and injection system
- Sanitary waste collection and discharge system
- Fire protection system
- Fire detection and alarm system
- Permanent plant communications system
- Domestic (potable) water system
- Wastewater collection, treatment and discharge systems, including neutralization tank
- Plant electrical distribution system
- Fuel gas compressor system
- Kettle reboilers

2.3.1 Cogeneration Facility Overall Characteristics

The plant basis will be a single General Electric 7FA combustion turbine with a nominal net power output of approximately 170 MW. The CTG will utilize dry low NO_x combustor for gas firing and water injection for NO_x control when firing distillate fuel. The turbine will exhaust to a HRSG, and the HRSG will exhaust gases into a single stack. A selective catalytic reduction (SCR) system will be installed in the HRSG to further

reduce NO_x emissions. The SCR system will use aqueous ammonia for NO_x reduction. An aqueous ammonia storage tank will be installed for on-site storage.

Export steam will be generated in three kettle reboilers located in the steam turbine building. The heat to convert the softened city water to export steam will be derived from the high pressure steam provided from the heat recovery steam generator.

2.3.2 Fuel System

The combustion turbine will be designed for natural gas firing as the primary fuel and low sulfur (0.05%) distillate as backup fuel. Natural gas will be supplied to the power plant through interconnection to an existing natural gas pipeline. Distillate will be stored on-site in the existing two-million-gallon kerosene storage tank.

2.3.3 Facility Water Use / Wastewater Generation

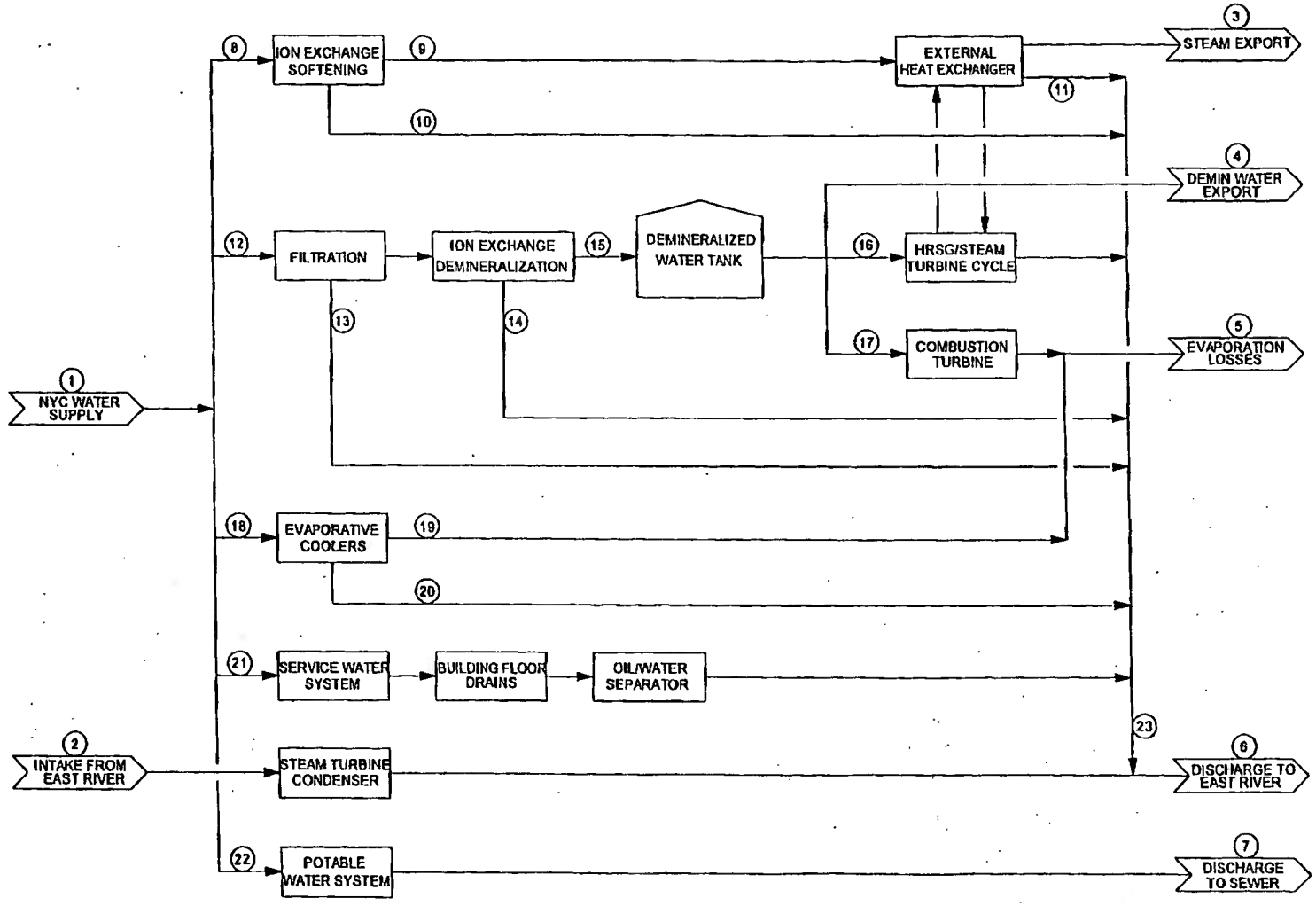
Water will be required for several functions associated with the generation of electricity. Figure 2-4 shows a preliminary water balance diagram illustrating principal water supply and wastewater effluent pathways for the new unit. Table 2-1 provides the maximum quantities for the various aspects of the water balance diagram.

Process, fire protection, and potable water requirements will be met through interconnections to the New York City municipal distribution system. Process water includes makeup to the demineralization system and the plant service water loop. Demineralized water will be used to satisfy water demands for the following:

- HRSG feedwater makeup (i.e., boiler makeup);
- combustion turbine injection water for NOx control when fired using oil; and
- on-line and off-line combustion turbine compressor cleaning operations.

Plant service water will be used for routine maintenance activities and as evaporative cooler makeup when ambient air temperature exceeds 60 °F. City water for process make-up and export steam requirements for the new unit are estimated to range between 400 gpm (under typical summer operating conditions) to 750 gpm when firing liquid fuel.

Cooling water for once-through cooling of the steam turbine condenser will be obtained from the East River through the existing Ravenswood Unit 3 screening/intake chamber. The maximum estimated increase in cooling water withdrawal from the Unit 3 intake is 85,000 gpm or approximately 125 million gallons per day; cooling water requirements



KeySpan Energy
250 MW Cogeneration Facility
Long Island City, Queens, NY

Figure 2-4. Preliminary Water Balance Diagram

Source: Burns & Roe Enterprises, Inc.

Table 2-1: Water Balance Diagram Quantities

Number	Description	Average Flow gpm (gas firing)	Average Flow Gpm (oil firing)
1	New York City Water Supply	440	701
2	Intake from East River	85,000	85,000
3	Steam Export	300	300
4	Demineralized Water Export	0	0
5	Evaporation Losses		
6	Discharge to East River	85,118	85,139
7	Discharge to Sewer	2	2
8	Influent to softener	331	331
9	Softened water production	326	326
10	Softener regeneration waste	5	5
11	External heat exchanger blowdown	26	26
12	Demineralizer influent	57	343
13	Filter backwash	1	5
14	Demineralizer regeneration waste	4	21
15	Total demineralized water production	52	317
16	HRSG feedwater makeup	52	52
17	Water injection to combustion turbine	0	265
18	Evaporative condenser makeup	25	0
19	Evaporation from evap condenser	20	0
20	Evaporative condenser blowdown	5	0
21	Service water use	25	25
22	Potable water use	2	2
23	Total process wastewater	118	139

Source: Burns and Roe

will be significantly reduced when steam is exporting to Con Edison. The maximum cooling water requirements for the proposed facility would be approximately 8 percent of the total allowable once-through cooling water withdrawal for the existing Ravenswood Generating Station. A chemical storage and feed system will be installed to prevent biofouling within the circulating water piping and/or condenser. Based on preliminary design information, the biofouling control system will include storage and feed equipment for sodium hypochlorite. All discharges will be monitoried to ensure compliance with the discharge limits established in the facility permits.

Process wastewater will be generated by the following operations:

- demineralization reject water;
- evaporative cooler blowdown;
- boiler blowdown;
- water analysis panel; and
- routine maintenance (i.e., floor drains).

Building floor drains and storm water drains from potentially oily areas will be treated in an oil/water separator prior to discharge. Process waste streams requiring pH adjustment prior to discharge will be directed to a neutralization tank

2.3.4 Circulating Water System

The circulating water system will be used to remove excess heat from the steam turbine condenser and the auxiliary cooling loop. The steam turbine condenser will require approximately 85,000 gpm of cooling water from the East River. The auxiliary cooling loop is used to remove excess heat from the combustion turbine coolers, generator coolers, lube oil coolers, vacuum pump condenser and boiler feed water pump coolers. The auxiliary cooling loop requires approximately 5,000 gpm of cooling water. The design change in temperature (Delta T) for the steam turbine condenser and auxiliary cooling loop will not exceed 16 degrees Fahrenheit (F). This Delta T will be lower during periods of steam export. The circulating water system will discharge to the existing discharge canal.

2.3.5 Circulating Water Flow Management

The cogeneration facility circulating cooling water pumps will be driven by variable speed motors. During periods of low river water temperature and when steam is being

exported to the Con Edison steam system, the circulating water flow will be significantly reduced by reducing the speed of the pumps.

2.3.6 Exhaust Stack

The exhaust gas from the combustion turbine will flow to the HRSG, through the SCR (located in the high-pressure boiler), and out the single stack. The stack will be equipped with a Continuous Emissions Monitoring (CEM) system to monitor the concentrations of NO_x, O_2 or CO_2, opacity, and CO; a platform will provide access to the monitoring equipment. In order to comply with provisions of the Acid Rain Program, SO_2 emissions will need to be quantified. Quantification of SO_2 emissions can be performed using direct CEMS measurement or mass-balance calculation from fuel sulfur content and fuel flow measurement.

2.3.7 Turbine Generator Building

The combustion turbine generator, the HRSG and the steam turbine generator will be housed in an industrial-type, metal-clad building. The building dimensions will be defined during final design of the facility. The building will also house other plant equipment such as pumps, motors and other electrical equipment. A control and administration area will be located on the second floor.

2.3.8 Electric Transmission

The proposed cogeneration project will be electrically interconnected to either Con Edison's Vernon 138 kV substation or Rainey 345 kV substation via a new underground cable. Con Edison will be performing the necessary electrical studies to determine the optimum interconnection point and the additional equipment requirements, if any. The Vernon 138 kV Substation is located approximately 900 feet south of the proposed plant site; the Rainey 345 kV substation is located approximately 900 feet to the north (see Figure 2-1)

2.3.9 Air Emissions

The proposed plant will minimize oxides of nitrogen (NO_x) emissions by the use of dry low NO_x combustion technology in the combustion turbines while firing natural gas. The NO_x emissions, while burning distillate, will be reduced by water injection.

NO_x emissions will be further reduced to the Lowest Achievable Emission Rate (LAER) by post combustion treatment with a selective catalytic reduction (SCR) system. The SCR consists of a catalyst bed installed in the HRSG. Aqueous ammonia will be injected into the flue gas stream, and react with the NO_x in the presence of the catalyst to form benign nitrogen and water vapor.

Natural gas does not contain appreciable amounts of sulfur, so sulfur dioxide (SO_2) emissions will be minimal when firing natural gas. When burning oil, low sulfur (0.05%) distillate will be used to minimize SO_2 emissions.

Control of carbon monoxide (CO) and volatile organic compounds (VOC) will be achieved through proper combustion in the combustion turbine, while particulate emissions will be minimized through the use of clean burning fuels (i.e. natural gas and low sulfur (0.05%) distillate).

3.0 ENVIRONMENTAL SETTING, POTENTIAL IMPACTS AND MITIGATION

The proposed cogeneration project will be located in the middle of a complex of existing power generating and support facilities on property that has been used for the generation of gas and electric power for nearly a century. As such, the proposed project is a continuation of the historical use of this area. Moreover, the addition of this high efficient, state-of-the-art, near zero emitting facility is expected to displace a portion of the operation of the existing older facilities at the site, resulting in a net environmental benefit.

As part of the Article X licensing process, KeySpan will undertake a comprehensive review of the environmental setting to thoroughly evaluate the potential impacts and expected benefits of the proposed project. The studies that will be undertaken will be designed to meet the substantive requirements of Article X and will also provide the detailed information for specific permit applications to be submitted to the U.S. Environmental Protection Agency (U.S. EPA) and the NYSDEC.

The studies that will be conducted will:

- Characterize the existing environmental setting and resources;
- Identify and assess potential impacts and anticipated benefits on the natural and man-made environment that would result from the construction and operation of the project;
- Identify and implement specific mitigation measures to minimize potential adverse environmental impacts and maximize benefits; and
- Provide the various regulatory agencies and the general public with the information necessary to reach informed decisions regarding the required permits.

3.1 Air Resources

This section identifies the air quality regulatory framework that will apply to the project and the general air resources, which may be affected by the proposed action. These regulations include the determination of the applicable air quality requirements and consequent actions required of the project (i.e. the regulatory framework for obtaining project approval, the need to apply pollution control and the need to perform modeling impact assessments). The air resources include existing air quality within the study area, existing climatic conditions (i.e., meteorological means and extremes) and other elements (i.e., topography).

3.1.1 Ambient Air Quality, Topography and Meteorology

Existing Air Quality

The proposed project site is located in Queens County, NYSDEC Region 2, New York-New Jersey-Connecticut Air Quality Control Region (AQCR). The NYSDEC Bureau of Air Surveillance operates various air quality monitors for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), inhalable particulates (PM-10; particulate matter with a mean diameter less than 10 micrometers), total suspended particulates (PM), ozone (O_3), lead (Pb), nitric oxides (NO_x), sulfates and nitrates. According to 40 CFR 81.333 (updated June 13, 1998) Queens County is "attainment" or "unclassified" for all criteria pollutants, except for ozone for which it is designated as severe non-attainment and CO for which it is designated as moderate non-attainment. New York County is a designated PM-10 non-attainment area, and as such, facility PM-10 impacts to this area can not exceed significant levels.

In approving the proposed revisions to New Jersey's State Implementation Plan (SIP) to eliminate the use of oxygenated fuel, the U.S. EPA has indicated that "the New York-Northern New Jersey-Long Island carbon monoxide non-attainment area has attained the carbon monoxide National Ambient Air Quality Standards." Although the approval of the New Jersey SIP revision must undergo additional public comment, the data supporting the request shows no violations of the CO standard within the New York-Northern New Jersey-Long Island area since 1994 (64 FR 48970). Given this, it is highly likely that U.S. EPA will approve NYSDEC's proposed CO "Re-designation Request" and subsequent revisions to the New York State SIP. Recent conversation with U.S. EPA Region II staff indicates that formal re-designation and revision to the New York State SIP will not be finalized until early in the year 2000, considering the requisite public review/public comment periods (TRC, 1999). Revision to New York State's Part 200 rules to formally codify the re-designation may take a considerably longer amount of time. Because of this potential delay, the project will be developed following two regulatory scenarios for CO: 1) re-designation occurs and BACT need only be considered, and 2) re-designation does not occur and non-attainment review needs to be considered.

Table 3-1 presents 1996-1998 background concentration data for O_3, SO_2, PM-10, NO_2, CO, PM and lead (Pb). The ambient air quality data presented herein has been converted from parts per million (ppm) values, as reported by NYSDEC, to micrograms per cubic meter ($\mu g/m^3$) concentration values to coincide with the modeling output (except for PM/PM-10 and lead, which are reported by NYSDEC in $\mu g/m^3$). Text following this table provides more detailed information for these pollutants, including trends and

concentrations specific to air quality standards. For those pollutants with short-term standards (i.e., 1-hour, 3-hour, 8-hour and 24-hour), second highest recorded concentrations are presented since compliance is based on the second highest value.

Table 3-1: 1996-1998 Background Concentrations for Criteria Pollutants

Pollutant	Averaging Period	NAAQS ($\mu g/m^3$)	Background Concentration[a] ($\mu g/m^3$)			Monitor Location
			1996	1997	1998	
O_3	1-Hour	235	206	**226**	186	Morrisania Located 8.7 km NNE of project site
SO_2	3-Hour	1,300	**225**	173	168	PS 59 New York County (Manhattan) Located 1.7 km W of project site
	24-Hour	365	**123**	105	100	
	Annual	80	**39**	31	31	
PM-10	24-Hour	150	**74**	59	72	
	Annual	50	**41**	31	30	
NO_2	Annual	100	**79**	75	75	
CO	1-Hour	40,000	**5,840**	5,150	5,040	
	8-Hour	10,000	**4,465**	3,665	**4,465**	
PM	24-Hour	260[b]	95	98	**111**	Greenpoint Sewage Treatment Plant Located 3.1 km S of project site
	Annual	75	**57**	58[c]	50	
Pb	3-month	1.5	**0.16**	**0.16**	0.14	

[a]Highest-second highest short-term (1-, 3-, 8-, and 24-hour) and maximum annual average and 3-month concentrations presented.

[b]Corresponding New York State standard is 250 ($\mu g/m^3$)

[c]Value based on less than 75 percent of data - not used for compliance purposes.

Bold font identifies the greatest value over the 3-year period.

Source: NYSDEC 1999b.

Ozone (O_3)

The closest representative ozone monitor to the Ravenswood site is the Morrisania Station in Bronx County. This station is located in a center city, commercial district and was sited to assess population exposure. NYSDEC notes that the monitor serves a representation of regional ozone levels. Another ozone monitor was once located in Queens College (Queens County), but sampling at this station was terminated in August of 1997. The Morrisania monitor is located approximate 8.7 km to the north-northeast of the project site. The maximum annual averages for the period 1996 through 1998 range from 37 to 41 $\mu g/m^3$. However, there is no applicable annual standard for ozone.

The highest-second highest hourly concentration in 1998 was recorded to be 186 $\mu g/m^3$, which is under the federal standard of 235 $\mu g/m^3$. Since 1996 there have been no cases where the hourly ozone standard was exceeded more than once in Morrisania, although other monitors located in the city have measured such exceedances.

It is difficult to infer pollution trends from ozone data since the occurrence of this pollutant depends not only on a source of the precursor pollutants (NO_x and VOC), but also the driving mechanism (sunlight) that accelerates ozone formation. Relative consistency in regional NO_x and VOC concentrations may result in different resultant ozone concentration depending on the particular meteorological pattern that was established during the May 1 through September 30 ozone season. In addition, long range transport of ozone and ozone precursors from upwind power plants in the Ohio Valley and Midwest may contribute to an increased background concentration in the Northeast.

Sulfur Dioxide (SO_2)

The closest, representative NYSDEC monitor for SO_2 is located approximately 1.7 km west of the project site at P.S. 59 in Manhattan (New York County). This monitor is considered representative to the Ravenswood site for the following reasons:

- The P.S. 59 monitor is located very close to the project site (1.7 kilometers or 1.1 miles west);
- The P.S. 59 monitor is located in urban population centers with proximate industrial usage, similar to the project site; and
- The P.S. 59 monitor has recent data up to and including the data year 1998.

Between 1996 and 1997, 3-hour and 24-hour SO_2 concentrations has decreased approximately 25 percent and 15 percent respectively; although decreases continued through 1998, the percentages were much less. Annual concentrations also showed a

substantial decrease from 1996 to 1997, dropping 20 percent; from 1997 through 1998 there was no change in the annual concentration. Data collected in 1998 show the 3-hour concentration at 13 percent of the NAAQS, the 24-hour concentration at 27 percent of the NAAQS, and the annual concentration at 39 percent of the NAAQS.

Inhalable Particulates (PM-10)

PM-10 is also recorded at PS 59 in Manhattan. PM-10 concentrations also dropped substantially from 1996 through 1997. The annual values dropped from 41 $\mu g/m^3$ to 31 $\mu g/m^3$, or approximately 25 percent, and the 24-hour values dropped from 74 $\mu g/m^3$ to 59 $\mu g/m^3$ or approximately 20 percent. During the 1997-1998 period, annual PM-10 values decreased slightly and the 24-hour values increased 22 percent to 72 $\mu g/m^3$. Data from 1998 show the 24-hour PM-10 level at 48 percent of the NAAQS and the annual concentration at 60 percent of the NAAQS.

Nitrogen Dioxide (NO_2)

The nearest, representative NO_2 monitor to the site is also located at PS 59 in Manhattan. Over the past three years, maximum annual NO_2 concentrations have shown a slight decline from the first to second year (79 $\mu g/m^3$ to 75 $\mu g/m^3$) and no change from the second to third year. The 75 $\mu g/m^3$ value recorded in 1998 is 75 percent of the 100 $\mu g/m^3$ ambient air quality standard.

Carbon Monoxide (CO)

The nearest, representative CO monitor to the site is also located at PS 59 in Manhattan. CO is more of a concern from mobile sources than from stationary combustion sources, as such, monitors are often located at busy traffic intersections (known as CO "hot-spots"). The annual averages for the period 1996 through 1998 decreased from 1,260 to 1,145 $\mu g/m^3$. However, there is no applicable annual standard for CO. Annual data collected from the period 1989 through 1998 show a gradual lessening of CO concentrations, which at PS 59 ranged from 1,947 $\mu g/m^3$ in 1989 to 1,145 $\mu g/m^3$ in 1998.

CO concentrations are monitored for comparison against a one-hour and an eight-hour standard. The highest-second highest hourly concentration in 1998 was recorded to be 5,040 $\mu g/m^3$, which is well under the standard of 40,000 $\mu g/m^3$. The maximum eight-hour concentration in 1998 was 4,465 $\mu g/m^3$, equal to that recorded in 1996, but both well under the 10,000 $\mu g/m^3$ standard.

Total Suspended Particulate Matter (PM)

The nearest representative total suspended particulate matter (PM) sampler is located at the Greenpoint Sewage Treatment Plant in the Greenpoint section of Brooklyn. The sampler location is approximately 3.1 km south of the project site. The Greenpoint sampler is located in a center city, industrial location and NYSDEC indicates that it is operated to assess population exposure. Another PM sampling station is located in mid-town Manhattan. However, that site is not considered representative of the project area since its location is in a highly trafficked area (Madison Avenue between 47th and 48th Streets), and PM impacts from mobile sources, including diesel-fueled buses and trucks, make the data not representative of the project site. The Greenpoint site, on the other hand, is similar to the project site; both are close to the East River, both are located in an industrial setting and both are adjacent to a residential neighborhood.

Annual PM concentration since 1987 at the Greenpoint site have not shown any trend and have ranged from 49 $\mu g/m^3$ to 70 $\mu g/m^3$. These values are all below the 75 $\mu g/m^3$ ambient air quality standard. Highest-second highest 24-hour average values at the Greenpoint site have remained well below the New York State standard of 250 $\mu g/m^3$. During 1997, the highest-second highest 24-hour PM value was 98 $\mu g/m^3$ and in 1996 the highest-second highest value was 95 $\mu g/m^3$. In 1998, the highest-second highest value increased to 111 $\mu g/m^3$.

Lead (Pb)

With the phase-out of leaded motor vehicle fuels in the 1980s, the issue of ambient lead has remained only at locations proximate to certain industries (i.e., lead smelters). The Greenpoint Sewage Treatment Plant monitor is the closest, representative location where particulate filters are analyzed for lead. Since 1987, annual ambient lead levels have showed a decline from the 0.11 to 0.13 $\mu g/m^3$ range in the late 1980s to the 0.07 to 0.08 $\mu g/m^3$ range in the late 1990s. There is no annual standard for lead; the not-to-exceed ambient air quality standard for lead is 1.5 $\mu g/m^3$ on a quarterly basis. At Greenpoint, the maximum quarterly values recorded in 1996 and 1997 were 0.16 $\mu g/m^3$; in 1998, the maximum quarterly value dropped to 0.14 $\mu g/m^3$. These values are all well below the ambient standard. Lead emissions are not expected to be a concern from the facility due to the use of natural gas as the primary fuel and light distillate oil as a back-up fuel.

Topography

The project site is located along the East River in the Long Island City section of Queens Borough. The site is immediately adjacent to the river and only a few feet above sea

level. To the west, across the East Channel, is Roosevelt Island and further west across the West Channel is Manhattan (at the approximate location of 69th Street). To the north are the Astoria Section of Queens and the south reaches of Bronx Borough across the Hell Gate Channel. To the east is the Ravenswood section of Queens; LaGuardia Airport is located approximately 5.2 km (3.2 miles) to the east-northeast (distances are from the site to the Marine Air Terminal located on the western portion of LaGuardia Airport). The northern boundary of Kings County and Brooklyn Borough is 2.5 km (1.5 miles) to the south. Terrain within 6.0 km (3.8 miles) of the site is relatively flat with elevations limited to 80 feet or less, with the exception of several higher hills to 140 feet in northern Manhattan. Beyond 6 km (3.8 miles), terrain remains below stack top (approximately 410 feet above sea level) throughout Brooklyn and Queens Counties. It is not until the Hudson River is crossed that elevated terrain (above stack top) is first encountered in the Palisades region of New Jersey. Terrain above stack top is first reached in the Palisades approximately 15 km (9.3 miles) to the north-northwest of the project site. Thereafter, only in a 1-kilometer-wide band of terrain that is the Palisades does the terrain consistently exceed stack top. This band stretches north-northeast parallel to the Hudson River from a distance of 15 km (9.3 miles) from the site and beyond. Another area of elevated terrain is noted 16 km (10 miles) and beyond to the north and northeast of the site in the areas of Mount Vernon, Yonkers and the northern Bronx. However, elevations within this terrain area remain below stack top. Further out, and beyond the range of the modeling, terrain exceeds stack top in northern Westchester County (terrain to 800 feet) and in Staten Island (at just over 400 feet).

Meteorology

The climate at the Ravenswood site is influenced by the nearby Atlantic Ocean and is classified as "modified continental".

The nearest National Weather Service (NWS) meteorological monitoring station is LaGuardia Airport, located approximately 5.2 km (3.2 miles) east-northeast of the project site. This station is classified as Class I, meaning it functions around the clock and collects all parameters of interest to the NWS. Of the various parameters collected, several are important in assessing the proposed project impacts. Specifically, wind speed and direction are necessary for the prediction of the location and magnitude of facility emission impacts (a third parameter, atmospheric stability, is calculated from several other parameters). Since combustion turbine performance is affected by inlet air temperature, average, maximum and minimum ambient temperature values are also important.

Wind speed and direction data covering a five-year period (1991 through 1995) has been plotted graphically as a "wind rose" in Figure 3-1. A wind rose depicts the various frequencies and intensities of wind direction and speed. Figure 3-1 shows the predominating wind flow from the northeast (in excess of 12 percent of the time) northwest (approximately 12 percent of the time) and the south (9 percent of the time). This distribution is consistent with the variety of weather to which the site is exposed: warm/hot summertime winds from the south, cold winds from the northwest in the winter, and northeast winds from coastal storms. At the project location, terrain has little effect on wind direction, unlike a mountainous region where valley channeling of wind would strongly influence a wind rose distribution.

The mean recorded temperature at LaGuardia Airport is 54.6 degrees Fahrenheit (° F) (2.5°C). The minimum and maximum mean monthly temperatures are 31°F (0°C) in January and 76°F (24.4°C) in July. The lowest temperature ever recorded at LaGuardia was -3°F (-9.4°C) and the warmest temperature ever recorded was 107°F (41.6°C). The NYSDEC Bureau of Technical Services has formulated guidance specific to the selection of appropriate maximum, minimum and average annual temperatures for modeling turbine performance. For this project, a minimum temperature of -5°F (-20.6°C) will be used, 100°F (37.8°C) will be used for the maximum and the previously mentioned average annual value will be used.

3.1.2 Regulatory Framework for Project Approval

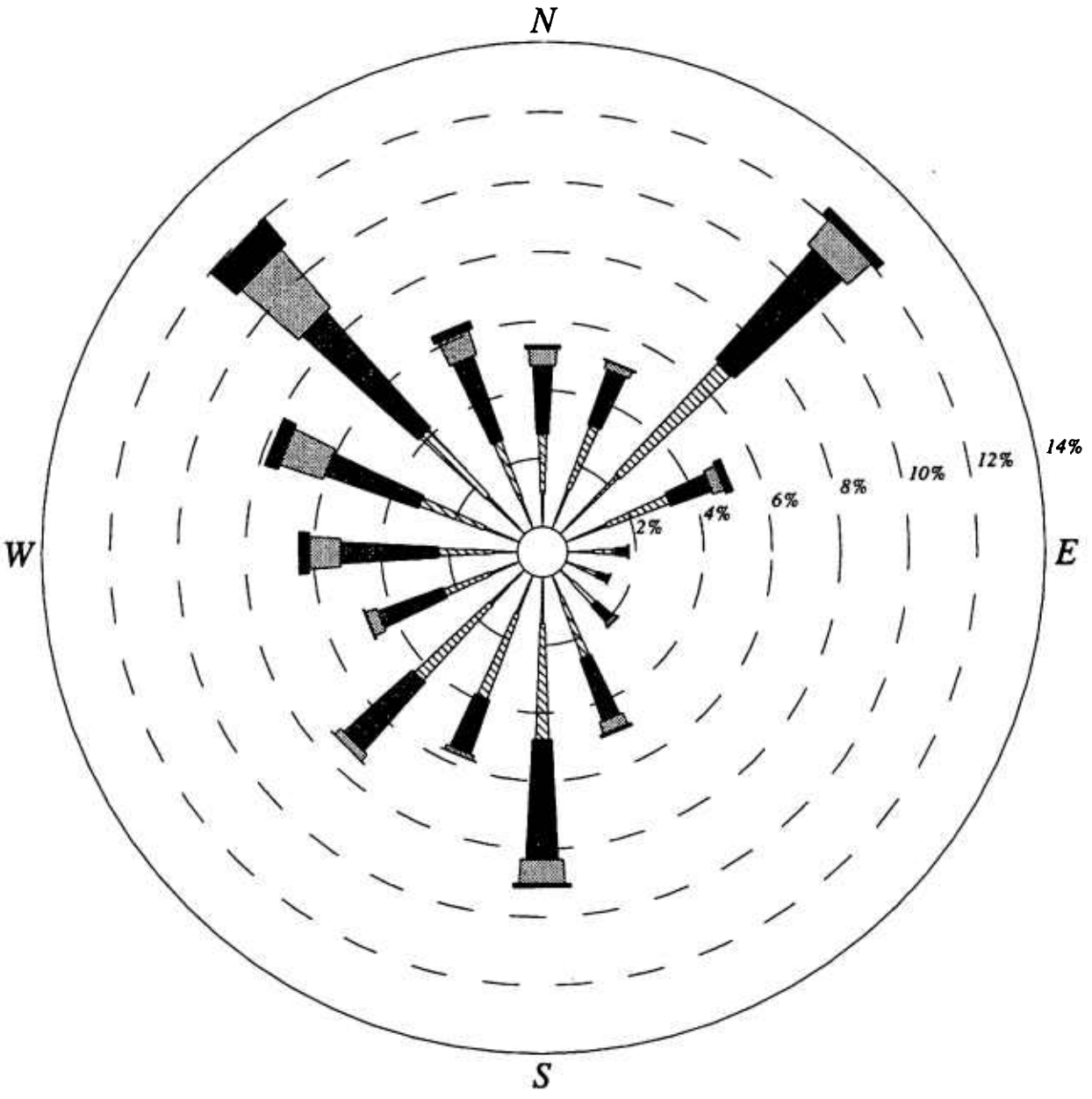
The proposed Facility will be highly efficient and outfitted with state-of-the-art emission controls resulting in near zero concentrations of combustion by-products. Nevertheless, it will potentially emit one or more regulated air pollutants that may exceed "major source" criteria. If so, the Facility will be subject to pre-construction new source review under the federal Prevention of Significant Deterioration (PSD) Regulations and the state Non-Attainment New Source Review (NSR) Regulations under 6 NYCRR Part 231-2. The Facility will comply with the requirements and procedures for major new source review permitting in New York State, as outlined in NYSDEC's Air Guide 12.

A facility permit application for the Facility will also be required. This will contain all necessary information for NYSDEC to generate a draft Title V permit in accordance with 6 NYCRR Part 201, and when approved, will authorize both construction and operation in accordance with all applicable state and federal requirements.

Title 24 of the Administrative Code and Charter of New York City provides rules and regulations for sources located within New York City. Key applicable requirements under

LaGuardia Annual 91-95

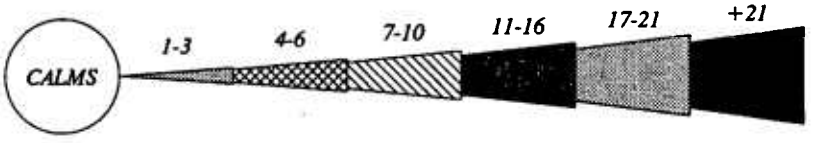
January 1-December 31; Midnight-11 PM



CALM WINDS 1.98%

NOTE: Frequencies indicate direction from which the wind is blowing.

WIND SPEED (KNOTS)



KeySpan Energy
250 MW Cogeneration Facility
Long Island City, Queens, NY

Figure 3-1. Wind Rose

Source: LaGuardia Airport, National Weather Service

TRC

State rules equal or exceed those for the City. The Facility will need to be registered with the New York City Department of Environmental Protection.

Demonstration of compliance with all applicable PSD, NSR, and other state and local requirements will support the Siting Board's issuance of a Certificate of Environmental Compatibility and Public Need. Following construction of the Facility, a state operating permit will be obtained pursuant to Title V of the CAA Amendments of 1990, as regulated under 6 NYCRR Subpart 201-6. This permit will consolidate all Facility design and operating requirements of the Siting Board Certificate.

The following section discusses the various federal and state air quality regulations that pertain to the proposed cogeneration project.

3.1.2.1 Standards

New Source Performance Standards

The New Source Performance Standards (NSPS) have been developed by U.S. EPA and codified in 40 CFR Part 60 for industrial process and combustion-related sources. Combustion turbine emission standards are specified in Subpart GG, Standards for Stationary Gas Turbines. The regulations identified in Subpart GG specify emission limits and continuous or surrogate monitoring requirements for NO_x and SO_2. The SO_2 standard (40 CFR 60.333) requires that either the flue gas SO_2 concentration be less than 150 ppmvd @ 15% O_2 or that the fuel contain less than 0.8% sulfur. However, since the turbine for the proposed project will be subject to Lowest Achievable Emission Rate (LAER) for NO_x, and Best Available Control Technology (BACT) requirements for SO_2, the anticipated permissible emission limits for these pollutants are expected to be well below the applicable NSPS emission limits. LAER and BACT are discussed in greater detail in the following sections.

National and New York State Air Quality Standards

The proposed location of the cogeneration project is an area currently designated as attainment for SO_2, NO_2 and PM-10. Therefore, for these pollutants the facility is required to demonstrate that the impact on air quality does not cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) or the New York Ambient Air Quality Standards (NYAAQS). The NAAQS and NYAAQS for the criteria pollutants are shown in Table 3-2.

Table 3-2: Ambient Air Quality Standards for Criteria Pollutants

		New York State Standards			Corresponding Federal Standards					
					Primary Standard			Secondary Standard		
Pollutant (1)	Avg. Period	Conc.	Units	Statistic (2)	Conc.	Units (3)	Statistic	Conc.	Units	Statistic
Sulfur Dioxide	12 consecutive months	0.03	ppm	Arithmetic Mean (A.M.)	80	µg/m³	A.M.			
	24-hour	0.14	ppm	Maximum	365	µg/m³	Maximum			
	3-hour	0.5	ppm	Maximum				1,300	µg/m³	Maximum
Carbon Monoxide	8-hour	9	ppm	Maximum	10	µg/m³	Maximum	10	µg/m³	Maximum
	1-hour	35	ppm	Maximum	40	µg/m³	Maximum	40	µg/m³	Maximum
Ozone (4)	1-hour	0.12	ppm	Maximum	235	µg/m³	Maximum	235	µg/m³	Maximum
Hydrocarbons (non-methane)	3-hour (6-9 am)	0.24	ppm	Maximum						
Nitrogen Dioxide	12 consecutive months	0.05	ppm	Arithmetic Mean (A.M.)	100	µg/m³	A.M.	100	µg/m³	A.M.
Lead (5)	3 consecutive months				1.5	µg/m³	Maximum			
Inhalable Particulates (PM-10) (6)	12 consecutive months				50	µg/m³	A.M.	50	µg/m³	A.M.
	24-hours				150	µg/m³	Maximum	150	µg/m³	Maximum
Total Suspended Particulates (PM) (7)	12 consecutive months	75	µg/m³	Geometric Mean (G.M.)						
	24-hours	250	µg/m³	Maximum	260	µg/m³	Maximum	150	µg/m³	Maximum

NOTES:

(1) New York State also has standards for beryllium, fluorides, hydrogen sulfide, and settleable particulates (dustfall). Ambient monitoring for these pollutants is not currently conducted.

(2) All maximum values are concentrations not to be exceeded more than once per calendar year. (Federal Ozone Standard not to be exceeded more than three days in three calendar years).

(3) Gaseous concentrations for Federal standards are corrected to a reference temperature of 25°C and to a reference pressure of 760 millimeters of mercury.

(4) Former NYS Standard for ozone of 0.08 ppm was not officially revised via regulatory process to coincide with the Federal standard of 0.12 ppm which is currently being applied by NYS to determine compliance status.

(5) Federal standard for lead not yet officially adopted by NYS, but is currently being applied to determine compliance status.

(6) Federal standard for PM-10 not yet officially adopted by NYS, but is currently being applied to determine compliance status.

(7) New York State also has 30, 60, and 90-day standards as well as geometric mean standards of 45, 55, and 65 µg/m³ in Part 257 of NYCRR. While these PM standards have been superseded by the above PM-10 standards, PM measurements may still serve as surrogates to PM-10 measurements in the determination of compliance status.

Source: NYSDEC, 1993.

Under 6 NYCRR, Subpart 257, the NYSDEC has promulgated ambient air quality standards (AAQS) for the NAAQS criteria pollutants, as well as certain other contaminants. It will be necessary to demonstrate through air quality dispersion modeling that the Facility will comply with all applicable ambient limits for the criteria pollutants, as well as for potentially emitted trace constituents such as fluorides, beryllium, and hydrogen sulfide. Standards for these pollutants are listed in Table 3-3.

In addition, the proposed Facility air quality impact in terms of other non-criteria pollutants will be evaluated for compliance with health risk criteria, upon request of the New York State Department of Health (NYSDOH).

Table 3-3: - New York State Ambient Air Quality Standards for Non-Criteria Pollutants

Pollutant (1)	Averaging Period	Concentration	Units	Statistic
Fluorides	1-month	1.0	ppb	Not to exceed values referenced to 25 degrees Celsius and 760 mm Hg
	1-week	2.0	ppb	
	24-hour	3.5	ppb	
	1-hour	4.5	ppb	
Beryllium	1-month	0.01	$\mu g/m^3$	Maximum
Hydrogen Sulfide	1-hour	0.01	ppm	Not to exceed values referenced to 25 degrees Celsius and 760 mm Hg
Settleable Particulates (Dustfall) (2)	12 Consecutive months	0.60	$mg/cm^3/mo$	50 percent of the values of the 30-day average shall not exceed standard
	12 Consecutive months	0.90	$mg/cm^3/mo$	84 percent of the values of the 30-day average shall not exceed standard

(1) Ambient monitoring for these pollutants is not currently conducted.

(2) Ambient standards for dustfall represents New York City Level IV classification.

Source: 6 NYCRR 257 and 6 NYCRR 288.

The Environmental Conservation Law, Article 19, Title 9 (pursuant to the State Acid Deposition Control Act) will require that the Facility's contribution of sulfate and nitrate deposition on each of eighteen sensitive New York, nearby state, and Canadian receptors be estimated. Procedures implemented by NYSDEC for quantifying proposed sources relative contributions to the total acidic deposition will be utilized. This is provided in the NYSDEC guidance memorandum, Source Specific Acidic Deposition Impacts for Permits Application (L. Sedefian to IAM Staff; March 4, 1993).

The project area is designated as severe non-attainment for ozone. Therefore, facilities emitting more than 25 tons per year of NO_x or VOC are subject to New Source Review (NSR) for these pollutants. NSR requirements, discussed in greater detail in the following sections, include the use of LAER controls and the need to obtain emission offset requirements. The emissions of these combustion products from the proposed project will be greater than this threshold and therefore will be subject to these NSR requirements.

3.1.2.2 Prevention of Significant Deterioration Permit

The PSD program in New York State is the administration of the federal rule by direct delegation from the U.S. EPA. A new facility that is among 28 EPA listed source categories in 40 CFR 52.21, that has potential 'major' emissions (i.e., 100 tpy or greater of any PSD-regulated pollutant, and that is located in an area not classified by U.S. EPA as "non-attainment" of the National Ambient Air Quality Standard (NAAQS) for that pollutant, is subject to PSD review. Such a facility is thereby also subject to PSD review for all other applicable pollutants potentially emitted in "significant" emission rates (SERs), as defined in the PSD Regulation and provided in Table 3-4. The proposed combustion turbine cogeneration facility is considered by U.S. EPA to be a listed source, as a "fossil fuel-fired" steam electric plant of more than 250 million British thermal units per hour heat input".

Table 3-4: PSD Significant Emission Rates

Pollutant	Significant Emissions Rates (Tons per year)
Carbon Monoxide (CO)	100 [(a)]
Sulfur Dioxide (SO_2)	40
Total Suspended Particulate (PM)	25
PM-10	15
Nitrogen Oxides (NO_x)	- [(b)]
Ozone (measured as VOC)	- [(c)]
Lead	0.6
Fluorides	3
Sulfuric Acid Mist	7
Total Reduced Sulfur Compounds	10

(a) Included as a PSD pollutant if Queens County is re-designated as attainment for CO
(b) Not applicable to PSD since NOx is an ozone non-attainment (NSR) precursor pollutant.
(c) Not applicable to PSD since VOC is an ozone non-attainment (NSR) precursor pollutant.

Source: U.S. EPA 1990, Table A-4.

Under the PSD regulations, it must be demonstrated that for each PSD-affected pollutant, the Facility will incorporate BACT, maintain compliance with the NAAQS, comply with PSD Class II air quality increment limitations, and result in no unacceptable impact on soils, vegetation, and visibility. Based upon expected facility emissions, an air quality impact analysis will be required for NO_2, SO_2, CO and PM/PM-10. A BACT demonstration will be required for SO_2, PM/PM-10, H_2SO_4 and possibly CO. As was discussed in Section 3.1.1, two scenarios are possible specific to the CO re-designation effort. CO is discussed in this section assuming that Queens County is re-designated as in attainment for CO. The following sections discuss modeling requirements.

Compliance with the NAAQS

Compliance with the NAAQS will be demonstrated for each PSD-affected pollutant. A key element in this demonstration will be the determination of whether any of the PSD-affected pollutants has significant impacts. For any pollutants with significant impacts, multi-source and increment consumption modeling will be performed. Impacts will then be added to background air quality levels to assess whether compliance with the NAAQS is maintained. These steps are discussed in further detail below.

Impact Area Determination

The first step of the ambient air quality analysis is to perform atmospheric dispersion modeling to determine if the facility will have significant impacts for one or more pollutants that exceed the U.S. EPA Significant Impact Concentrations (SIC's). These concentrations are presented in Table 3-5.

Multi-Source Modeling

Facilities for which predicted significant impact concentrations are below the levels shown in Table 3-5 need not be evaluated further. Those facilities for which predicted impacts exceed these values for one or more pollutants are considered to have an "area of impact" (which is defined as the area to the distance at which predicted air quality impacts fall below the SICs) and must undergo further evaluation which will include additional modeling in combination with existing major sources within 50 km of the proposed source's area of impact to evaluate compliance with NAAQS and NYAAQS. These compliance analyses will be performed using NYSDEC-recommended U.S. EPA guideline dispersion models and modeling methodologies. The technical guidance for the Facility NAAQS compliance demonstration will be the NYSDEC Air Guide 26: NYSDEC Guidelines on Modeling Procedures for Source Impact Analysis (NYSDEC,

Table 3-5: U.S. EPA Significant Impact Concentrations

Pollutant	Averaging Period	Significant Impact Concentration (µg/m3)
Sulfur Dioxide (SO_2)	3-hour	25
	24-hour	5
	Annual	1
Nitrogen Dioxide (NO_2)	Annual	1
Carbon Monoxide (CO)	1-hour	2,000
	8-hour	500
Particulates (as PM & PM-10)	24-hour	5
	Annual	1

Source: U.S. EPA, 1990, Table C-4

1996), and Air Guide 36: Emission Inventory Development for Cumulative Air Quality Impact Analysis (NYSDEC, 1995). Each of these guidelines were developed consistent with the U.S. EPA New Source Review Workshop Manual (U.S. EPA, 1990), and the U.S. EPA Guidelines on Air Quality Models (Revised), and incorporated in Appendix W of 40 CFR Part 51

New York County (Manhattan) is currently designated as a non-attainment area for PM-10 (40 CFR Part 81). Although the proposed project will be located in Queens County, which is an attainment area for this pollutant, the facility will be required to demonstrate that its emissions of PM-10 will not result in a significant impact on PM-10 levels in the New York County non-attainment area (6 NYCRR Part 231-2).

Increment Analysis

Facilities for which predicted impacts exceed the SICs shown in Table 3-5 will also reqquire additional modeling with other PSD sources within 50 km of the proposed source's area of impact to evaluate compliance with PSD increments. PSD increments define the maximum allowed incremental air quality impacts for all existing and proposed PSD sources. There are 3 classes of PSD increments, with the most stringent,

identified as Class I, for pristine areas and the most lenient, Class III, reserved for the most polluted areas. The majority of the country, including the site area, is designated as Class II. The closest Class I areas are in Vermont and southern New Jersey. The PSD increments are presented in Table 3-6.

Table 3-6: PSD Increments (µg/m3)

Pollutant[a]	Class I Increment	Class II Increment	Class III Increment
SO_2			
Annual [b]	2	20	40
24-Hour [c]	5	91	182
3-Hour [c]	25	512	700
PM-10			
Annual [b]	4	17	34
24-Hour [c]	8	30	60
NO_2			
Annual [b]	2.5	25	50

(a) There are no PSD increments established for CO

(b) Never to be exceeded

(c) Not to be exceeded more than once per year

Source: U.S. EPA, 1990; Table C-2.

Ambient Air Quality Monitoring

Proposed facilities subject to PSD review may have to perform up to one year of preconstruction ambient air quality monitoring for those pollutants emitted in amounts exceeding the significant emission rates shown in Table 3-4, unless granted an exemption by the reviewing agency. U.S. EPA Region II can grant an exemption from the monitoring if: 1) the proposed source demonstrates that it will have maximum impacts below the pollutant specific significant monitoring concentrations (SMC's), which are presented in Table 3-7, or 2) representative, quality assured air quality data exists for those pollutants for which impacts are predicted to exceeds the SMC's. KeySpan Energy will submit a request for exemption from ambient air quality monitoring to U.S. EPA

Region II based on the proximity of NYSDEC monitoring stations to the proposed project site.

Table 3-7: U.S. EPA Significant Monitoring Concentrations

Pollutant	Averaging Period	Significant Monitoring Concentration (ug/m^3)
Carbon Monoxide	8-hour	575
Nitrogen Dioxide	Annual	14
Sulfur Dioxide	24-hour	13
Particulate Matter (PM/ PM-10)	24-hour	10
Beryllium	24-hour	0.001
Fluorides	24-hour	0.25
Lead	3-month	0.1
Sulfuric Acid Mist, Total Reduced Sulfur, Reduced Sulfur	-	(a)

(a) Acceptable monitoring techniques not available

Source: U.S. EPA, 1990; Table C-3.

Additional Impact Analyses

The major source status of the proposed cogeneration project means that certain additional analyses are required as part of the modeling assessment. These include modeling to assess potential for impacts to soils and vegetation, and visibility in the area surrounding the proposed plant.

Class I Area Impacts

Proposed major sources within 100 km of a Class I area must perform an assessment of potential impacts in this area. This includes the additional impact analyses described above as well as impacts on PSD increment, regional haze and deposition. The nearest Class I areas to the proposed project are the Lye Brook National Wilderness Area, in Vermont and the Edwin B. Forsythe National Wildlife Refuge at Brigantine, New Jersey located approximately 280 kilometers to the north/northeast and approximately 115 kilometers to the south, respectively. Since the proposed project is located well over 100

kilometers from the nearest Class I areas, the proposed project will not be required to assess air quality impacts at these sensitive air quality areas.

Best Available Control Technology Demonstration

Facilities subject to PSD must perform a BACT demonstration for those pollutants for which emissions are expected to exceed the SER's presented in Table 3-4. A BACT demonstration consists of identifying all technically feasible emission control measures for each pollutant for the proposed size and type of combustion source (i.e. large, stationary combustion turbine). These control technologies are then rated according to their effectiveness from the most to least effective (so-called top down approach) and then evaluated for their economic, environmental, and energy impacts. Environmental benefits are then related to cost effectiveness on a dollars (cost) per ton (of pollutant removed) basis and the technology with the optimal, incremental cost effectiveness selected as BACT for each pollutant. A BACT analysis will be required for SO_2, PM/PM-10, H_2SO_4, and CO (if the CO non-attainment area in the New York Metropolitan Area is re-designated as attainment).

3.1.2.3 Non-Attainment New Source Review Requirements

In areas classified as non-attainment of the NAAQS for a given pollutant, the NSR (rather than PSD) permitting requirements of 6 NYCRR Subpart 231-2 are applicable to major new emission sources of that pollutant. Queens (Queens County), New York is designated as "severe non-attainment" for ozone (O_3), and is currently designated "moderate non-attainment" for carbon monoxide (CO) (40 CFR 81). NSR includes the need to apply LAER and obtain emission offsets.

For any given source, LAER is defined as the more stringent of the following criteria.

- The most stringent emission limitation contained in any state implementation plan for the subject class or category of source, unless the owner or operator of the proposed source demonstrates that such limitations are not achievable; or
- The most stringent emission limitation which is achieved in practice.

In addition, 6 NYCRR Subpart 231-2 requires an analysis of alternative sites, sizes, production processes, and environmental control techniques to be performed which demonstrates that the benefits of the proposed Facility outweigh the environmental and social costs imposed as a result of its location and construction in New York State.

Carbon Monoxide (CO)

Major new sources of CO in a moderate non-attainment area are also subject to LAER control and emission offsets requirements at a 1.15 to 1 ratio (i.e., 1.15 tons per year offset for every ton of potential Facility emissions), as well as demonstrating "net air quality benefit". However, the NYSDEC exempts otherwise subject sources from these requirements if potential CO emissions are below 100 tons per year and the ambient air quality impact is insignificant. As previously noted, the U.S. EPA has initiated the process to re-designate the New York City Metropolitan area as in attainment for CO. As was discussed in Section 3.1.1, two permitting scenarios for CO will be considered to cover either outcome of the re-designation effort.

Ozone (O_3)

Major new sources of VOC and NO_x in a severe O_3 non-attainment area are required to demonstrate LAER for control of VOC and NO_x, the regulated pollutant emission precursors of ambient O_3. In addition, emission offsets must be obtained from other existing sources of VOC and NO_x.

Since the proposed Facility will have the potential to emit 25 tons per year or more of NO_x and VOC, it will be a major source of these pollutants, and LAER control will be required. A demonstration for the Facility will be made to establish the proposed LAER for NO_x and VOC emissions. The U.S. EPA RACT/BACT/LAER Clearinghouse database will be reviewed to identify the approved LAER and supporting justification for recently permitted combustion turbine installations. Other information sources (e.g., state agency permit files) will also be reviewed to identify applicable case information to be incorporated into the LAER analysis. This analysis will entail a "top-down" approach akin to the BACT demonstration, but will be based on the above LAER criteria. It must be shown that any methods of potentially greater control than the proposed LAER are not appropriate or have not been adequately demonstrated.

Emission offsets for the potential annual NO_x and VOC emissions of the Facility will be acquired at the ratio of 1.3:1 (i.e., 1.3 tons per year offset for every ton per year of potential Facility emissions). These offsets, identified as NYSDEC-certified emission reduction credits (ERC), will be secured in conformance with 6 NYCRR Subpart 231-2 and the NYSDEC Air Guide 26 Appendix D, Interpretation of Subpart 231-2 Provisions on Emission Offset Source Location and Net Air Quality Benefit Analysis.

3.1.2.4 Other Regulatory Requirements

NO_x Budget Program

As an electric generating unit with a capacity of 15 MW or greater and a seller of electricity, the proposed cogeneration project will be subject to NO_x budget requirements.

On September 27, 1994 the Ozone Transport Commission (OTC) adopted a Memorandum of Understanding (MOU) committing the signatory states to develop and propose region-wide NO_x emission reductions in 1999 (Phase 2) and 2003 (Phase 3) (NESCAUM-OTC, 1994). The NO_x Budget Model Rule implements the OTC MOU NO_x emission reduction requirement through a market-based "cap and trade" program. This type of program sets a regulatory limit on mass emissions during the "ozone season" (May 1 through September 30) from a discrete group of sources, allocates allowances to the sources authorizing emissions up to the regulatory limit, and permits trading of allowances in order to effect cost efficient compliance with the cap on the state's emissions. The number of allowances allocated is limited by the cap on the state's emissions, and is not considered surplus in the same manner as emission reductions in an emission reduction-trading program.

To implement Phase 2 of the OTC MOU, the required emission reductions are applied to a 1990 baseline for NO_x emissions in the OTR to create a "cap", or emissions budget for each ozone season from 1999 through 2002. The budget would then be allocated as "allowances" to the emission units subject to the program (budget sources). Budget sources are defined as fossil fuel fired boilers and indirect heat exchangers of 250 mmBtu or greater, and electric generating units of 15 MW, or greater. Budget sources are defined on a unit level, meaning that each boiler or utility generator is considered a separate budget source. Beginning in 1999, the sum of NO_x emissions from all budget sources during the May through September control period can not exceed the aggregate number of allowances allocated to the state. An allowance is equal to one ton of NO_x emissions. The budget sources are allowed to buy, sell, or trade allowances to meet their needs.

Although the Phase 3 program elements are still being drafted among the participating OTC members, the allocation process will likely change and become "self-adjusting". Draft regulations being proposed for New York State will be codified as 6 NYCRR Part 204 (Proposed rules published in the New York State Register, June 30, 1999). Basically, allowances for an affected unit will be based on actual operations during specific, proceeding baseline periods. For the 2003 control period (a control period represents each ozone season running form May 1 through September 30), the allocation

formula will consider the greatest heat input experienced by an affected unit during the 1995 through 1998 control periods. Starting with the 2004 control period (and for each control period thereafter), the allocation formula will consider an affected unit's greatest heat input during any single control period from the preceding three control periods. Quantities of NO_x allowances will be set aside for new sources and to reward energy efficiency measures. The allowances that have been set aside will be provided to new sources to cover actual NO_x emissions; new sources will continue to have these allowances provided until the new facility is able to establish a three-year baseline of operations. At this point, the new facility is entered into the Phase 3 budget pool and will have allowances allocated to it following the formula applied to all other existing sources. U.S. EPA has published notice of proposed rulemaking which would approve the New York SIP for NO_x budget and allowance trading (64 FR 55667, October 14, 1999)

A facility subject to the provisions of the NO_x Budget Program must identify an Authroized Account Representative (AAR) and establish a NO_x Allowance Trading Account. The AAR is responsible for maintaining the facility account, including ensuring that enough allowances are in place in time to meet the regulatory deadline. Shortfalls in the account can be made up in several ways: transferring allowances from another facility account or outright purchase of the needed allowances. Sufficient quantities of allowances are available through NYSDEC new source set-aside allowances or through environmental brokerage firms.

In order to ensure that NO_x emissions do not exceed allowances, budget sources are required to monitor and report NO_x emissions during the control period of each year. The preferred method of emissions monitoring includes utilization of a sophisticated Continuous Emissions Monitoring (CEM) system, as approved under 40 CFR Part 75 (the Acid Rain Program). Although Part 75 need not be followed for the NO_x Budget program (the program allows for monitoring at a "near Part 75" level of effort), the proposed project will need to comply with Part 75 under the Acid Rain program. Any budget source currently subject to Part 75 monitoring must maintain and use that monitoring for emissions tracking under the NO_x Budget Program.

Acid Rain Program

Title IV of the CAAA required U.S. EPA to establish a program to reduce emissions of acid rain forming pollutants, called the Acid Rain Program. The overall goal of the Acid Rain Program is to achieve significant environmental benefits through reductions in SO_2 and NO_x emissions (the NO_x element of the program is only applicable to coal-fired utility units and will not be considered further in discussion since the proposed project will not fire solid fuels). To achieve this goal the program employs both traditional and

market-based approaches for controlling air pollution. Under the program, existing units are allocated SO_2 allowances by the U.S. EPA. Once allowances are allocated, affected facilities may use their allowances to cover emissions, or may trade their allowances to other units under a market allowance program. In addition, applicable facilities are required to install and operate a CEM system for affected units. The CEM requirements (Part 75) of the Acid Rain Program include: an SO_2 concentration monitor or alternative surrogate method; a NO_x concentration monitor; a volumetric flow monitor; an opacity monitor; a diluent gas (O_2 or CO_2) monitor; and a computer-based data acquisition and handling system for recording and performing calculations.

Implementation of the Acid Rain Program by the U.S. EPA has been broken into two phases. Phase I of the program required 110 sources identified in the CAAA to operate in compliance by January 1, 1995. Facilities identified in Phase II of the program are required to operate in compliance by January 1, 2000. Additionally, existing Phase II facilities were required to install and operate a certified CEM system after January 1, 1995. The proposed cogeneration project is subject to the Acid Rain Program based upon the provisions of 40 CFR 72.6(a)(3) since the turbines are considered utility units under the program definition and do not meet the exemptions listed under paragraph (b) of this Section. The proposed facility will be subject to Phase II Acid Rain requirements and will be required to submit an acid rain permit application 24 months prior to the date on which the unit expects to begin service as a generator.

State Emission Limits

The sulfur content of the fuel is limited under 6 NYCRR, Subpart 225-1.2 and under the Administrative Code and Charter of the City of New York, Title 24 Environmental Protection and Utilities, Subchapter 8 Fuel Standards. The Facility is subject, under state and city rules, to the limit of 0.20% sulfur content designated for distillate oil in New York City. It is anticipated, however, that 0.05% sulfur distillate oil will be used by the Facility and only as a backup (secondary) fuel source.

The particulate emissions for a stationary combustion installation firing oil, and with maximum heat input exceeding 250 mmBtu/hr, such as the proposed Facility, is limited by 6 NYCCRR Subpart 227-1.2 to 0.10 lb/mmBtu heat input. The PSD BACT requirement will result in a more stringent limitation.

Subpart 211.3 of 6 NYCRR will limit the opacity of Facility stack emissions to not greater than 20% (6-minute average), except for one 6-minute period per hour of not greater than 57%. Opacity is also regulated by 6 NYCRR, Subpart 227-1.3 which will limit opacity to less than 40% (i.e., Ringelmann No. 2) for any time period, and 20%

(Ringelmann No. 1) for a period of three or more minutes in any continuous period. NYSDEC has proposed a revision to 227-1.3 that would limit opacity to not greater than 20% (6-minute average), except for one 6-minute period per hour of not greater than 27%.

State Reasonably Available Control Technology Requirements

Pursuant to 6 NYCRR Subpart 227-2, "reasonably available control technology" (RACT) requirements have been imposed on all stationary sources of NO_x. Although the facility will be subject to the requirements of Subpart 227-2, proposed use of SCR for NO_x control in conjunction with evolving low-NO_x turbine technology will result in NO_x emissions that will be below those required under RACT. In addition, specific Part 227-2 requirements related to recordkeeping and reporting will apply.

Risk Management Program

Accident and risk management regulations pursuant to Title III of the CAAA (40 CFR Part 68, section 112r) require a subject facility to develop a risk management program (RMP). The RMP requirement is triggered for each regulated toxic and flammable substance present on-site in greater quantity than its specified regulatory threshold. Each regulated toxic substance anticipated to be present at the Facility will be accounted for and quantified with respect to its respective threshold.

The facility may be designed to accommodate a dedicated aqueous ammonia storage tank, minimizing any consequence of accidental releases. If technically feasible, the Facility design and maintenance plan will ensure that the risk of potential impacts on the public is de minimis, triggering no more than minimal requirements under 40 CFR Part 68.

New York City Department of Environmental Protection (NYCDEP) Requirements

Local permitting and regulatory issues are subsumed in the Article X review process. Title 15 RCNY, Chapters 2 and 9 require that owners of gas- and oil-burning installations acquire a Certificate of Operation from the NYCDEP Bureau of Air Resources. The Facility will comply with all applicable NYCDEP requirements found in 15 RCNY Chapter 2 and 9. Discussions will be held with the NYCDEP Bureau of Air Resources to ensure that all necessary and applicable standards are met.

Title 15 RCNY, Chapter 41 requires a responsible party involved in the processing, storage, handling or use of regulated toxic substances to participate in a detailed facility

reporting program with NYCDEP. Due to the proposed SCR NO_x control technology, the Facility may be subject to Chapter 41 requirements for aqueous ammonia (NH_3). (See also the discussions related to the Risk Management Program.) As was previously noted, New York City rules limit fuel sulfur content to 0.20% by weight for distillate oil.

Good Engineering Practice Stack Height

Section 123 of the CAAA required U.S. EPA to promulgate regulations to assure that the control of any air pollutant under an applicable State Implementation Plan (SIP) was not affected by: 1) stack heights that exceed Good Engineering Practice (GEP), or 2) any other dispersion technique. The U.S. EPA provides specific guidance for determining GEP stack height and for determining whether building downwash will occur in the Guidance for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations), (U.S. EPA, 1985). GEP is defined as "the height necessary to ensure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, and wakes that may be created by the source itself, nearby structures, or nearby terrain "obstacles".

The GEP definition is based on the observed phenomena of atmospheric flow in the immediate vicinity of a structure. It identifies the minimum stack height at which significant adverse aerodynamics (downwash) is avoided.

The U.S. EPA GEP stack height regulations specify that the GEP stack height is calculated in the following manner:

$$GEP = HB + 1.5L$$

where: HB = the height of adjacent or nearby structures, and

L = the lesser dimension (height or projected width of the adjacent or nearby structures)

KeySpan Energy's cogeneration project will be designed with a single exhaust stack. Preliminary site layout indicates that the stack will be located within the downwash zone caused by the existing power plant structures at the Ravenswood site. The controlling structure for the proposed stack will be the existing turbine building that houses the large Allis Chalmers "Big Allis" turbine. This turbine building has a height of 225 feet above grade level and would result in a GEP stack height of 562.5 feet above grade level. Final stack design may have a lower height in order to minimize viewshed impacts, provided air impacts allow for the construction of a non-GEP stack.

3.1.3 Potential Emissions and Air Quality Impacts

Potential Impacts on Air Quality

The proposed facility turbines will be required to employ very efficient emission control technology and will primarily operate on clean burning natural gas; low sulfur distillate oil will be used only as a backup fuel. A full air quality modeling analysis will be used to demonstrate the proposed facility meets the applicable air quality standards; the models and procedures to be used in the full analysis are discussed in Section 3.1.4.

Proposed Plant Emissions

The proposed cogeneration project will result in emissions of several regulated air pollutants. Specifically, these pollutants include nitrogen oxides (NO_x), sulfur dioxide (SO_2), inhalable particulate matter (PM-10), total suspended particulate matter (PM), carbon monoxide (CO), and volatile organic compounds (VOC). Minute quantities of trace elements are in distillate oil, and these elements, specifically lead, will also be emitted. Selective Catalytic Reduction (SCR) using ammonia injection will be employed to reduce emissions of NO_x. A small quantity of un-reacted ammonia may also be emitted. This amount should not to exceed 10 ppm average in-stack concentration. The following discusses the specific emissions expected from the proposed project.

Nitrogen oxides

NO_x forms as a result of fuel bound nitrogen and as a by-product of the combustion process itself. Typically, higher peak combustion temperatures result in higher NO_x emissions. The combustion gas turbine proposed for the project will use dry low-NO_x technology in which the peak flame temperature is reduced by increasing the size and duration of the flame front in the combustion chamber when firing natural gas. During distillate oil firing, steam or water is injected into the combustion chamber to act as a heat sink to lower the peak flame temperature. NO_x emissions are further reduced using SCR in which ammonia reacts with NO_x to form nitrogen (elemental) and water vapor. This process will significantly reduce NO_x emissions. NO_x emissions will be somewhat higher during periods of startup, fuel transfer, and off-peak loads, when the SCR may be not be operating at maximum efficiency.

Sulfur Dioxide

SO_2 is formed by the reaction of sulfur in the fuel and oxygen. Sulfur is present in trace amounts in natural gas as an odorant (methyl/ethyl mercaptan) and in distillate fuel oil. The new turbine will use distillate oil with a very low sulfur content (0.05%).

Particulate Matter (PM-10 and PM)

Very small amounts of particulate matter are present in exhaust gas as both unburned fuel carbon compounds and from trace mineral matter in distillate fuel oil. Additionally, the PM-10 component (that is, particulate matter with a mean diameter less than 10 micrometers) also includes those compounds that are considered to condense from the hot exhaust gas to form small particles. This fraction is called condensible particulates and may represent the majority of the particulate emission during natural gas firing. Additionally, the condensible fraction may include trace ammonia compounds resulting from a reaction with sulfur trioxide and ammonia from the SCR used to control NO_x emissions. The PM-10 emissions from the proposed project will include and account for both forms of particulate emissions, providing a conservative emission rate.

Carbon Monoxide

CO formation is typically the result of incomplete combustion of fuel within the turbine. Incomplete combustion typically occurs under start-up and low-load operating conditions. Since the project is located in an area that is currently designated as moderate non-attainment for CO, CO emissions may need to be controlled to LAER levels. As was previously noted, the need to consider LAER may be dependent on the Federal actions to re-designate the project area as in attainment for CO.

Volatile Organic Compounds

VOC emissions occur under the same conditions that form carbon monoxide. The combination of high efficiency turbine combustors, clean fuels and good operational practices will serve to minimize emissions of VOCs.

Ammonia

As previously discussed, ammonia is injected into the exhaust gas stream in order to react with nitrogen oxides to reduce the NO_x emissions. A small quantity of ammonia may

remain un-reacted in the exhaust stream resulting in emissions of typically less than 10 ppm.

Hazardous Air Pollutants (HAPs)

The use of low sulfur distillate oil (i.e., kerosene) as a back-up fuel may result in the release of trace elements. However, kerosene is a highly refined fuel and is the cleanest of the liquid distillates. Therefore, HAP emissions are expected to be minimal.

Fugitive Dust

The construction of the proposed project may result in sort-term and temporary fugitive dust emissions. While clearing and grading activities will be limited since the proposed site is paved, the transport and staging of the construction components on the site may generate fugitive particulate emissions. Where feasible, dust screens and water sprays will be used to minimize fugitive particulate emissions. The construction process is transient and is anticipated to last approximately 18 months, after which time all construction access roads will be paved or restored and all open soil areas will be covered with grass and plantings. Fugitive particulate emissions after construction are expected to be minimal.

3.1.4 Proposed Air Quality Modeling

Meteorological Data

A five-year surface and upper air meteorological database (1991 to 1995) will be used in the atmospheric modeling assessment. National Weather Service (NWS) surface data collected at LaGuardia Airport, located approximately 5.2 km (3.2 miles) east-northeast of the project site will be used. This five-year period (1991 to 1995) represents the last period when surface data were manually collected at LaGuardia Airport; data is currently collected using automated means and does not allow for the proper calculation of atmospheric stability. LaGuardia Airport data is representative of site conditions as terrain features and proximity to major water bodies (which influence local climate) are nearly identical. Upper air data collected from the U.S. Department of Energy's Brookhaven National Laboratory site (NWS station 94703) and Atlantic City Airport (NWS station 93755) will also be used in the modeling assessment. Two stations are required to complete the five-year record since data collection at Atlantic City, located 103 miles south-southwest of the project site, was terminated in August 1994 with the Brookhaven Laboratory site assuming responsibility at that time. The Brookhaven Laboratory site is located approximately 56 miles to the east, in Suffolk County

approximately midway between the north and south shores of Long Island. Brookhaven is the nearest location where upper air data is currently collected relative to the project site and is very much representative of upper air conditions at the project site as both are influenced by the same continental/coastal features.

Atmospheric Dispersion Modeling

Standard U.S. EPA dispersion models will be utilized for the dispersion modeling studies. These models will include ISCST3 and SCREEN3 for simple terrain areas and ISCST3/COMPLEX 1, RTDM or CTSCREEN for complex (elevated) terrain areas.

Distillate Fuel HAPs

As was previously noted, the use of distillate fuel may result in the emission of HAPs. Using mass balance or AP-42 emission factors, HAP emission rates will be estimated for distillate fuel firing. Acceptable air concentration levels developed by NYSDOH or listed in NYSDEC's Air Guide-1 "Guidelines for the Control of Toxic Ambient Air Concentrations" (NYSDEC, 1991), will be used in assessing impacts from these HAPs as required. Specific analytical procedures proposed to be followed will be detailed in the Air Quality Modeling Protocol to be submitted to the NYSDEC.

Basically, the procedures for performing an impact analysis are well defined for those HAPs that are listed in Appendix C of Air Guide-1. For pollutants that are not listed in Air Guide-1 or that do have assigned concentration levels from the NYSDOH, pollutant-specific impact thresholds will need to be developed. The development of such impact thresholds will use toxicity information contained in Material Safety Data Sheets or the Merck Index and recommended exposure limits provided by the National Institute of Occupational Safety and Health (NIOSH) and/or the American Conference of Governmental Industrial Hygienists (ACGIH). This information will allow for the calculation of the impact thresholds, known otherwise in Air Guide-1 as short-term and annual guideline concentrations (SGCs and AGCs, respectively). For unlisted pollutants that are classified as "High Toxicity", NYSDEC will be contacted to confirm specific analytical procedures.

Modeling Protocol

The air quality assessment that will be reflected in the Article X application will be performed in accordance with a modeling protocol developed for and approved by the NYSDEC and U.S. EPA Region II. The modeling protocol will identify the modeling procedures and applicable models proposed for use in assessing the air quality impacts

from the proposed facility. The protocol will be developed following guidance outlined in the following:

- U.S. EPA's "Guideline on Air Quality Models" (U.S. EPA, 1999, plus supplements);
- U.S. EPA's "Screening Procedures for Estimating Air Quality Impact of Stationary Sources, Revised" (U.S. EPA, 1992);
- NYSDEC's Air Guide 26 "NYSDEC Guidelines on Modeling Procedures for Source Impact Analyses" (NYSDEC, 1992); and
- NYSDEC's Air Guide 1 "Guidelines for the Control of Toxic Ambient Air Contaminants" (NYSDEC, 1991, plus revisions).

The protocol will determine the methodology to be used for the new source modeling study. Should the results of the single source modeling study indicate impacts greater than the Significant Impact Concentrations, a multi-source modeling study will be required. In this case, a separate protocol for the multi-source modeling approach and source inventory verification procedure will be developed and submitted to NYSDEC for their review and approval. Procedures for verifying sources that need to be included in the multi-source modeling will follow NYSDEC's Air Guide 36 "Emission Inventory Development for Cumulative Air Quality Impacts Analysis" (NYSDEC, 1995).

3.2 Land Use, Public Policy and Zoning

3.2.1 Land Use

Existing Conditions

Land use characteristics for the Queens Community District 1 and for the Borough of Queens are found in Table 3-8. Queens constitutes an urban land area with 64 percent of the 112.2 square miles of the borough consisting of residential uses and approximately 13% commercial/industrial/utility uses. When compared to the borough, Community District 1 is more industrial than the rest of Queens with only 39 percenet of the 5.8 square mile district dedicated to residential uses and 30 percent commercial/industrial/utilities uses. The land uses nearby and adjacent to the Ravenswood site include residential (Queensbridge Houses and Ravenswood Houses in Queens and residential development on Roosevelt Island), industrial and warehousing (on the opposite side of Vernon Boulevard, between 40th and 36th avenues), and public recreation (Queensbridge Park and Roosevelt Island).

The area within one mile of the proposed project site also includes most of the Long Island City area of Queens including a portion of the Hunters Point area, Roosevelt Island, and a portion of the Upper East Side in Manhattan. Roosevelt Island and the area of Manhattan within one-mile of the proposed project site is predominantly residential and is mostly part of Manhattan Community District 8; the area in Manhattan south of the Queensboro Bridge is located in Community District 6. The area of Queens located south of the Queensboro Bridge is located in Community District 2. Major land uses within one mile of the proposed project site are shown in Figure 3-2.

The Ravenswood site is bordered by the East River to the west, Vernon Boulevard to the east, the Vernon 138 kV substation and Queensbridge Park to the south, and the Roosevelt Island Bridge and the Rainey 345 kV substation to the north (see Figure 3-2). KeySpan's Ravenswood Generating Station occupies approximately 27.6 acres along the East River; Con Edison's facilities, which include the two substations, occupy an additional 15.2 acres. KeySpan's facilities include include the 1,753 MW Ravenswood Units 1, 2 and 3, and the 415 MW gas turbine complex. Units 1, 2 and 3 are indoor units in a common brick and metal clad powerhouse building which houses the boilers, turbine generators, administration offices, and maintenance shops. The gas turbine complex includes an administration building, a retired gas compressor house, a 2 million gallon kerosene storage tank, and a retired 105,000 gallon No. 2 fuel oil storage tank. The location and layout of KeySpan's existing facilities are shown on Figure 2-1.

The proposed project site is a 2.5-acre, paved parking area located adjacent and to the north of the existing Ravenswood Unit 3 ("Big Allis"). The location and general layout of the proposed 250 MW cogeneration plant is shown on Figure 2.2.

Land Use Changes and Potential Impacts

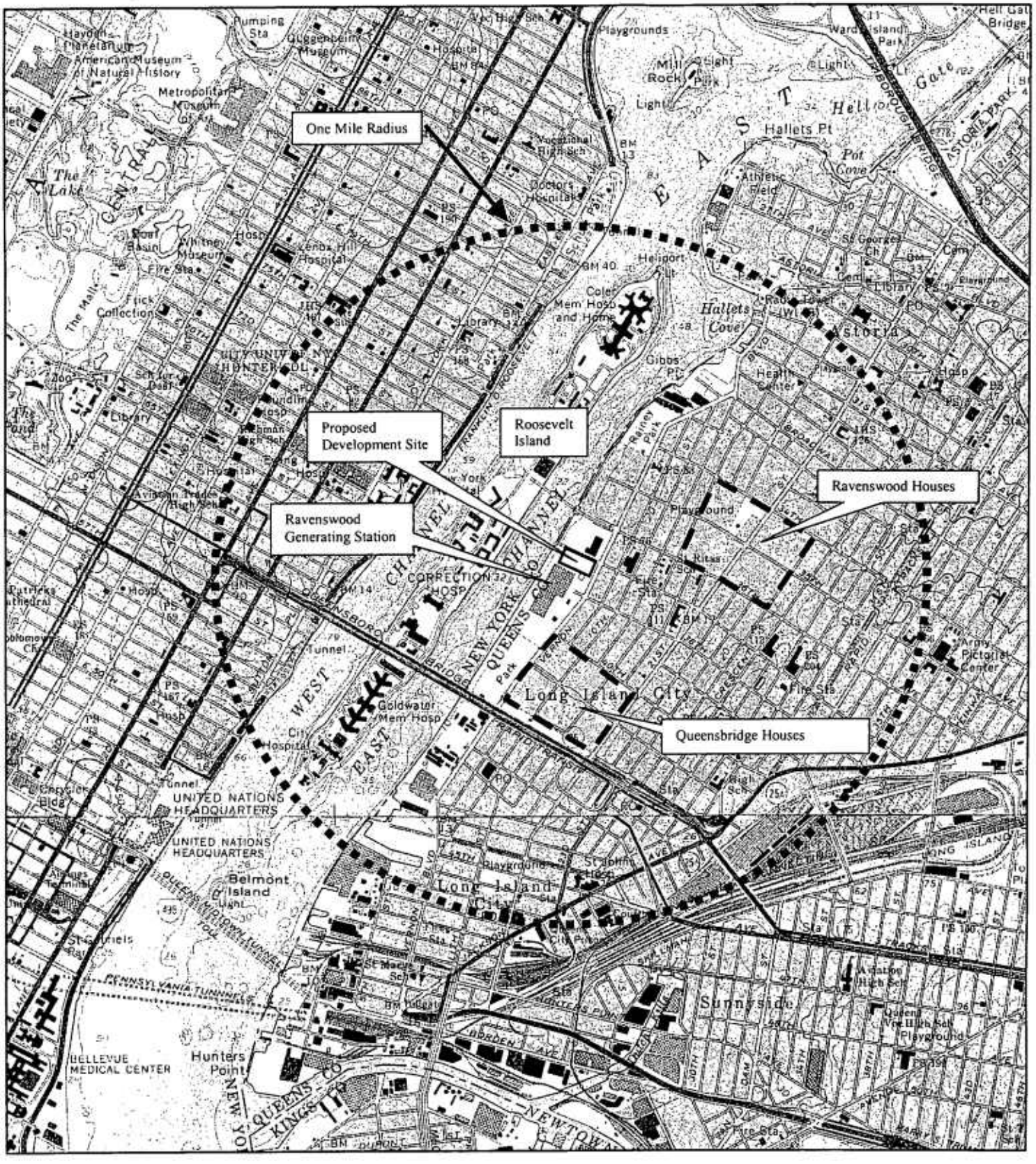
KeySpan's proposed cogeneration project will be located in the middle of a complex of existing power generating and support facilities on property that has been used for energy production for nearly a century. As such, the proposed project is a continuation and expansion of the current land use of this area. Accordingly, the siting of the proposed project is expected to have minimal land use impacts of the kind that are typically associated with industrial facilities on greenfield sites.

Temporary construction impacts, such as increases in ambient noise levels from construction vehicles, may be experienced in the nearby neighborhood. However, these potential impacts are not anticipated to be significant due to their temporary nature. All proposed construction will be in accordance with applicable local construction standards and conditions of the regulatory approvals to be obtained for the proposed project.

Table 3-9: Land Use Characteristics

Land Use, 1998 - Queens Community District 1 **Total Land Area: 3,702 Acres, 5.8 Square Miles**			
	Lots	**Acres**	**%**
1-2 Family Residential	8,927	481	18.0
Multi-Family Residential	5,884	559	21.0
Mixed Residential/Commercial	1,410	107	4.0
Commercial/Office	709	136	5.0
Industrial/Manufacturing	934	338	13.0
Transportation/Utility	279	225	8.0
Public Facilities/Institutions	186	520	19.0
Open Space/Outdoor Recreation	33	169	6.0
Parking Facilities	465	74	3.0
Vacant Land	453	68	3.0
Joint Interest Areas			
Total	19,280	2,677	100.0
Land Use, 1998 – Borough of Queens **Total Land Area: 71,780 Acres, 112.2 Square Miles**			
	Lots	**Acres**	**%**
1-2 Family Residential	242,868	19,064	50.1
Multi-Family Residential	31,733	5,394	14.2
Mixed Residential/Commercial	10,498	822	2.2
Commercial/Office	6,442	1,503	4.0
Industrial/Manufacturing	4,116	2,070	5.4
Transportation/Utility	2,193	1,389	3.7
Public Facilities/Institutions	2,462	2,702	7.1
Open Space/Outdoor Recreation	423	4,323	11.4
Parking Facilities	3,706	571	1.5
Vacant Land	11,709	2,076	5.5
Joint Interest Areas	65	2,305	6.1
Total	316,215	42,219	100.0

Source: New York City Department of City Planning, Community District Needs, Queens, Fiscal Year 2000.



KeySpan Energy
250 MW Cogeneration Facility
Long Island City, Queens, NY

Figure 3-2. Land Use
Scale: 1" = 2000'

Source: USGS Topographical Survey Maps
Central Park N.Y. - N.J. Quadrangle, Photorevised 1979

TRC

Proposed Studies

The assessment of potential land use impacts will take into consideration existing land uses and development plans in the vicinity of the site. Proposed studies to assess potential land use impacts in the project vicinity will involve the documentation of existing and proposed land uses surrounding all elements of the proposed project. Future land use plans for the surrounding neighborhoods, including any proposed large-scale developments, will be determined through conversations with city planning officials, the review of published planning documents, and feedback/information obtained through public outreach efforts with potentially affected stakeholders. Sensitive receptors will be identified by consulting with community/city officials, and the significance of potential impacts to these receptors will be assessed. The Article X Application will discuss the proposed project's consistency with local plans and land use policy.

Potential Mitigation

The need for mitigation to address issues associated with land use is not anticipated. The potential for significant land use impacts has been greatly reduced through the siting of the proposed project in an industrial zone on a site located within the middle of a complex of existing power generating facilities.

3.2.2 Zoning and Public Policy

Existing NYC Zoning

The New York City Zoning Map of the Project area can be found in Figure 3-3. The proposed site is in the M3-1 zone, a zone established for heavy industries which generate noise, traffic and pollutants. Power plants are a permitted use in the M3-1 Industrial Zone. All uses in this zone must ordinarily meet performance standards which establish limits on the amount and types of industrial nuisances which may be created.

The maximum floor area ratio in the M3-1 zone is 2.00. Floor area ratios have been established to control both building size and the level of activity and congestion in manufacturing districts. Parking is required for facilities permitted in the M3-1 zone.

New York State Coastal Zone Management Program

The Ravenswood site is located within the coastal zone of the State of New York. Accordingly, KeySpan's proposed project may need to be reviewed for consistency with the New York State Coastal Zone Management Program, which was established in 1981 by the Waterfront Revitalization and Coastal Resources Act and is administered by the New York State Department of State (NYSDOS). The Coastal Management Program is based on 44 policies covering waterfront revitalization, public access, water quality, fish and wildlife habitats, navigable waterways, and coastal erosion.

A Plan for the Queens Waterfront (New York City Department of City Planning, 1993) was prepared as part of New York City's Comprehensive Waterfront Plan (NYCDCP, 1992). The City's *Comprehensive Waterfront Plan* presents a long-range vision and practical strategies to guide land use and development. The Plan recognizes four principal functions of the waterfront : the Natural Waterfront, the Public Waterfront, the Working Waterfront, and the Redeveloping Waterfront. According to the Queens Waterfront Plan, the KeySpan site is part of the West Queens reach (Reach 12). The West Queens reach extends for six miles along the East River, from Orion's Astoria Generating Station at 20th Avenue south to New Town Creek, including the Ravenswood site. Historically, the West Queens shoreline has been used for industrial purposes, but the *Plan for the Queens Waterfront* recognizes that West Queens, particularly the Hunters Point area, has become the focus of redevelopment attention with the decline of the reach's waterfront industry.

Project Conformance with Plans and Zoning

Since the site is zoned and used for heavy industrial uses, the project is consistent with existing land uses and the designated zoning. The redevelopment of this industrial site is consistent with New York City's objective to locate heavy industrial uses within existing brownfield sites. The reuse of an existing industrial site also contributes to the minimization of environmental impacts through more efficient use of existing infrastructure such as electric and gas interconnections and other ancillary facilities such as parking and office space. Maximizing the use of existing infrastructure and facilities avoids the impacts associated with the development and installation of these facilities at a new location.

Proposed Studies

The proposed project will be reviewed for compliance with applicable zoning standards in the M3-1 zone. Additional discussion with local planning officials will be conducted to

assess the proposed project's compliance with applicable zoning and development standards.

The proposed project may also be reviewed for consistency with the coastal zone management policies of New York State and consistency with the *Plan for the Queens Waterfront* and the *Plan for Long Island City*. A coastal zone consistency certification will be prepared and submitted to the NYSDOS for their concurrence.

Potential mitigation

No mitigation is anticipated to be required to address potential zoning impacts. The proposed construction and operation of all project components will be designed to be consistent with applicable local zoning requirements to the maximum extent practicable. Should there be any areas where zoning requirements are unreasonably restrictive in view of existing technology, the Article X Application will seek the necessary findings and determinations from the Board to allow for construction and operation of the proposed facility.

3.3 Soils, Geology, and Hydrogeology

Existing Surface Conditions

The surface topography of the site is relatively flat with a gentle slope from east to west across the site. Surface elevations range from approximately 10 to 20 feet above mean sea level (MSL). Lower elevations are along the western property boundary, adjacent to the East River.

The ground surface cover over the trafficked portion of the site is concrete and/or asphalt; however, a significant portion of the site is covered with crushed stone (bluestone). In areas that contain electrical transmission equipment, the ground surface is covered with a layer of bluestone. In some areas, the bluestone surface layer has been observed to be as much as 2 to 3 feet thick before encountering the soil fill material that blankets the site.

Most of the adjacent area in Queens is also relatively level with elevations ranging up to 50 feet above msl. No significant natural topographic features are found in the project vicinity or surrounding area of Queens. In general, Queens County constitutes an urban land area where the soils have been so mixed, excavated or covered with fill that no attempt has been made to identify the different constituents (Cline and Marshall, 1977).

Existing Subsurface Conditions

Foster Wheeler Environmental Corporation prepared a Phase II Site Investigation Report for the existing Con Edison Ravenswood Generating Station dated October 1998. The soil profile identified in the report consists of soil fill forming the uppermost stratum which is underlain generally by a fine to medium, brown or gray sand with various amounts of silt to the top of the bed-rock. The surficial fill material is reported to consist of coarse to fine sand with various amounts of gravel and silt. Beneath the northern portion of the site a layer of silt and clayey silt were encountered just above the bedrock. The unconsolidated deposits are reported on historical site borings to range in thickness from approximately 6 to 27 feet along the eastern site limits to as much as 35 feet along the western site limit adjacent to the East River. These same general conditions are expected to be found at the proposed 250 MW cogeneration plant site.

The Geologic Map of New York, Lower Hudson Sheet indicates a ridge is formed beneath the site area by the Ravenswood Gneiss, which is a biotite-hornblende-quartz-plagioclase gneiss with accessory garnet and sphene. This unit strikes northeastward and also outcrops near Long Island Sound in Westchester County, New York and Connecticut where it is known as the Harrison Gneiss and the Brookfield Diorite Gneiss. According to the Ravenswood Generating Station Groundwater Contingency Plan, dated April 1997, Ravenswood is underlain by the Harrison Gneiss Formation. This formation parallels the East River, extending from the lower eastern site limits and lower elevation typically along the western limit. However, elevations of the bedrock at positions on the interior of the site vary significantly from the general trend.

According to the seismic zone map published in the Uniform Building Code of the United States, the proposed site is located in Zone 1, which denotes areas which may sustain minor damage in a future earthquake event, corresponding to intensities V and VI of the Modified Mercalli Intensity Scale of 1931.

Existing Hydrogeological Conditions

Hydrogeological information from the test borings and monitoring wells installed during the Con Edison Phase II Site Investigation indicated that the water table is located at an elevation of approximately 7 to 10 feet below the ground surface. The groundwater occurs in the unconsolidated deposits overlying bedrock under unconfined water table conditions and is recharged via rainwater percolating through the stone covered areas, seepage from the on-site Boiler "A" house freshwater reservoir and from regional groundwater flow from off-site areas. The overall site groundwater flow direction is

generally west towards the East River. These same general conditions are expected to be found at the proposed 250 MW cogeneration plant site.

The U. S. Geological Survey (USGS) Publication (File Report (81-1186) characterizes the underlying bedrock at the property as a low hydraulic conductivity formation that does not yield more than a few gallons per minute of water. Under these conditions the quantity of water that can flow vertically downward across the bedrock boundary is insignificant and groundwater will preferentially flow horizontally in the overlying unconsolidated deposits. The USGS publication further characterizes the bedrock surface as representing the bottom hydrologic boundary for the groundwater flow system in the area of the site.

Existing Environmental Conditions

Foster Wheeler Environmental Corporation prepared a Phase II Site Investigation Report dated October 1998 on behalf of Consolidated Edison Company of New York, Inc. Con Edison undertook this investigation at the Ravenswood Generating Station to provide information sufficient for Con Edison and potential buyers to fully understand the existing subsurface environmental conditions and to respond to the requirements of the November 4, 1994 New York State Department of Environmental Conservation (NYSDEC) Order on Consent (OC) to investigate impacted areas associated with past oil spills.

The Phase II field investigation at the Ravenswood Generating Station was conducted August 26 through October 12, 1998. The Phase II investigation at Ravenswood included the collection and chemical analysis of soil and groundwater samples in addition to the evaluation of previous remedial studies. Based on the field observation and results of the laboratory analyses, the site can be characterized as exhibiting residual impacts from historical release of petroleum related fuels and oils. No Light Non-Aqueous Phase Liquids (LNAPL) were observed during the soil sample collection or in the monitoring wells which indicated that the detected soil contamination is associated with residuals absorbed to the soil matrix and not a separate free phase layer. Likewise, the deeper borings exposed soils at the bottom of the soil column did not exhibit a free Dense Non-Aqueous Phase Liquids (DNAPL). However, the groundwater at the site did exhibit relatively low parts per billion (ppb) levels of volatile aromatics such as benzene, toluene, ethylbenzene and xylenes (BTEX) and polycyclic hydrocarbons (PAH) constituents.

The 1998 Phase II Environmental Site Investigation concluded that the groundwater on the site represents the principal areas for contamination migration beyond the site. Based upon physiochemical characteristics, dissolved volatile organic aromatic compounds, and

cyanides are expected to migrate the farthest in the groundwater while PAHs associated with fine particulates are expected to migrate with the groundwater flow for only a limited distance. The migration of contaminants into the biota due to biaccumulation was not considered a significant potential pathway. As a direct result of contaminant fate characteristics and transport mechanisms, contaminant concentrations in environmental media are expected to gradually diminish over time as long as no additional sources (i.e., future spills) introduce contaminants in the future.

Potential Impacts and Proposed Studies

The soil and subsurface conditions at the project site will have a direct bearing on the foundation requirements for the proposed plant. A geotechnical investigation of the proposed project site may be conducted to gather additional site specific information regarding subsurface conditions, depth to bedrock, and depth to groundwater. The results of this geotechnical investigation program, if conducted, would be used to develop the foundation design and, if available at the time, will be summarized in the Article X Application.

Additional environmental sampling at the proposed project site is also planned for some time in the near future. NYSDEC will be consulted regarding the proposed scope of studies as well as the final results and the recommended follow-up activities. The results of this additional environmental sampling will also be summarized in the Article X Application.

3.4 Surface Water and Aquatic Resources

This section provides an overview of the surface water resources in the vicinity of the proposed combined cycle project. Included is a description of the physical and hydrodynamic characteristics of the East River, an overview of the operational characteristics of the existing Ravenswood Generating Station cooling and makeup water systems, and an overview of aquatic and ecological resource data and information. The baseline sources of environmental information will be used to assess the water resource related impacts of the proposed project. The projected water supply requirements for the proposed project were described in Section 2.3.3. A preliminary water balance diagram is presented as Figure 2-4.

3.4.1 Physical and Hydrodynamic Characteristics of the East River

The East River is a tidal straight that connects New York Harbor to Long Island Sound. The New York Harbor (Upper Bay) entrance is between the Battery and Governors Island while the sound entrance is between the Throgs Neck and Willets Point. The East River's width varies from approximately 0.25 miles to 0.6 miles and acts as a physical boundary separating the western portion of Long Island and Queens from Manhattan. The proposed site is located directly across from Roosevelt Island. At this location the channel is approximately 625 feet wide. Channel depth along the eastern side of Roosevelt Island typically ranges between 20 and 40 feet referenced to mean lower low water (MLLW). Major tributaries to the East River include the Harlem, Bronx and Flushing Rivers and Newtown Creek.

Typically, two ebb tides and two flood tides occur every 24 hours in the East River. The mean tide range is 7.1 feet at Willets Point, 5.1 feet at Hell Gate and 4.6 feet at the Battery. Table 3-9 summarizes tidal amplitudes in the East River at various locations.

Table 3-9: East River Tidal Amplitudes*

Location	Mean Higher High Water	Mean High Water	Mean Low Water	Extreme Low Water
North Boulevard Bridge, Flushing	7.4	7.1	0.3	-4.0
North Brother Island	7.2	6.9	0.3	-4.0
Hell Gate, Hallets Point	5.7	5.4	0.3	-4.0
The Battery**	5.1	4.8	0.2	-4.0

*Elevations in feet above or below Mean Lower Low Water

Source: NOAA Navigational Chart No. 12339, East River – Tallman Island to Queensboro Bridge

**Source: NOAA Navigational Chart No. 12335, Hudson and East Rivers – Governors Island to 67th Street

Current velocity in the East River exceeds 5 knots at Hell's Gate, 3 knots at the Brooklyn Bridge and 1.5 knots north of Governors Island. Tidal fluctuations at the station typically range from 4.5 to 5.0 feet. Typical current speeds at the Ravenswood Generating Station intake approach 5 feet per second (ft/sec).

The strong tidal currents noted above result from differences in both amplitude (tidal stage) and phase (timing) of the tides experienced in New York Harbor and Long Island Sound. During each tidal cycle the water surface in Long Island Sound alternately rises above and falls below the level in New York Harbor at the Battery. In addition, high tide in New York Harbor typically occurs from 1.5 to 3 hours before high tide in Long Island Sound. As a result, current reversals are generally offset from the time of high or low tide throughout most reaches along the river. Tidal characteristics in the East River are also influenced by channel geometry, winds, and fresh water inflow. Variations in channel geometry include changes in width, depth, cross sectional area, slope and the presence or absence of obstructions (islands).

Existing documentation (tide stage and current measurements from prior studies) coupled with data available from the National Oceanic and Atmospheric Administration (NOAA) and the United States Geological Survey (USGS) provide a foundation for characterizing the tidal dynamics of the East River.

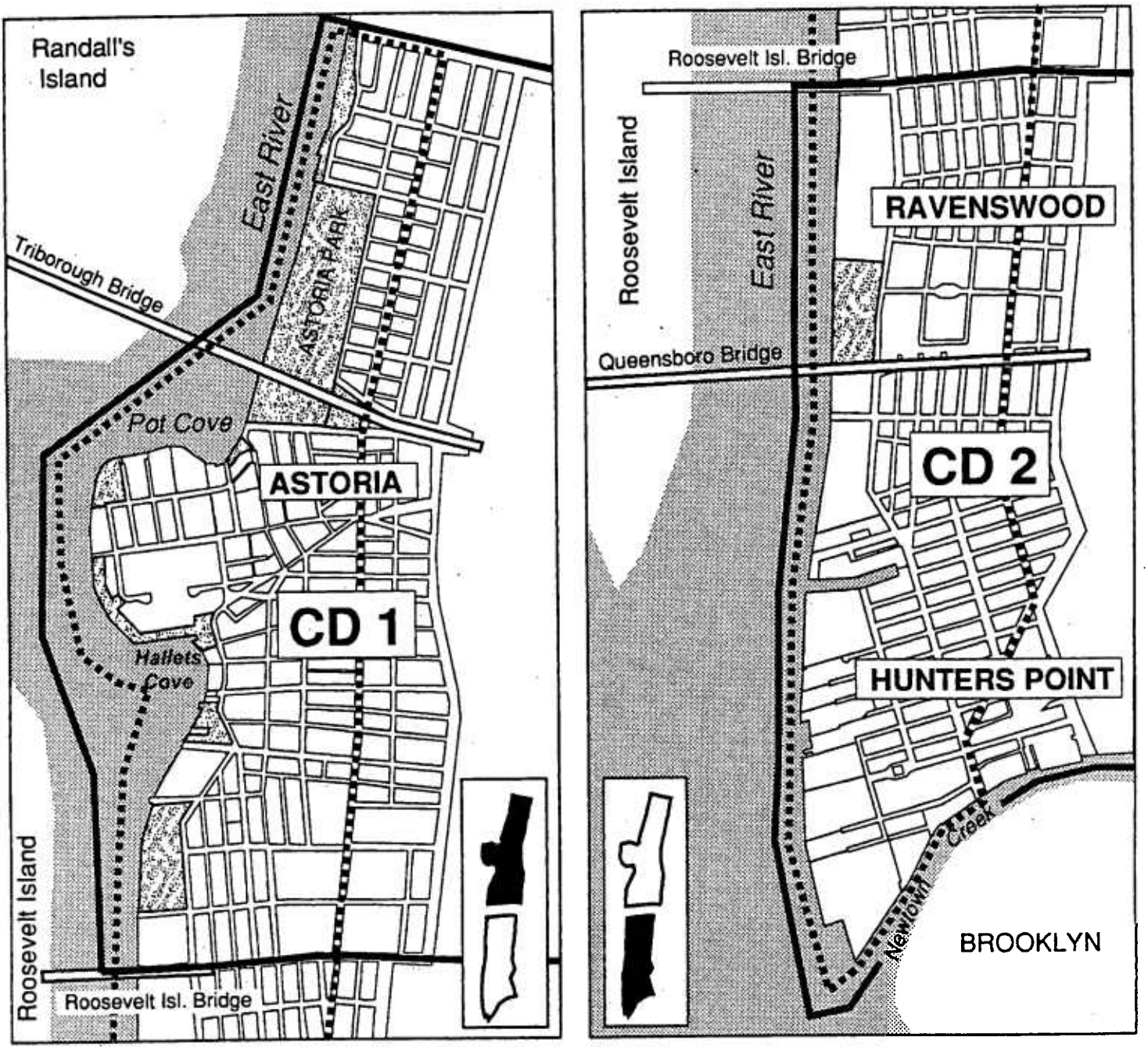
West Queens Reach

The proposed combined cycle project site is located in the West Queens Reach (Reach 12) which stretches six miles along the East River from Orion's Astoria Generating Station at 20th Avenue south to Newtown Creek at the border of Brooklyn. The reach encompasses parts of Queens Community Districts 1 and 2 and includes the waterfront portions of Astoria (20th Avenue and Broadway), Ravenswood (from Broadway to 37th Avenue) and the Hunters Point section of Long Island City (See Figure 3-4).

This section of the Queens coastline was created by fill, and the bank consists of either bulkhead or riprap. There are no significant natural areas or wildlife habitats in Reach 12, although the East River is an important fish migration route and some shallow, protected areas (e.g., Pot Cove and Hallets Cove) provide calm waters for fish nesting and feeding.

The waters of Reach 12 are rated "I" by the New York State Department of Environmental Conservation, meaning that their best intended use is for recreational activities such as fishing or boating. This standard is usually met at the surface, but levels of dissolved oxygen can occasionally fall below the Class I standard at lower depths.

There is a general distinction in the reach's zoning and land use between the waterfront north of the Queensboro Bridge (Astoria and Ravenswood) and the area to the south (northern Hunters Point). Land use in the northern section of the reach consists of a mix



KeySpan Energy
250 MW Cogeneration Facility
Long Island City, Queens, NY

Figure 3-4. Reach 12: West Queens

Source: New York City Department of Planning, Comprehensive Waterfront Plan

TRC

of parkland, residential, public utility and light industrial uses along the water, and residential or mixed residential/industrial communities upland. In the southern section large vacant waterfront sites contrast with a busy upland industrial area and the mixed-use community of Hunters Point. There are few industries located along the southern section of the waterfront and no heavy industrial uses, despite the area's M3 zoning.

3.4.2 Water Quality in the East River

Water quality data provided in this section (temperature, DO, salinity and pH) were taken from the 1993 and 1994 Impingement and Entrainment Studies conducted by Con Edison at the Ravenswood Generating Station. These studies were performed for a one-year period that began in February 1993 and extended through January 1994.

pH

Intake pH values varied throughout the 1993 Impingement and Entrainment Study sampling period. The pH ranged form a low of 6.7 standard units to a high of 8.5 standard units. The pH values were generally higher, ranging from 7.8 to 8.5, during late summer and early spring, with a typical range for the rest of the year from 7.3 to 7.8.

Water Temperature

Water temperature is an important environmental factor affecting aquatic biota. The temperature of the surrounding environment influences the physiologic processes of most aquatic organisms. Within aquatic ecosystems, temperature varies both temporally (seasonally and daily) and spatially across the length, width and depth of the estuary.

The daily water temperatures observed at the intake structure of the Ravenswood Generating Station during the 1993 Impingement and Entrainment Study followed a typical seasonal pattern. In February 1993 the average intake water temperature was 39.4°F (4.0°C) and remained fairly steady through early March. A rapid increase was observed through the spring and early summer months to a high of 77.5°F (25.3°C) in August. The temperatures remained around 75°F (24°C) through mid-September when a decreasing trend was observed, reaching a low of 35.2°F (1.8°C) in January 1994.

Temperature data collected at the Ravenswood Generating Station and the Astoria Generating Station along with USGS and NOAA data will be used to evaluate the thermal impacts of the proposed cogeneration project.

Salinity

Salinity has a major role in determining and understanding the distribution and abundance of marine life within the East River. Knowledge of the salinity and temperature distributions can also provide considerable insight toward understanding its hydrodynamic and mixing characteristics. Salinity also influences other water quality characteristics. For example, both temperature and salinity impact the saturation concentration of dissolved oxygen. Similarly, salinity variations can alter the species composition of dissolved anions and cations.

The salinity of the East River at the Ravenswood intake structure is characteristic of a coastal seawater system. During the 1993 Ravenswood Station impingement and entrainment study period salinity ranged from 15 parts per thousand (ppt) to 25 ppt. The average intake salinity levels fluctuated between 18 and 22 ppt from February to June 1993, from 22 to 25 ppt from mid-June 1993 through October 1993 and from 20 to 24 ppt from November 1993 through January 1994. A low salinity of 15 ppt was recorded on April 20, 1993. Surface salinity measurements were lowest during the spring when surface runoff (i.e., freshwater inflow to the New York Harbor Area) is typically greatest.

Salinity data collected at the Ravenswood Generating Station and the Astoria Generating Station, along with other relevant information, will be used in assessing potential impacts from the proposed project.

Dissolved Oxygen

Dissolved oxygen (DO) is one of the most important constituents of natural water systems. Fish and other aquatic species require oxygen to live. A minimum of 2 mg/L of dissolved oxygen is required to maintain higher life forms, although some species require more. In addition to this life sustaining aspect, oxygen is important because the end products of chemical and biochemical reactions in anaerobic (i.e., oxygen depleted) systems often produce aesthetically displeasing colors, tastes and odors.

Because ambient water temperature is a primary influence on DO concentrations, the DO observed at the Ravenswood Generating Station intake structure during the 1993 Impingement and Entrainment Study exhibited seasonal patterns. In February 1993, the DO concentrations in the intake water averaged 11.3 mg/l and remained above 11 mg/l through early April 1993. DO in the intake water began to decline as temperatures rose during the spring dropping to around 4.5 mg/l to 5.5 mg/l during July and August. The lowest average observed DO concentration of 3.5 mg/l occurred on July 13th, 1993. The

DO concentrations then gradually increased with dropping temperatures throughout the fall.

The DO values were generally higher in the discharge than the intake samples during the warmer months and lower during the colder months. The lowest average DO (3.7 mg/l) observed in the discharge occurred during the July 13, 1993 sampling event while the highest DO (12.2 mg/l) observed in the discharge occurred during the March 2, 1993, March 16, 1993 and January 11, 1994 sampling events.

The DO data collected at the Ravenswood Generating Station and the Astoria Generating Station along with other relevant information, will be used in assessing potential impacts from the proposed project.

Toxins

Toxic substances believed to pose the greatest risk to the East River fall into three major categories: pesticides and herbicides; heavy metals; and organic contaminants including polychlorinated biphenols (PCBs) and polynuclear aromatic hydrocarbons (PAHs). These contaminants may be acutely toxic or occur at levels that cause chronic or sublethal effects in organisms. Certain toxins can also bioaccumulate, concentrating in tissues of organisms higher in the food web.

Trace concentrations of metals are a natural component of the aquatic ecosystem, but can result in acute or chronic effects at elevated concentrations. Metals data available from the EPA STORET database indicate that most metals concentrations in the East River are within water quality standards.

3.4.3 Fisheries

The Astoria Generating Station located in Astoria, Queens collected impingement data from November 1977 through November 1978. Twenty-one species were found during the monitoring program and the predominant species included striped sea robin, blueback herring, winter flounder, striped bass and the grubby.

Lawler, Matusky and Skelly, Inc. (LMS) conducted fisheries studies just north of Newtown Creek on both the east and west shore of the East River during the 1980s which showed a diverse assemblage of fish species (LMS 1986 and 1989). Fifty-four species of fish were found in the East River in the vicinity of Newtown Creek. Winter flounder, striped bass, Atlantic tomcod, grubby, bay anchovy, white perch, American shad, and northern pipefish comprised 95% of the fish collected during these studies.

Impingement and entrainment data were collected at the Ravenswood Generating Station during the early 1990's. Sixty-one species of fish were found during the one-year study period that began in February 1993. The five most abundant species found were winter flounder, grubby, northern pipefish, Atlantic silverside and Atlantic herring.

The number of species (21 species) found during the 1977-1978 Astoria Generating Station Impingement and Entrainment Study is considerably less than the number of species (61 species) found in the 1993 Ravenswood Generating Station Impingement and Entrainment Study. The increase in species found between 1978 and 1993 occurred concomitant with improvement in water quality in the East River, including increased DO levels. The increase in the dissolved oxygen concentration followed implementation of the Clean Water Act which resulted in a reduction in the volume of pollutants discharged to receiving waters.

Data and information collected during the Ravenswood and Astoria Generating Station Impingement and Entrainment Studies in conjunction with past studies conducted along the East River will be used to characterize potential fisheries impacts associated with the proposed 250 MW combined cycle project. Given recent improvements in water quality observed in the East River, primary emphasis will be given to the more recent data collection programs.

3.4.4 Proposed Water Requirements and Wastewater Generation

Ravenswood Unit 30 is rated at 1,027 MW and has a once-through circulating water system shared with Units 10 and 20. With regard to Unit 30, cooling water is withdrawn from the East River through six conventional vertical traveling band screens and, following passage through the condensers, is returned to the East River at the southern end of the property through a surface level discharge canal. Cooling water is supplied by two circulating water pumps (CWP) each with a rated capacity of 268,500 gpm. In addition, there are two service water pumps (SWP) each with a rated capacity of 8,000 gpm. During normal unit operation both CWPs and one SWP operate resulting in a cooling water withdrawal flow of 545,000 gpm for Unit 30. Once-through cooling water flow for Unit 10 is 222,600 gpm, and the flow at Unit 20 is 214,000 gpm for a total existing facility flow of 981,600 gpm, or approximately 1,413 million gallons per day (mgd).

The six Unit 30 intake screen openings measure 11.2 feet (ft) wide and extend from the deck at elevation 16.0 ft to the bottom at elevation -24.0 ft. The tidal amplitude (mean low water [MLW] to mean high water [MHW]) is approximately 4.5 ft. The effective

screen area at MHW is approximately 319 ft^2 and the effective screen area at MLW is approximately 264 ft^2. A wall extends down the middle of the intake from the traveling screens to the CWPs. The wall divides the intake into two separate chambers, with all of the flow from a single CWP passing through three traveling screens. Average velocity through a single screen at the two tidal extremes MHW and MLW (assuming the total flow of one CWP and one SWP) is calculated as 0.64 fps and 0.78 fps, respectively.

Each conventional through-flow traveling screen has stainless steel woven wire mesh panels, with a square mesh opening measuring 0.375 by 0.375 inches. To remove the impinged material, the intake screens are washed intermittently. This occurs approximately 15 minutes every two hours when the associated circulator is in operation. However, when debris loads are heavy, the screens may be operated continuously for short periods until debris loads subside. High pressure spray systems wash fish, crabs and debris from the front (riverward) side of the traveling water screens to a spiral-shaped polyethlyene tube that conveys the impinged material to the drain pipe in the debris collection basin. The 24 inch diameter cast iron drain pipes at each unit carry screenwash material to the Station's discharge canal and, in turn, to the East River.

The proposed cogeneration facility would require 85,000 gpm, with the cooling water withdrawn from the Unit 30 intake. The cogeneration facility intake pipe would draw water from both three screen chambers downstream of the Unit 30 traveling screens. Assuming half of the proposed cogeneration facility flow would be drawn from each chamber, the calculated average screen velocities at MHW and MLW would be 0.74 fps and 0.89 fps, respectively.

The 85,000-gpm cogeneration facility flow represents a 15 percent increase in the Unit 30 cooling water volume withdrawn from the East River (approximately 8 percent of the overall facility's withdrawal), with the increase concentrated at the northern end of the facility. The 85,000 gpm represents the maximum flow required by the cogeneration facility. During periods of low river water temperatures and when steam is being exported to the Con Edison steam system, the circulating cooling water flow will be significantly reduced by reducing the speed of the cogeneration facility variable speed circulating water pumps. The increase in water withdrawal could have an influence on the Unit 30 zone of withdrawal, which could potentially result in a small increase in organism entrainment. However, the increase in the Unit 30 volume and velocity of water withdrawn as a result of the proposed cogeneration facility water withdrawal is minor compared to the East River flow passing the facility, and therefore, the potential increase in organism withdrawal should be minimal.

Cooling water from each unit is discharged into a common canal for return to the East River. The approximately 1,200-foot-long canal is about 25 feet wide and 15 feet deep and discharges at the bulkhead line south of the Station. The water depth at the terminus of the discharge canal is approximately 20 feet. The calculated flow velocity through the canal when all circulating water pumps and one service water pump at each unit are operating is approximately 5.9 ft/sec

The design maximum temperature difference between spent circulating water in the Station's discharge canal and ambient water in the East River is 17.4°F (9.7°C) with all three units operating at full power. The new unit will operate at a similar change in temperature. Therefore, the anticipated maximum temperature difference between the intake and discharge canals is expected to remain the same.

Con Edison prepared a Thermal Tolerance Assessment Report for the Ravenswood Generating Station in April 1999. The purpose of the report was to present the information on the thermal tolerance of selected species of finfish that are impinged at the Ravenswood Generating Station and determine whether exposure to elevated temperatures in the discharge canal during the return to ambient water is detrimental to survival. In addition, Con Edison measured velocity profiles at one of the conventional traveling screens at the Ravenswood Generating Station Intake Structure to determine the distribution of velocity, both speed and direction, across the submerged face of the screen. The results of the 1999 Thermal Tolerance Assessment Report, the June 25, 1998 Screen Velocity Study and the 1991 and 1993 Impingement and Entrainment Studies will be reviewed to determine if modifications (if any) to the existing intake structure (with the exception of additional pipes for water flow) are required to minimize the potential for biological impacts associated with impingement and entrainment.

Other Water Sources and Waste Streams

Potable water for the facility will be obtained from the municipal distribution system. This source will satisfy demineralizer makeup water requirements and meet miscellaneous plant maintenance needs.

High purity demineralized water is required for HRSG boiler feedwater makeup, water or steam injection for NO_x control under oil firing and for compressor cleaning operations. The high purity demineralized water is used to prevent scale formation and minimize corrosion of internal components. The treatment train will consist of multimedia filtration followed by cation/anion exchange and ultrafiltration units.

Multimedia filtration will be used as a preliminary treatment step to remove any suspended matter in the potable water supply that could damage pumps or downstream treatment equipment. Given the high quality makeup supply, backwashing of the multimedia filters should only be necessary on an infrequent basis. When required, backwash water will be pumped through the multimedia filter. Effluent will be pumped to the discharge canal.

The cation/anion exchange units will be regenerated on-site. Regeneration consists of dosing the units using sulfuric acid and/or sodium hydroxide to restore the cation/anion exchange capacity of the synthetic resins. The regenerant waste stream and subsequent rinse waters will be routed to a neutralization tank for pH adjustment and then pumped to the discharge canal. Discharges to the East River through the discharge canal will be carefully monitored and controlled in accordance with the discharge permit issued by the NYSDEC for the Ravenswood facility.

Low Volume Waste Streams

Other sources of process wastewater include plant floor drains, boiler blowdown, offline compressor cleaning wastewater and stormwater runoff. A description of these wastewater streams follows.

Floor Drains

Individual floor drain collection systems will be provided for the turbine areas, the boiler area, and the water treatment area. All floor drains located in areas of the plant where oil is used, stored or handled will be directed to an oil water separator prior to discharge. Floor drains serving areas of the proposed facility where routine maintenance will be limited to periodic washdown will be routed directly to the discharge canal.

HRSG Blowdown

Periodic blowdown of the boiler is required in order to protect against scale formation and internal corrosion. The typical blowdown rate for the new unit is estimated to range between 20 and 40 gpm. Chemical conditioners added to the boiler include ammonia to control pH; hydrazine as an oxygen scavenger; and trisodium phosphate as a scale inhibitor. The corresponding feed rates are estimated to be 1 gallon/day for ammonia, 0.5 gallons per day for hydrazine, and 5 pounds per day for trisodium phosphate.

Reboiler Blowdown

Periodic blowdown of the kettle reboiler is required to prevent against scale formation and internal corrosion. The average blowdown flow is estimated at 26 gpm.

Compressor Cleaning

Both on-line and off-line washing is required for the combustion turbine compressor. During an on-line wash demineralized water will be evaporated in the combustion turbine exhaust stream. During an off-line wash, demineralized water will be collected for off-site disposal. The periodic off-line wash rate is about 80 gpm for 20 minutes.

Stormwater Runoff

Currently the site is used as a parking lot for the existing Ravenwood Generating Station; therefore, impervious surfaces are not expected to be added to the site as a result of the proposed 250 MW facility. To mitigate potential increases in peak runoff flows and to control stormwater quality, a stormwater management system will be developed and implemented.

Pollutants Contained in Low Volume Waste Streams

In accordance with New Source Performance Standards (NSPS) for the Steam Electric Point Source Category (40 CFR Part 423), the quantity of pollutants discharged from low volume waste sources shall not exceed the following concentration based limits:

Constituent	Maximum for any one (1) day	30 day average
Total Suspended Solids (TSS)	100.0 mg/l	30.0 mg/l
Oil & Grease	20.0 mg/l	15.0 mg/l

Based on operating experience oil and grease are not expected to be contained at concentrations above these limits in any low volume waste streams discharged to the East River. Waste streams potentially containing oil and grease will be collected in a separate system, routed to an oil water separator and discharged following treatment.

Hydrogen Ion Concentration

NSPS criteria require that the pH of all discharges must be within the range from 6.0 to 9.0 standard units. All discharges from the proposed facility will comply with this criterium.

Metal Cleaning Wastes

NSPS criteria (40 CFR 423) require that the quantity of pollutants discharged in chemical metal cleaning waste streams not exceed the following concentration based limits:

Constituent	Maximum for any one (1) day	30 day average
Total Suspended Solids (TSS)	100.0 mg/l	30.0 mg/l
Oil & Grease	20.0 mg/l	15.0 mg/l
Copper, total	1.0 mg/l	1.0 mg/l
Iron, total	1.0 mg/l	1.0 mg/l

Metal cleaning wastes will be generated during chemical cleaning of the HRSGs and during off-line compressor cleaning operations. Both of these waste streams will be collected for off-site disposal at an appropriately licensed facility. As such, there will be no discharge of metal cleaning waste streams from the facility.

The quantity of pollutants discharged with the once-through-cooling water cannot exceed the following concentration based limits:

Constituent	Maximum
Free Available Chlorine	0.20 mg/l

In addition, neither free available nor total residual chlorine may be discharged from any unit for more than two hours per day and not more than one unit may discharge free available or total residual chlorine at any one time.

Thermal Assessment

The average discharge temperatures recorded during the 1993 Impingement and Entrainment Study followed a seasonal pattern. The lowest average discharge temperature of 44.8°F (7.1°C) was recorded in January 1994 and the highest discharge of 87.4°F (30.8°C) was recorded in August 1993. The average discharge temperature ranged from approximately 34°F (1°C) to 45°F (7°C) higher than the average intake temperatures. The design maximum delta T with all units operating, including the proposed 250 MW facility, at maximum capacity is 17.4°F (9.7°C).

SPDES Permitting Requirements

All waste streams discharged to the East River, including site stormwater runoff, require a State Pollutant Discharge Elimination System Permit (SPDES discharge permit) and authorization under Article X of the Pubic Service Law. These waste streams are also subject to NSPS in 40 CFR 423 pertaining to the Steam Electric Generating point source category. Any process waste streams discharged to the municipal wastewater treatment facility are subject to Pretreatment Standards for New Sources, also contained in 40 CFR 423.

Operation of the intake and discharge structures is also subject to review under Section 316 of the Clean Water Act (CWA) which is administered under the SPDES permitting process. Section 316(a) of the CWA authorizes the permit granting authority to impose alternative effluent limitations relative to the thermal component of any discharge. Section 316(b) grants the Administrator the authority to determine if the location, design, construction and capacity of the cooling water intake structure reflect the Best Technology Available (BTA) based on site-specific conditions.

3.4.5 Proposed Water-Related Studies

The project team will continue its review of available baseline data and information relative to both water supply and wastewater disposal. This will include a review of relevant permit application requirements (NYSDEC), review of existing 316(a) and 316(b) documentation, and water supply and/or wastewater disposal issues. Baseline data will be supplemented, when possible, with information available through the U.S. Army Corps of Engineers (ACOE), the National Oceanic and Atmospheric Administration (NOAA), the United States Geological Survey (USGS), the U.S. Environmental Protection Agency (EPA), the National Marine Fisheries Service (NMFS), and the NYS Department of Environmental Conservation (DEC).

The project team will maintain contact with local, regional and agency personnel to confirm facility permitting requirements; identify additional sources of data and information; and solicit comments and suggestions relative to alternative water supply and wastewater disposal options. As part of this effort, the team will hold pre-application conferences, as required, with NYSDEC and NYSDPS representatives to discuss the proposed project and solicit initial agency feedback regarding the permitting approach. Additional meetings with regulatory agency personnel as well as community groups or interested stakeholders are also anticipated.

The results of the 1999 Thermal Tolerance Assessment Report, the June 25, 1998 Screen Velocity Study and the 1991 and 1993 Impingement and Entrainment Studies will be reviewed thoroughly to determine if modifications to the existing intake structure (with the exception of additional pipes for water flow) are required to minimize the potential for biological impacts associated with impingement and entrainment for the proposed project and to assure compliance with Section 316(b) of the Clean Water Act.

The potential for thermal and water quality impacts on the East River from the proposed project's discharge will be evaluated using the U.S. EPA CORMIX model or an equivalent methodology. CORMIX was developed by U.S. EPA as a screening level model to evaluate the near-field mixing characteristics (of various outfall configurations) under steady-state and tidally reversing conditions. It has also been accepted for use by the NYSDEC under the SPDES permitting program. However, CORMIX is not generally applicable to all discharge/outfall configurations. Alternative modeling strategies will be investigated if CORMIX cannot be used for the existing outfall.

The Ravenswood project team will work closely with the New York City Bureau of Water Supply and Wastewater to verify that adequate potable water will be available to meet process makeup water requirements for the new unit. Requirements associated with establishing an interconnection to the municipal distribution system will also be evaluated. A backflow prevention device will be required for an industrial hookup to the distribution system.

3.4.6 Potential Mitigation

The proposed facility will operate in accordance with the terms and conditions of a SPDES permit, as applicable. This permit will likely be issued as a modification of the existing SPDES permit for the Ravenswood Generating Station. Monitoring the discharge in accordance with the permit requirements will ensure that the designated uses of the receiving waters (East River) will be maintained. Potential modifications to the Unit 30 intake will be evaluated, if necessary, to ensure compliance with Section 316b of the Clean Water Act.

3.5 Vegetation, Wetlands and Wildlife

The proposed project site has been extensively altered by prior electric generating station development activities and, as such, is characterized by a total absence of natural habitat. Currently, the proposed site for the new plant is paved and is used for ancillary parking. Photographs of the proposed development site are included as previous Figure 2-2.

3.5.1 Wetlands

Existing Conditions

Wetlands regulated under the New York State Freshwater and Tidal Wetlands Acts have been mapped and classified by the NYSDEC. No state-regulated freshwater wetlands are present on the site or within the vicinity of the site based on the NYSDEC map of the area (Central Park quadrangle, Queens County Map 1 of 10). The potential for tidal wetlands on site is precluded by existing bulkheads and rip rap along the shoreline in the vicinity of the project site. The NYSDEC Tidal Wetland Map identifies the East River as Littoral Zone.

Potential Impacts and Proposed Studies

No wetlands are present at the proposed development site, therefore, no wetland impacts are anticipated and no further studies are proposed.

3.5.2 Threatened and Endangered Species

Existing Conditions

The New York State Department of Environmental Conservation (NYSDEC) Natural Heritage Program, the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) were recently contacted regarding the potential presence of state-listed or federally listed threatened and/or endangered species or potential habitat on the proposed project site or in the vicinity of the site. Copies of this correspondence are included in Appendix A. To date, no responses have been received from these agencies.

Correspondence from the NYSDEC and the USFWS regarding other projects in the area have indicated that there are no records of known occurrences of federal- or state-listed animals and plants, or significant natural communities or habitats, in the vicinity of the proposed project site.

Potential Impacts and Mitigation

Considering that the proposed project site is essentially devoid of natural habitat, no state or federally listed threatened or endangered wildlife species or potential habitat are likely

to occur on the site. Accordingly, no impact to protected species or their habitat is anticipated, and no further mitigation is required or planned.

Proposed Studies

A list of wildlife that has been noted to occur on the site or within the project vicinity will be developed as part of the future ecological studies proposed for the site. This list will be developed based on direct observations of wildlife (and signs) during site investigations.

3.5.3 Areas of Ecological Significance

Existing Conditions

The area of Queens surrounding the Ravenswood site is an intensely developed, urban area devoid of any appreciable areas of natural habitat or ecological significance. Similarly, the area of Roosevelt Island opposite the Ravenswood site is developed with high-rise residential buildings. In addition, the City's *Comprehensive Waterfront Plan* indicates that the nearest areas proposed for designation as significant coastal fish and wildlife habitat areas are North Brother and South Brother Islands, located approximately 3.4 miles northeast of the proposed project site, and the Lower Hudson River along the west side of Manhattan. Both of these areas are far removed from the proposed project site.

Potential Impacts and Proposed Studies

Considering the distance between the proposed project site and North Brother and South Brother Islands and the Lower Hudson River, no impacts are anticipated and no further studies are proposed.

3.6 Stormwater Management

Existing Conditions

The topography at the proposed site is relatively flat with an average elevation approximately 15.0 feet above mean sea level. The predevelopment drainage consists of both sheet flow (the existing parking lot area) and overland flow with direct discharges from ditches and culverts to the East River. This drainage system is currently part of the Ravenswood complex.

Potential Impacts

Because nearly all of the proposed project site is currently paved, the increase in impervious coverage is expected to be minimal with the proposed construction of the cogneration project and ancillary structures. Nevertheless, stormwater management techniques, as described in the following section, will be implemented for the proposed facility to ensure that the amount and peak rate of runoff is no greater than current site conditions.

Proposed Studies

A detailed stormwater management plan will be prepared for the proposed facility. The management of stormwater at the proposed facility will comply with the regulations of the NYSDEC and the NYCDEP.

Potential Mitigation

A conceptual drainage plan will be prepared for the proposed facility and presented in the Article X application. In keeping with existing stormwater management practices at the site, stormwater from roofs, roads, parking lots and general site areas will most likely be directed to the East River.

During construction, appropriate sediment and erosion control measures, including silt fences and hay bale barriers, will be implemented to ensure that runoff from construction areas is minimized and does not leave the project site or impact the East River.

The proposed 250 MW power plant will be designed in conformance with current regulatory guidelines and in conformance with the goals and objectives of the existing plans. These plans will be revised or supplemented to incorporate the proposed project prior to operation. In addition, plant personnel will be trained in the areas of plant safety, environmental systems and controls, security procedures, emergency response to hazardous materials and appropriate spill response procedures including initial containment and notification requirements.

To the maximum extent practicable, all areas of the proposed plant in which oil or hazardous substances are routinely stored, processed or transferred will be constructed to prevent the largest probable spill from flowing, draining, or leaching into the lands and waters of the State of New York. Secondary containment structures at the facility will include curbs, drip pans and sumps that lead to the oily waste compartment of the

contaminated drain pit, where oil and water are separated with the oil skimmed and removed. Plant personnel will also perform daily inspections of the equipment serviced by lube-oil reservoirs to detect leaks. If an equipment leak is detected, the leaking material will be captured and contained using drip pans, sorbent materials or pads and the leaking equipment, where practical, will be promptly repaired, replaced or taken out of service.

3.7 Visual Resources

Existing Conditions

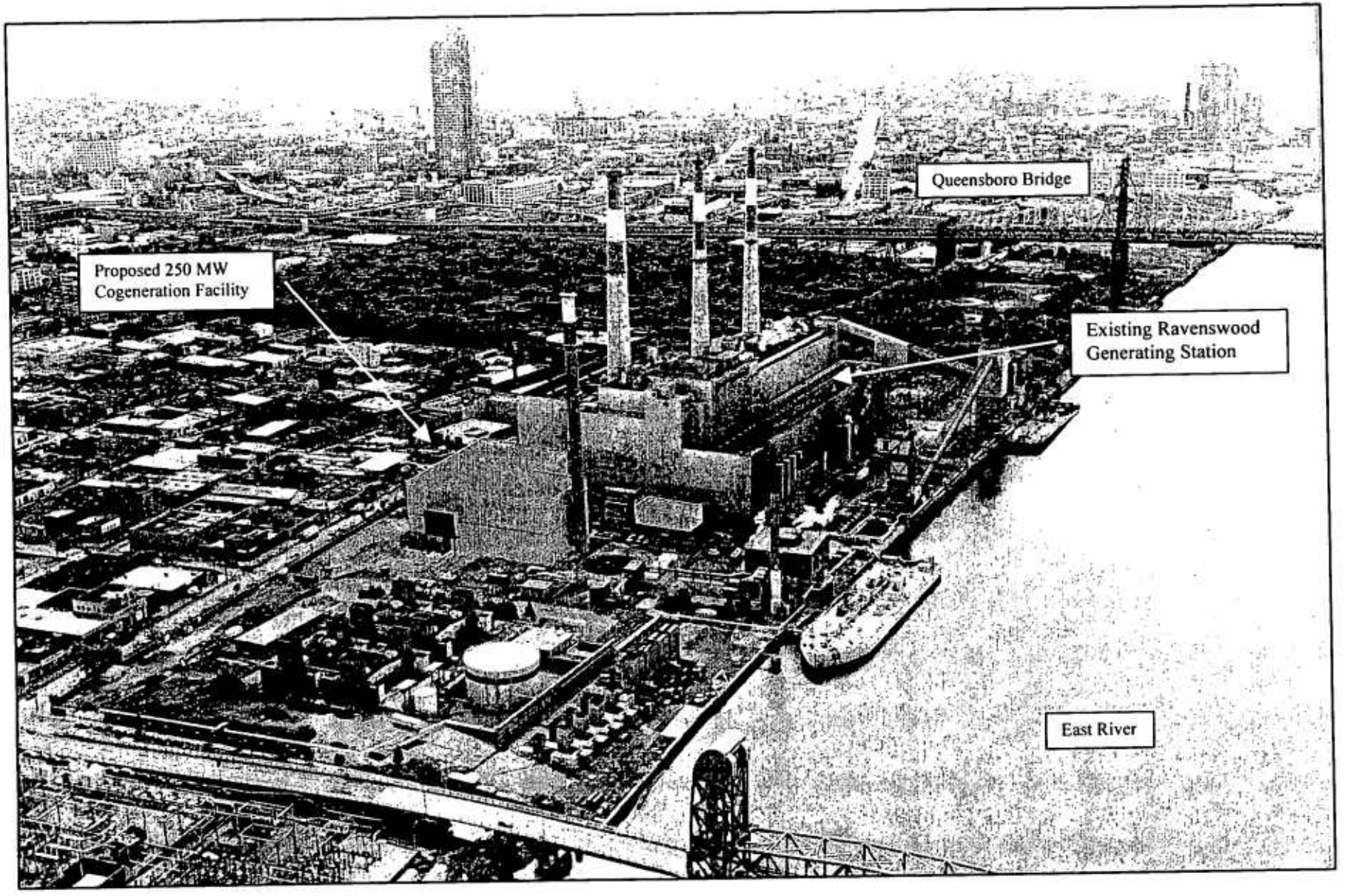
The proposed project site consists of a 2.5-acre paved parking area located adjacent to KeySpan's existing 27.6-acre Ravenswood Generating Station. Prominent man-made visual features on the site include the existing electric generating facilities, coal handling facilities and stacks. Figure 3-5 provides an artist's rendering of the proposed facility.

The area surrounding the proposed site can be characterized as an urban coastal setting with limited topographic relief; elevations within one mile of the project site are generally less than 50 feet above mean sea level. The few visual vantage points in the area are provided by high rise buildings and elevated roadways and bridges, such as the Queensborough (59th Street) Bridge and the Roosevelt Island Bridge.

A preliminary inventory of visually sensitive resources within one mile of the proposed project is provided in Table 3-10. Visually sensitive resources are defined as identifiable sites where visual quality and aesthetics are important to the use and enjoyment of the site. Visually sensitive resources include: historic buildings and sites; parks and other public recreation areas; designated scenic districts and roads; and scenic vistas and overlooks.

Potential Impacts

Due to the height and bulk of the existing facilities at the Ravenswood site, only intermittent views of the proposed project are anticipated from the surrounding neighborhood. Visibility alone, however, does not necessarily constitute an adverse aesthetic impact. Other factors, such as viewer context, the visual absorption capacity of the surrounding landscape, and the activities of potential viewers are important in establishing the proposed facility as a significant visual point of interest. These factors will be especially important in evaluating the aesthetic impact of the proposed facility, considering the highly industrial nature of the surrounding waterfront area and the dense development of the adjacent residential neighborhood. In this context, the potential visual



KeySpan Energy
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Figure 3-5. Project Photosimulation

Source: Burns and Roe Enterprises, Inc., November 1999

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Table 3-10: Visually Sensitive and Historic Resources Within One Mile* of the Proposed Project Site

Site Name	*Location*	*Remarks*
Rainey Park	Vernon Blvd. and 34th St.	Waterfront park (8.09 acres)
Queensbridge Park	Vernon Blvd. and Bridge Plaza	Waterfront park adjacent to Queensboro Bridge (20.34 ac)
Roosevelt Island Park	Main Street	Park in the middle of Roosevelt Island adjacent to Queensboro Bridge (20.34 acres)
Blackwell Park	Roosevelt Island	
Ravenswood Park	34th Avenue and 21st Street	2.75 acre playground
Lighthouse Park	Roosevelt Island	North side of island.
Astoria Health Center Playground	14th Street and 31st Avenue	0.21 acre playground
Queensbridge "Baby" Park	Vernon Blvd. and 21st St	Waterfront park
Van Alst Playground	30th Avenue and 14th Street	0.9 acre playground
Astoria Heights Playground	30th Road and 45th Street	2.2 acre playground
Astoria Park/Astoria Lower Playground	Shore Blvd., 23rd Avenue, 23rd Road	Playground
Athens Square Park	29th St and Newtown Ave.	0.9 acre playground
Broadway Playground (Sean's Place)	38th St. , 31st Avenue, Broadway	0.58 acre playground
35th Avenue Playground	35th Avenue and Steinway Street	0.218 acre playground
Corp. Frank F. Fagan Square	Broadway, Newtown Rd	.004 acre sitting area
Hallets Cove Playground	Vernon Blvd., Hallets Cove, 30th Avenue	5.7 acre waterfront playground
Hellgate Field	2nd Street and 26th Avenue	3.62 acre park
John J. Dwyer Square	Northern Blvd.., 47th Street and 34th Avenue	Sitting area
Socrates Sculpture	Broadway, Vernon Blvd., 31st Road	1.55 acre park
St. Michael's Park	BQE, 30th Ave	8.8 acre playground
Spirit Playground	36th Avenue and 9th Street	0.7 acre playground
Dutch Hills Playground	36th and 37th Avenues, Crescent	2.4 acre playground
Placella Park	37th Avenue and 21st Street	0.22 acre sitting area
Strippoli Triangle	31st Avenue and 54th Street	0.61 acre sitting area
Ruppert Park		
Rafferty Triangle	Crescent St., 44 Dr., Hunter Street	0.001 acre triangle
Short Triangle	Jackson Ave., 45 Rd., 23rd Street	0.01 acre sitting area
Murray Playground	45th Ave., 45th Road, 11, 21 Streets	2.5 acre park

Andrews Playground	49th Ave, Vernon Blvd, 5 St	.51 acre playground
Court Square Park	Jackson, Thomson Aves., Court Square	0.105 sitting area
Gordon Triangle	Vernon Blvd., 10 St., 44 Dr.	0.8 acre sitting area
14 Honey Locusts	First, Second Avenues, East 59th Street	0.295 acre sitting area
Saint Catherine's Park	E 67 – 68 Streets, First Ave.	1.38 acre park
24 Sycamore Playgrounds	FDR Drive, York Ave., 60-61 Streets	0.622 acres with playground
Judge Seabury Park		
John Jay Park	78th St and FDR, NYC	Playground, hockey field, pool and bathhouse (3.31 acre)
Carl Schurz Park	East End Avenue, 84 – 90th Streets	Environmental education center, Gracie Mansion, hockey field, 14.938 acres
90th Street Pier		Environmental use
60 Street Pavilion	E. 60th Street and East River Drive	Sitting area
East River Drive Esplanade	FDR Drive, E 68th to E 96th Street	1.828 acre esplanade
Tramway Plaza	Second Avenue	0.345 acre plaza
PS 1 Contemporary Art Center	22-25 Jackson Avenue at 46th Street	Long Island City
PS 5	30th Ave and 30st Street	
PS 76	36th Ave and 9th Street	
PS 83	34th Ave. and 9th Street	
PS 111	38th Ave. and 13th Street	
PS 112	37th Ave. and Crescent Street	
PS 158	Near York and East 79th St	Elementary school
PS 166	35th Ave and 34th Street	
PS 171	30th Ave. and 14th Street	
PS 198		Beacon School
PS 204	37th Ave. and 28th Street	
Roosevelt Island School	Roosevelt Island	Beacon School
JHS 10		
JHS 126	30th Road and 45th Street	2.2 acre playground
St. Patrick's School	39th Ave. and 28th Street	
St. Rita's School	36th Ave. and 11th Street	
Kaufman-Astoria Studios	35th Street and 35th Avenue	Historic landmark
Queensboro Bridge	59th Street Bridge	Historic landmark
Gracie Mansion	East End Avenue	Historic landmark

* Study Area includes portions of Queens Community District 1, Queens Community District 2, Manhattan Community District 6 and Manhattan Community District 8 within one mile of the project site.

impact of the proposed facility is expected to be very limited and insignificant considering the location of the site is within an existing power plant complex and limited views afforded by the dense development in the surrounding area.

Proposed Studies

Starting with the preliminary inventory shown in Table 3-10, visually sensitive resources will be identified within a one-mile radius of the proposed project site using existing maps and other published sources, including the National and State Registers of Historic Places. The one-mile radius will encompass parts of Long Island City, Astoria, Manhattan and Roosevelt Island. Beyond one mile, potential visual impacts are expected to be insignificant considering the existing urban/industrial context within which the plant will be located. Visually sensitive resources will be mapped at an appropriate scale for presentation in the Article X Application.

Identified visually sensitive resources will be evaluated in the field to determine if the proposed project will be visible and to assess the relative importance of views which may include the proposed plant. The field investigations will make note of viewer context, existing landscape quality, and the extent of potential project visibility (i.e., partial or full view). The existing stacks at the Ravenswood sites will be used to determine the potential project views. If necessary, photographs will be taken to document the existing views toward the proposed project.

Based on the results of the inventory and field investigations, a visual and aesthetic impact assessment will be prepared for incorporation in the Article X Application. This assessment will be based on the major physical features of the plant (i.e., turbine building and stack) as well as the potential for a visible stack plume. Since visibility alone does not constitute a visual or aesthetic impact, the assessment will rely on the results of the field investigation as opposed to the mechanical construction of a viewshed map. A viewshed map, typically developed on the basis of topography alone, is not considered appropriate for this analysis due to the urban nature of the project location and the limitations created by the dense urban development.

Potential Mitigation

The design of the proposed facility will consider the visual appearance of the plant in the selection of the building materials and colors. The objective will be to create a visually attractive project within the limitations of the proposed technology.

3.8 Cultural Resources

3.8.1 Archaeological Resources

Historic Sanborn Fire Insurance Maps were reviewed for the years 1898, 1915, 1936, 1947, 1950, 1980, and 1991, to assist in the identification of historic uses of the project site. These maps indicated that the proposed project site was occupied by 1898 with facilities (i.e., tar well and gas holders) associated with the East River Gas Light Co. These facilities were expanded by 1915 under the ownership of the New Amsterdam Gas Co. The 1936 map shows little change from 1915, with continued ownership by the New Amsterdam Gas Co. The 1947 and 1950 Sanborn maps depict ownership of the facilities by Consolidated Edison Co. of New York, and most of the facilities associated with the gas manufacturing plant (MGP) remain shown on the 1950 Sanborn map. By 1980, these MGP facilities were removed and the facilities seen today (i.e., water reservoir, boiler "A" house, and the Ravenswood Generating Station) were in place.

Representatives from the Office of Parks, Recreation and Historic Preservation will be consulted to review the information known about the proposed project site and determine the need for any additional archeological investigations.

3.8.2 Historic Architectural Resources

Manhattan

There are six historic districts in the Manhattan Community Board 8 area. These include the Upper Eastside Historic District, Carnegie Hill Historic District , Metropolitan Museum Historic District, Treadwell Farm Historic District, Henderson Place Historic District, and the Hardenburgh-Rhinelander Historic District.

Gracie Mansion stands in Carl Schurz Park near Hell Gate. The Dutch West India Company deeded the land in 1646 to Sybout Claessen. The first house was built on the site around 1770 by Jacob Walton, a merchant and British Loyalist. Archibald Gracie, a Scottish shipping magnate, bought the property in 1798 and built the mansion in 1799. Fiorello LaGuardia made the Federal-style mansion the official residence of the Mayor of the City of New York in 1942. The mansion, restored in 1984 through gifts to the Gracie Mansion Conservancy, has a museum on the first floor.

Queens

In 1919, Lasky and Zukor's Famous Players Film Company opened Kaufman – Astoria Studios at Pierce and Sixth Streets, now known as 35th Street and 36th Avenue. With the creation of Paramount Studios in the 1920s, the area became the movie-making capital of the East Coast. After two decades of making movies, then 30 years of turning out instructional films as the US Army Pictorial Center (1942-1972), the buildings fell into disuse and were badly vandalized until a coalition of Queens officials and motion-picture labor unions organized a restoration project in 1976.

Potential Impacts and Proposed Studies

The proposed project will not result in any direct impacts on the historic architectural resources located throughout Manhattan and Queens. Potential visual impacts to these identified resources will be evaluated as part of the visual impact assessment for the proposed project (see section 3.7).

The Article X application will present a complete inventory of historic architectural resources and historic districts listed on the State and National Registers of Historic Places as well as designated New York City Landmarks within one mile of the project site. Considering the industrial nature of the property surrounding the proposed project and the small incremental change in the aesthetics of the area, further efforts to inventory potentially eligible historic architectural resources is not considered warranted.

3.9 Traffic and Transportation

3.9.1 Roadway Network

Existing Conditions

The Ravenswood Facility is located approximately 2,000 feet north of the Queensboro Bridge and 500 feet south of the Roosevelt Island Bridge. Significant roadways within the project area include the Brooklyn Queens Expressway, Northern Boulevard, Grand Central Parkway, Astoria Boulevard, and the Long Island Expressway. Bridges in close proximity to the project site include the Queensboro Bridge, Roosevelt Island Bridge and the Triborough Bridge. The existing roadway network in the vicinity of the project site is indicated in Figure 3-6.

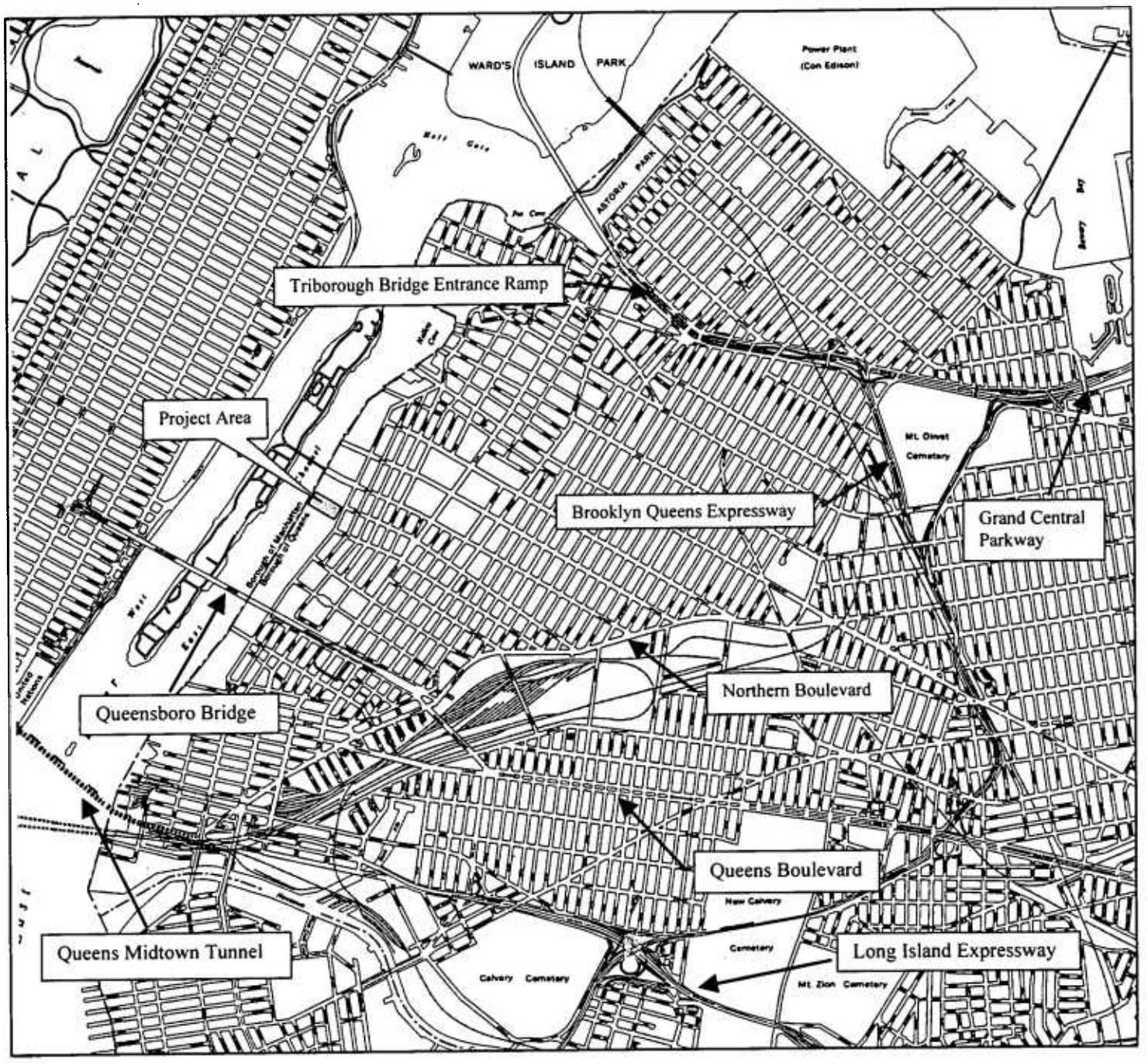

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Figure 3-6. Local Roadway Network

Source: NYC Dept of Planning Sectional Maps

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The Grand Central Parkway is the major east-west, limited-access highway through the project area serving the Astoria, East Elmhurst and the Jackson Heights neighborhoods of Queens and La Guardia Airport. Traveling east along the highway, destinations within Flushing Meadows and Jamaica, Queens can be reached as well as Nassau County, Long Island. The Parkway also provides access to Interstate Route 678 (the Van Wyck and Whitestone Expressways) and Interstate Route 495 (Long Island Expressway).

The Long Island Expressway (LIE), another major east-west highway, is located south of the project site. The LIE, or I-495, is a limited-access highway that serves as a connector to the Brooklyn Queens Expressway (I-278), which is the boundary line between Long Island City and Jackson Heights. Interstate 278, comprising the Brooklyn Queens Expressway and Triborough Bridge in the project area, is the major north-south limited access highway serving the project site. Traveling north on the Triborough Bridge, access is provided to destinations within Manhattan and the Bronx. Traveling south on the Brooklyn Queens Expressway local destinations within Queens and Brooklyn can be reached as well as Manhattan via the Williamsburg, Manhattan, and Brooklyn Bridges or the Brooklyn Battery Tunnel.

The study area immediately adjacent to the project site includes Vernon Boulevard, Northern Boulevard, Long Island Expressway and 34th Avenue. The main gate of the project site is located on Vernon Boulevard, which is a major north-south thoroughfare in Long Island City adjacent to the East Channel. Additional north-south thoroughfares in the area include 21st Street, 31st Street and Steinway Streets. Queens Plaza North and 34th Avenue provide primary east-west access in the vicinity of the project site.

Potential Impacts

Primary access to the proposed KeySpan facility will be from the existing main entrance on Vernon Boulevard. As such, existing traffic patterns will not be altered by the proposed project.

During the 18-month proposed construction period of the project, there will be an increase in the use of local roadways due to the ingress and egress from the project site of construction equipment and workmen vehicles and deliveries of building materials. It is anticipated that project generated traffic during construction would utilize regional highways to gain access to the project area. Vernon Boulevard, 34th Avenue and Queens Plaza North would most likely be used locally to access the project site.

To minimize conflicts with operations of the existing Ravenswood Plants and to reduce traffic impacts to the local roadway network during construction, the delivery of larger system equipment by barge via the East River will be evaluated.

Significant impacts to the local transportation network as a result of the operation of the proposed project are not anticipated. As future activities at the site will not vary greatly from those currently occurring, local roadways are expected to operate similar to existing conditions. During operations, project related traffic will involve a limited number of service vehicles, tank trucks, and employee vehicles. Future employees responsible for the operation of proposed facility will continue to use the primary entrance gate. Parking for future project employees will be provided on the existing station property, proximate to the proposed facility.

Proposed Studies

A traffic study will be conducted to evaluate existing traffic volumes and assess roadway operating conditions in the vicinity of the project. Existing information available from the New York State Department of Transportation, the New York City Department of Planning, and the New York Metropolitan Transportation Council will be reviewed to examine existing operating conditions and physical characteristics for the primary access roadways and regional highways. Trip generation estimates will be developed for both future construction and operation conditions. These will include estimates for both peak trip generation during construction and times of normal operation. The likely hours of travel to and from the project site and the number and type of equipment deliveries will also be presented. The potential project-related impacts will then be assessed by evaluating estimated project generated vehicle trips and likely routes of travel in light of existing traffic conditions within the proposed project area.

Potential Mitigation

Significant impacts to the local roadway network are not anticipated as a result of the operation of the proposed facility. Several mitigation measures, however, are available to minimize potential transportation impacts during construction of the proposed facility.

- Scheduling of construction shifts so that the majority of construction related project traffic occurs outside of peak commuting hours.
- Staggering of construction shifts start and finish times by trade.
- Scheduling, to the maximum extent possible, delivery of construction materials outside of peak commuting hours.

- Delivery of large project components/equipment by barge, should this be determined to be possible.

- Development of carpooling programs, if determined to be feasible.

3.9.2 Mass Transit

Existing Conditions

There are a number of mass transit opportunities within the project area. A station for the Metropolitan Transit Authority (MTA) New York City Subway "B" and "Q" line is located at 21st Street and Queensbridge, located approximately 1/2 mile south of the project site. The subway line originates at 34th Street-Herald Square and serves the Long Island City sections of Queens. Numerous opportunities for bus and rail transfers exist along the line. Community District 8 has only one subway line, the Lexington Avenue IRT subway, traveling the East Side. Presently, the Lexington Avenue IRT carries 600,000 commuters each day and is between 40% and 60% over capacity at rush hour. The Board's Statement District Needs notes that "public transit is overwhelmed, especially with recent incentives such as free transfers and unlimited Metrocard passes.

Free transfers are available between the subway and bus lines. MTA Bus service within the project area includes the New York City Transit, Queens Surface Corporation, and Triboro Coach Corporation lines. The New York City Transit bus route transports passengers over the Queensboro Bridge and provides service to Queens Boulevard. The Queens Surface Corporation provides service to Roosevelt Island and throughout Long Island City and Hunters Point. The Triboro Coach Corporation has bus routes connecting Hunters Point, Long Island City and Astoria on a north-west route along 21st Street.

Potential Impacts and Proposed Studies

No significant impacts to the operation of mass transit systems are anticipated as a result of the proposed facility. As such, no further studies are proposed.

3.9.3 Aviation

LaGuardia Airport is located in the Borough of Queens approximately three miles northeast of the proposed project site. LaGuardia Airport has been operated by the Port Authority of New York and New Jersey under a lease with New York City since June 1, 1947. The airport consists of 680 acres and 72 aircraft gates. There are two main

runways (4-22 and 13-31) each measuring 7,000 feet long by 150 feet wide. Five hangars are located at LaGuardia with space for the following airlines: Delta, United, TWA, Northwest and American. LaGuardia Airport is one of three major airports in the New York metropolitan region, serving more than 22 million air travelers annually.

The 60th Street Heliport, which was located in Manhattan on the East River directly across from Roosevelt Island, has been closed. This site will be used to extend the park located along the East River to the FDR Drive at 59th Street.

Considering the location and height of the existing facilities at the Ravenswood site, the proposed project is not expected to have any impact on the operations at LaGuardia Airport. Nevertheless, the project will require completion of a Notification of Construction or Alteration for submittal to and review and approval by the Federal Aviation Administration.

3.10 Community Facilities and Services

3.10.1 Police, Fire, and Emergency Services

The proposed project site is located within the New York Police Department's 114th Precinct's jurisdiction, which serves Queens and Roosevelt Island. The 19th Precinct serves Community Board District 8 in Manhattan.

The site is also located within Fire Engine Company #250's district. The NYCFD will annually inspect the facility and test the site's fire suppression system. The fire protection system at the facility will include automatic fire detection and alarm systems that will also activate fire suppression systems and provide warning to on-site personnel. In the event of a fire, the NYCFD and local officials will implement any community emergency plans.

In the event of an emergency, the facility's response plan will be consulted. The proposed facility's response plan will be similar to the existing Ravenswood Facility Response Plan. Hospitals within the project area include Astoria General Hospital (30th Avenue and Crescent Street), Coler Hospital (Roosevelt Island), Goldwater Memorial Hospital (Roosevelt Island), Memorial Sloan Kettering Hospital (York Avenue), and Cornell Medical Center (FDR Drive). The hospitals on Roosevelt Island are specialized long-term care facilities.

The proposed project will not result in any increased demand or requirements for the local police and fire departments, therefore, no impacts on these services are anticipated and no further studies are proposed.

3.10.2 Solid Waste

Existing Conditions

The Final Scoping Document for the Comprehensive Solid Waste Management Plan DEIS dated May 28, 1999, states that all waste generated by the City's commercial businesses and industries is currently managed by private companies and exported out of the City through existing private transfer facilities and by direct hauls in collection vehicles. Any waste generated by the proposed facility will also be handled in a similar manner by an independent hauler.

Potential Impact

Solid waste will be generated during construction as well as operation of the proposed facility. All wastes will be handled and disposed of by licensed haulers in accordance with all applicable state and city laws and regulations, similar to the handling and disposal of wastes generated at the existing Ravenswood Generating Station.

Proposed Studies/Data Collection

The Article X Application will characterize and quantify the various anticipated solid waste streams anticipated from construction of the proposed facility. Generation of solid waste during facility operation will be minimal and will be handled through the existing disposal contractor.

Potential Mitigation

The proposed project will be integrated into KeySpan Energy's recycling programs for selected wastes such as paper, plastic and aluminum cans in order to minimize the amount of solid waste generated. Since all solid wastes generated at the proposed facility will be handled and disposed of in accordance with applicable laws and regulations, no specific mitigation is warranted or proposed.

3.10.3 Recreational and Educational Facilities

Existing Conditions

Table 3-13 identifies the existing recreational and educational facilities located within one mile of the project site. Community Districts within one mile include Queens Community Board 1, Queens Community Board 2, Manhattan Community Board 6 and Manhattan Community Board 8.

According to the Plan for the Queens Waterfront, Community District 1 is the second most underserved district in Queens in terms of parkland, with most of the major public open spaces located in the western part of the district along the East River. Community District 2's parkland consists of only eight parks, excluding triangles and sitting squares, for the 100,000 residents of that district.

Community District 8's Statement of Needs addresses the educational issues such as Beacon Schools, universal pre-kindergarten programs, recreational opportunities and teen safety. The Board is concerned that funding for youth programs is inadequate. Community School Board 2 and the Division of High Schools addresses public education issues in District 8.

Potential Impact

Direct impacts to recreational areas and educational facilities, such as limiting access or creating additional demand, will not occur during construction or operation of the facility. It is anticipated that any impacts to the resources identified in Table 3-13 during the construction and operation of the proposed project will overlap concerns and studies discussed in the noise and visual impact sections of this report.

Proposed Studies/Data Collection

The Article X application will identify the recreational and educational facilities in Queens, such as Queensbridge Park and Rainey Park, that have the potential for experiencing increased noise or visual impacts. Potential impacts to these facilities will be evaluated in accordance with the methodologies outlined in sections 3.12 (Noise) and 3.7 (Visual Resources) of this Pre-Application report.

Potential Mitigation

Potential mitigation with regard to recreational and educational facilities will be addressed, as appropriate, in terms of noise and visual impacts.

3.11 Socioeconomics

Projects similar to the proposed facility typically create a social and economic impact to an area during construction as well as during operation of the project. Impacts to the socioeconomic environment due to construction of a facility are shorter in term, but typically have a greater impact than the impacts due to operation. This is primarily due to the influx of construction personnel. Socioeconomic impacts of the proposed project will be evaluated in terms of demographics, economic status (i.e., income levels) and employment.

3.11.1 Demographics

Existing Demographic Characteristics

Existing data sources, such as the Community District Needs FY 2000 and U.S. Census data, were reviewed to assist in identifying the socioeconomic characteristics of the area. The proposed project is located within the boundaries of Community District 1 in Queens, New York. Generally, the demographic characteristics and trends in Community District 1 are similar to those in the remainder of Queens and those in the city as a whole. Demographic data for the District is found in Table 3-11.

The population trends in New York City, Queens and Community District 1 have followed the same patterns since 1970. All three regions experienced a decline in total population between 1970 and 1980 and an increase in population between 1980 and 1990. Even with the increases in population between 1980 and 1990, none of the areas have reached the total population levels recorded in 1970.

The percentage of the 1998 population residing within the boundaries of Queens Community District 1 receiving public assistance (15%) is basically the same as the percentages for Queens Borough (14.5%). The percentage of the 1998 population residing within the boundaries of Community District 2 receiving public assistance was 12.9%. All three areas have lower percentages of the population receiving public assistance than New York City as a whole (21.7%).

Table 3-11: 1990 Population by Race and Hispanic Origin

Race	New York City		Queens Borough		Queens Community District 1		Queens Community District 2	
	Number	%	Number	%	Number	%	Number	%
Total	7,322,564	100	1,951,598	100	188,549	100	88,930	100
White Non-Hispanic	3,163,125	43	937,557	48	101,934	54	55,465	62
Black Non-Hispanic	1,847,049	25	390,842	20	20,223	11	1,406	2
Hispanic Origin	1,783,511	24	381,120	19	48,797	26	23,141	26
Asian, Pacific Non-Hispanic	489,851	7	229,830	12	16,176	8	8,654	10
American Indian, Non-Hispanic	17,871	0.2	5,606	0.3	437	0.2	92	0.1
Other Non-Hispanic	21,157	0.3	6,643	0.3	982	0.5	172	0.2
Under 18 years	1,686,718	23	408,627	21	33,802	18	16,969	19
18 years and older	5,635,846	77	1,542,971	79	154,747	82	71,961	81

Race	Manhattan Borough		Manhattan Community District 6		Manhattan Community District 8	
	Number	%	Number	%	Number	%
Total	1,487,536	100	133,748	100	210,880	100
White Non-Hispanic	726,755	49	108,798	81	183,979	87
Black Non-Hispanic	261,120	18	5,730	4	6,256	3
Hispanic Origin	386,630	26	8,984	7	11,748	6
Asian, Pacific Non-Hispanic	106,306	7	9,950	7	8,517	4
American Indian, Non-Hispanic	2,793	0.2	147	0.1	154	0.1
Other Non-Hispanic	3,932	0.3	139	0.1	226	0.1
Under 18 years	246,827	17	9,928	7	21,699	10
18 years and older	1,240,709	83	123,820	93	189,181	90

Source: New York City Department of City Planning, December 1998

Potential Impacts

The proposed project will not have any direct impact on population or income levels, and the proposed project will not result in any displacements. There may be concerns, however, that the proposed project could result in disproportionately high and adverse human health or environmental effects on minority populations and low income populations.

Proposed Studies

The documentation of the socioeconomic conditions of the community surrounding the proposed project site will be used to demonstrate that the siting and operation of the proposed project will not unfairly impact or disadvantage any minority or low-income groups.

Existing data sources will be reviewed to identify the socioeconomic characteristics of Community District 1 and the neighborhoods near the Ravenswood Generating Station. Specific characteristics will include: total population; population by age and sex; racial and ethnic background; number of persons below poverty level; and household income. For comparative purposes, similar statistics will be obtained for the Borough of Queens and the City of New York. Data sources will include: the Queens Borough Community District Needs, Fiscal Year 1999; the NYC Department of City Planning; and the U.S. Bureau of the Census.

The environmental justice evaluation will take into consideration the demographic and socioeconomic characteristics of the nearby neighborhoods as well as the area of potential direct and indirect impacts from the proposed project, most notably air quality and noise impacts. The U.S. EPA environmental justice strategy will be reviewed to ensure that the proposed project and the evaluation of potential impacts adequately demonstrate the lack of environmental justice concerns.

3.11.2 Employment

Direct socioeconomic benefits will be associated with construction and operation of the proposed facility. During construction, approximately 200 to 250 local union jobs will be created, resulting in the employment of specialized craftspersons. Employment benefits will continue throughout the 18-month construction period. The local economy will also benefit from the purchase of construction materials from local suppliers. Additional, although modest, employment gains will also be realized during operation of the

proposed facility. The Article X application will quantify the employment benefits of the proposed project.

3.12 Noise

Existing Conditions

The existing noise environment surrounding the Ravenswood Generating Station is typical of urban areas, dominated by traffic and transit noise. The proximity of the Queensboro Bridge and LaGuardia Airport also contribute significantly to the ambient noise levels. Existing ambient noise levels will be determined through the performance of a community noise monitoring program.

Potential Impacts

Construction of the proposed facility may result in some short-term, temporary noise impacts for the most proximate residential locations. Actual noise levels during construction will vary with the construction activity and distance to the receptors.

During operation of the proposed facility, noise will be generated by a variety of sources. These include the gas turbines (casing, air inlet and exhaust), steam turbine, HRSG casing and stacks, main transformers and a variety of pumps. Noise levels produced by these sources will be a function of the control measures used and the distance to the noise sensitive receptors.

Proposed Studies

Existing ambient noise levels will be determined through the performance of a community noise monitoring program. Monitoring will be conducted at the nearest identified noise sensitive receptors (residential areas) such as the Queensbridge Houses located east of Vernon Avenue between 40th Avenue and Queens Plaza North. The noise sensitive receptors will be identified through a review of area maps and a site reconnaissance. Measurements of the total and octave band L_{90} noise levels will be made for a duration of 15-minutes at each identified location during the evening hours. These baseline data will be used in the impact assessment for the project.

Computer noise modeling of the major facility sources will be prepared. Noise level data for each of the major facility noise sources will be obtained from equipment vendors. In cases where these data are not available, octave band spectra will be developed following

accepted industry procedures such as those found in Edison Electric Institute's "Electric Power Plant Environmental Noise Guide".

The modeling will consider hemispherical spreading and atmospheric absorption for this analysis. Standard conditions of 59° F and 70 percent relative humidity will be assumed, as well as wind parameters indicated in Figure 3-1. Modeling receptors will be chosen in the same residential locations as where background monitoring is performed.

The noise modeling will be used as a design tool in order to determine the degree of abatement or mitigation (if any) required on individual noise sources. Modeling runs will be made, with noise control added as required, until the required noise limitations are achieved. In accordance with NYSDPS requirements, the modified Composite Noise Rating Method (CNR) will be used to assess potential noise impacts associated with facility operation.

Composite Noise Rating is a widely accepted method to assess community reaction to new noise sources. It takes into account the other influencing factors besides the intensity of the new noise source. These factors include existing background noise and the existence of tonal characteristics in the new noise source. The expected community response to the new noise source is judged based on weighting these components. It is expected that the facility operation will result in the lowest rating "no observed reaction."

Compliance With Standards

An electric generating facility located in New York City must comply with the most restrictive of three separate noise standards/criteria as follows:

New York City Noise Code. The New York City noise code regulates noise levels based on "noise quality zones", which are essentially different land use zones. Subchapter 6 of the code provides the allowable noise levels by noise quality zone. The residential receptors which could potentially be impacted by the project are located in a high density residential zone. This being the case, noise levels from the proposed project would be limited to no greater than 55 dBA at night and 65 dBA during the day. Because the proposed project has the capability to operate 24 hours a day, the facility must comply with the 55 dBA level. Note that this level is the allowable facility contribution, and does not include extraneous sounds such as traffic and other industrial sources.

New York State Department of Public Service (NYSDPS). In accordance with NYSDPS requirements, the modified Composite Noise Rating Method (CNR) must be used to assess potential noise impacts associated with facility operation. This

methodology takes into account many factors including the expected sound level from the plant, the existing sound levels, character of the noise (e.g., tonal, impulsive), duration, time of day and year, and subjective factors such as community attitude and history of previous exposure. The NYSDPS has historically accepted a rating of "D", corresponding to a response of "sporadic complaints", although is currently requesting for new projects that a more stringent rating of "C", corresponding to "no reaction although noise is noticeable" be achieved.

There are no Federal noise standards applicable to this project.

Potential Mitigation

Short-term, temporary noise impacts may occur during construction activities. These impacts may occur when activities, such as pile driving and excavating take place. Impacts could also occur during plant operation if the proper noise control measures are not implemented. Several mitigation measures are available to minimize these potential impacts. Potential noise mitigation measures during construction include:

- Requiring functional mufflers on all equipment.
- Limiting construction hours to daytime only, weekday and Saturdays.
- Staggering the noisiest construction activities such that they do not occur simultaneously.
- Requiring silencers for boiler steam blows.

A variety of noise control measures are also available for operation of this type of facility. Where practical, the selection of low-noise design equipment will be made. In addition, potential mitigation measures include:

- Enclosing sources in buildings.
- Installing tuned HRSG stack silencers.
- Arranging equipment on-site to take advantage of shielding provided by facility buildings.
- Barrier walls.

Recommended noise mitigation measures for the project will be determined following completion of the noise modeling and noise impact assessment are completed. The actual measures implemented, which could differ from those specified during the impact assessment due to changes in plant layout or final equipment vendors, will be determined during final facility design.

4.0 ALTERNATIVES

The principal reason for pursuing the development of the proposed 250 MW cogeneration project is to meet KeySpan's current and projected customer requirements for a reliable and cost-effective supply of electricity in light of the evolving, competitive marketplace for electricity. The stated purpose of the proposed project will be presented as a yardstick for evaluating the acceptability of the various design alternatives.

The following presents the alternatives that will be evaluated in the Article X application.

4.1 No Build Alternative

The evaluation of the No Build Alternative will address the implications of not building the proposed cogeneration facility, including continued operation of the Boiler "A" house for steam production.

4.2 Alternative Facility Designs

The size and configuration of the proposed cogeneration project is somewhat constrained by the space limitations at the Ravenswood Generating Station. To a large extent, these limitations have directed the selection of a single GE Frame 7FA combustion turbine with a HRSG and steam turbine generator as the appropriate size for the proposed project. Alternative plant layouts have been developed to determine the optimum configuration for the facility, based on specific arrangement requirements of the facility components and the needed service connections. These alternative layouts will be described in the Article X application to support the selected configuration for the proposed project.

4.3 Alternative Design Options

The Article X application will identify and evaluate various design options for selected plant components such as alternative cooling systems (i.e., wet cooling tower; air-cooled condensers).

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40CFR81 – Designation of Areas for Air Quality Planning Purposes, 81.333 New York.

6NYCRR 211, General Prohibitions, Subpart 211.3 Visible Emissions Limited.

6NYCRR 255-1, Fuel Composition and Use – Sulfur Limitations, Table 2.

6NYCRR 227-1, Stationary Combustion Installations, Subpart 227-1.2 Particulate Emissions, paragraph (3), and Subpart 227-1.3 Smoke Emissions, paragraphs (1) and (2).

6NYCRR 227-2, Reasonably Available Control Technology (RACT) for Oxides of Nitrogen (NOx).

6NYCRR 231-2, New Source Review in Nonattainment Areas and Ozone Transport Regions, Section 231-2.16 Table 3, Nonattainment Area Classification for PM-10 and CO.

6NYCRR 257 Air Quality Standards: Subpart 257-3.x Standard for Settleable Particulates (Dustfall); Subpart 257-8.3 Ambient Air Quality Standards for Fluorides: Subpart 257-9.3 Ambient Air Quality Standards for Beryllium; Subpart 257-10.3 Ambient Air Quality Standard for Hydrogen Sulfide.

6NYCR 288 Air Quality Standards – Classification System for New York City.

Appendix A

Agency Correspondence

TRC

November 11, 1999

Mr. Mike Stoll
U. S. Fish and Wildlife Service
3817 Luker Road
Cortlandt, New York 13045

Subject: KeySpan Energy - Proposed 250 MW Cogeneration Project
Long Island City, Queens, New York

Dear Mr. Stoll:

KeySpan proposes to construct a 250 megawatt combined-cycle/cogeneration power project on approximately 2.5 acres of the 27.6-acre existing Ravenswood Generating Facility property located in Long Island City, Queens, New York. TRC Environmental, as the applicant's environmental consultants, would like to request the input of the U. S. Fish and Wildlife Service regarding potential impacts on any ecologically significant areas and/or federal or state species of concern known to exist within the project area. The requested information is for the purpose of environmental review in accordance with Article X of the New York State Public Service Law.

The location of the existing Ravenswood Generating Station is indicated in the attached map. The proposed project site is bordered by the East River to the west, Vernon Boulevard to the east, Queensbridge Park to the south, and the Roosevelt Island Bridge to the north. The proposed development site is currently paved and is used for parking.

If you have any questions concerning the proposed project or this request, please contact me at (201) 933-5541, ext.113. Thank you for your attention to this request.

Sincerely,

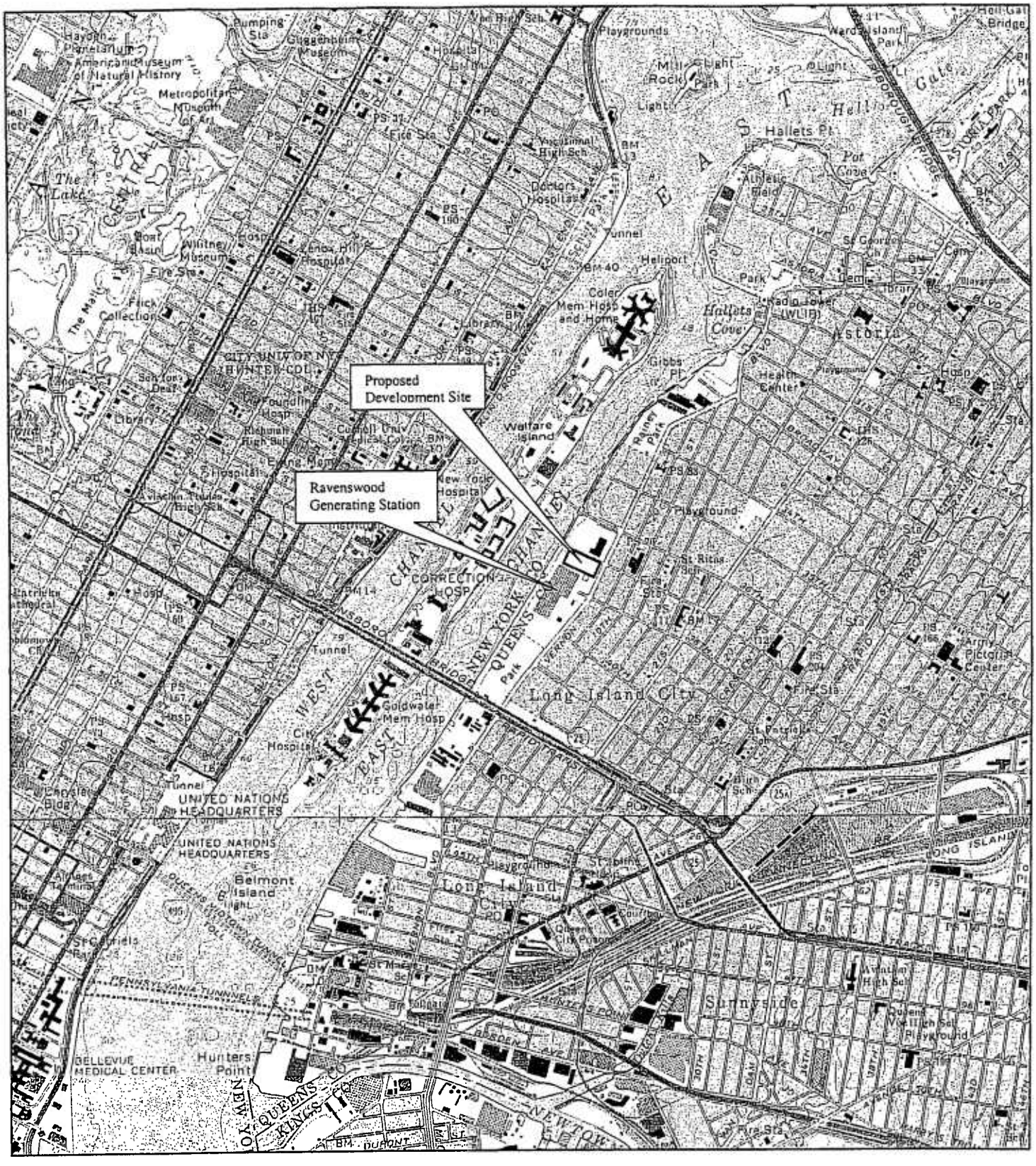
TRC Environmental Corporation

Craig H. Wolfgang
Project Manager

Enclosures

cc: C. Corrado, KeySpan

1200 Wall Street West, 2nd Floor • Lyndhurst, New Jersey 07071
Telephone 201-933-5541 • Fax 201-933-5601



KeySpan Energy
250 MW Cogeneration Facility
Long Island City, Queens, NY

Figure 1-1. Regional Location Map
Scale: 1" = 2000'

Source: USGS Topographical Survey Maps
Central Park N.Y. - N.J. Quadrangle, Photorevised 1979
Brooklyn, N.Y. , Photorevised 1979

TRC

TRC

November 11, 1999

Mr. Stanley Gorski
National Marine Fisheries Service
Habitat and Protected Resources Division
James J. Howard Marine Sciences Laboratories
74 Magruder Road
Highlands, NY 07732

Subject: KeySpan Energy - Proposed 250 MW Cogeneration Project
Long Island City, Queens, New York

Dear Mr. Gorski:

KeySpan Energy proposes to construct a 250 megawatt combined-cycle/cogeneration power project on approximately 2.5 acres of the existing 27.6-acre Ravenswood Generating Facility property located in Long Island City, Queens, New York. The proposed project will include modification of the existing intake on the East River and an increased withdrawal from the East River for cooling water; the discharge will be back to the East River through the existing discharge structure. TRC Environmental, as the applicant's environmental consultants, would like to request the input of the National Marine Fisheries Service regarding potential impacts on any ecologically significant areas and/or federal or state species of concern known to exist within the project area. The requested information is for the purpose of environmental review in accordance with Article X of the New York State Public Service Law.

The location of the existing Ravenswood Generating Station is indicated in the attached map. The proposed project site is bordered by the East River to the west, Vernon Boulevard to the east, Queensbridge Park to the south, and the Roosevelt Island Bridge to the north. The proposed development site is currently paved and is used for parking.

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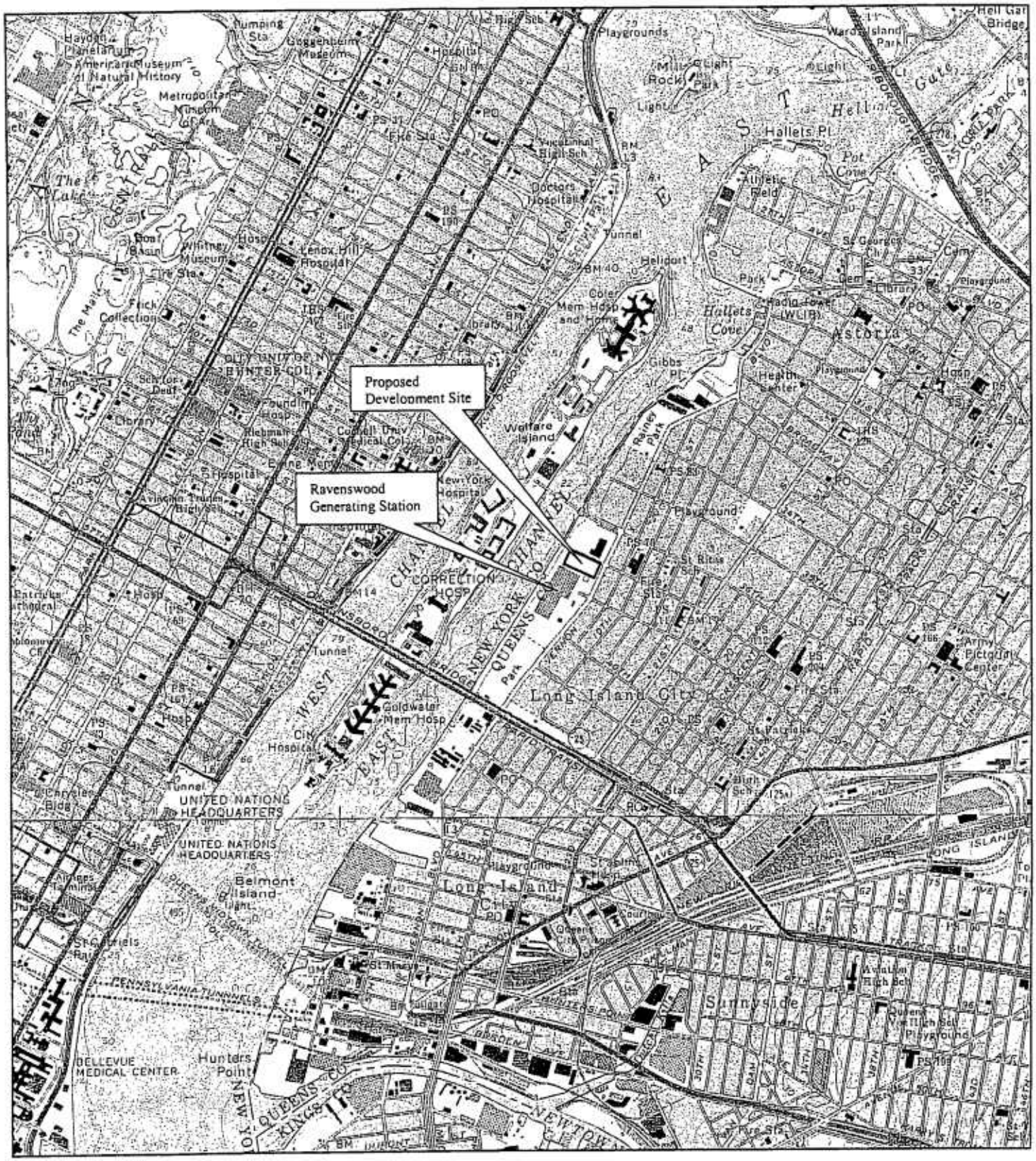
Sincerely,

TRC Environmental Corporation

Craig H. Wolfgang
Project Manager

Enclosures
cc: C. Corrado, KeySpan

1200 Wall Street West, 2nd Floor • Lyndhurst, New Jersey 07071
Telephone 201-933-5541 • Fax 201-933-5601



KeySpan Energy
250 MW Cogeneration Facility
Long Island City, Queens, NY

Figure 1-1. Regional Location Map
Scale: 1" = 2000'

Source: USGS Topographical Survey Maps
Central Park N.Y. - N.J. Quadrangle, Photorevised 1979
Brooklyn, N.Y., Photorevised 1979

TRC

TRC

November 11, 1999

Ms. Betty Ketchum
NYS Department of Environmental Conservation
NY Natural Heritage Program
700 Troy-Schenectady Road
Latham, New York

Subject: KeySpan Energy - Proposed 250 MW Cogeneration Project
Long Island City, Queens, New York

Dear Ms. Ketchum:

KeySpan Energy proposes to construct a 250 megawatt combined-cycle/cogeneration power project on approximately 2.5 acres of the 27.6-acre existing Ravenswood Generating Facility property located in Long Island City, Queens, New York. TRC Environmental, as the applicant's environmental consultants, would like to request the input of the NYS Department of Environmental Conservation regarding potential impacts on any ecologically significant areas and/or federal or state species of concern known to exist within the project area. The requested information is for the purpose of environmental review in accordance with Article X of the New York State Public Service Law.

The location of the existing Ravenswood Generating Station is indicated in the attached map. The proposed project site is bordered by the East River to the west, Vernon Boulevard to the east, Queensbridge Park to the south, and the Roosevelt Island Bridge to the north. The proposed development site is currently paved and is used for parking.

If you have any questions concerning the proposed project or this request, please contact me at (201) 933-5541, ext.113. Thank you for your attention to this request.

Sincerely,

TRC Environmental Corporation

Craig H. Wolfgang
Project Manager

Enclosures

cc: C. Corrado, KeySpan

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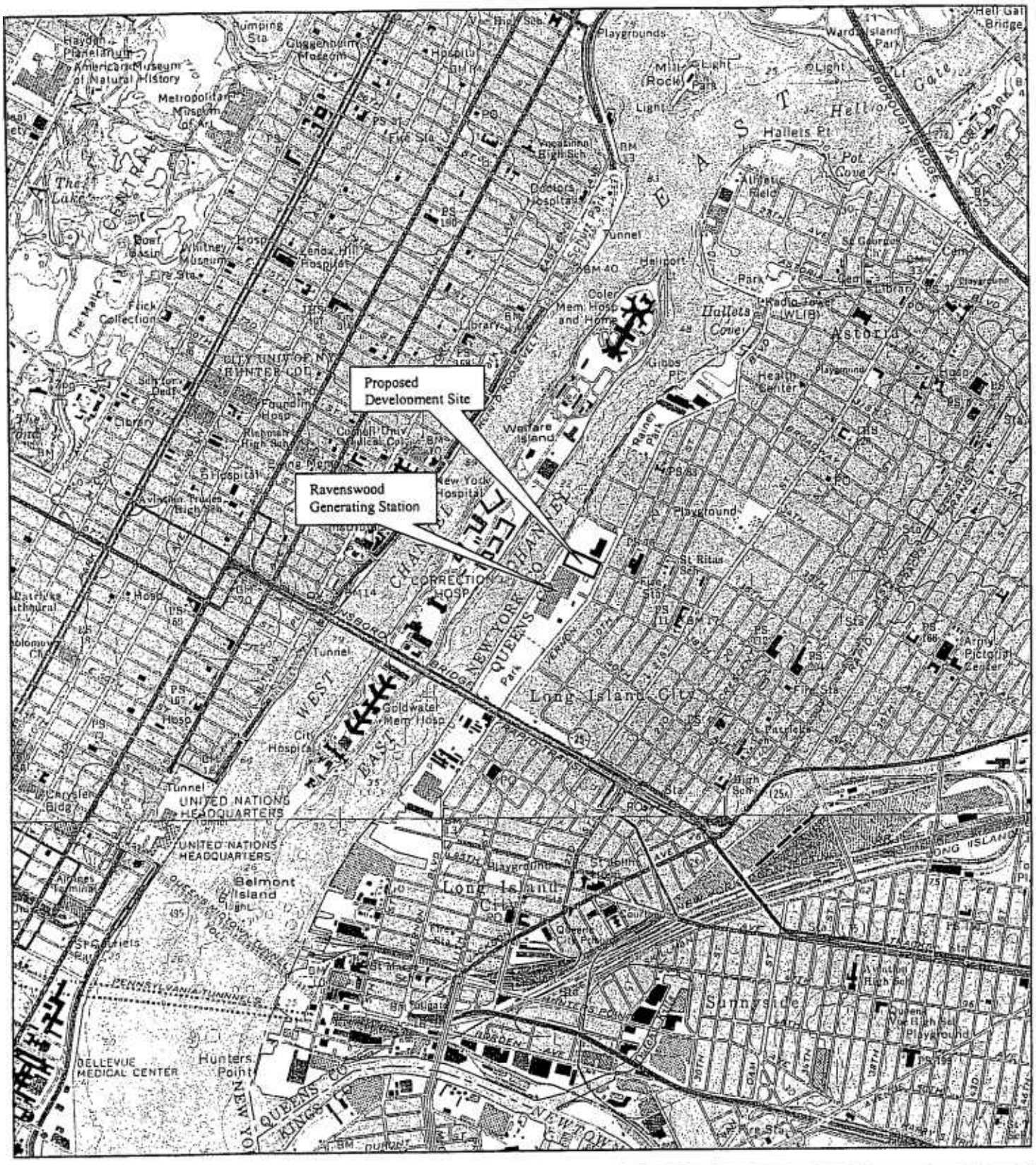

KeySpan Energy
250 MW Cogeneration Facility
Long Island City, Queens, NY

Figure 1-1. Regional Location Map
Scale: 1" = 2000'

Source: USGS Topographical Survey Maps
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Brooklyn, N.Y., Photorevised 1979

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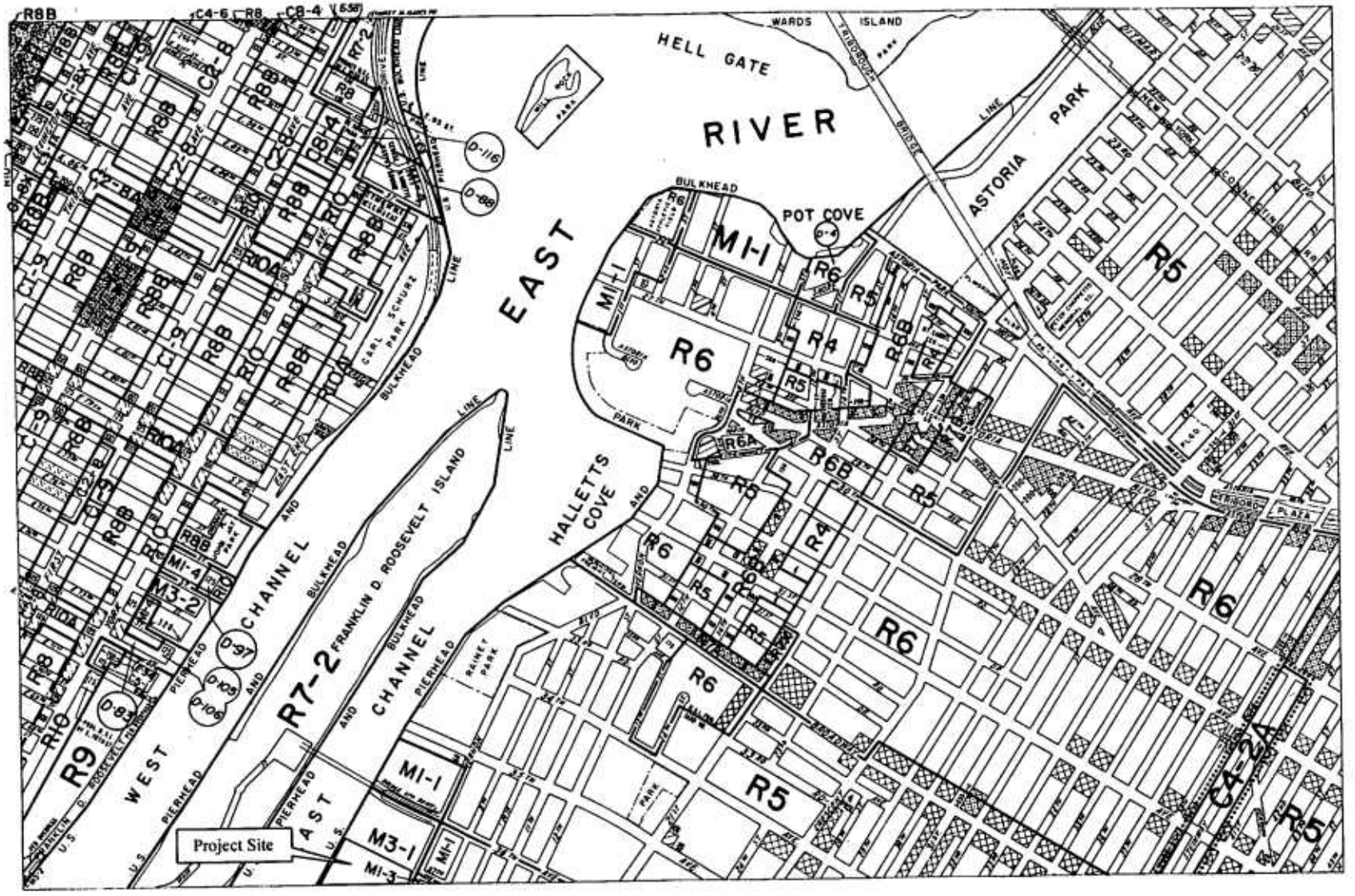

M3: Heavy Manufacturing – low performance
M1: Light Manufacturing – high performance
C4: General Commercial District
C8: General Service District

R4: General Residence District
R5: General Residence District
R6: General Residence Distrct
R7: General Residence District

KeySpan Energy
250 MW Cogeneration Facility
Long Island City, Queens, NY

Figure 3-3. Zoning Map
Scale: As Shown

Source: New York City Zoning Resolution, July 1990

TRC