CEQR ENVIRONMENTAL ASSESSMENT STATEMENT

FORMER FLUSHING AIRPORT WETLANDS DEVELOPMENT PROJECT
COLLEGE POINT, QUEENS, NEW YORK

CEQR REFERENCE NUMBER: 05DME018Q

LEAD AGENCY:
OFFICE OF DEPUTY MAYOR FOR ECONOMIC DEVELOPMENT AND REBUILDING

PREPARED BY:
EDWARDS AND KELCEY

March 2006

City Environmental Quality Review

ENVIRONMENTAL ASSESSMENT STATEMENT

PART I, GENERAL INFORMATION

Reference Numbers

1. 05 DME 0182
CEQR REFERENCE NUMBER (TO BE ASSIGNED BY LEAD AGENCY)

N/A
BSA REFERENCE NO. IF APPLICABLE

N/A
ULURP REFERENCE NO. IF APPLICABLE

N/A
OTHER REFERENCE NO.(S) IF APPLICABLE
(e.g. Legislative Intro, CAPA, etc)

Lead Agency & Applicant Information
PROVIDE APPLICABLE INFORMATION

2a. Lead Agency

Deputy Mayor for Economic Development and Rebuilding
NAME OF LEAD AGENCY

Robert Kulikowski
NAME OF LEAD AGENCY CONTACT PERSON

100 Gold Street
ADDRESS

New York, NY 10038
CITY STATE ZIP

212-788-2937
TELEPHONE FAX

rkulikowski@cityhall.nyc.gov
EMAIL ADDRESS

2b. Applicant Information

Douglas Rice
NAME OF APPLICANT

New York City Economic Development Corporation
NAME OF APPLICANT'S REPRESENTATIVE OR CONTACT PERSON

110 William Street, 3rd Floor
ADDRESS

New York, NY 10038
CITY STATE ZIP

212-312-3750 212-312-3989
TELEPHONE FAX

drice@nycedc.com
EMAIL ADDRESS

Action Description
SEE CEQR MANUAL SECTIONS 2A & 2B

3a. NAME OF PROPOSAL Former Flushing Airport Wetlands Development Project

3b. DESCRIBE THE ACTION(S) AND APPROVAL(S) BEING SOUGHT FROM OR UNDERTAKEN BY CITY (AND IF APPLICABLE, STATE AND FEDERAL AGENCIES) AND, BRIEFLY, DESCRIBE THE DEVELOPMENT OR PROJECT THAT WOULD RESULT FROM THE PROPOSED ACTION(S) AND APPROVAL(S):

See page 1a, Project Description

3c. DESCRIBE THE PURPOSE OF AND NEED FOR THE ACTION(S) AND APPROVAL(S):

Refer to the attached supplemental report

Required Action or Approvals

4. CITY PLANNING COMMISSION ☐ Yes ☒ No

☐ Change in City Map ☐ Zoning Certification ☐ Site Selection - Public Facility
☐ Zoning Map Amendment ☐ Zoning Authorization ☐ Disposition - Real Property ☐ Franchise
☐ Zoning Text Amendment ☐ Housing Plan & Project ☐ UDAAP ☐ Revocable Consent ☐ Concession
☐ Charter 197-a Plan
☐ Zoning Special Permit, specify type:
☐ Modification of
☐ Renewal of
☐ Other

5. UNIFORM LAND USE PROCEDURE (ULURP) ☐ Yes ☒ No

6. BOARD OF STANDARDS AND APPEALS ☐ Yes ☒ No

☐ Special Permit ☐ New ☐ Renewal Expiration Date
☐ Variance ☐ Use ☐ Bulk
Specify affected section(s) of Zoning Resolution N/A

7. DEPARTMENT OF ENVIRONMENTAL PROTECTION ☐ Yes ☒ No

☐ Title V Facility ☐ Power Generation Facility ☐ Medical Waste Treatment Facility

PLEASE NOTE THAT *MANY ACTIONS ARE* NOT SUBJECT TO CEQR. SEE SECTION 110 OF TECHNICAL MANUAL

8. OTHER CITY APPROVALS ☒ Yes ☐ No

☐ Legislation ☐ Rulemaking; specify agency: _____

☐ Construction of Public Facilities ☐ Funding of Construction, Specify ☐ Funding of Programs, Specify

☐ Policy or plan ☐ Permits, Specify: _____

Other; explain: Funding of construction

9. STATE ACTIONS/APPROVALS/FUNDING ☒ Yes ☐ No

If "Yes," identify DEC permits; DEC Grant

10. FEDERAL ACTIONS/APPROVALS/FUNDING ☒ Yes ☐ No

If "Yes," identify Refer to attached supplemental report

Action Type

11a. ☐ Unlisted; or ☒ Type I; specify category (see 6 NYCRR 617.4 and NYC Executive Order 91 OF 1977, as amended): More than 10 acres

11b. ☒ Localized action, site specific ☐ Localized action, change in regulatory control for small area ☐ Generic action

Analysis Year

12. Identify the analysis year (or build year) for the proposed action: 2007 (Phase I), 2009 (Phase II)

Would the proposal be implemented in a single phase? ☐ Yes ☒ No ☐ NA.

Anticipated period of construction: _____

Anticipated completion date: 2007, 2009

Would the proposal be implemented in multiple phases? ☒ Yes ☐ No ☐ NA.

Number of phases: 2

Describe phases and construction schedule: Refer to attached supplemental report

Directly Affected Area

INDICATE LOCATION OF PROJECT SITE FOR ACTIONS INVOLVING A SINGLE SITE ONLY

(PROVIDE ATTACHMENTS AS NECESSARY FOR MULTIPLE SITES)

13a. LOCATION OF PROJECT SITE

Refer to attached supplemental report for Project Location

STREET ADDRESS

Refer to attached supplemental report for Description of Property

DESCRIPTION OF PROPERTY BY BOUNDING OR CROSS STREETS

M1-1 — 10a

EXISTING ZONING DISTRICT, INCLUDING SPECIAL ZONING DISTRICT DESIGNATION IF ANY — ZONING SECTIONAL MAP NO.

Project site: Block 4177, 4178, 4208-4210, 4238-4240, 4278, 4280, 4282,4305 and 4306 — Queens — District 7

TAX BLOCK AND LOT NUMBERS — BOROUGH — COMMUNITY DISTRICT NO.

Upland development area: Block 4179-4183, 4210-4213, 4240-4213, 4282, 4305 and 4306

13b. PHYSICAL DIMENSIONS AND SCALE OF PROJECT

TOTAL CONTIGUOUS SQUARE FEET OWNED OR CONTROLLED BY PROJECT SPONSOR: 3,998,808 sq. ft. (91.8 acres) SQ. FT.

PROJECT SQUARE FEET TO BE DEVELOPED: 1,332,936 sq. ft. (30.6 acres) SQ. FT.

GROSS FLOOR AREA OF PROJECT: N/A SQ. FT.

IF THE ACTION IS AN EXPANSION, INDICATE PERCENT OF EXPANSION PROPOSED IN THE NUMBER OF UNITS, SQ. FT. OR OTHER APPROPRIATE MEASURE: N/A % OF N/A

DIMENSIONS (IN FEET) OF LARGEST PROPOSED STRUCTURE: N/A HEIGHT; N/A WIDTH; N/A LENGTH.

LINEAR FEET OF FRONTAGE ALONG A PUBLIC THOROUGHFARE: N/A

13c. IF THE ACTION WOULD APPLY TO THE ENTIRE CITY OR TO AREAS THAT ARE SO EXTENSIVE THAT A SITE-SPECIFIC DESCRIPTION IS NOT APPROPRIATE OR PRACTICABLE, DESCRIBE THE AREA LIKELY TO BE AFFECTED BY THE ACTION:

N/A - Localized action.

13d. DOES THE PROPOSED ACTION INVOLVE CHANGES IN REGULATORY CONTROLS THAT WOULD AFFECT ONE OR MORE SITES NOT ASSOCIATED WITH A SPECIFIC DEVELOPMENT? ☐ Yes ☒ No

IF 'YES', *IDENTIFY THE LOCATION OF THE SITES* PROVIDING THE INFORMATION REQUESTED IN 13a & 13b ABOVE.

PART II, SITE AND ACTION DESCRIPTION

Site Description

EXCEPT WHERE OTHERWISE INDICATED, ANSWER THE FOLLOWING QUESTIONS WITH REGARD TO THE DIRECTLY AFFECTED AREA. THE DIRECTLY AFFECTED AREA CONSISTS OF THE PROJECT SITE AND THE AREA SUBJECT TO ANY CHANGE IN REGULATORY CONTROLS.

1. **GRAPHICS** Please attach: (1) a Sanborn or other land use map; (2) a zoning map; and (3) a tax map. On each map, clearly show the boundaries of the directly affected area or areas and indicate a 400-foot radius drawn from the outer boundaries of the project site. The maps should not exceed 8½ x 14 inches in size. Refer to Figures 2, 3 and 4 of supplemental report

2. **PHYSICAL SETTING** (both developed and undeveloped areas)
Total directly affected area (sq. ft.): 3,998,808 sf (91.8 ac) Water surface area (sq. ft.): 87,120 sf (2.0 ac)
Roads, building and other paved surfaces (sq. ft.) 426,888 sf (9.8 ac) Other, describe (sq. ft.): 3,484,800 sf (80 ac) includes phragmites, floodplains, and upland areas

3. **PRESENT LAND USE**

Residential
Total no. of dwelling units N/A No. of low-to-moderate income units _____
No. of stories _____ Gross floor area (sq. ft.) _____
Describe type of residential structures:

Commercial
Retail: No. of bldgs N/A Gross floor area of each building (sq. ft.): _____
Office: No. of bldgs N/A Gross floor area of each building (sq. ft.): _____
Other: No. of bldgs N/A Gross floor area of each building (sq. ft.): _____
Specify type(s): No. of stories and height of each building: _____

Manufacturing/Industrial
No. of bldgs N/A Gross floor area of each building (sq. ft.): _____
No. of stories and height of each building: _____
Type of use(s): Open storage area (sq. ft.) _____
If any unenclosed activities, specify:

Community facility N/A
Type of community facility:
No. of bldgs _____ Gross floor area of each building (sq. ft.): _____
No. of stories and height of each building: _____

Vacant land N/A
Is there any vacant land in the directly affected area? ☐ Yes ☐ No
If yes, describe briefly:

Publicly accessible open space
Is there any existing publicly accessible open space in the directly affected area? ☐ Yes ☒ No
If yes, describe briefly:

Does the directly affected area include any mapped City, State or Federal parkland? ☐ Yes ☒ No
If yes, describe briefly:

Does the directly affected area include any mapped or otherwise known wetland? ☒ Yes ☐ No
If yes, describe briefly: Freshwater wetlands (NYSDEC) -Class II

Other land use
No. of stories N/A Gross floor area (sq. ft.) Approx. 17,000 sq. ft. 1 story hangars and outbuilding
Type of use: Abandoned airport, mapped dilapidated streets: Linden Place between 25th and 23rd Avenues, 23rd Avenue between Linden Place and 130th Street, and mapped, unbuilt 132nd Street between Linden Place/23rd Avenue and 20th Avenue.

4. **EXISTING PARKING**

Garages
No. of public spaces: N/A No. of accessory spaces: _____
Operating hours: _____ Attended or non-attended? _____

Lots
No. of public spaces: N/A No. of accessory spaces: _____
Operating hours: _____ Attended or non-attended? _____

Other (including street parking) - please specify and provide same data as for lots and garages, as appropriate.

5. **EXISTING STORAGE TANKS**
Gas or service stations? ☐ Yes ☒ No Oil storage facility? ☐ Yes ☒ No Other? ☐ Yes ☒ No
If yes, specify: _____
Number and size of tanks: N/A Last NYFD inspection date: N/A
Location and depth of tanks:

SEE CEQR TECHNICAL MANUAL CHAPTER III F., HISTORIC RESOURCES

6. **CURRENT USERS**
No. of residents: 0
No. and type of businesses: 0
No. and type of workers by businesses: _____
No. and type of non-residents who are not workers: _____

7. **HISTORIC RESOURCES (ARCHITECTURAL AND ARCHAEOLOGICAL RESOURCES)**
Answer the following two questions with regard to the directly affected area, lots abutting that area, lots along the same blockfront or directly across the street from the same blockfront, and, where the directly affected area includes a corner lot, lots which front on the same street intersection.

Do any of the areas listed above contain any improvement, interior landscape feature, aggregate of landscape features, or archaeological resource that:
(a) has been designated (or is calendared for consideration as) a New York City Landmark, Interior Landmark or Scenic Landmark;
(b) is within a designated New York City Historic District;
(c) has been listed on, or determined eligible for, the New York State or National Register of Historic Places;
(d) is within a New York State or National Register Historic District; or
(e) has been recommended by the New York State Board for listing on the New York State or National Register of Historic Places?
Identify any resource:

Do any of the areas listed in the introductory paragraph above contain any historic or archaeological resource, other than those listed in response to the previous question? Identify any resource. None identified

SEE CEQR TECHNICAL MANUAL CHAPTER III K., WATERFRONT REVITALIZATION PROGRAM

8. **WATERFRONT REVITALIZATION PROGRAM**
Is any part of the directly affected area within the City's Waterfront Revitalization Program boundaries? ☒ Yes ☐ No
(A map of the boundaries can be obtained at the Department of City Planning bookstore.)

If yes, append a map showing the directly affected area as it relates to such boundaries. A map requested in other parts of this form may be used. Refer to Figure 7 in the supplemental report

Project Description

THIS SUBPART SHOULD GENERALLY BE COMPLETED ONLY IF YOUR ACTION INCLUDES A SPECIFIC OR KNOWN DEVELOPMENT AT PARTICULAR LOCATIONS

9. **CONSTRUCTION**
Will the action result in demolition of or significant physical alteration to any improvement? ☒ Yes ☐ No
If yes, describe briefly: Demolition of three dilapidated and abandoned airport hangars

Will the action involve either above-ground construction resulting in any ground disturbance or in-ground construction? ☒ Yes ☐ No
If yes, describe briefly: Construction will be primarily at-grade - reconstruction of Linden Place between 25th and 23rd Avenues and 23rd Avenue between Linden Place and 130th Street, construction of 132nd Street from 20th Avenue to Linden Place/23rd Avenue, and construction of open water and emergent wetland.

10. **PROPOSED LAND USE**
Residential N/A
Total no. of dwelling units _____ No. of low-to-moderate income units _____ Gross floor area (sq. ft.) _____
No. of stories _____ Describe type of residential structures:

Commercial
Retail: No. of bldgs N/A Gross floor area of each building (sq. ft.): _____

Office: No. of bldgs _____ Gross floor area of each building (sq. ft.): _____

Other: No. of bldgs _____ Gross floor area of each building (sq. ft.): _____
Specify type(s):

No. of stories and height of each building: _____

Manufacturing/Industrial N/A
No. of bldgs _____ Gross floor area of each building (sq. ft.): _____

No. of stories and height of each building: _____
Type of use(s): Open storage area (sq. ft.) _____ If any unenclosed activities, specify:

Community facility N/A
Type of community facility:

No. of bldgs _____ Gross floor area of each building (sq. ft.): _____

No. of stories and height of each building: _____

Vacant land
Is there any vacant land in the directly affected area? ☒ Yes ☐ No
If yes, describe briefly: Former Flushing Airport

Publicly accessible open space

Is there any existing publicly accessible open space in the directly affected area? ☐ Yes ☒ No
If yes, describe briefly:

Does the directly affected area include any mapped City, State, or Federal parkland? ☐ Yes ☒ No
If yes, describe briefly:

Does the directly affected area include any mapped or otherwise known wetland? ☒ Yes ☐ No
If yes, describe briefly: NYSDEC Freshwater Wetland

Other land use N/A
Gross floor area (sq. ft.)_____ No. of stories _____ Type of use:

11. **PROPOSED PARKING** N/A

Garages
No. of public spaces: _____ No. of accessory spaces: _____
Operating hours: _____ Attended or non-attended? _____

Lots
No. of public spaces: _____ No. of accessory spaces: _____
Operating hours: _____ Attended or non-attended? _____

Other (including street parking) - please specify and provide same data as for lots and garages, as appropriate.
No. and location of proposed curb cuts:

12. **PROPOSED STORAGE TANKS**

Gas or service stations? ☐ Yes ☒ No Oil storage facility? ☐ Yes ☒ No Other? ☐ Yes ☒ No
If yes, specify: _____
Size of tanks: Location and depth of tanks:

13. **PROPOSED USERS** N/A

No. of residents: 0 No. and type of businesses: 0
No. and type of workers by businesses: 0 No. and type of non-residents who are not workers: 0

14. **HISTORIC RESOURCES (ARCHITECTURAL AND ARCHAEOLOGICAL RESOURCES)**

Will the action affect any architectural or archaeological resource identified in response to either of the two questions at number 7 in the Site Description section of the form? ☐ Yes ☒ No
If yes, describe briefly:

SEE CEQR TECHNICAL MANUAL CHAPTER III B., SOCIO-ECONOMIC CONDITIONS

15. **DIRECT DISPLACEMENT**

Will the action directly displace specific business or affordable and/or low income residential units? ☐ Yes ☒ No
If yes, describe briefly:

SEE CEQR TECHNICAL MANUAL CHAPTER III C., COMMUNITY FACILITIES & SERVICES

16. **COMMUNITY FACILITIES**

Will the action directly eliminate, displace, or alter public or publicly funded community facilities such as educational facilities, libraries, hospitals and other health care facilities, day care centers, police stations, or fire stations? ☐ Yes ☒ No
If yes, describe briefly:

Zoning Information

17. What is the zoning classification(s) of the directly affected area? M1-1 - Project site is zoned for manufacturing

18. What is the maximum amount of floor area that can be developed in the directly affected area under the present zoning? Describe in terms of bulk for each use. N/A

19. What is the proposed zoning of the directly affected area?
No proposed zoning amendments

20. What is the maximum amount of floor area that could be developed in the directly affected area under the proposed zoning? Describe in terms of bulk for each use.
N/A

21. What are the predominant land uses and zoning classifications within a 1/4 mile radius of the proposed action?

Predominant land uses include the College Point Corporate Park, which includes office, light and heavy manufacturing, utilities, commercial and retail uses. Business located in the College Point Corporate Park include the United States Postal Service facility, the New York Times printing facility, and various retail uses including Target, TJ Maxx, Babies R Us, Staples, Waldbaums, Starbucks, and Circuit City. Residential uses and community facilities are located east of the project site. West of the project site are mixed light industrial, commercial, residential and parkland, including the College Point Sports Association facility and Stroehmann's Bakery. Zoning districts include M1-1; R3-2; R5; M2-1; R6; M3-1; R4; R2

Additional Information

22. Attach any additional information as may be needed to describe the action. If your action involves changes in regulatory controls that affect one or more sites not associated with a specific development, it is generally appropriate to include here one or more reasonable development scenarios for such sites and, to the extent possible, to provide information about such scenario(s) similar to that requested in the Project Description questions 9 through 16.

Refer to attached for introduction, purpose/needs and list of properties within project site.

Analyses

23. Attach analyses for each of the impact categories listed below (or indicate where an impact category is not applicable):

a. LAND USE, ZONING, AND PUBLIC POLICY	See CEQR Technical Manual Chapter III.A.
b. SOCIOECONOMIC CONDITIONS	See CEQR Technical Manual Chapter III.B
c. COMMUNITY FACILITIES AND SERVICES	See CEQR Technical Manual Chapter III.C.
d. OPEN SPACE	See CEQR Technical Manual Chapter III.D.
e. SHADOWS	See CEQR Technical Manual Chapter III.E.
f. HISTORIC RESOURCES	See CEQR Technical Manual Chapter III.F.
g. URBAN DESIGN/VISUAL RESOURCES	See CEQR Technical Manual Chapter III.G.
h. NEIGHBORHOOD CHARACTER	See CEQR Technical Manual Chapter III.H.
i. NATURAL RESOURCES	See CEQR Technical Manual Chapter III.I.
j. HAZARDOUS MATERIALS	See CEQR Technical Manual Chapter III.J.
k. WATERFRONT REVITALIZATION PROGRAM	See CEQR Technical Manual Chapter III.K.
l. INFRASTRUCTURE	See CEQR Technical Manual Chapter III.L.
m. SOLID WASTE AND SANITATION SERVICES	See CEQR Technical Manual Chapter III.M.
n. ENERGY	See CEQR Technical Manual Chapter III.N.
o. TRAFFIC AND PARKING	See CEQR Technical Manual Chapter III.O.
p. TRANSIT AND PEDESTRIANS	See CEQR Technical Manual Chapter III.P.
q. AIR QUALITY	See CEQR Technical Manual Chapter III.Q.
r. NOISE	See CEQR Technical Manual Chapter III.R.
s. CONSTRUCTION IMPACTS	See CEQR Technical Manual Chapter III.S.
t. PUBLIC HEALTH	See CEQR Technical Manual Chapter III.T.

The CEQR Technical Manual sets forth methodologies developed by the City to be used in analyses prepared for the above-listed categories. Other methodologies developed or approved by the lead agency may also be utilized. If a different methodology is contemplated, it may be advisable to consult with the Mayor's Office of Environmental Coordination. You should also attach any other necessary analyses or information relevant to the determination whether the action may have a significant impact on the environment, including, where appropriate, information on combined or cumulative impacts, as might occur, for example, where actions are interdependent or occur within a discrete geographical area or time frame.

Applicant Certification

24. Kathleen Gralton, Edwards and Kelcey
PREPARER NAME

Planner
PREPARER TITLE

PREPARER SIGNATURE

3/1/06
DATE

Edwards and Kelcey
PRINCIPAL

Toby Kizner, AICP, PP
NAME OF PRINCIPAL REPRESENTATIVE

Associate Vice President
TITLE OF PRINCIPAL REPRESENTATIVE

SIGNATURE OF PRINCIPAL REPRESENTATIVE

3/1/06
DATE

NOTE: Any person who knowingly makes a false statement or who knowingly falsifies any statement on this form or allows any such statement to be falsified shall be guilty of an offense punishable by fine or imprisonment or both, pursuant to Section 10-154 of the New York City Administrative Code, and may be liable under applicable laws.

Impact Significance

PART III, ENVIRONMENTAL ASSESSMENT AND DETERMINATION

TO BE COMPLETED BY THE LEAD AGENCY

The lead agency should complete this Part after Parts I and II have been completed. In completing this Part, the lead agency should consult 6 NYCRR 617.7, which contains the State Department of Environmental Conservation's criteria for determining significance.

The lead agency should ensure the creation of a record sufficient to support the determination in this Part. The record may be based upon analyses submitted by the applicant (if any) with Part II of the EAS. The CEQR Technical Manual sets forth methodologies developed by the City to be used in analyses prepared for the listed categories. Alternative or additional methodologies may be utilized by the lead agency.

1. For each of the impact categories listed below, consider whether the action may have a significant effect on the environment with respect to the impact category. If it may, answer yes.

LAND USE, ZONING, AND PUBLIC POLICY	_____
SOCIOECONOMIC CONDITIONS	_____
COMMUNITY FACILITIES AND SERVICES	_____
OPEN SPACE	_____
SHADOWS	_____
HISTORIC RESOURCES	_____
URBAN DESIGN/VISUAL RESOURCES	_____
NEIGHBORHOOD CHARACTER	_____
NATURAL RESOURCES	_____
HAZARDOUS MATERIALS	_____
WATERFRONT REVITALIZATION PROGRAM	_____
INFRASTRUCTURE	_____
SOLID WASTE AND SANITATION SERVICES	_____
ENERGY	_____
TRAFFIC AND PARKING	_____
TRANSIT AND PEDESTRIANS	_____
AIR QUALITY	_____
NOISE	_____
CONSTRUCTION IMPACTS	_____
PUBLIC HEALTH	_____

2. Are there any aspects of the action relevant to the determination whether the action may have a significant impact on the environment, such as combined or cumulative impacts, that were not fully covered by other responses and supporting materials? If there are such impacts, explain them and state where, as a result of them, the action may have a significant impact on the environment.

3. If the lead agency has determined in its answers to questions 1 and 2 of this Part that the action will have no significant impact on the environment, a negative declaration is appropriate. The lead agency may, in its discretion, further elaborate here upon the reasons for issuance of a negative declaration.

4. If the lead agency has determined in its answers to questions 1 and 2 of this part that the action may have a significant impact on the environment, a conditional negative declaration (CND) may be appropriate if there is a private applicant for the action and the action is not Type I. A CND is only appropriate when conditions imposed by the lead agency will modify the proposed action so that no significant adverse environmental impacts will result. If a CND is appropriate, the lead agency should describe here the conditions to the action that will be undertaken and how they will mitigate potential significant impacts.

5. If the lead agency has determined that the action may have a significant impact on the environment, and if a conditional negative declaration is not appropriate, then the lead agency should issue a positive declaration. Where appropriate, the lead agency may, in its discretion, further elaborate here upon the reasons for issuance of a positive declaration. In particular, if supporting materials do not make clear the basis for a positive declaration, the lead agency should describe briefly the impact(s) it has identified that may constitute a significant impact on the environment.

Lead Agency Certification

Douglas Rice PREPARER NAME	Robert Kulikowski NAME OF LEAD AGENCY REPRESENTATIVE
Vice President PREPARER TITLE	Assistant to the Mayor TITLE OF LEAD AGENCY REPRESENTATIVE
Douglas Rice PREPARER SIGNATURE	Robert Kulikowski SIGNATURE OF LEAD AGENCY REPRESENTATIVE
_____ DATE	March 14, 2006 DATE

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I. INTRODUCTION/SITE DESCRIPTION

The New York City Economic Development Corporation (EDC) proposes to implement a wetland creation/restoration plan (the "proposed Project") at the site of the former Flushing Airport in College Point, Queens County, New York. The proposed Project includes creation of new open water wetland and restoration of existing wetlands on the former airport site and improvements to nearby roadways. As illustrated in Figure 1, the project site is approximately 32.9 acres and includes the location of wetland creation, Linden Place between 28th and 23rd Avenues and 23rd Avenue between Linden Place and 130th Street, which are being reconstructed, and the segment of 132nd Street to be constructed from 20th Avenue to Linden Place/23rd Avenue. Also illustrated on Figure 1, the upland development area is bound by 20th Avenue to the north, the former Mill Creek to the east and south, and Linden Place to the west. Drainage from the adjacent 55.2-acre upland development area will be improved to facilitate flow to the wetland and a portion of the soils excavated to create the open waterway will be relocated to this parcel and covered with 2 feet of clean fill. Improvements proposed for nearby roadways include the repair of Linden Place and portions of 23rd Avenue, and the construction of 132nd Street between 23rd Avenue and 20th Avenue.

In conjunction with the creation of the proposed wetland, the tide gates, located on the stormwater drainage way, about ¼ mile from the site, and within the New York Police Department tow pound, will be relocated to a newer set of culverts. These structures which are designed to permit stormwater to run off through the drainage way to Flushing Bay while keeping saltwater, storm and high tide flows from flooding the wetland site and adjacent areas, are now attached to culverts in a gabion wall structure which has failed and permits saltwater intrusion onto the wetland site.

PURPOSE AND NEED

A portion of the proposed wetland restoration is required pursuant to the New York State Department of Environmental Conservation (NYSDEC) Order of Consent (File Nos. R2-2918-90-03, R2-3159-90-08, and R2-3160-90-08), dated February 2002. Approximately 7.4 acres of wetland creation are required on the project site to accommodate wetland losses resulting from the industrial developments on adjacent parcels; however, NYCEDC will develop the entire 32.9-acre parcel as a functioning wetland and floodplain habitat, with surrounding upland forested areas which will also compensate for wetlands lost as a result of construction of the roadways. The wetland creation and restoration will provide significant environmental benefits by enhancing water quality, improving flood storage, increasing wetland habitat values, creating a buffer floodplain and forested upland areas, and improving the visual appearance of the project site and upland development area.

1/4 Mile Study Area
Project Site
Upland Development Area

FIGURE 1 - PROJECT SITE

Former Flushing Airport Wetlands Development Project

New York City Economic Development Corporation

0 500 Feet

NORTH

The College Point Corporate Park and surrounding residential communities are subject to increased vehicle congestion and gridlock from thriving manufacturers and large stores in the area. Reconstruction of Linden Place, a chronically flooded roadway, and portions of 23rd Avenue, will provide vehicles with an alternate route. The construction of 132nd Street from 23rd Avenue to 20th Avenue will provide an additional travel route option to and from the College Point Corporate Park and the surrounding community. The proposed roadway improvements will serve to alleviate the extreme congestion that exists at 20th Avenue near the Whitestone Expressway.

PROPOSED ACTION

The proposed Project will create 5.0 acres of emergent wetlands, 12.1 acres of open water, 4.9 acres of forested uplands, and will eliminate the presence of 6.6 acres of non-native and invasive *Phragmites* on the project site. All hard surfaces, including existing structures and runways located on the 32.9-acre project site will have been removed as a result of the project. Water control structures will be installed and the existing tide gates will be reconstructed to control flood and storm waters that flow from adjoining developed properties. The wetland creation/restoration plan component of the proposed Project will be completed in 2007; however, long term monitoring will be conducted to prevent regrowth of *Phragmites* and to help achieve the desired character and ecological functions of the overall project. Additional benefits of the proposed Project include the creation of an ideal habitat for waterfowl and wading bird populations.

Roadway improvements and construction are part of a two (2) phase process. Phase I, to be completed in 2007, will commence in conjunction with the former Flushing Airport wetland creation/restoration project. Phase I involves the reconstruction of Linden Place between 28th and 23rd Avenues and 23rd Avenue between Linden Place and 130th Street. The total area of ROW improvements in Phase I is approximately 4.51 acres. Phase II, to be completed in 2009, involves the construction of 132nd Street from 20th Avenue to Linden Place/23rd Avenue within an existing 1.65 acre ROW.

REQUIRED PERMITS

The following regulatory approvals are required for implementation of the project:

- Joint Application for Permit for the USACOE and NYSDEC: Stream Disturbance (bed and banks); Navigable Waters (excavation and fill); Freshwater Wetlands; Tidal Wetlands; 401 Water Quality Certification; Section 404 (Waters of the United States); Section 10 (Rivers and Harbors Act); and Nationwide Permit No. 27
- Coastal Zone Consistency Assessment

II. LAND USE

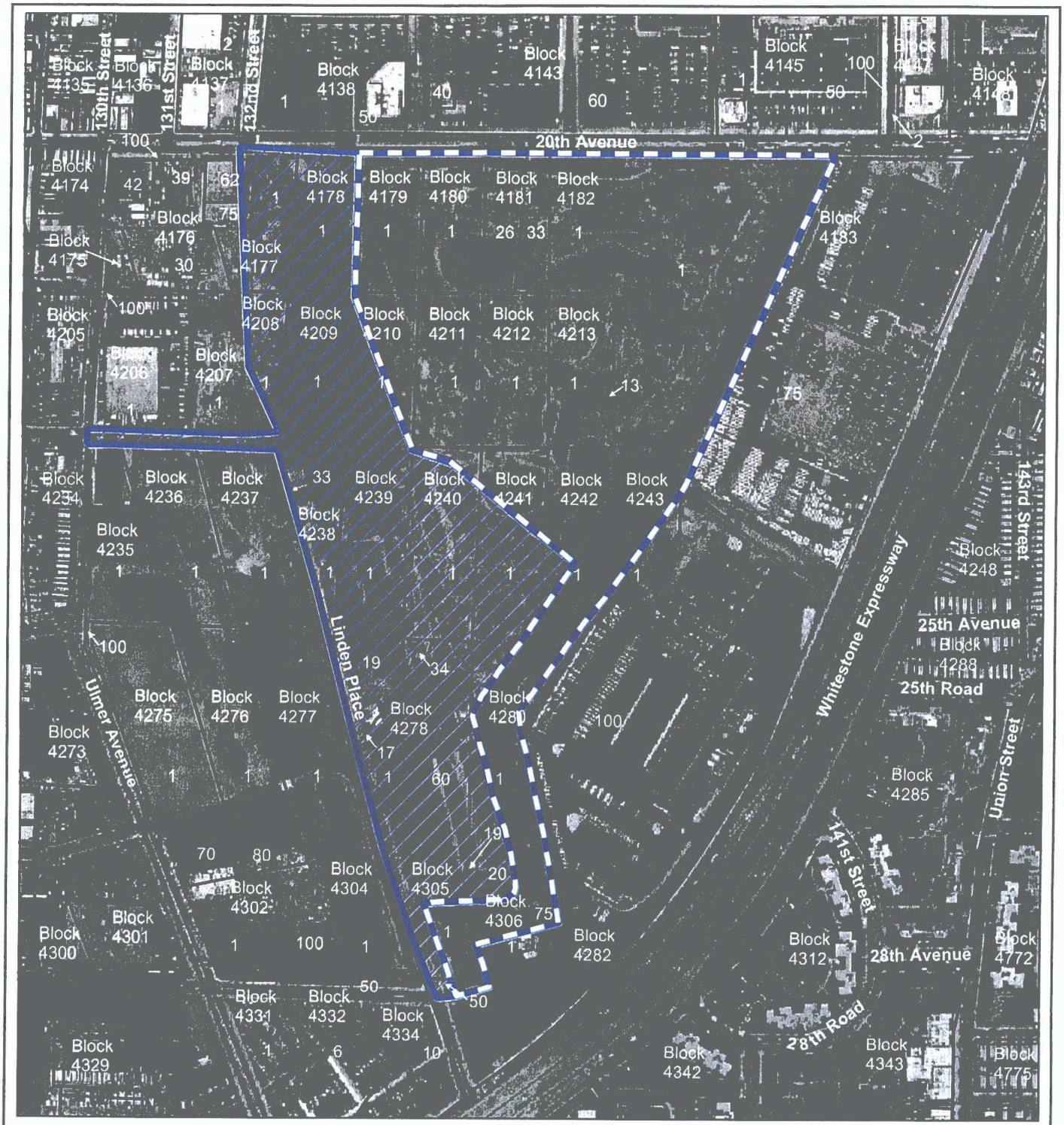
Existing Conditions

The approximately 88.1-acre combined project site and upland development area is located south of 20th Avenue, west and north of the United States Postal Service and New York Times facilities, and east of Linden Place, which is the site of the former Flushing Airport. It contains three abandoned hangars, an abandoned shed, and two asphalt runways, all of which are now partially submerged by standing water. Linden Place, an improved roadway, abuts the western property line of the former Flushing Airport. Linden Place is partially submerged in water and is impassible by vehicle. Linden Place and the former Flushing Airport are currently enclosed in chain link fencing to prevent access. North of Linden Place is 132nd Street, an unimproved paper street that runs between 23rd Avenue and 20th Avenue. West of the former Flushing Airport is 23rd Avenue, running east to west, and 130th Street, running north to south. The west end of 23rd Avenue is paved and provides access to Stroehmann's Bakery and the vacant Hi-Realty parcel currently used for vehicle storage; the eastern terminus of the road is unimproved and sectioned off with a chain link gate. 130th Street is currently improved and is well traveled.

As illustrated in **Figure 2**, the project site is located on the following tax blocks: 4177, 4178, 4208-4210, 4238-4240, 4278, 4280, 4282,4305 and 4306. The upland development area is located on blocks 4179-4183, 4210-4213, 4240-4213, 4282, 4305 and 4306. The ¼ mile study area, illustrated in **Figure 3**, is generally bound by 14th Avenue to the north, 31st Avenue to the south, 125th Street to the west and the Whitestone Expressway Service Road to the east.

The project site and upland development area are located within the College Point Corporate Park, an Industrial Urban Renewal area. The northern section of the corporate park contains office space, distribution facilities and retail uses. Major retailers include Babies R Us, Target, Old Navy, Modell's, McDonalds, TJ Maxx, Staples, Waldbaums, BJ's Wholesale Club, Starbucks, and Circuit City. The remainder of the corporate park includes light and heavy manufacturing uses, warehouse and distribution facilities, utilities, auto-related uses, and mixed commercial and industrial operations. Representative photos of the study area and project site can be found on the following pages.

The United States Postal Service facility is located on the southwest corner of the Whitestone Expressway Service Road South and 20th Avenue. The New York Times printing and distribution facility is located directly south of the postal service facility and extends to the intersection of the Whitestone Expressway Service Road South and Linden Place. Uses along the northbound Whitestone Expressway Service Road are a mixture of single-family homes and low-rise apartment complexes, interspersed with a mixture of community facilities. West of the project site is the Hi-Realty site, Stroehmann's, and two construction equipment rental companies. Also located west of the project site is the College Point Sports Association facility, which contains a little league ball field and baseball field. Land uses west of 130th Street are mixed and consist of residential, industrial and manufacturing uses.



Upland Development Area

Project Site

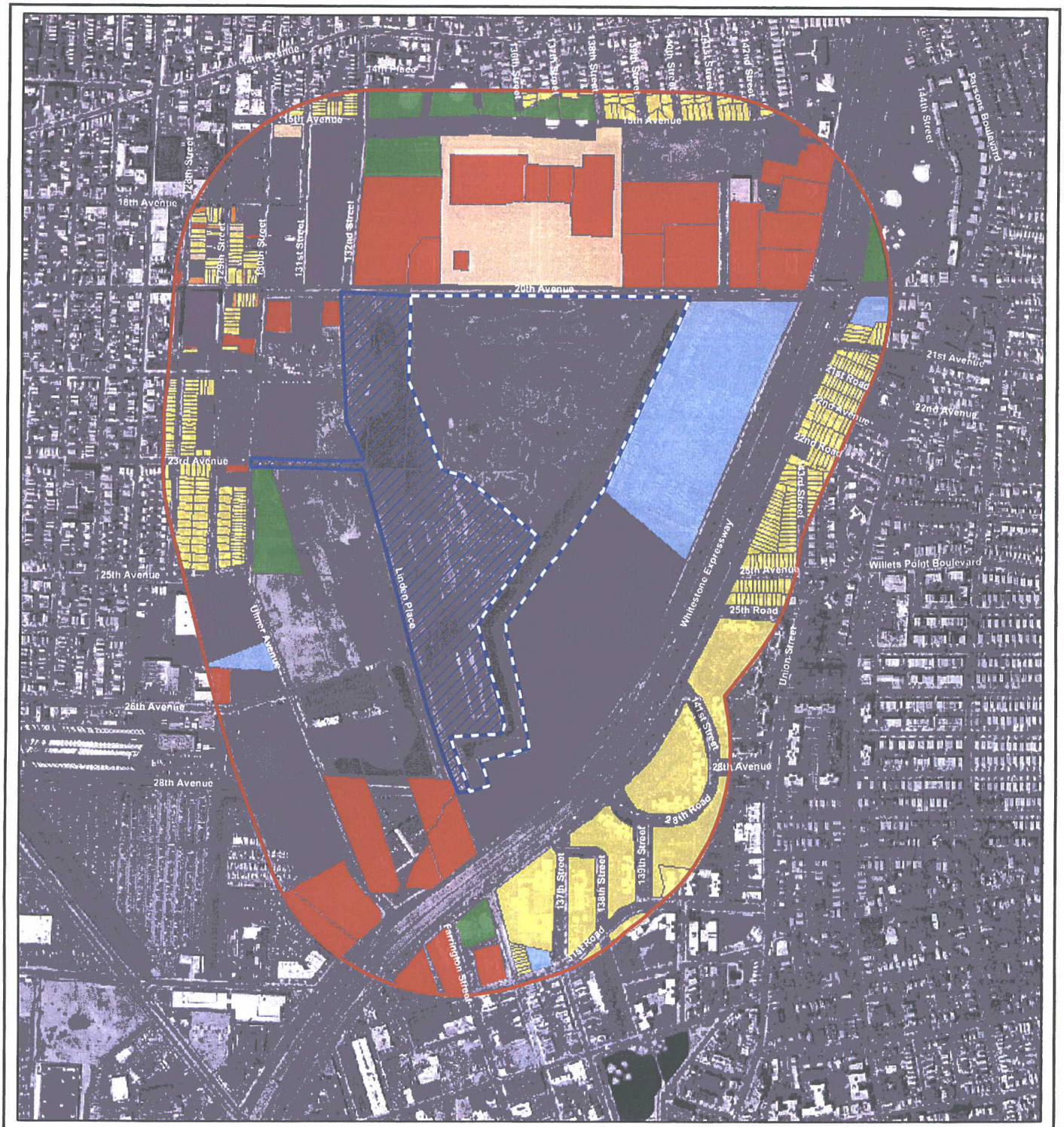
FIGURE 2 - TAX BLOCK & LOT DATA

Former Flushing Airport Wetlands Development Project

New York City Economic Development Corporation

0 500 1,000 Feet

NORTH



Land Use

- 1/4 Mile Study Area
- Project Site
- Upland Development Area
- Commercial
- Residential
- Mixed Use
- Industrial
- Parking Facilities
- Open Space & Outdoor Recreation
- Public Facilities & Institutions
- Transportation & Utility
- Vacant Land

0 500 1,000 Feet

NORTH

FIGURE 3 - LAND USE

Former Flushing Airport Wetlands Development Project

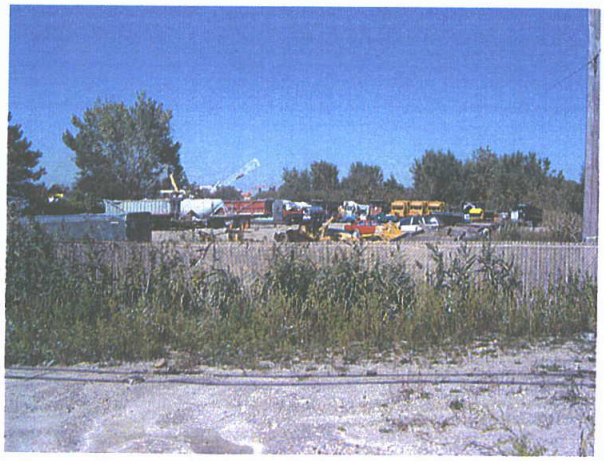
New York City Economic Development Corporation

LAND USE PHOTO PAGE 1

View of 23rd Avenue, looking west from the project site

View of the New York Times printing facility, looking southeast from the project site

View of the project site from the corner of Linden Place and 28th Avenue



View of the Stroehmann property, looking west from the project site

View of the Stroehmann property, looking northwest from 23rd Avenue

View of the project site, looking north from the corner of Linden Place and the Whitestone Expressway service road

LAND USE PHOTO PAGE 2

View of PS 29, looking southwest from the corner of 23rd Ave and 126th Street

View of the College Point Shopping Center, looking northeast from 20th Avenue

View of the project site, looking southeast from the corner of 20th Avenue and 132nd Street

View of former Flushing Airport hangar buildings on the project site

View of 132nd Street, looking north from outside the project site.

View of the College Point Sports Association facility, located at 130th Street and 23rd Avenue.

No Action Condition

An assessment of future plans and projects, to be completed by the year 2007 independent of the Former Flushing Airport Wetlands Development Project, was conducted for the study area. The only future proposed development identified in the study area is the construction of a ± 100,000 square foot auto technical school. Construction of the proposed facility, sponsored by the Greater NY Auto Dealers Association, is scheduled for completion in 2007. The facility would be located at the northern terminus of Petracca Place at the north end of the study area, and enroll 900 students. This proposed development will not result in adverse impacts to the project site, upland development area or to the study area.

Under the no action condition, it is assumed that no improvements will occur to the project site. The dilapidated former runway pavement area will continue to lie within the former wetland area. The patches of vegetation on the site will continue to be dominated by *Phragmites australis*, the invasive form of *Phragmites*. Water within the project site will continue to collect in the lower lying and discontinuous areas of the site. The tide gates will not be repaired or replaced, so the project site will continue to back up during periods of storm high tides, contributing to flooding of the area during storm periods. In general, the project site will remain in a state of disrepair.

Build Condition

Under the build condition, at the completion of Phase I in 2007, the wetland creation/restoration plan and improvements to Linden Place and 23rd Avenue will be complete. Restoration and expansion of the freshwater wetlands on the project site will provide an enhanced wetland environment. Phase I is not expected to generate new development. Traffic in the study area will not increase, but will be redistributed, thereby reducing congestion.

The Phase II completion of the 132nd Street extension, anticipated in 2009, will also serve to reduce local roadway congestion by redistributing existing traffic. No significant adverse impacts are expected from these activities.

III. ZONING

Existing Conditions

As illustrated in **Figure 4**, the project site is located within the M1-1 Light Manufacturing District, which requires adherence to a series of strict performance standards put forth in the *New York City Zoning Resolution.* Land uses permitted in the M1-1 zone include printing or publishing facilities, certain community facilities, and retail, commercial and recreational uses. The M1-1 zoning district is intended to serve as a buffer between more intense manufacturing zones and adjacent residential and commercial districts. A floor area ratio (FAR) of 1.0 is the maximum permitted in the M1-1 zoning district.

Uses north of the project site and upland development area are located within the M1-1 Light Manufacturing zoning district and the R2 residential zoning district. The R2 district is limited to single family homes with a 3,800 square foot minimum lot area. The maximum FAR permitted in this zoning district is 0.5.

The south end of the study area is zoned M2-1 and R6. Uses within the M2-1 Zoning district occupy the middle ground between light and heavy industrial uses, with performance standards that are more restrictive when bordering a residential zoning district. The M2-1 Zoning district has a maximum FAR of 2.0. The R6 Residential zoning district permits medium density housing, usually between three and twelve stories high. The FAR permitted in this district ranges from 0.78 to 2.43.

The west end of the study area is located within the R4, R3X, M3-1 and M1-1 Zoning districts. The R4 Zoning district permits detached, single and two-family residences with a minimum lot size of 3,800 square feet for lots with a 40-foot width, and 1,700 square feet on lots with an 18-foot lot width. The maximum FAR is 0.75 with a 0.15 attic allowance. The R3X Zoning district limits new residential development to both one- and two-family homes on lots with a minimum width of 35 feet. The maximum FAR for this zoning district is 0.6. The M3-1 zoning district permits heavy industrial uses that generate noise, traffic and pollutants. Typical uses include chemical and power plants and foundries. These districts are often located near the waterfront and buffered from residential areas. The maximum FAR is 2.0.

Parcels east of the Whitestone Expressway are located within the R3-2 and R5 zoning districts. The R3-2 General Residence zoning district permits all types of dwelling units, including detached and semi-detached, single- and two-family homes, garden apartments, row houses and various community facilities. A FAR of 0.5, plus a 0.1 attic allowance is the maximum permitted in the R3-2 zoning district. One off-street parking space is required for each dwelling unit. Similar to the R3-2 zoning district the R5 zone is a general residence district that permits a variety of housing types. With a maximum permitted FAR of 1.25 and lot coverage of 55%, the R5 zoning district provides a transition between lower and higher density neighborhoods. The R5 district requires one off-street parking space per dwelling unit or one space per 85% of the apartments if the structure contains multiple units.

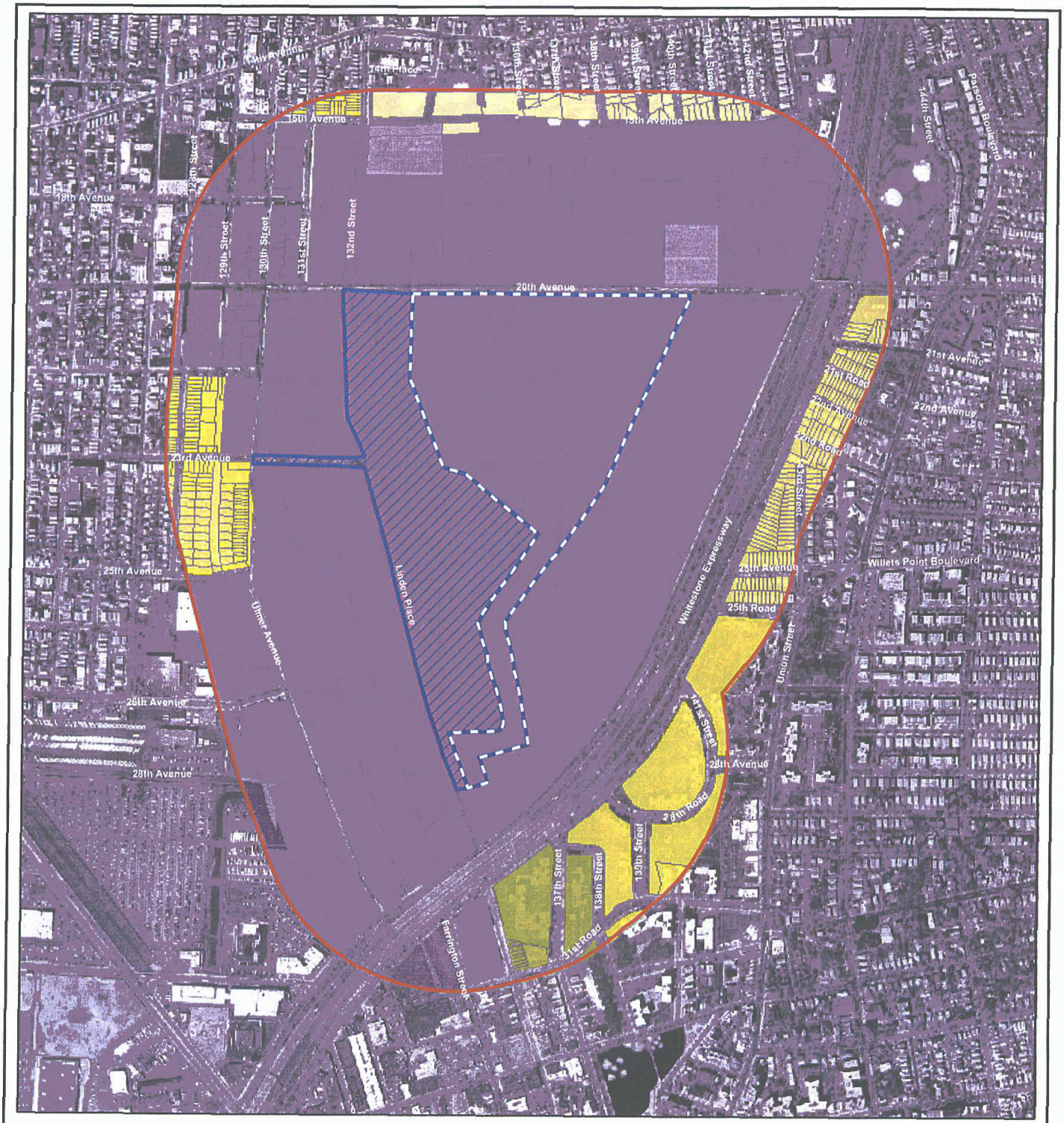


FIGURE 4 - ZONING

Former Flushing Airport Wetlands Development Project

New York City Economic Development Corporation

No Action Condition

In the future without the project, the project site's zoning for the future baseline years, 2007 and 2009, would not be changed. Zoning within the study area would remain as described. It is assumed that no improvements will occur to the former Flushing Airport property. The dilapidated former runway pavement area will continue to lie within the former wetland area.

The proposed ± 100,000 square foot auto technical school on Petracca Place, sponsored by the Greater NY Auto Dealers Association, will comply with existing zoning.

Build Condition

The project site's zoning for the future baseline years, 2007 and 2009, would remain M1-1 Light Manufacturing. Zoning within the study area would remain as described. The proposed Project will not create an adverse zoning impact.

IV. PUBLIC POLICY

Existing Conditions

In addition to the requirements of the *New York City Zoning Resolution*, the following public policy documents impact development opportunities on the subject property and within the adjoining study area.

Community Board Number 7 – Statement of District Needs

The commercial areas of College Point generate large numbers of trucks that place a significant burden on streets and highways within the district. The Statement of District Needs states that capital construction is necessary to accommodate the increased traffic volume and the deteriorated condition of existing roadways. The community board supports the proposed Project, which will alleviate severe flooding and road deterioration. According to Community Board 7, this project will provide roadways needed to accommodate the enormous growth of the area and to relieve traffic backups on the Whitestone Expressway. With the development of the corporate park and new retail component, these roadways are a necessity.

Community Board Number 7 has also stated that flooding and ponding conditions are a problem in the district. Additional funds are needed for manpower and construction of storm sewers, sanitary sewers and catch basin maintenance, as many areas within the district are subject to storm and sanitary backups.

Plan for the Queens Waterfront, NYC Department of City Planning, 1992

The Plan for the Queens Waterfront, a part of the New York City's Comprehensive Waterfront Plan issued in August 1992, presents detailed studies of Queens Borough's five reaches, also referred to as waterfront study areas. The Comprehensive Waterfront Plan presents long-range goals and strategies to guide land uses that promote waterside activities, protect and restore natural resources, support industry and waterborne commerce (the working harbor), provide new job generating development, and introduce revenue and housing.

The project site, upland development area and study area are located within Reach 10 and referred to as "Queens North Shore" in the Plan for the Queens Waterfront. Goals that are specific to the project study area relate to traffic circulation. Specifically, NYCDOT plans to improve traffic circulation in College Point, which is heavily burdened by truck traffic generated by College Point Industries. The NYCDOT anticipates traffic conditions to further deteriorate as traffic volumes increase in the future. As such, the NYCDOT developed a plan that would include traffic improvements, capital improvements, and system management and transportation demand management measures.

College Point Transportation Study, New York City Department of Transportation, June 1999

The College Point Transportation Study identified the current and future travel and transportation needs in the College Point section of Queens County. The objective of the study was to examine existing transportation network problems in relation to the area's travel needs as a function of traffic, transit, parking and pedestrian activity, and to generate effective solutions to the identified problems. The study identified many problem locations and mitigation measures and concurred with the mitigation measures and findings of the College Point Traffic Study, New York City Department of Transportation, 1990. Mitigation measures were recommended, as shown in **Table 1**.

Table 1: College Point Transportation Study Recommendations

Location	Recommendation
Whitestone Expressway SB Service Road & 20th Avenue	Restripe eastbound 20th Avenue approach to add a thru lane and right-turn lane; re-time traffic signals to coordinate with northbound service road.
Whitestone Expressway NB Service Road & 20th Avenue	Widen northbound service road; widen 20th Avenue to add one eastbound lane and widen the two westbound lanes; add travel lanes on the 20th Avenue overpass by removing striped out areas; re-time traffic signal to increase east-west green time and change cycle length.
Whitestone Expressway SB Service Road & Linden Place	Re-stripe the westbound center lane from through/left to exclusive through lane and shift green time from the southbound phase to the westbound phase.
Whitestone Expressway NB Service Road & Linden Place	Widen Linden Place to add an eastbound and a westbound lane east of the Whitestone Expressway; shift green time from Linden Place to northbound service road
31st Road and Linden Place	Shift green time from 31st Road to Linden Place

Citywide Industry Study, Department of City Planning, 1993

The citywide industry study provides a policy framework for land use planning in industrial areas and for zoning affecting industrial-sector activities. The study presents an analysis of economic trends over the past thirty years and a snapshot of New York City's current industrial sector. College Point is one of the 59 industrial areas that were analyzed in the citywide industry study. The study concluded that the successful growth of the College Point Corporate Park has led to increased truck traffic into and out of the area and College Point's major streets routinely experience congestion.

No Action Condition

Current policies that provide the framework for development and usage of properties, as well as transportation improvements within the study area, would still be in effect in the future without the project. The proposed auto technical school is consistent with the plans for the College Point area, and is supported by Community Board 7. The school is located in the College Point Corporate Park, and will generate jobs and economic benefits for the area. The College Point area has recently undergone a significant amount of growth, and as a result, plans such as the 1999 *College Point Transportation Study* were developed to address its potential impacts.

Build Condition

The proposed Project conforms to the transportation goals for Queens and College Point, by improving traffic circulation in the area. Community Board 7 recommended the wetland creation/restoration plan to alleviate flooding and road deterioration. CB 7 also recommended construction of Linden Place and 132nd Street, to accommodate growth in the area and relieve traffic congestion. The proposed project will be consistent with stated public policy initiatives and will not represent an adverse impact.

V. SOCIOECONOMIC CONDITIONS

Existing Conditions

The project study area extends ¼ mile from the boundaries of the subject property and contains portions of census tracts 889.01, 889.02, 907, 919, 925, 945, 947 and 1039, as illustrated in **Figure 5**. The project site and upland development area are located within census tract 907. Demographic data for the populations within these census tracts includes race, origin, age, population growth, income and housing.

Population Characteristics

The total population within the project study area is 32,324, as noted in **Table 2** (below). The study area population represents 1.4% of the population of Queens County, and 0.4% of the population of New York City. The vast majority of the study area is zoned M1-1, which accounts for some of the low population numbers in several of the census tracts. The study area includes several residential zoning districts around its edges. According to the data in **Table 2**, more than half (54%) of the study area residents are Caucasian, with nearly equal percentages of Asian (21%) and Hispanic (20%) residents. The average median age of the study area is 37.5, which is higher than that of both Queens County (35.4) and New York City (34.2).

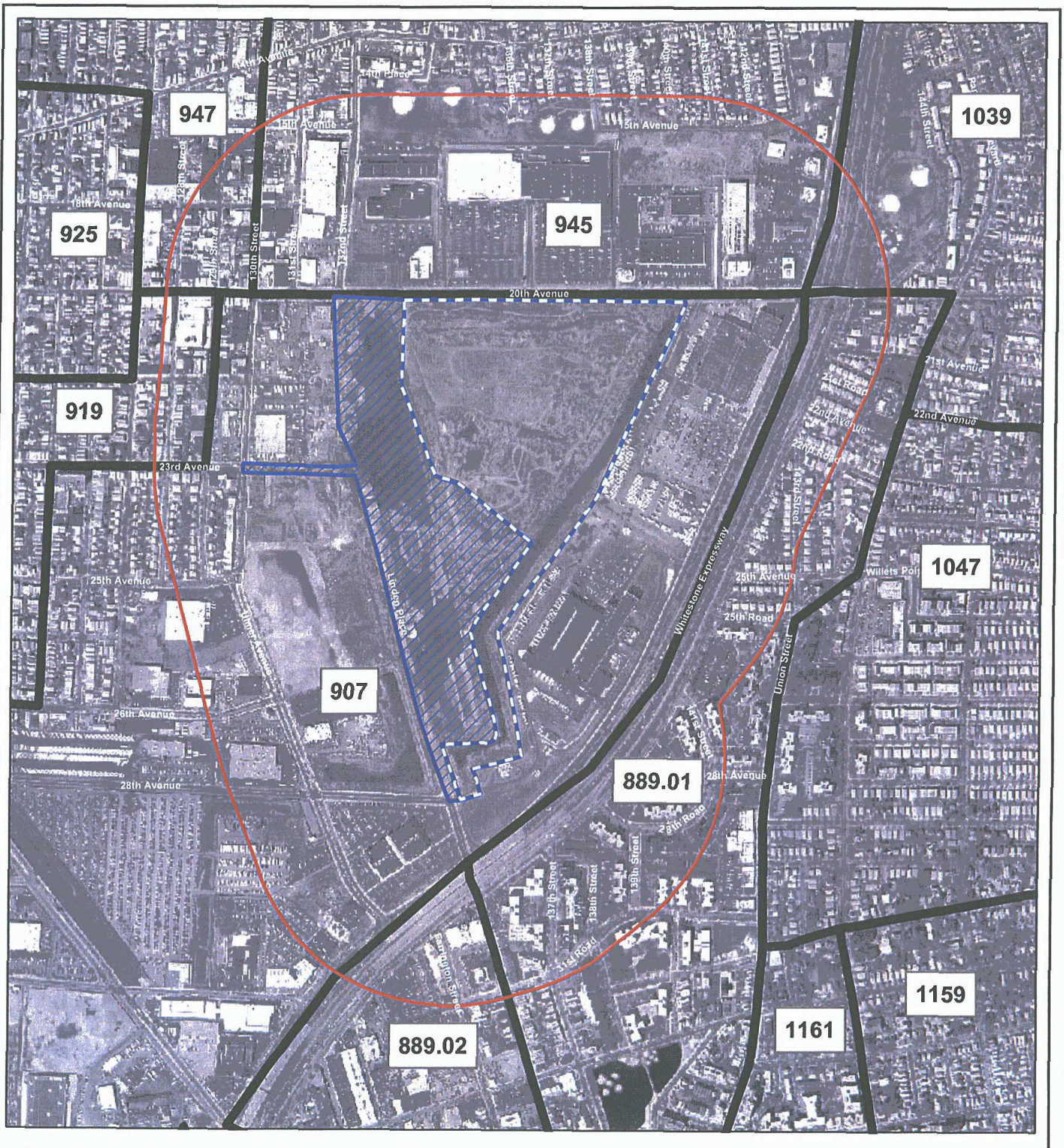


FIGURE 5 - CENSUS TRACTS

Former Flushing Airport Wetlands Development Project

New York City Economic Development Corporation

Table 2: Population Characteristics, College Point Study Area

Census Tract	Total Population	Race/Ethnic Composition of Residential Population						Median Age
		Caucasian	African American	Asian	Two or More Races, Non-Hispanic	Hispanic	Other[1]	
889.01	9079	3,602 (39.7%)	536 (5.9%)	2,943 (32.4%)	170 (1.9%)	1,796 (19.8%)	32 (0.4%)	44.2
889.02	602	81 (13.5%)	39 (6.5%)	311 (51.7%)	20 (3.3%)	144 (23.9%)	7 (1.2%)	36.1
907	1,354	762 (56.3%)	12 (0.9%)	224 (16.5%)	54 (4%)	293 (21.6%)	9 (0.7%)	34.7
919	5,454	2,675 (49%)	186 (3.4%)	1,091 (20%)	184 (3.4%)	1,296 (23.8%)	22 (0.4%)	37.3
925	3,344	1,610 (48.1%)	23 (0.7%)	439 (13.1%)	72 (2.2%)	1,190 (35.6%)	10 (0.3%)	34.2
945	4,191	2,886 (68.9%)	51 (1.2%)	676 (16.1%)	56 (1.3%)	494 (11.8%)	28 (0.7%)	40.3
947	2,139	1,258 (58.8%)	8 (0.4%)	287 (13.4%)	54 (2.5%)	527 (24.6%)	5 (0.2%)	35.3
1039	6,161	4,483 (72.8%)	11 (0.2%)	971 (15.8%)	119 (1.9%)	565 (9.2%)	12 (0.2%)	37.8
Study Area	32,324	17,357	866	6,942	729	6,305	125	37.5
Queens County	2,229,379	732,895	422,831	389,303	92,511	556,605	35,234	35.4
New York City	8,008,278	2,801,267	1,962,154	780,229	225,149	2,160,554	78,925	34.2

1. "Other" includes American Indian and Alaska Native, Native Hawaiian and other Pacific Islander, some other race alone, two or more races.
Source: U.S. Department of Commerce, Bureau of Census

Population Growth

In 1990, 28,932 persons resided in the study area census tracts. The total population for these census tracts has increased by approximately 12 percent between 1990 and 2000, with a current population of 32,324. The New York City and Queens County populations increased by approximately 9 percent and 14 percent, respectively.

Table 3: Population Growth, 1990-2000

Study Area Census Tracts	Total Population 1990	Total Population 2000	Population Change 1990-2000 (%)
889.01	9,151[1]	9,079	-.7
889.02	N/A	602	N/A
907	1,162	1,354	+16.5
919	4,614	5,454	+18.2
925	2,748	3,344	+21.6
945	3,782	4,191	+10.8
947	1,883	2,139	+13.5
1039	5,592	6,161	+10.2
Study Area	28,932	32,324	+11.7
Queens County	1,951,598	2,229,379	+14.2
New York City	7,322,564	8,008,278	+9.4

1. Census tracts 889.01 and 889.02 were part of tract 889 in 1990.
Source: U.S. Department of Commerce, Bureau of Census

Income and Housing

The average median income for the study area census tracts was $50,276, which is higher than the median income for Queens County ($42,439) and New York City ($38,293). Census tract 889.01 has the lowest median income ($34,107), approximately $16,000 less than the average median income for the project study area ($50,276).

As shown in **Table 4**, the study area contained a total of 12,283 housing units with an occupancy rating of 96 percent in 2000. The lowest occupancy rating was in census tract 889.02 which had an occupancy of 81.5 percent.

Table 4: Housing and Income Data

Area Census Tract	Median Household Income in 1999 ($)	Per Capita Income 1999 ($)	Housing Units 2000	Housing Units Occupied 2000	Vacant Housing Units 2000	Households Receiving Public Assistance 1999
889.01	34,107	21,232	4,033	3,839	194/4.8	183
889.02	61,250	14,963	237	193	44/18.5	0
907	45,956	17,735	448	442	6/1.3	3
919	49,926	19,886	1,750	1689	61/3.4	58
925	42,802	17,483	1,242	1,192	50/4.0	19
945	62,870	27,281	1,514	1,464	50/3.3	33
947	50,929	22,303	750	739	11/1.4	8
1039	54,366	22,719	2,309	2,234	75/3.2	17
Total Study Area	50,276	20,450	12,283	11,792	491/4.0	321
Queens County	42,439	19,222	817,250	334,815	34,586	33,951
New York City	38,293	22,402	3,200,912	912,296	179,324	227,886
Source: U.S. Department of Commerce, Bureau of Census						

No Action Condition

Under the no action condition, the Greater NY Auto Dealers Association is proposing to construct an auto technical school to be located at the northern terminus of Petracca Place. The ± 100,000 square feet facility, expected to enroll 900 students, is scheduled for completion in 2007. This development will slightly increase the study area daytime population, but will not significantly impact the economic and social conditions in the study area.

Build Condition

As the proposed Project involves neither the introduction of a new residential population or business nor the displacement of an existing residential population or business, a significant change in economic and social conditions is not anticipated.

VI. COMMUNITY FACILITIES AND SERVICES

Existing Conditions

The community facilities analysis focuses on public or publicly-funded facilities including schools, police and fire stations, hospitals and day care centers. This analysis looks at the proposed action's potential effect on the provision of services provided by these facilities. This generally occurs when a project either physically displaces or alters a community facility, or causes a change in population that could affect the service delivery of a community facility, as might occur if a facility is already over utilized.

Community Centers

The Garden Jewish Center is located on Parsons Boulevard between 25th Avenue and 22nd Road.

The St. Alphonsus Redemptorist Residence, located at 22-04 Parsons Boulevard (between 21st and 22nd Avenues) is a residence for priests and studying priests.

The North Flushing Senior Center is located at 29-09 137th Street. The Center offers education and recreation activities for seniors.

Day Care Facilities

There are several day care facilities located within the project study area. Tutor Time Learning Center is located at 25-56 Ulmer Street. Holy Mountain Nursery is located at 29-49 137th Street.

Schools

The study area contains two public elementary schools. PS 29 Queens is located on the western edge of the study area, at 23rd Avenue and 126th Street, and has an enrollment of 638 students. PS 242 is located in the southern portion of the study area at 136-11 31st Road. Enrollment at PS 242 is 333 students. Just outside the study area is PS 214 Cardwallader Coldens, located at 31-15 140th Street. Enrollment at PS 214 is 448 students.

Police Protection

The New York City Police Department (NYPD) provides police protection and services in the Borough of Queens, which is divided into sixteen patrol service precincts. The study area, proposed project site and upland development area are located within the 109th Precinct. The 109th Precinct, part of the Queens North Patrol Borough, is located at 37-05 Union Street and covers a service area of 12.7 square miles.

Fire Protection and Emergency Medical Service

The Fire Department of the City of New York (FDNY) provides fire and emergency medical services within the Borough of Queens. While there are no fire houses located within the study

area, a number of fire companies are located in the area that would provide first response. Engine 295 Ladder 144 is located at 12-49 149th Street, and Engine 297 Ladder 130 is located at 119-11 14th Road. Engine 273 Ladder 129 is located at 40-18 Union Street. Emergency Medical Service (EMS) Flushing Station #52 is located south of the study area at 135-16 38th Ave.

Hospitals and Medical Facilities

There are no hospitals located within the study area. The Flushing Hospital Medical Center (FHMC), a 268 bed facility, is located south of the study area at 146-43 45th Ave. in Flushing. The FHMC Department of Emergency Medicine provides 24-hour care for all adult and pediatric, medical, surgical and OB/GYN emergencies. There are separate Cardiac Emergency and Pediatric Emergency Units. The department operates a 24-hour ambulance service and participates in the New York City Emergency Medical Service 911 System.

The Bridge View Nursing Home, operated by NYS Department of Housing, is located on the southeast corner of the Whitestone Expressway Service Road and 20th Avenue. It is a 200-bed facility.

No Action Condition

In the year 2007, a new development will have been completed within the study area irrespective of the proposed project. The Greater NY Auto Dealers Association is proposing to construct an auto technical school to be located at the northern terminus of Petracca Place. This proposed facility will be ± 100,000 square feet and enroll 900 students. This development is not expected to adversely impact the provision of medical or emergency services.

In the future no action condition, it is assumed that no improvements will occur to the former Flushing Airport property. The dilapidated former runway pavement area will continue to lie within the former wetland area.

Build Condition

Since the proposed Project will not introduce a new residential population to the study area, schools and day care facilities will not be impacted by the proposed development. Existing services and facilities will be able to accommodate the proposed use.

Hospitals are analyzed based on a proposed action's ability to cause over crowding, which is measured by a deficiency of available beds. Flushing Hospital Medical Center would not be negatively impacted by the Linden Place and 132nd Street construction, since the project will not introduce a new population to the study area.

Construction of the proposed Project would not cause any adverse impacts to the provision of police, fire protection and emergency medical service (EMS) within the area.

VII. OPEN SPACE RESOURCES

Existing Conditions

Open space is defined as publicly or privately owned land that is publicly accessible and has been designated for leisure, play, or sport, or land set aside for the protection and/or enhancement of the natural environment. An analysis of open space is required to determine whether or not a proposed action would have either a direct or indirect impact resulting from elimination or alteration of open space or an indirect impact resulting from overtaxing available open space. There are several parks located within the study area.

The College Point Sports Association facility is a 25.39 acre park that contains baseball fields and open space. It is located on 130th Street and 23rd Avenue.

Frank Golden Park, an 11.124 acre park, is located at the southeast intersection of 132nd Street and 14th Road, and contains four ball fields.

George U. Harvey Playground is a 9.476-acre facility located at the northeast corner of the Whitestone Expressway Service Road and 20th Avenue. The park contains a football /soccer field with overlapping softball fields and a hockey rink.

The Mitchel Gardens Cooperatives, located at the east end of the study area, has a playground at the intersection of the northbound Whitestone Expressway Service Road and 24th Road.

No Action Condition

There are no plans for the creation of new public open spaces within the study area and no plans for changes to existing open spaces. It is therefore expected that the open space inventory will remain essentially the same as at present. Similarly, no new residential developments are anticipated within the study area. The user population is therefore expected to remain essentially the same as at present. Since no significant changes are anticipated within the open space inventory or the demand for open space resources, there is not expected to be a significant change in the adequacy of the area's open space to serve the user population.

A slight increase in the study area daytime population is expected from the proposed auto technical school to be constructed at the northern terminus of Petracca Place. The ± 100,000 square feet facility is scheduled for completion in 2007. With an expected enrollment of 900 students, the study area daytime population will increase, which may in turn increase the demand for open space in the study area.

Build Condition

An adverse impact to the study area's open space and recreational facilities would occur only if a proposed project would: (1) eliminate or adversely affect existing open space resources either

on the project site or located in close proximity to it; or (2) increase the demand for open space by adding residents or workers in an area where available facilities cannot satisfy the increased demand. The proposed Project will not adversely impact open space or recreational facilities within the study area. The wetland restoration portion of the project is expected to increase passive recreation resources in the study area.

VIII. HISTORIC RESOURCES

Existing Conditions

A review of potential historic architectural and archaeological resources within the study area was conducted in coordination with the New York City Landmarks Preservation Commission and the New York State Office of Parks, Recreation and Historic Preservation. There are no identified historic architectural or archaeological resources located on the project site that would be affected by the project.

No Action Condition

As there are no identified historic resources in the directly affected area, impacts are not anticipated under the no action condition. Additionally, it is assumed that no improvements will occur to the former Flushing Airport property. The dilapidated former runway pavement area will continue to lie within the former wetland area.

Build Condition

Since the project does not involve demolition of historically significant structures and neither the project site nor the upland development area is located within close proximity to any historic landmark or district, impacts associated with the proposed development are not anticipated.

In a letter dated January 25, 2005, Gina Santucci, Environmental Review Coordinator of the City of New York Landmarks Preservation Commission, stated that the project site and upland development area are neither architecturally nor archaeologically significant, and adverse impacts to designated historic resources within the project study area are not anticipated (Refer to Appendix C).

In a letter dated February 24, 2006, from Ruth Pierpont, Director of the New York State Office of Parks, Recreation and Historic Preservation, the proposed project will have no impact upon cultural resources in or eligible for inclusion in the State and National Registers of Historic Places.

IX. URBAN DESIGN/VISUAL RESOURCES

Existing Conditions

The project site and upland development area are currently vacant and enclosed with chain link fencing to prevent pedestrian and vehicle access. Much of the site contains remains of the former Flushing airport, consisting of old runways, taxiways, and dilapidated hangars. The presence of phragmites and other vegetative growth, in addition to the low elevation of the site, blocks views to these structures from adjoining properties and roadways. A small segment of Linden Place at the south and west end of the property is visible; the remainder of the roadway is covered with standing water.

The project study area is primarily industrial and commercial in nature, with scattered pockets of residential land uses. The study area is generally characterized by the typical New York City street grid pattern. The Whitestone Expressway is located near the eastern border of the project study area. The highway is primarily at-grade, with overpasses located at 20th Avenue and Linden Place. The highway serves as a strong visual boundary between the disparate land uses immediately on either side, specifically the sprawling commercial and industrial parcels to the west and the dense residential land uses to the east.

The residential and small industrial uses located in the study area are of a similar low-scale. Most of the industrial facilities are one-story with little or no on-site parking. The residential blocks, of which there are few in the study area, are quiet and not heavily traveled.

No Action Condition

In the future no action condition, it is assumed that no improvements will occur to the former Flushing Airport property. The dilapidated former runway pavement area will continue to lie within the former wetland area.

One new development is expected to occur within the project study area. The Greater NY Auto Dealers Association is proposing to construct an auto technical school to be located at the northern terminus of Petracca Place. The ± 100,000 square feet facility is scheduled for completion in 2007. The parcel is located to the northeast of the project site.

The proposed auto technical school is not anticipated to have a negative impact on the urban design and visual character of the study area. The block form and street pattern in the area will be unaffected by the proposed development. Similarly, the existing streetscape, street hierarchy, and land uses will be unaltered.

The existing lot to be developed is not classified as open space; therefore no net loss of green space is anticipated from this development project. The visual character of the project study area will be altered due to the addition of the new structure, but no significant views or vistas

will be altered or blocked, no natural features will be changed or eliminated, and no historic resources will be significantly affected.

Build Condition

An analysis of urban design and visual resources is appropriate if a proposed project would a) result in buildings that have substantially different height, bulk, form, setbacks, size, scale, use or arrangement that exists in an area; b) change block, form, demap an active street, or map a new street, or affect the street hierarchy, street wall, curb cuts, pedestrian activity, or street space elements; or c) would result in above-ground development in an area that includes significant visual resources. While a small portion of the roadway will be new, less than one-quarter mile, it will be consistent with the surrounding roadways, and not significantly alter the visual character of the study area. The study area is densely developed, and the resulting new roadway extension will terminate at an existing 3-way intersection. A wetland creation and restoration program will be implemented in an area that has previously been closed to the general public. Positive visual impacts will result from the implementation of this project.

X. NATURAL RESOURCES

Existing Conditions

A detailed report, entitled "*Former Flushing Airport Wetland Mitigation*," was prepared by Louis Berger Associates to implement the wetland creation and restoration measures proposed by the New York City Economic Development Corporation (NYCEDC). A portion of the proposed creation and restoration plan is required pursuant to the NYSDEC Order of Consent, NYSDEC File Nos. R2-2918-90-03, R2-3159-90-08, and R2-3160-90-08 (Signed February 2002). In addition to the creation of the required project elements, the NYCEDC determined that more acreage is available on site to establish additional areas of wetland and upland restoration. The *Wetland Mitigation* report documents both the creation and restoration efforts to be undertaken by NYCEDC, as well as the over eight years of research conducted by NYCEDC Consultants, Louis Berger and EEA on documenting the existing conditions on site. For additional detailed information regarding natural resources, refer to **Appendix A** for the "*Former Flushing Airport Wetland Mitigation*" report.

Surface Water Bodies and Wetlands

The project site and upland development area currently contain approximately 8.6 acres of discontinuous patches of open water and emergent wetland, based on a delineation that was updated in the summer of 2003. The site was historically a brackish tidal marsh. Since abandonment of the airport, pumping of stormwater off site and increased stormwater runoff to the site, a portion of the site is now classified by NYSDEC as a freshwater wetland. Refer to **Figure 6** for state and federally regulated wetlands. The existing wetland area is dominated by *Phragmites australis* (reed grass) and is classified by NYSDEC standards as a Class II wetland. NYSDEC ranks wetlands according to their ability to perform wetland functions and provide wetland benefits. There are four ranked regulatory classes of wetlands, depending upon the degree of benefits supplied. These benefits are then translated into characteristics, used to classify the wetlands. Class I is the highest ranking. If a wetland meets any one of seventeen NYSDEC stated characteristics, it is a Class II wetland. The project site and upland development area is a Class II wetland because it exhibits the following NYSDEC characteristics:

- *It is one of the three largest wetlands within a city, town, or New York City Borough (664.6(e)(3)).* The project site and upland development area contains the third largest remaining wetland areas in Queens;
- *It is within an urbanized area (664.6(e)(3)).* The project site and upland development area is located within an urban area; and
- *It contains two or more wetland structural groups (664.6(b)(1).* The project site and upland development area contains both an herbaceous and a water vegetative structural group.

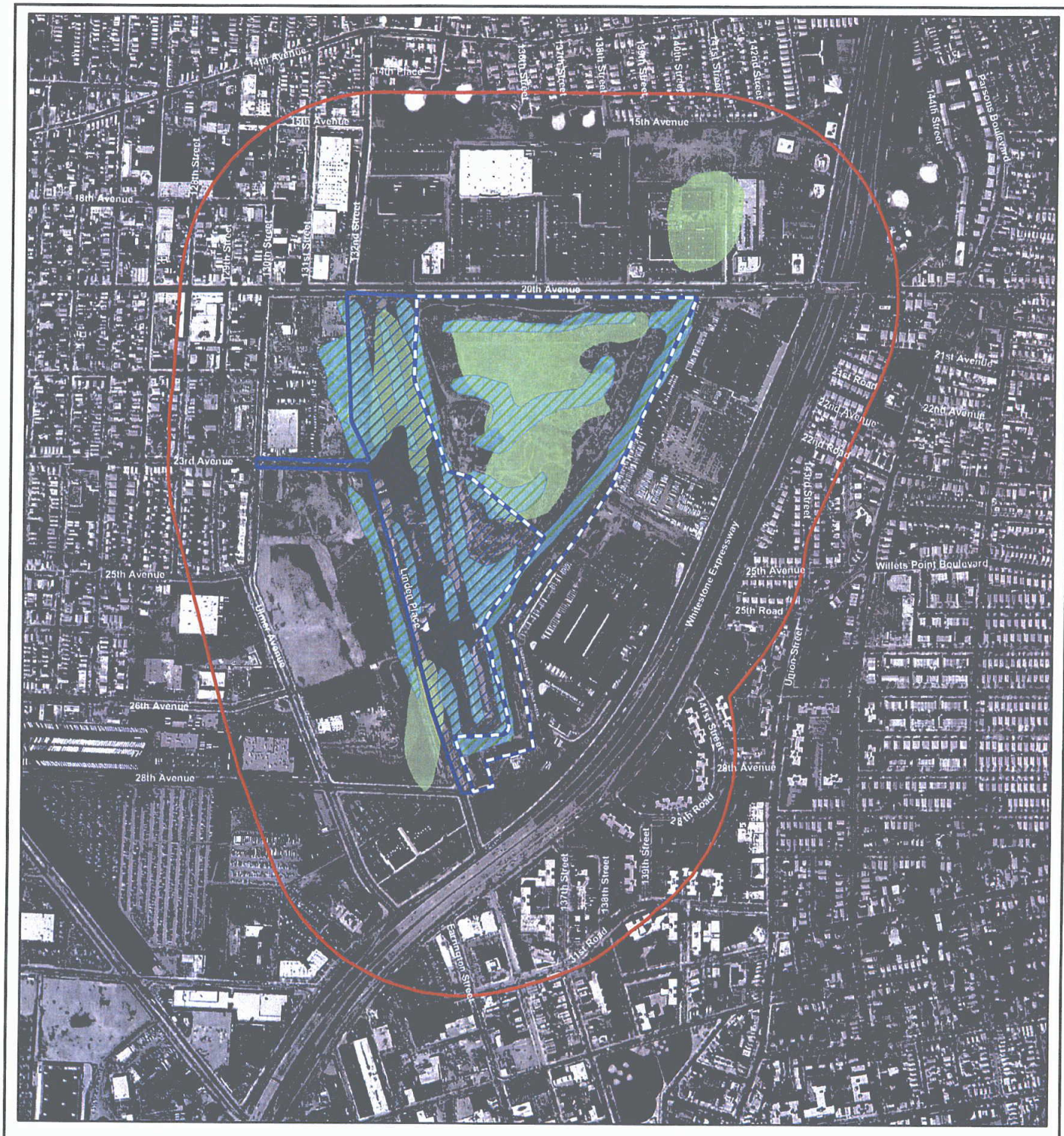


FIGURE 6 - WETLANDS

Former Flushing Airport Wetlands Development Project

New York City Economic Development Corporation

The western portion of the site lies adjacent to the former Mill Creek, which as a stormwater control measure was channelized and flows in a southwesterly direction through a series of manmade channels and dilapidated tide gates, eventually draining to Flushing Bay. Due to the dilapidated condition of the tide gates, during periods of spring high and storm tides the site is hydrologically connected with Flushing Bay.

Groundwater

Queens County has an upper glacial aquifer underlain by the Jameco-Magothy and Lloyd Aquifers (Stone and Webster, 1997). A groundwater and subsurface investigation study conducted in September-October of 1994 concluded that the groundwater and surface water on-site are an interconnected system with no definable boundary. The groundwater flow is to the west in the direction of Flushing Bay. The groundwater flow is tidally influenced and is generally located approximately 1.5 feet below or 11.5 feet above Mean Sea Level.

Floodplains

According to the Federal Insurance Rate Map issued in 1983, the project site and upland development area are located within the 100-year floodplain with a base flood elevation of 10.3 QVD. Since the time of the original study conducted by the Flood Insurance Management Agency, flood management features, including detention ponds, tide gates, and additional drainage channels, have been introduced to the area and may have influenced the area extent and inundation elevation of the 100-year flood. Much of the site is flooded for extended periods with water depths ranging from a few inches to three feet.

Built Resources

The project site is partially developed with a runway, taxiway, apron, severely dilapidated hangars and other small ancillary structures associated with the former Flushing Airport. The upland development area consists of open water, *Phragmites*-dominated areas, floodplains, and upland areas. Linden Place is an improved roadway, however, it is partially submerged in water and impassible by vehicle. The west end of 23rd Avenue is paved; the eastern terminus of the road is unimproved but used by vehicles, and is therefore not vegetated.

Vegetation

The upland development area contains herbaceous plant species, predominantly mugwort *(Artemisia vulgaris).* Mugwort is a highly invasive plat species found in fill-dominated soils throughout the city. Other species found include *Phragmites* reed grass, goldenrod *(Solidago sp),* English plantain *(Plantago lanceolata),* Queen Anne's lace *(Daucus carota),* and common mullein *(Verbascum thapsus).* These are common species found in degraded, filled upland habitats. The periphery of the project site contains a small number of trees and shrubs, including tree-of-heaven *(Ailanthus altissima),* cottonwood *(Populus deltoids),* and smooth sumac *(Rhus glabra).*

Wildlife

The species composition on-site and within the study area consists primarily of transient species and other species typical of an urban environment. Areas surrounding the project site and upland development area do not currently feature suitable habitat areas for endangered, threatened, rare species since they are primarily paved and significantly developed.

In excess of 100 avian species have been identified as using the project site and upland development area, the majority of which were waterfowl and shorebird species. Several of the more common species include snowy egret *(Egretta thula)*, black-crowned-night-heron *(Nycticorax nycticorax)*, great blue heron *(Ardea herodias)*, great egret *(Casmerodius albus)* and Canadian goose *(Branta canadensis)*. Additional non-waterfowl species include ring-necked pheasant *(Phasianus colchicus)*, common yellowthroat *(Geothlypis trichas)*, and red-winged blackbird *(Agelaius phoeniceus)*.

Mammals verified or likely to occur in the project area include raccoon *(Procyon lotor)*, muskrat *(Ondatra zibethicus)*, and Norway rat *(Rattus norvegicus)*. These species are common throughout the city.

Three herpetile species, the eastern painted turtle *(Chrysemys picta)*, snapping turtle *(Cheludra serpentine)*, and Fowler's toad *(Bufo woodhousei fowleri)* have been reported to occur in the project area.

No Action Condition

Under the future no action condition, it is assumed that no improvements will occur to the former Flushing Airport property. The dilapidated former runway pavement area will continue to lie within the former wetland area. The patches of vegetation on the site will continue to be dominated by *Phragmites australis*, the invasive form of *Phragmites*. Water within the site will continue to collect in the lower lying and discontinuous areas of the site. The tide gates will not be repaired or replaced, so the site will continue to back up during periods of storm high tides, contributing to flooding of the area during storm periods. In addition, the proposed construction of Linden Place and 132nd Street would not be implemented. In general, the site will remain in a state of disrepair.

Under the future no action condition, any approved development in the study area, including the proposed auto technical school, would be required to conform to city, state and federal programs that have been initiated to protect natural resources. As such, significant impacts to natural resources under the no action condition are not anticipated.

Build Condition

In the future with the project, the dilapidated remains of the former airport will be removed from the site, and the size, quality, and functionality of the wetland will be substantially upgraded. At the completion of Phases I and II, the 32.9-acre project site area will include over

12 acres of contiguous open water and 5 acres of emergent wetlands, as well as a 9 acre floodplain zone and the remaining acreage in a scrub-shrub/forested upland habitat.

The restoration of the open water and wetland areas will enhance water quality; improve flood storage for the project site, upland development area and adjoining developments; improve hydrologic flows; decrease mosquito populations by providing proper habitat for the natural enemies of mosquitoes and reducing flooding; enhance fish and wildlife habitat, improve viewsheds for the surrounding neighborhood, and improve the overall aesthetic value of the study area. Additionally, the project will involve planting and seeding of native vegetation and the removal of Phragmites, a non-native/invasive plant species. It is anticipated that the creation of an irregular shoreline will attract a diverse waterfowl and wading bird population, will provide a suitable habitat for nesting waterfowl, maximize the potential feeding and loafing areas in shallow emergent plant zones, will provide potential roosting areas and feeding opportunities within floodplains.

A long term monitoring plan and *Phragmites* management plan has been developed to ensure sustainability. Site monitoring will assess the degree of success of the created/restored freshwater wetland and will ensure that the desired character and ecological functions at the restoration site are achieved. The *Phragmities* management will prevent the regrowth of *Phragmites* by manual removal of the shoots, rhizomes and root masses.

The installation of water control structures and reconstruction of the tide gates will help control storm waters from surrounding developments.

At the completion of Phase I, Linden Place and portions of 23rd Avenue will be improved. At the completion of Phase II, a new roadway, 132nd Street, will exist between 23rd Avenue and 20th Avenue.

Construction of new roadways will require surcharging with the use of wick drains, to compact existing highly compressible organic soils on-site. The surcharge area will be 15' feet high for the width of the ROW and will slope off at a 1:1 ratio for a distance of 15 feet on either side of the roadway. At a few locations, the surcharge area will encroach upon or will fall within 100 feet of regulated freshwater wetlands. The surcharge is anticipated to remain in place and will be monitored by a geotechnical specialist for a period of approximately 12 months. Phase II will result in roadway reconstruction to meet the recommended legal grade established by the Office of the Borough President of Queens, Topographical Bureau. As such, some temporary effects may occur as a result of the road surcharge. However, no permanent wetland impacts are assumed to occur as the wetland creation/restoration design takes into account the new road design as well as the surcharge area. The surcharge of the road is scheduled to occur prior to the wetland creation/restoration construction effort. All areas temporarily disturbed by the surcharge area will be regraded and planted with native grass and shrub species, and the site contours will mesh with the contours of the wetland transition area.

The project would impact some wildlife species that nest within stands of Phragmites and use the seeds and rhizomes as a food source. The proposed planting of native vegetative species will provide existing wildlife species with a new nesting area and food source, while also

attracting other avian and wildlife species to the site. This plan will create an improved habitat for all species.

XI. WATERFRONT REVITALIZATION

The New York City Coastal Zone Management Program, established under the Federal Coastal Zone Management Act (CZMA) of 1972, affects actions involving the New York City waterfront. In New York State, actions must be consistent, to the maximum extent possible, with a municipality's "Local Waterfront Revitalization Program" (LWRP).

The LWRP for New York City is the "Waterfront Revitalization Plan" (WRP), which is the City's principal coastal zone management tool. The NYC Coastal Zone Management Program is responsible for the implementation of all state and federal policies relating to land located within the designated coastal zone. In 1982, the New York City Department of City Planning adopted the Waterfront Revitalization Plan (WRP), consisting of 56 policies, in response to local, state and federal concerns about deterioration and inappropriate use of the waterfront. The WRP established a Coastal Zone Boundary within which all projects were to be reviewed by the Department of City Planning for consistency with the established policies.

In 1999, the City of New York eliminated the 56 city and state WRP policies and replaced them with ten (10) policies dealing with: (1) residential and commercial redevelopment; (2) water-dependent industrial uses; (3) commercial and recreational boating; (4) coastal ecological systems; (5) water quality; (6) flooding and erosion; (7) solid waste and hazardous substances; (8) public access; (9) scenic resources; and (10) historical and cultural resources. The new policies simplify and clarify the consistency review process without eliminating any policy element required by state and federal law. For each policy, goals, standards and criteria are provided to set parameters for consistency determinations. Depending upon the conditions in a particular area, the policies articulate appropriate land use goals and present a hierarchy of preferred options for meeting those goals.

According to the Coastal Zone Map, provided by the New York City Department of City Planning, the project site and upland development area are located within the designated Coastal Zone, as shown in **Figure 7**. As such, the proposed action must be assessed for consistency with the City's Local Waterfront Revitalization Program (LWRP).

To determine consistency with the Local Waterfront Revitalization Program (LWRP), the New York City Consistency Assessment Form was completed and an addendum, providing policy responses, was prepared. The information provided in this section summarizes the Waterfront Revitalization Program Consistency Assessment Form and Addendum, prepared by the Louis Berger Group, Inc. The following policies were addressed in response to the questions answered "yes" on the Consistency Assessment Form (policies 21, 30, 34 and 40).

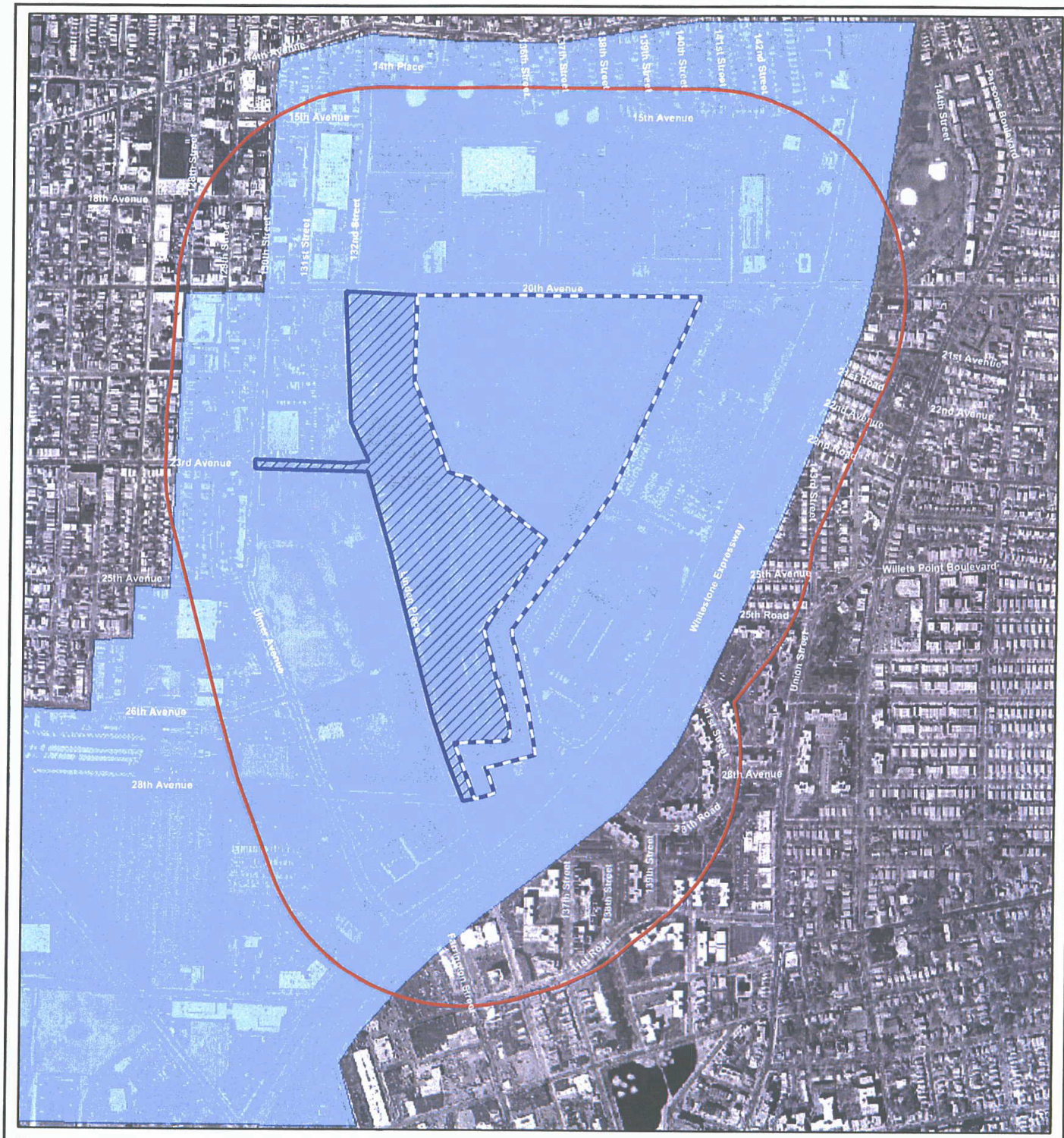


FIGURE 7 - COASTAL ZONE

Former Flushing Airport Wetlands Development Project

New York City Economic Development Corporation

POLICY 21: WOULD THE ACTION INVOLVE ANY ACTIVITY IN OR NEAR A TIDAL OR FRESHWATER WETLAND?

In addition to creating new wetlands to provide for wetland losses specified in the consent order, the wetland creation and enhancement plan will be of sufficient size to offset wetland losses due to roadway construction/reconstruction on the basis of 2 acres created/enhanced for every acre lost.

Approximately 7.4 acres of wetland creation on the project site is required in accordance with the NYSDEC Order of Consent and guidance from the U.S. Army Corps of Engineers under Section 404. In addition to the required acreage to be created, NYCEDC proposes to restore the additional surrounding wetland and upland areas to restore the site's functions to provide wildlife and fish habitat, flood storage and conveyance, enhance water quality, and provide recreation and aesthetic benefits to the surrounding urban community.

The proposed action involves creating new wetland areas and restoring additional wetland and adjacent upland areas. This action is consistent with the stated policy in that it will (1) avoid the draining of, placement of fill in, or excavation of wetlands; (2) minimize adverse impacts, and (3) provide mitigation for any adverse impacts that may remain after all appropriate and practicable minimization measures have been taken. There will be no placement of fill in existing wetland areas. Areas to be excavated include only those areas that were previously filled or developed. Wetland areas will be temporarily drained and filled during construction to protect water quality and prevent soil erosion and sedimentation, but all temporary berms will be removed after construction is complete and the wetland areas will be restored and planted and seeded with native vegetation.

Vegetative buffers to the wetland areas consisting of scrub-shrub floodplains and forested uplands will be restored on-site. Currently, floodplain and upland areas are dominated by invasive species indicative of disturbed areas (e.g. mugwort). Vegetated berms (to be dominated by native grasses) will be constructed around portions of the site to preserve the hydrologic balance within the wetland and the surrounding upland area.

Although the historical tidal wetland cannot be restored due to changes that occurred both on site and off site over time, the historical functions of the wetland system will be restored. Wetland functions, such as water quality, flood storage, and wildlife and fish habitat, will be restored and maximized.

The proposed roadway improvements are being performed in conjunction with the proposed wetland creation/restoration development project. Additional

mitigation measures required by the NYCDEC and ACOE as a permit condition will be implemented as required.

POLICY 30: WILL THE PROJECT INVOLVE THE EXCAVATION OR PLACING OF FILL IN OR NEAR NAVIGABLE WATERS, MARSHES, ESTUARIES, TIDAL MARSHES OR OTHER WETLANDS?

The proposed action will protect water quality during construction. The construction will include excavating the previously filled and/or developed areas to remove historical fill, and all paved surfaces and structures. To protect water quality and prevent soil erosion and sedimentation during construction, a berm will be placed within the wetland area during construction to divert drainage.

No dredging will occur within the site. Excavation and fill operations will meet state standards for physical, health and aesthetic factors. All excavation and placement of fill will occur during the fall and winter months, and will minimize potential adverse impacts on aquatic life. Excavated materials, other than asphalt, will be reused on site within upland and berm areas. The wetland creation/restoration will result in enhanced and increased habitat for aquatic life, including the creation of deep pools and emergent vegetated zones.

Improvements to existing roadways and construction of Linden Place and 132nd Street will be conducted in compliance with NYSDEC and ACOE requirements and permit conditions. The placement of fill within wetlands may be required for surcharging. Impacts to wetlands that may result from roadway construction will be mitigated, as required.

POLICY 34: WOULD THE ACTION INVOLVE CONSTRUCTION OR RECONSTRUCTION OF A FLOOD OR EROSION CONTROL STRUCTURE?

The inoperable tide gates located on Mill Creek, southwest of the site, will be relocated and reconstructed as part of the proposed Project. Currently, the tide gates are allowing tidal flows from Flushing Bay to flow in and out of the site twice daily. The restored tidal gates will allow for the site to function as a freshwater wetland habitat, preventing site inundation from high tide saltwater incursion onto the created and restored wetland. Therefore, the proposed project will maximize the flooding and erosion protective capacities of the site.

POLICY 40: WOULD THE ACTION RESULT IN DEVELOPMENT OF A SITE THAT MAY CONTAIN CONTAMINATION OR THAT HAS A HISTORY OF UNDERGROUND FUEL TANKS, OIL SPILLS, OR OTHER FORM OF PETROLEUM PRODUCT USE OR STORAGE?

As part of the geotechnical investigation for the creation and restoration of the wetland and upland habitat, the site was also surveyed for the presence of contamination. The majority of the site was found to include historic fill. The

historical fill was placed on site during the early 1900s to increase site elevations for the airport development.

During the soil and groundwater surveys, nine areas with elevated levels of contaminants were identified. Two of these areas, related to previously removed underground storage tanks, were removed and disposed of in accordance with all federal and state regulations. The remaining seven areas, which were found to contain elevated contaminant levels related to the historic fill, will be delineated, removed and disposed of in accordance with all federal and state regulations prior to the wetland creation/restoration.

The site has been fully investigated and delineated in accordance with state and federal standards. The creation and restoration of wetland areas will result in the removal of any contaminated soils on site, and allow for the proper disposal of these materials. Soils excavated to create open water area will be reused to create a berm to fill small depressions on the upland area. These soils will be capped with two feet of soil meeting NYS TAGM 4046 guidance.

XII. INFRASTRUCTURE

Existing Conditions

Water Supply

Public water is supplied to New York City through an extensive network of reservoirs, aqueducts and tunnels that extend north into the Catskill region. Distribution mains direct water from primary conduits to the customer. The Delaware and Catskill systems deliver water collected from upstate watershed areas to the Hillview Reservoir in Yonkers. The water is then distributed to the Bronx, Manhattan and Brooklyn through City Tunnel #1. City Tunnel #2 distributes water from Yonkers to the Bronx, Queens, Brooklyn and Staten Island. Approximately 1.2 billion gallons per day are consumed by users in New York City through this water supply system.

Sanitary Sewage and Stormwater Disposal

Stormwater and sewage generated within the boundaries of the City of New York are directed in to a series of sewers below grade that discharge waste to one of 14 different water pollution control plants (WPCP). Queens is serviced by a combined system that carries sanitary sewage from buildings and stormwater that is collected in storm drains and catch basins.

The project site is located within Water Pollution Control Drainage Area Number 8, Tallmans Island, which can treat a maximum of 80 million gallons of wastewater a day. Wastewater generation is assumed to be equal to water consumption. The City of New York is committed to treating all wastewater generated and to maintaining its wastewater treatment plants at or below the capacity permitted by state and federal permits, etc. To achieve this goal, the city develops plans based on expected flows to ensure that they fall within authorized categories. Therefore, only unusual actions with very large flows could have the potential for significant impacts on sewage treatment.

Stormwater discharge from the surrounding area utilizes a surface drainage system that collects runoff from the retail use properties along 20th Avenue, the USPS and NY Times facilities, the 88-acre former airport parcel and adjacent roadways. This flow is diverted to the drainage way, which discharges into Flushing Bay.

No Action Condition

Water Supply

Under the no action condition, the Greater NY Auto Dealers Association is proposing to construct an auto technical school to be located at the northern terminus of Petracca Place. The ± 100,000 square feet facility is scheduled for completion in 2007. With the implementation of water conservation measures, water demand from the project site is not expected to change or increase. It is anticipated that added water demand generated by the proposed development

and the general population growth would be accommodated by the existing water supply system.

Sanitary Sewage and Stormwater Disposal

The proposed development would not produce enough sanitary waste to adversely impact the city's sewage transmission and treatment capacity.

Build Condition

Water Supply

According to the CEQR Technical Manual, a detailed water supply impact analysis is only required if the proposed action conforms with the following criteria:

- Actions that would have exceptionally large demand for water, such as power plants, very large cooling systems, or large developments (e.g., those that use more than one million gallons per day).
- Actions in the Rockaway Peninsula and Coney Island, which are at the end of the water system, where water pressure can be low.

The proposed Project will not require water; therefore, impacts to the New York City water supply system are not anticipated.

Sanitary Sewage and Stormwater Disposal

The proposed Project will not generate sanitary waste; therefore, during dry weather conditions there will be no impacts to the sanitary sewage system.

The proposed roadway reconstruction will increase the impervious surface area on the project site. During a storm event, the volume of runoff anticipated on the project site will not be significant enough, however, to create very large flows. The construction of the proposed Project will increase storage capacity for stormwater runoff and the relocation and reconstruction of the tide gates will reduce high tide-generated flooding from Flushing Bay.

XIII. SOLID WASTE AND SANITATION SERVICES

Existing Conditions

The Department of Sanitation (DOS) is responsible for the collection and disposal of municipal solid waste and recyclable materials generated by residences, some nonprofit institutions, tax exempt properties, and City agencies. Commercial and Industrial institutions are required to contract with private waste carters for waste and recyclables collection and disposal. Although private carters are responsible for commercial and industrial waste, these establishments are required to source-separate recyclable materials to conform with Local Law 19 of 1989 of the Administrative Code of the City of New York.

After collection, private carters deliver putrescible and non-putrescible commercial and industrial waste to solid waste management facilities located both inside and outside of the city. The waste is unloaded from the trucks, processed and then loaded onto larger trucks or rail cars for transport to out-of-city disposal facilities.

No Action Condition

Under the no action condition, adverse impacts to solid waste collection are not anticipated. Solid waste generated by the proposed auto technical school on Petracca Place is considered commercial waste and would be hauled by private carters.

Build Condition

In all phases of development, the solid waste generated from the proposed Project would not be considered municipal solid waste, but construction and demolition debris. Accordingly, it would be hauled by a private carter to an appropriate disposal site. There would be no adverse impacts and mitigation would not be required.

XIV. ENERGY

Existing Conditions

CEQR requires an assessment of energy consumption during environmental review to identify any irreversible and irretrievable commitments of resources associated with an action. A discussion of the effects of the action on the use and conservation of energy is required as part of this analysis. Energy analysis focuses on an action's consumption of energy, and where relevant, any effects on the transmission of energy that could result from the action. A detailed energy assessment is required for actions that could significantly affect the transmission or generation of energy or that generate substantial indirect consumption of energy. Consolidated Edison and Keyspan Energy Services provide natural gas to the study area and Consolidated Edison currently provides electric service. The level of service currently provided is adequate to meet the needs of the proposed use.

No Action Condition

It is anticipated that the Greater NY Auto Dealers Association auto technical school on Petracca Place will increase energy consumption within the study area. With the implementation of energy conservation methods, as required by the New York State Energy Conservation Code, it is anticipated that the proposed development would not affect the transmission of energy, or generate a substantial indirect consumption of energy. Future projects that have not been proposed, to date, would be reviewed on a case-by-case basis for energy impacts.

In the future no action condition, it is assumed that no improvements will occur to the former Flushing Airport property. The dilapidated former runway pavement area will continue to lie within the former wetland area.

Build Condition

Implementation of the proposed Project is not expected to result in increased energy usage. Energy consumption in terms of gasoline and oil expended by vehicles is expected to decrease as a result of this project.

XV. TRAFFIC

The traffic analysis evaluated the potential future redistribution of daily peak hour traffic as a result of the proposed roadway reconstruction and the construction of a new roadway section within the study area. The full Traffic Study was reviewed and approved by the NYCDOT and is available for review upon request. The proposed Project includes the reconstruction and construction of the following improvements in two phases (refer to **Figure 8**):

Phase 1 - Reconstruction
Linden Place Reconstruction, from 28th Avenue to 23rd Avenue
23rd Avenue Reconstruction, from Linden Place to 130th Avenue

Phase II – New Construction
132nd Street, from the 23rd Avenue and Linden Place intersection to 20th Avenue

The construction of Phase I is scheduled for completion in 2007 and Phase II is tentatively scheduled for completion in 2009. The intersection levels of service at the study intersections in the existing conditions, 2007 with the existing roadway network, 2007 with the Phase 1 improvements, 2009 with the Phase 1 improvements, and 2009 with the Phase 1 And Phase II improvements are listed in Table 10 and 11 (refer to full Traffic Study) for the AM and PM peak hours, respectively.

Existing Conditions
A data collection program was conducted to identify existing traffic conditions around the proposed project site. Peak hour turning movement counts were conducted at sixteen intersections in the study area. A level of service analysis was also conducted to establish the existing vehicular delays at each of the study intersection.

The 20th Avenue at the Whitestone Expressway Service Road North and at the Whitestone Expressway Service Road South intersections carry the highest peak hour traffic volumes in the study area during the existing traffic conditions. The intersection capacity analysis identified seven intersections with congestion during the peak hours of the day that includes both the Service Road intersections with 20th Avenue.

Additionally, an improper traffic control was identified during the study at the signalized 14th Avenue and the Whitestone Expressway Service Road North intersection. The 144th Place approach to the signalized intersection is controlled by a red signal. The red signal for the 144th Place approach is a shoulder mounted single section traffic signal head that is mounted on a utility pole. The signal changes from a solid red to a flashing red at the same time that the parallel Whitestone Expressway Service Road North receives a green signal. With the exception to the 144th Street approach, all other approaches to the intersection are signalized.

Phase I
The study area roadway network traffic volume in 2007 was derived by applying a one percent annual background traffic growth rate to the 2004 traffic volume and by incorporating the projected trips generated by other planned developments expected to be in operation by 2007.

Figure 8
Study Area with Proposed Project Limits

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Edwards AND Kelcey

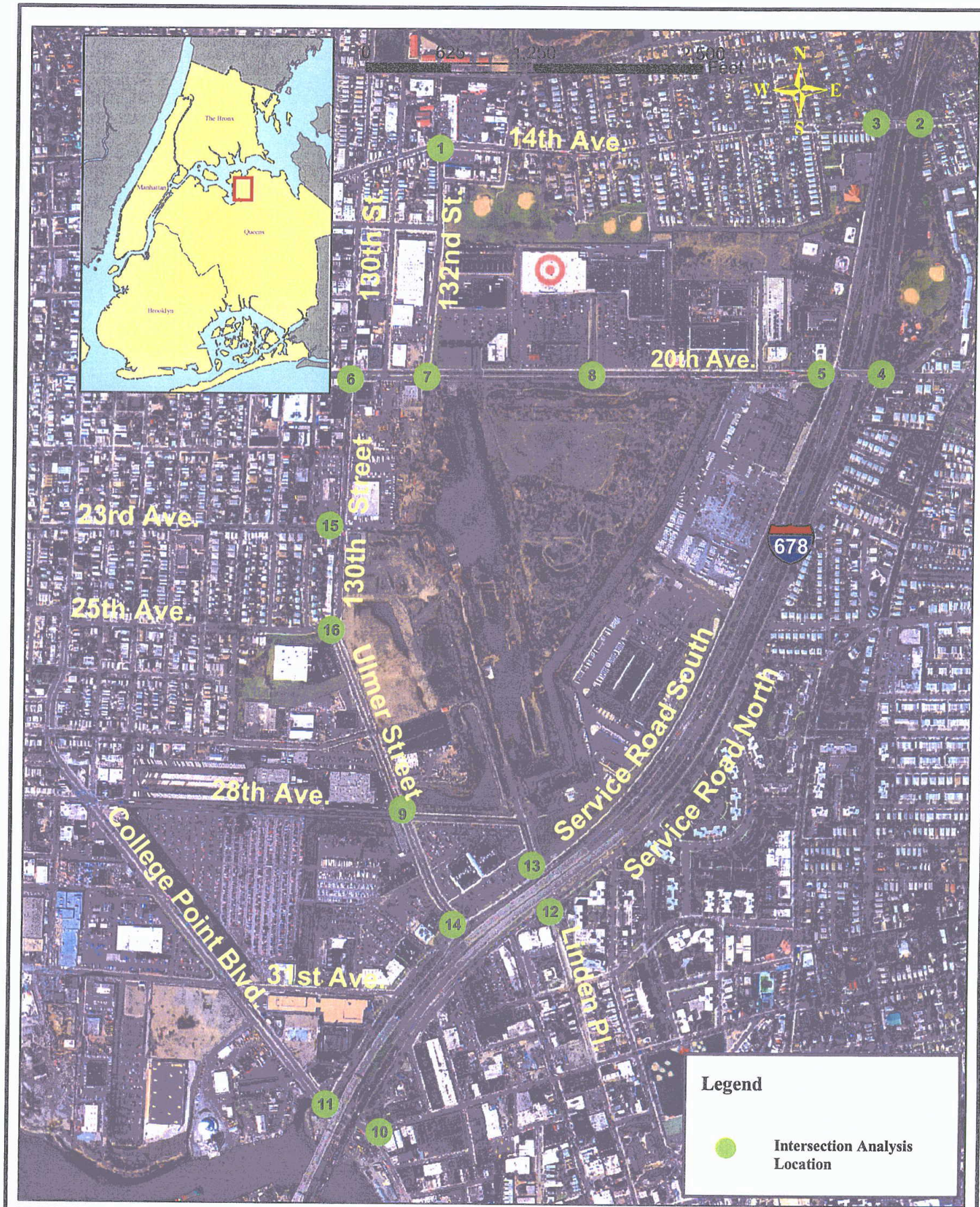

Figure 9
Intersection Analysis Locations

Edwards AND Kelcey

The Center of Automotive Education and Training is the only known planned development that is anticipated to open in 2007 within the study area. The Center's projected traffic volume was incorporated into the future roadway volume as part of the 2007 traffic volume without the Phase 1 improvements.

An intersection capacity analysis was conducted to identify the projected traffic conditions in 2007 on the existing study area roadway network (Refer to **Figure 9**). All seven intersections that were identified with congestion in 2004 were also identified with congestion in 2007.

A subsequent level of service analysis was conducted at the study intersections to compare the 2007 area traffic conditions without Phase 1 roadways and with the phase 1 roadways. The proposed Phase 1 roadways were integrated into the existing study area roadway network with the projected 2007 traffic volumes. The projected traffic volumes were assigned to the Phase 1 roadways based upon existing traffic distribution. The Linden Place traffic that may divert to the Phase 1 roadways on the way to 23rd Avenue was developed by applying the existing percentage of traffic that turns north on Ulmer Street from the westbound 28th Avenue approach and percentage of the northbound approach that continued through on 130th Street at 25th Avenue.

The Phase I improvements are not expected to attract additional traffic into the area. The roadway reconstruction is projected to reduce the traffic volume along 130th Street and Ulmer Street, between 23rd Avenue and 28th Avenue (Refer to Traffic Study Figures 9 and 10 located in Appendix B). The reduction in traffic is expected to improve the level of service at the 28th Avenue and Ulmer Street intersection and at the 25th Avenue and 130th Street intersection.

At the 23rd Avenue and 130th Street intersection, the northbound approach volume is projected to decrease with Phase I and the westbound approach volume is projected to increase. The overall intersection entering volume is not expected to change significantly. At the 28th Avenue and Linden Place intersection, the northbound left turn traffic volume is also projected to decrease while the northbound through volume is projected to increase. The overall intersection entering volume is also not expected to change significantly.

The Phase I improvements will require traffic control changes to the currently uncontrolled 28th Avenue and Linden Place intersection. The gated New York Times driveway approach to the intersection is controlled by a stop sign. Due to the projected traffic volume along Linden Place, upon completion of Phase I, the 28th Avenue approach to Linden Place was analyzed with a stop control.

Phase II

Phase II of the Linden Place Reconstruction Traffic Study is the construction of a 132nd Street roadway section that will connect with 20th Avenue to the north and the Phase I improvements to the south (Refer to Traffic Study Figures 15 and 16 located in Appendix B). The traffic condition in 2009 was determined by projecting the 2007 intersection traffic volumes on the study area roadway network with the Phase I improvements. The same annual background traffic growth rate was applied to the study area traffic volume that was applied to the 2004 traffic volumes. A level of service analysis was conducted to identify traffic conditions in 2009 on the existing roadway network with the Phase I improvements.

The seven intersections that were identified with congestion issues in 2004 were also identified with congestion issues in 2009. The 23rd Avenue and 130th Street intersection is also projected to have congestion issues in 2009.

The proposed Phase II improvements are not expected to attract additional traffic into the study area. The Phase II improvements will provide the study area an alternate north-south roadway that will connect Linden Place to 20th Avenue and bypass the two highest volume intersections in the study area, 20th Avenue and the Whitestone Expressway Service Road north, and 20th Avenue and the Whitestone Expressway Service Road south. The Phase II improvements will require modifications to the lane assignments and to the traffic signal plan of the 20th Avenue and 132nd Street intersection.

The completion of the Phase II improvements is expected to cause a redistribution of limited traffic volumes from select traffic flows within the study area (Refer to Traffic Study Figures 13 and 14 located in Appendix B). The intersection entering volume at the 20th Avenue and Whitestone Expressway Service Road North, 20th Avenue and Whitestone Expressway Service Road South, 20th Avenue and 130th Street, and the 23rd Avenue and 130th Street intersections are expected to *decrease* while the entering traffic at the Linden Place and Whitestone Expressway Service Road South, 28th Avenue and Linden Place, 23rd Avenue and Linden Place, and 20th Avenue and 132nd Street intersections are expected to *increase*.

Table 5 lists the overall intersection level of service results for the existing conditions, 2007 without Phase I, 2007 with Phase I roadway, 2009 without Phase II roadway, and 2009 with Phase II improvements for the AM peak. **Table 6** lists the overall results for the PM peak.

Conclusion

The completion of the Phase I improvements is projected to have negligible effect on the study area. The Phase I improvements will provide an alternate route between the 23rd Avenue at 130th Street intersection and the Linden Place at the Whitestone Expressway Service Road intersections.

The completion of the Phase I improvements is expected to:

- Cause some of the traffic on 130th Street and Ulmer Street to travel on the Phase I improvements and decrease the traffic volumes on 130th Street and Ulmer Street between 28th Avenue and 23rd Avenue.
- Redistribute the approaching traffic volume at the 23rd Avenue and 130th Street intersection without increasing the total intersection volume and to increase the vehicular delays at the all-way stop controlled intersection. However, the completion of Phase II is projected to lower vehicular delays and improves the intersection to an acceptable level of service.
- Alter the 28th Avenue and Linden Place intersection configuration and traffic flows. Due to the changes to the geometry and traffic flows, the 28th Avenue approach to the Phase I roadway was analyzed with stop control to minimize delays. The intersection would be designed as a two-way stop controlled intersection.

TABLE 5

AM PEAK INTERSECTION LEVEL OF SERVICE

Map ID	Intersection	Approach	Mov't	2004 Existing Roadways			2007 No Action			2007 With Phase 1 Roads			2009 With Phase 1 Roads			2009 With Phase 1 & 2 Roads		
				v/c ratio	Delay	LOS	v/c ratio	Delay	LOS	v/c ratio	Delay	LOS	v/c ratio	Delay	LOS	v/c ratio	Delay	LOS
1	14th Avenue at 132nd Street	EB	TR	0.49	10.7	B	0.5	10.9	B	0.5	10.9	B	0.51	11.1	B	0.51	11.1	B
		WB	L	0.43	12	B	0.46	12.6	B	0.46	12.6	B	0.47	13	B	0.47	13	B
		WB	T	0.45	10.3	B	0.47	10.4	B	0.47	10.4	B	0.48	10.6	B	0.48	10.6	B
		NB	LR	0.28	16.1	B	0.29	16.2	B	0.29	16.2	B	0.29	16.2	B	0.29	16.2	B
		Intersection			11.4	B		11.7	B		11.7	B		11.8	B		11.8	B
2	14th Avenue at Whitestone Exwy Service Road North	EB	LT	0.83	31.3	C	0.9	38.4	D	0.9	38.4	D	0.93	43	D	0.93	43	D
		WB	T	0.86	34.4	C	0.92	40.2	D	0.92	40.2	D	0.94	42.9	D	0.94	42.9	D
		WB	R	0.27	16.9	B	0.28	17	B	0.28	17	B	0.28	17.1	B	0.28	17.1	B
		NB	L	0.21	16.1	B	0.21	16.2	B	0.21	16.2	B	0.22	16.2	B	0.22	16.2	B
		NB	T	0.32	17.4	B	0.33	17.6	B	0.33	17.6	B	0.34	17.6	B	0.34	17.6	B
		NB	R	0.14	15.5	B	0.15	15.6	B	0.15	15.6	B	0.16	15.6	B	0.16	15.6	B
		Intersection			27.4	C		31.8	C		31.8	C		34.3	C		34.3	C
3	14th Avenue at Whitestone Exwy Service Road South	EB	TR	0.48	23.6	C	0.5	23.9	C	0.5	23.9	C	0.51	24.1	C	0.51	24.1	C
		WB	L	0.95	61.6	E	1.06	93.8	F	1.06	93.8	F	1.1	104.9	F	1.1	104.9	F
		WB	T	0.6	17.3	B	0.62	17.8	B	0.62	17.8	B	0.63	18.1	B	0.63	18.1	B
		SB	L	0.63	29.6	C	0.65	30.3	C	0.65	30.3	C	0.67	30.8	C	0.67	30.8	C
		SB	T	0.54	26.7	C	0.57	27.3	C	0.57	27.3	C	0.58	27.7	C	0.58	27.7	C
		SB	R	0.26	22.1	C	0.27	22.3	C	0.27	22.3	C	0.28	22.4	C	0.28	22.4	C
		Intersection			29.2	C		35.1	D		35.1	D		37.1	D		37.1	D
4	20th Avenue at Whitestone Exwy Service Road North	EB	L	0.65	29.2	C	0.71	39.3	D	0.71	39.3	D	0.74	44	D	0.74	44	D
		EB	T	0.2	12.1	B	0.21	12.1	B	0.21	12.1	B	0.21	12.2	B	0.21	12.2	B
		WB	TR	0.76	34.7	C	0.81	36.7	D	0.81	36.7	D	0.83	37.6	D	0.83	37.6	D
		NB	L	0.97	71.6	E	1.22	153.6	F	1.22	153.6	F	1.24	163.2	F	1.18	139.7	F
		NB	LTR	0.72	39.4	D	0.78	41.8	D	0.78	41.8	D	0.8	42.5	D	0.79	42	D
		Intersection			39.2	D		59.5	E		59.5	E		62.3	E		56.5	E
5	20th Avenue at Whitestone Exwy Service Road South	EB	T	0.35	37	D	0.37	37.2	D	0.37	37.2	D	0.37	37.3	D	0.37	37.3	D
		EB	R	0.73	47.1	D	0.76	48.1	D	0.76	48.1	D	0.77	49	D	0.77	49	D
		WB	L	0.93	37.5	D	0.96	45.7	D	0.96	45.7	D	0.99	51.8	D	0.99	51.8	D
		WB	T	0.39	13.6	B	0.49	14.9	B	0.49	14.9	B	0.5	15	B	0.48	14.8	B
		SB	LTR	0.92	56.8	E	0.95	60.9	E	0.95	60.9	E	0.96	64.2	E	0.96	64.2	E
		SB	R	0.99	82.8	F	1.36	218.8	F	1.36	218.8	F	1.39	230.3	F	1.39	230.3	F
		Intersection			43.2	D		65	E		65	E		68.4	E		68.9	E
6	20th Avenue at 130th Street	EB	LTR	0.56	11.9	B	0.58	12.2	B	0.58	12.2	B	0.59	12.5	B	0.59	12.5	B
		WB	L	0.38	11	B	0.4	11.4	B	0.4	11.4	B	0.41	11.7	B	0.2	8.5	A
		WB	TR	0.5	11	B	0.52	11.2	B	0.52	11.2	B	0.53	11.4	B	0.53	11.4	B
		NB	LTR	0.33	16.9	B	0.34	17	B	0.34	17	B	0.34	17.1	B	0.34	17.1	B
		NB	R	0.4	17.9	B	0.41	18.1	B	0.41	18.1	B	0.42	18.2	B	0.3	16.5	B
		SB	LTR	0.3	16.3	B	0.31	16.4	B	0.31	16.4	B	0.31	16.5	B	0.33	16.9	B
		Intersection			13.2	B		13.5	B		13.5	B		13.6	B		13.3	B
7	20th Avenue at 132nd Street	EB	L	0.45	15	B	0.48	16.2	B	0.48	16.2	B	0.51	17.4	B	0.45	14.8	B
		EB	T	0.39	9.1	A	0.41	9.2	A	0.41	9.2	A	0.41	9.2	A	n/a	n/a	n/a
		EB	TR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.4	9.1	A
		WB	TR	0.56	10.8	B	0.58	11	B	0.58	11	B	0.59	11.2	B	n/a	n/a	n/a
		WB	LTR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.67	12.8	B
		NB	L	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.06	13.8	B
		NB	TR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.13	14.2	B
		SB	L	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.55	18	B
		SB	TR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.15	14.3	B
		SB	LR	0.53	17.4	B	0.55	17.7	B	0.55	17.7	B	0.56	17.9	B	n/a	n/a	n/a
		Intersection			11.4	B		11.6	B		11.6	B		11.8	B		12.4	B
8	20th Avenue at Target Driveway	EB	L	0.19	14.6	B	0.2	15.2	B	0.2	15.2	B	0.21	15.7	B	0.21	15.1	B
		EB	T	0.33	8.9	A	0.34	9	A	0.34	9	A	0.35	9.1	A	0.35	9.1	A
		WB	T	0.43	15.6	B	0.44	15.8	B	0.44	15.8	B	0.45	15.9	B	0.43	15.6	B
		WB	R	0.12	12.4	B	0.13	12.4	B	0.13	12.4	B	0.13	12.4	B	0.12	12.4	B
		SB	L	0.09	34.7	C	0.09	34.7	C	0.09	34.7	C	0.09	34.7	C	0.09	34.7	C
		SB	R	0.04	25.8	C	0.04	25.8	C	0.04	25.8	C	0.04	25.8	C	0.04	25.8	C
		Intersection			13.5	B		13.6	B		13.6	B		13.8	B		13.6	B

TABLE 5 (Continued)

AM PEAK INTERSECTION LEVEL OF SERVICE

Map ID	Intersection	Approach	Mov't	2004 Existing Roadways			2007 No Action			2007 With Phase 1 Roads			2009 With Phase 1 Roads			2009 With Phase 1 & 2 Roads		
				v/c ratio	Delay	LOS	v/c ratio	Delay	LOS	v/c ratio	Delay	LOS	v/c ratio	Delay	LOS	v/c ratio	Delay	LOS
9	28th Avenue at Ulmer Street	EB	L	0.18	12	B	0.19	12.3	B	0.15	11.4	B	0.15	11.4	B	0.1	10.7	B
		EB	TR	0.52	15.3	B	0.54	15.6	B	0.54	15.6	B	0.55	15.8	B	0.56	16.1	B
		WB	LTR	0.51	13.9	B	0.52	14.2	B	0.39	12.7	B	0.4	12.8	B	0.36	12.3	B
		NB	LT	0.16	10.9	B	0.16	11	B	0.16	11	B	0.17	11	B	0.17	11	B
		NB	R	0.01	9.8	A	0.01	9.8	A	0.01	9.8	A	0.01	9.8	A	0.01	9.8	A
		SB	L	0.36	13.4	B	0.37	13.5	B	0.3	12.7	B	0.31	12.8	B	0.13	10.8	B
		SB	TR	0.72	19.7	B	0.74	20.4	C	0.74	20.4	C	0.75	21	C	0.75	20.8	C
		Intersection			15.6	B		15.9	B		15.6	B		15.9	B		16	B
10	College Point Blvd at 32nd Avenue	WB	L	0.18	14.6	B	0.19	14.7	B	0.19	14.7	B	0.19	14.7	B	0.19	14.7	B
		NB	T	0.5	18.3	B	0.52	18.5	B	0.52	18.5	B	0.53	18.7	B	0.53	18.7	B
		SB	L	0.37	13.2	B	0.39	13.7	B	0.39	13.7	B	0.4	14.2	B	0.4	14.2	B
		SB	T	0.4	8.8	A	0.41	8.9	A	0.41	8.9	A	0.42	9	A	0.42	9	A
		Intersection			13.1	B		13.3	B		13.3	B		13.4	B		13.4	B
11	College Point Blvd at Whitestone Exwy South	EB	T	0.38	8.9	A	0.39	8.9	A	0.39	8.9	A	0.4	9	A	0.4	9	A
		WB	T	0.37	8.8	A	0.38	8.9	A	0.38	8.9	A	0.39	9	A	0.39	9	A
		SB	L	0.55	17.6	B	0.57	17.8	B	0.57	17.8	B	0.58	18.1	B	0.58	18.1	B
		SB	R	0.14	14.2	B	0.14	14.2	B	0.14	14.2	B	0.14	14.3	B	0.14	14.3	B
		Intersection			10.6	B		10.7	B		10.7	B		10.8	B		10.8	B
12	Linden Place at Whitestone Exwy North	EB	L	0.59	24.2	C	0.61	25	C	0.61	25	C	0.62	25.5	C	0.62	25.5	C
		EB	T	0.25	13.2	B	0.25	13.2	B	0.25	13.2	B	0.26	13.3	B	0.26	13.3	B
		WB	TR	1.05	84.8	F	1.08	94.9	F	1.08	94.9	F	1.1	102.3	F	1.1	104	F
		NB	LTR	0.55	22.6	C	0.57	22.9	C	0.57	22.9	C	0.58	23.1	C	0.58	23.1	C
		Intersection			36.3	D		39	D		39	D		41	D		41.4	D
13	Linden Place at Whitestone Exwy South	EB	TR	0.33	26.1	C	0.34	26.2	C	0.34	26.2	C	0.34	26.3	C	0.34	26.3	C
		WB	L	0.42	10.2	B	0.43	10.6	B	0.43	10.6	B	0.44	10.9	B	0.44	10.9	B
		WB	T	0.42	8.1	A	0.44	8.2	A	0.44	8.2	A	0.44	8.3	A	0.48	8.8	A
		SB	L	0.84	53	D	0.87	56	E	0.87	56	E	0.88	58.5	E	0.88	58.5	E
		SB	TR	0.74	39.2	D	0.76	40.2	D	0.76	40.2	D	0.77	40.9	D	0.77	40.9	D
		Intersection			26.3	C		27.2	C		27.2	C		27.8	C		27.6	C
14	Ulmer Street at Whitestone Exwy S/R	EB	R	0.99	63.5	E	1.02	71	E	1.02	71	E	1.04	76.8	E	1.04	76.8	E
		SB	U-turn	0.49	29.1	C	0.5	29.3	C	0.5	29.3	C	0.51	29.5	C	0.51	29.5	C
		SB	LTR	0.87	42.6	D	0.9	45.3	D	0.9	45.3	D	0.92	47.3	D	0.92	47.3	D
		Intersection			52.7	D		57.8	E		57.8	E		61.7	E		61.7	E
15	23rd Avenue at 130th Street	EB	LTR		10.8	B		11.1	B		12.4	B		12.7	B		11.6	B
		WB	LTR		9.9	A		10.1	B		15.2	C		15.6	B		16.8	C
		NB	LTR		13.2	B		13.8	B		13.1	B		13.4	B		11.5	B
		SB	LTR		12	B		12.4	B		15.6	C		16.2	B		12.2	B
		Intersection			12.2	B		12.7	B		14.4	B		14.8	B		13.8	B
16	25th Avenue at 130th Street and Ulmer Street	EB	L		9.4	A		9.5	A		9	A		9.1	A		8.6	A
		EB	R		11.4	B		11.7	B		10.7	B		10.9	B		9.9	A
		NB	L		11	B		11.3	B		11	B		11.1	B		10.7	B
		NB	T		14.1	B		14.8	B		10.7	B		10.8	B		9.5	A
		SB	T		15.5	B		16.3	C		13.8	B		14.1	B		11.1	B
		SB	R		8.2	A		8.2	A		8	A		8	A		7.8	A
		Intersection			13.2	B		13.7	B		11.6	B		11.8	B		10.2	B
**	28th Avenue at Linden Place (Two way Stop)	EB	LR		n/a	n/a		n/a	n/a		8.4	A		28.8	D		32	D
		EB	R		n/a	n/a		n/a	n/a		7.5	A		9.6	A		9.7	A
		WB	L		n/a	n/a		n/a	n/a		50	E		40.6	E		35	D
		WB	TR		n/a	n/a		n/a	n/a		20.8	C		18.6	C		18.8	C
		NB	L		n/a	n/a		n/a	n/a		8.4	D		8.4	A		8.6	A
		SB	LT		n/a	n/a		n/a	n/a		7.5	A		7.5	A		7.7	A

The study area AM peak hour occured between 8:00 AM and 9:00 AM.

TABLE 6

PM PEAK INTERSECTION LEVEL OF SERVICE

Map ID	Intersection	Approach	Mov't	2004 Existing Roadways			2007 No Action			2007 With Phase 1 Roads			2009 With Phase 1 Roads			2009 With Phase 1 & 2 Roads		
				v/c ratio	Delay	LOS	v/c ratio	Delay	LOS	v/c ratio	Delay	LOS	v/c ratio	Delay	LOS	v/c ratio	Delay	LOS
1	14th Avenue at 132nd Street	EB	TR	0.54	11.5	B	0.56	11.8	B	0.56	11.8	B	0.57	12	B	0.57	12	B
		WB	L	0.25	9.3	A	0.27	9.6	A	0.27	9.6	A	0.28	9.8	A	0.28	9.8	A
		WB	T	0.51	10.9	B	0.52	11.2	B	0.52	11.2	B	0.53	11.3	B	0.53	11.3	B
		NB	LR	0.28	16.1	B	0.29	16.2	B	0.29	16.2	B	0.3	16.3	B	0.3	16.3	B
		Intersection			11.7	B		11.9	B		11.9	B		12.1	B		12.1	B
2	14th Avenue at Whitestone Exwy Service Road North	EB	LT	0.93	41.5	D	0.98	52	D	0.98	52	D	1.01	59.5	E	1.01	59.5	E
		WB	T	0.72	26	C	0.75	27.3	C	0.75	27.3	C	0.76	27.9	C	0.76	27.9	C
		WB	R	0.09	15	B	0.09	15	B	0.09	15	B	0.09	15	B	0.09	15	B
		NB	L	0.31	17.4	B	0.32	17.5	B	0.32	17.5	B	0.33	17.6	B	0.33	17.6	B
		NB	T	0.02	14.3	B	0.02	14.3	B	0.02	14.3	B	0.02	14.3	B	0.02	14.3	B
		NB	R	0.25	16.7	B	0.27	17	B	0.27	17	B	0.28	17.1	B	0.28	17.1	B
		Intersection			30.4	C		35.3	C		35.3	C		38.7	D		38.7	D
3	14th Avenue at Whitestone Exwy Service Road South	EB	TR	0.62	26.1	C	0.64	26.5	C	0.64	26.5	C	0.65	26.8	C	0.65	26.8	C
		WB	L	0.53	19.3	B	0.59	21.3	C	0.59	21.3	C	0.61	22.2	C	0.61	22.2	C
		WB	T	0.76	22.1	C	0.78	23.1	C	0.78	23.1	C	0.8	23.9	C	0.8	23.9	C
		SB	L	0.44	25	C	0.46	25.2	C	0.46	25.2	C	0.47	25.5	C	0.47	25.5	C
		SB	T	0.28	22.2	C	0.29	22.4	C	0.29	22.4	C	0.3	22.4	C	0.3	22.4	C
		SB	R	0.2	21.3	C	0.21	21.4	C	0.21	21.4	C	0.21	21.4	C	0.21	21.4	C
		Intersection			23.5	C		24.2	C		24.2	C		24.7	C		24.7	C
4	20th Avenue at Whitestone Exwy Service Road North	EB	L	0.99	71.8	E	1.15	122.5	F	1.15	122.5	F	1.17	130.5	F	1.17	130.5	F
		EB	T	0.42	17	B	0.44	17.2	B	0.44	17.2	B	0.45	17.4	B	0.45	17.4	B
		WB	TR	0.54	32.3	C	0.56	32.8	C	0.56	32.8	C	0.57	33.1	C	0.57	33.1	C
		NB	L	0.91	55	D	1	72.7	E	1	72.7	E	1.02	77.5	E	0.95	60.7	E
		NB	LTR	0.65	33.7	C	0.68	34.4	C	0.68	34.4	C	0.69	34.9	C	0.68	34.6	C
		Intersection			38.8	D		51.2	D		51.2	D		53.6	D		50.4	D
5	20th Avenue at Whitestone Exwy Service Road South	EB	T	0.54	35.8	D	0.6	37	D	0.6	37	D	0.62	37.3	D	0.62	37.3	D
		EB	R	0.91	55.5	E	1.01	74.6	E	1.01	74.6	E	1.03	80.4	F	1.03	80.4	F
		WB	L	0.51	16.3	B	0.55	19.8	B	0.55	19.8	B	0.56	21.5	C	0.56	21.5	C
		WB	T	0.45	12.9	B	0.49	13.5	B	0.49	13.5	B	0.5	13.6	B	0.47	13.2	B
		SB	LTR	0.99	74.2	E	1.02	82	F	1.02	82	F	1.05	88.1	F	1.05	88.1	F
		SB	R	1	87.2	F	1.13	128	F	1.13	128	F	1.15	136.3	F	1.15	136.3	F
		Intersection			46.2	D		56.4	E		56.4	E		59.8	E		60.3	E
6	20th Avenue at 130th Street	EB	LTR	0.72	15.5	B	0.75	16.3	B	0.75	16.3	B	0.76	16.8	B	0.76	16.8	B
		WB	L	0.86	36.9	D	0.92	46.3	D	0.92	46.3	D	0.95	52.8	D	0.66	20.6	C
		WB	TR	0.57	12	B	0.59	12.4	B	0.59	12.4	B	0.6	12.6	B	0.6	12.6	B
		NB	LTR	0.43	18.5	B	0.45	18.7	B	0.45	18.7	B	0.45	18.8	B	0.44	18.6	B
		NB	R	0.54	20.5	C	0.56	20.9	C	0.56	20.9	C	0.57	21.1	C	0.55	20.7	C
		SB	LTR	0.39	17.5	B	0.4	17.7	B	0.4	17.7	B	0.4	17.8	B	0.5	20.2	C
		Intersection			18.5	B		20.1	C		20.1	C		21.2	C		17.1	B
7	20th Avenue at 132nd Street	EB	L	0.33	11.4	B	0.36	11.9	B	0.36	11.9	B	0.38	12.5	B	0.35	11.7	B
		EB	T	0.43	9.4	A	0.45	9.5	A	0.45	9.5	A	0.46	9.6	A	n/a	n/a	n/a
		EB	TR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.48	9.8	A
		WB	TR	0.46	9.6	A	0.47	9.8	A	0.47	9.8	A	0.48	9.8	A	n/a	n/a	n/a
		WB	LTR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.56	11.1	B
		NB	L	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.07	13.9	B
		NB	TR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.07	13.9	B
		SB	L	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.51	17.2	B
		SB	TR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.22	14.7	B
		SB	LR	0.58	18.1	B	0.59	18.5	B	0.59	18.5	B	0.6	18.7	B	n/a	n/a	n/a
		Intersection			10.9	B		11.1	B		11.1	B		11.3	B		11.5	B
8	20th Avenue at Target Driveway	EB	L	0.38	16.1	B	0.4	16.9	B	0.4	16.9	B	0.41	17.5	B	0.42	17.2	B
		EB	T	0.36	9.2	A	0.37	9.3	A	0.37	9.3	A	0.38	9.4	A	0.38	9.4	A
		WB	T	0.36	14.7	B	0.37	14.8	B	0.37	14.8	B	0.38	14.9	B	0.36	14.7	B
		WB	R	0.28	14.1	B	0.29	14.2	B	0.29	14.2	B	0.29	14.3	B	0.28	14.1	B
		SB	L	0.44	39.6	D	0.46	39.8	D	0.46	39.8	D	0.47	40	D	0.47	40	D
		SB	R	0.13	27.1	C	0.14	27.1	C	0.14	27.1	C	0.14	27.2	C	0.14	27.2	C
		Intersection			17.1	B		17.3	B		17.3	B		17.4	B		17.4	B

TABLE 6 (Continued)

PM PEAK INTERSECTION LEVEL OF SERVICE

Map ID	Intersection	Approach	Mov't	2004 Existing Roadways			2007 No Action			2007 With Phase 1 Roads			2009 With Phase 1 Roads			2009 With Phase 1 & 2 Roads		
				v/c ratio	Delay	LOS	v/c ratio	Delay	LOS	v/c ratio	Delay	LOS	v/c ratio	Delay	LOS	v/c ratio	Delay	LOS
9	28th Avenue at Ulmer Street	EB	L	0.14	11.4	B	0.15	11.5	B	0.11	10.8	B	0.11	10.9	B	0.08	10.5	B
		EB	TR	0.46	14.2	B	0.47	14.4	B	0.47	14.4	B	0.48	14.6	B	0.49	14.8	B
		WB	LTR	0.48	13.6	B	0.49	13.8	B	0.34	12.2	B	0.35	12.2	B	0.34	12.1	B
		NB	LT	0.18	11.1	B	0.18	11.1	B	0.18	11.1	B	0.19	11.1	B	0.19	11.1	B
		NB	R	0.02	9.9	A	0.02	9.9	A	0.02	9.9	A	0.02	9.9	A	0.02	9.9	A
		SB	L	0.45	14.9	B	0.47	15.2	B	0.39	13.8	B	0.4	13.9	B	0.08	10.4	B
		SB	TR	0.63	17.1	B	0.65	17.5	B	0.65	17.5	B	0.66	17.9	B	0.66	17.9	B
		Intersection			14.6	B		14.8	B		14.3	B		14.5	B		14.5	B
10	College Point Blvd at 32nd Avenue	WB	L	0.18	14.6	B	0.19	14.7	B	0.19	14.7	B	0.19	14.7	B	0.19	14.7	B
		NB	T	0.5	18.3	B	0.51	18.5	B	0.51	18.5	B	0.52	18.6	B	0.52	18.6	B
		SB	L	0.53	16	B	0.55	16.8	B	0.55	16.8	B	0.56	17.3	B	0.56	17.3	B
		SB	T	0.4	8.8	A	0.42	8.9	A	0.42	8.9	A	0.43	9	A	0.43	9	A
		Intersection			13.4	B		13.7	B		13.7	B		13.9	B		13.9	B
11	College Point Blvd at Whitestone Exwy South	EB	T	0.31	8.3	A	0.32	8.4	A	0.32	8.4	A	0.32	8.4	A	0.32	8.4	A
		WB	T	0.32	8.4	A	0.33	8.5	A	0.33	8.5	A	0.34	8.6	A	0.34	8.6	A
		SB	L	0.6	18.5	B	0.62	18.9	B	0.62	18.9	B	0.63	19.2	B	0.63	19.2	B
		SB	R	0.07	13.9	B	0.08	13.9	B	0.08	13.9	B	0.08	13.9	B	0.08	13.9	B
		Intersection			10.8	B		10.9	B		10.9	B		11	B		11	B
12	Linden Place at Whitestone Exwy North	EB	L	0.68	36.1	D	0.71	37.9	D	0.71	37.9	D	0.73	39	D	0.73	39	D
		EB	T	0.3	13.7	B	0.31	13.8	B	0.31	13.8	B	0.32	13.9	B	0.32	13.9	B
		WB	TR	0.85	46.8	D	0.88	49.7	D	0.88	49.7	D	0.9	52	D	0.88	50.2	D
		NB	LTR	0.57	22.8	C	0.59	23.1	C	0.59	23.1	C	0.6	23.3	C	0.6	23.3	C
		Intersection			27.1	C		28.1	C		28.1	C		28.7	C		28.4	C
13	Linden Place at Whitestone Exwy South	EB	TR	0.38	26.6	C	0.39	26.7	C	0.39	26.7	C	0.4	26.9	C	0.4	26.9	C
		WB	L	0.22	8.2	A	0.22	8.4	A	0.22	8.4	A	0.23	8.6	A	0.23	8.6	A
		WB	T	0.36	7.4	A	0.37	7.5	A	0.37	7.5	A	0.37	7.6	A	0.42	8	A
		SB	L	1	79.5	E	1.03	86.8	F	1.03	86.8	F	1.05	93.2	F	1.05	93.2	F
		SB	TR	0.57	34.4	C	0.59	34.8	C	0.59	34.8	C	0.6	35.1	D	0.6	35.1	D
		Intersection			33.4	C		35.1	D		35.1	D		36.7	D		36	D
14	Ulmer Street at Whitestone Exwy S/R	EB	R	0.9	45.6	D	0.92	48.9	D	0.92	48.9	D	0.94	51.6	D	0.94	51.6	D
		SB	U-turn	0.37	27.4	C	0.38	27.5	C	0.38	27.5	C	0.39	27.6	C	0.39	27.6	C
		SB	LTR	0.58	30.7	C	0.6	31	C	0.6	31	C	0.61	31.3	C	0.61	31.3	C
		Intersection			39.9	D		42.3	D		42.3	D		42.9	D		42.9	D
15	23rd Avenue at 130th Street	EB	LTR		20.5	C		22.5	C		38.4	E		42.4	E		31.2	D
		WB	LTR		12.1	B		12.6	B		33.6	D		36.7	E		29.9	D
		NB	LTR		36.7	E		44.1	E		33.4	D		36.4	E		25.5	D
		SB	LTR		35.9	E		42.9	E		101.1	F		117.3	F		33.3	D
		Intersection			31.7	D		36.9	E		56.3	F		63.7	F		30.2	D
16	25th Avenue at 130th Street and Ulmer Street	EB	L		10.5	B		10.5	B		10.4	B		10.4	B		10	B
		EB	R		16.7	B		17.1	C		16.8	C		17.3	C		15.6	C
		NB	L		32.1	D		35.5	E		35.2	E		37.9	E		32.1	D
		NB	T		121.9	F		138.4	F		26	D		27.7	D		21.2	C
		SB	T		134.2	F		151.6	F		99.5	F		110.7	F		25.5	D
		SB	R		9.7	A		9.8	A		9.6	A		9.7	A		9.5	A
		Intersection			88.1	F		99.4	F		49.8	E		54.5	F		23.5	C
**	28th Avenue at Linden Place (Two way Stop)	EB	LR		n/a	n/a		n/a	n/a		8.2	A		23.5	C		28.2	D
		EB	R		n/a	n/a		n/a	n/a		7.6	A		10.3	B		10.6	B
		WB	L		n/a	n/a		n/a	n/a		39.3	E		44.6	E		37.4	E
		WB	TR		n/a	n/a		n/a	n/a		15.8	C		16.1	C		18.1	C
		NB	L		n/a	n/a		n/a	n/a		22	C		8.2	A		8.8	A
		SB	LT		n/a	n/a		n/a	n/a		10.3	B		7.6	A		7.7	A

The study area PM peak hour occured between 5:00 PM and 6:00 PM.

The completion of the Phase II roadway is contingent on the completion of the Phase I improvements. The Phase I and Phase II improvements are projected to benefit the study area by providing an alternative north-south corridor that is anticipated to relieve the traffic congestion at the 20th Avenue and the Whitestone Expressway Service Road North and South intersections, and to reduce the traffic along 130th Street and Ulmer Street. The 20th Avenue at Service Road North and 20th Avenue at Service Road South carries the highest intersection traffic volume within the study area during the peak periods of the day.

The construction of the Phase I and II improvements:

- Is not expected to attract additional traffic to the study area
- Will provide study area traffic an alternative route between the areas south of Linden Place and areas adjacent to the College Point Retail Center that avoids the congestion at the 20th Avenue intersection with the Whitestone Service Road North and the Whitestone Expressway Service Road South.
- Is expected to cause a reduction to the following:
    - Traffic turning left (westbound) from the northbound Whitestone Expressway Service Road at 20th Avenue;
    - Westbound through traffic at 20th Street and Whitestone Service Road south; and
    - Through traffic along 130th Avenue and Ulmer Street.

XVI. AIR QUALITY

The air quality impact assessment for this project was performed in accordance with New York City's *CEQR Technical Manual.* The air quality characteristics for the future no action condition and the future action condition are identified and discussed within the context of the Clean Air Act of 1990 requirements and applicable air quality standards.

Introduction

Primary Pollutants

Six pollutants have been identified by the U.S. Environmental Protection Agency (USEPA) as being of concern nationwide: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$) sulfur dioxide (SO_2), and lead (Pb). Accordingly, USEPA has established National Ambient Air Quality Standards (NAAQS) for these six principal pollutants, which are called "criteria" pollutants. Of these criteria pollutants, the primary pollutant emissions from automobiles are CO, hydrocarbon (HC), and nitrogen oxides (NO_x). Levels of NO_X are influenced by both mobile and stationary sources, while levels of inhalable particulates (PM_{10} and $PM_{2.5}$) and SO_2 are directly associated with stationary sources. A summary of the characteristics of the pollutants follows:

- *Carbon Monoxide* – CO is a colorless and odorless gas, which is associated with the incomplete combustion of vehicle fuel. CO is very reactive and its concentrations are limited to relatively short distances near crowded intersections and along slow moving, heavily traveled roadways. Under the Clean Air Act of 1990, each state is committed to offset any CO emissions resulting from Vehicle Miles Traveled (VMT) growth in a non-attainment area.[1]

- *Nitrogen Oxides* – NO_x are produced when fuels are burned at high temperatures. Although there are a number of nitrogen oxides, only nitric oxide (NO) and nitrogen dioxide (NO_2) are released by motor vehicles into the atmosphere in appreciable quantities. Together, nitrogen oxides are often referred to as NO_X. Nitrogen oxides are also of particular concern due to their role in the formulation of photochemical oxidants, commonly known as ozone.

- *Lead* - Lead emissions are associated with industrial uses and motor vehicles that use gasoline containing lead additives. Most U.S. vehicles available since 1975 and all after 1980 are designed to use unleaded fuel. As newer models have replaced these older vehicles, lead emissions have decreased.

- *Sulfur Dioxide* - SO_2 emissions are primarily associated with the combustion of sulfur containing fuels such as oil and coal. The major sources of this emission are fossil fuel fired power plants and oil refineries. No significant quantities are emitted from mobile sources.

[1] Under the Clean Air Act, a "non-attainment area" is a locality where air pollution levels persistently exceed the NAAQS

- *Coarse Particulate Matter* (PM_{10}) - Particulate matter is emitted into the atmosphere from a variety of sources including industrial facilities, power plants, and construction activity. Gasoline-powered vehicles do not produce any measurable quantities of particulate emissions. Diesel-powered vehicles, especially heavy trucks and buses, emit particulates. Inhalable particulate concentrations may, therefore, be locally elevated near roadways with high volumes of heavy diesel-powered vehicles. The primary concern is with particulates that are less than 10 microns (mm, 1 micron equals 0.000001 meter or one one-millionth of a meter) in diameter, which can affect human respiratory functions.

- *Fine Particulate Matter* ($PM_{2.5}$) - Recent scientific developments have indicated a connection between respiratory problems, such as asthma and bronchitis, and fine particulate particles that have an aerodynamic diameter of 2.5 microns or smaller. Recognizing the adverse health risk associated with fine particulate matter, in 1997, USEPA promulgated the NAAQS for $PM_{2.5}$. $PM_{2.5}$ emissions are primarily from stationary and mobile sources that burn fossil fuels.

- *Ozone* - Ground level ozone is formed through a series of chemical reactions, which occur in the presence of sunlight. Elevated levels of ozone typically occur miles from the source since the series of chemical reactions is slow and pollutants are diffused downwind.

Air Quality Standards

National Ambient Air Quality Standards (NAAQS) and New York State Standards have been established for the major air pollutants described above (refer to **Table 7**). The primary standards are intended to prevent adverse health effects while the secondary standards are intended to further protect the public welfare by minimizing material damage and maximizing visibility.

Table 7: National and New York State Ambient Air Quality Standards

Pollutant	Averaging Period	NY State Standards	NAAQS	
			Primary	Secondary
Carbon Monoxide (CO)	1-hour	35 ppm	35 ppm	35 ppm
	8-hour	9 ppm	9 ppm	9 ppm
Ozone (O_3)	1-hour	0.12 ppm	0.12 ppm	0.12 ppm
	8-hour	0.08 ppm	0.08 ppm	0.08 ppm
Nitrogen Dioxide	Annual	0.05 ppm	0.05 ppm	0.05 ppm
Lead (Pb)*	3-month	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$
Coarse Inhalable Particulates (PM_{10})	24-hour	150 $\mu g/m^3$	150$\mu g/m^3$	150 $\mu g/m^3$
	Annual	50 $\mu g/m^3$	50 $\mu g/m^3$	50 $\mu g/m^3$
Fine Inhalable Particulates ($PM_{2.5}$)	24-hour	65 $\mu g/m^3$	65 $\mu g/m^3$	65 $\mu g/m^3$
	Annual	15 $\mu g/m^3$	15 $\mu g/m^3$	15 $\mu g/m^3$
Sulfur Dioxide (SO_2)	3-hour	----	----	0.5 ppm
	24-hour	0.14 ppm	0.14 ppm	----
	Annual	0.03 ppm	0.03 ppm	----

State Implementation Plan (SIP)

The Clean Air Act of 1990 requires each state to submit a State Implementation Plan (SIP) to the U.S. Environmental Protection Agency (USEPA) for attainment of NAAQS. The SIP describes how the state will attain and maintain air quality standards in non-attainment areas, and must be approved by the U.S. EPA. Projects that do not result in violation of the NAAQS and conform to the attainment plans in the SIP are considered to be consistent with the SIP. In November 1991, the entire New York Metropolitan Area was officially designated and classified as a "high" moderate CO nonattainment area by the USEPA for violating the 8-hour NAAQS. In May 2002, as requested by the NYSDEC due to the successful execution of the revised SIP, the EPA redesignated the New York City portion of the New York Metropolitan Area as in attainment of the NAAQS for carbon monoxide.

De Minimis Criteria

In addition to the NAAQS, the City of New York has developed *de minimis* criteria to assess the significance of the project-related impacts on local air quality levels. These criteria set the minimum range in CO concentrations for mobile sources (roadway vehicles) that indicates a significant air quality impact. Significant effects are defined as: (1) an increase in 0.5 parts per million (ppm) or greater for the maximum eight-hour concentration, when the baseline (or future no action condition) concentration is equal to or between 8.0 ppm and 8.5 ppm; and (2) an increase in one-half or more of the difference between the baseline concentrations and the eight-hour standard when concentrations are 8.0 ppm or below.

Methodology

A screening analysis was performed for the project study area to determine the locations of greatest potential air quality impact resulting from the proposed project. Criteria for screening future mobile source emissions are based on the amount of traffic induced or diverted by the project. CEQR guidelines stipulate that air quality impacts from mobile source emissions must only be assessed for intersections in which the proposed project would add 100 or more induced vehicular trips. The intersection of Linden Place and 28th Avenue is the only intersection expected to have an increase of 100 or more vehicular trips (Refer to Traffic Study Figures 13 and 14 located in Appendix B).

Predicting CO Concentrations

The prediction of vehicle-generated CO concentrations in an urban environment is dependent upon environmental and meteorological conditions, traffic characteristics and the physical configuration of each affected intersection in the study area. Air pollutant dispersion models commonly used in New York City simulate how meteorological, physical, and environmental characteristics of the project area affect pollutant concentrations. Most of these models are conservative and tend to over-predict pollutant concentrations.

This CO analysis employs models and techniques that are commonly used for evaluating air quality-related impacts for projects throughout New York City and New York State. The

methodology for analysis employed for this project was approved by the NYCDEP, and assumptions were made incorporating conservative parameters relating to meteorological conditions, traffic, background concentrations and distance to receptors. The combination of these parameters results in a conservative estimate of CO emissions generated by the proposed project.

Dispersion Model

The prediction of CO was conducted using the CAL3QHC (Version 2.0) air quality dispersion model (EPA-454/R-92-006). This model is currently recommended in the USEPA Guidelines for Modeling Carbon Monoxide from Roadway Intersection (EPA-454/R-92-005) for estimating CO levels near congested intersections and along heavily traveled roadways. This model estimates air pollutant concentrations downwind of a roadway and assumes that the rate at which pollutants disperse is a function of wind speed, direction, and ambient temperatures.

Different emission rates occur when vehicles are stopped (idling), accelerating, decelerating, and traveling at different speeds. CAL3QHC includes emissions contributions from free flow and idling vehicles. CAL3QHC estimates the average number of vehicles that would queue during the red phase of an intersection based on the characteristics of both the intersection and the traffic. Contributions from idling emissions contribute significantly to the CO concentration at the intersection. CAL3QHC is a conservative model utilized for screening purposes.

Worst-Case Meteorological Conditions

Air quality at intersections from vehicular-related sources are influenced by such factors as wind direction, wind speed, and atmospheric stability. Wind speed and wind direction influence not only the absolute pollutant concentrations that would affect an area but also the specific locations that would be affected in the microscale analysis. The pollutant concentration predicted at any given location is inversely related to wind speed; therefore, lower wind speeds result in higher estimated CO concentrations.

The wind direction would determine the receptor locations that would be affected by the estimated concentrations. For this analysis, the wind direction towards the receptors evaluated was assumed to occur for the averaging period of one hour. A wind angle search was conducted, in one-degree increments, to determine the worst-case wind direction resulting in the maximum concentrations.

To simulate worst-case pollutant dispersion and CO levels at the receptor sites analyzed, wind speeds reflecting stable meteorological conditions were used for the microscale conditions. The worst-case wind speed was assumed to be one meter per second for both the peak one- and eight-hour predictions. A persistence factor of 0.70 and Stability Class D (i.e., neutral) was used in model predictions for the selected roadway receptors proximate to the project site. Persistence factors were utilized to estimate the eight-hour CO levels based on the peak hour predictions, to account for the variability of traffic and wind direction over the eight-hour period.

Atmospheric stability is a measure of atmospheric turbulence. If the atmosphere is stable, little vertical mixing of pollutants at varying altitudes occurs, resulting in the increase of pollutant levels at ground level. Under unstable atmospheric conditions, vertical mixing of pollutants can occur and as a result ground level concentrations of pollutants actually decrease. Therefore, predictions were conducted assuming neutral atmospheric conditions.

The level of pollutant CO emissions from automobile engines reflected in the USEPA MOBILE6.2 emission factor model is higher at lower ambient temperatures. Accordingly, for conservatism in the air quality impact analysis, a mean temperature of 43 degrees Fahrenheit was used to project vehicle-related emissions.

Vehicular Emissions

To predict ambient air quality concentrations at selected receptor sites, emission levels from vehicle exhaust systems were estimated using the latest version of the USEPA emission factor model, MOBILE6.2. Vehicular emissions are greatly affected by vehicle speed, thermal state (i.e., engine operating conditions), ambient temperature, vehicle age, and mileage distribution of the fleet. Emission estimates were prepared for the 28 MOBILE6.2 classes of motor vehicles listed in **Table 8**.

The characteristics of the vehicle fleet are an essential input to MOBILE6.2. Inputs such as mile accumulation rate, vehicle age, vehicle mix, and percentage of diesel vehicles all play a large part in determining the emission factor for an area. Data for all of these was taken from 2004 NYMTC Air Quality Conformity data.

Local regulations in regards to fuel programs, inspection and maintenance programs, and regional fuel characteristics are also important factors. Parameters for these programs were also taken from 2004 NYMTC Air Quality Conformity data.

Table 8: MOBILE6.2 Motor Vehicle Classifications

Number	Abbreviation	Description
1	LDGV	Light-Duty Gasoline Vehicles (Passenger Cars)
2	LDGT1	Light-Duty Gasoline Trucks 1 (0-6,000 lbs. GVWR, 0-3,750 lbs. LVW)
3	LDGT2	Light-Duty Gasoline Trucks 2 (0-6,000 lbs. GVWR, 3,751-5,750 lbs. LVW)
4	LDGT3	Light-Duty Gasoline Trucks 3 (6,001-8,500 lbs. GVWR, 0-5,750 lbs. ALVW)
5	LDGT4	Light-Duty Gasoline Trucks 4 (6,001-8,500 lbs. GVWR, greater than 5,751 lbs. ALVW)
6	HDGV2b	Class 2b Heavy-Duty Gasoline Vehicles (8,501-10,000 lbs. GVWR)
7	HDGV3	Class 3 Heavy-Duty Gasoline Vehicles (10,001-14,000 lbs. GVWR)
8	HDGV4	Class 4 Heavy-Duty Gasoline Vehicles (14,001-16,000 lbs. GVWR)
9	HDGV5	Class 5 Heavy-Duty Gasoline Vehicles (16,001-19,500 lbs. GVWR)
10	HDGV6	Class 6 Heavy-Duty Gasoline Vehicles (19,501-26,000 lbs. GVWR)
11	HDGV7	Class 7 Heavy-Duty Gasoline Vehicles (26,001-33,000 lbs. GVWR)
12	HDGV8a	Class 8a Heavy-Duty Gasoline Vehicles (33,001-60,000 lbs. GVWR)
13	HDGV8b	Class 8b Heavy-Duty Gasoline Vehicles (>60,000 lbs. GVWR)
14	LDDV	Light-Duty Diesel Vehicles (Passenger Cars)
15	LDDT12	Light-Duty Diesel Trucks 1and 2 (0-6,000 lbs. GVWR)
16	HDDV2b	Class 2b Heavy-Duty Diesel Vehicles (8,501-10,000 lbs. GVWR)
17	HDDV3	Class 3 Heavy-Duty Diesel Vehicles (10,001-14,000 lbs. GVWR)
18	HDDV4	Class 4 Heavy-Duty Diesel Vehicles (14,001-16,000 lbs. GVWR)
19	HDDV5	Class 5 Heavy-Duty Diesel Vehicles (16,001-19,500 lbs. GVWR)
20	HDDV6	Class 6 Heavy-Duty Diesel Vehicles (19,501-26,000 lbs. GVWR)
21	HDDV7	Class 7 Heavy-Duty Diesel Vehicles (26,001-33,000 lbs. GVWR)
22	HDDV8a	Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 lbs. GVWR)
23	HDDV8b	Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs. GVWR)
24	MC	Motorcycles (Gasoline)
25	HDGB	Gasoline Buses (School, Transit and Urban)
26	HDDBT	Diesel Transit and Urban Buses
27	HDDBS	Diesel School Buses
28	LDDT34	Light-Duty Diesel Trucks 3 and 4 (6,001-8,500 lbs. GVWR)

Predicting PM_{10} and $PM_{2.5}$ Concentrations

The prediction of PM concentrations is similar to those employed for the CO analysis. USEPA-developed models and methodologies approved by NYCDEP were used in this study. Conservative parameters relating to meteorological conditions, traffic, background concentrations and distance to receptors were utilized in the modeling.

Dispersion Model

PM_{10} and $PM_{2.5}$ modeling of on-street vehicular emissions were conducted with CAL3QHCR. CAL3QHCR is an enhanced version of CAL3QHC that utilizes the dispersion algorithm of CAL3QHC, and can process up to a year of meteorological data. Five separate years of meteorological data are processed with the highest concentration reported.

The analysis used meteorological data collected from LaGuardia Airport and was from the most recent five years available, 1999 to 2003.

To predict ambient particulate matter concentrations at selected receptor sites, emissions levels from vehicular exhaust systems were estimated using the particulate matter emission portion of USEPA's MOBILE6.2 emission factor model.

Traffic Data

Traffic volumes were derived through field counts conducted as part of the project's traffic analysis. Running speeds were taken from the 24-hour speed profiles produced for NYMTC's 2004 Air Quality Conformity analysis. The PM peak period has the highest volumes. Traffic data for this hour was analyzed for the 1-hour analysis. The peak 8-hour concentrations were determined by applying a persistence factor of 0.70 to the maximum predicted 1-hour concentrations. This persistence factor takes into account that over 8 hours, vehicle volumes would fluctuate downward from the peak, speeds may vary, and wind directions and speeds would change somewhat, as compared with the conservative assumptions used for the single highest hour.

Background Concentrations

Background concentrations are those pollutant concentrations not directly accounted for through the modeling analysis (the modeling analysis directly accounts for vehicle-generated emissions on the streets immediately adjacent to the receptor location). Background concentrations must be added to the modeled result to account for pollutants emitted from existing sources, in the vicinity, independent of the project. A value of 2.0 ppm (parts per million) was added to the eight-hour CO results for the build year of 2009. A value of 50 $\mu g/m^3$ was added to the PM_{10} for the 24-hour analysis and 20 $\mu g/m^3$ was added for the annual analysis. These values were provided by NYCDEP, based on New York State Department of Environmental Conservation (DEC) methodology, data for Queens was used for the CO background, and data for Brooklyn was used for the PM_{10}, since Queens County data was not available. To be conservative, 2004 maximum values were used as the background concentration for $PM_{2.5}$, 48 $\mu g/m^3$ for the 24-hour analysis and 13 $\mu g/m^3$ for the annual analysis.

Receptor Locations

The receptor locations analyzed for this study were selected based on where maximum changes in vehicular activity would be expected to occur with the implementation of the proposed project. Receptors were placed at the center of the sidewalks and adjacent to queue lanes. Queue lanes are roadways where vehicles are backed up, usually at a traffic signal. Emissions from idling vehicles may contribute to higher concentration along queue lanes than at intersection locations.

Existing Conditions

The NYSDEC operates a network of monitoring stations throughout the state to measure ambient air quality with the results published on an annual basis. **Table 9** shows the 2004 Air Quality conditions.

Table 9: Existing Air Quality Conditions

Pollutant	Monitoring Station	2004 Maximum Values		NY State Standards	NAAQS	
					Primary	Secondary
Carbon Monoxide	Gravett Rd, Queens	1-hour	3.3 ppm	35 ppm	35 ppm	35 ppm
		8-hour	2.4 ppm	9 ppm	9 ppm	9 ppm
Ozone	Gravett Rd, Queens	1-hour	0.14 ppm	0.12 ppm	0.12 ppm	0.12 ppm
		8-hour	0.08 ppm	0.08 ppm	0.08 ppm	0.08 ppm
Nitrogen Dioxide	Gravett Rd, Queens	12-month	0.025 ppm	0.05 ppm	0.05 ppm	0.05 ppm
Lead (Pb)*	Leonard St, Brooklyn	3-month	0.04 µg/m³	1.5 µg/m³	1.5 µg/m³	1.5 µg/m³
Coarse Particulates (PM_{10})	Leonard St, Brooklyn	24-hour	47 µg/m³	150 µg/m³	150 µg/m³	150 µg/m³
		Annual	18 µg/m³	50 µg/m³	50 µg/m³	50 µg/m³
Fine Particulates ($PM_{2.5}$)	Gravett Rd, Queens	24-hour	48 µg/m³	----	65 µg/m³	65 µg/m³
		Annual	13 µg/m³	----	15 µg/m³	15 µg/m³
Sulfur Dioxide (SO_2)	Gravett Rd, Queens	3-hour	0.059 ppm	----	----	0.5 ppm
		24-hour	0.029 ppm	0.14 ppm	0.14 ppm	----
		Annual	0.006 ppm	0.03 ppm	0.03 ppm	----

Source: New York State Department of Environmental Conservation, 2005

No traffic currently exists at the intersection of Linden Place and 28th Avenue, since this intersection is proposed for construction under the build condition. Therefore, no analysis has been prepared for this condition.

No Action Condition

Under the no action condition, the intersection would not be in place and no traffic would occur at the intersection of Linden Place and 28th Avenue. Therefore, no analysis has been prepared for this condition.

Build Condition

Carbon Monoxide

Carbon monoxide (CO) concentrations at the intersection of Linden Place and 28th Avenue were predicted for the future with the project in 2009. Receptors were placed at multiple locations at the intersections that were selected during the screening procedure, in accordance with USEPA

modeling guidelines. Carbon monoxide concentrations were calculated for each receptor location for the PM peak period. **Table 10** shows the maximum predicted existing carbon monoxide 8-hour concentrations. As shown, the maximum predicted 8-hour carbon monoxide concentrations are below the NAAQS.

Table 10: Predicted Future Action Air Quality Conditions

Pollutant	Analysis	Standards	Background	Future Action Concentration	Increase over Background
Carbon Monoxide	8-hour	9 ppm	2.0 ppm	2.1 ppm	0.1 ppm
Coarse Particulates (PM_{10})	24-hour	150 $\mu g/m^3$	50 $\mu g/m^3$	50.3 $\mu g/m^3$	0.3 $\mu g/m^3$
	Annual	50 $\mu g/m^3$	20 $\mu g/m^3$	20.1 $\mu g/m^3$	0.1 $\mu g/m^3$
Fine Particulates ($PM_{2.5}$)	24-hour	65 $\mu g/m^3$	48 $\mu g/m^3$	48.2 $\mu g/m^3$	0.2 $\mu g/m^3$
	Annual	15 $\mu g/m^3$	13 $\mu g/m^3$	13.1 $\mu g/m^3$	0.1 $\mu g/m^3$

Source: New York State Department of Environmental Conservation, 2005

In addition, the project-induced increase in CO at all locations was lower than the *CEQR Technical Manual* allowable increment of one-half the difference between the 2004 baseline concentration and the NAAQS of 9 ppm. Therefore, no significant impacts would be expected.

Particulate Matter

PM_{10} and $PM_{2.5}$ concentrations were predicted for the future action condition at the same intersection analyzed for carbon monoxide. The most recent five years (1999-2003) of meteorological data from LaGuardia Airport was used as input into the CAL3QHCR model. The highest projected values are reported in **Table 10** above. The modeled results demonstrate that no violation of the NAAQS would occur for either PM_{10} or $PM_{2.5}$.

In the future with the project, overall traffic flow within the study area will be improved and no significant adverse air quality impacts are expected. The proposed project will not result in any significant adverse impacts to air quality and no mitigation is required.

XVII. NOISE

Existing Conditions

The noise impact assessment for this project was performed in accordance with New York City's *CEQR Technical Manual.* An initial screening analysis was performed to identify whether a potential exists for the proposed project to generate a significant noise impact at a receptor, or be significantly affected by high ambient noise levels. For vehicular noise, if the passenger car equivalent (PCE) values are at least doubled between the No Action Condition and the Build Condition along any affected roadway link, then a detailed noise analysis must be performed. A doubling of PCE's would increase sound levels by 3 dBA. Consequently, if a doubling of PCE's does not occur, there would be no potential for significant impacts, and further analysis would not be required.

No Action Condition

The College Point Corporate Park and surrounding residential communities are subject to increased vehicle congestion and gridlock from thriving manufacturers and large stores in the area. Without the proposed roadway improvements, vehicles will continue to use the existing street network. As noted in the traffic section, background traffic is assumed to increase at approximately 1% per year. Noise associated with this traffic would not be significant.

Build Condition

As illustrated in Figure 10, noise sensitive receptors within the study area were identified, and the traffic anticipated to pass each receptor was calculated for the no action and build conditions to determine the expected increase in PCE values. Table 9 shows the PCE values for both the AM and PM peak hours for the No Action and Build Conditions for five locations within the study area.

The redevelopment of Linden Place will have negligible effects on the water quality and wildlife in the area. The increased impervious surface will increase surface water flow to the wetland area. However, the improved drainage associated with the redevelopment will decrease the amount of standing water and improve the overall flow of water. Increased traffic through the area will disrupt wildlife along the edges of the wetland area. However, increased scrub/shrub and herbaceous plantings along the edges of the roadway will provide increased cover and will help to buffer the wetland habitat from the roadway. Noise impacts to the wildlife area from the redeveloped road will affect the southwest edge of the site, but the overall impacts will be negligible due to the existing ambient noise in the area (e.g. off of the Whitestone Expressway, under the flight path for LaGuardia Airport).

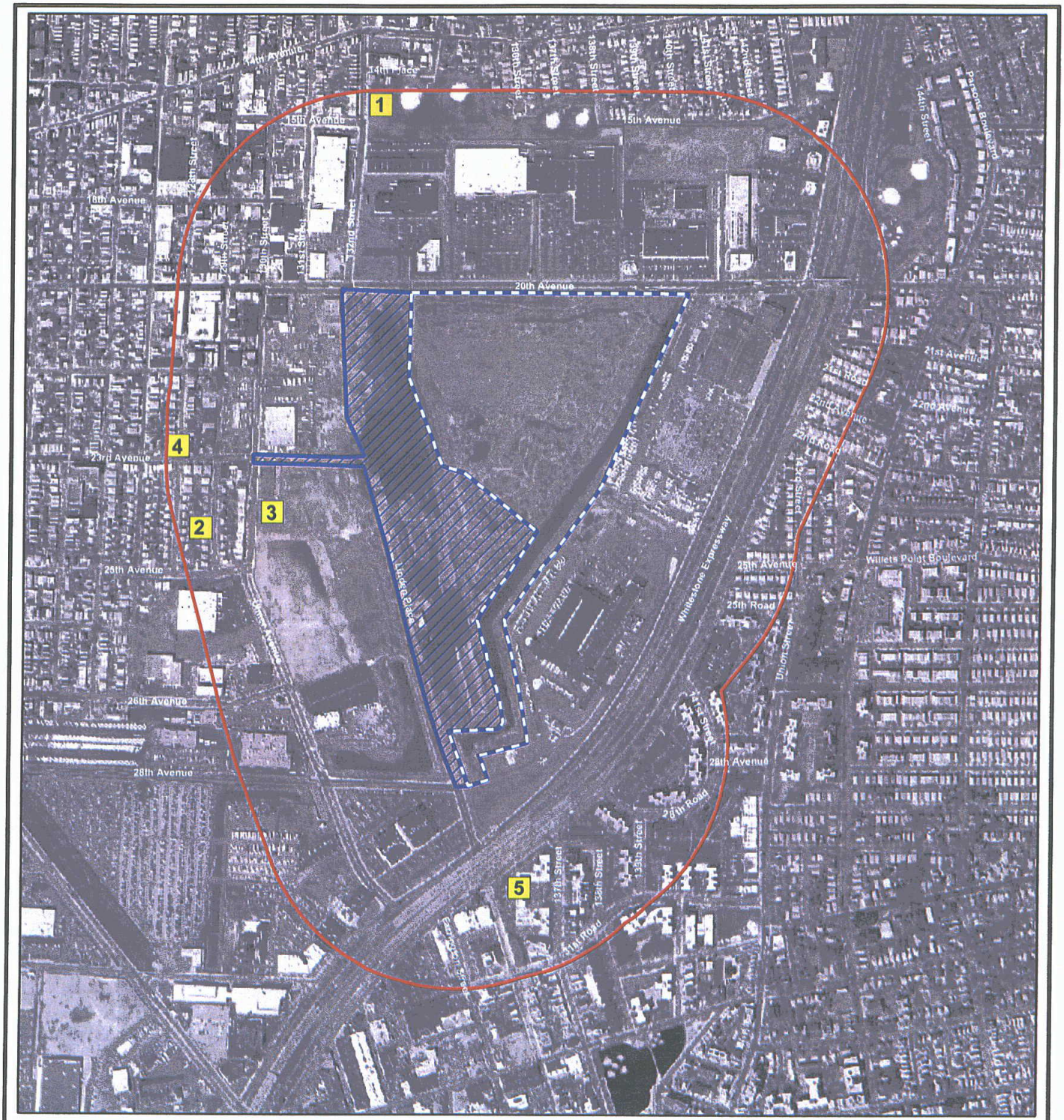

FIGURE 10 - NOISE SENSITIVE RECEPTORS

Former Flushing Airport Wetlands Development Project

New York City Economic Development Corporation

The development of 132nd Street will introduce increased impervious surface and also increase traffic in an isolated area. However, at the current time, the area is subsiding and eroding, and is vegetated with invasive vegetative species. The development of 132nd Street will stabilize the area, and allow the undeveloped portions of the area to be connected with the larger wetland area and be planted with native wetland vegetative species. Noise impacts to the wildlife area from the newly developed road will affect the northwest edge of the site, but the overall impacts will be negligible due to the existing ambient noise in the area (e.g. off of the Whitestone Expressway and 20th Avenue, under the flight path for LaGuardia Airport).

Table 11: Noise Sensitive Receptors and Associated PCE Values

Noise Sensitive Receptor and Reference Number	No Action AM Peak Period PCEs	Phase II Build AM Peak Period PCEs	PCE Increase	% increase in PCEs	No Action PM Peak Period PCEs	Phase II Build PM Peak Period PCEs	PCE Increase	% increase in PCEs
1. Park and residences on 132nd St.	604	621	17	3%	607	625	18	3%
2. Residences on Ulmer Ave.	984	686	-298	-30%	1346	999	-347	-26%
3. Park between Ulmer Ave. and Linden Pl.	984	1047	63	6%	1346	1424	78	6%
4. Residences on 23rd Ave.	283	287	4	1%	384	392	8	2%
5. Residences on Linden Pl. (south of Expressway)	894	912	18	2%	853	870	17	2%

Source: Edwards and Kelcey, 2004, Traffic Study, Figures 5, 6, 15, and 16 located in Appendix B.

Additionally, new traffic would be introduced on Linden Place between 28th Avenue and 23rd Avenue at the end of Phase I construction, and on 130th Street between Linden Place and 23rd Avenue and 20th Avenue at the end of Phase II construction. However, there are no sensitive receptors along these roadway segments and no noise impact screening analyses were performed at these locations.

As shown in **Table 11**, the greatest increase in PCEs with Phase II improvements would be 6%, at the park located between Ulmer Avenue and Linden Place. Since this would be significantly less than the 100% increase threshold described above, the project would not have the potential for a significant noise impact, and according to Section 200 of Chapter 3R of the CEQR Technical Manual, a detailed noise analysis is not required.

XVIII. PUBLIC HEALTH

Existing Conditions

Public health involves the activities that society undertakes to create and maintain conditions in which people can be healthy. A public health assessment is required pursuant to CEQR to determine the potential for the project to impact vehicular traffic patterns, increase exposure to contaminants, introduce contaminants to the water supply that are a result of historic spills, implement poor solid waste management practices, impact sensitive receptors from noise and odors or for the project to exceed local, state or federal standards.

This chapter addresses the potential for adverse public health impacts from the proposed action. As mentioned in the beginning of this document, the environmental review requires agencies to disclose the potential for significant adverse environmental impacts, if any, of a proposed action and examine, to an appropriate extent, how these impacts can be avoided or minimized. Issues to be considered when determining whether an impact would be considered "significant" to public health include the likelihood of occurrence, the time frame, seriousness of the potential health effect, duration, the number of people affected and reversibility of potential impacts.

The following accepted guidelines were utilized in this assessment, to determine impacts to the public health, which are discussed in detail in the Hazardous Materials, Air Quality and Noise sections of this document.

- USEPA National Ambient Air Quality Standards (NAAQS) promulgated under the Clean Air Act.
- Agency for Toxic Substances and Disease Registry (ATSDR) - Minimal Risk Levels (MRL).
- USEPA - Reference Concentration Levels in Air.
- NYSDEC Air Annual Guidance Criteria/Short-term guidance Criteria - (AGC/SGC).

Build Condition

As discussed in previous chapters, the proposed Project will not have significant impacts on air quality, will not contaminate the drinking water supply, and will not utilize unsanitary solid waste management practices. With the development of testing and removal protocols, the implementation of the approved construction health and safety plan (HASP), the proper removal of potential sources of contamination from the project site and upland development area, and the covering of excavated soils that will be reused on site with two feet of clean fill; significant public health impacts are not expected with respect to hazardous materials. For further discussion of fill materials, refer to the Hazardous Materials section.

XIX. NEIGHBORHOOD CHARACTER

Neighborhood character is typically considered to be the sum of all of the different elements that give neighborhoods their distinct "personality." The neighborhood character section of this document describes how the cumulative effects of other environmental characteristics including land use, socioeconomics, urban design, visual quality, traffic, noise, etc. combine to alter the context and nature of a neighborhood. The following section considers the cumulative effects of these elements contributing to the neighborhood character of the study area.

Existing Conditions

The 88.1-acre project site and upland development area are located south of 20th Avenue, west and north of Mill Creek, and east of Linden Place. The site is located within Queens Community District 7, which spans a 12.7 square-mile area and supports a population of 242,952 (2000 Census). Neighborhoods in Community District 7 include College Point, Whitestone, Clearview and Flushing.

The project site is comprised of the former Flushing Airport, now vacant. The site features two paved runways and taxiways, three hangars and an outbuilding, all partially submerged. The site also includes a portion of 23rd Avenue, an existing city street, and a currently unimproved paper road located between 20th Avenue and 23rd Avenue. The upland development area generally consists of overgrown vacant land with 2 small wetland areas totaling approximately 2 acres and is dominated by common reed (Phragmites australis). The proximity of the site to the stormwater drainage structure has resulted in fluctuating levels of open water based on rainfall amounts.

The ¼ mile study area is generally bound by 14th Avenue to the north, 31st Avenue to the south, 125th Street to the west and the Whitestone Expressway Service Road to the east. The majority of the study area is zoned M1-1, Manufacturing. There are small pockets of residential zoning, both single and multi-family districts, at the edges of the study area.

The College Point Corporate Park surrounds and includes the project site and upland development area and contains office space, distribution facilities and retail uses. Major retailers at the park include Babies R Us, Target, Old Navy, Modell's, McDonald's, TJMaxx, Staples, Waldbaums, BJ's Wholesale Club, Starbucks, and Circuit City. Industrial uses include warehouse and distribution facilities, utilities, auto-related uses, and mixed commercial and industrial operations.

The United States Postal Service facility is located on the southwest corner of the Whitestone Expressway Service Road South and 20th Avenue. The New York Times printing and distribution facility is located directly south of the postal service facility and extends to the intersection of the Whitestone Expressway Service Road South and Linden Place. Uses along the northbound Whitestone Expressway Service Road are a mixture of single-family homes and low-rise apartment complexes, interspersed with community facilities.

West of the project site on 130th Street is the College Point Sports Association facility, a 25.39 acre park containing several baseball fields. Land uses west of 130th Street are mixed and consist of residential, industrial and manufacturing uses.

The study area is not heavily populated, with 32,324 residents living within ¼ mile of the project site. This represents 1.4% of the population of Queens County, and 0.4% of the population of New York City. The population in the study area grew 11.4% between 1990 and 2000. The median household income exceeds that of Queens County and New York City, and 0.9% of the households currently receive public assistance.

The character of the Former Flushing Airport Wetlands Development Project study area can be summarized as a varied and largely developed urban place with a range of activities and uses, all of which are generally desirable and common for the mature urban settlement.

No Action Condition

In the future no action condition, it is assumed that no improvements will occur to the former Flushing Airport property. The dilapidated former runway pavement area will continue to lie within the former wetland area.

Under the no action condition, neighborhood character would not be significantly different from existing conditions. The proposed development on Petracca Place is consistent with the character of the study area and will not significantly change the character of the area.

Build Condition

No adverse impacts to neighborhood character are anticipated as a result of the proposed Project. The proposed action will not result in substantial direct changes to a visual feature, will not impact historic resources, and will not substantially impact socioeconomic conditions. The dilapidated remains of the former airport will be removed from the site, thus improving the quality of the land use. The size, quality, and functionality of the wetland will be substantially upgraded. Overall traffic conditions will improve, and there will be no deterioration in noise or mobile source emissions.

XX. HAZARDOUS MATERIALS

Existing Conditions

This chapter summarizes site inspections conducted in 1994, 1995 and 2003, as well as a 2004 Workplan for the disposal of contaminated soils that has been accepted by DEC. A portion of the following information has been excerpted from the Hazardous Materials Section of the *Former Flushing Airport Wetland Mitigation Report*, prepared by the Louis Berger Group. In addition, several reports from 1999 and 2000 are summarized that concern underground storage tanks previously located on the former Flushing Airport site.

Summary of 1994 Site Investigation

In 1994, a subsurface investigation of the project site was performed in three phases by EEA Inc. The initial phase, conducted in June 1994, consisted of the analysis of two test pits, one at the southern end of the project site and a second test pit at the approximate center of the project site. The results indicated the presence of petroleum products in the soils and/or the groundwater at the second test location, located at the approximate mid-point of the airstrip.

Based on the results of this initial phase, NYSDEC approved a subsequent investigation to determine the nature and extent of the petroleum contamination. In August 1994, a total of six test borings were taken radially at a distance of 25 feet around the second test location and analyzed for total petroleum hydrocarbons. The results showed that petroleum contamination was present in the subsurface, but localized within the vicinity of the test location as no discernable plume was found.

As an origin for the contamination was yet to be determined, a more detailed and comprehensive investigation was needed to establish the extent and possible source of petroleum products. NYSDEC approved the final phase of the investigation, a more extensive examination of the subsurface of the site consisting of 37 soil borings located on existing paved areas and 6 groundwater monitoring wells. The final phase was completed in October 1994. The results were as follows:

- Low or non-detectable concentrations of VOCs were present in all soil samples collected, with the exception of samples collected from two boring locations.
- Elevated concentrations of certain SVOCs were present across the site, including polycyclic aromatic hydrocarbons (PAHs) such as chrysene, benzo(a)pyrene and benz(a)anthracene). Higher concentrations existed in samples collected from five soil borings.
- Elevated concentrations of total petroleum hydrocarbons (TPH) (up to 18 parts per million) were present in selected soil samples.
- Elevated concentrations of TPH, VOCs and PAHs were present in selected groundwater samples.

- The majority of petroleum contamination at one location consisted of lubricating oil with lower concentrations of gasoline and gasoline additives, as well as the presence of lead at elevated concentrations.

- Concentrations of arsenic and chromium at one location exceeded Technical and Administrative Guidance Memorandum (TAGM) soil cleanup guidelines.

The summary of findings of the 1994 investigation report stated the following:

- The origin of the petroleum product contamination appeared to be from the materials previously used as fill on the site. Neither the soil borings nor the monitoring wells established any recognizable pattern of petroleum contamination.

- The majority of contamination was in the form of SVOCs, most likely derived from coal gasification and combustion operations, as the highest concentrations of these compounds coincided with areas of the most extensive coal cinder and ash fill.

- The presence of the SVOCs in the groundwater was likely from suspended sediments in the samples, rather than any dissolved fractions.

- There is no evidence that indicates the coal ash constituents are moving off-site in the groundwater.

Summary of 1995 Site Investigation

Based on the findings of the 1994 site investigation, NYSDEC determined that an additional investigation should be undertaken at the site. The 1995 investigation entailed a comparison study of metals in the subsurface soils of paved versus unpaved areas within the former airport. Testing consisted of 22 soil samples in unpaved, paved, and isolated wetland areas. In addition, the general stratigraphy of the site was established.

The ten (10) soil samples collected from unpaved areas showed a wide range of total metal concentrations, including the following:

- Lead and zinc were in relatively elevated concentrations in many samples;
- Mercury exceeded TAGM standards in a few samples; and
- Toxicity characteristic leaching procedure (TCLP) testing showed one boring location to have a lead concentration above the regulatory limit.

Soil samples collected from paved areas also showed a wide range of total metal concentrations, including the following:

- Lead and zinc were in relatively high concentrations in many samples;
- Mercury exceeded TAGM standards in two samples; and
- TCLP testing did not show any samples exceeding regulatory limits.

The paved areas located on site (former runways, taxiways, and other paved areas) contain an asphalt layer approximately four- to six-inches thick, underlain by a thin layer of sub-base gravel. The top six inches of the unpaved areas consisted of a vegetative root zone, underlain in some areas by a shallow three- to six-inch deep, poorly developed soil horizon. The top zones of both the paved and unpaved areas were underlain by an assortment of fill materials and fill soils, consisting of a mix of fine sand, silt, and clay, with a significant amount of coal cinders and furnace ash. The proportions of soil material and coal cinders varied throughout the site, but the majority of the site contained a one- to three-foot layer of these materials. The total thickness of fill varied from one-to six-feet below grade, but averaged four to five feet over most of the site. A silty-clay peat meadow bog existed below the fill line, which represents the original land surface prior to filling activities.

The summary of findings of the 1995 investigation report stated the following:

- The concentration of lead and zinc in the fill soils underlying both paved and unpaved areas area elevated in comparison with the concentrations of cadmium, mercury, selenium, and vanadium; however, these concentrations are common in fill soils throughout the metropolitan area.
- No significant differences in metal concentrations were found between the two areas.
- The soils underlying the entire site appear to be of similar composition and origin.
- The findings of the 1994 and 1995 reports support the conclusion that the proposed wetland creation and restoration plan is feasible.

Based upon data from the 1994 and 1995 site investigations, the contamination issues that needed to be addressed at the site were:

1. Elevated concentrations of lead at one boring location.
2. Elevated concentrations of VOCs at two boring locations.
3. Elevated concentrations of certain semi-volatile organic compounds (SVOCs) across the site, including polycyclic aromatic hydrocarbons (PAHs) chrysene, benzo(a)pyrene and benzo(a)anthracene.

Summary of 1999 Field Investigation

Petroleum

On September 9, 1999, Tyree Brothers Environmental Services, Inc. (TBES) identified petroleum contamination on surface water during a search for USTs on-site. TBES notified the NYSDEC Oil Spills Unit and spill # 99-06893 was assigned to the site. A total of 10,150 gallons of contaminated groundwater was removed from the excavation and was transported off-site by

AB Oil Service, Ltd. on September 27, 1999. The water was remediated at their facility located in Bohemia, New York.

USTs

On September 23, 24 and 25, 1999, eleven (11) 550 gallon single wall, steel, jet fuel USTs were excavated and removed from the site. Tyree Brothers Environmental Services, Inc. deadlined a product/water mixture from the USTs and placed the mixture in a holding tank on September 23, 1999. On September 28, 1999, 535 gallons of rinse water produced by the cleaning of the holding tank were removed by TBES, and subsequently disposed of at the Tyree Organization's wastewater treatment facility in Farmingdale, New York. Five (5) 55-gallon DOT drums of tank bottom sludge were generated by tank cleaning activities. The drums were removed on October 8, 1999 by AB Oil Service and disposed of at their facility in Bohemia, New York.

Soil Samples

One (1) representative soil sample was collected from the stockpile adjacent to the excavation. The sample was analyzed for volatile organic compounds via EPA method 8021. Groundwater was encountered during excavation activities at a depth of 2 feet below grade. A groundwater sample was obtained and also analyzed for volatile organic compounds via EPA method 8021.

Laboratory results for the soil sample indicated that all concentrations of volatile organic compounds were within NYSDEC guidance values. Five (5) volatile organic compounds were noted in the groundwater sample. These concentrations exceeded NYSDEC groundwater standards.

Summary of 2000 Site Investigation Plan

The New York City Department of Design and Construction requested that LiRo- Kassner, Inc. (LiRo) perform site investigations in support of their underground storage tank (UST) program. LiRo prepared a work plan to identify corrective action investigation activities. The purpose of the investigation was to identify the presence of petroleum contamination, evaluate the need for corrective action, and recommend a remedial approach if corrective action was deemed necessary.

The Site Investigation Plan (SSIP) was prepared in accordance with the "Generic Site Investigation Protocol for Underground Petroleum Storage Tank Sites" (GSIP), which was approved by the New York State Department of Environmental Conservation (NYSDEC). The GSIP also specifies the standard field and laboratory procedures, which would be used during the investigation. The investigation results were reported in an Investigation Summary and Remedial Plan (ISRP).

The 2000 Site Investigation Plan called for the following:

1. Soil Sampling Program

Soil borings were drilled to collect soil for environmental analysis and to characterize site hydrogeological conditions. The borings were incrementally with 6-5/8" hollow stem augers and soil samples were collected using a standard split-spoon sampler. Samples were collected continuously. The split-spoon samples were screened for the presence of organic vapors using a photoionization detector (PID) and samples for laboratory analysis were collected at two (2) feet below grade.

2. Groundwater Monitoring Program

The groundwater-monitoring program involved the installation of new monitoring wells to evaluate groundwater quality and site hydrogeological conditions. The new monitoring wells were installed in accordance with GSIP procedures and constructed with new 4-inch PVC screen and risers. The screens were 10 feet long and installed to straddle the water table (if possible). Groundwater samples were collected from the new monitoring wells and analyzed for VOCs and SVOCs.

Groundwater and product thickness measurements were collected at least twice from the new wells. The depth to groundwater and product thickness was also measured prior to sampling.

3. Monitoring Well Development

The new monitoring wells were developed in accordance with the GSIP by pumping until field parameters stabilized, the discharge of water is free of turbidity, or 55 gallons have been removed.

4. Monitoring Well Purging and Sampling

A groundwater sample was collected from the new monitoring wells (unless floating product was present). Prior to sampling, each well was be purged. Groundwater samples were collected using a new disposable bailer. If free product was present samples were collected for the TPH fingerprint analysis using a new disposable bailer.

5. Hydraulic Conductivity Testing

Slug testing was performed on site monitoring wells to evaluate the hydraulic conductivity of the water-table unit. Slug test data was analyzed using the Method of Bower and Rice.

6. Surveying and mapping

New monitoring wells were surveyed to determine their location as specified in the GSIP. The survey was referenced to USGS (NGVD) vertical datum and the New York State Plane horizontal coordinates. Surveying was conducted under the supervision of a licensed surveyor.

Upon completion of the 2000 Site Investigation Plan, LiRo completed a Site Investigation Summary and Remedial Plan report in February 2002. Because the project site was occupied by an emergent wetland, the only remedial actions considered were those that involved minimal

disruption of the wetland. Wetlands plant species were used in constructed wetlands for the treatment of contaminated sites to enhance the attenuation of petroleum contamination. Biochemical sampling results for this site indicated that the soil had sufficient nutrients to support indigenous heterotrophic bacteria and that bacteria colonies were present in all samples tested. Natural attenuation with groundwater monitoring was approved by NYSDEC as the preferred remedial alternative for the site.

LiRo monitored the site by collecting annual groundwater elevation measurements and groundwater samples for laboratory analysis. The most recent sampling was conducted in December 2004. Compared to baseline conditions, total organic contaminant levels decreased by a site-wide average of 70 percent in the 13 monitoring wells. LiRo recommended continued groundwater monitoring at the site because the groundwater contaminant levels still exceed NYSDEC groundwater quality criteria at nine of the site wells. The NYSDEC criteria are based on groundwater ingestion. Because there is no groundwater used at or adjacent to the site, the groundwater contamination poses no apparent human health risk.

Summary of 2003 Field Investigation

On November 13, 2003, The Louis Berger Group, Inc., performed a field investigation, to analyze the two boring locations identified in the 1994 and 1995 investigations. Due to surface conditions, only one location was sampled. Eight subsurface samples were collected from soil borings, equally spaced, four at a distance of 10 feet and four at a distance of 25 feet. All of the borings were advanced using a hand auger; seven to a depth of three feet below ground surface (bgs) and sampled from the 2.5 to 3.0 foot interval, and one (sample S9E2) was advanced to 3.5 feet bgs and sampled from the 3.0 to 3.5 foot interval. All samples were analyzed for lead by the TCLP method (EPA Method 1311/6010B) at Accutest Laboratories in Dayton, NJ (NYSDOH # 10983).

No lead was detected above the detection limit of 0.5 milligrams per liter (mg/L), which is the regulatory limit for lead. The field sampling personnel were unable to penetrate the subsurface at the other location with a hand auger.

2004 Workplan

In December 2004, a Workplan was prepared by The Louis Berger Group, Inc. to document the proposed delineation soil sampling and analysis for the former Flushing Airport site. The purpose of the Workplan was to obtain documented approval from NYSDEC to proceed with field activities. The Workplan included a site history, a discussion of proposed Workplan activities, Quality Assurance/Quality Control (QA/QC) and Health and Safety Protocols using Section 2.1 of the NYSDEC Spill Guidance Manual (NYSDEC, 1992) for direction, as well as a summary of reporting and scheduling.

Based on previous soil and groundwater surveys, nine areas with elevated levels of contaminants were identified. Two of these areas, related to two previously-removed underground storage tanks, have already been removed and disposed of in accordance with all federal and state regulations. As identified in the Workplan, the remaining seven areas, which

were found to contain elevated contaminant levels related to historic fill, will be delineated, removed and disposed of in accordance with all federal and state regulations prior to the wetland creation/restoration.

On January 27, 2005, NYSDEC accepted the Workplan with several conditions.

No Action Condition

In the future without the project, there would be no clearing, grading or ground disturbance on the project site or upland development area, and thus, there would be no potential for exposure to hazardous materials. In the future no action condition, it is assumed that no improvements will occur to the former Flushing Airport property. The dilapidated former runway pavement area will continue to lie within the former wetland area.

Build Condition

The wetland creation/restoration plan includes enhancing and restoring both wetland and upland areas on site. Implementation of the plan requires the removal of old fill to promote the establishment of wetlands; and the placement of the excavated fill in adjoining upland areas to meet proposed upland grades. In addition, to mitigate wetland impacts during construction, a temporary berm will be installed around the wetland creation/restoration area.

It is necessary to utilize all materials excavated from the proposed wetland areas to raise the upland elevations to create the necessary slopes and berm area. Due to the existence of elevated concentrations of SVOCs in fill materials across the site, a materials re-use plan has been developed for the management of these materials during excavation and placement. This plan is outlined below:

1. Excavate and grade the site to elevations that are six inches lower than those established by the wetland creation/restoration design plan, utilizing the excavated soil material on-site in the construction of the upland areas and berms. Approximately 62,300 cubic yards will be excavated.

2. Place a six-inch layer of clean topsoil across the entire site and grade to reach the elevations established within the wetland creation/restoration plan. The clean topsoil layer will cap all exposed soils, as well as all of the excavated materials used as fill, therefore preventing direct contact or the potential for the migration of SVOC-impacted soils. Approximately 29,910 cubic yards of topsoil will be placed on-site.

3. As part of the soil erosion and sediment control plan, sediment/detention ponds, turbidity barriers, silt fencing, and other appropriate sediment and erosion control measures will be in place during construction. The ponds will allow for the deposition of particles that may become suspended in surface waters due to contact with potentially contaminated excavated and/or exposed soils.

Implementation of the materials reuse plan will stabilize excavated and exposed soils during construction and prevent exposure to the reused SVOC-impacted soils after completion of the project.

To prevent direct contact with contaminated soils and the migration of SVOC-impacted soils, 2 feet of clean fill including a 6-inch thick clean topsoil layer will be placed on-site to cap exposed soils and excavated materials. Sediment/detention ponds, turbidity barriers, silt fencing, and other appropriate sediment and erosion control measures will be utilized during construction to prevent direct contact of potentially contaminated excavated and exposed soils with surface waters.

All local, state and federal laws and regulations governing hazardous waste, particularly the Resource Conservation and Recovery Act (RCRA) and the New York Standards Applicable to Generators of Hazardous Waste, will be followed during construction.

XXI. CONSTRUCTION IMPACTS

The purpose of this section is to summarize the anticipated impacts during construction of the proposed Project. Construction impacts are temporary, and will cease with the completion of construction. In order to minimize overall adverse impacts during construction, the project would be planned, designed, scheduled and staged to minimize disruption. Although some adverse impacts would be unavoidable, applying best management practices during construction would minimize the duration and severity of these effects. The types of materials and practices that are typically used to minimize any adverse impacts generated during construction activities are briefly described below.

Construction Materials and Equipment

The proposed project would require demolition, excavation, preparation of the subgrade, addition of subbase material, and paving. Primary construction materials required for these purposes would consist of clean fill, subbase and asphalt/concrete. Standard construction equipment such as pavers, scrapers, loaders, spreaders, rollers, and haul trucks would be used to move and consolidate soil, pave and transport materials to and from the site. Backhoes may be needed to install drainage facilities and other utilities.

Access and Staging

To prevent impacts to natural and built features, access will be taken from Linden Place at the south end of the project site, 23rd Avenue at the west end of the project site, and from the existing driveway apron off 20th Avenue, just east of 132nd Street. Berms will be constructed to protect existing wetland areas for the duration of construction.

Temporary construction easements will be required for surcharging and construction of Linden Place and 132nd Street, as surcharging will extend approximately 15 feet east and west of the existing ROW.

The 2 feet of fill material, if delivered to the site before it is needed for cover, will be stored on the adjacent parcel.

Air Quality

Air quality impacts during construction will be limited to short term, increased fugitive dust and mobile source emissions. Fugitive dust is airborne particulate matter, generally of a relatively large particulate size. Construction-related fugitive dust is generalized by concrete demolition, haul trucks, concrete trucks, delivery trucks, and earth-moving vehicles operating around the project site. This will be due primarily to particulate matter being resuspended ("kicked-up") by vehicle movement over paved and unimproved surfaces, dirt tracked onto paved surfaces from unpaved areas at access points, and material blown from areas of exposed soils.

Generally, the distance particles drift from their sources depends on their size, emission, height, and wind speed. Small particles in the 30- to 100-micron range (one micron equals 0.000001 meter) can travel several hundred feet before settling to the ground, depending on wind speed. Most fugitive dust, however, is made up of relatively large particles (i.e., particles greater than 100 microns in diameter). Given their relatively large size, these particles tend to settle within 20 to 30 feet of their source. The application of various control measures during construction activities will be employed to minimize the amount of construction dust generated, such as applying water or other soluble moisture-retaining agents to dirt areas, covering haul trucks carrying loose material, or treating materials likely to become airborne and contribute to air pollution if left untreated.

Carbon Monoxide is the principal pollutant of concern when assessing localized air quality impacts of motor vehicles. Some emissions of CO from motor vehicles increase with decreasing vehicle speed, disruption of traffic during construction could result in short-term elevation of CO concentrations. The precautions to minimize traffic disruption in the area, discussed above, will minimize the construction-related effect on mobile source emissions.

Hazardous Waste

All local, state and federal laws and regulations governing hazardous waste, particularly the Resource Conservation and Recovery Act (RCRA) and the New York Standards Applicable to Generators of Hazardous Waste, will be followed during construction.

Noise

Noise impacts during construction will include noise from construction equipment operation and from construction vehicles traveling to and from the project site (it is expected that most construction workers would travel by automobile). The construction noise impact on sensitive receptors near the project site will depend on the type of construction equipment and the duration of activity, as well as the distance from the construction site. Typical noise levels of construction equipment at 50 feet are shown in **Table 12.**

Construction noise is regulated by the New York City Noise Code and by U.S. Environmental Protection Agency regulations for construction equipment. These regulations mandate that certain classifications of construction equipment and motor vehicles must meet specified noise emissions standards; that except under exceptional circumstances, construction activities be limited to weekdays between the hours of 7:00 AM and 6:00 PM.; and that construction material be handled and transported in such a manner as to not create unnecessary noise. In addition, New York City regulations require that noise control measures specified in the contract documents be followed to ensure compliance. The project will comply with the New York City Noise Code, U.S. Environmental Protection Agency Regulations and New York City Noise regulations during construction.

Table 12: Typical Noise Emission Levels for Construction Equipment

Equipment Item	Noise Level at 50 ft (dBA)
Air Compressor	81
Asphalt Spreader	89
Asphalt Truck	88
Backhoe	85
Bulldozer	87
Compactor	80
Concrete Plant	83[1]
Concrete Spreader	89
Concrete Mixer	85
Concrete Vibrator	76
Crane (derrick)	88
Delivery Truck	88
Diamond Saw	90[2]
Dredge	88
Dump Truck	88
Front End Loader	84
Gas-driven Vibrio-compactor	76
Hoist	76
Jackhammer (Paving Breaker)	88
Line Drill	98
Motor Crane	83
Pile Driven/Extractor	101
Pump	76
Roller	80
Shovel	82
Truck	88
Tug	85
Vibratory Pile Driver/Extractor	89

[1]Wood, E. Wood and A.R. Thompson, "Sound Level Survey, Concrete Batch Plant: Limerick Generating Station", Bold Beranek and Newman Inc., Report 2825, Cambridge, MA, May 1974.
[2]New York State Department of Environmental Conservation, "Construction Noise Survey", Report No. NC-P2, Albany, NY, April 1974.
[3]Bungener, J.H., "Sound Level Survey: Wise's Landing, Kentucky," Bolt Beranek and Newman Inc., report 2880, Downers Grove, IL, June 1975.
[4]F.B. Foster Company, "Foster Vibrio Driver/Extractions," Electric Series Brochure, W-925-10-75-5M.

Source: Patterson, W.N., R.A. Ely, and S.M. Swanson, "Regulating of Construction Activity Noise," Bolt Beraneck and Newman, Inc., Report 2887, for the Environmental Protection Agency, Washington, D.C., November 1974. Except for footnoted items.

Water Quality

The foremost potential construction impacts on water resources are soil erosion and sedimentation, which could occur due to grading activities. Exposed soils from these activities could erode during rainfall events, and possibly affect the existing storm sewer system located on and adjacent to the site. A soil erosion control plan would be implemented during construction activities. Potential contamination of groundwater could possibly occur as a result of leaking construction equipment and/or temporary on-site sanitary storage facilities. Proper maintenance procedures on the construction site would avoid most leaks and mishaps. Any spills (oil, gasoline, brake fluid, transmission fluid) would be contained immediately and disposed of properly, off-site.

Traffic and Transportation

Traffic and transportation operations in the study area may be affected by the movement of construction equipment, materials, and personnel to and from the site on a daily basis. Movement of oversize machinery and/or materials may result in temporary lane or street closures. The project could potentially result in short-term increased congestion within the vicinity of the project site, especially at 130th Street, where roadway improvements are proposed. Congestion at 23rd Avenue is not anticipated, as it is not a through street and only provides access to loading docks and employee parking facilities, to which access shall be maintained during construction. Two rows of parking for Stroehmann's Bakery employees will be temporarily displaced on the north side of 23rd Avenue to accommodate the proposed roadway improvements. Linden Place is currently enclosed in chain link, preventing vehicular and pedestrian access, and has been for over a decade. Traffic conditions will not be impacted.

A formal maintenance and protection of traffic (MPT) plan will be prepared by the design consultant and will be implemented during construction. The MPT plan will maintain pedestrian and vehicular access to businesses and residences fronting the work zone and will provide access for school buses, local and emergency traffic, at all times.

Other Areas

In all other areas, construction period impacts are not anticipated. For example, lane closures and other construction-related effects will alter traffic patterns during construction, but these effects will be temporary and are not expected to result in any significant impacts to land use, public policy, community facilities, socioeconomic conditions, urban design and visual resources. Further, while utility relocation will be required during construction, all necessary measures will be taken to prevent significant impacts related to interruptions of service, maintenance access to utilities, etc.

Appendix A
Former Flushing Airport Wetland Mitigation Report

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FIGURES

TABLES

APPENDICES

PART 1: PERMIT APPLICATIONS

This document presents the permit applications required to implement the mitigation and restoration measures proposed by the New York City Economic Development Corporation (EDC) for the Former Flushing Airport project, located in Whitestone, Queens County, New York. To supplement the applications, the project history, the project purpose and need, existing site conditions, and the mitigation/restoration plan and design are all discussed in detail in Part 2 of this report.

The permit applications include a Joint Permit Application for the New York State Department of Environmental Conservation (NYSDEC) and United States Army Corps of Engineers (USACE), a USACE Environmental Questionnaire, and Coastal Zone Consistency Assessment. EDC, the Applicant for this project, maintains that with the submission of this report, including the design plans and permit applications, all permit requirements for the mitigation and restoration of this site are met. In addition, the design report and design plan document the ongoing coordination that has occurred between EDC and NYSDEC and the USACE over the past eight years to make certain that the proposed design not only meets the permitting requirements, but that the resultant ecosystem becomes a valuable wildlife habitat tucked within the urban setting of Whitestone, Queens County.

JOINT PERMIT APPLICATION – NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION AND UNITED STATES ARMY CORPS OF ENGINEERS

A completed Joint Permit Application is presented at the end of this section. Following is the additional information needed to answer Item No. 6 of the application:

The site is located in Whitestone, Queens County, and is associated with numerous tax blocks, including:

- 4177-4186;
- 4208-4217;
- 4238-4242;
- 4278-4281; and
- 4305-4307.

Following is the information needed to address the General Instructions for Joint Application:

- See Figure 1 in Part 2 for the site location map with location coordinates.
- See Appendix D for wetland delineation map, as well as Figures 6 and 7 in Part 2 for NYSDEC Freshwater Wetlands and U.S. Fish and Wildlife Service National Wetlands Inventory Map.
- See Appendix A for Wetland Mitigation/Restoration Design Plans.
- See Appendix C for site photographs, including photograph location map.

As checked on the form, permits applied for under the Joint Permit for the Former Flushing Airport project include:

- Stream Disturbance (Bed and Banks);

- Navigable Waters (Excavation and Fill);
- Freshwater Wetlands;
- Tidal Wetlands;
- 401 Water Quality Certification;
- Section 404 (Waters of the United States);
- Section 10 (rivers and Harbors Act); and
- Nationwide Permit No. 27.

Please note that the requirements for a Dams and Impoundment Structures Permit and a State Pollutant Discharge Elimination System (SPDES) Permit were also reviewed as they pertain to this project. It was determined that neither of these permits were required for the following reasons.

- Dams and Impoundment Structures Permit

  The restoration of the wetland area will require the excavation of approximately 62,300 cubic yards of material to remove historical fill and to establish the proper elevations to support hydrophytic vegetation. In addition, an outlet structure will be constructed at the edge of the exiting pond. This outlet structure will serve to reinforce the impoundment of approximately 158 acre-feet of water at its normal pool water level (-1.0 feet Queens Vertical Datum [QVD]). The outlet structure for the wetland will be constructed with its invert set at -1.0 feet QVD, approximately 0.5 feet above the downstream swale elevation (0.5 feet below the existing ground surface at that location).

  In accordance with the 1999 New York State Environmental Conservation Law, Article 15-0503, a "dam" means "any artificial barrier including any earthen barrier, together with its appurtenant works, which impounds or will impound waters, provided it has (1) a height equal to or greater than fifteen feet or (2) a maximum impoundment capacity equal to or greater than three million gallons; except that for purposes of this section a dam shall not include any structure which has (i) a height equal to or less than six feet regardless of the structure's impoundment capacity, or (ii) an impoundment capacity not exceeding one million gallons regardless of the structure's height." The height of a dam, as set forth in the 1986 New York Code of Rules and Regulations (6NYCRR) Part 673 - Dam Safety Regulations, is "the vertical dimension from the downstream toe of the dam at its lowest point to the top of the dam."

  Based on the proposed design of the wetland and the outlet structure, the height of the outlet structure, is by definition, approximately 0.5 feet. Therefore, since the height of the impoundment structure is less than six feet, in accordance with the 1999 New York State Environmental Conservation Law Article 15-0503, a permit is not required.

- Structures Permit and a State Pollutant Discharge Elimination System

  Following a review of the New York State Environmental Conservation Law, Article 17, Titles 7 & 8, and Article 70, it was determined that a permit through SPDES is not required. The restored wetland area will not be discharging sewage or other industrial pollutants and will not increase current storm water discharge. In fact, due to the storage capacity and detention time associated with the restored wetland, the proposed design will serve to reduce the existing surface water discharge into Mill Creek and improve water quality through the development of a healthy wetland eco-system.

UNITED STATES ARMY CORPS OF ENGINEERS ENVIRONMENTAL QUESTIONNAIRE

A completed Environmental Questionnaire is presented at the end of this section.

Following is additional information needed to answer Question 3 under Bulkheading/Bank Stabilization/Filling Activities:

> For construction staging purposes, some wetland areas will be temporarily drained and/or filled for the construction of temporary diversion berms to protect water quality and prevent soil erosion and sedimentation during construction. However, all temporary berms will be removed by the time construction is complete and the wetland areas will be restored and planted and seeded with native vegetation.

COASTAL ZONE CONSISTENCY ASSESSMENT FORM

A completed Consistency Assessment Form is presented at the end of this section.

The mitigation/restoration project site lies within the coastal zone, as defined within the *Coastal Zone Boundary Appendix* (May 1997). The coastal zone boundary defines the geographic scope of the Waterfront Revitalization Program (WRP). Pursuant to federal statute, the boundary encompasses "all land and water uses of direct and significant impact on coastal waters".

Since the project lies within the Coastal Zone and requires approvals from both the NYSDEC and USACE, the project must show consistency with the policies and intent of the New York State Coastal Zone Management Program, under the direction of the NYS Department of State (NYSDOS), and the local WRP.

To determine consistency, the New York City WRP Consistency Assessment Form was completed. The form consists of a series of location and policy questions, and a negative answer to each of the questions presumes that the project is in compliance with the stated location and policy questions. In assessing the consistency of this project, all of the location questions were negatively answered and all but four of the policy questions were negatively answered. The four questions that were positively answered are discussed further below.

POLICY 21: WOULD THE ACTION INVOLVE ANY ACTIVITY IN OR NEAR A TIDAL OR FRESHWATER WETLAND?

> The proposed action will protect and restore freshwater wetlands. Historically, the project site contained a tidal wetland. However, due to development, placement of tide gates along the tidal input, and increased storm water runoff to the site, the site is now classified as a freshwater wetland.
>
> The proposed action involves enhancing the existing wetland areas and restoring additional wetland areas. This action is consistent with the stated property in that it will (1) avoid the draining of, placement of fill in, or excavation of wetlands; (2) minimize adverse impacts, and (3) provide mitigation for any adverse impacts that may remain after all appropriate and practicable minimization measures have been taken. There will be no placement of fill in existing wetland areas. Areas to be excavated include only those areas that were previously filled or developed and are now paved. Wetland areas will be temporarily drained and filled during construction to protect water quality and prevent soil erosion and sedimentation, but all temporary berms will be

removed after construction is complete and the wetland areas will be restored and planted and seeded with native vegetation.

Vegetative buffers to the wetland areas consisting of scrub-shrub floodplains and forested uplands will be restored on site. Currently, floodplain and upland areas are dominated by invasive species indicative of disturbed areas (e.g. mugwort). Vegetated berms (to be dominated by native grasses) will be constructed around portions of the site to preserve the hydrologic balance within the wetland and the surrounding upland area.

Although the historical tidal wetland cannot be restored due to changes that occurred both on site and off site over time, the historical functions of the wetland system will be restored. Wetland functions, such as water quality, flood storage, and wildlife and fish habitat, will be restored and maximized.

POLICY 30: WILL THE PROJECT INVOLVE THE EXCAVATION OR PLACING OF FILL IN OR NEAR NAVIGABLE WATERS, MARSHES, ESTUARIES, TIDAL MARSHES OR OTHER WETLANDS?

The proposed action will protect water quality during construction. The construction will include excavating the previously filled and/or developed areas to remove historical fill, and all paved surfaces and structures. To protect water quality and prevent soil erosion and sedimentation during construction, a berm will be placed within the wetland area during construction to divert drainage.

No dredging will occur within the site. Excavation and fill operations will meet state standards for physical, health and aesthetic factors. All excavation and placement of fill will occur during the fall and winter months, and will minimize potential adverse impacts on aquatic life. Excavated materials, other than asphalt, will be reused on site within upland and berm areas. The wetland mitigation and restoration will result in enhanced and increased habitat for aquatic life, including the creation of deep pools and emergent vegetated zones.

POLICY 34: WOULD THE ACTION INVOLVE CONSTRUCTION OR RECONSTRUCTION OF A FLOOD OR EROSION CONTROL STRUCTURE?

The inoperable tide gates located on Mill Creek, southwest of the site, will be reconstructed as part of this mitigation and restoration project. Currently, the tide gates are allowing tidal flows from Flushing Bay to flow in and out of the site twice daily. The restored tidal gates will allow for the site to function as a freshwater wetland habitat, but will allow flood flows to move out into the Bay if necessary. Therefore, the proposed project will maximize the flooding and erosion protective capacities of the site.

POLICY 40: WOULD THE ACTION RESULT IN DEVELOPMENT OF A SITE THAT MAY CONTAIN CONTAMINATION OR THAT HAS A HISTORY OF UNDERGROUND FUEL TANKS, OIL SPILLS, OR OTHER FORM OF PETROLEUM PRODUCT USE OR STORAGE?

The site has been surveyed for the presence of contamination. Three areas with elevated levels related to underground storage tanks were identified. To remediate these areas, the City of New York and the EDC have begun implementing the *Site Specific Investigation Plan* (May 2000), developed for the NYS Department of Sanitation, prepared for the NYC Department of Design and Construction, and developed by Liro Engineering & Construction Management. These areas

with elevated levels will be removed and disposed of in accordance with all federal and state regulations prior to the construction of the wetland mitigation/restoration site.

PART 2: WETLAND MITIGATION/RESTORATION REPORT

1.0 INTRODUCTION

This report is presented to supplement the permit applications required to implement the mitigation and restoration measures proposed by the New York City Economic Development Corporation for the Former Flushing Airport project, located in Whitestone, Queens County, New York (Figures 1 and 2). The purpose of the mitigation/restoration plan is to enhance 8.6 acres of existing degraded wetlands and create 8.5 acres of restored wetlands at the site of the abandoned airport to enhance water quality, improve flood storage, increase wetland habitat values, and improve the overall aesthetic value of the area. The mitigation/restoration plan also includes creating 9.1 acres of scrub/shrub floodplain and 4.9 acres of forested upland.

The mitigation of wetland areas is required under the State of New York Department of Environmental Conservation (NYSDEC) Order on Consent, NYSDEC File Nos. R2-2918-90-03, R2-3159-90-08, and R2-3160-90-08 (signed February 2002). As stated in the Order of Consent (page 7 of 18), "the Mitigation Plan includes:

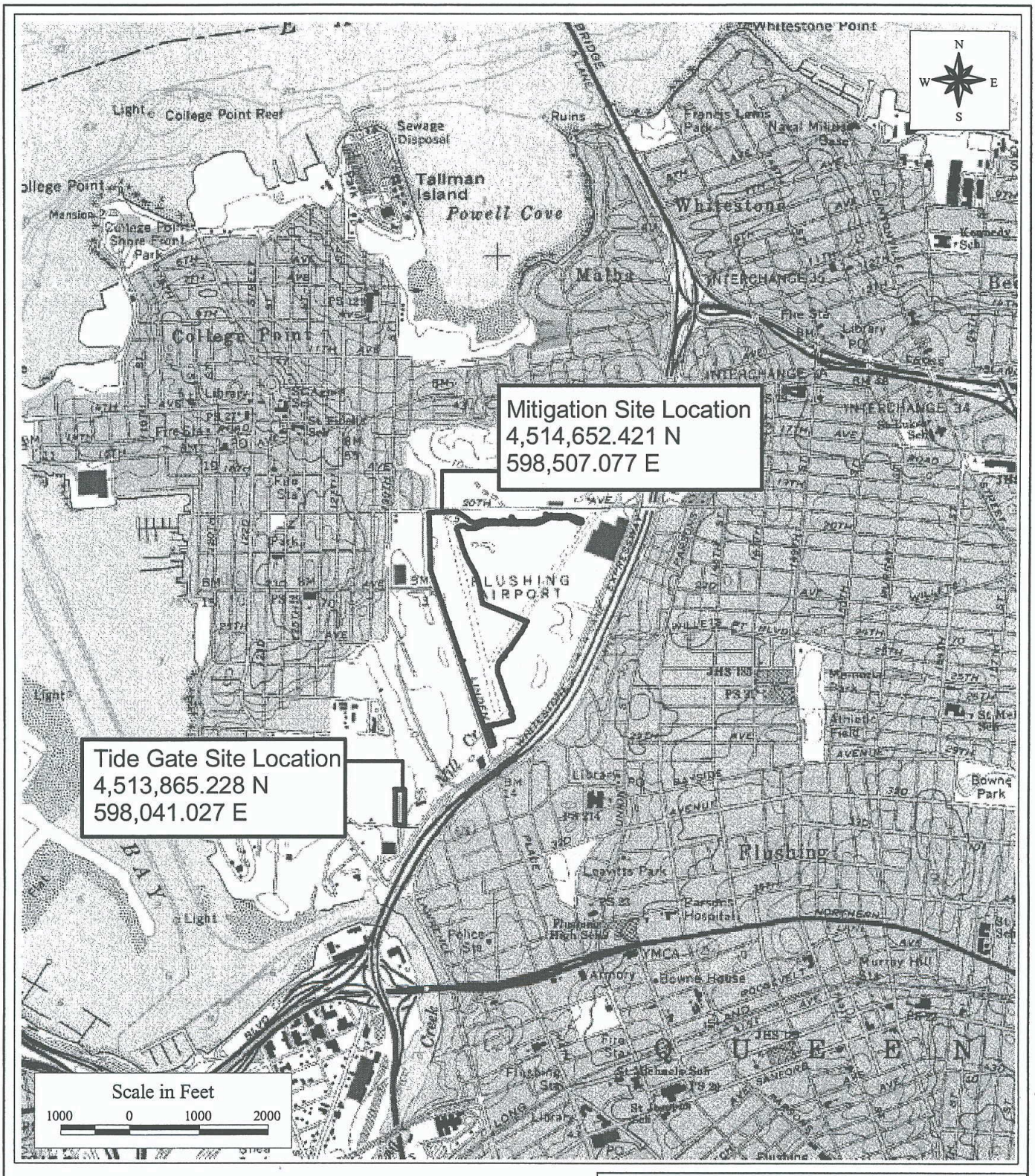
a) A 2.5 acre mitigation area for the impacts on state regulated wetlands caused by the violations addressed in this Order of Consent;
b) A 1.2 acre mitigation area required by the United States Army Corps of Engineers (USACE) for the filling of a federally but not state regulated wetlands area; and proposes
c) The creation of wetland areas to mitigate, on a ratio of two acres of wetlands creation for each acre of wetland lost or significantly impacted, the impacts to wetlands anticipated in connection with the planned commercial or industrial development in the Former Flushing Airport area."

To fulfill the requirements of the Order of Consent, the mitigation/restoration design plan detailed in this report and presented in Appendix A was progressed from the NYSDEC Consent Order Documentation Flushing Airport Wetland Mitigation Plan (February 2000). With the enhancement and creation of 5.0 acres of emergent wetland and 12.1 acres of open water, the mitigation/restoration plan fulfills the requested 2.5 acre and 1.2 acre wetland mitigation requirements at a replacement ration of 2:1.

1.1 Regulatory Approvals

To implement the proposed mitigation/restoration plan, a number of regulatory approvals must first be obtained. The permit approvals for the mitigation/restoration work include:

- Joint Application for Permit to the USACE and NYSDEC
    - Stream Disturbance (Bed and Banks)
    - Navigable Waters (Excavation and Fill)
    - Freshwater Wetlands
    - Tidal Wetlands
    - 401 Water Quality Certification
    - Section 404 (Waters of the United States)



New York City Economic Development Corporation
Site Location Wetland Mitigation Design for the Former Flushing Airport
Location: Whitestone, Queens County, NY
Date: November 2003 ID: JR5074_report.apr
The Louis Berger Group, Inc. 20 Exchange Place 22nd Floor New York, NY 10005 — Figure 1

SOURCE: USGS Topographic Quadrangle, Flushing, NY.

  - Section 10 (rivers and Harbors Act)
  - Nationwide Permit No. 27

- Coastal Zone Consistency Assessment

Part 1 of this report contains copies of the completed permit applications and some of the required supplemental information. Additional supplemental information is presented in Part 2 of this report, as well as in the mitigation/restoration design plans.

In the eight years over which the mitigation/restoration plans have been progressed, a number of meetings and discussions were held with the NYSDEC and USACE to ensure that all plans were progressed with the input of the regulatory agencies. The design plan presented in this report reflects the comments and requirements of the agencies as related over the past eight years.

2.0 SITE HISTORY

Prior to the development of the Flushing Airport, the site supported tidal wetlands. Figure 3 presents an early map of the site, depicting tidal wetlands across the majority of the site. In the mid-1920s, portions of the wetlands were used for the disposal of coal ash and other debris.

In 1927, the site was developed and Flushing Airport was opened, becoming the city's first airport. With the completion of La Guardia Airport (formerly North Beach Airport) in 1939, a sizable portion of the airport's business dwindled away. The airport was completely abandoned in 1984 following the crash of a light aircraft into a nearby house. EDC took possession of the site in the mid-1980s.

As part of the airport operations, a pump station and drainage system were developed to isolate the area from tidal influence. With the complete abandonment of the Former Flushing Airport and the failure of the drainage facilities, the site became inundated with fresh to brackish water. The pooling water stimulated hydrophytic vegetative growth; however, because no seed sources were available for native wetland vegetation, the invasive species, common reed (*Phragmites australis*), quickly dominated the site.

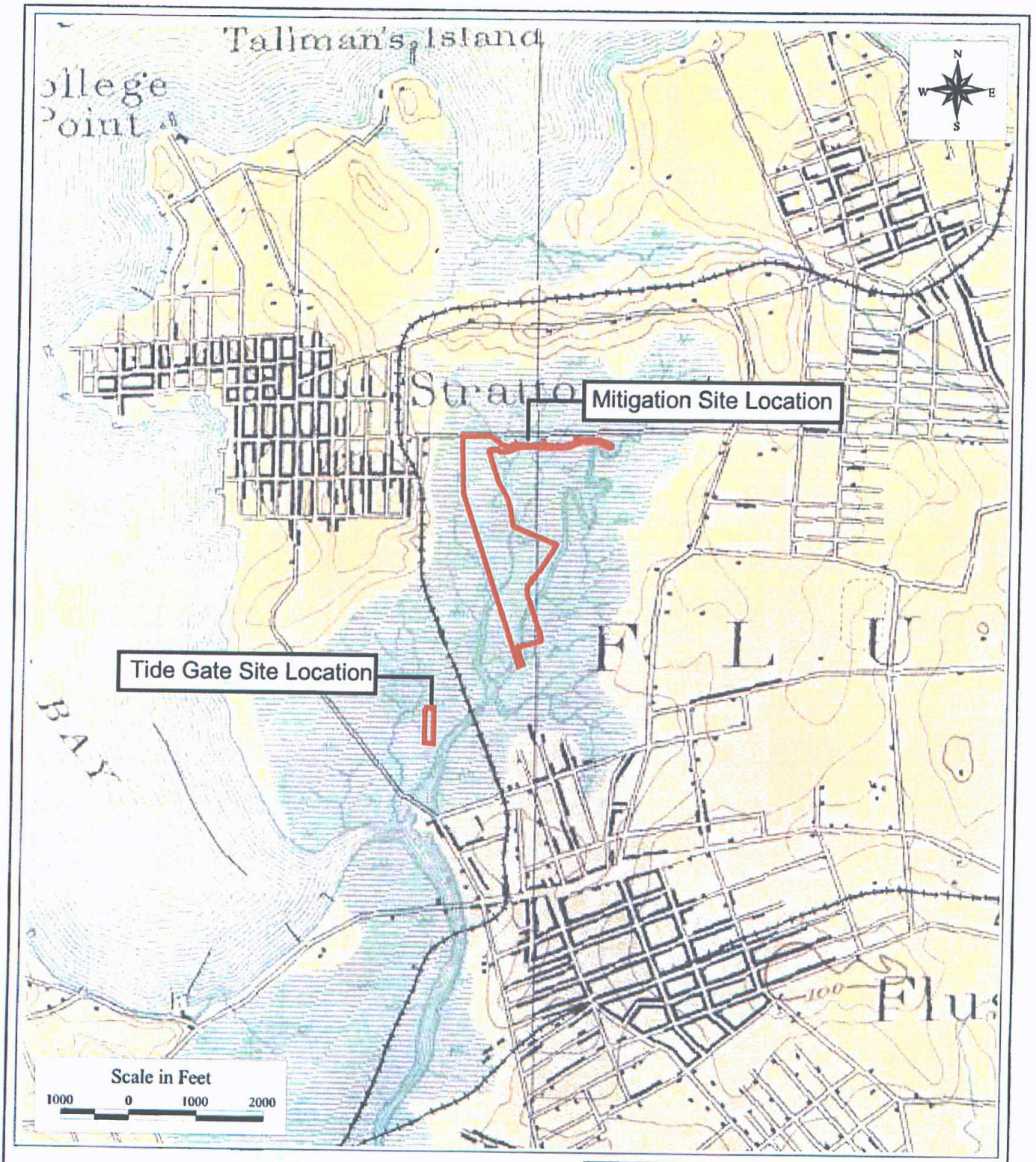
Steel flap gates were installed in Mill Creek, adjacent to the NYC Police Impoundment yard, to control tidal influence. However, at the present time these flap gates are not functional. Currently, sections of the paved and unpaved areas are under water. The total acreage of the open water areas fluctuates based on rainfall.

3.0 DESCRIPTION OF THE WETLAND MITIGATION AND RESTORATION PLAN

The mitigation/restoration plan, presented in Appendix A, provides for restoration and enhancement of approximately 5.0 acres of emergent wetland, 12.1 acres of open water, 9.1 acres of adjacent floodplain, and 4.9 acres of forested upland. Table 1 presents a comparison of the cover types between the existing and proposed conditions.

The mitigation/restoration plan includes the removal of paved surfaces (i.e., runway, taxiway and apron), site structures (hangars), and the excavation of past fill material to set elevations for the creation of open water areas, emergent wetlands and adjacent floodplain and forested areas. After excavation activities are completed and elevations are set, the emergent wetlands, floodplain areas and forested uplands areas will

be planted and seeded with native vegetation. The site will then be monitored and maintained for a period of five years.



New York City Economic Development Corporation

1891 Historic Map

Wetland Mitigation Design for the Former Flushing Airport

Location: Whitestone, Queens County, NY

Date: November 2003 ID: JR5074_report.apr

The Louis Berger Group, Inc.
20 Exchange Place 22nd Floor
New York, NY 10005

Figure 3

SOURCE: USGS Topographic Quadrangle, Harlem, NY 1891

Table 1: Existing and Proposed Cover Types

COVER TYPE	EXISTING (ACRES)	PROPOSED (ACRES)
Hard Surface	6.3	0.0
Open Water	2.0	12.1
Phragmites-Dominated Areas	6.6	0.0
Emergent Wetland	0	5.0
Floodplain	12.3	9.1
Forested Upland	0	4.9
Upland	10.8	6.9
TOTALS	38.0	38.0

3.1 Purpose and Objectives of the Wetland Mitigation/Restoration

The purpose of the mitigation/restoration plan is to create and enhance existing freshwater wetlands in a degraded, urban setting as both an ecological amenity and as mitigation for losses of wetlands on adjacent parcels resulting from industrial development.

The primary aspects of this mitigation/restoration plan include:

- Removal of paved surfaces;
- Demolition of existing abandoned buildings and structures;
- Removal of debris and waste throughout the site;
- Excavation of fill material from areas previously characterized as wetland;
- Installation of site water control structures;
- Planting and seeding of emergent, floodplain and forested vegetation;
- Implementation of a monitoring plan; and
- Reconstruction of tide gates along Mill Creek.

The objectives of the mitigation/restoration plan are to enhance water quality, improve flood storage, increase wetland habitat values, and improve the overall aesthetic value of the area. The removal of the paved surfaces will allow for an improved surface/groundwater connection. The demolition of the abandoned areas and removal of debris will remove unsafe features and allow for increased aesthetic features. Improved water flows and water retention areas will allow for better overall water quality, and increased and more controlled flood storage. The installation of the water control structures and reconstruction of the tide gates will also help to control flood and storm waters flowing from the increasingly developed area surrounding the site.

Additional goals include attracting a diverse waterfowl and wading bird population by providing an irregular shoreline which maximizes habitat diversity along the upland/water interface and increases protected "coves" for nesting waterfowl, maximizes the potential feeding and loafing areas in shallow emergent plant zones, provides potential roosting areas and feeding opportunities in the flood plain zones, provides grassy adjacent upland areas which encourage additional forage opportunities and loafing areas; and provides open water areas for resting and over-wintering habitat. The project also seeks to increased vegetative diversity with the removal of *Phragmites* and planting and seeding of native vegetation.

3.2 Need for the Wetland Mitigation/Restoration

The mitigation/restoration of the site is required under the NYSDEC Order of Consent due to unpermitted fills that occurred within wetland areas. The unpermitted fills were removed under earlier actions. The mitigation/restoration plan is focused on removing historic fills, abandoned buildings, and debris, and creating open water areas, emergent wetlands, and associated floodplain and forested habitats.

Due to poor drainage and possible subsidence, much of the site is flooded for extended periods with water depths ranging from a few inches to three feet. While wetlands have developed, they are of poor quality and are dominated by *Phragmites*. The hardened surface of asphalt and concrete (runways, aprons, taxiways) has prevented the establishment of benthic invertebrate communities, an essential feature of productive wetlands. In addition, the local community is increasingly concerned with the threat of West Nile Virus related to stagnant pools of water both on site and in adjacent areas.

Development within the adjacent areas has increased in the past few years, increasing the amount of paved areas and surface water runoff leading to the site. The project site is located in the lowest lying area within the watershed, and all storm water tends to drain directly to the site, increasing the need for improved water movement and flood storage capabilities.

NYSDEC has classified the site as a Class II wetland due to the site's characteristics:

- It is one of the three largest freshwater wetlands in Queens.
- It is located within an urbanized area.
- It contains both an herbaceous and a water vegetative structural group.

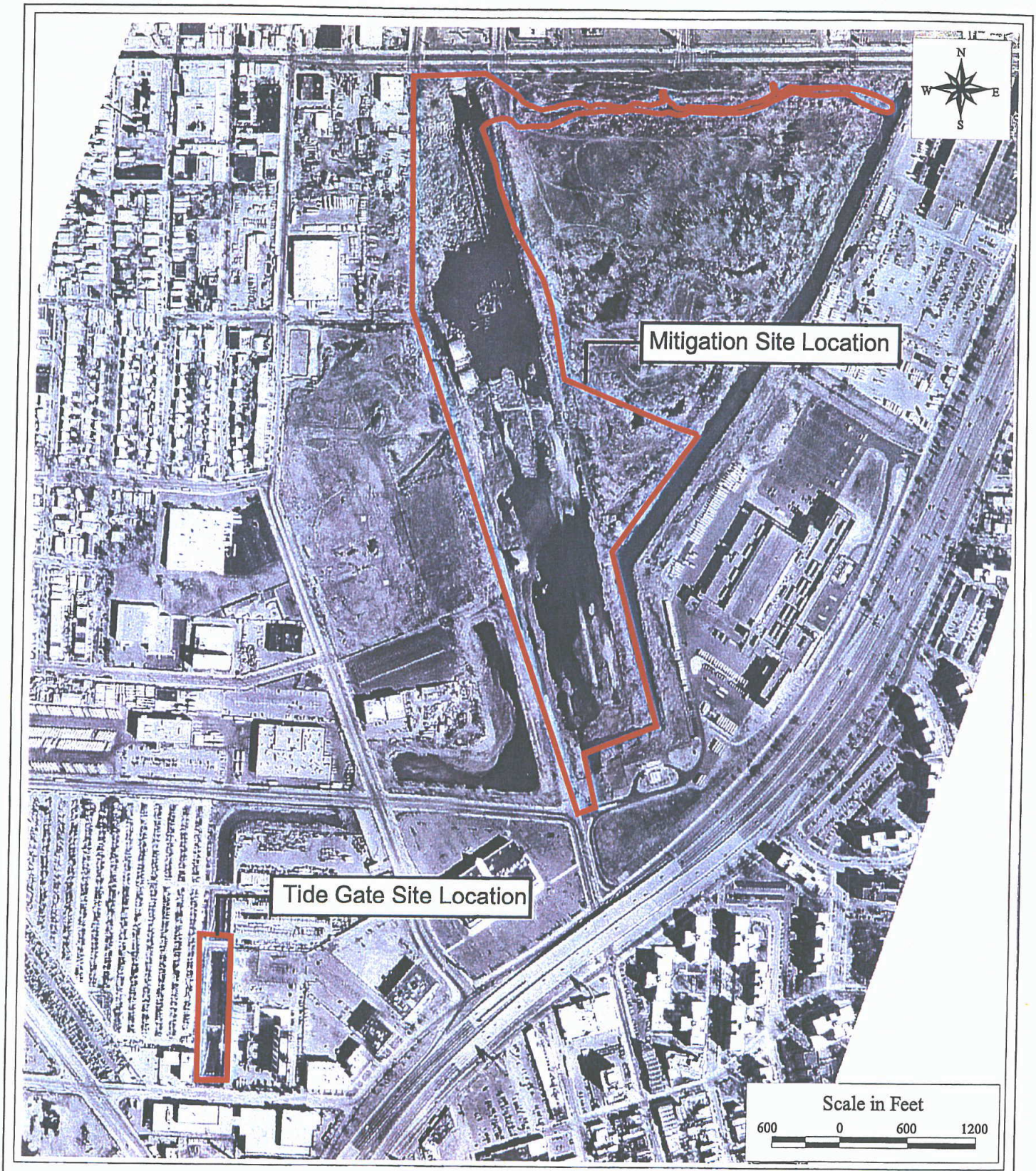
While the Former Flushing Airport site is valued based on these characteristics, the functions of the wetland are impeded by disturbed site conditions. Poor soil quality caused by historic filling activities, the domination by invasive vegetative species such as *Phragmites*, poor water quality, limited flood storage, and accumulating debris on the site have all contributed to a general degraded condition of the wetland and its adjacent areas.

4.0 SITE DESCRIPTION

The project site, which includes the wetland mitigation/restoration area and surrounding upland areas, is approximately 38 acres in size. The project area is bounded by 20th Avenue to the north, Mill Creek to the east and south, and Linden Place to the west. A recent aerial photograph of the site is presented as Figure 4.

Current developed areas on site include the paved runways (approximately 2800 feet), taxiways, aprons, and three hangars and one out building. These paved surfaces cover approximately 6.3 acres. Appendix B presents the original layout of the airport with the paved surface areas. The remainder of the site is primarily dominated by open water and open space.

The subject site lies within an M1-1 district, which permits light manufacturing. Surrounding parcels of land make up the College Point Corporate Park, also owned by EDC. College Point Corporate Park is slated for soft-recreational or light-industrial development. The immediate vicinity of the project site is highly urbanized and contains a mixture of commercial, industrial, institutional, and recreational land uses. Off-site adjacent areas include a United States Post Office and the New York Times color printing plant to the east and shopping complexes to the north and south.



New York City Economic Development Corporation

2003 Aerial Photograph

Wetland Mitigation Design for the Former Flushing Airport

Location: Whitestone, Queens County, NY

Date: November 2003 ID: JR5074_report.apr

The Louis Berger Group, Inc.
20 Exchange Place 22nd Floor
New York, NY 10005

Figure 4

SOURCE: Mercator Land Surveying, LLC. 2003

Current site photographs are presented in Appendix C, along with a photographic location map.

4.1 Topography

A topographic site survey dated July 2, 2003, was conducted by Mercator Land Surveying LLC from April 2003 to June 2003. The survey is used as the base mapping for the design plans presented in Appendix A.

The survey is based on a combination of aerial mapping, field investigations and surveys. The vertical datum is the Borough of Queens Datum, feet, being 2.725 feet above mean sea level at Sandy Hook, New Jersey (NGVD of 1929). The horizontal datum is based on the Queens Borough Datum of New York.

In general, site elevations reach a minimum of -4 feet within open water areas, average around .5 feet in areas adjacent to the open water, and reach a maximum of 5 feet along Mill Creek and along 20th Avenue. Within the 25-acre triangular parcel located west of the site, elevations range from approximately 0 feet to 5 feet.

4.2 Soils and Geology

The project site lies within the area formerly occupied by glacial Lake Flushing.

In general, the site is covered by one-foot to six-foot layers of fill material. A four- to six-inch layer of asphalt covers the fill in the paved areas, while an approximately six-inch layer of roots and organic matter cover the fill in the vegetated areas.

The top stratum, consisting of a thin cover of partially decomposed meadow mat, is underlain by organic silty clay with approximately 95 percent water content. This stratum is underlain by peat and highly decomposed meadow mat formed during a period of depressed sea level prior to filling of the basin with organic sediments. This stratum is underlain by loose gray silty sand, trace shells, organic matter, and gravel.

Soils underlying the fill consist primarily of sand (67 percent), silt/clay (22 percent) and gravel (11 percent). These soils are typical of unconsolidated glacial till deposited across much of New York City.

The organic soils are underlain by Pleistocene soils consisting of glacial lake deposits. The first stratum generally encountered consists of medium compact to compact silty sand approximately 20 feet in thickness. This stratum is underlain by a varved formation of silt and clay with some sand that is approximately 70 feet thick. Glacial till and boulders are encountered underneath the varved silt and clay, and glacial outwash is encountered under the glacial till.

Cretaceous-age sediments are encountered underneath the glacial outwash and consist of Raritan Formation multi-colored clays and fine sands of hard consistency. Bedrock lies at depths exceeding 200 feet.

In areas that were previously paved, the site specific stratigraphy indicates that four to six inches of asphalt and sub-base gravels are underlain by fill consisting of coal cinders and furnace ash, and debris. Four to five feet of this cinder fill is generally encountered across paved areas at the Flushing Airport site.

4.3 Surface Water

Historically on site, tidal wetlands existed and Mill Creek meandered through from Flushing Bay. With the construction of the airport in the 1920s, site drainage was controlled due to high ground water levels. These controls, the filling associated with the development of the airport, and the construction of the downstream tidal gates eliminated tidal influence to the airport site for many years. In addition, historic filling activities affected approximately ten acres of the site, raising site topography three to four feet above the groundwater level and resulting in alteration of the site drainage patterns.

In the late 1950's, a man-made drainage ditch and culvert system was constructed which replaced and altered Mill Creek's original configuration. A pump station was constructed to control groundwater levels on the airport via drainage ditches. At the time of airport closure, flooding on adjacent roadways was controlled by diverting the drainage onto the airport site in a new set of constructed drainage ditches. After the Airport closed in 1984, increases in storm water runoff to the site, the disuse of the pump station and the lack of drainage ditch and water control structure maintenance caused sections of the site to become flooded and aided in the establishment of freshwater wetland systems interspersed throughout portions of the site.

Due to high groundwater levels, storm water inputs, and inoperable drainage and water control structures, a freshwater wetland system has developed on site. The freshwater wetland contains a large expanse of open water that varies in size according to storm water inputs and evaporation rates. The average size of the freshwater wetland is approximately two acres.

The open water area and wetland system are classified by NYSDEC as freshwater, and the site tends to function as a freshwater system when the tide gates are in operation. Salinity readings were taken on site over time to verify salinity levels. In 1995, following the repair of the tide flap gates, salinity readings indicated that salinity levels had dropped to an average of 0.8 parts per thousand (ppt) for a limited period of time. However, the tide gates stopped functioning soon after. As a result, in 1997, the average salinity on the southern portion of the site was observed to be 8.0 ppt. By definition, the salinity of estuarine wetlands is defined as being in excess of 0.5 ppt.

Mill Creek, which once meandered through the site, is now located along the southeastern edge of the site and the adjacent triangular parcel. Mill Creek flows from Flushing Bay. This flow has been interrupted in the past by the placement of tide gates southwest of the project site. However, since sometime in the late 1990s, these tide gates have been inoperable.

The project site is located within the College Point Industrial Park development area. According to an extensive drainage study (NYCPDC, 1977) conducted prior to the development of the College Point Industrial Park, the College Point Industrial Park project area occupied approximately 560 acres out of a total drainage basin area of 860 acres. The 560-acre area is bounded by Whitestone Expressway to the east, the former Flushing River and Flushing Bay to the south and southwest, approximately 130th Street to the west, and approximately 14th Avenue to the north. Drainage in the College Point Industrial Park area has since been significantly altered by subsequent development of the area.

Based on current conditions in the College Point Industrial Park area, the majority of the water supply for the proposed wetland is expected to be storm water runoff from neighboring offsite areas. A description of the storm water presently contributing to the wetland and to Mill Creek is provided in the following sections.

4.3.1 Contributing Drainage Areas to Wetland

The majority of the water supply for the proposed wetland consists of storm water from paved areas north of the Former Flushing Airport property, unpaved areas within the property (east of the proposed wetland), and paved areas west of the proposed wetland site. The drainage area, land use, hydrologic soil group, and Natural Resources Conservation Service (NRCS) curve number are provided in Table 2. At the northwest end of the property, there is a 48-inch corrugated metal pipe (CMP) that discharges storm water from 132nd Street and industrial/commercial buildings (Jetro/Nextel/Motorola) to the proposed wetland. The total area that drains to this pipe is 7.32 acres.

To the north of the property and east of 132nd Street, there are three storm water pipes that discharge storm water from the retail centers north of 20th Avenue to the proposed wetland and to swales drawing into the proposed wetland. A 24-inch CMP collects water from the Mattone Group retail centers (Waldbaums, Staples) and condominium building and drains to the proposed wetland. The total drainage area to this pipe is 10.91 acres.

A 54-inch CMP discharges storm water collected from roof drains and paved areas located on the Related Retail Commercial Center (Target Complex) and road runoff from portions of 20th Avenue to the proposed wetland. The total drainage area that feeds into this pipe is 11.47 acres. The eastern half of the Related Retail Commercial Center (BJs complex) has a 48-inch CMP which collects water from roof drains, paved areas and road runoff from portions of 20th Avenue to the proposed wetland. The total drainage area that feeds into this pipe is 12.15 acres.

Seven outfalls west of the proposed wetland, from Linden Place, 23rd Ave, and 130th Street, drain directly into the proposed wetland. These outfalls consist of six 12-inch CMPs, all of which contribute to draining an area totaling 5.26 acres of paved land, and one 18-inch CMP which drains storm water from 0.94 acres of unpaved grass land. Also, to the west of the proposed wetland, the Modern/Continental industrial/commercial buildings and the unpaved Hi-Realty property contribute to the off-site drainage into the wetland. Approximately 1.88 acres of the Hi-Realty property drains into the proposed wetland via overland flow and 6.02 acres of paved land from the Modern/Continental buildings drain into the wetland through three 8-inch reinforced concrete pipes (RCP).

In addition to the offsite drainage, approximately 43.2 acres of currently unpaved area (including the buffer area and the 24.5-acre parcel to be developed into recreational or soft industrial land) is assumed to drain into the proposed wetland by overland flow and through a swale drawing into the wetland. The total drainage area contributing storm water to the proposed wetland is approximately 99 acres.

4.3.2. Contributing Drainage Areas to Mill Creek

The vast majority of the water draining to Mill Creek comes from paved areas north of the property, a portion of the currently unpaved areas to be developed into a recreational/soft industrial area west of the Mill Creek, and the paved areas on the east side of Mill Creek. The area, land use, hydraulic soil group, and NRCS curve number are provided in Table 1. A 48-inch CMP north of Mill Creek discharges storm water collected from 12.35 acres of paved commercial buildings including the Motorola building in between the Whitestone Expressway and Petracca Place, and 9.78 acres of park area located east of the Whitestone Expressway, into Mill Creek. A second culvert north of Mill Creek, a 54-inch CMP, discharges storm water from 32.05 acres of paved land, consisting of several commercial buildings and 6.86 acres of open space. To the west of Mill Creek, storm water discharge from 4.7 acres of the U.S. Postal Service (USPS) site is collected into a 24-inch CMP which drains into Mill Creek. To the east of Mill Creek, 4.84 acres of unpaved land from the Former Flushing Airport property, drains into Mill Creek via overland flow.

Table 2: Contributing Drainage Areas to the Wetland and Mill Creek

Drainage Area Description	Receiving Pipe	Area (ft^2)	Area (acres)	Land Use	Impervious Surface (percent)	Hydraulic Soil Group	Curve Number
A) Contributing Drainage Areas to Wetland							
Related Retail (BJs)	48" CMP	529,094	12.15	Commercial & Paved Lots	100		98
Related Retail (Target)	54" CMP	499,450	11.47	Commercial & Paved Lots	100		98
The Mattone Group (Waldbaums, Staples) and Condo Bldg	24" CMP	352,256	10.91	Commercial & Paved Lots	100		98
132nd Street	54" CMP	49,152	1.13	Roadway	100		98
Jetro (Large Bldg)	54" CMP	147,968	3.40	Industrial/Commercial	100		98
Jetro (Small Bldg)	54" CMP	73,728	1.69	Industrial/Commercial	100		98
Nextel/Motorola Bldg	54" CMP	49,152	1.13	Industrial/Commercial	100		98
Commercial Bldgs (Modern, Continental)	3-8" CMP	262,144	6.02	Commercial Urban District	85	B	92
Hi-Realty Property	Overland flow	81,920	1.88	Open Space (Fair Condition)	0	B	69
Linden Place/23rd Avenue/130th Street	6-12" CMP 1-18" CMP	229,263 41,143	5.26 0.94	Roadway Brush-Weeds-Grass (<50% cover)	100 0	B	98 67
B) Contributing Drainage Areas to Mill Creek							
Public Park	48" CMP	426,015	9.78	Open Space (Fair Condition)	20	B	69
Misc. Commercial Bldgs btwn Whitestone Expwy & Petracca Place	48" CMP	537,913	12.35	Commercial & Paved Lots	100		98
Residential Bldgs btwn 14th & 15th Aves	54" CMP	784,896	18.02	Residential (1/8 acre or less)	65	C	90
Open Space	54" CMP	299,008	6.86	Open Space (Fair Condition)	0	B	69
Parking Deck/Petracca Place	54" CMP	147,456	3.39	Commercial & Paved Lots	100		98
World Journal Bldg/Petracca Place	54" CMP	36,864	0.85	Commercial & Paved Lots	100		98
Petracca Bldg	54" CMP	194,560	4.47	Commercial & Paved Lots	100		98
Triangle Plaza	54" CMP	232,150	5.33	Commercial & Paved Lots	100		98
USPS	24" CMP	204,800	4.70	Commercial & Paved Lots	100		98

The total drainage area contributing storm water to Mill Creek, excluding downstream contributions from the proposed wetland, is approximately 71 acres.

4.4 Groundwater Resources

U.S. Geological Survey's (USGS) investigations have shown that Queens County has an upper glacial aquifer which is underlain by two deeper aquifers, Jameco-Magothy and Lloyd (Stone and Webster, 1997). The USGS descriptions of the upper glacial aquifer state that they discharge into adjacent bays or the Long Island Sound. The USGS description of historical water resources in Queens County states that seeps and springs existed in the vicinity of the project area. Data from a USGS stream gage in a nearby stream, Alley Creek, show a base flow closer to 1 cubic feet per second (cfs) for the period October 1994 to September 1995.

As part of an environmental subsurface investigation study in September-October 1994 at the Former Flushing Airport property (EEA, 1994), groundwater data was collected from six monitoring wells. Groundwater was found from just below the surface grade to a depth of approximately three feet on the site. The depth to water table from the study translates to an elevation of approximately 1.0 feet QVD to -2.0 feet QVD. EEA (1994) states that the groundwater and surface water found at the property were an interconnected system, with no definable boundary. In other words, the water table measurements were a subsurface representation of the surface water system found on-site and may not be the regional groundwater table.

The ground water flow direction at the site is to the west in the direction of Flushing Bay, appearing to mimic the original flow of Mill Creek. At the northern portion of the site, the water table is reportedly mounded in the center, where it flows downward in all directions. Ground water is tidally influenced and generally occurs at approximately 1.5 feet below grade or 11.5 feet above Mean Sea level.

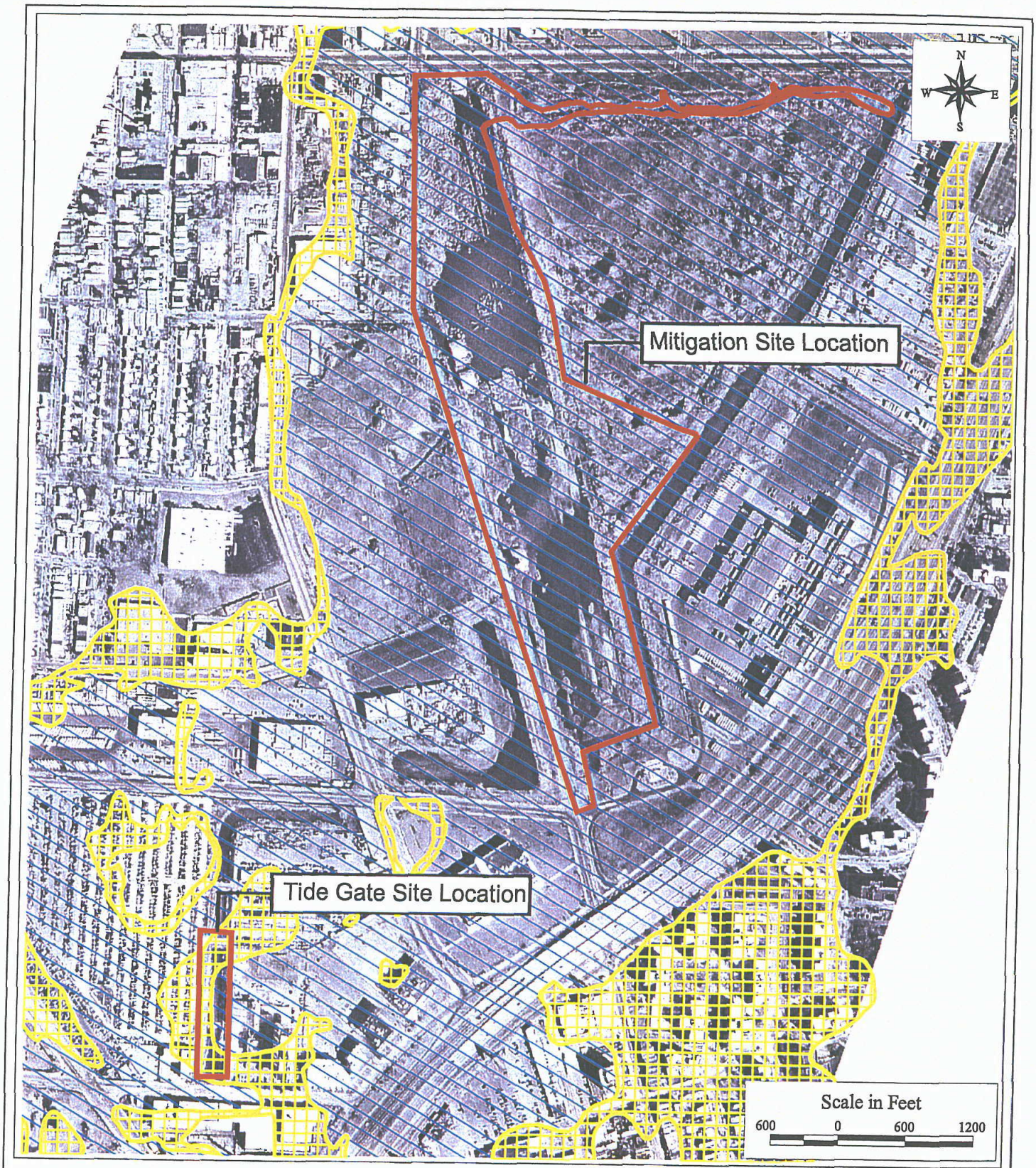
4.5 Floodplains

The Flood Insurance Rate Map published in 1983 by the National Flood Insurance Program of the Federal Emergency Management Agency (FEMA, 1983) shows that the entire Former Flushing Airport property is within the 100-year flood boundary, with a 100-year base flood elevation of 10.3 feet QVD (Figure 5). The flood boundary and flood elevations shown on the FEMA map take into account the tidal influence of Flushing Bay.

It should also be noted that Mill Creek has undergone considerable changes. Since the time of the original FEMA study, several flood mitigation features have been added to the area, including detention ponds, tide gates and additional drainage channels which may have influenced the areal extent and inundation elevation of the 100-year flood.

4.6 Wetland Resources

Historically, the site supported a tidal wetland. However, as a result of site development, placement of tide gates, relocation of Mill Creek, and an increase in storm water inputs, no tidal wetlands exist on site. The wetlands that now exist on site are classified by NYSDEC as freshwater (see Figure 6), although occasionally salinity levels approach estuarine levels due to inoperable tide gates along Mill Creek. All of the NYSDEC mapped wetlands found within the project area are located along the unpaved strips between the paved runways, taxiways, and aprons. The inundated paved areas are not included on the NYSDEC map.



Flood Zones

- AE - An area inundated by 100-year flooding, for which BFE's have been determined.
- X500 - An area inundated by 500-year flooding.

SOURCE: Mercator Land Surveying, LLC. 2003. FEMA Q3 Digital Flood Data.

New York City Economic Development Corporation

FEMA Flood Zones

Wetland Mitigation Design for the Former Flushing Airport

Location: Whitestone, Queens County, NY

Date: November 2003 ID: JR5074_report.apr

The Louis Berger Group, Inc.
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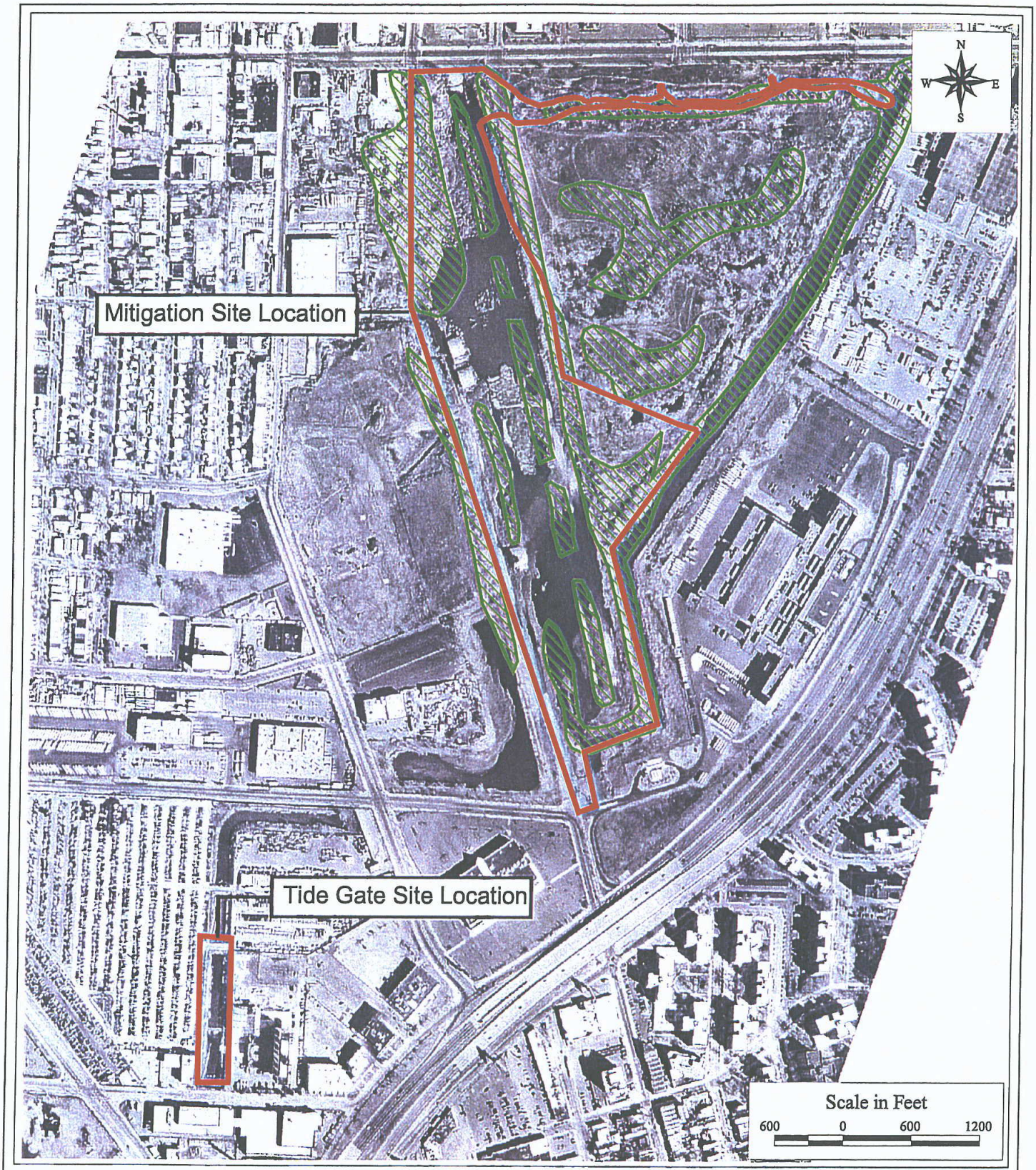
New York, NY 10005

Figure 5



Legend

NYSDEC Freshwater Wetlands

SOURCE: Mercator Land Surveying, LLC. 2003. NYSDEC Freshwater Wetlands, Queens County.

New York City Economic Development Corporation

NYSDEC Freshwater Wetlands

Wetland Mitigation Design for the Former Flushing Airport

Location: Whitestone, Queens County, NY

Date: November 2003 ID: JR5074_report.apr

The Louis Berger Group, Inc.
20 Exchange Place 22nd Floor
New York, NY 10005

Figure 6

The U.S. Fish and Wildlife Service, National Wetlands Inventory (NWI) Map (1980) (see Figure 7), also identifies freshwater wetlands in the northwestern corner of the site and within the adjacent areas.

To determine existing wetland acreage within the project area, a wetland delineation was conducted in July and August of 2003. (The triangular parcel is not included as part of the project area and was not delineated at this time.) The delineation was based on the NYSDEC and NWI wetland maps, the historical information regarding the paved surfaces (Figure 3), a previous delineation conducted in 1995, as well as site observations recorded in July of 2003. The delineation, provided in Appendix D, indicates that the existing freshwater wetland and open water areas cover an area of approximately 8.6 acres, with approximately two acres of open water and 6.6 acres of *Phragmites*-dominated area. The type of *Phragmites* that exists on site is considered to be a non-native species and invasive.

The NYSDEC classifies the freshwater wetland as a Class-II based on three characteristics:

- It is the third largest freshwater wetland in Queens.
- It is located within an urbanized area.
- It contains both an herbaceous and a water vegetative structural group.

4.7 Vegetation

Subaquatic vegetation located within the project site includes widgeon grass (*Ruppia maritima*), coontail (*Ceratophylum demersum*), and Naiad (*Najas flexilis*). *Phragmites* dominates the vegetative plant communities within the project area. Other species that occur in small isolated patches includes: switchgrass (*Panicum virgatum*), purple loosestrife (*Lythrum salicaria*), black grass (*Juncus gerardi*), chair-maker's rush (*Scirpus pungens*), and soft-stem bulrush (*Scirpus validus*).

The majority of the upland habitat is located east of open water and freshwater wetland areas, outside of the project area. Past studies indicate that the upland areas provide poor quality habitat dominated by invasive plant species and disturbed soils containing large quantities of construction materials, rock, glass, sand, and other materials not conducive to upland plant propagation.

The upland habitat is dominated by herbaceous plant species and consists primarily of mugwort (*Artemisia vulgaris*). Mugwort is a highly invasive plant species of low wildlife value found in fill-dominated soils throughout the city. Other species observed in the upland include: *Phragmites,* seaside goldenrod (*Solidago sempervirens*), English plantain (*Plantago lanceolata*), Queen Anne's lace (*Daucus carota*), and common mullein (*Verbascum thapsus*). These are common urban species found in degraded, filled, upland habitats. Very few woody shrubs or trees are found on the site. A few tree-of-heaven (*Ailanthus altissima*), cottonwood (*Populus deltoides*), and smooth sumac (*Rhus glabra*) are located around the periphery of the project site.

4.8 Coastal Resources

The mitigation/restoration project site lies within the coastal zone as defined within the *Coastal Zone Boundary Appendix* (May 1997). The coastal zone boundary defines the geographic scope of the Waterfront Revitalization Program (WRP). Pursuant to federal statute, the boundary encompasses "all land and water uses of direct and significant impact on coastal waters".

Since the project lies within the Coastal Zone and requires approvals from both the NYSDEC and USACE, the project must show consistency with the policies and intent of the New York State Coastal Zone Management Program, under the direction of the NYS Department of State (NYSDOS), and the local WRP.

Figure 7: USFWS NWI Map

To determine consistency, the New York City WRP Consistency Assessment Form was completed and is presented in Part 1 of this report. The form consists of a series of location and policy questions, and a negative answer to each of the questions presumes that the project is in compliance with the stated location and policy questions. In assessing the consistency of this project, all of the location questions were negatively answered and all but four of the policy questions were negatively answered. The four questions that were positively answered are discussed further below.

Policy Question 21: Would the action involve any activity in or near a tidal or freshwater wetland?

The proposed action will protect and restore freshwater wetlands. Historically, the project site contained a tidal wetland. However, due to development, placement of tide gates along the tidal input, and increased storm water runoff to the site, the site is now classified as a freshwater wetland.

The proposed action involves enhancing the existing wetland areas and restoring additional wetland areas. This action is consistent with the stated property in that it will (1) avoid the draining of, placement of fill in, or excavation of wetlands; (2) minimize adverse impacts, and (3) provide mitigation for any adverse impacts that may remain after all appropriate and practicable minimization measures have been taken. There will be no placement of fill in existing wetland areas. Areas to be excavated include only those areas that were previously filled or developed and are now paved. Wetland areas will be temporarily drained and filled during construction to protect water quality and prevent soil erosion and sedimentation, but all temporary berms will be removed after construction is complete and the wetland areas will be restored and planted and seeded with native vegetation.

Vegetative buffers to the wetland areas consisting of scrub-shrub floodplains and forested uplands will be restored on site. Currently, floodplain and upland areas are dominated by invasive species indicative of disturbed areas (e.g. mugwort). Vegetated berms (to be dominated by native grasses) will be constructed around portions of the site to preserve the hydrologic balance within the wetland and the surrounding upland area.

Although the historical tidal wetland cannot be restored due to changes that occurred both on site and off site over time, the historical functions of the wetland system will be restored. Wetland functions, such as water quality, flood storage, and wildlife and fish habitat, will be restored and maximized.

Policy Question No. 30: Will the project involve the excavation or placing of fill in or near navigable waters, marshes, estuaries, tidal marshes or other wetlands?

The proposed action will protect water quality during construction. The construction will include excavating the previously filled and/or developed areas to remove historical fill, and all paved surfaces and structures. To protect water quality and prevent soil erosion and sedimentation during construction, a berm will be placed within the wetland area during construction to divert drainage.

No dredging will occur within the site. Excavation and fill operations will meet state standards for physical, health and aesthetic factors. All excavation and placement of fill will occur during the fall and winter months, and will minimize potential adverse impacts on aquatic life. Excavated materials, other than asphalt, will be reused on site within upland and berm areas. The wetland mitigation and restoration will result in enhanced

and increased habitat for aquatic life, including the creation of deep pools and emergent vegetated zones.

Policy Question No. 34: Would the action involve construction or reconstruction of a flood or erosion control structure?

The inoperable tide gates located on Mill Creek, southwest of the site, will be reconstructed as part of this mitigation and restoration project. Currently, the tide gates are allowing tidal flows from Flushing Bay to flow in and out of the site twice daily. The restored tidal gates will allow for the site to function as a freshwater wetland habitat, but will allow flood flows to move out into the Bay if necessary. Therefore, the proposed project will maximize the flooding and erosion protective capacities of the site.

Policy Question No. 40: Would the action result in development of a site that may contain contamination or that has a history of underground fuel tanks, oil spills, or other form of petroleum product use or storage?

The site has been surveyed for the presence of contamination. Three areas with elevated levels related to underground storage tanks were identified. To remediate these areas, the City of New York and the EDC has begun implementing the *Site Specific Investigation Plan* (May 2000), developed for the NYS Department of Sanitation, prepared for the NYC Department of Design and Construction, and developed by Liro Engineering & Construction Management. These areas with elevated levels will be removed and disposed of in accordance with all federal and state regulations prior to the construction of the wetland mitigation/restoration site.

Based on this assessment, the proposed actions appear to be consistent with all of the WRP and NYSDOS policies.

5.0 WETLAND MITIGATION/RESTORATION DESIGN

Establishment of the proper hydroperiod for the proposed wetland is critical to the success of the mitigation/restoration project. Therefore, in support of the wetland restoration design, a detailed hydrologic and hydraulic analysis was performed. The analysis consisted of storm water modeling using an integrated two-dimensional storm water management model to predict storm water runoff from specific precipitation events and the development of a detailed water budget for the wetland areas. Based on the results of the modeling and the needs of the wetland areas, an outlet structure was designed that would detain water within the wetland long enough to establish a wetland hydroperiod that can support the development of a healthy wetland eco-system, as well as safely pass the runoff from larger storm events without inducing excessive upland flooding.

5.1 Storm Water Modeling

Hydrologic and hydraulic modeling was performed using the integrated two-dimensional storm water management model, MIKE-SWMM (DHI, 2003), to simulate the inflow of storm water from contributing drainage areas into the wetland areas to determine whether the storm water runoff from contributing areas is sufficient to fill the proposed open water and emergent wetland areas and to meet the wetland hydroperiod requirements. The simulations were performed for one-year, two-year, and five-year storm events.

MIKE-SWMM is a link-node based model that performs hydrology, hydraulic, and water quality analysis of storm water and wastewater drainage systems. A link represents a hydraulic element (such as a pipe, channel, culvert, or weir) that transports flow and its constituents. A node can represent the junction of two or more links, or as storage element, such as a detention pond or lake. MIKE-SWMM provides both non-linear reservoir routing (Runoff Modeling) and full hydrodynamic wave routing (Extran Modeling) for performing hydraulic analysis. Runoff inflow from all contributing drainage areas are computed using several methods, including the NRCS Method, by accounting for rainfall into all the catchments. The Runoff Modeling provides a non-linear reservoir formulation for channel and pipes. The Extran Modeling solves the complete dynamic flow routing equations (St. Venant's equations) throughout the drainage network and includes modeling of backwater effects, flow reversal, and interconnected ponds.

5.1.1 Methodology and Assumptions

For the purposes of the hydrologic modeling, the off-site drainage areas were broken up into sub-areas (or catchments) that led to outfalls into the proposed wetland. The model input information for the off-site drainage areas was determined from a combination of sources including: aerial photographs from the 1998 Digitally Enhanced Ortho-imagery (NYSDOS, 1998); as built drawings obtained from New York City Department of Environmental Protection (NYCDEP) Division of Water and Sewers; Related Retail (developers of Target and BJs retail centers); the Mattone Group (developers of Waldbaums and Staples shopping centers); and Edwards and Kelcey (the architects of the Linden Place Reconstruction Project).

The important methods, assumptions, and input data used to run the MIKE-SWMM model for this application are described in the following sections.

5.1.2 MIKE-SWMM Runoff File Input Data

Hydrologic modeling of off-site drainage areas was performed using the Soil Conservation Service (SCS) method in MIKE-SWMM. The one-year, two-year and five-year, 24-hour rainfall amounts for Queens County, New York (2.7 inches, 3.5 inches and 4.5 inches respectively), were obtained from the New York State Erosion and Sediment Control Guidelines (SWCS, 1997) and the Type III rainfall distribution values (NRCS, 1986) for these 24-hour events were input into the model in 15-minute increments.

Runoff volumes from the off-site drainage areas were computed using the NRCS method. Runoff hydrographs were generated using the NRCS dimensionless hydrograph method. The runoff curve numbers for the NRCS method were selected from tables given in the NRCS Technical Report No. 55 (NRCS, 1986) using land use from the aerial photographs and soils information from the New York City Soil Survey (NRCS, 2003), and assuming average antecedent moisture conditions. The time of concentration was computed as detailed in the NRCS Technical Report No. 55 by considering sheet flow, shallow concentrated flow, and open channel flow. Each of the lag times, computed from the time of concentrations, were specified directly into the model in hours. The runoff curve numbers and time of concentrations computed for each of the contributing drainage areas are given in Table 2, along with background information on the drainage areas.

5.1.3 MIKE-SWMM Conduit and Junction File Input Data

MIKE-SWMM requires input files describing the conduits and their associated junctions for each of the storm water drainage pipe conveyance systems discharging into the proposed wetland. The conduit data input for each pipe segment included depth, width, length, area, upstream and downstream inverts, roughness coefficients, and head loss coefficients of the pipes. The junction data input for each catch basin or manhole consisted of ground elevation, invert elevation, and coordinates of all the junctions.

The proposed wetland was modeled as a variable area storage junction and was described by the depth-area relationship of the pond. Outflow from the proposed wetland was modeled using standard reservoir routing techniques and the proposed outlet structure weir configuration.

Schematics of the contributing drainage areas to the proposed wetland, including the pipe networks consisting of all junctions and conduits, are presented as Figure E-1-1 in Appendix E-1.

The final configuration of the weir system modeled for the proposed wetland area consisted of a 90° V-notch weir (primary weir) with an invert elevation of -1.0 feet QVD and a 25-foot long broad crested weir (secondary weir) with a crest elevation of 0.0 feet QVD, and a 25-foot long auxiliary spillway with a crest elevation of 1.2 feet QVD. To create a wetland that will include open water and emergent wetland areas, and will allow slow release of water after inundation from a storm event, a multistage weir such as this is required. In addition, the auxiliary spillway is required to safely pass excess water from larger storm events. Initial estimates for V-notch weir angle, V-notch weir invert elevation, broad-crested weir length, and broad-crested weir crest elevation were assumed based on the results of previous studies, past experience, and the existing topography of the location where the outlet structure is to be constructed. These initial estimates were revised through an iterative procedure of balancing the results of the MIKE-SWMM modeling with the results of the water budget analysis (discussed in section 5.4).

While setting up the MIKE-SWMM input file, it is important to set a small value for the time step, since this will yield a lower percent error for the overall model. For the models runs described here, the specified time step was set at 5 seconds.

5.1.4 Simulation Scenarios

MIKE-SWMM was used to simulate storm water flow into the proposed wetland area for the 1-year, 2-year, and 5-year storm events using two initial water level conditions within the open water area of the wetland. The first scenario was called the "dry pond" condition, where the open water area was assumed to be completely empty to the bottom elevation of -7.0 feet QVD. This scenario represents the worst-case for determining if there is sufficient storm water to fill the wetland and meet the wetland hydroperiod requirements. The second scenario was called the "wet pond" condition, where the open water area was assumed to be full to the V-notch invert elevation of -1.0 feet QVD.

5.1.5 Results and Discussion

The estimated runoff inflow characteristics into the proposed wetland are summarized in Table 3. The table shows the peak discharge, average discharge, and volume of water from the various contributing drainage areas into the proposed wetland for 1-year, 2-year, and 5-year storm events respectively. As shown in Table 3, the total peak runoff inflow into the proposed wetland for a 1-year storm event is 298 cubic feet per second (cfs) and the total volume of water is approximately 37.6 acre-feet. The total peak runoff inflow into the proposed wetland for a 2-year storm event is 414 cfs and the total volume of water is approximately 50.9 acre-feet. The total peak runoff inflow into the proposed wetland for a 5-year storm event is 531.6 cfs and the total volume of water is approximately 67.5 acre-feet.

During a storm event, the water surface within the proposed wetland will begin to rise as water flows into the wetland. At some point, as the storm begins to pass and the runoff inflow from contributing drainage areas begins to slow, the water within the proposed wetland will reach its maximum stage (elevation) after which the water surface elevation within the proposed wetland will drop until it reaches the invert of the weir.

Table 3: Hydrologic Description of Drainage Areas Contributing to the Wetland

Drainage Area Description	Receiving Pipe	Area (ft^2)	Area (acres)	Land Use	Impervious Surface (percent)	Hydrologic Soil Group	Curve No.	Time of Concentration (hrs)
Related Retail (BJs)	Wetland 48" CMP	529,094	12.15	Commercial & Paved Lots	100		98	1.01
Related Retail (Target)	Wetland 54" CMP	499,450	11.47	Commercial & Paved Lots	100		98	1.07
The Mattone Group (Waldbaums, Staples) and Condo Bldg	Wetland 24" CMP	352,256	10.91	Commercial & Paved Lots	100		98	1.03
132nd Street	132nd Street Site 54" CMP	49,152	1.13	Roadway	100		98	1.27
Jetro (Large Bldg)	132nd Street Site 54" CMP	147,968	3.40	Industrial/ Commercial	100		98	0.40
Jetro (Small Bldg)	132nd Street Site 54" CMP	73,728	1.69	Industrial/ Commercial	100		98	0.14
Nextel/Motorola Bldg	132nd Street Site 54" CMP	49,152	1.13	Industrial/ Commercial	100		98	0.15
Commercial Bldgs (Modern, Continental)	Wetland 3-8" CMP	262,144	6.02	Commercial Urban District	85	B	92	0.48
Hi-Realty Property	Wetland Overland flow	81,920	1.88	Open Space (Fair Condition)	0	B	69	0.11
Linden Pl/ 23rd Avenue/ 130th Street	Linden Pl StormSewer 6-12" CMP 1-18" CMP	229,263 41,143	5.26 0.94	Roadway Brush-Weeds-Grass (<50% cover)	100 0	B	98 67	1.53 0.54

Table 4: Estimated Inflow and Total Runoff Volumes from the Contributing Drainage Areas into the Proposed Wetland for the Storm Events

	Total Hydrograph Volume	Total Hydrograph Volume	Average Flow	Total Peak Flow	Maximum Peak Flow
Units	**cubic feet**	**acre-ft**	**cfs**	**cfs**	**cfs**
1-Year Storm	1,638,707	37.62	4.3	298.3	29.6
2-Year Storm	2,217,123	50.90	6.1	414.0	44.5
5-Year Storm	2,941,963	67.54	8.5	531.6	45.4

The stormwater runoff inflow hydrographs were routed through the wetland and the proposed outlet structure using standard reservoir routing techniques. The routing considered discharge through the multiple outlet structure (primary V-notch weir, secondary broad-crested weir, and auxiliary spillway) and evaporation and seepage losses. The stage and flow hydrographs obtained from the routing technique for the one-year, two-year, and five-year storm events (for the dry pond and the wet pond scenarios) are provided in Appendix E-1.

The maximum elevation reached in the wetland for the one-year, two-year, and five-year storm events are tabulated in Table 5. The maximum elevation values in Table 5 shows that runoff from contributing areas

is sufficient to fill the proposed wetland and pass water over the weir (over the primary V-notch weir for the 1-year dry pond scenario and over the primary V-notch and secondary broad-crested weirs for all the other scenarios). Table 5 also shows the final elevation of water in the open water after the water had completely receded back to the crest elevation of the V-notch weir.

Table 5: Water Surface Elevation in Wetland for One-Year, Two-Year, and Five-Year Storm Events

Initial Water Level	Dry Pond	Wet Pond	Dry Pond	Wet Pond	Dry Pond	Wet Pond
Storm Event	1-Year	1-Year	2-Year	2-Year	5-Year	5-Year
Maximum Water Surface Elevation in the Proposed Wetland (ft)	-0.37	+0.52	+0.18	+0.81	+0.48	+1.15

The duration of inundation and saturation of the emergent wetland area were then computed in the following manner. The duration of inundation was computed as the amount of time water was above the surface of the emergent wetland area. For the purposes of this analysis, it was assumed that the water level in the emergent wetland area was receding at a rate equal to the rate at which the water level in the open water area was receding. This assumption was based on the close proximity between emergent wetland area and the open water area throughout the wetland, and that the subsurface water in the emergent wetland is hydraulically connected with surface water in the open water throughout the wetland. The lag time expected between the water levels in the open water area and the water levels in the emergent wetland area is minimal, as the soil in the upper 4-5 feet of the proposed emergent wetland is fill and soils of coarser texture (silt loam soils). Therefore, the duration of saturation in the emergent wetland area can be approximated by the time it takes for water level to drop from the maximum elevation in the wetland to the lower boundary of the zone of saturation in the open water area.

The duration of inundation and saturation for the emergent wetland area, computed using the methodology described above, is presented in Table 6. The results show that the duration of continuous saturation and/or inundation following a 1-year storm event is greater than 5 percent (12.4 days) of the growing season and that the duration of continuous saturation and/or inundation falls within the target hydroperiod of 5 percent (12.4 days) to 12.5 percent (31 days) of the growing season. Therefore, it can be concluded that the proposed design exhibits the required wetland hydroperiod for the emergent wetland area for one-year, two-year, and five-year storm events.

Table 6: Duration of Inundation and Saturation for the Emergent Wetland Area Following One-Year, Two-Year, and Five-Year Storm Events

Initial Water Level	Dry Pond	Wet Pond	Dry Pond	Wet Pond	Dry Pond	Wet Pond
Storm Event	1-Year	1-Year	2-Year	2-Year	5-Year	5-Year
Duration of Inundation (days)	1.4	3.7	3.6	3.8	3.8	3.8
Duration of Saturation (days)	27.8	30.0	29.8	30.2	30.0	30.2

5.1.6 Summary

The storm water modeling results show that the runoff from the one-year, two-year and five-year storm events provide a sufficient amount of water to fill the proposed wetland area to elevations above the emergent wetland areas (elevation -0.5 feet QVD), even under the worst-case scenario with the open water area completely "dry" prior to the storm event. The duration of saturation predicted from the

modeling results show that the emergent wetland area will result in continuous inundation and/or saturation for 5 percent to 12.5 percent of the growing season for all storm events and scenarios simulated. The proposed design, therefore, exhibits the required wetland hydroperiod for the emergent wetland area for the one-year, two-year, and five-year storm events.

5.2 Hydraulic Design of Auxiliary Spillway

The auxiliary spillway was designed as part of the wetland mitigation/restoration plan so that, in the event of a large storm, excess water could be passed through the wetland without causing excessive upland flooding. The auxiliary spillway was designed so that it will only be active during larger storm events, storm events greater than the five-year storm. Therefore, the crest elevation of the auxiliary spillway was set at 1.2 feet QVD, just above the predicted maximum water surface elevation from the five-year "wet pond" simulation (presented above).

In sizing the width of the auxiliary spillway, two scenarios involving the modeling of a large storm event (the 100-year storm) were considered. In the first scenario, it was assumed that Mill Creek will not be able to drain during the storm due to an extended high tide event (or storm surge) that will keep the downstream tide gates closed. In this scenario, storm water will discharge into the wetland and Mill Creek and the water will reach an equilibrium elevation before it can be discharged downstream. In the second scenario it was assumed that the wetland is free to drain into Mill Creek throughout the duration of the storm with no tail water effects. For both design scenarios, it was assumed that the initial water level in the wetland and Mill Creek are at the normal pool elevation of -1.0 feet QVD (the V-notch weir invert elevation).

For the first scenario, the total storage volume available in the event of a major flood event is approximately 126 acre-feet. This storage area is comprised of the proposed wetland areas, Mill Creek, and the 25-acre parcel in the former Flushing Airport property up to an elevation of approximately three feet QVD. Water elevations above three feet QVD will overflow the banks of Mill Creek and back up into the adjacent properties, such as the New York Times and USPS facility. For the purposes of this analysis, it was assumed that the majority of the 25-acre parcel will be developed and filled to an elevation of more than three feet QVD and thus be unavailable for storm water storage.

The total storm water runoff volume generated by a 100-year storm event for the proposed wetland and Mill Creek combined is approximately 167 acre-feet of water. Since this volume of water is greater than the available storage volume up to elevation three feet QVD, it was assumed that water will spill into the adjacent properties and thus, a maximum water surface elevation of three feet QVD was used for the analysis. The volume of water in the proposed wetland area corresponding to this maximum water surface elevation was then routed over the auxiliary spillway, primary and secondary weirs to determine the time to discharge the storm water generated from the 100-year storm event, through the proposed wetland. The results showed that the 25-foot wide auxiliary spillway and proposed outlet structure configuration can discharge a sufficient volume of water to reduce the water surface elevation in the wetland from 3.0 feet to 0.0 feet in approximately 15 hours. The discharge water surface plot for Scenario 1 is shown in Appendix E-2.

In the second scenario, it was assumed that the wetland is free to discharge the storm water runoff from the 100-year storm event into Mill Creek throughout the duration of the storm. Therefore, the 100-year storm inflow hydrograph was routed through the wetland and the proposed auxiliary spillway and outlet structure configuration to determine the maximum flood stage in the wetland and the duration of inundation above the outlet weirs. The results of this analysis showed that the water surface rose to a maximum elevation of 1.95 feet QVD and drained down to the crest of the broad crested weir (elevation

0.0 feet QVD) approximately 40 hours after the onset of the storm. The inflow, outflow and water surface discharge plots for Scenario 2 are shown in Appendix E-2.

Based on the results of the two scenarios, it was determined that the proposed 25-foot long auxiliary spillway, with a crest elevation of 1.2 feet QVD, in conjunction with the proposed outlet structure, will pass the 100-year storm event in a reasonable period of time without inducing any excessive flooding.

5.3 Riprap Stone Sizing

Riprap protection is required for erosion control and energy dissipation, on either side of the V-notch, broad-crested weir and auxiliary spillway combination (the outlet structure). Since riprap protection is being provided for erosion control, velocity considerations were first examined. The riprap stone sizing for velocity considerations was based on a velocity based riprap design procedure outlined in the USACE Riprap Revetment Design Manual (USACE, 1989).

Due to the design configuration of the spillways, flow through outlet structure was modeled as an open channel. Erosive forces in and around the outlet structure typically occur in the following locations: the upstream (wetland) side of the weir and spillway as the water enters the outlet structure from the wetland; along the crest of the weir and spillway; and the downstream (Mill Creek) side of the weir and spillway as the water is leaving the outlet structure to Mill Creek. During flows that result in maximum velocities, the most erosive forces occur on the downstream side of the weir and spillway. Therefore, the riprap stone sizing was based on velocities at the downstream side of the outlet structure.

The velocity based riprap design procedure is based on shear stress theory, yet in its final form uses flow velocity and flow depth as its controlling parameters. According to the velocity-based procedure, the D_{50} riprap stone size is given by:

$$D_{50} = \frac{0.007V^3}{d_{avg}\,0.5(K_1^{1.5})} \qquad (1)$$

where:

V = average section velocity in the main flow channel in meters/second
d_{avg} = the average cross section depth in the main flow channel in meters
K_1 = bank slope correction term

The maximum velocity encountered at the outlet structure for a 100-year storm event was estimated from calculations in the spillway design section (Appendix E-2) as 3.46 ft/sec at a flow depth of 1.8 feet above the spillway crest elevation and 4.48 ft/sec at a flow depth of 3.0 feet above the broad-crested weir crest elevation. The bank slope correction term was computed using nomograph in the USACE Riprap Revetment Design Manual by using the bank angle on the downstream side of the weir and the material angle of repose for very angular rocks with mean stone size D_{50} of 6 to 18 inches. Using the above input data in equation 1, the mean stone size (D_{50}) to handle the velocities design velocities was computed as 2 inches for both the auxiliary spillway and the secondary broad-crested weir. However, in order to account for energy dissipation, a minimum D_{50} stone size of 6 inches was recommended for all the riprap structures in the proposed wetland area.

5.4 Water Budget

The water budget analysis for the proposed open water and emergent wetland areas comprised of: a daily continuous water budget for a year with normal rainfall and evaporation (normal year – 1974); a year with the difference between rainfall and evaporation much lower than the long-term average (dry year – 1995); and a year with the difference between rainfall and evaporation much higher than the long-term average (wet year – 1983).

The daily water budget was developed to verify if the open water and emergent wetland areas met the wetland hydroperiod for dry years (which also had dry spring months), normal years (which also had normal rainfall and evaporation during spring months), and wet years (which also had wet spring months). The year with normal spring and annual rainfall and evaporation, year with spring and annual rainfall and evaporation much below normal, and the year with spring and annual rainfall and evaporation much above normal were selected after examining rainfall and pan evaporation data for the period 1972 through 2001.

Potential hydrologic sources for the proposed wetland creation areas include precipitation and runoff from offsite and onsite contributing drainage areas. Potential hydrologic losses include evapotranspiration, seepage from the open water area, percolation from the emergent wetland area, and surface water outflow through the outlet structure. Even though groundwater recharge and discharge may occur to and from the open water area, it was assumed that the groundwater inflow and outflow did not result in a change in water storage within the open water area. Based on this assumption, groundwater recharge and discharge was not considered in the daily water budget analysis.

The methodology and results for the daily water budget are described in the next sections.

5.4.1 Methodology

The daily water budget for the proposed wetland area was developed following an application of the conservation of mass law expressed by the equation of continuity:

$$\underbrace{\Delta S}_{\text{Change in Storage}} = \underbrace{(P + Q_R + R_O)}_{\text{Inflow}} - \underbrace{(ET + Q_D + C)}_{\text{Outflow}} \qquad (2)$$

Where:

ΔS = Change in storage
P = Precipitation
Q_R = Groundwater recharge
R_O = Runoff from contributing drainage areas
ET = Evapotranspiration
Q_D = Groundwater discharge
C = Seepage or Percolation

This approach is consistent with guidance suggested by Pierce (1993) and Garbisch (1994). Equation 2 is expressed in units of volume for each month. Equation 2 can be expressed in terms of depth of water per day by taking into consideration the sources and losses, as well as the stage-volume relationship of the wetland.

The general equation for computing the final water surface elevation can be expressed as follows:

$$EL_2 = \Delta S + EL_1 \quad (3)$$

Where:

EL_2 = Water elevation at the end of the period in feet
EL_1 = Water elevation at the beginning of the period in feet
ΔS = Change in storage (can be positive or negative)

Equations 2 and 3 were implemented to the open water and emergent wetland areas in the following manner. The volume of water from daily precipitation and runoff, if any, was first fed into the wetland area. The water elevation in the open water and emergent wetland area was then determined using the stage-volume relationship of the wetland that included the open water area and the emergent wetland area. The discharge losses through the primary V-notch weir and the secondary broad-crested weir as well as evaporation and seepage losses from the open water area were then subtracted to obtain the final water elevation in the open water area. The methods used for computing the sources and losses in Equation 2 are discussed in detail in the following sections.

Daily precipitation recorded at the nearest weather station with historical rainfall and evaporation data were the main weather data used in the water budget analysis. The daily water budget was performed on three typical years (normal year – 1974, wet year – 1983, and dry year – 1995) after examining long-term weather data (rainfall and pan evaporation). Evaporation from the open water and emergent wetland areas was considered equal to the daily pan evaporation observed at the weather station.

Groundwater recharge/discharge can be estimated using the following equation:

$$Q_R \text{ or } Q_D = \frac{KW}{2L}(H^2 - h^2) \quad (4)$$

Where:

Q_R/Q_D = Groundwater recharge or groundwater discharge (cubic feet/month)
K = Hydraulic conductivity of groundwater (feet/month)
W = Width of the recharge/discharge area (feet)
L = Length of phreatic (groundwater) line (feet)
H = Height of the static groundwater column above reference elevation at recharge point (feet)
h = Height of the static groundwater column above reference elevation at discharge point (feet)

As previously discussed, groundwater recharge and discharge were not considered in the water budget.

Run-off from each of the contributing drainage areas into the wetland was estimated using the NRCS Runoff Curve Number method (NRCS, 1986). According to this method, runoff volume is determined as:

$$R_o = \frac{(P - 0.2S)^2}{(P + 0.8S)} \quad (5)$$

Where:

R_o = Run-off (inches/month)
P = Rainfall (inches/month)
S = Potential maximum retention after runoff begins (inches/month)

Potential maximum retention, S, is related to soil and cover conditions of the drainage area through the curve number (CN). CN has a range of 0 to 100, and S is related to CN by:

$$S = \frac{1000}{CN} - 10 \qquad (6)$$

Seepage from the open water and emergent wetland areas were assumed to occur at a steady rate computed using Darcy's Law:

$$C = \frac{K_s H}{L} \qquad (7)$$

Where:

C = Seepage/percolation loss below the lower boundary (inches/month)
K_s = Effective vertical saturated hydraulic conductivity of the soil column that drives water through the lower boundary (inches/month)
H = Head that drives water through the lower boundary (inches)
L = Thickness of the saturated soil column (inches)

5.4.2 Assumptions

The daily water budget for the wetland area was based on the following assumptions on the proposed site conditions.

It was assumed that the water level in the emergent wetland area was receding at a rate equal to the rate at which the water level in the open water area was receding. This assumption can be justified in the following manner. The emergent wetland area lies in close proximity to the open water area throughout the wetland, and in the southern portions of the wetland, the emergent wetland area is situated between the open water area and Mill Creek. Therefore, the subsurface water in the emergent wetland is hydraulically connected with surface water in the open water throughout the wetland. The lag time expected between the water levels in the open water area and the water levels in the emergent wetland area is minimal as the soil in the upper 4-5 feet of the proposed emergent wetland is fill and soils of coarser texture (silt loam soils).

Since the regional groundwater table at the wetland area could not be determined accurately and due to the absence of detailed shallow groundwater measurements at the proposed wetland area, assumptions were made with respect to groundwater recharge and discharge terms in Equation 2 and the lower boundary for seepage loss computations. With respect to the groundwater recharge and discharge terms in equation 2, groundwater input into the wetland was assumed to be balanced by groundwater export and therefore assumed to not result in a change in water storage within the wetland area. In other words, the net increase in groundwater elevation due to groundwater recharge was assumed to be negated by the net decrease in groundwater elevation due to groundwater discharge. As a result of this assumption,

groundwater recharge and discharge terms cancel each other in the water balance equation (Equation 2). With respect to the lower boundary for seepage loss computations, soil layers with low vertical hydraulic conductivities were assumed to be present beneath the wetland below an elevation of -4.0 feet QVD.

Initial water elevation in the open water and emergent wetland areas was assumed to be at -1.0 feet QVD.

5.4.3 Input Variables

A summary of the water budget input variables and their sources are provided in Table 7. Daily precipitation recorded at the New York LaGuardia Airport and daily pan evaporation data recorded at the nearest weather station with historical evaporation data, New Brunswick, New Jersey, were the important weather data used in the water budget analysis. The weather data were obtained from the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) weather station for the selected years.

The water budget for the wetland area was performed on a daily basis for the years 1995 [8.13 inches below annual average of the difference between monthly rainfall and monthly evaporation for the period 1972 through 2001, 5.13 inches below spring (March through May) average of the difference between monthly rainfall and monthly evaporation for the period 1972 through 2001], 1974 [0.59 inches above annual average of the difference between monthly rainfall and monthly evaporation for the period 1972 through 2001, 0.34 inches above spring average of the difference between monthly rainfall and monthly evaporation for the period 1972 through 2001], and 1983 [10.46 inches above annual average of the difference between monthly rainfall and monthly evaporation for the period 1972 through 2001, 12.27 inches above spring average of the difference between monthly rainfall and monthly evaporation for the period 1972 through 2001].

All drainage areas off-site and within the Former Flushing Airport properties that have the potential to contribute storm water runoff to the proposed wetland were considered in the water budget. The name of the contributing areas, the drainage areas, and their curve numbers are provided in Table 2. In addition to the areas listed in Table 2, runoff from the upland areas and floodplain areas within the wetland and direct precipitation on the emergent wetland area and open water area were considered in the water budget.

To estimate seepage losses, vertical saturated hydraulic conductivity of the pond liner in the open water area were estimated based on the HELP Model Engineering Documentation for Version 3 (USACE, 1994). The U.S. Department of Agriculture textural classification assumed and the vertical saturated hydraulic conductivity selected are provided in Table 7.

5.4.4 Output Analysis

The water budget for the open water area and the emergent wetland area was developed on a spreadsheet using the methodology, assumptions, and the input data presented in the previous sections. The spreadsheet model is given in Appendix E-3.

Total volume of water available from direct precipitation and runoff available to service the wetland areas for a dry year (1995), a normal year (1974), and a wet year (1983) are shown in Table 8.

The annual water balance components, with the exception of the discharge losses through the weir (discussed in MIKE-SWMM section), for the dry year (1995), normal year (1974), and wet year (1983) are provided in Table 9. These water balance values show that there is a net loss (negative storage) of water from the wetland.

Table 7: Input Variables for the Water Balance Model for the Proposed Wetland

Parameter	Source
Precipitation	LaGuardia Airport, NY, NOAA NWS weather station – Dry Year (1995), Normal Year (1974), Wet Year (1983)
Runoff	Runoff from contributing drainage areas (99 acres). Curve numbers used for each drainage areas contributing to wetland are provided in Table 2
Evapotranspiration (ET)	Evaporation in the open water area and ET in the emergent wetland area were estimated from pan evaporation data. Pan evaporation from New Brunswick, NJ, NOAA NWS weather station for the years 1974, 1983, and 1995 were used.
Seepage	Vertical saturated hydraulic conductivity (K_s) of the pond liner was based on HELP Model Engineering Documentation for Version 3 (USACE, 1994) and was assumed to be $1.2x10^{-6}$ cm/sec.
Outlet Structure Details	The primary 30° V-notch weir crest elevation is set at -1.0 feet QVD. The secondary broad-crested weir with crest length of 25 feet was set at 0.0 feet QVD. The secondary spillway with crest length of 25 feet was set at +0.5 feet QVD.
Emergent Wetland Surface Elevation and Zone of Saturation	The Emergent Wetland Surface Elevation was set at -0.5 feet QVD and the zone of saturation (root zone) was 12 inch thick ranging from -0.5 feet QVD to -1.5 feet QVD.

Table 8: Monthly Volume of Water available for the Wetland from Direct Precipitation and Runoff Inflow for Dry Year, Normal Year and Wet Year

Month	Runoff Inflow Volume (acre-feet)		
	Dry Year (1995)	Normal Year (1974)	Wet Year (1983)
January	9.44	6.66	11.54
February	9.25	2.34	7.91
March	2.71	12.78	23.50
April	4.00	7.16	37.86
May	6.25	10.40	9.17
June	6.17	6.00	5.16
July	16.20	3.94	9.65
August	0.15	17.05	7.11
September	7.79	20.36	10.59
October	17.11	5.99	22.73
November	11.29	1.90	13.30
December	5.19	20.26	19.70
Annual Total	95.55	114.85	178.21

Table 9: Annual Water Balance Components for the Open Water Area for Dry Year, Normal Year and Wet Year

Component	Annual Total		
	Dry Year (1995)	Normal Year (1974)	Wet Year (1983)
Rainfall (inches)	35.35	41.64	60.87
Initial Water in the Wetland (ac-ft)	+28.07	+28.07	+28.07
Direct Precipitation + Runoff Inflow (ac-ft)	+95.55	+114.85	+178.21
Evaporation (ac-ft)†	–53.10	–53.46	–56.34
Seepage (ac-ft)†	–156.96	–159.66	–159.84

† Volume of water computed by spreading the loss over the sum of the surface areas of open water and emergent wetland areas (18.0 acres)

The daily water budget results for the open water area are presented graphically in Figure 8 for a dry year (1995), a normal year (1974), and a wet year (1983). Figure 8 shows that the open water area will remain inundated throughout the growing season, even in the dry years. The lowest predicted water surface elevation during the growing season in the dry year, normal year, and wet year was -2.67 feet QVD, -1.89 feet QVD, and -1.62 feet QVD, respectively.

From Figure 8, it can also be deduced that the water levels in the emergent wetland, which was assumed equal to water levels in the open water area, were in the zone of saturation (root zone) for more than 31 days in the growing season of all three years simulated.

Thus, the water budget results from dry year (1995), normal year (1974), and wet year (1983) shows that the target duration of inundation of 75 percent to 100 percent in the open water area and the target duration of saturation of 12 to 31 days of continuous inundation and saturation (5 percent to 12.5 percent of the growing season) in the emergent wetland area would be achieved. Therefore, it can be concluded from the daily water budget results that the proposed wetland design exhibits the required wetland hydroperiod during the growing season.

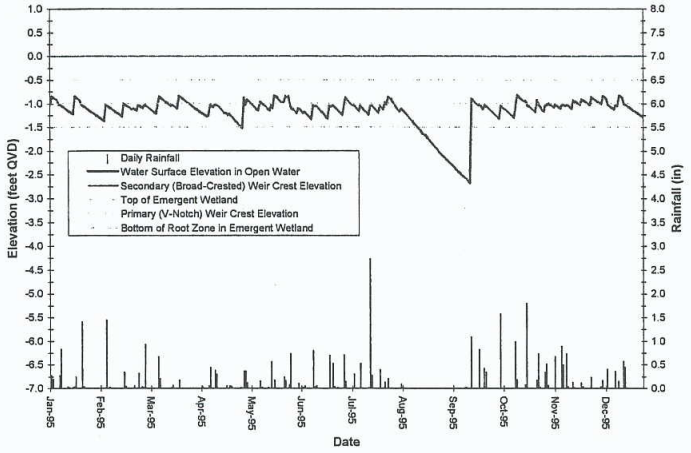
5.4.5 Summary and Conclusions

The hydrologic and hydraulic analysis has demonstrated that the design of the proposed wetland will meet the wetland hydrology requirements as well as allow the safe passage of runoff from larger flood events. The storm water modeling results using MIKE-SWMM model show that storm water runoff from contributing drainage areas for a 1-year storm event provides sufficient water to fill the open water and emergent wetland areas and provide the necessary hydroperiod, even under the worst-case scenario when there is no water in the open water area.

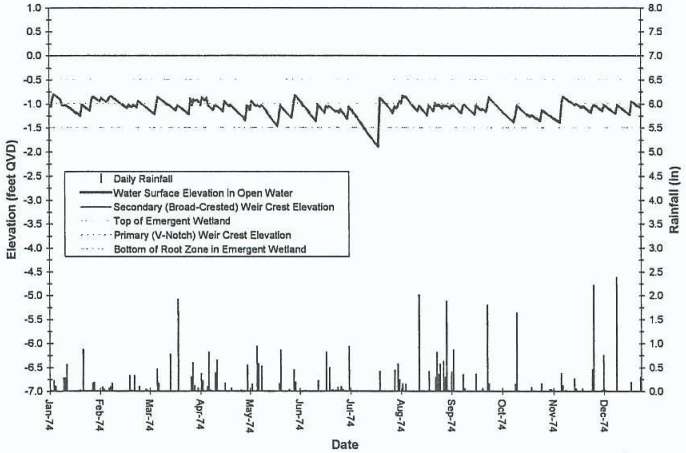
The daily water budget results shows that the target duration of inundation of 75 percent to 100 percent in the open water area and the target duration of saturation of 12 to 31 days of continuous inundation and saturation (5 percent to 12.5 percent of the growing season) in the emergent wetland area would be achieved even in a dry year.

Figure 8: Water Budget for the Open Water:
a) Dry Year (1995); b) Normal Year (1974); and c) Wet Year (1983)

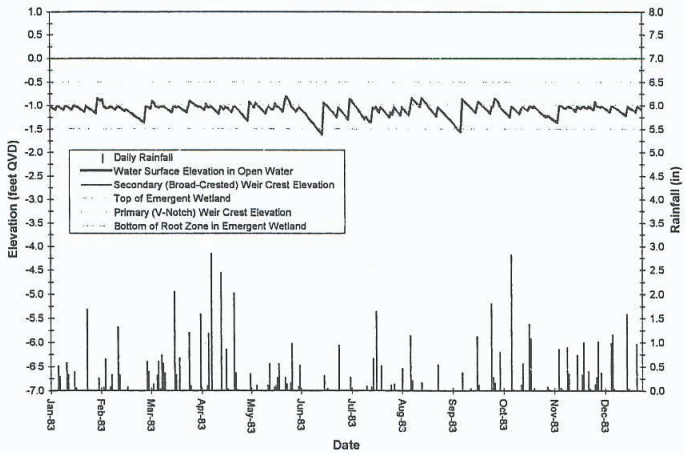
a)



(b)



(c)



Therefore, it can be concluded from the hydrologic and hydraulic analysis that there is sufficient wetland hydrology to support the designed wetland and allow for the development of a healthy open water and emergent wetland eco-system.

5.5 Construction Plan – Materials and Quantities

To accomplish the proposed mitigation/restoration plan, the following items of work will be required:

- Removal of paved surfaces;
- Demolition of existing abandoned buildings and structures;
- Removal of debris and waste throughout the site;
- Excavation of fill material from areas previously characterized as wetland;
- Installation of site water control structures;
- Planting and seeding of emergent, floodplain and forested vegetation; and
- Reconstruction of tide gates along Mill Creek.

Removal of Paved Surfaces: Prior to commencement of excavation for the proposed mitigation/restoration plan, the existing aircraft runways, aircraft parking aprons, access roads and vehicle parking areas will be removed. Removal will consist of rubblizing the concrete pavements and scarifying the asphalt pavements to allow for their disposal at concrete and asphalt recycling operations.

Demolition of Existing Buildings: Currently there are three abandoned aircraft hangars and several smaller out buildings on the site. Lead and asbestos surveys have not been performed for the two northern most hangars and associated buildings and will need to be performed prior to their demolition. A previous investigation by EGS Associates completed in October 1997 indicated that there is asbestos containing pipe insulation on the piping within the boiler room area of the southern hangar. It is anticipated that there may be some asbestos associated with the boiler rooms of the hangars and based on age of the buildings, that lead based paints may have been applied. The demolition contractor will be required to perform the demolition work of these structures in conformance with the current local, state and federal regulations governing the handling of lead based paint and abatement of asbestos building materials. The structures will be demolished to one foot below the proposed grade of the mitigation/restoration site and all debris removed from the site and disposed of at recycling facilities or in a licensed landfill.

Clearing Site: The proposed mitigation/restoration site will first be sprayed with herbicide to eradicate the invasive species *Phragmites.* Spraying operations will be coordinated with the growing season to allow the herbicide to penetrate into the root structure of the *Phragmites*. The dead stands of *Phragmites* will be mowed prior to the start of excavation operations. The mowed wrack and root structure will be buried in the lower lifts of the fill areas. The site will also be cleared of other debris that may be left from the former airport operations or may have accumulated on the site over time.

Excavation and Grading: Prior to the commencement of excavation and grading operations, temporary water diversions will be constructed to allow surface flow to be re-routed around the excavation area into Mill Creek. Dewatering operations will be necessary to lower the water levels within the excavation areas. Complete dewatering may not be possible, and is not absolutely necessary. Dredging of the excavated areas can be accomplished, as long as the sediment laden water and runoff from excavated soils is prevented from leaving the site. The site will be excavated to allow for the placement of six inches of imported topsoil over the excavation and embankment areas, to provide a substrate for planting. Excavation and re-use of excavated materials is discussed further in Section 7.0 "Materials Re-Use Plan." The temporary water diversions will be relocated as necessary to divert surface flow away from the excavation. At the completion of excavation and construction of the outlet control structures, the flow in

the swale parallel to 20th Avenue will be reversed. This will be accomplished by removing the culvert at the northwest corner of the site where the swale discharges into Mill Creek, placing a permanent compacted soil plug, and dredging the swale, as necessary, to facilitate the flow reversal into the proposed open water pools.

Water Control Structure: Two water control structures will be constructed at the easterly limits of the mitigation/restoration site adjacent to Mill Creek. The outlet control weir will consist of reinforced concrete construction on spread footings incorporating a riprap protected overflow weir that extends from the structure to the banks of Mill Creek. The draw down structure will be constructed to the north of the outlet control weir and will also be of reinforced concrete construction on spread footings. The structure will include a 24-inch sluice gate as manufactured by Rodney Hunt Company (or approved equal) leading to a 24-inch diameter reinforced concrete pipe that will discharge into Mill Creek, to allow the draw down of the mitigation/restoration site pools.

Planting and Seeding: As mentioned above, once subgrade elevations are achieved, the site will be covered with six-inches of topsoil to provide a substrate for the proposed plantings and to provide a cover for the soils exposed during the excavation and embankment operations. The Planting Plan is described in greater detail in Section 5.7 "Planting Plan" below.

Reconstruction of Tide Gates along Mill Creek: The existing tide gates located downstream from the site along Mill Creek and within the NYC Police Department Auto Pound Facility are to be removed and new tide gates installed on the existing 8-inch diameter culvert pipes upstream from the existing tide gates. The tide gates are discussed in greater detail in Section 5.6 below.

Demobilization: Upon completion of the planting, the temporary erosion control devices and diversions will be removed and any remaining disturbed areas will be stabilized and seeded.

5.6 Tide Gates

A set of tide gates located on Mill Creek downstream of the airport have become non-functional, causing a temporary inflow of tidal waters from Flushing Bay onto the site. The flap gates were repaired, but the headwall and corrugated pipes remain in disrepair. As a result of the physical condition of the tide gates, the runway, aprons, and taxiway at the Former Flushing Airport site continue to be inundated by one to three feet of water. These waters have intermittently been estuarine and have been recorded with a salinity range of 3.0 to 14.0 parts per thousand (ppt). In order to prevent future tidal inflow to Mill Creek and the site, the existing tide gates will be removed and replaced by new tide gates installed upstream. Sheet 13 – Tide Gate Plan and Details in Appendix A details the removal and installation activities.

The existing tide gates are of a flap gate style construction, making them susceptible to being jammed in the open position by floating debris. Additionally, the flap and hinge assemblies are susceptible to damage from floating debris and vandalism. This type of gate requires regular maintenance visits to assure that they are not jammed open and are seating properly during the high tide cycle. The proposed replacement gate valves (Tideflex Series TF-1 Valves) are constructed from neoprene, operate by the head pressure acting on them, are capable of sealing around small debris, and have no sliding, rotating, swinging or plunging parts and require no maintenance.

The existing tide gates are located approximately 2,000-feet downstream from the proposed mitigation/restoration site, within the NYC Police Department Auto Pound Facility at 31st Avenue and College Point Boulevard. Removal and installation activities will be completed within the tide gate site, an area approximately 2.3 acres in size (Figure 1). The proposed plan is for the installation of two 84-inch Tideflex Series TF-1 Valves (or approved equal) at the existing northern vehicle crossing on the existing

84-inch corrugated metal pipe (CMP). The installation will involve the removal of the existing downstream CMP flared end sections, addition of a 10-foot long CMP extension, and installation of the Tideflex valves. Once the new valves are in place, the existing rock filled gabion wall, pipe, and tide gates will be removed.

5.7 Planting Plan

After excavation activities are completed and elevations are set, the site will be seeded and planted with native vegetation. The site is divided into five planting zones: general seeding area; berm; upland; floodplain; and emergent. Open water areas will not be seeded or planted.

The plant species and/or seed mixes were selected for each of the zones based upon the elevation range and desired canopy. Certain species were also selected to attract a diverse waterfowl and wading bird population, with each of the zones providing different habitat areas. The emergent vegetation will maximize the potential feeding and loafing areas, the floodplain vegetation will provide protective cover, potential roosting areas, and feeding opportunities, and the upland vegetation will encourage additional forage opportunities and loafing areas. Finally, as the salinity levels in some areas of site are slightly higher than normal for freshwater wetlands, some salt-tolerant species were included overall.

Sheet 14 – Planting Plan Sheet 1 of 2 and Sheet 15 – Planting Plan Sheet 2 of 2 show the proposed planting plan (Appendix A). These sheets also contain the planting and seeding notes, which give specific planting and seeding instructions to promote proper planting and seeding. Lastly, a planting table lists the planting species, divided by planting zone, along with their required containers, spacing, and quantities.

To assess the degree of success of the restored freshwater wetland and to help achieve the desired character and ecological functions at the restoration project site, the site will then be monitored and maintained for a period of five years. The monitoring and maintenance plan is detailed in Section 6.0.

5.8 Wildlife Habitat Features

Over 30 percent of all North American birds depend directly on wetlands for some critical resource (i.e., nesting area, food supply, and protection from predators). These birds forage for various fish species and utilize plants as resources and, in turn, provide a food source for many species of reptiles, mammals, and other birds. Before filling activities were initiated in the early 1920s, the tidal wetlands that existed in the migration area had provided beneficial uses for shorebirds, passerine birds, waterfowl species, small and large mammals, fish, and invertebrates. Construction of wetlands on site for a freshwater ecosystem will provide a mixed palustrine emergent/open water habitat and floodplain habitat for a comparable assemblage of target and support wildlife species.

It is anticipated that the construction of open water with a shallow emergent vegetation fringe, adjacent floodplains, and uplands will be suitable to support the target and support wildlife species. The open water and wetland areas will provide a resting area during migratory periods and feeding grounds for the year-round waterfowl residents. Wading birds (e.g. herons and egrets) will utilize the wetlands as a food source and the surrounding vegetation as a sanctuary. Incidental avian species, such as raptors and passerine species, may be attracted to wetlands to forage. Additionally, many small mammal species will potentially find suitable habitat associated with these wetlands. The wetlands and their surrounding habitat are expected to increase biodiversity as the wetlands develop and become established.

The restoration and enhancement will benefit both resident and migratory wildlife species. The primary target species of wildlife will be the various waterfowl and wading bird species.

Many waterfowl populations have declined steadily over the past ten years in the metropolitan area. This is due in part to drought conditions in the breeding areas and a reduction in suitable habitat acreage. Restored wetlands would provide breeding habitat for numerous species of waterfowl, shorebirds, marsh birds, and birds of prey. These groups include ducks (family Anatidae), herons and egrets (*Ardeidae*), rails (*Rallidae*), and osprey (*Pandionidae*). Support populations that will also directly benefit by the mrigation effort include hawks (*Accipitridae*), falcons (*Falconidae*), owls (*Strigidae*), kingfisher (*Alcedinidae*), swans and geese (*Anatidae*), gulls and terns (*Laridae*), shorebirds (*Charadriidae*), and pheasants (*Phasianidae*). Additional wildlife species would benefit from the creation of wetlands as well.

The primary focus of the restoration plan is to provide habitat for the small puddle ducks (i.e. mallard ducks, black ducks, and gadwalls). These species seek small, isolated bodies of water with dense stands of vegetation nearby to provide adequate cover for breeding and food supply. Target puddle duck species include mallard, black, gadwall, wood duck, northern pintail, American widgeon, canvasback, and common merganser.

6.0 MONITORING AND MAINTENANCE PLAN

The following sections include the proposed mitigation monitoring plan and the proposed site maintenance program after construction is completed. It is assumed that after the mitigation monitoring requirements have been met, the land will be maintained and managed by another city or non-profit organization for conservation and preservation into perpetuity.

6.1 Monitoring Plan

A monitoring plan for the mitigation area has been developed to meet the requirements of both the NYSDEC and the USACE. The *New York State Salt Marsh Restoration and Monitoring Guidelines* prepared by the NYS Department of State (NYSDOS, 2000) were used as a primary resource for developing this monitoring plan. Where necessary and appropriate, the plan was modified to include site-specific protocols.

Purpose: The purpose of this monitoring protocol is to assess the degree of success of the mitigated freshwater wetland and to help achieve the desired character and ecological functions at the restoration project site. Regular monitoring of the emergent areas shall occur for total vegetative cover, planting survival and growth, plant colonization including desired native species versus *Phragmites*, soil properties, benthic organism colonization, and fish and bird species usage.

Restoration Performance Criteria: The performance criteria for the restoration site includes:

a) 85 percent vegetative cover of the mitigated wetland within five years of initial planting (emergent & floodplain zones by both planted and volunteer species); and
b) Minimal re-establishment of *Phragmites* and other undesirable invasive vegetation to ten percent or less of the total mitigated area.

Monitoring Protocol Design: Monitoring at the project site shall be conducted in the mitigated, emergent wetland area and at one reference site. The reference site shall be located at the head of Mill Creek. The reference site is located in close proximity to the restored site and ensures adequate representation of vegetative cover types and approximate elevations found within the project site. The reference site will be monitored using the same methodologies and seasonal conditions as the restored site, and reference site data will be used to identify environmental trends over the period of monitoring within the vicinity of the restoration site.

Sampling transects will be established within the emergent areas and marked to ensure that monitoring is conducted at the same locations over time. Monitoring data will be collected for a five-year period following completion of plant installation. Annual sampling will be conducted along fixed transects, utilizing the methodologies described below. Additionally, wildlife observations will be recorded for the restored marsh, as described below.

Monitoring components will include an assessment of coverage of planted and volunteer species in the emergent zone, the physical stability of the substrates, and surveys of macro-invertebrates, fish and birds utilizing the restored marsh. Parameters measured will include: species composition and percent plant cover; species composition and numbers of birds (i.e., waterfowl, wading and shorebirds); and observed macro-invertebrates (i.e., crabs, bivalves, and gastropods).

Pre-Construction Monitoring Activities: The baseline data for this site has been collected over the past eight years and is summarized in this report. For the reference areas, all parameters described below shall be monitored at least once prior to construction in late summer. Photographs will be taken of the approximate locations of each transect prior to any construction activities. Photographs of the reference area shall also be taken at the same time.

Post-Construction Assessment (Immediately following Construction): A topographic map will be created to establish that the site was graded to the designed elevations. All records of planting and seeding activity will be maintained. The site will also be photographed to establish a visual baseline and enable timeline comparisons.

Immediately following construction and prior to planting, the site will be inspected to determine if additional restoration work is required. Additional work may include, but is not limited to: need for supplemental irrigation to proposed planting areas; protection from wildlife damage, pedestrian traffic, scour, soil erosion and vandalism; invasive weed control procedures, and long-term *Phragmites* control; and replacement of dead plant materials and erosion control blankets, gully patching, and re-seeding. As part of the site maintenance plan, the site will also be inspected each year at the time of monitoring. Observations will be recorded in the yearly site monitoring report.

Post-Construction Monitoring (Long Term): A total of six transects will be established perpendicular to the shoreline within the emergent zones and monitored over a period of five years. Monitoring will occur in late summer of each year.

Transects will extend from the edge of the open water and terminate at the landward side of the emergent zone. The transects will be established using PVC pipe at each end point. The location of each transect will be marked on a site map and a photograph taken of each transect, from the water's edge looking landward. Care will be taken during monitoring to minimize trampling of the vegetation.

Vegetative Monitoring: A square-meter quadrat will be used for defining the boundaries of the sampling points. A minimum of three quadrats will be placed along each transect, for a final total of 18 quadrats. No quadrat will be located within ten feet of another quadrat. Vegetative parameters to be observed and recorded at each quadrat include the following:

a) **Plant Species Occurring and Percent Cover:** Record all plant species occurring within each selected quadrat. Percent cover can be recorded as cover class categories (e.g., Braun-Blanquet method).

b) **Plant Height/Stem Density:** Randomly select 0.25 m2 sections of each quadrat and record all living vegetative stems. Randomly select 25 live stems in the quadrat and measure from base of the plant to the top of stem in centimeters.
c) **Signs of Plant Disease, Predation or Disturbance:** Record for each quadrat.

Soil Properties: A composite of at least one sample for each transect will be obtained and tested for soil organic matter and soil salinity, for a total of six samples.

Macrofaunal, Benthic Invertebrate and Avian Observations: During the transect monitoring, all observations of ribbed mussels, fiddler crab burrows and other benthic invertebrates will be counted within each quadrat, and noted for surrounding areas. Surveys for macrofaunal and avian species will be conducted once yearly between June and August at both the restoration and reference sites. Observation locations will be selected to minimize disturbance. Surveys will be undertaken for two hours in the morning, avoiding conditions of high winds, rain or low barometric pressure, recording time of day and weather conditions.

The following parameters shall be monitored:

- Breeding bird census;
- Shorebird survey;
- Wading bird strike survey; and
- Other Macrofauna – record number of species and individuals (or reasonable presence) of macrofauna at project site such as small mammals, horseshoe crabs, and reptiles.

In addition, wintering waterfowl will be monitored once yearly in December, recording the species, abundance and activity. Also to be noted will be any grazing effects on the restored or reference marsh vegetation.

Monitoring Reporting Requirements: Written monitoring reports will be submitted to NYSDEC and USACE by December 1 of each of the five monitoring years and will begin after the first post-construction growing season. Included in each report shall be the monitoring data, labeled photographs, and a brief summary of the collected data. At the end of the five-year monitoring commitment, a summary report of the entire monitoring and maintenance efforts and results shall be compiled.

6.2 *Phragmites* Management Program

Phragmites is an invasive species that can rapidly overtake wetland habitats and out-compete native wetland and adjacent upland vegetation, creating monocultures that offer little value to wildlife and waterfowl. Without the implementation of proper control measures at specific times during the plant's life cycle, *Phragmites* will not enable the establishment of desired native wetland and upland vegetation. Consequently, this *Phragmites* management program is proposed for the project site. Review of the current literature and results from successful wetland restoration projects were used to prepare this *Phragmites* management program.

To deter the re-establishment of *Phragmites*, certain design elements were incorporated into the mitigation/restoration plan. These design elements include excavating the paved and filled on site areas, removing *Phragmites* root mat, and altering the water regime to create deep-water pockets of three feet or more. In addition, the management program shall include the following measures:

1) Removing existing *Phragmites* stands;
2) Placing excavated *Phragmites* wrack and debris below at least twelve inches below the surface;
3) Placing six inches of clean topsoil across the site and grading prior to planting;
4) Timing construction to occur in the fall and winter months so the native vegetative cover can be established immediately following construction; and
5) Conducting an intensive mowing program for at least two years in floodplain and upland areas.

If a small area of *Phragmites*, less than 1 square meter, is found during routine inspection, the shoots, rhizomes and root masses shall be removed by hand, if feasible. If *Phragmites* re-sprouts become persistent and/or maintain areas greater than 1 square meter, manual removal must be continued throughout the second growing season after planting.

Chemical eradication shall be considered only as a contingency, if other mechanical means of *Phragmites* removal have not proven successful after two years of post-installation maintenance. Any plans for chemical treatment will be subject to pre-approval from NYSDEC and will be subject to a separate State pesticide permit. Chemical treatments shall include application of a State-approved systemic herbicide, such as glyphosphate (Rodeo). A licensed pesticide applicator shall apply the herbicide at a pre-approved rate to the above ground stubble by "wicking". This treatment methodology enables the chemical application to be applied directly to the target plant without effecting the surrounding vegetation. No treatments shall be conducted during conditions of high wind to prevent overdrift. All treatments shall be suspended if rain is expected within 24 hours of the application to ensure full effectiveness of the application.

7.0 MATERIALS RE-USE

7.1 Summary of 1994 Site Investigation

In 1994, a subsurface investigation of the project site was performed in three phases by EEA Inc.. The initial phase, conducted in June 1994, consisted of the analysis of two test pits, TP-1 at the southern end of the site and TP-2 at the approximate center of the site (see Appendix F for test pit locations). The results indicated the presence of petroleum products in the soils and/or the groundwater at TP-2.

Based on the results of this initial phase, NYSDEC approved a subsequent investigation to determine the nature and extent of the petroleum contamination. In August 1994, a total of six test borings were taken radially at a distance of 25 feet around TP-2 and analyzed for total petroleum hydrocarbons. The results showed that petroleum contamination was present in the subsurface, but localized within the vicinity of TP-2 as no discernable plume was found.

As an origin for the contamination was yet to be determined, a more detailed and comprehensive investigation was needed to establish the extent and possible source of petroleum products. NYSDEC approved the final phase of the investigation, a more extensive examination of the subsurface of the site consisting of 37 soil borings located on existing paved areas and 6 groundwater monitoring wells (see Appendix F for boring and well locations). The final phase was completed in October 1994. The results were as follows:

- Low or non-detectable concentrations of volatile organic compounds (VOCs) were present in all of the soil samples, with the exception of the samples collected from borings S-24 and S-35 (naphthalene).

- Elevated concentrations of certain semi-volatile organic compounds (SVOCs) were present across the site, including polycyclic aromatic hydrocarbons (PAHs) such as chrysene, benzo(a)pyrene and benz(a)anthracene). Higher concentrations existed in samples collected from borings S-1, S-4, S-11, S-13, and S-18.

- Elevated concentrations of total petroleum hydrocarbons (TPH) (up to 18 parts per million) were present in selected soil samples.

- Elevated concentations of TPH, VOCs and PAHs were present in selected groundwater samples.

- Majority of petroleum contamination at TP-2 was lubricating oil with lower concentrations of gasoline and gasoline additives, as well as the presence of lead at elevated concentrations.

- Concentrations of arsenic and chromium at TP-2 exceeded Technical and Administrative Guidance Memorandum (TAGM) soil cleanup guidelines.

The summary of findings of the 1994 investigation report stated the following:

- The origin of the petroleum product contamination at TP-2 appeared to be from the materials previously used as fill on the site. Neither the soil borings nor the monitoring wells established any recognizable pattern of petroleum contamination.

- The majority of contamination was in the form of SVOCs, most likely derived from coal gasification and combustion operations, as the highest concentrations of these compounds coincided with areas of the most extensive coal cinder and ash fill.

- The presence of the SVOCs in the groundwater was likely from suspended sediments in the samples, rather than any dissolved fractions.

- There is no evidence that indicates the coal ash constituents are moving off-site in the groundwater.

7.2 Summary of 1995 Site Investigation

Based on the findings of the 1994 site investigation, NYSDEC determined that an additional investigation should be undertaken at the site. The 1995 investigation entailed a comparison study of metals in the subsurface soils of paved versus unpaved areas. Testing consisted of 22 soil samples in unpaved (10), paved (10), and isolated wetland areas (2) (see Appendix G for boring locations). In addition, the general stratigraphy of the site was established.

Soil samples collected from unpaved areas showed a wide range of total metal concentrations, including the following:

- Lead and zinc were in relatively elevated concentrations in many samples;
- Mercury exceeded TAGM standards in a few samples; and
- Toxicity characteristic leaching procedure (TCLP) testing showed B-9 to have a lead concentration above the regulatory limit. Note: This sample location corresponds to the location of TP-2 in the 1994 investigation.

Soil samples collected from paved areas also showed a wide range of total metal concentrations, including the following:

- Lead and zinc were in relatively high concentrations in many samples;
- Mercury exceeded TAGM standards in two samples; and
- TCLP testing did not show any samples exceeding regulatory limits.

The paved areas located on site (former runways, taxiways, and other paved areas) contain an asphalt layer approximately four- to six-inches thick, underlain by a thin layer of sub-base gravel. The top six inches of the unpaved areas consisted of a vegetative root zone, underlain in some areas by a shallow three- to six-inch deep, poorly developed soil horizon. The top zones of both the paved and unpaved areas were underlain by an assortment of fill materials and fill soils, consisting of a mix of fine sand, silt, and clay, with a significant amount of coal cinders and furnace ash. The proportions of soil material and coal cinders varied throughout the site, but the majority of the site contained a one- to three-foot layer of these materials. The total thickness of fill varied from one-to six-feet below grade, but averaged four to five feet over most of the site. A silty-clay peat meadow bog existed below the fill line, which represents the original land surface prior to filling activities.

The summary of findings of the 1995 investigation report stated the following:

- The concentration of lead and zinc in the fill soils underlying both paved and unpaved areas area elevated in comparison with the concentrations of cadmium, mercury, selenium, and vanadium; however, these concentrations are common in fill soils throughout the metropolitan area.

- No significant differences in metal concentrations were found between the two areas.

- The soils underlying the entire site appear to be of similar composition and origin.

- The findings of the 1994 and 1995 reports support the conclusion that the proposed mitigation and restoration plan is feasible.

Based upon data from the 1994 and 1995 site investigations, the contamination issues that need to be addressed at the site are as follows:

1) Elevated concentrations of lead at boring TP-2 (see Appendices E & F for test pit/boring location).

2) Elevated concentrations of VOCs at borings S-24 and S-35 (see Appendix G for boring locations).

3) Elevated concentrations of certain semi-volatile organic compounds (SVOCs) across the site, including polycyclic aromatic hydrocarbons (PAHs) chrysene, benzo(a)pyrene and benzo(a)anthracene.

Plans to address these three issues are detailed in Sections 7.2 and 7.3.

7.3 Hot Spot Removal

The VOC-contaminated soils at boring S-24 have already been excavated and disposed of as part of Citywide Order of Consent for underground storage tank removal. The soils containing an elevated concentration of lead at boring TP-2/B-9 (see Appendices F & G for test pit/boring location) and elevated concentrations of VOCs at boring S-35 (see Appendix G for boring locations) will be excavated and disposed of prior to the commencement of any construction activities at the site. The excavation and disposal activities for these two areas will be completed as a separate action from the wetland mitigation/restoration project.

7.4 Materials Re-Use Plan

The wetland mitigation/restoration plan includes enhancing and restoring both wetland and upland areas on site. Existing upland area elevations will be raised to meet the proposed upland grades, while the proposed wetland areas will require excavation to remove prior fills and allow for proper elevations for the successful establishment of the wetland hydroperiod and growth of hydrophytic vegetation. In addition, at the request of regulatory representatives, a berm has been placed around the project site to separate the conservation area from the adjacent parcel that will be developed in the future. It is necessary to utilize all materials excavated from the proposed wetland areas to raise the upland elevations to create the necessary slopes and berm area. Due to the existence of elevated concentrations of SVOCs in fill materials across the site, a materials re-use plan has been developed for the management of these materials during excavation and placement. This plan is outlined below:

1. Excavate and grade the site to elevations that are six inches lower than those established by the mitigation/restoration design plan, utilizing the excavated soil material on-site in the construction of the upland areas and berms.

2. Place a six-inch layer of clean topsoil across the entire site and grade to reach the elevations established within the mitigation/restoration plan. The clean topsoil layer will cap all exposed soils, as well as all of the excavated materials used as fill, therefore preventing direct contact or the potential for the migration of SVOC-impacted soils.

3. As part of the soil erosion and sediment control plan, sediment/detention ponds, turbidity barriers, silt fencing, and other appropriate sediment and erosion control measures will be in place during construction. The ponds will allow for the deposition of particles that may become suspended in surface waters due to contact with potentially contaminated excavated and/or exposed soils.

Implementation of the materials reuse plan will stabilize excavated and exposed soils during construction and prevent exposure to the reused SVOC-impacted soils after completion of the project.

8.0 SUMMARY AND CONCLUSIONS

This report was presented to supplement the permit applications required to implement the mitigation and restoration measures proposed by EDC for the Former Flushing Airport project. The mitigation of the site is required under the State of NYSDEC Order on Consent, NYSDEC File Nos. R2-2918-90-03, R2-3159-90-08, and R2-3160-90-08 (signed February 2002). However, permits for the restoration and enhancement of the site are still required to be obtained from NYSDEC and USACE. EDC submits that with the submission of this report, and the attached plans and permit applications, all permit requirements have been met. In addition, EDC has been working over the years with NYSDEC and USACE to make

certain that the proposed wetland mitigation and restoration will not only meet the requirements of the Order of Consent, but also to make certain that the resultant wetland enhancement and restoration will become a valuable wildlife habitat tucked within the urban setting of Whitestone, Queens County.

The purpose of the mitigation/restoration plan is to enhance 8.6 acres of existing degraded wetlands and create 8.5 acres of restored wetlands at the site of the abandoned airport to enhance water quality, improve flood storage, increase wetland habitat values, and improve the overall aesthetic value of the area. The mitigation/restoration plan also includes creating 9.6 acres of scrub/shrub floodplain and 4.9 acres of forested upland. The mitigation/restoration plan will also include the removal of abandoned paved surfaces and debris; removal of dilapidated structures (hangars); installation of water control structures and repair of tide control structures; and the excavation of past fill material. After excavation activities are completed and elevations are set, the emergent wetlands, floodplain areas and forested uplands areas will be planted and seeded with native vegetation.

Additional goals include attracting a diverse waterfowl and wading bird population by providing an irregular shoreline which maximizes habitat diversity along the upland/water interface and increases protected "coves" for nesting waterfowl, maximizes the potential feeding and loafing areas in shallow emergent plant zones, provides potential roosting areas and feeding opportunities in the flood plain zones, provides grassy adjacent upland areas which encourage additional forage opportunities and loafing areas; and provides open water areas for resting and over-wintering habitat. The project also seeks to increase vegetative diversity with the removal of *Phragmites* and planting and seeding of native vegetation.

While the site in its current state has certain functions and values associated with it due to the existing wetland features, these functions and values are impeded by the disturbed site conditions. Poor soil quality caused by historic filling activities, the domination by invasive vegetative species such as *Phragmites*, poor water quality, limited flood storage, and accumulating debris on the site have all contributed to a general degraded condition of the wetland and its adjacent areas.

As a result of the proposed plan, the restored habitat will serve to enhance water quality, improve flood storage, increase wetland habitat values, and improve the overall aesthetic value of the urban area. The removal of the paved surfaces will allow for an improved surface/groundwater connection. The demolition of the abandoned areas and removal of debris will remove unsafe features and allow for increased aesthetic features. Improved water flows and water retention areas will allow for better overall water quality, and increased and more controlled flood storage. The installation of the water control structures and reconstruction of the tide gates will also help to control flood and storm waters flowing from the increasingly developed area.

PART 3 – REFERENCES

1. DHI. *MIKE SWMM: An Integrated Modeling Package for Wastewater and Stormwater Management – User Guide, MIKE SWMM 2003*. DHI Inc., Newtown, PA. 2003.

2. EEA, Inc. *Environmental Subsurface Investigation: Flushing Airport, College Point, New York.* December 1994.

3. EEA, Inc. *Comparative Study of Subsurface Soils, Paved Versus Unpaved Areas: Flushing Airport, College Point, New York.* November 1995.

4. EGS Associates, Inc. *Environmental Site Assessment: Flushing Airport Mitigation Project.* October 22, 1997. Revised August 25, 1998.

5. Stone & Webster Environmental Technology and Services Corporation. *Flushing Airport Wetlands Investigation – Volume I: Historical & Existing Water Resources for Mill Creek & Vicinity.* August 1997.

6. New York City Public Development Corporation & John J. Kassner & Co. *Drainage Study:College Point Industrial Park and Tributary Area.* 1977.

Appendix B
Linden Place Reconstruction and 132nd Street Construction Traffic Study

(Transmitted under separate cover)

Appendix C
Correspondence

THE CITY OF NEW YORK LANDMARKS PRESERVATION COMMISSION
1 Centre St., 9N, New York, NY 10007 (212) 669-7700

ENVIRONMENTAL REVIEW

EDC/LA-CEQR-Q — PROJECT NUMBER

01/21/05 — DATE RECEIVED

PROJECT

FLUSHING AIRPORT WETLANDS:

(X) No architectural significance

(X) No archaeological significance

( ) Designated New York City Landmark or Within Designated Historic District

( ) Listed on National Register of Historic Places

( ) Appears to be eligible for National Register Listing and/or New York City Landmark Designation

( ) May be archaeologically significant; requesting additional materials

COMMENTS

Gina SanTucci — SIGNATURE

01/25/05 — DATE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

January 24, 2005

Ms. Kathleen Gralton
Planner
Edwards and Kelcey
5 Penn Plaza, 16th Floor
New York, NY 10001

Dear Ms. Gralton:

This responds to your correspondence of December 22, 2004, requesting information on the presence of endangered or threatened species and significant habitats in the vicinity of the proposed wetland mitigation and restoration site located at the former Flushing Airport, College Point, Queens County, New York.

Except for occasional transient individuals, no Federally-listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact area. In addition, no habitat in the project impact area is currently designated or proposed "critical habitat" in accordance with provisions of the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). Therefore, no further ESA coordination or consultation with the U.S. Fish and Wildlife Service (Service) is required. Should project plans change, or additional information on listed species or critical habitat becomes available, this determination may be reconsidered. The most recent compilation of Federally-listed and proposed endangered and threatened species in New York* is available for your information. If your project is not completed within one year from the date of this determination, we recommend that you contact us to ensure that the listed species presence/absence information for your proposed project is current.

The above comments pertaining to endangered or threatened species under our jurisdiction are provided pursuant to the ESA. This response does not preclude additional Service comments under other legislation.

For additional information on fish and wildlife resources or State-listed species, we suggest you contact the appropriate New York State Department of Environmental Conservation regional office(s), * and:

New York State Department of Environmental Conservation
New York Natural Heritage Program Information Services
625 Broadway
Albany, NY 12233-4757
(518) 402-8935

If you require additional information or assistance please contact Jill Olin of our Long Island Field Office at (631) 581-2941.

Sincerely,

David A. Stilwell
Field Supervisor

* Additional information referred to above may be found at our website at: http://nyfo.fws.gov/es/esdesc.htm.

cc: NYSDEC, Long Island City, NY (Environmental Permits)
NYSDEC, Albany, NY (Natural Heritage Program)

New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **FAX:** (518) 402-8925
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

January 24, 2005

Kathleen Gralton
Edwards and Kelcey
5 Penn Plaza, 16th floor
New York, NY 10001

Dear Ms. Gralton:

In response to your recent request, we have reviewed the New York Natural Heritage Program databases with respect to an Environmental Assessment for the proposed Flushing Airport Restoration Plan - 38-acres, Project 185 01 12, area as indicated on the map you provided, located at College Point, Queens County.

We have no records of known occurrences of rare or state-listed animals or plants, significant natural communities, or other significant habitats, on or in the immediate vicinity of your site.

The absence of data does not necessarily mean that rare or state-listed species, natural communities or other significant habitats do not exist on or adjacent to the proposed site. Rather, our files currently do not contain any information which indicates their presence. For most sites, comprehensive field surveys have not been conducted. For these reasons, we cannot provide a definitive statement on the presence or absence of rare or state-listed species, or of significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

This response applies only to known occurrences of rare or state-listed animals and plants, significant natural communities and other significant habitats maintained in the Natural Heritage Data bases. Your project may require additional review or permits; for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

Sincerely,

Betty Ketcham jp

Betty A. Ketcham, Information Services
New York Natural Heritage Program

Enc.
cc: Reg. 2, Wildlife Mgr.

DIVISION OF ENVIRONMENTAL PERMITS REGIONAL OFFICES

January 2004

REGION	COUNTIES	REGIONAL PERMIT ADMINISTRATORS
1	Nassau & Suffolk	John Pavacic NYS-DEC BLDG. 40 SUNY at Stony Brook Stony Brook, NY 11790-2356 Telephone: (631) 444-0365
2	New York City (Boroughs of Manhattan, Brooklyn, Bronx, Queens, & Staten Island	John Cryan NYS-DEC One Hunters Point Plaza 47-40 21st Street Long Island City, NY 11101-5407 Telephone: (718) 482-4997
3	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster & Westchester	Margaret Duke NYS-DEC 21 South Putt Corners Road New Paltz, NY 12561-1696 Telephone: (845) 256-3054
4	Albany, Columbia, Greene, Montgomery, Rensselaer & Schenectady	William Clarke NYS-DEC 1150 North Wescott Road Schenectady, NY 12306-2014 Telephone: (518) 357-2069
4 (sub-office)	Delaware, Otsego & Schoharie	Kent Sanders NYS-DEC Route 10 HCR#1, Box 3A Stamford, NY 12167-9503 Telephone: (607) 652-7741
5	Clinton, Essex, Franklin & Hamilton	Thomas Hall NYS-DEC Route 86, PO Box 296 Ray Brook, NY 12977-0296 Telephone: (518) 897-1234
5 (sub-office)	Fulton, Saratoga, Warren & Washington	Thomas Hall NYS-DEC County Route 40 PO Box 220 Warrensburg, NY 12885-0220 Telephone: (518) 623-1281
6	Jefferson, Lewis & St. Lawrence	Brian Fenlon NYS-DEC State Office Building 317 Washington Street Watertown, NY 13601-3787 Telephone: (315) 785-2245
6 (sub-office)	Herkimer & Oneida	J. Joseph Homburger* NYS-DEC State Office Building 207 Genesee Street Utica, NY 13501-2885 Telephone: (315) 793-2555

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189
518-237-8643

Bernadette Castro
Commissioner

February 24, 2006

Kathleen Gralton, AICP
Edwards and Kelcey
5 Penn Plaza, 16th Floor
New York, New York 10001

Re: DEC/CEQR
Former Flushing Airport Wetlands Development Project
Linden Place Reconstruction/132nd Street Construction
Queens, Queens County
04PR06563

Dear Ms. D'Alessio:

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the project in accordance with the New York State Parks, Recreation and Historic Preservation Law, Section 14.09.

Based upon this review, it is the OPRHP's opinion that your project will have No Impact upon cultural resources in or eligible for inclusion in the State and National Registers of Historic Places.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above.

Sincerely,

Ruth L. Pierpont

Ruth L. Pierpont
Director

RLP:bsa

cc: Doug Rice, NYCEDC