DRAFT GENERIC ENVIRONMENTAL IMPACT STATEMENT

CAYUGA COUNTY
EMERGENCY RADIO COMMUNICATIONS PROJECT

VOLUME I OF II

Lead Agency:

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Reference:	Evaluation of Potential Uncontrolled Exposure to Microwave Frequency Electromagnetic Fields Generated by the Planned Cayuga County, New York Emergency Telecommunications Network, RAM TRAC Corporation, April 2010 ("Oswego EMF Study")

GLOSSARY

Access Road	A dedicated or shared roadway used to access an antenna system location. An access road may be a private road.
Agricultural Conservation Easements	An agricultural conservation easement is a deed restriction landowners voluntarily place on their property to protect resources such as productive agricultural land, ground and surface water, wildlife habitat, historic sites or scenic views. They are often used by a landowner (i.e., "grantor") to authorize a qualified conservation organization or public agency (i.e., "grantee") to work with the grantor to protect specific resources. These easements are flexible documents tailored to each property and the needs of individual landowners. They may cover an entire parcel or only portions of a property. The landowner usually works with the prospective grantee to decide what activities should be limited to protect specific resources.
Agricultural Districts	A locally-initiated mechanism by which the State's agricultural land is protected and enhanced. Once land is in an agricultural district, the land receives the benefits and protections of not only the general agricultural preservation policies of section 300 of the Agricultural and Markets Law but also the specific protections of sections 305 and 308. Section 305(1) allows eligible farmers to have their land assessed at its agricultural value rather than its fair market value. Agricultural districts provide landowners with assurances that protection against public acquisition, nuisance suits and restrictive local ordinances are available if needed.
Agricultural Land Management Systems	Systems of operation that are commonly utilized by the agricultural industry to manage agricultural lands more efficiently and effectively through the use of best management practices.
Agriculturally Important Soils	Soils with a Land Capability Classification of 1, 2, 3 or 4.
Alluvium	Clay, silt, sand, gravel or similar detrital material deposited by running water.
Amplitude	The loudness of a sound or noise.
Antenna Support Structure	Any structure of any height, material or type of construction intended, designed or constructed for a primary purpose other than the support of radio, television, microwave or satellite antennas and dishes. Antenna support structures can be modified, engineered or renovated specifically to accommodate installation of the aforementioned antennas and dishes at a later time.
Antenna System	Antenna systems consist of antenna, antenna support structures (e.g., buildings and electrical transmission line infrastructure) or towers, communications equipment shelters and accompanying support equipment (e.g., power and communications infrastructure, equipment enclosures and backup power supplies).

Associated Agricultural Operations	Such operations include storage units and barns, sorting and packing houses, refrigeration units, roadside markets, cropland/accessways and common farm traffic.
Avian	Of or relating to birds.
Ballast	A layer of crushed stone, crushed slag, gravel or similar material that is placed under the ties of a railroad.
Cable	A structural element formed from steel wire bound in strands and sometimes employed as the suspending element in a bridge.
Carrier	An individual, partnership or corporation engaged in the business of transporting goods or persons.
Collocation	The mounting or installation of an antenna on an existing tower, building or structure for the purpose of transmitting and/or receiving radio frequency signals for communications purposes. FCC, National Conference of State Historic Preservation Officers and Advisory Council on Historic Preservation, *Nationwide Programmatic Agreement* (2001).
Commercial Radio	The transmission of programs for the public by radio broadcast.
County	The Cayuga County Legislature, lead agency for review of the Cayuga County Emergency Communications Project
Critical Environmental Areas (CEA)	A specific geographic area designated by a State or local agency having exceptional or unique environmental characteristics. 6 NYCRR § 617.2(i).
Critical Habitat	Areas inhabited or depended upon by endangered, threatened, rare or special/concern species.
Cumulative Impacts	Impacts on the environment that result from the incremental or increased impact of an action(s) when the impacts of that action are added to other past, present and reasonably foreseeable future actions. Cumulative impacts can result from a single action or a number of individually minor but collectively significant actions taking place over a period of time. Either the impacts or the actions themselves must be related. DEC, *The SEQR Handbook* (November 1992).
dB(A) or dBA	A measurement of perceived loudness expressed in a decibel scale weighted for the range of human hearing.
Decibel or dB	A relative measure of sound intensity.
Demographics	The statistical characteristics of human populations.
Drumlin	An elongated or oval hill of glacial drift.
Electromagnetic Radiation	A series of electromagnetic waves.
Encryption	To encode or convert a message into cypher.
Erosion	The removal and subsequent loss of soil by the action of water, ice, wind, gravity and human activities.

Evapotranspiration	The process of transferring moisture from the earth to the atmosphere by evaporation of water and transpiration from plants.
Formation	A persistent body of igneous, sedimentary or metamorphic rock having easily recognizable boundaries that can be traced in the field without recourse to detailed paleontologic or petrologic analysis and which is large enough to be represented on a geologic map as a practical or convenient unit for mapping and description. A formation is the basic cartographic unit in geologic mapping.
Frequency	The pitch or tone of a sound or noise.
Geomorphology	The science that is concerned with the general configuration of the Earth's surface. Specifically, it is the study of the classification, description, nature, origin and development of present landforms and their relationships to underlying structures and of the history of geologic changes as recorded by these surface features. In the United States, it has come to replace the term "physiography" and is usually considered a branch of geology.
Grade	The degree of inclination of a slope, road or other surface.
Greenfield	Previously undeveloped site or lands.
Hard-Wire Cable	Telecommunications cables other than fiber-optic cables.
Important Bird Area	A site that provides essential habitat to one or more species of breeding or non-breeding birds.
Interoperability	The ability of one Agency, unit of local government, public service or public safety entity to talk to another. Interoperability is required both between and among entities and across jurisdictions.
Lacustrine	Of, relating to or formed in lakes.
Land Capability Classification System	A method of grouping soils primarily on the basis of their capability to produce common cultivated crops and pasture plants without deteriorating over a long period of time. Identifies, for each soil type, the limitations for field crops, the risk of damage if they are used for crops and the way they respond to management.
Land Use Settings	Areas with common patterns of land cover, use, population, etc. For the purposes of this document, metropolitan, town, village, rural, recreation, open space, forest land, park land and coastal areas are the only land use settings addressed.
Ldn	Day-night average sound level.
Leq	Equivalent Sound Level.
Moraine	A mound, ridge or other distinct accumulation of unsorted, unstratified glacial drift, predominantly till, deposited chiefly by direct action of glacier ice, in a variety of topographic landforms.
Muck Soils (or Organic Soils)	Soils that have unique properties and are essential for certain agricultural crops. These soils have a high organic content and have a tendency to flood.
National Register of Historic Places	The official list compiled by the National Park Service of buildings, structures, districts, objects and sites significant in the history,

	architecture, archaeology and culture of the United States.
Network Management Center ("NMC")	The physical location where Project operations, maintenance and management is monitored and controlled. One or more NMCs will be established as part of the Project.
Orogeny	The process of mountain formation or upheaval.
Parapet Walls	A low wall or railing used to protect the edge of a platform, roof or bridge.
Park	Any area that is predominately open space with natural vegetation and landscaping used principally for active or passive recreation.
Parkway	Through travel lanes similar to freeways but typically without parallel frontage roads.
Physiographic Province	A region in which all parts are similar in geologic structure and, consequently, has a unified geomorphic history. A region whose pattern of relief features or landforms differs significantly from that of adjacent regions.
Potable	Suitable for drinking.
Prime Farmland	Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops and also is available for these uses. Such land could be cropland, pastureland, rangeland, forest land or other land but not urban built-up land or water. This land has the soil quality, growing season and moisture supply needed to economically produce sustained high yields of crops when treated and managed according to acceptable farming methods.
Prime Farmland Where Drained	Prime Farmland that cannot be used for agricultural purposes unless drained by artificial means.
Rail Fastenings	A fastening attached to the foot of the running rail of a railroad track or bearing against the side of the chair or stepper to resist longitudinal movement of the rail.
Riparian	Relating to or living on the bank of a natural watercourse or sometimes of a lake or tidewater.
Road	Any highway, road, street, avenue, public place, public driveway or any other public way as defined by section 134 of the NYS Vehicle and Traffic Law, as now or hereafter amended.
Runway	A strip of level, usually paved, ground on which aircraft take off and land.
Self-Contained Equipment Enclosure	A prefabricated, all-weather enclosure specifically manufactured to house radio and related backup power supply equipment.
Siting Guidelines	Within the context of the required geographic coverage, Project facilities will be sited according to siting guidelines to minimize any potential environmental impact from the siting of Project facilities. Sites will be selected in this order of preference: collocation on existing, County or municipally owned buildings,

	towers or structures; or sited at current or newly acquired county-owned sites (previously disturbed, then greenfields); , and third-party sites.
Sole Source Aquifer	An aquifer that supplies 50% or more of the drinking water in a particular area.
State Highway	Roads, streets and highways maintained by the State.
State Register of Historic Places	The official list compiled by the State Historic Preservation Office ("SHPO") of buildings, structures, districts, objects and sites significant in the history, architecture, archaeology and culture of New York State.
Structures	Towers, antenna support structures, equipment shelters and other permanent site infrastructure.
Study Area	The geographic area studied in this DGEIS encompassing Cayuga County and a limited area of neighboring land beyond Cayuga County's borders where Project facilities may be located depending on geographic coverage requirements
Sub-grade	The native soil mass that makes up the primary foundation of the trail that supports the tread surface.
Tectonics	A branch of geology that studies structural features of regional extent for the clues they provide regarding the forces that cause the earth's crust to be deformed, producing continents, mountains and other geological features.
Telemetry	The science or process of telemetering data.
Terminal	A full-time pick-up or delivery location for passengers or goods.
Till	Glacial drift deposited underneath a glacier and consisting of a heterogeneous mixture of clay, silt, sand, gravel and boulders ranging widely in size and shape.
Topography	Physical features (e.g., mountains) that characterize a certain landscape.
Unique Farmland	Land other than prime farmland that is used for the production of specific high value food and fiber crops. Unique farmland has a special combination of soil quality, location, growing season and moisture supply needed to economically produce sustained high quality or high yields of a specific crop.

ACRONYMS

Acronym	Meaning
ACHP	Advisory Council on Historic Preservation
AGL	Above Ground Level
ANSI	American National Standards Institute
APE	Area of Potential Effect
ASTM	American Society of Testing and Materials
ATF	Bureau of Alcohol, Tobacco, Firearms and Explosives
BCA	Bird Conservation Area
BMP	Best Management Practices
CAF	Coastal Assessment Form
CB	Citizen's Band Radio
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
DEA	Federal Drug Enforcement Administration
DEC	New York State Department of Environmental Conservation
DGEIS	Draft Generic Environmental Impact Statement
DOH	New York State Department of Health
DOI	United States Department of the Interior
DOL	New York State Department of Labor
DOS	New York State Department of State
DSL	Digital Subscriber Line
ECL	Environmental Conservation Law
EIS	Environmental Impact Statement
EJ	Environmental Justice
EMS	Emergency Medical Services
ENB	DEC's Environmental Notice Bulletin
FAA	Federal Aviation Administration
FBI	Federal Bureau of Investigation
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FGEIS	Final Generic Environmental Impact Statement
FWS	United States Fish and Wildlife Service
GIS	Geographic Information System
HAPs	Hazardous Air Pollutants
HRA	Health Risk Assessment
IBA	Important Bird Area
IEEE	Institute of Electrical and Electronic Engineers
kW/hr	Kilowatt per Hour
LCCS	Land Capability Classification System
LSZ	Landscape Similarity Zone
MPE	Maximum Permissible Exposure
LWRP	Local Waterfront Revitalization Program

NAAQS	National Ambient Air Quality Standards
NCRPM	National Council on Radiation Protection and Measurements
NCSHPO	National Conference of State Historic Preservation Officers
NEPA	The National Environmental Policy Act
NHPA	National Historic Preservation Act
NMC	Network Management Center
NOx	Nitrogen oxides
NRCS	Natural Resource Conservation Service
NYCRR	New York Codes, Rules and Regulations
NYNHP	New York Natural Heritage Program
OET	FCC Office of Engineering and Technology
OFT GEIS	The Generic Environmental Impact Statement prepared by the New York State Office for Technology in 2004 in relation to the proposed Statewide Wireless Network
OFT GVIA	The generic visual impact assessment prepared for the OFT GEIS
O_3	Ozone
OPRHP	New York State Office of Parks, Recreation and Historic Preservation
OSHA	Occupational Safety and Health Administration
OTR	Ozone Transport Region
Pb	Lead
PCS	Personal Communications Service
PM_{10}	Particulate matter with an aerodynamic size of 10 microns or less
$PM_{2.5}$	Particulate matter with an aerodynamic size of 2.5 microns or less
PSAP	Public Safety Answering Position
PSTN	Public Switched Telephone Network
RPA	Registered Professional Archaeologist
SEIS	Supplemental Environmental Impact Statement
SEQRA	State Environmental Quality Review Act
SHPO	State Historic Preservation Officer
SMR	Specialized Mobile Radio
SPDES	State Pollutant Discharge Elimination System
SPL	Sound Pressure Level
SO_2	Sulfur dioxide
SWN	Statewide Wireless Network
THPO	Tribal Historic Preservation Officer
TLMR	Trunked Land Mobile Radio
UDP	Unanticipated Discovery Plan
UHF	Ultra High Frequency
USGS	United States Geological Survey
UV	Ultraviolet
VOCs	Volatile Organic Compounds

EXECUTIVE SUMMARY

I. PREFACE

The Cayuga County Legislature ("County") is proposing improvements to its emergency communications system ("Project"). As the proposed Project's name signifies, the Emergency Communications Project is a much-needed effort to improve public safety and public service communications infrastructure throughout Cayuga County. The Project will be a coordinated network of interconnected receiving and transmitting antenna sites that will provide communications services to public safety and public service agencies. Network communications will be controlled, monitored and administered by one or more network management centers ("NMCs"). The Project will be available for use by all public safety and public service agencies.

Because the proposed Project will involve construction of a number of new towers and modification of existing towers sites which will span the entire geographic area of Cayuga County, and in some cases, areas adjacent to Cayuga County, the County, acting as lead agency, elected to conduct a generic environmental review of the Project, to give the Project the widest possible public exposure and opportunity for public comment. This draft generic environmental impact statement ("DGEIS") is intended to comply with section 8-0101 *et seq.* of the New York Environmental Conservation Law ("ECL") and Title 6, Part 617 of the New York Code of Rules and Regulations ("NYCRR"), (collectively, the State Environmental Quality Review Act or "SEQRA"); to inform the public of any potential environmental consequences that may result from the Project; and to analyze reasonable alternatives that may avoid or minimize those potential impacts. The County has and will continue to encourage open and public dialogue regarding the environmental review of the Project. The impacts and considerations included in the scoping document have been incorporated into this document and relevant comments on this DGEIS will be addressed and incorporated into the final generic environmental impact statement ("FGEIS").

The County appreciates the continuing support of the many citizens, agencies and officials who have advocated for, commented on and otherwise joined in the effort to improve public safety and public service communications throughout Cayuga County.

II. NEED FOR THE PROJECT

State, municipal and federal agencies have employed wireless communications systems for several decades to communicate within and between their organizations and to provide services to their constituents. In recent years, there have been a number of well-publicized events that have occurred that demonstrate the desirability of a county-wide wireless communications system for public safety and public service entities to better prevent and respond to emergencies

and protect the County's residents. Technological advances make it possible to design and implement a secure wireless communications system that both allows local and distant first responders to coordinate the efforts on an as-needed basis in a secure environment as well as serve routine, day-to-day communications needs on a local basis. Although the technology exists to allow such an advanced, secure and reliable system, no such network exists today in Cayuga County.

Generally speaking, communications amongst public safety providers is critical to the reduction of incident response time. The communications and coordination between multiple agencies during large events, natural disasters such as ice or wind storms, and man made disasters, including fire, are all examples of events that put an extreme load on public safety communications systems. Seamless communications between Cayuga County's 911 Center, police organizations, emergency medical services ("EMS") providers, and fire departments across Cayuga County is a daunting task during an emergency, and the Project is intended to make that task manageable.

A range of factors challenge the existing emergency radio communications system, including that (1) the existing system is currently outdated and has met its useful service life, and replacement parts for certain equipment are no longer manufactured or available; (2) the existing system has a limited number of communications sites for the entire County and radio coverage is not adequate for public safety; (3) there are many areas in Cayuga County where adequate coverage is very poor or does not exist; (4) many system users across municipalities are unable to communicate with one another because of the varying frequency bands. This lack of interoperability causes additional problems when managing the scene of an incident, particularly when multiple jurisdictions are involved.

Further, Federal regulations will require FCC license holders such as Cayuga County to comply with frequency "re-banding" requirements which necessitate modifications to the existing system and installation of new equipment.

III. SEQRA PROCESS-TO-DATE

The County declared its intent to act as lead agency for the proposed action by resolution dated May 25, 2010. Pursuant to 6 NYCRR section 617.3(g)(1), the County permissibly segmented the review of the "Design Project" (obtaining potential prime contractors and subcontractors for the design, engineering, construction, and operation of the Project, and consideration of approvals related to bonding for the Project so that sufficient funding exists to explore appropriate alternatives as required by SEQRA and other provisions of law) from the remainder of the Project. The County determined that the Design Project was not likely to result in a

significant impact on the environment and issued a "negative declaration" for that portion of the proposed action.

Additionally, the County permissibly segmented certain minor improvements to existing emergency wireless communications systems related to the City of Auburn 911 Communications system (the "Improvements") from the remainder of the Project. Although the Improvements were found to constitute a Type II action, the County nevertheless reviewed the potential environmental impacts that could result from the Improvements. Finding that there were no potential significant adverse environmental impacts, the County issued a Negative Declaration for the Improvements.

The County also determined that the Project posed potentially significant environmental impacts and issued a "positive declaration," determining that a generic environmental impact statement must be prepared. The County prepared and circulated a draft scope to define the issues to be discussed in this DGEIS and conducted a public scoping hearing on August 16, 2010. The County also accepted written comments on the draft scope from August 9 through September 7, 2010.

No comments were received on the draft scope, the DGEIS, or the Project. Accordingly, the County finalized the scoping document in September 2010. Copies of the Final Scope were sent to all potentially involved and interested agencies. The Final Scope is the basis for this DGEIS, which discusses and evaluates the potential environmental impacts associated with the proposed action.

Consistent with 6 NYCRR 617.9(b)(7), this DGEIS incorporates by reference the Generic Environmental Impact Statement prepared in 2004 for the New York State Office for Technology's Statewide Wireless Network ("OFT GEIS"). Throughout this DGEIS, relevant discussions of potential significant impacts and appropriate mitigation contained in the OFT GEIS are referenced or reproduced in whole or in part where relevant to this generic environmental review. Where necessary, relevant discussions in the OFT GEIS have been revisited, updated and confirmed to provide an accurate projection and evaluation of the environmental impacts associated with construction and operation of the Project.

It is reasonable and appropriate to rely on information in the OFT GEIS because many of the same environmental considerations were evaluated in that study, and the Project proposes a similar wireless network to that evaluated for the Statewide Wireless Network ("SWN") in the OFT GEIS. Accordingly, this DGEIS will follow a similar format and scope as the OFT GEIS. It will omit discussion of environmental impacts associated with areas of New York State outside

of Cayuga County and its surrounding areas and/or not otherwise applicable to the Project, as appropriate.

A. SELECTION CRITERIA

The required functionality of the proposed Project is paramount rather than the particular technology or equipment. The most important functional requirements include 87% portable radio coverage; expandability; voice and data security; interoperability; specified call features; and digital format, to name a few.

B. ENVIRONMENTAL CONSIDERATIONS

This DGEIS was prepared to inform both the County and the public about the potential environmental impacts associated with the Project.

The County has established specific goals to minimize the environmental impacts associated with the Project. To address concerns regarding visual impacts associated with telecommunications facilities and their perceived inconsistencies with surrounding land uses, the County has proposed use of siting guidelines which recommend use of County or municipally owned, existing towers in the first instance and use of previously undisturbed sites or "greenfields" should be used only if no previously disturbed sites are available. These siting guidelines ultimately will reduce the number of third party and greenfield sites that will be used, where feasible, considering the performance specifications of the Project.

The County seeks the fair treatment and meaningful involvement of all people in the SEQRA process regardless of race, color, national origin or income. Among the County's objectives for the Project is to avoid any disproportionate, adverse environmental impacts to "potential environmental justice areas" or "communities of concern" as defined by the Department of Environmental Conservation's Environmental Justice Policy CP-29 (2003).

C. SELECTION, DESCRIPTION AND LOCATION OF THE PROPOSED ACTION

Ultimately, the proposed Project is desirable because it remedies the points of vulnerability in currently existing public safety and public service agencies' wireless communications systems, while at the same time it protects the well-being of the environment and the financial viability of the County and its municipalities. The proposed system will be capable of expansion; flexibility; interoperability; real-time transmission; short call set-ups; and a high degree of both reliability and coverage. The selected Project has multiple redundancies to provide for seamless, reliable communications. The Project will be available for use by County and municipal public safety and public service agencies, as well as other agencies approved by the County.

The proposal under consideration in this DGEIS includes an integrated solution, incorporating several radio technologies. The core network would consist of a UHF Simulcast Trunked system. This network would be specifically designed to meet the County's requirements, the communications needs for today, as well as allowing for expansion for future technology standards established by the public safety community. Below is an overview of what is being proposed to meet the fundamental requirements of the Cayuga County performance specification:

- A UHF trunking and a conventional UHF analog simulcast paging system
- A single simulcast network for improved countywide coverage
- A network compatible with the nationally adopted Association of Public Safety Communications Officials (APCO) Project 16 and Project 25 digital communications standards
- An infrastructure that provides capacity, capability and expandability for the future
- A new digital microwave transport backbone
- Single point of entry for subscriber information
- Expandability to support additional simulcast systems, channels and multiple zones
- Reduced Prime to Remote site bandwidth requirements
- High reliability and Remote site routers
- Security Partitioning
- A design that shares the Onondaga Master Switch and affords the County a lower cost system design that would not sacrifice functionality or autonomy

The core of the proposed system consists of a between 7 and 15 radio site simulcast trunked system which would result in:

- APCO Project 25 compliance and Simulcast technology to improve radio coverage
- 87% portable on street countywide radio coverage
- Mobile, portable radio subscriber equipment
- Console interface equipment

- System/Network management equipment
- Microwave network for data transmission

The proposed simulcast digital trunking solution proposal includes the latest generation compatible base radio platform with IP connectivity throughout the network. The stations would use APCO Project 25 12.5 kHz digital technology that would meet future FCC requirements, including the upcoming FCC narrowband requirements.

The Project would include base stations to meet the County's analog interoperability requirements. To provide County dispatchers with the necessary access to the trunking system, the system would include up to date, compatible radio dispatch consoles, which would be located at the 911 Center. The Project includes consoles that consist of PC-based workstations at each console position. This configuration would minimize any significant operational changes at the 911 Dispatch Center.

The proposed system would include providing compatible subscriber radios for communication system users. All radios would be flash upgradeable for future expansion when required. The Project would provide 87% area reliability, which is a goal of the Project. Clear communications would be realized throughout the rural, suburban and high population areas of Cayuga County.

The Project will also include one or more Network Management Centers. The NMCs' activities include providing dispatch services and regional support for the system, monitoring and directing use of the Federal Communications Commission ("FCC") Mutual Aid Channels; directing communications during emergency situations; providing backup for other NMCs; and coordinating other agency communications. Additionally, at least one NMC will provide system management and administration; coordination with all aspects of the Project; monitoring system traffic status; monitoring antenna site status; servicing Project problems; dispatching service crews to trouble spots; monitoring Project security; optimization of the Project and performing Project resource management in times of emergency. NMCs may have building or roof-mounted antennas and may be connected to an existing or new antenna site.

IV. SUMMARY OF ENVIRONMENTAL REVIEW FOR THE PROPOSED ACTION

This DGEIS has been prepared pursuant to the National Environmental Policy Act ("NEPA") (42 U.S.C. §§ 4321 *et seq.*), its implementing regulations, and SEQRA. This DGEIS is intended to inform the County, all potentially involved and interested agencies, and the public about the potentially significant adverse impacts the Project may pose to natural, human and cultural resources throughout the Study Area.

Evaluation of the impacts associated with the deployment of the Project must be discussed more generally than would a site-specific environmental evaluation because the Project will involve installation of system components across Cayuga County and its surrounding areas. To that end, the County has evaluated these impacts through a DGEIS, and will prepare an FGEIS following the conclusion of the public comment period on the DGEIS. In addition, the County, in accordance with SEQRA, will complete additional SEQRA review, including preparation of supplemental environmental impact statements ("SEISs") when necessary.

After the County's acceptance and approval of the FGEIS, individual site selection and construction will occur. Whether additional environmental review beyond the analysis contained in the FGEIS will be required for a particular site or specific construction activity will depend upon the County's evaluation as to whether the reasonably anticipated environmental impacts associated with a specific site or construction activity fall within or outside the parameters of the analysis contained in the FGEIS. Activities in conformance with the conditions and thresholds established in the FGEIS will not require further review.

In those instances where the County determines that development of a site or undertaking certain construction activity may not be in conformance with the conditions and thresholds established in the FGEIS, the County will require additional information to be provided to allow the County to determine whether the proposed activity is likely to result in a significant adverse impact to the environment. The County will then evaluate that information and prepare either a Negative Declaration (no significant adverse environmental impact is likely) or a Positive Declaration (an SEIS is required).

Examples of when further review will be required, possibly including preparation of an SEIS, include construction of a 300-foot lighted antenna tower, construction that may disturb a sensitive receptor, or construction in a wetland or coastal dune. In all circumstances, the County is committed to monitoring the potential environmental impacts of the Project closely and carefully, erring on the side of caution and engaging in an ongoing and continuous environmental review throughout deployment of the Project.

Due to the scale of the proposed project, this DGEIS will present a range of potential conditions, thereby providing a framework for depicting a full consideration of impacts associated with the proposed action and its alternatives. Within the Project area, certain common land use settings were identified including metropolitan areas, town and village areas, rural areas, recreation, open space, forest land and park land areas, and coastal areas.

This DGEIS evaluates the current environmental settings, the various natural resources including geology, air quality, water resources, terrestrial and aquatic ecology and agricultural resources;

human resources including transportation systems, compatibility with existing land use and zoning, community services and demography; cultural resources including visual resources, noise disturbance, historical and archaeological resources; and public health and safety associated with, among other things, radiofrequency electromagnetic emissions (DGEIS § 3.01 *et seq.*). The DGEIS then identifies potential impacts to each of these resources according to each land use setting and whether the impact was likely to occur during the construction or operation of the Project (DGEIS § 4.0 *et seq.*). The County has developed mitigation and avoidance measures to minimize or eliminate these potential impacts (DGEIS § 5.0 *et seq.*). Additionally, the DGEIS discusses those adverse environmental impacts that cannot be avoided if the Project is implemented (DGEIS §6.0), provides an analysis of alternatives to the Project (including the No Build Alternative)(DGEIS §7.0), and considers irreversible and irretrievable commitment of resources, cumulative impacts and growth inducing aspects, and effects on the use and conservation of energy (DGEIS §§8.0, 9.0 and 10.0).

The DGEIS demonstrates that there will be no significant adverse impacts to geology, water resources, wetlands and floodplains, air quality, agricultural resources, transportation, community services and utilities, or demography, resulting from the construction or operation of the Project. To the extent that there may be any possible adverse environmental impacts to these resources, they will be minimized to the greatest extent practicable.

Potentially significant impacts to natural, human and cultural resources such as terrestrial and aquatic ecology (avian species), land use, visual resources, noise, historical/archeological resources and human health and safety (radiofrequency electromagnetic emissions effects), are discussed in detail in this DGEIS. However, the mitigation measures proposed in Section 5 of this DGEIS will minimize or avoid any potential significant adverse impact to the maximum extent practicable. The natural, human and cultural resources that are potentially significant are summarized below.

A. AVIAN SPECIES

The DGEIS examines the potential for bird collisions with new towers associated with the Project. Despite reports of collision fatalities at some known types of communications towers for over 50 years, there is virtually no risk to avian species posed by the types of towers associated with this Project. According to the studies reviewed, while birds may collide with towers of virtually any height, fatality events are limited, almost exclusively, to towers over 500 feet in height. In fact, at least one study demonstrated that the height of guyed communications towers is a prime risk factor in avian tower collision fatalities. Additionally, lighted towers in excess of 500 feet are of particular concern. Shorter towers, even when located in the same place

as a tall tower known to kill a large number of birds, have a much lower impact on night-migrating birds.

According to these studies, guy wires are the single most important risk factor with respect to bird collisions and only one or two fatalities have been reported from un-guyed towers. It is reasonable to conclude that un-guyed towers do not represent a significant adverse impact for birds. Studies also indicate that multiple sets of steady-burning red lights attract night-migrating birds to communications towers when compared to unlit towers or towers with only flashing lights.

The types of towers anticipated for use with the Project will often fall into the U.S. Fish and Wildlife Service's guidelines for avoiding bird impacts, i.e. collocation of antennas on existing towers and avoidance of use of guyed towers. Additionally, Project towers are expected to be significantly lower in height than 500 feet. As a result, impacts to avian species are expected to be minimal and, to the extent that they exist at all, will be mitigated to the greatest extent practicable.

B. LAND USE AND ZONING

There is the potential for impacts to municipal and regional land use patterns and zoning as a result of the construction and operation of Project antenna sites on greenfield sites. Generally, the location of an antenna site in a particular area has no impacts on surrounding land uses. These sites do not physically interfere with existing land uses in the areas in which they are located and do not preclude the use of surrounding lands for any purpose. The only tangible impact is that an antenna site physically occupies a given space, converting it to telecommunications purposes for the operational life of the Project. There is a perceived impact that use of property for antenna sites is inconsistent with surrounding land uses, based largely on visual impacts (which are discussed in this DGEIS) and an alleged diminution of property values as a result of changes in the viewshed.

The County will, to the extent practicable, avoid and mitigate these perceived impacts and those impacts associated with constructing new telecommunications facilities in areas not municipally-zoned for such uses. The siting guidelines favor use of existing facilities over new construction and siting on already developed land over previously undeveloped sites, which will be the most effective manner of mitigation. The siting guidelines recommend siting of antenna sites on existing, County or municipally owned towers ("collocations") where feasible. Collocations will not have an impact on existing land uses. The land is already dedicated to such uses and the inclusion of an additional antenna or associated equipment will not expand that use. In the event

any antennas are sited on roofs, those structures will also not affect surrounding land uses, because these uses will continue, unaffected, despite the presence of an additional antenna.

For those sites that will need to be located on undeveloped sites, the County will comply to the extent practicable with local zoning requirements to achieve consistency and harmony with local land use patterns and zoning regulations and to mitigate any potential adverse impacts to the extent practicable. The County recognizes that in some circumstances compliance with local zoning may not be feasible. In those circumstances, the County will necessarily rely upon its immunity from local land use laws. Nevertheless, for each site, the County will comply, to the extent practicable, with the substantive provisions of municipal land use controls (i.e., setbacks, berming, height limitations, lighting limitations, site security and access road security).

The County will evaluate each potential antenna site to determine whether a State, regional or federal land use plan is in place at the site and, if so, will comply therewith to the extent practicable. The County will also identify specific resource areas that may or may not have land use plans associated with them within the area where the Project may be sited. To the extent practicable, the County will avoid such areas and, where avoidance is impracticable, will consult and comply with the land use plan to the extent practicable.

In light of the siting guidelines, the County's development of siting criteria that incorporate certain trends in local antenna siting restrictions, commitment to follow local siting regulations to the extent practicable and commitment to follow State or federal land use programs, impacts to land use will be mitigated to the maximum extent practicable.

C. VISUAL RESOURCES

Certain visual resources or "viewsheds" throughout the County and its surrounding areas are of notable value. Such areas exhibit outstanding or unique arrangements of natural or man-made features including water features, land forms or vegetative patterns that provide inspiration, hold interest and command the attention of the viewing public. Visual resources can be of Statewide, local or national importance and are often a function of two perspectives: the view of a given location and the view from a given location. Likewise, the accessibility of a visual resource to the population aids in its assessment. The County will survey all proposed sites for visual resources surrounding the area and will ensure that views of and from State, locally and nationally designated visual resources are identified and appropriately assessed prior to construction.

The visual analysis contained in this DGEIS concludes that the vast majority of potential visual impacts resulting from the Project would be associated with the construction of new, high-profile tower sites. The Project siting guidelines substantially mitigate this potential impact by requiring

collocation of antennas on existing, County or municipally-owned structures where feasible. For those antenna sites that require new construction, there are additional specific mitigation techniques that will eliminate or substantially reduce any visual impact of the individual sites. Mitigation will be achieved through selective siting of the high-profile Project facilities to the extent practicable. This includes, to the extent practicable given Project coverage requirements, keeping the sites off of prominent hilltops and ridges and at greater distances from areas of settlement and other visually sensitive receptors.. These will almost always serve to substantially reduce visibility and visual impact. Collocation and siting of antennas where the visual quality of the landscape is already compromised will also reduce visual impact. Minimizing tower height and reducing the size and number of microwave dish antennas wherever possible also will reduce contrast in scale and form. As a result, on both a system-wide and site-specific basis, visual impacts will be mitigated to the maximum extent practicable.

To avoid any potential visual impacts or mitigate them to the maximum extent practicable, NMCs and antenna sites will be sited as far from historic properties and sensitive viewsheds as is practicable. If siting is necessary on an historic structure, every effort will be made to avoid making changes to the structure, façade and other visible features of the property. The County will also comply fully with all applicable FCC programmatic agreements pertaining to the siting of antenna sites on or near historic properties. All consultation and permitting requirements under the National and State Historic Preservation Acts will be followed, and historic preservation officers will be consulted (Cultural Resources, Appendix C). Where avoidance is not possible, all historic properties within the Area of Potential Effect ("APE") of a Project facility will be treated as a sensitive receptor.

D. NOISE

A potential significant noise impact may result from persistent noise generated during operation of antenna sites and/or NMCs. Persistent sounds may arise during Project operations from structural vibration sound in an area with persistent wind, electrical and mechanical equipment noise. In metropolitan areas and most town, village and agricultural areas, these persistent sounds are seldom audible, however, in rural areas, certain agricultural areas, areas adjacent to certain parks, recreation areas or open spaces, the actual background noise may be quite low. Therefore, persistent noise may be more noticeable and potentially significant at sound levels sufficiently higher than background noise levels in those areas.

The DGEIS proposes to equip permanent stationary equipment noise sources, such as generator engines, with noise mufflers as specified by the engine manufacturer and the generator will be housed in a noise reducing housing or structure. For facility structures that require cooling fans,

those fans will be located in structures designed to dampen fan noise while allowing for adequate ventilation. Noise from the operation of mechanical or electrical equipment will be reduced by its enclosure in equipment shelter located at the site.

E. HISTORICAL & ARCHEOLOGICAL RESOURCES

Historical resources within the viewshed of a new antenna site or NMC may be potentially visually impacted if the new facility results in a diminution of the integrity of the setting associated with the historic resource. Any increase in noise levels in excess of 3 dB (the threshold at which an increase in noise level becomes noticeable) at a historical site that results from operation of a Project facility would also constitute a potential adverse impact. Additionally, ground disturbance during Project construction has the potential to disturb or destroy archeological resources.

The DGEIS proposes avoidance as the primary mitigation measure. Collocation of antennas on existing, County or municipally-owned towers, provided that those existing towers are not historical resources, reduces impact to the viewshed of a historical resource, as well as potential noise impacts and ground disturbance during construction (due to reduced construction). All historical resources within the area of potential effect associated with each Project facility will be treated as sensitive receptors. Mitigation of potential visual and acoustic impacts will include those measures described in other sections of this DGEIS to reduce these potential impacts. Screening, size reduction, and designing the structure so that it blends with its surroundings will minimize impact to historical resources for new builds. Additionally, mitigation measures proposed to minimize noise above will also minimize noise impact to historical resources.

For archeological impact, avoidance of potential archeological resources will be employed to the extent practicable. If an archeological resource is known to be in close proximity with the proposed construction, a site specific archeological resource protection plan will be developed. If significant archeological resources that cannot otherwise be avoided are located on a site, mitigation would likely include a data recovery plan designed and implemented under the supervision of a Registered Professional Archaeologist ("RPA") and in accordance with the New York Archaeological Council's *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State* (1994) and recommended for use by OPRHP, and the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*, 48 FR 44716 (as amended 1990). Alternatively, the archeological resource could be protected by controlled burial. An Unanticipated Discovery Plan will be developed in consultation with the OPRHP where necessary.

F. ELECTROMAGNETIC EMISSIONS

The DGEIS includes an evaluation of the effects, if any, of electromagnetic emissions on human health and safety. In our everyday world, electromagnetic emissions are present and are emitted from a variety of sources ranging from the sun to radio stations. Electromagnetic energy waves of varying length, frequency and energy continually shower all living things. Most of such energy has little or no impact on biological processes.

The Project will employ technology which works by sending and receiving signals in the form of radio waves. Project transmitters emit only non-ionizing radiation, meaning that they are not of sufficient strength to break chemical bonds in organic molecules. The FCC sets human exposure limits for all radiofrequency emissions. The "power density" of these emissions is a function of mounting height of the transmitters, the type of radiation, transmitter power and the presence or absence of similar emissions in a proximate area. The DGEIS contains a thorough evaluation of the potential electromagnetic emission exposure which will result from the Project which concluded that calculated power densities are well within the FCC-allowable maximum power densities. Further, the FCC has concluded from previous studies that installations such as those proposed by the County have been Categorically Excluded from causing adverse health effects due to their low power densities.

Accordingly, the analysis concludes that no potential risk of adverse human health effects are associated with electromagnetic power densities in the frequency and power ranges of the planned Project equipment. (*See* OFT DGEIS Public Health and Safety, Appendices A, B and C). There will be no adverse impacts to human health or the environment based on the electromagnetic emissions of the Project. The County will adhere to all FCC regulations pertaining to transmitter elevation, access control, distance from buildings and microwave beam directionality. This will ensure that no member of the public will be exposed to unsafe levels of electromagnetic emissions as a result of the construction or operation of the Project.

V. CONCLUSION

All potentially significant impacts were identified, studied and either determined to be not significant or to have been mitigated to the maximum extent practicable. In the event that site-specific conditions fall outside the scope of the DGEIS analysis, further appropriate review will be conducted.

1.0 INTRODUCTION

1.1 DESCRIPTION OF THE PROPOSED ACTION

The Cayuga County Legislature proposes to implement an emergency communications system upgrade for voice and data radio communications services to enable public safety and public service entities operating within Cayuga County to better respond to emergencies, and to protect its citizens through interoperability between and among agencies at all levels of government. This Project will provide improved public communications systems important to the coordination of public safety and public service resources.

The Project will include a network of between 7 and 15 interconnected receiving and transmitting antenna sites located throughout Cayuga County and, in some instances, in areas neighboring Cayuga County. It will be controlled and monitored by one or more NMCs administered at the County level. The Project will provide full redundancy to ensure high reliability and will supply continuous communications even in the face of equipment failure, natural disasters and natural, accidental or intentional incidents. The Project will be available for use by County and municipal public safety and public service agencies, as well as other agencies approved by the County.

1.2 PROJECT SPONSOR

1.2.1 Cayuga County Legislature

The Cayuga County Legislature is the legislative body for the county of Cayuga. It consists of 15 representatives elected from districts throughout the County and its offices are located in Auburn, New York.

1.2.2 Purpose and Scope

The Project will provide wireless network services for County and local governmental entities, as well as other interested agencies that operate within Cayuga County's geographic borders. The Project will facilitate and coordinate the communications systems of Cayuga County, and its political subdivisions and municipalities, and all other participating agencies by improving the governmental wireless communications infrastructure.

1.3 GENERAL PROJECT LOCATION

The Project will generally be located throughout Cayuga County. Additionally, where coverage requirements necessitate it, sites may be constructed on lands neighboring Cayuga County. For purposes of the generic environmental review contained in this DGEIS, a study area encompassing Cayuga County and a limited area of neighboring land beyond Cayuga County's

borders (the “Study Area”)is being used. The exact number and locations of Project sites is not known at this time.

The Study Area is located in north-central New York. The Study Area contains several different types of geographic, topographic and demographic settings. The Project will be designed to ensure 87% coverage in Cayuga County with the Project's interconnected antenna systems located throughout the Study Area.

Within the context of the required geographic coverage, Project facilities will be sited according to siting guidelines to minimize, to the maximum extent practicable, any potential environmental impact. In the first instance, the siting guidelines propose collocation on existing buildings, towers or structures to the extent feasible, with a preference for County or municipally-owned sites over than third party sites. If collocation is not possible due to area or geographic coverage needs, new construction activity will be considered. Project antennas will be sited on County-owned sites where possible with a preference for previously developed County or municipally owned land over previously undeveloped or “greenfield” sites. If the County does not currently own suitable properties where sites are required to satisfy geographic coverage needs, then the County may acquire new property, with a preference for previously disturbed properties over greenfields.

For the purposes of this environmental review, potential impacts and mitigation measures have been evaluated in each of the following characteristic land use settings:

- Metropolitan Areas
- Towns and Villages
- Rural Areas
- Recreation, Open Space, Forest Land & Park Land Areas
- Coastal Areas

1.4 STATE ENVIRONMENTAL QUALITY REVIEW ACT COMPLIANCE TO DATE

Actions proposed by any governmental agency, including the County, require a review of environmental impacts in accordance with SEQRA. The County is principally responsible for carrying out the action. There are numerous State and local agencies that may eventually have the jurisdiction to approve one or more aspects of the action ("involved agencies"). Many other agencies may have an interest in the action but will not have approval authority over any aspect of it ("interested agencies"). It is not currently possible to ascertain which agencies, in fact, could become involved or interested. Accordingly, all cities, towns and villages in the Study

Area, and several State Agencies and departments that have the potential to approve one or more aspects of the action, were identified and treated as involved agencies for the purpose of this SEQRA review process. Several Federal agencies were identified and treated as interested agencies for purposes of this review.

On May 25, 2010, the County declared its intent to act as lead agency for the action by resolution. Subsequently, the County was designated as the lead agency for the purposes of SEQRA.

Pursuant to 6 NYCRR section 617.3(g)(1), the County permissibly segmented the review of the "Design Project" (obtaining prime contractors and subcontractors for the design, engineering, construction, and operation of the Project, and consideration of approvals related to bonding for the Project so that sufficient funding exists to explore appropriate alternatives as required by SEQRA and other provisions of law) from the remainder of the Project.

The County notified all potentially interested and involved agencies of its intention to permissibly segment the environmental review of this action pursuant to 6 NYCRR section 617.3(g)(1). The County concluded that the Design Project is in the nature of a preliminary planning and design action and therefore would not have any significant adverse impact on the environment and would not commit the Agency to a particular course of action. Additionally, the County found that none of the dangers of segmentation were present because of the thorough review taking place in this DGEIS. Thereafter, the County made a finding of no significant impact regarding the Design Project and issued a Negative Declaration. Accordingly, an environmental impact statement ("EIS") need not be prepared regarding the Design Project.

Additionally, the County considered segmentation of certain minor improvements to existing emergency wireless communications systems related to the City of Auburn 911 Communications system (the "Improvements"). The Improvements, including collocation of antennas on the City of Auburn 911 and the County 911 Emergency Center, installation of associated equipment shelters and emergency backup generators for the sites, and installation of wiring at the Onondaga County 911 Center, were reviewed for purposes of SEQRA. The County determined that the Improvements constitute a replacement, rehabilitation, or reconstruction in kind as that term is used in 6 NYCRR 617.5(c)(2) because the Improvements will be installed at locations with a substantially similar use (i.e., emergency wireless communications).

The County determined that segmentation was permissible because the Improvements constitute a Type II action that may be segmented and require no SEQRA review, and the County found that none of the dangers of segmentation were present because of the thorough review taking place in this DGEIS. The County nevertheless reviewed the potential environmental impacts that

could result from the Improvements. Finding that there were no potential significant adverse environmental impacts, the County issued a Negative Declaration for the Improvements.

The County also considered the relevant areas of environmental concern and applied the criteria set forth in 6 NYCRR 617.7(c) in relation to the Project and concluded that development of the Project may result in a significant adverse impact on the environment. On June 30, 2010, the County, as lead agency, issued a Positive Declaration of Significance regarding the Project. Notice of the Positive Declaration appeared in the July 21, 2010 issue of the Department of Environmental Conservation's Environmental Notice Bulletin ("ENB"). The Positive Declaration of Significance was circulated to the involved and interested agencies on July 7, 2010.

Because this Project will involve construction of a number of new towers and refurbishing existing towers which will span the entire geographic area of Cayuga County, as well as some neighboring lands the County determined to conduct a generic review of the Project. Subsequently, a draft scope for this DGEIS was prepared and circulated August 9, 2010. Involved and interested agencies, to the extent that they could be identified with due diligence, were put on notice and invited to participate in the SEQRA process.

The County accepted written comments on the draft scope and conducted a public scoping session at the Cayuga County offices on August 16, 2010. The scoping process was designed to focus the DGEIS on any potentially significant adverse impacts of the action and to eliminate consideration of irrelevant or non-significant impacts. No comments were received on the draft scope, the DGEIS, or the Project. Accordingly, the County prepared a final scope, which was approved by the County on September 28, 2010 and circulated to potentially involved and interested agencies in accordance with SEQRA. The final scope is the basis of this DGEIS.

2.0 DESCRIPTION OF THE PROPOSED ACTION

As discussed in the Executive Summary, this section incorporates portions of the OFT GEIS that are relevant to this DGEIS, in particular, the Project description and approvals that are similar to those analyzed for the SWN.

2.1 Project Purpose, Needs and Benefits

2.1.1 Background and History

The County currently has a wireless communications system in place in various locations across Cayuga County to provide support for law enforcement, fire, emergency medical, local, and county government agencies. The current radio infrastructure is well over 30 years old and operates from five tower sites. It is currently comprised of many different frequency bands. Some agencies operate on VHF Lowband, while others are on an 800 MHz trunked system. Additionally, the County police agencies are on a VHF narrowband system. The systems are linked to the 911 Center by microwave.

The current system includes Zetron, Model 4040 consoles at the 911 Center. The subscriber units in the field consist of Motorola CDM 1250, Motorola Maxtrac, Maratrac, and many others. Portables in the field consist of Motorola HT1250, HT750, MT1000, HT1000, and P1225. Cayuga County utilizes mobiles with power supplies attached at the control station to operate its back up center.

2.1.2 Public Need for the Project

Generally speaking, communications amongst public safety providers is critical to the reduction of incident response time. The communications and coordination between multiple agencies during large events, natural disasters such as ice or wind storms, and man made disasters such as fire, are all examples of events that put an extreme load on public safety communications systems. Seamless communications between Cayuga County's 911 Center, police organizations, emergency medical services ("EMS") providers, and fire departments across Cayuga County is a daunting task during an emergency, and the Project is intended to make that task manageable.

A range of factors challenge the existing emergency radio communications system, including that (1) the existing system is currently outdated and has met its useful service life, and replacement parts for certain equipment are no longer manufactured or available; (2) the existing system has a limited number of communications sites for the entire County and radio coverage is not adequate for public safety; (3) there are many areas in Cayuga County where adequate coverage is very poor or does not exist; (4) many system users across municipalities are unable to communicate with one another because of the varying frequency bands. This lack of

interoperability causes additional problems when managing the scene of an incident, particularly when multiple jurisdictions are involved.

Further, Federal regulations will require FCC license holders such as Cayuga County to comply with frequency "re-banding" requirements which necessitate modifications to the existing system and installation of new equipment.

2.1.3 Objectives of the Project Sponsor

The County will deploy the Project in a coordinated, phased manner and on a countywide basis. The County's objectives also include:

- Technology – The Project will be designed and deployed to meet the needs of participating public safety and public service providers.
- Reliability - the Project will be designed for mission critical applications with multiple levels of fault tolerance, redundancy, and back up power
- Capacity - Capability to accommodate a multitude of public safety users during emergencies with orderly and prioritized access
- Control - Ability to manage and monitor who is communicating, when they communicate, and whom they communicate with
- Minimization of Visual Impact – The Project will be designed to minimize visual impacts on surrounding landscapes. The number and height of required new towers will be minimized to the extent practicable, with collocation of Project antennas where feasible. Use of available technology and siting strategies will be employed to minimize the visual impacts of the tower structures into the surrounding landscape.
- Public Participation – Encouraging public participation in the planning for Project deployment is one of the County's principal objectives. Notices relating to the Project were sent by mail to every municipality in the Study Area − nearly 35 communities. The County conducted a public scoping session and established a period to receive written comments. Electronic copies of the DGEIS will be sent to each of the over 40 potentially involved agencies and interested parties within and outside the Study Area. Paper copies have been sent to designated public repository(ies) to make the document available for public review. A copy of this DGEIS is available on the worldwide web. The public is invited and encouraged to provide comment on this DGEIS.

- Environmental Justice – The County seeks the fair treatment and meaningful involvement of all people regardless of race, color, national origin or income with respect to the deployment of the Project. Among the County's objectives is the avoidance of siting facilities that impose a disproportionate share of any negative environmental impact upon particular racial, ethnic or socioeconomic groups. To accomplish this objective, the County will evaluate data on minority representation, income and existing environmental burdens in areas considered for facility siting.

2.1.4 Benefits of the Proposed Action

The benefits of the Project can be generally divided into three categories: (1) overcoming current shortcomings in the existing emergency communications network; (2) assisting Cayuga County cities, towns and villages fire and EMS agencies by providing improved communications infrastructure for use that will meet FCC specifications; and (3) avoidance of the need for uncoordinated, independent local systems, to the extent practicable, which in turn, will minimize the proliferation of towers and cumulative adverse environmental impacts that could result from multiple communications networks.

The County proposes to implement a new UHF Simulcast Trunked system that will integrate all emergency communications within Cayuga County and will be available to the County and its municipalities, as well as State and federal agencies as approved by the County. This will allow for greater interoperability as well as more efficient communications. The Project will be expandable, and will allow for coordination within and among agencies. It will be monitored 24 hours a day, 7 days a week, by the provider to ensure that the network will always be available. It will provide 87% geographic coverage portable on street throughout the County. The Project will provide centralized network management to ensure high reliability.

The Project provides a coordinated strategy of deployment for public safety communications infrastructure. As FCC specifications mandate more stringent, and often more expensive, telecommunications facility standards, local development of compliant systems becomes more difficult. The Project will ensure that municipalities do not have to choose between the financial well being of their municipal government and the safety of their citizens. The Project will upgrade emergency systems in a cost-effective and well-planned manner while providing for the safety of citizens across Cayuga County.

2.2 Design, Construction and Operation

2.2.1 Technical Design

The County has completed a needs assessment to identify the improvements required to address the system deficiencies identified above. Based on these evaluations, the Project would consist of the construction of between 7 and 15 communications facilities in various locations throughout the Study Area. In addition to the physical site improvements and construction, new radio equipment and hardware will be provided to provide a complete and operable system.

The proposal under consideration in this DGEIS includes an integrated solution, incorporating several radio technologies. The core network would consist of a UHF Simulcast Trunked system and a UHF Simulcast Analog paging system. This network would be specifically designed to meet the County's requirements, the communications needs for today, as well as allowing for expansion for future technology standards established by the public safety community. Below is a high level view of what is being proposed to meet the fundamental requirements of the Cayuga County performance specification:

- A UHF trunking and a conventional UHF analog simulcast paging system
- A single simulcast network for improved countywide coverage
- A network compatible with the nationally adopted Association of Public Safety Communications Officials (APCO) Project 16 and Project 25 digital communications standards
- An infrastructure that provides capacity, capability and expandability for the future
- A new digital microwave transport backbone
- Single point of entry for subscriber information
- Expandability to support additional simulcast systems, channels and multiple zones
- Reduced Prime to Remote site bandwidth requirements
- High reliability and Remote site routers
- Security Partitioning
- A design that shares the Onondaga Master Switch and affords the County a lower cost system design that would not sacrifice functionality or autonomy

The core of the proposed system consists of a between 7 and 15 radio site simulcast trunked system which would result in:

- APCO Project 25 compliance and Simulcast technology to improve radio coverage
- 87% portable on street countywide radio coverage
- Mobile, portable radio subscriber equipment
- Console interface equipment
- System/Network management equipment
- Microwave network for data transmission

The proposed simulcast digital trunking solution proposal includes the latest generation compatible base radio platform with IP connectivity throughout the network. The stations would use APCO Project 25 12.5 kHz digital technology that would meet future FCC requirements, including the upcoming FCC narrowband requirements.

The Project would include base stations to meet the County's analog interoperability requirements. To provide County dispatchers with the necessary access to the trunking system, the system would include up to date, compatible radio dispatch consoles, which would be located at the 911 Center. The Project includes consoles that consist of PC-based workstations at each console position. This configuration would minimize any significant operational changes at the 911 Dispatch Center.

The proposed system would include providing compatible subscriber radios for communication system users. All radios would be flash upgradeable for future expansion when required. The Project would provide 87% area reliability. Clear communications would be realized throughout the rural, suburban and high population areas of Cayuga County.

It is anticipated that between 7 and 15 antenna sites will be required for the Project. Where feasible, sites may be sited on existing, County or municipally-owned structures. Antenna support structure heights vary depending on the height of available structures, coverage requirements and the environmental and aesthetic features of the siting location. If collocation pursuant to the siting guidelines is not feasible, construction of a new tower, sited pursuant to the siting guidelines, is expected.

The Project will also include one or more Network Management Centers. The NMCs' activities include providing dispatch services and regional support for the system, monitoring and directing use of the FCC Mutual Aid Channels; directing communications during emergency situations;

providing backup for other NMCs; and coordinating other agency communications. Additionally, at least one NMC will provide system management and administration; coordination with all aspects of the Project; monitoring system traffic status; monitoring antenna site status; servicing Project problems; dispatching service crews to trouble spots; monitoring Project security; optimization of the Project and performing Project resource management in times of emergency. NMCs may have building or roof-mounted antennas and may be connected to an existing or new antenna site.

2.2.1.1 Antenna Sites

Antenna sites consist of antenna and antenna support structures (e.g., towers, buildings, electrical transmission lines). Antenna sites are the basic hardware feature of the Project. These receive and transmit wireless signals between system users and NMCs. New antenna sites for the Project may consist of either construction of completely new towers or installation of equipment at existing, County or municipally-owned communications towers/facilities (Collocations). At this time, the number, type and location of each site is not currently known and site selection will be predicated a number of environmental, engineering and financial considerations.

New Tower Construction

As previously mentioned, a "new build" would consist of the construction of a new communications facility on an occupied or unoccupied piece of land. Listed below are the principal items expected to be included in this site type and a brief description of item.

Steel Lattice Tower

Steel lattice towers are typically expected to range in height from 150-200 feet tall, although towers may reach 300 feet in height. All towers would be of galvanized steel construction and supported by a below grade, cast-in-place concrete foundation. All towers would be designed in conformance with applicable state and local codes and conform to the requirements of ANSI EIA/TIA 222-G standard for design and installation of communications towers.

Antenna sites must comply with height restrictions and marking requirements, as specified by the Federal Aviation Administration ("FAA"). Freestanding antennas and building antennas that extend above the building rooftop may require formal correspondence with the FAA. The FAA specifies construction limitations and determines if structural painting or illumination is required. Objects that exceed 200 feet aboveground level must be marked or lighted for aviation safety. Marking of alternate structural sections with orange and white paint may be required. Some structures of

lower height may require marking or lighting if the FAA determines that their proximity to an airport or flight lane causes a potential flight hazard. All towers will be appropriately marked and/or lighted in accordance with applicable FAA standards.

Communications Shelter

Each site would include installation of a new equipment shelter to house the proposed radio equipment. The proposed equipment shelter would typically be 12 feet wide by 20 feet long and be constructed of pre-cast concrete. The shelters would be fully fabricated off-site and delivered to each proposed installation site with minimal on-site construction. The equipment shelter would be supported on a below grade, cast-in-place concrete slab that would be constructed on-site prior to delivery of the equipment shelter. All new radio hardware and control equipment will be located inside the equipment shelter.

Emergency Generator

Each site typically would include a diesel-fueled emergency power generator to provide auxiliary power in the event of a power outage. The generator would be delivered to the site fully fabricated in a self-contained, sound attenuated enclosure. A cast-in-place concrete slab would be constructed on-site prior to delivery of the generator. The generator would be typically sized to provide 50 KW of auxiliary power, which will be sufficient to support a 200 amp, 240 VAC, single phase electrical service. All diesel fuel for the generator would be stored in a doubled walled storage tank in full conformance with NFPA standards.

Equipment Compound

The above-referenced equipment/facilities would be installed within a chain link fenced compound. The fenced compound would typically be approximately 70 feet wide by 70 feet long and surfaced with a durable gravel material. The fence would be of galvanized chain link construction, 6 foot high, with 3 strands of barb wire. The equipment compound is expected to be sized to easily accommodate the County's proposed equipment.

Access Drive

Each site would include the construction of a new access drive from the nearest public or existing road to the location of the proposed equipment compound. The access drive would be solely for the purpose of accessing the proposed facility and would not be designed for public access or transportation. The access drives would be approximately fifteen feet wide and constructed with a hard, durable stone material. Access drives

would be suitably graded and will include swales, ditches and culverts as required to facilitate proper drainage at each site.

Electric Service

An electric service is expected to be installed at each site to provide the necessary power for the proposed equipment. The source of electric power for each site will be the nearest available connection point as determined by the local power utility. The power service would typically be routed underground at a point starting at the beginning of the proposed access drive and would follow the general route of the access drive to the facility. A utility-supplied electric transformer would be mounted adjacent to the equipment compound to provide the necessary electric voltage to the proposed equipment. The County equipment installation is expected to require a 200 amp, 240 VAC, single phase electric service.

Antennas and Cables

Each new build site would require the installation of new communication antennas on the towers; the number, size and type varying with each site installation. Typically, each site would require three transmit (TX) and one receive (RX) antenna for proper system functionality. The receive antennas would typically consist of omni-directional "whip" antennas which are approximately 3 inches in diameter and 10-15 feet long. Transmit antennas may be either directional panel antennas or omni-directional whip antennas. Directional panel antennas may be 8-12 inches wide by 5-10 feet long. In addition to the transmit and receive antennas described above, each site would require the installation of 1-5 microwave antennas which will transmit data between the various communication system sites. Microwave antennas would be of a parabolic configuration and may range in size from 3-8 feet in diameter. Each antenna is expected to have at least one associated coaxial cable that will be routed from the antenna, down the respective communication tower, and into the equipment shelter located in the immediate vicinity of the tower.

The land area that would be disturbed as a result of the proposed construction would typically range from ¼ acre to 1 acre depending on the length of the access road to be constructed. For new build sites, the County may utilize existing, County-owned land, or the County may purchase the land required to support the construction of the proposed facilities. At this time, it is anticipated that the typical size of the land purchase would be approximately 1 acre. However, the actual size will be dictated by local zoning requirements and other site specific criteria. Prior to purchase, the land would be subdivided in accordance with local zoning regulations as applicable.

Collocated Towers

This site type involves the installation of new equipment for the Project at an existing communications facility. The existing communications facility may be owned by the County, another government entity, or a private communications company. Collocation facilities would have an existing tower that would be used to support the County's antennas. However, in order to collocate, the existing tower must have the required height for proper functionality of the Project and the existing tower must be structurally capable of supporting the County's proposed antennas. In addition, the existing tower must be in the proper location to adequately communicate with other neighboring communication facilities that will be part of the Project. Listed below are the principal items expected to be constructed for a collocation and a brief description of item.

Communications Shelter

All new radio hardware and control equipment would be located inside an equipment shelter for collocated sites. Typically, a new equipment shelter would be installed to accommodate Project equipment. The dimensions, features, and construction required for equipment shelters is identical to those required for a new build site, described above.

Emergency Generator

A diesel-fueled emergency power generator would be installed at each site to provide auxiliary power in the event of a power outage. The features, construction and requirements associated with emergency generators are identical to those required for a new build site, described above.

Equipment Compound

The above-referenced equipment/facilities would be installed within a chain link fenced compound. Where possible, the County's equipment will be installed inside the existing chain link fence compound at each site. For sites that do not have fenced compounds of sufficient size to accommodate the County's equipment, the existing compounds would be expanded as required.

Access Drive

Existing access drives will be used for each co-location unless they are deemed inadequate for continued use.

Electric Service

An electric service is necessary to power the collocated County equipment. Most existing communications facilities are served by an electric power service and the County would utilize existing services to the extent that they are available and meet the County's capacity requirements. The County's equipment installation requires a 200 amp, 240 VAC, single phase electric service.

Antennas and Cables

Similar to the previously described existing facilities, each site would require the installation of new communication antennas on the towers; the number, size and type varying with each site installation. The typical antenna requirements for a collocation are expected to be identical to those for a new build site, described above.

The land area to be disturbed as a result of the proposed construction for collocated sites would typically be less than ¼ acre. For collocation sites, the necessary land/space either will be owned by the County, utilized pursuant to a memorandum of understanding or other agreement with a municipality, or would be leased from the owner of the existing communication facility.

2.2.1.2 Network Management Systems

The Project requires construction of one or more Network Management Systems. Existing structures may be upgraded to accommodate the Project, or in the alternative, construction of new facilities may occur. A description of the typical improvements required for each of these conditions is provided below.

<u>NMC Construction at Existing Facilities</u>

There are several existing facilities that, if selected, would require improvements to support the Project. Likely locations may include the County public safety building communications facility, the County's "Frozen Ocean" communications facility located in the Town of Niles, and others. In addition to these sites, equipment will be installed at the Onondaga County 911 communications facility to allow system functionality, which would be partially controlled by equipment currently located at that facility.

Each of the existing facilities referenced above have existing steel lattice towers of varying heights and ground-based communication hardware that would be replaced if selected for Project use. Each of these facilities would require the installation of a new equipment shelter to house the proposed radio equipment. The proposed equipment shelters would be identical in dimensions, features and construction requirements to those associated with new build sites

and/or collocation of towers, above. The Cayuga County 911 communications facility would require the installation of up to two (2) new equipment shelters of the type described above to accommodate the new equipment necessary for the Project.

In addition to the equipment shelters, diesel-fueled emergency power generators would be utilized to provide auxiliary power in the event of a power outage. The generators would be similar in features, construction and requirements to those described for the new build and/or collocated sites above. However, the Cayuga County 911 facility will likely require a 100 KW generator in lieu of a 50 KW generator.

Each existing facility would require the installation of new communication antennas on the existing towers; the number, size and type varying with each site installation. The typical antenna requirements for a collocation are expected to be identical to those for a new build and/or collocated antenna site, described above. Existing potential NMC sites including the County's "Frozen Ocean" site and the Onondaga County 911 center site would not require the installation of transmit or receive antennas and would only require the installation of microwave antennas.

2.2.1.3 Ancillary Equipment/Facilities

The Project includes the installation of various radio equipment/hardware for system functionality. As previously mentioned, with the exception to the tower-mounted antennas, all equipment would be housed within equipment shelters. Improvements for the existing radio hardware and installation of new equipment would be required at the existing County 911 center. All equipment would be installed within the existing 911 facility or new equipment shelters being provided. The system also includes new hand-held radios, pagers and vehicle mounted equipment to allow various user groups to communicate through the new system.

2.2.2 Construction

Each site will be constructed following a detailed engineering design provided by a State Licensed Professional Engineer. The design will be based on consideration of tectonic stability, snow and ice loading, wind, soil conditions and soil resistivity. Construction methods will be performed consistent with specific site characteristics and any unique site features. Foundations, temporary and permanent roadways and surface construction may be required. .

2.2.2.1 Antenna Sites

Construction of antenna sites will vary depending on the type of installation. Assessments for new or reconstructed tower sites will include pre-development site work, such as soil borings and excavations to establish subsurface conditions. Truck or all terrain vehicle mounted drill rigs

and tracked or rubber-tired excavators will be used for these investigations. Preconstruction activities may include removal of vegetation and topsoil, soil stabilization and other site work. Utilities, roadways and foundations will require excavation. Common earth working equipment including bulldozers, tracked and rubber-tired excavators will be used for these tasks.

As described generally above, construction may include installation of subsurface foundations, electrical wiring, grounding wiring, telecommunications lines, fuel storage tanks; erection of the antenna tower, communications equipment shelter or equipment enclosure; and installation of fencing, cabling, transmitting and receiving antennas and microwave antennas. Construction equipment typically includes a crane and heavy and light trucks.

The trades involved in the installation of towers include equipment operators, carpenters, masons, riggers, electricians and laborers. Construction supervisors and managers, engineers and inspectors are integral to the process. Truck drivers, suppliers and administrative personnel support the construction and installation team. Peak construction activity at any given antenna site may require between 10 to 15 workers.

Construction of antenna and supporting equipment on structures typically require most of the previously-identified trades and processes. Following completion of construction, site finishing will be provided including final area grading, landscaping and permanent access road construction. Individual antenna sites will typically require a 60- to 90-day construction period.

2.2.2.2 Network Management Centers

As with antenna sites, NMCs will require establishing and/or upgrading as needed utility connections for electric, communications, backup power supplies and fencing. Backup power fuel sources such diesel fuel will be installed on site. Subsurface work may include trenching, excavating, foundation and grounding measures. Finish work may include grading, landscaping and driveway construction.

NMCs are expected to be located in existing buildings and will meet applicable State building codes and regulations with plans prepared by a State Licensed Professional Engineer. Construction will require electricians, communications technicians, carpenters, painters, millwrights, plumbers and laborers. Supervision will be provided by construction supervisors, managers, engineers and architects supported by administrative staff and suppliers. NMC construction is expected to occur within 60 to 90 days.

2.2.3 Operation

2.2.3.1 Antenna Sites

Antenna sites, regardless of their location or host supporting structure (i.e., tower, building, water tower) are unmanned sites. Day-to-day operation does not require human presence. In the case of technical difficulties, the NMCs will be notified electronically. Depending on the problem, a remote repair or solution may be available.

Periodic maintenance and support access will be necessary at antenna sites. The following activities may be expected:

- Maintenance – Sites will require periodic maintenance. Maintenance activities may include evaluation of the hardware, recalibration and troubleshooting. Maintenance of battery power supply systems, generators, oil changes, filter replacements and other fixed assets (FAA & security lights, security features) will also be performed. Preventive maintenance − such as equipment inspections of electrical, antenna, generators and battery supplies, structural inspections of tower, structural mounts and cabling − and inspection of the ground space are performed on a predetermined schedule. Biweekly to monthly visits may be expected. Typical maintenance vehicles are panel vans and pickup truck sized vehicles. During severe weather, all terrain vehicles or snowmobiles may be used to reach remote sites.
- Repair – In the event of an antenna site failure, a physical investigation and evaluation will be performed. The evaluation will include determination of the cause of the failure and correction of the problem. In the event that equipment is not in conformance with the requirements, it will be repaired or replaced. Repair or replacement of equipment located within the communications equipment enclosure or shelter will be accomplished without construction equipment. As with maintenance responses, typical repair vehicles are panel vans and pickup truck sized vehicles or off road vehicles. Repairs or replacement of the shelter, guy wires, electrical and communications cables and the support structure generator or equipment may require construction equipment.
- Upgrades – Upgrade of the antenna site or supporting infrastructure will be performed when the system component is obsolete or where enhancement is required. Upgrades are typically scheduled. The equipment necessary depends on the upgrade requirements.

- Deliveries – Parts, equipment or fuel will be delivered to the sites. Equipment delivery will be non-routine and typically by truck.
- Emergency response – In the event of vandalism or sabotage, an emergency response to the site may occur. Fire, police, ambulance or other public safety services may be expected to respond with corresponding equipment.

2.2.3.2 Network Management Centers

Periodic maintenance, repair, upgrades and associated deliveries to NMCs will be required. The frequency of maintenance and repair, although not readily quantifiable, will be directly related to the size and complexity of the center.

2.3 REQUIRED APPROVALS AND APPLICABLE REGULATORY PROGRAMS

At this phase of Project development, the State, local and federal agencies with actual approval authority over the Project cannot be identified with certainty. It is equally difficult to identify with certainty all of the permits/approvals that may be needed for any individual Project facility. The following summary describes those permits/approvals likely to be associated with reasonably anticipated site conditions. Greater detail is provided for those permits/approvals that are more likely relevant to a greater number of sites. Less likely permits/approvals are treated in less detail.

2.3.1 New York State

A number of regulatory requirements, permits, approvals and consistency findings may be required by various State Agencies prior to the deployment of specific Project telecommunications facilities. The most likely State approvals and regulatory regimes are summarized below.

2.3.1.1 Department of Environmental Conservation ("DEC")

Endangered and Threatened Species Protection, N.Y. ENVTL. CONSERV. LAW §§ 9-1503, 11-0535 *et seq.*; 6 NYCRR Parts 182 & 193.

The Project will involve the erection of antenna sites throughout the County in a variety of locales and natural habitat types. There is the possibility that an antenna site must be located in a place where an endangered or threatened species lives or passes through.

The State protects certain threatened or endangered species under the Harris Act, which is incorporated in the ECL. The Harris Act incorporates the federal list of endangered and threatened species and authorizes the designation of additional endangered species not on the federal list. DEC has exercised this authority and published its own lists of endangered species

and threatened species. The Harris Act prohibits the taking, importation, transportation, possession or sale of any listed species or items made from endangered species, without a license. Taking includes killing as well as all lesser acts, such as disturbing wildlife and fish, and habitat modification or destruction.

Species of special concern are species of fish and wildlife identified by DEC as at risk of becoming either endangered or threatened in the State. Species of special concern are not afforded the same special legal protection provided to endangered or threatened species. Nonetheless, actions that would present a further risk to these species are discouraged.

Freshwater Wetlands Act, N.Y. ENVTL. CONSERV. LAW § 24-0101 *et seq.*; 6 NYCRR Parts 662-663.

Any person desiring to conduct any form of draining; dredging; excavation; removal of soil, mud, sand, shells, gravel or other aggregate from any freshwater wetland, either directly or indirectly; any form of dumping, filling or depositing of any soil, stones, gravel, mud, rubbish or fill of any kind; the driving of pilings or placing of any other obstructions whether or not changing the ebb and flow of the water; any form of pollution including, but not limited to, installing a septic tank, running a sewer outfall, discharging sewage treatment effluent or other liquid wastes into, or so as to drain into, freshwater wetlands; and any other activity that substantially impairs any of the several functions served by freshwater wetlands or the benefits derived therefrom on areas designated by the State as freshwater wetlands, must obtain a permit.

These activities are subject to regulation whether or not they occur upon the wetland itself, if they impinge upon or otherwise substantially affect the wetland and are located within 100 feet from the wetland boundary (or a greater distance if required by special circumstance or by the local government).

Regulated freshwater wetlands are waters of the State generally shown on the freshwater wetlands maps prepared by DEC to depict the boundaries of freshwater wetlands. DEC maps freshwater wetlands of 12.4 acres or larger. The County will obtain a copy of these maps to determine where State-mapped freshwater wetlands are located.

State Pollutant Discharge Elimination System ("SPDES"), N.Y. ENVTL. CONSERV. LAW §§ 17-0503, 17-0505, 17-0701, 17-0803, 17-0807; 6 NYCRR Part 750.

A SPDES permit from DEC is required to discharge any pollutant to the waters of the State from an outlet or point source. Project construction activities may require a permit under the SPDES program depending on the size of land area disturbed. If required, before the County begins any construction subject to this requirement, it will obtain a SPDES General Permit for Construction

Activities. This permit can be used for construction activities involving any amount of disturbed acreage, provided that certain eligibility requirements are met. Clean Water Act, 33 U.S.C. §§ 1341 *et seq.*

Section 401 of the Clean Water Act provides that any applicant for a federal license or permit to conduct any activity including but not limited to the construction or operation of facilities which may result in any discharge into navigable waters shall provide the licensing or permitting agency with a certificate from the State in which the discharge originates that such discharge will comply with State water quality standards adopted under the Clean Water Act. This 401 Water Quality Certification procedure is implemented by DEC in New York.

Air Pollution Control Act, N.Y. ENVTL. CONSERV. LAW §§ 19-0103 *et seq.*

Under DEC's air permitting program, a permit is required to operate an "air contamination source." An "air contamination source" is any apparatus or machine capable of emitting any air contaminant to the outdoor atmosphere. DEC technical staff reviews applications to determine the nature and volume of emissions from the source and to be sure that compliance with air pollution control requirements will be achieved.

Specifically listed as trivial activities not requiring a permit are engine exhaust emissions and/or refueling emissions generated from mobile and portable powered vehicles and equipment used for the propulsion or operation of construction and off-road vehicles.

Bald and Golden Eagle Protection, N.Y. ENVTL. CONSERV. LAW § 11-0537.

The taking of any Bald Eagle or Golden Eagle is prohibited without a license. Taking includes habitat modification. If Project facilities will have a potential impact on Bald or Golden Eagle habitat, a license will be obtained from DEC as well as the United States Department of the Interior ("DOI") as Bald or Golden Eagles are a threatened species under both State and federal statutes and have been afforded additional protection in the State.

Fish & Wildlife Management Areas, N.Y. ENVTL. CONSERV. LAW §§ 11-0101 *et seq.*; 6 NYCRR §§ 50 *et seq.*

DEC has established nine fish and wildlife management districts throughout the State. These districts include all counties in New York with the exception of Bronx, Kings, New York, Queens and Richmond Counties. DEC has the power to regulate land-use, hunting and fishing practices within these wildlife management districts. DEC prohibits the construction of any permanent structures, blinds, stands or platforms within such areas without the written permission of DEC regional supervisor or his agent. A permit is required prior to the construction of any structure within these wildlife management districts.

Sole Source Aquifer Protection, N.Y. ENVTL. CONSERV. LAW § 55-0101 *et seq.*

DEC can take measures to protect sole source aquifers that furnish the exclusive water supply of large populations. This power is limited to designated sole source aquifers within counties of at least one million people. Any municipality or person can nominate such an area within a federally-designated sole source aquifer within counties having a population of one million or more. Once designated a special groundwater protection area, the "designated planning unit" is then charged with preparing a plan for the special groundwater protection area to ensure the non-degradation of the high quality of the aquifer. The designated planning units also have the ability to regulate land uses for the purpose of protecting special groundwater protection areas.

Special groundwater protection areas constitute areas of critical environmental concern and require EISs for any action with significant impact on these areas. The EIS must include a detailed discussion of the effects of any proposed action on, and its consistency with, the comprehensive management plan for the special groundwater protection area.

Incompatible uses over primary water supply aquifers (as defined by U.S. Geologic Survey maps and in the New York State Department of Health ("DOH"), *Report of Groundwater Dependence in New York* (1981)) are also regulated and in many cases prohibited.

Coastal Erosion Hazard Areas Act, N.Y. ENVTL. CONSERV. LAW § 34-0101 *et seq.*; 6 NYCRR Part 505.

Coastal development is limited to minimize erosion and consequent losses of soil. The construction of structures is regulated by DEC in areas designated "coastal erosion hazard areas" and "significant fish and wildlife habitats." Municipalities can prepare erosion area control measures to accomplish these purposes. These local control measures are subject to approval and subsequent enforcement by DEC.

DEC is the permitting authority that processes applications when there is no DEC-approved local or county plan in place. Applications for permits must include a description of the proposed activity, a map showing the location of the activity and any other information DEC may require. DEC will issue a permit only where it finds that the proposed activity is "reasonable and necessary," will not cause a measurable increase in erosion at the site and prevents or minimizes impacts on significant fish and wildlife habitats and natural protective features. In areas with natural protective features, excavating, grading, mining or dredging is prohibited absent a special authorization in the permit.

Stream Protection Act, N.Y. ENVTL. CONSERV. LAW § 15-0501; 6 NYCRR Part 608.2.

Subject to certain exceptions, no person or public corporation may change, modify or disturb the course, channel or bed of a protected stream, or remove any sand, gravel or other materials from the bed of a protected stream or the banks thereof, without first obtaining a stream protection permit from the DEC. This prohibition only applies to certain types of classified streams.

Protection of Navigable Waters, N.Y. ENVTL. CONSERV. LAW § 15-0505; 6 NYCRR Part 608.5.

No excavation or placement of fill in navigable waters of the State is allowed below the mean high water level (including adjacent and contiguous marshes, and wetlands), without first obtaining a Protection of Waters Permit from DEC. Navigable waters include lakes, rivers and other waterways and water bodies on which water vessels with a capacity of one or more persons are operated or can be operated. DEC will issue a permit only if the proposal is in the public interest, in that: (a) the proposal is reasonable and necessary; (b) the proposal will not endanger the health, safety or welfare of the people of the State; and (c) the proposal will not cause unreasonable, uncontrolled or unnecessary damage to the natural resources of the State, including soil, forests, water, fish, shellfish, crustaceans and the aquatic or land-related environment.

Wild, Scenic & Recreational Rivers System Act, N.Y. ENVTL. CONSERV. LAW § 15-2705 *et seq.*; 6 NYCRR Parts 666.2, 666.11.

After any river is included in the State's wild, scenic and recreational rivers system, no dam or other structure or improvement obstructing the natural flow may be constructed in the river, except as expressly authorized by statute. In addition, land uses are allowed or prohibited within the boundaries of a designated river area depending upon the classification of the area. All State Agencies are directed to pursue policies designed to enhance the conditions of designated rivers.

Land use and development on all designated wild, scenic and recreational rivers is controlled by DEC.

Flood Control Act, N.Y. ENVTL. CONSERV. LAW § 16-0101 *et seq.*; 6 NYCRR Part 500.

The essence of the national flood insurance program, in which the State participates, is the regulation of land uses in areas identified by the Federal Emergency Management Agency ("FEMA") as areas of special flood hazard. No person may construct any improvement, excavate or deposit material, or operate a motorcycle, snowmobile or motor vehicle (except lawn maintenance equipment) upon lands acquired or burdened by a flood control easement without a permit.

DEC issues permits when the proposed activity will not interfere with or endanger the flood control works. Development in a flood hazard area must comply with a set of criteria provided under the flood control regulations.

2.3.1.2 Department of State ("DOS")

Coastal Zone Management Program, N.Y. EXEC. LAW § 910 *et seq.*; 19 NYCRR Part 600 *et seq.*

The federal Coastal Zone Management Act ("CZMA") requires states and territories to develop and implement enforceable programs to control pollution from a wide range of non-point sources to protect coastal waters. The State Executive Law provides for coordinated and comprehensive policy and planning for the preservation, enhancement, protection, development and use of the State's coastal and inland waterway resources. The Coastal Zone Management Program ("CZMP") is administered by the DOS in coordination with DEC. Every action undertaken by a State Agency within the coastal area must be consistent with the coastal area policies. The County does not have to comply with the Coastal Zone Management Program, however, compliance by any state agencies that are issuing permits in relation to the Project is required as described below.

The federal coastal program provides the opportunity for coastal states to voluntarily prepare state-specific coastal programs pursuant to the CZMA. DOS is the sole authority for administering the coastal program in the State. Actions undertaken by State Agencies are required to be consistent to the maximum extent practicable with State coastal policies or the policies of an approved local or regional coastal management program. If the State Agency cannot certify an action as being consistent with the relevant coastal policies of the State CZMP or an approved Local Waterfront Revitalization Program ("LWRP"), the action shall not be undertaken.

State activities, including development projects, permits, funding and planning are reviewed for consistency with the coastal area policies by the agency conducting the activity. An Agency must modify the activity if it would adversely affect the State's coastal resources and conflict with the policies of the CZMP or an approved LWRP. The DOS Division of Coastal Resources advises agencies on the consistency of their activities with the State or local programs. No State Agency involved in a Type I or Unlisted SEQRA action may carry out, fund or approve the action until the Agency has complied with the requirements for consistency review.

DOS's Part 600 regulations require that an action that cannot be certified as consistent to the maximum extent practicable with State coastal policy shall not be undertaken. Modifications of an action, or actions, may result in consistent activities.

As soon as an Agency determines its action is in a coastal area, and prior to making a determination of significance pursuant to the SEQRA, the Agency must complete a Coastal Assessment Form ("CAF") to assist it in making determinations of coastal consistency and environmental significance. Where a State Agency prepares an EIS, the EIS must identify the applicable coastal policies and describe the effects of the action in light of those policies, whether the Agency is acting as the lead or as an involved agency. State Agencies may not make a final decision on the action until the Agency issues a written finding that the action is consistent with the coastal policies.

2.3.1.3 Office of Parks, Recreation & Historic Preservation ("OPRHP")

State Historic Preservation Act, PARKS REC. & HIST. PRESERV. LAW § 14; 9 NYCRR Parts 426, 428 and 464.

The Commissioner of Parks, Recreation and Historic Preservation ("Commissioner"), in consultation with the State Board for Historic Preservation, has established the New York State Register of Historic Places. Sites, districts, structures, buildings, areas or objects designated in the Register or eligible for listing on the State Register of Historical Places and sites listed on the National Register (established under the National Historic Preservation Act of 1966 ("NHPA")) are afforded special protections. Any action that may have an adverse impact on property listed on the Register is subject to review. Two elements are required to trigger review: (1) the presence of a property of historic, architectural, cultural or archaeological significance; and (2) the involvement of a State Agency in a project that will affect that property.

Listing is not required to satisfy the first of these two triggers. All that is required is eligibility for the State and/or national registries. Sponsors can file a request for determination of eligibility at any reasonable time prior to the undertaking. The Commissioner is obligated to determine whether the property is eligible within 30 days of receiving a request.

The second of the two triggers can be satisfied by a variety of actions. They include projects directly undertaken by State Agencies, such as construction, as well as projects funded by State Agencies. They also include activities that are approved or licensed by State Agencies, or that require a State permit.

Certain Agency actions are excluded from preservation review. For instance, projects that are either necessary to prevent an immediate and imminent threat to life or property or that undergo review pursuant to the NHPA need not undergo State preservation review.

Once it is determined that review is required, the Agency sponsoring the project is obligated to consult with the OPRHP and to consider alternatives that minimize or avoid harm to the historic

sites to the maximum extent practicable. Before the final design of a project, the sponsor is required to give the Commissioner sufficient documentation to make an informed and reasoned determination concerning the impact of the undertaking on eligible or registered property.

Within 30 days of receiving the notice, the Commissioner is obligated to determine whether the proposed project may have an adverse impact on any property that is listed on the National or State Register of Historic Places. In determining whether an undertaking will have an adverse impact on eligible or registered property, the Commissioner must consider whether the project will destroy, isolate or alter the property; introduce visual, audible or atmospheric elements inconsistent with the character of the property; or result in the neglect or deterioration of the property.

If the Commissioner determines that an adverse impact will occur, he must notify the sponsoring State Agency in writing. This notice must include recommendations for the mitigation of impacts. If the sponsoring agency disagrees with a recommendation, it must give a factual basis for the disagreement and provide an alternative for mitigation. If the sponsor and the Commissioner disagree as to the need for a hearing, either can unilaterally prescribe one.

The overall purpose for this consultation procedure is to determine if there are feasible and prudent alternatives that would avoid or mitigate any adverse impact on the registered property. Every Agency must fully explore feasible and prudent alternatives and give consideration to plans which avoid or mitigate adverse impacts. A State Agency need not take all possible measures to preserve historic structures, but only those measures that are "feasible and prudent."

The consultation process can result in any number of outcomes. The sponsoring Agency is free to abandon the project. The sponsoring Agency and the Commissioner can agree on an alternative or mitigation measure embodied in a "Letter of Resolution." If a Letter of Resolution is used, the Agency must certify in writing that the undertaking has been completed in accordance with the Letter.

If the sponsoring Agency and Commissioner agree that there are no reasonable alternatives or mitigation measures, but that the project is nonetheless in the public interest, they make a joint written declaration to this effect that includes the factual basis for their decision. Finally, the sponsoring Agency alone can determine that no feasible alternatives are available and may terminate consultation unilaterally. The Agency must give the Commissioner written notice of this determination that includes the reason for the Agency's decision and the facts supporting it. If the sponsoring Agency complies with these consultation procedures, considers alternatives, determines that there are no feasible and practicable options other than those proposed and is

able to provide a reasoned elaboration to the Commissioner in writing, then the Agency may proceed with the project, even in the case of opposition by the Commissioner.

An EIS may satisfy certain parts of the preservation review process. An EIS can serve as a sponsoring Agency's response to the Commissioner's recommendations if the Commissioner determines that the Draft Environmental Impact Statement contains sufficiently detailed information.

Land agreements with OPRHP will be required for Project facilities proposed to be located on State parkland.

2.3.1.4 Other State Approvals

The Project may require approvals from other State departments and authorities including, but not limited to, those listed below. Many of these Agencies have defined approval procedures which will vary depending on the agency's relationship to the Project.

- NYS Public Service Commission
- NYS Department of Transportation
- New York Power Authority
- NYS Emergency Management Office
- NYS Department of Health
- NYS Division of Military and Naval Affairs
- NYS Division of State Police
- NYS Department of State - Office of Fire Prevention and Control
- State University of New York

2.3.2 Federal Government

A number of permits, approvals, and consistency findings may be required from federal agencies prior to the deployment of specific Project facilities. These permits/approvals include, but are not limited to, the following:

2.3.2.1 Federal Communications Commission

The FCC most likely will be the lead federal agency with respect to environmental review of the Project facilities under NEPA.

The FCC requires licensees to determine whether any proposed structure may significantly affect the environment. When the licensee determines that a proposed facility is within an

environmentally sensitive area, it must submit an Environmental Assessment to the FCC. An EA is typically required for facilities that:

- Are located in an officially designated wilderness area.
- Are located in an officially designated wildlife preserve.
- May affect listed threatened or endangered species, designated critical habitats, are likely to jeopardize the continued existence of any endangered or threatened species or are likely to result in the destruction or adverse modification of critical habitats.
- May affect districts, sites, buildings, structures or objects significant in American history, architecture, archaeology, engineering or culture that are listed, or are eligible for listing, in the National Register of Historic Places.
- May affect Native American religious sites.
- May be located in a flood plain.
- Will involve a significant change in surface features (including, but not limited to, wetland fill, deforestation or water diversion).
- Will include antenna towers and/or supporting structures equipped with high intensity white lights and which are located in residential neighborhoods, as defined by the applicable zoning law.
- Will produce radio frequency radiation in excess of established limits if the facility, operations and transmitters fall into certain categories.

Telecommunications Act of 1996, 47 USC § 151 *et seq.*; 47 CFR § 1.1301 *et seq.*

The FCC grants registrations for the construction and operation of antenna structures.

2.3.2.2 Department of Interior − Fish and Wildlife Service

Endangered Species Act, 16 USC § 1531 *et seq.*; 50 CFR Part 17.

The federal Endangered Species Act prohibits the taking of any species listed as endangered or threatened. A taking includes harassment, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing or collecting a listed species, or the attempt to engage in such conduct. Harassment includes acts that annoy wildlife so as to significantly affect behavior patterns and habitat. The United States Fish and Wildlife Service ("FWS") is authorized to designate critical habitat, the modification or disturbance of which amounts to a taking. Any agency proposing such a taking must obtain an "incidental take" permit from the FWS.

Developers must submit a habitat conservation plan that includes mitigation measures and a statement explaining why less harmful alternatives are impracticable. The FWS will issue a permit if it finds the taking will be incidental to the project and will not appreciably reduce the species' chances for survival or recovery.

FCC licensees, applicants, tower companies and their representatives can act as non-federal representatives for purposes of consultation under the ESA. The FCC retains ultimate responsibility. Non-federal representatives may consult informally with the FWS to determine if more formal consultation is necessary.

Migratory Bird Treaty Act, 16 USC § 703 *et seq.*

A "migratory bird" is any wild bird native to North America that is unconfined and protected under the Migratory Bird Treaty Act. The Director of the FWS is responsible for ensuring NEPA compliance as it pertains to migratory birds. If the Director of the FWS assumes responsibility for determining a project's impact on migratory birds, the applicant will not be required to submit an EA to the FCC. Although the FCC's NEPA regulations do not specifically address harm to migratory birds, the regulations do address harm to endangered species and critical habitats.

2.3.2.3 Federal Aviation Administration

Persons proposing to erect or alter an object that may affect navigable air space must notify the FAA of the construction before it begins. Notice is required if the construction or modification would be more than 200 feet above ground level and, in other circumstances, within 20,000 feet of certain airports, or, in other circumstances, within 10,000 feet of airports with shorter runways. The FAA requires 30 days notice prior to construction of a tower, construction that may cause electromagnetic interference or that may cause transmitted signals to be reflected upon ground-based or airborne air navigation or communications equipment.

Upon review of the proposed construction or modification, the FAA may order an aeronautical study and will ultimately determine whether the construction or modification represents a hazard to air navigation. Obstructions to air navigation may be subject to FAA standards on location, marking and lighting.

2.3.2.4 United States Army Corps of Engineers / Environmental Protection Agency

Clean Water Act, 33 USC § 1251 *et seq.*; 33 CFR Part 322.

Changes to surface features involving wetlands and water diversion not only will trigger the preparation of an EA under the FCC's NEPA implementing regulations, but also will require further environmental investigation and mitigation under the Clean Water Act and, for structures

in navigable water, under the Rivers and Harbors Act of 1899. The Army Corps of Engineers issues permits for dredging and filling of navigable waters of the United States. The Rivers and Harbors Act requires a permit for altering any water course of the United States. These permits apply to all structures or work in navigable waters.

2.3.2.5 Advisory Council on Historic Preservation ("ACHP")

National Historic Preservation Act, 16 USC § 470; 4 CFR Part 60 & 800 - 812; 25 CFR Part 262; 43 CFR Part 7; Exec. Order 13007.

This statute is implemented through the federal agency's NEPA rules. Under this act, the federal agency is required to consider the effects of projects on historic sites. If facilities affect districts, sites, buildings, structures or objects significant in American history, architecture, archaeology, engineering or culture that are listed or are eligible for listing in the National Register or that affect Native American religious sites, they may have an adverse impact. Where a potential adverse impact is identified, consultation with the State Historic Preservation Officer ("SHPO") and any relevant Tribal Historic Preservation Officer ("THPO") should be undertaken. In the event that a National Historic Landmark may be affected adversely, an EIS should be prepared.

Licensees and applicants act on behalf of the federal agency in consultation with SHPOs and THPOs to comply with the regulations of the ACHP. The federal agency remains responsible for consultation with the ACHP.

In May 2003, Michael K. Powell, Chairman and Commissioner of the FCC, announced a comprehensive action plan to enhance the FCC's implementation of NEPA and the NHPA. The action plan consists of four elements: (1) initiate a series of proceedings designed to enhance expertise in environmental and historic matters and modify FCC rules as necessary; (2) work with industry and government agencies to develop more efficient and effective communication; (3) examine administrative processes for streamlining opportunities; and (4) enforce rules swiftly and effectively to create incentives for parties to follow the required processes before construction.

On February 3, 2004, the FCC announced a new voluntary system to notify SHPOs and federally recognized Native American tribes of proposed new tower construction. This new system provides an avenue for early screening of potential tower locations for potential objections arising out of concern for historic preservation or Native American religious sites. The Tower Construction Notification System helps coordinate early, informal consultation.

It is anticipated that the FCC will perform a historic preservation review of Project sites under section 106 of the NHPA. On March 16, 2001, the FCC, the National Conference of State

Historic Preservation Officers ("NCSHPO"), and the ACHP entered into a Programmatic Agreement that sets forth procedures the FCC will follow in evaluating the effects of the collocation of a new antenna on an existing antenna facility. On January 5, 2005, the FCC finalized the Nationwide Programmatic Agreement for Review Under the NHPA ("Nationwide Agreement"), which and describes the process for identifying and evaluating impacts to other FCC approved undertakings, including the construction and operation of new antenna sites subject to FCC approval (*i.e.*, many facilities that will comprise the Project).

The Nationwide Agreement excludes from historical preservation review under section 106 of the NHPA ("Section 106") certain communications tower enhancements subject to FCC licensing, permitting or approval, and which typically pose no adverse impacts on historic resources. Where construction or modification of communications facilities subject to FCC licensing, permitting or approval are not eligible for an exclusion, the Nationwide Agreement streamlines Section 106 review.

Communications tower enhancements excluded from Section 106 review include collocation of an antenna on an existing tower, building or other structure, or any change to an existing tower, including replacement of a tower that does not result in a substantial increase in the size of the tower. Examples of a "substantial increase in the size of the tower" as defined in the Nationwide Agreement include the mounting of a proposed antenna on a tower that: (1) would increase the existing height of the tower by more than 10%; (2) would involve the installation of more than the standard number of new equipment cabinets for the technology involved, or more than one new equipment shelter; (3) would involve adding an appurtenance to the body of the tower that would protrude from the edge of the tower more than twenty feet; or (4) would involve excavation outside the current tower site. The exclusions apply to all towers constructed on or before March 16, 2001, and to towers constructed after that date which have gone through Section 106 review.

The Nationwide Agreement also excludes from Section 106 review construction of communications towers less than 200 feet in height in industrial parks, commercial strip malls, or shopping centers that occupy a total land area of 100,000 square feet or more. Notwithstanding this exclusion, full Section 106 review must be conducted where the property on which the tower will be constructed is within the boundaries of, or within 500 feet of, an historic property.

Communications facilities located in, or within 50 feet of, a right-of-way designated for communications towers or aboveground utility transmission lines, and which will not be a substantial increase in size over existing structures in the right-of-way, are also exempted from Section 106 review. Finally, the Nationwide Agreement provides that the State Historic

Preservation Office, consistent with relevant State procedures, may specify geographic areas where no review is required for potential impacts on archaeological resources or no review is required for visual impacts.

The Nationwide Agreement provides that if one of the above exclusions applies, the applicant, in this case the County, need not submit any documentation to SHPO regarding the application of the exclusion. Nor must the County otherwise give notice of application of the exclusion to SHPO. The County should retain documentation of its determination that one of the above exclusions applies to a communications facility. Documentation that an exclusion applies must be provided to the FCC upon request, and SHPO may also require production of such records to the extent authorized under State law.

Where the Nationwide Agreement does not exclude from Section 106 review construction or modification of communications facilities subject to FCC approval, it streamlines the review process for these activities through use of a submission packet. The packet includes information that identifies historic properties that surround the proposed site, assesses the APE for visual and direct effects, includes a field survey for archeological resources where required, and evaluates the historic significance of identified properties as appropriate. The packet will also assess the effects of Project facility siting on historic properties.

The submission packet process requires public notice and consultation with local governments and interested members of the public. The prepared packet is submitted to SHPO and any consulting parties. If a determination of No Historic Properties Affected or No Adverse Effect is reached by the County, and SHPO agrees, then consultation is complete. If SHPO disagrees, the Nationwide Agreement provides a process for dispute resolution. Whenever the County or the FCC concludes, or SHPO advises, that a proposed project will have an adverse effect on a historic property, the County and SHPO should investigate mitigation measures that would avoid the adverse effect and permit a conditional no adverse effect determination. If mitigation measures are agreed upon, then a No Adverse Effect determination is issued.

Archaeological and Historic Preservation Act, 16 USC § 469 *et seq.*

If a project will affect a property with archaeological value, the DOI must be notified and may impose additional requirements on an Agency.

Archaeological Resources Protection Act, 16 USC § 470aa *et seq.*

If federal or Indian lands are involved, this legislation may impose additional requirements on the Agency, particularly where excavation is involved.

American Indian Religious Freedom Act, 42 USC § 1996.

This statute incorporates mandatory consultation with Indian religious practitioners, where a place of religious importance to American Indians may be affected by an undertaking.

Native American Graves Protection and Repatriation Act, 18 USC § 1170, 25 USC §§ 3001-3013; 43 CFR Part 10.

Any excavation on federally-owned lands requires consultation with "appropriate Indian tribes" prior to excavation or removal after inadvertent discovery of several kinds of cultural items, including human remains. Consent from the tribe must be obtained for excavation.

2.3.2.6 Office of Coastal Zone Management

Coastal Zone Management Act, 16 USC § 1451; 33 CFR Part 320; 15 CFR Part 930.

The CZMA mandates that all federal agencies conducting activities, including development, that directly impact a state's coastal zone must comply with that state's coastal zone management program. As discussed above, the State has its own Coastal Zone Management Program. Applicants for a federal license or permit to conduct activity affecting land or water uses in the State's coastal zone must comply with the State's Coastal Zone Management Program.

Pursuant to the consistency provisions of the CZMA of 1972, as amended, and the regulations at 15 CFR Part 930, the DOS reviews activities which may affect the State's coastal area for their consistency with the applicable, enforceable policies of the NYS Coastal Management Program. Effects to the coastal area of the State are to be broadly considered and include, but are not limited to, direct and indirect, cumulative and secondary impacts to land and water uses and natural resources of the coastal area. Impacts to coastal uses and resources may also be beneficial and should occur if they advance the objectives of the coastal program. If the DOS objects to the consistency of an activity requiring federal authorization, utilizing federal financial assistance, or which includes the direct involvement of a federal agency, the consistency provisions prohibit that activity from being undertaken unless the Department's objection is overridden on appeal to the U.S. Secretary of Commerce.

The CZMA requires that all federal activities in coastal areas be consistent with approved State Coastal Zone Management Programs to the maximum extent possible. If an action may affect a coastal zone area, the responsible official must assess the impact of the action on the coastal zone. If the action significantly affects the coastal zone area and the State has an approved coastal zone management program, a consistency determination must be obtained in accordance with procedures promulgated by the Office of Coastal Zone Management.

Any activity subject to review by the DOS must satisfy the requirements of the consistency provisions of the CZMA and the relevant regulations at 15 CFR Part 930. Applicants, federal agencies proposing direct activities or municipalities requesting federal financial assistance must submit a copy of their federal application, a consistency certification and policy analysis (or, in the case of a direct federal agency activity, a consistency determination) and all other necessary data and information required by 15 CFR Part 930 and the NYS Coastal Management Program. The DOS reviews the required information and makes a decision on the consistency of the activity. No federally authorized, funded or proposed activity may be undertaken if the DOS issues an objection without a successful appeal to the U.S. Secretary of Commerce overriding the Department's objections.

Depending on site-specific characteristics, federal approvals may be required under the following statutes:

- National Wildlife Refuge System, 16 USC § 668dd.
- Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC §§ 9601 *et seq.*
- Farmland Protection Policy Act, 7 USC §§ 4201-4209.
- Wilderness Act, 16 USC §§ 1131-1163.
- Erie Canalway National Heritage Corridor, Public Law 106-554.
- National Trails System Act, 16 USC § 1241 *et seq.*

2.3.3 Local Jurisdictions/Municipalities

2.3.3.1 Cayuga County

The primary approval will be the decision to deploy the Project. Cayuga County, as the lead agency, must certify that consistent with social, economic and other essential considerations from among the reasonable alternatives available, the deployment of the Project will avoid or minimize adverse environmental impacts to the maximum extent practicable. The County must also certify that adverse environmental impacts will be avoided or minimized to the maximum extent practicable by incorporating those mitigative measures that were identified as practicable as conditions to the decision to approve deployment of the Project.

Additionally, the County will determine whether or not to acquire property associated with Project sites where appropriate.

2.3.3.2 Local Approvals

Generally, construction of a new tower, and to a limited extent, collocation of equipment on existing towers is subject to a number of local zoning approval processes, including site plan review, variances and/or special use permits, and subdivision, depending on local requirements. However, New York law provides that governmental agencies are immune from local land use laws when the interests of the public outweigh the interests to be served by zoning and land use laws.

The factors considered when applying the balancing of public interests test set forth in *Matter of County of Monroe,* 72 N.Y.2d 338, 343 (1988) include: (1) the nature and scope of the instrumentality seeking immunity; (2) the kind of function or land use involved; (3) the extent of the public interest to be served thereby; (4) the effect local land use regulation would have upon the enterprise concerned and the impact upon legitimate local interests; (5) the encroaching entity's legislative grant of authority; and (6) alternative locations and methods for achieving the improvement. Additional important factors that must be considered under the test are intergovernmental participation in the project development process and an opportunity to be heard.

Since *County of Monroe*, courts have affirmed its reasoning. *See Crown Communication New York, Inc. v. Dep't of Transp. of the State of New York*, 4 N.Y.3d 159 (2005)(finding that installation of antennas on state-owned towers was immune from local zoning); *Town of Hempstead v. State of New York*, 42 A.D.3d 527 (2d Dept. 2007)(finding that siting of a tower 250 feet from residential areas with acknowledged visual impact was immune from local zoning); *Port Washington Police District v. Town of North Hempstead*, 2009 Slip Op 51758U (Sup. Ct. Nassau Cty 2009)(finding that a police district siting a tower within a town does not have to comply with local zoning because the *County of Monroe* factors, on balance, favor the police district, and because of the burden it would impose on the police district's need for emergency communications to be required to comply with zoning).

The overarching public interest associated with the Project is the critical need to improve public safety communications, and to do so in compliance with upcoming federal mandate deadlines. The Project will replace outdated communications systems with a state of the art digital trunked land mobile radio network. It will be used in emergency situations to coordinate the deployment of all levels of government resources more effectively and efficiently (e.g., State, local and federal) to such emergencies and to enhance the safety of both the County's emergency service responders and the citizens they serve. All municipalities throughout the Study Area have been invited and will have the opportunity to comment on and participate in Project deployment.

Public hearings have been and will continue to be held for the Project and there will also be opportunity for written public comment.

One of the objectives of the County, to minimize the proliferation of towers, will be met in part by the collocation of antennas on existing buildings or structures where feasible. For collocated Project sites, there will be minimal impacts on local land use patterns, and generally, local zoning requirements would be minimal. Conversely, local review of new builds with the competing land use restrictions and policy choices that exist among the various municipalities throughout the Study Area could foil the fulfillment of the greater public purpose of improved Countywide public safety and public service communications. The County's public interest in implementing the Project outweighs any competing interest that may arise within specific municipalities in the application of their zoning and land use regulations. It is noted that zoning approval processes in each municipality where a tower would be sited would add considerable time to the siting process, and possibly additional months or years to challenge an unfavorable decision in court, during which time the communications problems would remain. *See Port Washington Police District, supra*.

After applying the balancing of public interests test adopted by the New York Court of Appeals in *Matter of County of Monroe,* the County has concluded that the County's paramount interests in an effective and comprehensive emergency communications system renders the County exempt from local zoning and land use regulations in connection with the proposed Project.

Nevertheless, in pursuing the proposed Project, the County has and will continue to encourage partnerships with local governments to improve communications and achieve economies in Project build out. In addition, even though the County is exempt from local land use law, the County will comply with local zoning requirements to achieve consistency and harmony with local land use patterns and zoning regulations and to mitigate any potential adverse impacts to the extent practicable. The County recognizes that in some circumstances compliance with local zoning may not be feasible. In those circumstances, the County will necessarily rely upon its immunity from local land use laws.

In addition to local zoning requirements, other local approvals, such as leases or site access agreements, are likely to be required to site Project components on municipally-owned land and buildings. Approvals that are likely to be required in connection with the Project generally fall into three categories:

1. Permits and other authorizations from State Agencies and public authorities for the construction of Project facilities within geographic areas under their respective jurisdictions.

2. Leases and other agreements between the County and State or local agencies, or private entities that own or control real property where Project facilities are to be established. This category may include virtually any agency that owns real property.
3. Agreements between the County and agencies that wish to use the new system.

2.3.4 Other Jurisdictions

In addition to the State, local and federal regulatory regimes, approvals and permits, there are a number of international, interstate and intrastate commissions from whom approvals may be required for the deployment of the Project. Many of the agencies may not have regulatory authority over the Project but may participate as interested agencies in the SEQRA process. These involved/interested agencies may include:

- Interstate Environmental Commission.
- Central New York Regional Planning and Development Board.
- New York State Great Lakes Basin Advisory Council.

Given that the Study Area includes portions of neighboring counties, various approvals may be required from county or local officials in Onondaga or Seneca counties.

2.3.5 Location Specific Use Approval Process

Many of the locations selected for Project facilities will be owned or controlled by the County, or State, local or federal entities. Likewise, some may be located on private property. A variety of methods will be used to gain access to such sites.

These methods may include:

- Purchase of certain properties, with the terms of the sale negotiated with potential sellers, with sales being subject to screening by a number of site acquisition criteria. .
- Lease of property or space on existing telecommunications facilities or other structures suitable for collocation. In the event a third party site is used, the party arranging for site acquisition will negotiate with parties to acquire access to, and the use of, the selected properties or facilities for a specified term.
- Licenses, or negotiated access agreements that will not grant any property rights, but rather, will grant a right of occupancy to a site for the purpose of erecting and maintaining Project facilities.

- Easements or rights-of-way granting limited property rights to use or occupy property while allowing the current resident to retain ownership.

In addition to these mechanisms, when seeking to use municipal, federal, or State-owned property, the County may enter into a memorandum of understanding with the appropriate agency, authority, or public benefit corporation to arrange for site access and occupancy.

2.3.6 Relationship to Other Projects Countywide

The planning, design, related SEQRA review and completion of the procurement action for the Project will be ongoing in the coming months. New structures suitable for the collocation of Project facilities may be built during this period by other parties. Towers constructed by government agencies and private developers may become available for consideration in Project design.

Because of the large capital commitment and the changing regulatory, economic and technological environment, estimating the number of new towers to be built is a very subjective effort. Below is a brief summary of development plans as reported for some of the major tower sponsors.

- Wireless Phone Companies – The wireless phone companies (e.g., carriers) likely will be the largest private builders of new towers. Although their build-out plans are aggressive, it typically takes 12 to 18 months from design to tower completion. Because of this time delay, it is very difficult to establish exactly what towers will be built, the location of the tower, and construction time frame. A further complication is that the suitability of a new antenna for collocation is not known until design, and sometimes construction has been completed. Changing financial considerations make prediction of availability uncertain at best.
- Tower Companies – Tower companies have been severely impacted by the financial markets and have reduced plans for building towers. For the most part, they are not committing to build towers until one or more carriers commit to leases. Many tower companies have planned for new construction but it is anticipated that they will fall short of projected construction due to lack of commitment from the carriers.
- Government Agencies and Municipalities – Most local governments need to enhance their 911 and emergency infrastructures. They are greatly hampered by the high cost of infrastructure improvement. Municipalities will likely proceed

with very limited infrastructure development, and then only when absolutely necessary to meet the minimal requirements for public safety. A summary of the development plans for government agencies, authorities and municipalities is provided below.

- Utility Companies – The current incentive for utilities to modernize their wireless capabilities will require some reworking of utility company infrastructure. The move to telemetry and additional microwave transmission will require a limited number of new towers. This is expected to be limited to fewer than five new towers. The opportunities to raise revenue by attracting wireless carriers to their towers has caused several utility companies to market their electrical transmission infrastructure for collocation. The utility companies' ability to lease collocation positions successfully often is hampered by New York State Public Service Commission restrictions, licenses, and installation and maintenance costs.
- Independents – Independent companies have a tendency to be more risk tolerant. Some seek to fill the void created by the large tower companies' reluctance to build new towers. Their construction plans are modest and subject to the same time delays and financial uncertainties as are faced by the carriers.

Those structures that are newly constructed or planned for construction that may be available for collocation and will be pursued if feasible for the County.

Some sponsors are required to register their new antenna structures with the FCC. The FCC has prepared an Antenna Structure Registration database that is available through its website (www.wireless.fcc.gov). Because the Antenna Structure Registration requirements only apply to those antenna structures that may create a hazard to air navigation (either because of their height or proximity to an airport), a sponsor may not have needed to register its tower with the FCC. The registration database, therefore, does not contain a comprehensive record of all antenna structures for the Study Area.

Municipalities

Local governments continue to look for opportunities to enhance their 911 and emergency infrastructures. They are greatly constrained by financial considerations.

3.0 ENVIRONMENTAL SETTING

As discussed in the Executive Summary, this section incorporates portions of the OFT GEIS that are relevant to this DGEIS, in particular, the environmental setting of the Study Area that is similar to those analyzed for the SWN.

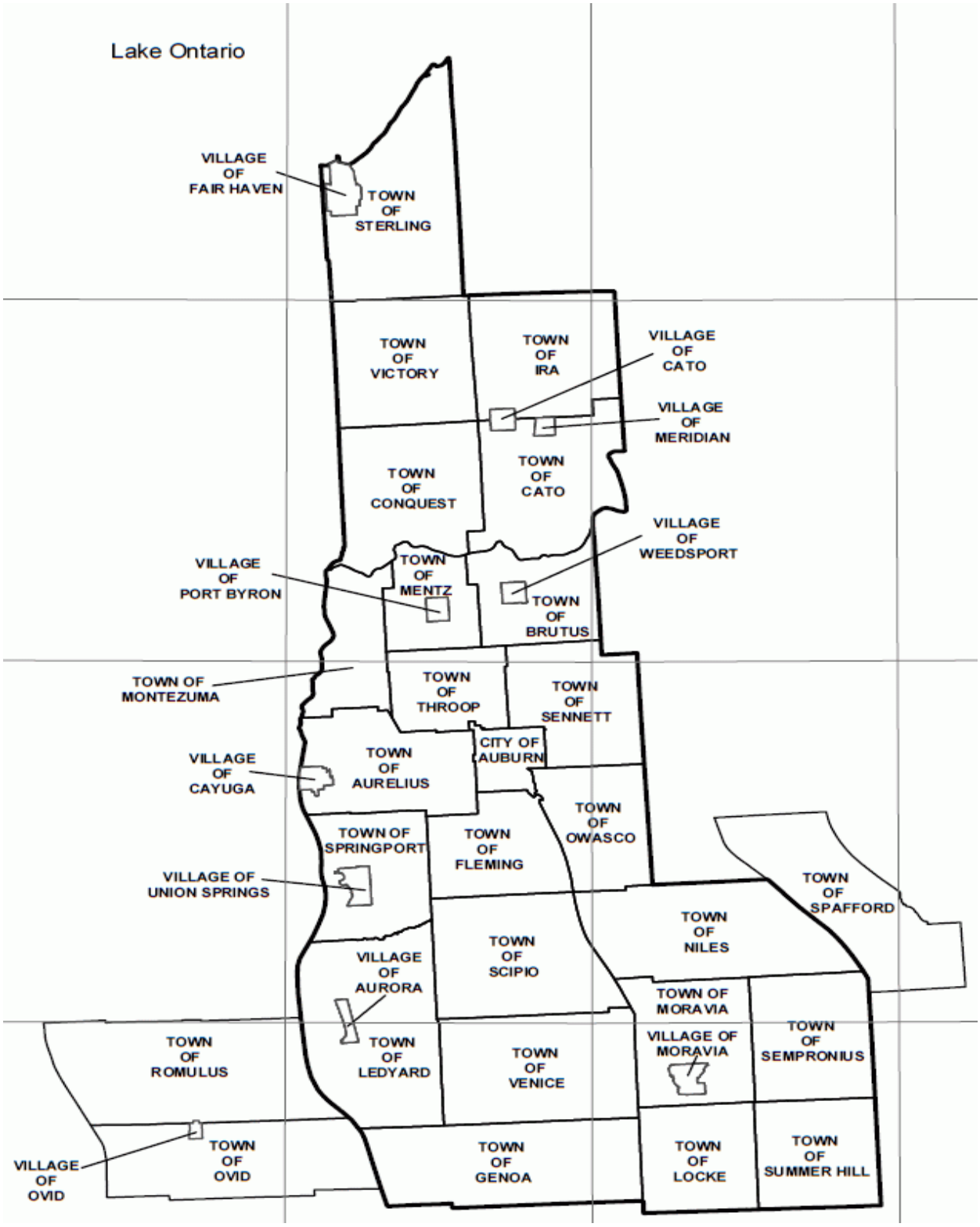
The environmental setting section of this DGEIS addresses both natural and human resources within the Study Area.

3.1 STUDY AREA LAND USE TYPES

Natural and human resources are discussed as they occur in each of the municipalities within Study Area, as appropriate. (*See* Figure 3.1 below and Appendix G, Figure 1- Study Area Cities, Towns and Villages). The Study Area is comprised of the following Cities, Towns and Villages: Auburn, Aurelius, Brutus, Cato (Town and Village), Cayuga, Conquest, Fair Haven, Fleming, Genoa, Ira, Ledyard, Locke, Meridian, Mentz, Montezuma, Moravia (Town and Village), Niles, Ovid (Town and Village), Owasco, Port Byron, Romulus, Scipio, Sempronius, Sennett, Spafford Springport, Summerhill, Sterling, Throop, Union Springs, Venice, Victory (Town and Village) and Weedsport. The Study Area is situated in central New York between Syracuse and Rochester and has a diverse economy that includes agriculture (vital to the areas economy - livestock, dairy products, vineyards & cash crops such as corn), manufacturing and distribution and some tourism. Industries within the Stud Area include: electrical/electronics, fiber optics, diesel engines, auto parts, glass bottles, plastic products and high quality steel and machined products. The region also supports year-round tourism, outdoor sports, and recreation.

The Study Area, located in the midst of the Finger Lakes, contains small towns and villages that are the essence of what the Finger Lakes are all about, rural charm with a sophisticated flair. Auburn is Cauyga County's seat and its largest community. Aurora/Sherwood was settled in 1799 and is home to the renowned accessories company, MacKenzie-Childs, Ltd. Cato is geographically surrounded by some of the best formed drumlins in the world. Fair Haven/Sterling was historically a shipping port that is now a resort community. King Ferry/Genoa are known as the agricultural heart of Cayuga County. Locke, formed in 1862, is an agrarian community that includes beautiful farmland, historic farms and cemeteries. Moravia/New Hope/Summerhill is where the 13th President of the United States, Millard Fillmore, was born. Port Byron/Mentz was incorporated in 1837 and is one of the principal grain markets in western New York. Union Springs contains many springs within its boundaries and extensive minerals, gypsum and limestone, which have played an important role in the industrial development of the town, as well as its draw as a health resort. Weedsport was the site for early development of the Erie Canal back in 1818. (2010 Cayuga County Office of Tourism)

Figure 3.1 - Study Area Cities, Towns and Villages



Land use categories were established to differentiate the settings for the Project. The land use types have the practical, ordinary meanings commonly associated with them.

Metropolitan Areas – Centers of population, commerce and culture of significant size and importance, places where many people live and work in high rise buildings, commute to work by public transportation and where the environment is generally noisy and busy.

Towns and Villages – These are inhabited areas, including suburbs, with low to moderate population density, possibly having a centralized commercial district, public facilities and services such as a town hall, library or shared community utilities, including mixed residential and commercial areas that are not urban or rural.

Rural Areas – These are sparsely populated areas that generally do not have a centralized business district. They include agricultural or seasonally inhabited areas. Rural areas may be characterized as being rustic, and sometimes are referred to as the countryside, as distinguished from a city or town.

Recreation, Open Space, and Park Land Areas – These are non-residential, non-commercial areas that are essentially empty except for wildlife, vegetation and temporary visitors. They are not used for agricultural purposes. They may be designated as permanently wild or as publicly-owned land, such as timber reserves, or dedicated for the specific use of public recreation. This land use type includes the major parks and forested areas, outside of community areas. Community parks are considered part of the urban town and village land use types when located in these areas.

Coastal Areas – This land use type includes any of the above areas that are in the vicinity of the coast, (i.e., land next to the Great Lakes). Coastal areas are subject to New York State coastal policies and the Coastal Zone Management Program. The coastal land use area is relevant to, among other things, wetland resources (tidal wetlands occur in coastal zones), and land use and zoning considerations.

3.2 NATURAL RESOURCES OF THE STUDY AREA

Natural resources include: geology; water resources; terrestrial and aquatic ecology; air resources; agricultural resources; and climate change. Following the description of the aspects of each resource, information is provided to characterize the resource as it occurs in the Study Area or each municipality, as appropriate. Land use types are used to further distinguish features of the resources.

3.2.1 Geology

The geology of the area is extremely diverse in terms of historical events, age of deposits, types of deposits, structure and geomorphology (land forms). The topography of the area is intimately tied to the geology and geomorphology. The Study Area is located within the Ontario Lowlands and the Allegheny Plateau physiographic provinces (refer to Appendix A, Figure 1- Study Area Elevation). Physiographic provinces are geographic areas of similar major topographic and geomorphic characteristics or features, which are related to and/or created, at least in part, by their geologic history, and the rock types and structures that form or underlie them. Geologic formations underlying the Study Area consist of sandstone and shale (*See* Appendix A, Figure 2- Study Area Bedrock Geology). Surficial mineral deposits in the area include many sand and gravel deposits of glacial origin; limestone and dolostone bedrock; and other natural materials (e.g., till, clay, and shale) (*see* Appendix A, Figure 3- Study Area Surficial Geology).

The Ontario Lowlands physiographic province is part of a larger basin and is occupied by present-day Lake Ontario. This province is somewhat analogous to the Erie Lowlands Province, in that it occupies relatively low lying ground north of the Onondaga Escarpment, which forms the east-west oriented northerly limit or boundary of the Allegheny Plateau. The Ontario Lowlands occupy a large area of land south of the present Lake Ontario Basin. Lake Ontario is a reduced-size version of a glacial lake (Lake Iroquois) that formerly occupied more of the basin area during the late Wisconsin period of the Pleistocene Epoch, more than 10,000 years ago.

The surficial geologic deposits within the Ontario Lowlands province consist primarily of glaciolacustrine lake silts, clays and fine sands, with major areas overlain by glacial till or ground moraine. The province also contains several notable east-west oriented linear surficial deposits consisting of either moraines (glacial ice-front deposits) or beach ridge deposits. Minor deposits of sand and gravel are found in localized, glacially-related ice contact and outwash deposits. Recent sand and gravel deposits are found as alluvium in major stream valleys.

The Allegheny Plateau physiographic province extends from Lake Erie in the west to the Catskill Mountains in the east. The Allegheny Plateau is bordered by the Lake Erie Lowlands physiographic province to the west, the New York/Pennsylvania border to the south, the Ontario Lowlands and the Mohawk River Valley to the north and the Hudson River Valley to the east. The Allegheny Plateau is part of the larger Appalachian Plateau areas of Ohio, New York and Pennsylvania.

The Allegheny Plateau was formed as a combination of uplift and erosion. The general topographic expression of the Plateau is that of a dissected plateau with areas of high elevation

and deep valleys. Relief varies from the relatively rugged topography of the Catskill Mountains in the east, to more moderate relief in the central and western areas.

Surficial deposits cover most of the Plateau with bedrock cropping out occasionally. The surficial geologic deposits covering the Allegheny Plateau are primarily the result of glacial deposition. In order of areal extent, the deposits are predominantly till, followed by diamicton, outwash sand and gravel and kame features. Lacustrine sands, silts and clay, as well as swamp deposits, account for a minor part of the total surficial deposits. The thickness of the surficial deposits in the Allegheny Plateau varies between 0 and 984 feet.

The following surficial deposits make up a minority (<5%) of the total surficial deposits on the Plateau: swamp, lacustrine delta and lacustrine sand. Swamp materials consist of peat-muck, organic silt and sand. They are generally between 6 and 66 feet thick and create potential land instability. Lacustrine beach deposits form a linear pattern along the northwestern edge of the Plateau in the west. They are comprised of coarse to fine gravel and sand, which is stratified and generally well-sorted. Their thickness ranges between 10 and 49 feet.

3.2.2 Water Resources

3.2.2.1 Groundwater

The Study Area has a vast array of groundwater resources that are used in all aspects of life, work and play. For example, in rural parts of the Study Area, groundwater resources tapped by individual water wells are often the sole source of water to residential and agricultural users. In more developed, metropolitan areas, groundwater is often collected and distributed in municipal groundwater supply systems where entire residential communities and businesses use a common potable groundwater supply. Groundwater also serves industrial uses such as water-based product manufacturing and industrial cooling.

<u>Groundwater Classification</u>

New York State has adopted a series of water quality regulations that classify surface water and groundwater. The classifications are defined by the best usage of the water resource. The groundwater classifications are:

Class GA fresh groundwaters – Best used as a source of potable water supply.

Class GSA saline groundwaters – Best used as a source of potable mineral waters, or for conversion to fresh potable waters, or as raw material for the manufacture of sodium chloride or its derivatives or similar products.

Class GSB saline groundwaters – Best used as a receiving water for disposal of wastes. Class GSB waters are saline groundwaters that have a chloride concentration in excess of 1,000 milligrams per liter or a total dissolved solids concentration in excess of 2,000 milligrams per liter.

Identification and Protection of Groundwater

In many areas throughout the State, including the Study Area, groundwater can be pumped from the geologic media in which it occurs in sufficient quantities to satisfy the demands of residential users. Elsewhere, groundwater occurs in high porosity geologic material, such as sand and gravel. Within these media, significant recharge of the groundwater source is also possible. These areas are commonly referred to as groundwater aquifers and may provide sufficient water supply for entire communities. (*See* Appendix B, Figure 1- Study Area Recognized Aquifers.) Several State and federal agencies have attempted to understand the location and characteristics of the most heavily used and productive aquifers. In 1987, DEC identified, in general terms, a series of major sand and gravel aquifers and designated them as either primary or principal aquifers. Primary aquifers are those unconsolidated geologic deposits that are highly productive and heavily used for private, community and public water supplies. Principal aquifers are unconsolidated deposits that are known to be highly productive, or have the potential to be highly productive, but are not currently used as a major source of public water supply. Subsequent to the DEC adoption of the system of primary and principal aquifers, the United States Geological Survey ("USGS") published a series of maps that identified these sand and gravel aquifers in more detail. More recent versions of the primary and principal aquifer maps have been expanded to include potentially highly productive consolidated bedrock aquifers in addition to the primary and principal sand and gravel aquifers**.**

Beyond the efforts of DEC and USGS to identify known aquifers in the State, EPA also identifies and maps sole source aquifers throughout the country. A "sole source aquifer" is an aquifer that supplies 50 percent or more of the drinking water in a particular area. The EPA has identified ten separate sole source aquifers that lie entirely or partially in New York State. There is one Sole Source Aquifer located in the southeastern corner of the Study Area (*See* Appendix B, Figure 1 - Study Area Recognized Aquifers).

Potable drinking water supplies from groundwater are obtained in both rural and urban areas alike. The surficial land use does not necessarily determine or preclude the occurrence, utility, or quality of a groundwater resource.

Use of Groundwater

Drinking water supplies in the Study Area are relatively abundant, and ample water supply is generally available to support residential, commercial and industrial activities, including public and private drinking water supplies. Groundwater used for public consumption is regulated by the DOH and may also be subject to the review by DEC and the various county Health Departments.

Groundwater Drinking Water Supplies in the Study Area

All groundwater supplies in the Study Area are classified as Class GA. Water well production rates range from 5 to 500 gallons per minute. In the various municipalities making up the Study Area, there are numerous unconsolidated and/or potentially productive bedrock aquifers. (*See* Appendix B, Figure 1 - Study Area Recognized Aquifers). The various unconsolidated bedrock aquifers have production rates including 10-100 gallons per minute, 5-500 gallons per minute, or less than 100 gallons per minute. Potentially productive bedrock aquifers include carbonate-rock aquifers, sandstone and carbonate-rock aquifers, sandstone aquifers, and semiconsolidated sand aquifers. *See* Appendix B, Figure 1.

3.2.2.2 Surface Water

In general, New York State has a moist, temperate climate that supports an abundance and diversity of surface water bodies throughout the State, including the Study Area (*see* Appendix B, Figure 2 - Study Area Major Drainage Basins and Water Bodies). Lakes, ponds and reservoirs provide for many types of recreation, and supply large quantities of water for municipalities, industry and agriculture (Greeson et. al., 1976). The same can be said for some streams and rivers. This section provides an overview of the surface water resources within the Study Area. They include: surface water quantity; surface water quality; drinking water supplies; special designations (e.g., wild, scenic and recreational rivers) or protection areas and floodplains.

Surface Water Quantity

Surface waters are continually recharged by an abundant supply of rain and snow. The mean annual precipitation over a ~30-year time period (1951-1980) is widely variable in this part of New York State, ranging from a low of 34 to a maximum value of 40 inches per year (Randall 1996). Mean annual precipitation and runoff for the Study Area for the same time period is depicted in Appendix B, Figure 3- Study Area Mean Annual Runoff. Evapotranspiration for this part of New York State typically ranges from 18 - 19 inches per year (*See* Appendix B, Figure 4- Study Area Mean Annual Precipitation and Evapotranspiration).

Surface Water Quality

Surface waters are classified according to their "best usages." These classifications include designations for both fresh surface waters and saline surface waters. The surface water classifications are as follows.

- Class N fresh surface waters – Best usages are the enjoyment of water in its natural condition and, where compatible, as a source of water for drinking or culinary purposes, bathing, fishing, fish propagation and recreation. There can be no discharge of sewage, industrial wastes or other wastes, waste effluents or any sewage effluents not having had filtration resulting from at least 200 feet of lateral travel through unconsolidated earth. A greater distance may be required if inspection shows that, due to peculiar geologic conditions, this distance is inadequate to protect the water from pollution. These waters shall contain no deleterious substances, hydrocarbons or substances that would contribute to eutrophication, nor shall they receive surface runoff containing any such substance.
- Class AA-Special (AA-S) fresh surface waters – Best usages are for drinking, culinary or food processing purposes, primary and secondary contact recreation and fishing. The waters are suitable for fish propagation and survival. These waters contain no floating solids, settleable solids, oil, sludge, deposits, toxic wastes, deleterious substances, colored or other wastes or heated liquids attributable to sewage, industrial wastes or other wastes. There can be no discharge or disposal of sewage, industrial wastes or other wastes in these waters. These waters contain no phosphorous and nitrogen in amounts that will result in the growth of algae, weeds and slimes that will impair the waters for their best usages.
- Class A-Special (A-S) fresh surface waters – Best usages are for drinking, culinary or food processing purposes, primary and secondary contract recreation and fishing. The waters are suitable for fish propagation and survival. This classification may be given to those international boundary waters that, if subjected to approved treatment equal to coagulation, sedimentation, filtration and disinfection with additional treatment, if necessary, to reduce naturally present impurities, meet or will meet, DOH drinking water standards and are or will be considered safe and satisfactory for drinking water purposes.
- Class AA fresh surface waters – Best usages are a source of water supply for drinking, culinary or food processing purposes, primary and secondary contact recreation and fishing. The waters are suitable for fish propagation and survival. This classification may be given to those waters that, if subjected to approved disinfection treatment, with additional treatment if necessary to remove naturally present impurities, meet, or will

meet DOH drinking water standards and are or will be considered safe and satisfactory for drinking water purposes.

- Class A fresh surface waters – Best usages are a source of water supply for drinking, culinary or food processing purposes, primary and secondary contact recreation and fishing. The waters are suitable for fish propagation and survival. This classification may be given to those waters that, if subjected to approved treatment equal to coagulation, sedimentation, filtration and disinfection, with additional treatment if necessary to reduce naturally present impurities, meet or will meet, DOH drinking water standards and are or will be considered safe and satisfactory for drinking water purposes.
- Class B fresh surface waters – Best usages are primary and secondary contact recreation and fishing. These waters are suitable for fish propagation and survival.
- Class C fresh surface waters – Best usage is fishing. These waters are suitable for fish propagation and survival. The water quality is suitable for primary and secondary recreation, although other factors may limit the use for these purposes.
- Class SA saline surface waters – Best usages are shellfishing for market purposes, primary and secondary contact recreation and fishing. These waters are suitable for fish propagation and survival.
- Class SB saline surface waters – Best usages are primary and secondary contact recreation and fishing. These waters are suitable for fish propagation and survival.
- Class SC saline surface waters – The best usage is fishing. These waters are for fish propagation and survival. The water quality is be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.
- Class I saline surface waters – The best usages are secondary contact recreation and fishing. These waters are suitable for fish propagation and survival.
- Class SD saline surface waters – The best usage is fishing. These waters are suitable for fish survival. This classification may be given to those waters that, because of natural or man-made conditions, cannot meet the requirements for primary and secondary contact recreation and fish propagation.

In some cases, surface waters are further designated as being suitable for trout and salmon survival or trout spawning. (The Cayuga-Seneca Lakes and Canal contain these fish).

Part 897 of 6 NYCRR contains the classifications for the Study Area's many surface waters. *See also* DEC's 303(d) List of Impaired / TMDL Waters.

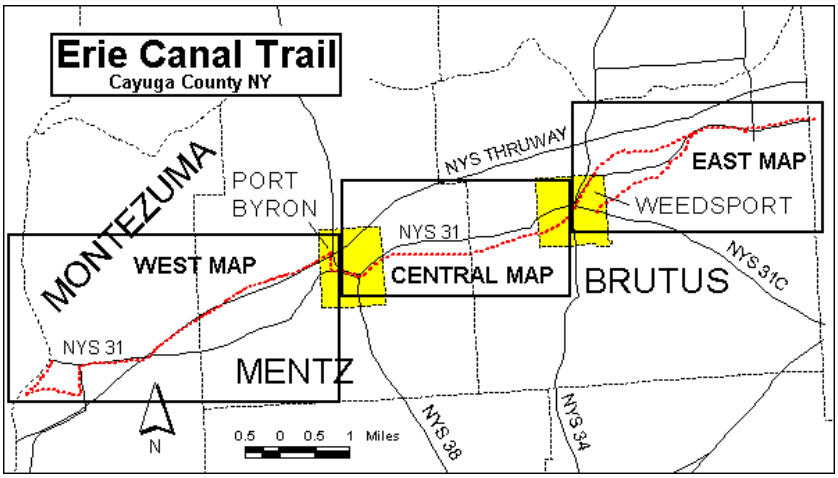
Drainage Basins and Major Water Bodies

A drainage basin is an area in which all of the runoff eventually flows into a common water body. The Study Area is located partially in the Oswego Basin, the Lake Ontario drainage basin, and the Susquehanna Basin as depicted in Appendix B, Figure 2- Study Area Major Drainage Basins and Water Bodies. Notable waterbodies in the Study Area include Owasco Lake, Cross Lake, Cayuga Lake, Skaneateles Lake, Otisco Lake, the Erie Canal, Seneca River, Salmon Creek, Sterling Creek, Owasco Lake Inlet and Owasco Lake Outlet.

Special Protections

Additional/special protection for water resources are provided by programs administered by the New York State Canal Corporation for lands under and along the New York State canal system and by the DOS for coastal areas along Lake Ontario. The DEC also provides special protections via permitting.

The Cayuga Seneca Canal connects the Erie Canal to Cayuga and Seneca Lakes. The Erie Canal passes through/borders a number of cities, towns and villages within the Study Area, including Brutus, Port Byron, Weedsport, Mentz and Montezuma. A portion of the Lake Ontario Coastal Zone is located in the Study Area.



Surface Water Drinking Water Supplies in the Study Area

New York State has an abundant supply of water that is used for many purposes, including drinking water supplies. Surface water used for public consumption is regulated by the DOH and may also be subject to the review of the DEC and the local county health department. There are a number of surface drinking water intakes in the Study Area which varies depending on geographic location.

3.2.3 Terrestrial and Aquatic Ecology

Biodiversity refers to the variety of plant and animal life. It includes the diversity of genetic materials within species, the variety of species and the multitude of communities, ecosystem and landscapes within which species coexist and evolve. The Study Area has thousands of species. The terrestrial and aquatic ecological resources of the Study Area are broadly distributed and highly variable due to physiographic, vegetation and land use characteristics. Such resources include, among others, fish and wildlife, vegetation and wetlands.

The New York Natural Heritage Program ("NYNHP") is aimed at cataloguing rare plants and animal species and ecological communities, ranking them in significance and maintaining data so as to preserve them. Under the program, DEC maintains the State's most comprehensive database on the status and location of rare species and natural communities. The database includes detailed information on the relative rarity of each species and community, the quality of their occurrences and descriptions of sites. The information is used by public agencies, the environmental conservation community, developers and others to aid in land-use decisions.

Ecological Communities

The ecological communities classification system used in New York State is based on vegetation, recognizing 222 communities, 120 of which are wetland or deepwater habitats (Edinger et al., 1990). These natural communities are grouped into ecosystems. This system is hierarchical, recognizing six major systems: Marine, Estuarine, Riverine (Rivers and Streams), Lacustrine (Lakes and Ponds), Palustrine (Grasslands, Shrublands and Forests) and Terrestrial. Cultural Landscapes (Agricultural and Urban) and Sub-terranean are additional categories. There are numerous classes and subclasses that describe the substrate, vegetative community or dominant vegetation.

Ecological Provinces of Terrestrial Ecosystems

A four-level hierarchy is used to differentiate ecosystems, with the broadest classification being the domain. Domains are groups of related climates. They are differentiated on the basis of precipitation and temperature. There are four domains used for worldwide ecosystem classification. All four appear in the United States: the polar domain, the humid temperate domain, the dry domain and the humid tropical domain (www.nationalatlas.gov). New York State is located entirely in the humid temperate domain. This domain contains forests of broadleaf deciduous and needleleaf evergreen trees.

Divisions represent the climates within each domain; they are differentiated based on precipitation levels and patterns as well as temperature. Winter frost determines six divisions:

warm continental, hot continental, subtropical, marine, prairie and mediterranean. The Study Area is located within the hot and warm continental divisions. Vegetation of the hot continental division is comprised of winter deciduous forests, dominated by tall broadleaf trees that provide a continuous dense canopy in summer, but shed their leaves completely in winter. Vegetation of the warm continental division is comprised of needleleaf and mixed needleleaf-deciduous forests growing throughout the colder northern parts of the humid continental climate zone, extending into the mountain regions of the Adirondacks and northern New England. Lower layers of small trees and shrubs are weakly developed. In spring, a luxuriant ground cover of herbs quickly develops, but is greatly reduced after trees reach full foliage and shade the ground.

Divisions are subdivided into provinces, which are differentiated based on vegetation or other natural land covers. The Study Area is within the Eastern Broadleaf Forest (Continental) Providence and the Laurentian Mixed Forest Providence which generally contain the following vegetative cover types: natural forested upland, shrubland/herbaceous upland, agriculture and wetlands.

The Eastern Broadleaf (Continental) Province is dominated by broadleaf deciduous forest, but the smaller amounts of precipitation found here favor the drought resistant oak-hickory association. Although other forests have oak and hickory, only this particular forest association has both species and abundance. The oak-hickory forest is medium-tall to tall. The understory is usually well-developed, often with flowering dogwood. Other understory species include sassafras and hophornbeam. The shrub layer is distinct, with some evergreens. Many wildflower species occur. Wetter sites typically feature an abundance of American Elm, tuliptree and sweet gum. Northern reaches of the oak-hickory forest contain increasing numbers of maple, beech and basswood.

The Laurentian Mixed Forest Province lies between the boreal forest and the broadleaf deciduous forest zones and is therefore transitional. It consists partly of mixed stands of a few coniferous species (mainly pine) and a few deciduous species (mainly yellow birch, sugar maple and American beech). The rest is a mosaic of pure deciduous forest in favorable habitats with good soils and pure coniferous forest in less favorable habitats with poor soils. Mixed stands have several species of conifer, mainly northern white pine in the Great Lakes region, with an admixture of eastern hemlock. Pine trees are often the pioneer woody species that flourish in burned-over areas or on abandoned arable land. Because they grow more rapidly than deciduous species where soils are poor, they quickly form a forest canopy; but where deciduous undergrowth is dense, they have trouble regenerating and remain successful only where fire recurs. Fires started by lightning are common in this province, particularly where soils are sandy and there is a layer of dry litter in summer.

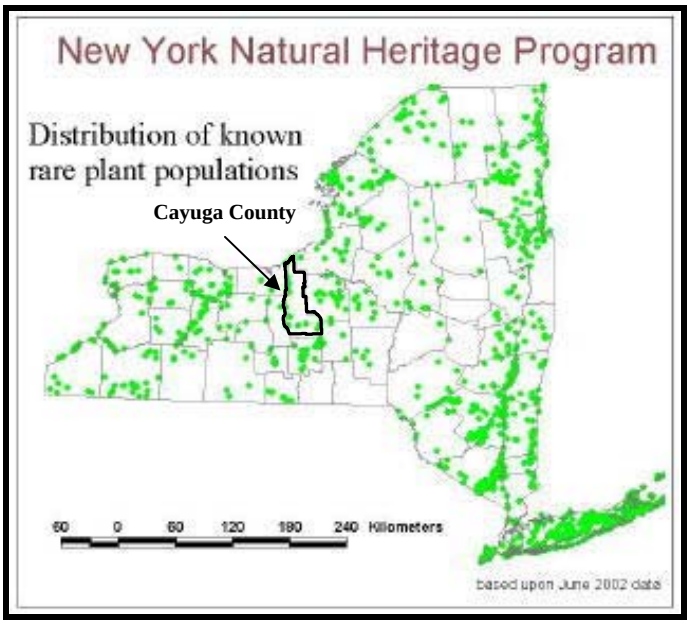
3.2.3.1 Vegetation

According to the New York State Biodiversity Clearinghouse, the State's plant species are divided into non-vascular plants (mosses, liverworts) and vascular plants (ferns, flowering plants, and trees). The NYNHP assigns various global and State ranks that reflect the rarity of a particular resource, such as plants, animals and ecosystems throughout the world (global rank) and throughout the State (State rank). Definitions for each global and State rank are presented in Appendix C, Table 1 -Definitions of Global and State Ranks.

Some plant species are documented with double ranks (e.g., S1S2, S1S3). The first rank indicates rarity based upon documentation. The second rank indicates the probable rarity after all historical records and likely habitat have been checked. Double ranks denote plant species that need additional field surveys.

The DEC Botany Program is part of the NYNHP. The Botany Program keeps track of the State's rare flowering plants, conifers, ferns and fern allies and mosses. Data on currently known distribution of rare plant populations in the State are kept up to date by this program. The distribution is shown in Figure 3.2 - Distribution of Known Rare Plant Populations (NYNHP, 2003) below.

Figure 3.2 - Distribution of Known Rare Plant Populations (NYNHP, 2003)



Information regarding the exact locations of rare species is considered sensitive. The distribution of information which identifies the locations of rare species or their habitat is limited.

No comprehensive rare plant surveys of the State have been conducted. Several lists of rare plants are maintained, although these lists contain some conflicting information. Appendix C, Table 2 - Protected Plants and Natural Communities of the Study Area provides a summary of protected plant and flowering plant species, ferns and fern allies, natural communities (uplands, freshwater, non-tidal, rivers and streams) known to exist within the Study Area, according to the NYSNHP.

The Study Area is predominantly located within the following minor ecosystem regions within the Great Lakes Plain: Erie-Ontario Plain, Drumlin, Central Appalachians amd the Finger Lake Highlands (*See* Appendix C, Figure 1- Study Area Ecological Regions). The predominant ecological communities of the Great Lakes Plain Eco-Region includes northern forest; atlantic highlands; northern appalachian and atlantic maritime highlands. Other important ecological communities in this area include: eastern temperate forest; mixed wood plains; eastern great lakes and hudson lowlands.

3.2.3.2 Fish and Wildlife

The Study Area contains a broad diversity of fish and wildlife. Wildlife populations vary depending upon available food and habitat and the land use type. For example, larger and more diverse wildlife populations are more likely to exist in rural undisturbed wooded areas and parklands, and are less likely to exist in urban environments.

The diversity of the Study Area's geography is reflected in its variety of mammals. New York, in general, is advantageously situated between warmer southern and coastal climates and northern boreal forest habitats, allowing the ranges of otherwise diverse species to overlap in the State.

Federal and State authorities assign legal status to plant and animal species as follows:

- Endangered Species (E) – Any species that is in imminent danger of extirpation or any species listed as endangered by the DOI. Listed species are those with five or fewer extant sites, or fewer than 1,000 individuals, or those restricted in their range to fewer than 4 USGS 7.5 minute topographical map areas.
- Threatened Species (T) – Any species likely to become an endangered species within the foreseeable future in the State, or any species listed as threatened by the DOI. Listed species are those with six to fewer than twenty extant sites, or 1,000 to fewer than 3,000 individuals, or those restricted to not less than 4 or more than 7 USGS 7.5 minute topographical map areas.

- Special Concern Species (SC) – Those species which are not yet recognized as endangered or threatened, but for which documented concern exists for their continued welfare in the State.
- Protected Species (P) – Wild game, wild birds, endangered animals and plant species. Additional categories include rare species (listed species that have 20 to 35 extant sites, or 3,000 to 5,000 individuals Statewide).
- Exploitably Vulnerable Species (V) - Those species that are likely to become threatened in the near future throughout all or a significant portion of their range within the State if causal factors continue to be unchecked).
- Unprotected Species (U) – Species not included in the categories listed above.

Information regarding the exact locations of rare species is considered sensitive. The distribution of information which identifies the locations of rare species or their habitat is limited. Appendix C, Table 3 - Current Study Area Listed Endangered, Threatened and Special Concern Species summarizes current state and federal endangered, threatened and special concern species known to exist within the Study Area. This information was provided by the NYNHP and FWS.

Bird Conservation Areas & Important Bird Areas

In 1997, the State developed a model Bird Conservation Area ("BCA") program based on the Important Bird Area ("IBA") program that was developed by the Audubon Society. An IBA is a site that provides essential habitat to one or more species of breeding or non-breeding birds. Although these types of areas vary in size, they are usually discrete and distinguishable in character, habitat, or ornithological importance from surrounding areas. State-owned lands and waters that meet IBA criteria can be designated as a BCA, which gives birds and bird conservation priority in management of the sites. The following BCA's are located within the Study Area:

Table 3.1 - Bird Conservation Areas of the Study Area

Bird Conservation Areas	Owner	Size (acres)	Date Designated
Bear Swamp	NYSDEC	~3,316	9/25/06
Montezuma Wetlands Complex	NYSDEC	7,500	5/5/00
Montezuma Wetlands Complex	NYSDEC, Fed. Priv.	70,000	
Cayuga Lake	NYSDEC, Priv., Munic.	41,999	
Seneca Army Depot	Seneca County Industrial Development Authority	10,000	
Southern Skaneateles Lake Forest	NYSDEC	9,501	

IBA criteria are categorized as follows:

Category NY-1 – Sites where birds concentrate in significant numbers when breeding, in winter, or during migration and that are within any of the following categories:

- The site regularly supports at least 2,000 waterfowl (at one time) during some part of the year. Waterfowl includes such birds as loons, grebes, cormorants, geese, ducks, coots and moorhens.
- The site regularly supports at least 100 pelagic seabirds or terns (at one time) or 10,000 gulls (at one time) during some part of the year. Human-made food sources for gulls such as landfills, dumpsites and sewage outflows are not considered an IBA. Pelagic seabirds include shearwaters, storm-petrels, fulmars, gannets, jaegers and alcids.
- The site regularly supports at least 300 shorebirds (at one time) if an inland site, or 1,000 shorebirds (at one time) if coastal, during some part of the year. Shorebirds include plovers, sandpipers, snipe, woodcock and phalaropes.
- The site regularly supports at least 100 wading birds during some part of the year. Wading birds include bitterns, herons, egrets and ibises.
- The site is regularly an important stopover site, "bottleneck" or migratory corridor for at least 8,000 raptors (seasonal total) during spring or fall migration.
- The site supports an exceptional diversity of bird species. This would include sites that do not necessarily harbor large numbers of birds but that provide important bird habitat for more bird species than found at most sites.
- The site supports a significant number of a particular species but supports a smaller number of birds than any of the criteria above. Sites should support many more of the species in question than other sites where the species occurs. Ideally, the site should be known to hold, or thought to hold more than 1% of the State population of species.

Category NY-2 – Sites that support a significant population of a species that is classified as endangered, threatened or special concern.

Category NY-3 – Sites that contain assemblages of species characteristic of a representative, rare, threatened, or unique habitat. Category NY-3 is meant to cover relatively large areas capable of supporting significant bird populations, especially of species with particular habitat requirements such as grassland or forest nesting birds (e.g., Henslow's and Grasshopper Sparrow, Cerulean Warbler). Category NY-3 sites include the following:

- Sites that contain an assemblage of species characteristic of a habitat type that is rare, threatened or unusual within the State or region.
- Sites that contain an assemblage of species characteristic of a habitat type that is an exceptional representative of a natural or near-natural habitat within the State or region.

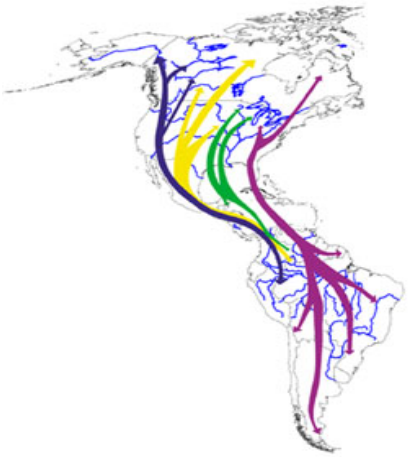
Category NY-4 – Sites used for long-term avian research or monitoring. These sites are natural areas where a long-term research or monitoring project is based that contributes substantially to ornithology and bird conservation. An indicator of Category NY-4 sites is that there will often be a long record of data collected that results in a publication in ornithological journals, such as the Auk, Condor, Wilson Bulletin, Journal of Field Ornithology, American Birds (Audubon Field Notes) or The Kingbird. These types of sites are not necessarily essential habitats for birds. They are technically not IBA's but they are considered important to identify and conserve. The following IBA's are located within the Study Area:

Table 3.2 - Important Bird Areas in the Study Area

Important Bird Area	Ownership	Size (acres)
Aurora Grasslands Complex	Private	420
Cayuga Lake	NYS, Municipal,&Private	41,999
Greater Summerhill Area	NYS, Non-profit & Private	28,999
Montezuma Wetlands Complex	USFWS, DEC, Non-Profit, Private	70,000
Southern Skaneateles Lake Forest	State, & Non-Profit	9,501
NOTE: Dorothy Mcllroy Bird Sanctuary (not an IBA) is located in the County. It is a 157 acre nature preserve that is owned and operated by the Finger Lakes Land Trust.		

Bird Migration/Flyways - The following main migratory bird flyways cross the United States: Pacific; Central; Mississippi and Atlantic (*See* Figure 3.3- Main Migratory Flyways, below). These major flyways represent a generalized path which can contain corridors that are hundreds of miles wide in some areas. Each major flyway branches off into thousands of tributaries which often include heavy bird traffic along coastal areas, mountain ranges and through principal river valleys. The Atlantic Flyway (includes principal and merging routes) includes the Study Area. Within the Study area, various estuaries, riparian areas, parks, wildlife refuges and wetland areas serve as important flyways for migrating birds. These corridors/flyways contain vital nesting, breeding, feeding and resting places for many migrating species.

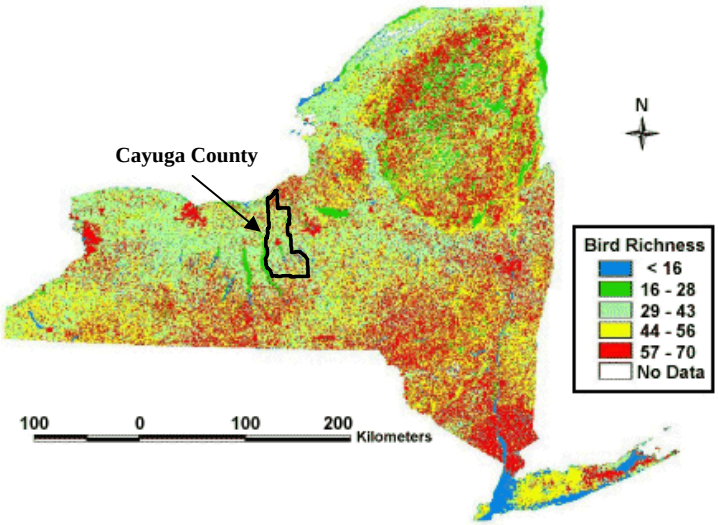
Figure 3.3 - Main Migratory Flyways



Main Migratory Flyway Figure from http://10000birds.com/flyways-and-byways.htm

Figure 3.4 - Expected Species Variety of Breeding Birds illustrates expected species variety (richness) of breeding birds across the State. This illustration was prepared by mapping the expected relationships of breeding birds to different habitats (Smith et al. 2001).

Figure 3.4 - Expected Species Variety of Breeding Birds



The relatively high accuracy of these predictions (89.5% at the ecoregion level), when compared to known occurrences from the first breeding bird atlas, supports the validity of these patterns. The State is not positioned geographically to include substantial parts of any major North American migratory flyways. However, the south shore of Lake Ontario and the Eastern Lake

Ontario Marshes BCA (located in Oswego and Jefferson Counties) have significant breeding and overwintering habitats, and serves as a critical migratory corridor for birds.

Herpetofauna

The DEC maintains a herpetofauna atlas with maps indicating the number of species reported and where they have been reported within the State (New York State Amphibian and Reptile Atlas, 1990-1998 data). Appendix C, Table 4-Protected Herpetofauna of the Study Area provides a summary of the herpetofauna documented in the Study Area.

Wildlife Management Areas

Wildlife Management Areas (WMAs) are lands owned by New York State under the control and management of the Department of Environmental Conservation's Division of Fish, Wildlife and Marine Resources. These lands have been acquired primarily for the production and use of wildlife. Money used to acquire lands included in the WMA system has been a combination of state and federal funding, sportsmen license fees and federal taxes on guns and ammunition. WMAs provide areas for the public to interact with wildlife, primarily through fishing, hunting and trapping, as well as offering opportunities for research, hiking, cross-country skiing, and birdwatching. The DEC maintains information on State Wildlife Management Areas. See Table 3.3, Wildlife Management Areas in the Study Area, below for Wildlife Management Areas located in the the Study Area.

Table 3.3 - Wildlife Management Areas in Study Area

Wildlife Management Areas	Acres	Land Type
Cross Lake Islands	32	Wetland
Cayuga Lake	225	Cattail marsh & wooded swamp
Willard	158	Upland
Northern Montezuma National Wildlife Refuge	7,500	Upland & Wetland

3.2.3.3 Wetlands and Floodplains

Wetlands are among the most productive ecosystems in the world, providing many ecological functions and values, including fish and wildlife habitat, natural water quality improvement, floodwater storage, shoreline erosion protection, aesthetic enhancement and biological

productivity. The New York State Open Space Conservation Plan estimates that there are 25,000 acres of vegetated tidal wetlands and 2,600,000 acres of freshwater wetlands in the State. The greatest density of freshwater wetlands occur within counties immediately bordering Lake Ontario and the St. Lawrence River. New York State designated wetlands are protected under the Fresh Water Wetlands Act, which applies to wetland areas 12.4 acres or larger. Federal Wetlands are under the jurisdiction of the U.S. Army Corps of Engineers, irrespective of size, under Section 404 of the Clean Water Act.

The complex glacial geology of the Study Area has resulted in a number of significant hydrological features including surface water bodies, aquifers and wetlands. Appendix C, Figure 2 - Study Area DEC Mapped Wetlands**,** shows DEC wetlands distribution througout the Study Area and identifies the wetland classes. Appendix C, Figure 4 - Federal Wetlands in the Study Area presents the mapped Federal Wetlands and classifications.

Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year, or for varying periods of time during the year, including during the growing season. Three criteria necessary for an area to be considered a wetland include the presence of hydric soils, hydrophytic vegetation and hydrology.

Hydric soils – These soils exhibit evidence of long-term saturation during the growing season. Soils that are saturated or waterlogged for long periods become depleted in oxygen. This retards normal breakdown of dead plant debris, causing partly decomposed organic matter to accumulate on the soil surface and produces chemical changes in the soil, which can affect its color (predominantly gray, with orange or brown spots) and odor (sulfurous).

Hydrophytic vegetation – This includes plants that grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content. Of the roughly 22,500 plant species in the United States over 6,700 such as cattails, bulrushes, sedges and cordgrass commonly grow in wetlands.

Wetland hydrology – This refers to the presence of surface water or waterlogged soils for a sufficient period of time in most years to influence the kinds of plants and soils that occur in an area. The most reliable evidence of wetland hydrology is provided by gauging stations or groundwater wells, but such information is limited in most areas and, when available, requires analysis by trained individuals. Other evidence of periodic flooding or soil saturation includes: standing or flowing water, or waterlogged soil observed during the growing season; water marks on trees and other erect objects indicating the depth of standing or flowing water; drift lines or small piles of debris deposited by flowing water along the contours and indicating the approximate extent of flooding in an area; thin layers of sediment that coat leaves or other

objects on the ground when suspended particles settle out of flood waters over a period of time; plant roots that have rust-colored coatings or zones of soils around them caused by leakage of oxygen out of plant roots, resulting in oxidation of iron compounds in the soil around the root.

The term wetlands includes areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. The Army Corps of Engineers requires that at least one indicator from each category, (e.g., vegetation, soil and hydrology) must be present for an area to be identified as a wetland. The boundary of a wetland is determined by the transition of vegetation from wetland to upland species and soils from hydric to non-hydric. The State also recognizes the importance of buffers or "adjacent areas" (e.g., the area surrounding a wetland where that transition takes place).

Wetlands vary widely because of regional and local differences in soil, topography, climate, hydrology, water chemistry, vegetation and other factors, including human disturbance. The Study Area contains a number of inland wetlands, which are most common on floodplains along rivers and streams (riparian); in isolated depressions surrounded by dry land (playa basins, potholes); along the margins of lakes and ponds (lacustrine) and in other low-lying areas where the groundwater intercepts the soil surface or where precipitation sufficiently saturates the soil (vernal pools and bogs).

Wetlands fall into four categories – marshes (tidal and non-tidal), swamps (forested and shrub), bogs (northern bogs and pocosins) and fens. Marshes are wetlands dominated by soft-stemmed vegetation. Swamps have mostly woody plants. Bogs are freshwater wetlands, often formed in old glacial lakes. They are characterized by spongy peat deposits, evergreen trees and shrubs and a floor covered by a thick carpet of sphagnum moss. Fens are freshwater peat-forming wetlands covered mostly by grasses, sedges, reeds and wildflowers.

Marshes are further defined as wetlands frequently or continually inundated with water, characterized by emergent soft-stemmed herbaceous vegetation, such as sedges, cattails and bulrushes adapted to saturated soil conditions. Marsh types include fens, sloughs, potholes and wet meadows. They can generally be divided into two primary categories: tidal and non-tidal.

Non-tidal marshes are the most prevalent and widely distributed wetlands in North America. They are mostly freshwater marshes, although some are brackish. They frequently occur along streams in poorly drained depressions and in the shallow water along the boundaries of lakes, ponds and rivers. Water levels in these wetlands generally vary from a few inches to two or three feet. Some marshes may periodically dry out completely. A non-tidal marsh can be recognized by its characteristic soils, vegetation and wildlife. Highly organic, mineral rich soils

of sand, silt and clay underlie these wetlands, while lily pads, cattails, reeds and bulrushes provide excellent habitat for waterfowl and small mammals, such as red-winged blackbirds, great blue herons, otters and muskrats. Freshwater marshes include wet meadows and vernal pools.

Swamps are any wetlands dominated by trees, shrubs and other woody plants. Swamps are characterized by saturated soils during the growing season and standing water during certain times of the year. The highly organic soils of swamps form a thick, black, nutrient-rich environment for the growth of water-tolerant trees such as Atlantic white cedar, northern white cedar, red maple, black willow, pin oak and tupelo. Some swamps are dominated by shrubs, such as dogwoods, willows, buttonbush or smooth alder. Swamps serve vital roles in flood protection and nutrient removal. Floodplain forests are especially high in productivity and species diversity because of the rich deposits of alluvial soils from floods. Many upland creatures depend on the abundance of food found in the lowland swamps. Valuable timber can be sustainably harvested to provide building materials. Due to the nutrient rich soils present in swamps, many of these fertile woodlands have been drained and cleared for agriculture and other development.

Swamps are divided into two major classes. They are shrub swamp and forested swamp. Forested and shrub swamps are often found adjacent to one another. Swamps are often inundated with floodwater from nearby rivers and streams. Sometimes, they are covered by many feet of very slowly moving or standing water. In very dry years they may represent the only shallow water for miles. Their presence is critical to the survival of wetland dependent species like wood ducks, river otters and cottonmouth snakes. Some of the common species of trees found in these wetlands are red maple and pin oak.

Bogs are a very distinctive kind of wetland generally dominated by sphagnum moss, which, when it dies, builds up thick layers of peat. This wetland type is characterized by these spongy peat deposits and acidic water. Bogs receive all or most of their water from precipitation rather than from runoff, groundwater or streams. As a result, bogs are low in the nutrients needed for plant growth, a condition that is enhanced by acid forming peat mosses. There are two primary ways that a bog can develop. Bogs can form as sphagnum moss grows over a lake or pond and slowly fills it (terrestrialization), or bogs can form as sphagnum moss blankets dry land, preventing water from leaving the surface (paludification). Over time, many feet of acidic peat deposits build up in bogs of either origin. The unique and demanding physical and chemical characteristics of bogs result in the presence of plant and animal communities that demonstrate many special adaptations to low nutrient levels, waterlogged conditions and acidic waters, such as carnivorous plants. Bogs occurring in the State are referred to as Northern Bogs.

Northern Bogs often form in old glacial lakes and are generally associated with low temperatures and short growing seasons where ample precipitation and high humidity cause excessive moisture to accumulate. Bogs serve an important ecological function in preventing downstream flooding by absorbing precipitation. Bogs support rare plants and provide habitat to animals threatened by human encroachment.

Fens are peat-forming wetlands that receive water and nutrients from sources other than precipitation, usually from upslope sources through drainage from surrounding mineral soils and from groundwater movement. Fens are less acidic and have higher nutrient levels than bogs and they support a much more diverse plant and animal community. These systems are often covered by grasses, sedges, rushes and wildflowers. Some fens are characterized by parallel ridges of vegetation separated by less productive hollows. The ridges of these patterned fens form perpendicular to the down-slope direction of water movement. Over time, peat may build up and separate the fen from its groundwater supply. When this happens, the fen receives fewer nutrients and may become a bog. Fens provide important benefits in a watershed, including preventing or reducing the risk of floods, improving water quality and providing habitat for unique plant and animal communities, including several federal and State listed species. Fens are considered rare. Up to 10,000 years are required to form a fen naturally.

Wetland Classifications

Wetlands have been classified by DEC according to their ability to perform wetland functions and provide wetland benefits, thus recognizing that not all wetlands are of equal value. Class I wetlands have the highest rank and supply the greatest benefits. The ranking descends through Classes II, III and IV. Class IX is reserved for unclassified wetlands.

Floodplains

Certain low-lying areas may be subject to periodic flooding as a result of intense precipitation or runoff events. Flood potential is influenced by natural features, such as soil type, vegetative cover, slope, drainage basin size, and storage capacity. Flooding potential can also be influenced by man-made construction and development activities. Flooding will occur when upstream recharge and runoff into a receiving water body exceeds the discharge capacity of the main channel. Water levels may rise above the “normal” riverbank and inundate the adjoining lowland, which is known as a floodplain. A flood that has a one-percent chance of occurrence in any given year is commonly referred to as a 100-year flood event and its boundaries are typically mapped by FEMA through the National Flood Insurance Program. Floodplains for the Study Area are depicted on Appendix C, Figure 3 - Study Area Special Flood Hazard Areas

3.2.4 Air Resources

Since the 1950s, the State has recognized that its citizens are entitled to protection of the ambient (outdoor) air to assure healthful living conditions and clean air to breathe. In the 1960s, the State created an air quality control program to regulate the discharge of air pollutants from stationary and mobile sources. This was based on the observation that activities involving combustion of fossil fuels (coal, oil and natural gas) and industrial activities created air pollutants that may reduce local and regional air quality to a point that adversely affects the public health and the environment. The regulations required facilities to both identify and quantify the emission of air pollutants and to install air pollution control devices. With the passage of time, and increased industrial activities along with EPA's regulations, promulgated under the Clean Air Act, the state regulations for air quality have gone through numerous changes and amendments, each time progressively stricter and more comprehensive than the previous ones. At this time, any new project that has the potential to impact air quality must be reviewed comprehensively to assure that air quality is preserved or, preferably, improved.

<u>NAAQS</u>

National Ambient Air Quality Standards ("NAAQS") have been established for six criteria air pollutants – particulates (including fine and ultra fine particulates), sulfur dioxide ("SO_2",) nitrogen oxides ("NOx"), carbon monoxide, ozone (measured by its volatile organic compounds ("VOCs") and NOx) and lead. In 1990, ultra fine particulate matter, or particulate with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$), was added to the list of criteria pollutants. $PM_{2.5}$ is associated with the combustion of fossil fuels, including natural gas and propane, and, to a lesser degree, as a fractional component of fugitive dust. Primary standards and secondary standards for varying exposure times have been established for each of these criteria pollutants. Primary standards are designed to protect the public health. Secondary standards are established to prevent other adverse environmental impacts and to protect the public welfare. The goal of the Clean Air Act is to achieve compliance with both primary and secondary standards set forth in the NAAQS. Appendix D, Table 1, Criteria Air Pollutants - Sources and Effects provides a summary of the sources and effects of the criteria pollutants. The NAAQS are provided in Appendix D, Table 2, National and State Ambient Air Quality Standards.

With the establishment of the NAAQS, states are required by the EPA to conduct ambient air monitoring for a number of years to determine if ambient air quality in various geographical areas, or ambient air quality control regions, meet these standards. If compliance with the standards is demonstrated, the air quality region is said to be in attainment. If the standard is exceeded, then the air quality region is said to be in nonattainment.

Attainment status for each criteria pollutant is evaluated by the EPA every five years in each of seven ambient air quality control regions in the State. The criteria air pollutant attainment status for the Study Area relative to the NAAQS is provided in Table 3.4, Ambient Air Quality Classifications - Six Criteria Air Pollutants, below. The entire State is treated as a moderate nonattainment area for ozone. Photochemical smog (derived from smoke plus fog) is a secondary air pollutant principally composed of ozone. Ozone is formed in the atmosphere from the chemical reaction of precursor compounds emitted from mobile and stationary combustion and industrial sources. The precursor compounds, NOx and VOCs in the presence of sunlight, create ozone. This pollutant can be transported by wind currents hundreds of miles from the sources emitting these precursor compounds. The precursor compounds of NO_x and VOC are products of fossil fuel combustion.

Table 3.4 - Ambient Air Quality Classifications - Six Criteria Air Pollutants

Region	Attainment	Non-Attainment	Non-Attainment Classification	Additional Comments
Entire State	SO2, Pb, CO, NO_2	Ozone - O_3	Moderate or Severe	$PM_{2.5}$ State-wide Classification pending
Study Area	PM_{10}, SO_2, Pb, CO, NO_2	O_3	Moderate [1]	Attainment
1 – Classification of moderate nonattainment based upon inclusion in the Ozone Transport Region..				

The Ozone Transport Region is a multistate region comprising the six New England states, in addition to New York, New Jersey, Pennsylvania, Delaware, northern Virginia as well as Washington, D.C

The DEC has been collecting ambient $PM_{2.5}$ data in its Statewide network since the third quarter of 1999. The air quality monitoring station closest to the Study Area is located to the east at East Syrcuse in Onondaga County which is also the only station monitoring inhalable particulates, $PM_{2.5}$, in Region 7 and in central New York State. Beyond compliance with the $PM_{2.5}$ standards, the 2007, 2008 and 2009 reporting years' data reveals continued air quality improvement with regard to this pollutant. 2007, 2008 and *Annual* $PM_{2.5}$ monitoring data at East Syracuse were 9.8, 8.7 and 8.5 ug/m^3 respectively versus a standard of 15 ug/m^3, and *Twenty-four Hour* monitoring data were 28.0, 24.0 and 25.0 ug/m^3 respectively versus a standard of 35 ug/m^3.

Toxic air emissions are addressed in the National Emission Standards for Hazardous Air Pollutants. Maximum achievable control technologies have been established for 186 hazardous air pollutants ("HAPs") that are emitted in significant quantities from 178 emission sources and source categories. Stationary combustion engines are included in the HAP emission source categories.

Facilities emitting or having the potential ability to emit major quantities of either the criteria pollutants or HAP must obtain a special operating permit, known as a Title V operating permit. If the major source thresholds are not exceeded, then the facility must obtain an air state facility permit or a minor facility registration unless the facility is exempted or meets the regulatory definition of a trvial source. The level of the emissions of the criteria pollutants and HAP will determine the comprehensiveness of the permitting effort.

Parks and Indian tribal lands are accorded special consideration under certain federal air quality programs in terms of regional haze and impairment of visibility caused by air pollutants.

The Study Area is primarily comprised of small towns and villages heavily associated with agricultural, dairy and livestock activities**.** Agricultural tilling and cattle feed lot operations have been identified as primary sources of fugitive particulate matter under the EPA Emission Inventory Improvement Program, due to the mobilization of geological particulate matter under the action of mechanical tilling equipment, and the movement of animals and materials in feed lots (US EPA Emission Inventory Improvement Program, Volume IX – Particulate Emissions).

The 2009 DEC Air Quality Data indicates that the DEC Region 7, which includes the Study Area, reports no observations of exceedances in SO_2, PM_{25}, CO or O_3.

Climate Change

The DEC has recently adopted a policy entitled "Assessing Energy Use and Greenhouse Gas Emissions in Environmental Impact Statements". The policy is recommended to be used for those actions where DEC is the SEQRA lead agency in project review and energy use or GHG emissions have been identified as significant in a positive declaration or, as a result of scoping, are required to be discussed in an EIS. Neither of these conditions apply to this Project, however, a general assessment of potential climate change impact is included in Section 4.2.4 of this DGEIS.

3.2.5 Agricultural Resources

Approximately 25% of New York's land area, or 7.6 million acres, is occupied by some 37,500 farms. A substantial portion of the Study Area is dedicated to agriculture, producing a diverse array of agricultural commodities such as flowers, trees, shrubs, hay, fruits, vegetables, wheat, grain products, dairy products, meat and poultry products. These commodities are essential to New York's farm economy and New York's economy as a whole (NYSASS, 2003).

The average size of an agricultural operation in Study area is approximately 233 acres. Cayuga County is the top producer in New York for corn for grain or seed. Seneca County has highest inventory of hogs and pigs in New York State. Crops grown in the Study Area include corn for

grain or seed, corn for silage or green chop, oats, wheat, potatoes, hay, alfalfa, grapes, apples, onions, cabbage, sweet corn and tomatoes (Agricultural Land Usage, 2003). Muck soil crop production in this region includes onions, lettuce, potatoes, field corn, sweet corn, carrots and turf grass (NYSASS, 2002).

According to www.nywineries.org, New York grape, grape juice and wine industries contributed over $3.76 billion in economic benefits to the state's economy in 2008. Overall, New York has 962 vineyards covering 31,745 acres, 169 wineries, all of which produce 150,000 tons of grape products annually. According to Cornell University's Cooperative Extension, Finger Lakes Grape Program, "The Finger Lakes Region of New York is one of the premier grape growing regions in the U.S. east of the Rocky Mountains. The region is home to almost 10,000 acres of vineyards and over 70 different grape varieties, which are used for the production of grape juice and wine by both large, national producers and small premium wineries."

Wineries located in the Study Area include:

- Bet the Farm – A 23 acre winery and gourmet market located in Aurora
- Chateau Dusseau – An approximately 2 acre winery located on a high bluff in Locke
- CJS Vineyards & Aurelius Winery – An approximately 3 acre winery located in Auburn
- Dill's Run Winery – An approximately 16 acre winery and Bed & Breakfast located in Auburn
- Giancarelli Brothers Winery – A winery located in Weedsport
- Heart & Hands Wine Company – An approximately 7 acre winery located in Union Springs
- Izzo's White Barn Winery – An approximately 18 acre facility, including a winery located in Cayuga
- King Ferry Winery – A winery located in King Ferry
- Long Point Winery – An approximately 72 acre winery located in Aurora overlooking Cayuga Lake
- Stone Meadows Farm Winery – A winery located in Moravia
- Swedish Hill Winery – A winery located in Romulus
- Goose Watch Winery – A winery located in Romulus

- Cobblestone Farm Winery & Vineyard – An approximately 35 acre winery located in Romulus
- Buttonwood Grove Winery – A winery located in Romulus
- Knapp Wine – A winery located in Romulus
- Sheldrake Point Winery – A winery located in Ovid
- Cayuga Ridge Estate Winery – A winery located in Ovid
- Hosmer Winery – An over 60 acre winery located in Ovid

There are a number of agricultural land protections available, including use of agricultural districts, creation of conservation easements, and others. Creation of agricultural districts is based on the principle that land will remain in agricultural protection only insofar as an economic, regulatory and land use climate exists which encourages landowners to remain in farming (New York State Agriculture & Markets, 2003). Certain resource protections apply to lands located in agricultural districts. The Study Area's Agricultural Districts are identified on Appendix E, Figure 1 - Study Area Agricultural Districts.

County Soil Survey maps are available at the Cornell University Geospatial Information Repository website (http://cugir.mannlib.cornell.edu/) or from the U.S. Department of Agriculture: Natural Resources Conservation Service "Soil Survey Geographic Database."

Agricultural conservation easements commonly are established to protect agriculturally productive lands. Generally, lands protected under such an easement are less likely to be converted from agricultural uses to non-agricultural uses.

In general, agricultural resources typically do not exist in Metropolitan Areas, Open Space, Recreational and Parkland Areas. Soils with agricultural ratings may be located within these land use types but they are not used for agricultural purposes. The majority of agricultural resources for the Study Area are in the towns and villages, rural and coastal land use types. These land use types are discussed together because the agricultural resources in each land use area are similar.

3.2.5.1 Farmland

Farmland is rated by the Natural Resource Conservation Service ("NRCS") in order to identify and protect it for the Nation's short and long term needs for food and fiber. The NRCS categories are Prime, Unique, Additional Farmland of Statewide Importance, Farm Woodland and Additional Farmland of Local Importance (NRCS-NSSH, 2004).

- Prime Farmland - According to the NRCS, Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops, and is also available for these uses (the land could be cropland, pastureland, rangeland, forest land or other land, but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed according to acceptable farming methods.
- Unique Farmland - Unique Farmland is land other than Prime Farmland that is used for the production of specific high value food and fiber crops. It has the special combination of soil quality, location, growing season and moisture supply needed to economically produce sustained high quality yields of a specific crop when treated and managed according to acceptable farming methods. Examples of such crops are citrus, tree nuts, olives, cranberries, fruits and vegetables.
- Additional Farmland of Statewide Importance - This land, in addition to Prime and Unique Farmland, is of Statewide importance for the production of food, feed, fiber, forage and oil seed crops. Criteria for defining and delineating this land type are determined on a site-specific basis. Generally, Additional Farmlands of Statewide Importance include those lands that are nearly Prime Farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods.
- Additional Farmland of Local Importance - Additional Farmlands of Local Importance may produce food, feed, fiber, forage and oilseed crops, even though these lands are not identified as having national or Statewide importance. Additional Farmlands of Local Importance may include tracts of land that have been designated for agriculture by local ordinance (NRCS-NSSH, 2004).
- Farm Woodland (Timber Stands) - Statewide, Farm Woodland includes tracts of land producing wood for logs, lumber, posts and firewood. Farm Woodland does not include land used to produce Christmas trees or land used for the processing or retail merchandising of woodland products.

3.2.5.2 Agricultural Soils

The NRCS also classifies soils according to their ability to support crops based on the Land Capability Classification System ("LCCS"). This system identifies, for each soil type, limitations for field crops, the risk of damage if certain soils are used for crops and the way certain soils respond to management (NRCS-NSSH, 2004).

- Soil Survey Mapping Units - Soil survey information results from the examination, classification and mapping of soil types within specified geographical areas. Soil survey information can be used to determine the agricultural suitability and potential of certain soils in addition to principal hazards and limitations when planning for specified uses. Each soil type is assigned a general map symbol.
- Land Capability Classification System - The LCCS groups soils are primarily based on their capability to produce common cultivated crops and pasture plants without deteriorating over a long period of time. Land capability classifications are subdivided into capability classes and subclasses on a State and national level.
- Capability subclasses are the second category in the LCCS. The subclasses have the following priority: e, w, s, and c, where the kinds of limitations are essentially equal. Subclasses are not assigned to soils or miscellaneous areas in capability classes I and VIII.

Muck Soils

According to the New York State Department of Agriculture and Markets, the State also contains distinct agricultural soils that are classified as "Muck Soils or Organic Soils." These soils have unique properties and are essential for certain agricultural crops. Muck Soils are not classified with the LCCS, but do have specific classification groupings that describe muck depth, drainage and flooding potential.

According to the 2006 New York Agricultural Land Classification (December 9, 2005), there are small pockets of muck soils within fields of mineral soils in the Study Area. The raising of truck crops, especially onions and lettuce, is the most important farm enterprise on the muck soils.

New York State Coastal Management Policy 26

The Study Area contains coastal lands subject to Coastal Management Program Policy 26, for actions in "agricultural lands" in the coastal zone, where state agencies approve, undertake, or fund the action. Individual sites will be evaluated for consistency with this policy where applicable.

3.3 HUMAN RESOURCES OF THE STUDY AREA

Human resources include: transportation; land use and zoning; community services; demography; visual resources; noise; historical and archeological resources; and, public health and safety. Following the description of the aspects of each resource, information is provided to characterize the resource as it occurs in the Study Area or each municipality, as appropriate. Land use types are used to further distinguish features of the resources.

3.3.1 Transportation

Transportation resources in the Study Area include roadways; bridges; bus services; rail services; ferry services; commercial and private airports; tunnels; canals and waterways; ports, marinas; and non-motorized modes of transportation such as pedestrian and bicycle facilities. Major roads and other transportation features are presented on Appendix F, Figure 1, Study Area Major Roads, Rails and Airports.

3.3.1.1 Transportation Infrastructure

Roadways

Roadways have different characteristics including number of lanes, lane width, types of lanes, shoulder width, wearing surface and grade. Roadways are further classified by the character of service they provide. Appendix F, Table 1- Roadway Classifications discusses roadway classifications.

Roadways accommodate private vehicles, truck lines, bus lines, taxi services and, in many cases, pedestrians and bicyclists; they allow exceptionally high accessibility to almost all potential destinations; hence they are used extensively by residents, workers and tourists. The Study Area contains hundreds of miles of state and county roadways. Examples include:

- NY State Routes 3, 3F, 5, 31B, 34, 34B, 38, 38A, 41, 41A, 89, 90, 96, 96A, 104, 104A, 176, 326, 370, and 414. (http://www.gribblenation.net/nyroutes/)
- County Routes - 1, 2A, 3B,4A, 4B, 5B,6A, 6B, 7A, 10A,10B, 10C, 12B, 12C, 13B, 13C, 14, 15A, 15B, 16, 17A, 17B, 18B, 19A, 19B, 19C, 22, 23, 24A, 24B, 26C, 26D, 26E, 31B, 32, 34, 34B, 35A, 35B, 37A, 37C, 38, 38A, 38B, 39A, 39B, 41A, 41B, 42A, 42B, 43A, 43B, 43C, 44A, 44B, 44C, 45A, 45B, 46, 54, 54A, 56, 58A, 58B, 60, 60A, 60B, 61A, 61B, 61C, 62A, 62B, 62C, 63A, 65A, 65B, 66A, 66B, 71A, 71B, 72, 72B, 74, 75, 76A, 76B, 81A, 81B, 83, 84, 86, 87A, 87B, 88, 89, 89E, 93, 94, 95, 96, 97, 98, 101, 102, 104, 104A, 105, 108, 114A, 114B, 124, 135, 135A, 139, 139A, 141A, 141B, 142, 142A, 142B, 144, 144A, 150, 150A, 151, 156, 156A, 156B, 157, 161, 164, 167, 168A, 168B, 266, 268, 326 (http://www.empirestateroads.com/cr/crcayuga.html)
- Scenic Highways and Trails - Seaway Trail (Route 104A)

Interstate 90 (I-90) and U.S. Routes 20 and 104 also traverse the Study Area.

Bus and Train Services

There are thousands of miles of railroad track in New York State; a portion of which passes through the Study Area. Track structures consist of sub-grade, ballast, ties, rail and rail

fastenings. There are also special provisions to handle intersecting, merging and diverging track. Rail tracks are used for light rail, rail rapid transit, intercity rail and intercity freight. The railway industry (e.g., private railroads) own and maintain their own rights-of-way, and terminals. Railroads are more suited to transport of large-volume or high-weighted, low-value commodities; they are also used for public transportation.

Bus and rail providers within the Study Area include Centro and CSX, Conrail and the Finger Lakes Railroad respectively.

Bridges

Bridges vary in span length, clearance height and have different weight restrictions. Bridge operation, maintenance and use are regulated by various State, local and federal agencies. Any integrated transportation network requires bridge structures to carry traffic over a variety of crossings (e.g., highways, rail lines, canals, water courses, ravines). Hence these bridge structures are used extensively by residents, workers, and tourists.

Under New York State law, a bridge must be at least 20 feet in length. Anything under that length is a culvert, no matter how it is constructed. As a consequence of state law, local communities are responsible for bridges of 20-25 feet in length.

Airports/Heliports

Examples of airports/heliports and seaplane ports located in the Study Area include:

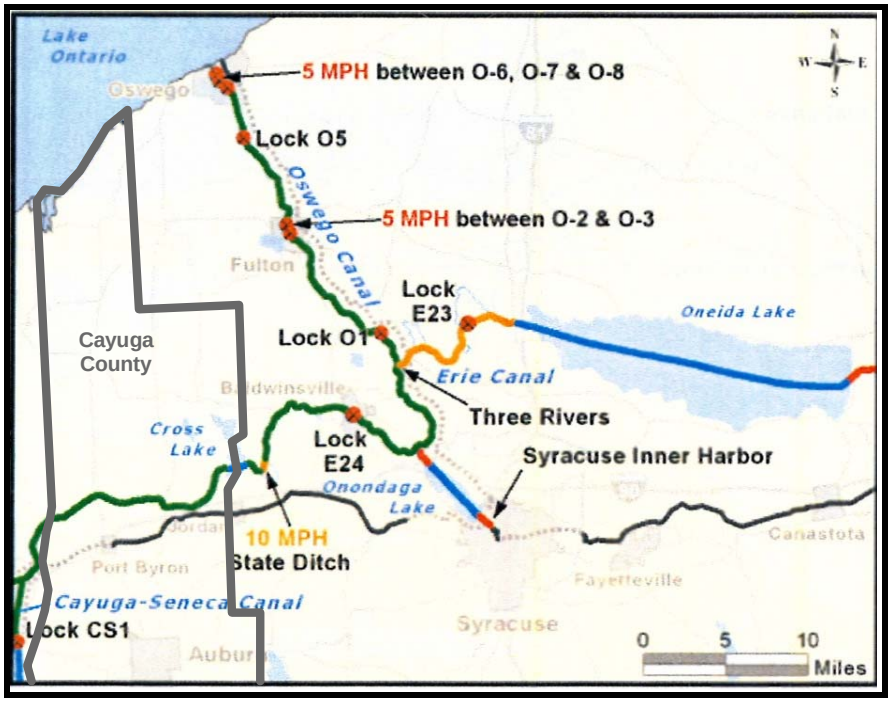
- Auburn Memorial Hospital Heliport, Auburn, NY
- Murphy Field Airport, Auburn, NY
- NYS Police Heliport, Auburn, NY
- Match Mate Airport, Aurora, NY
- Owasco Airport, Moravia, NY
- Maus Marineland Seaplane Base, New Hope, NY
- Killian Airfield Airport, Scipio
- St Bernard Field Airport, Union Springs, NY
- Whitford's Airport, Weedsport, NY
- Ovid Airport, Ovid, NY
- Skaneateles Aero Drome, Skaneateles, NY

Compared to fixed-wing aircraft, there are a small number of helicopters. Heliports are owned by public safety, security providers and private companies. Helicopters are commonly used for emergency services, corporate transportation and tourism.

Canals and Waterways

The Study Area contains part of the New York State Canal System, a 524-mile inland waterway that crosses 25 counties across New York, and connects with the Hudson River and Lake Ontario/St. Lawrence Seaway. The Cayuga-Seneca Canal connects the Erie Canal to Cayuga Lake and Seneca Lake. (*See* Figure 3.5 New York State Canal System below).

Figure 3.5 - New York State Canal System



These canals and waterways vary in depth and might have vertical clearance restrictions (i.e., maximum passage height for going under a bridge). Canals are administered by the New York State Canal Corporation, a subsidiary of the New York State Thruway Authority. .

Ports and Marinas

Public and privately-owned ports and marinas are located within the Study Area. Services offered vary and include boat launches, transient and overnight dockage, electricity, water and waste pump-out. These facilities are used by all types of boats, ferries and commercial ships transporting vehicles, pedestrians and cargo. Marinas are operated by the DEC, the OPRHP, the Canal Corporation, municipalities and private companies.

One example of a local port and marina community is Fair Haven/Sterling, located on the southern shore of Lake Ontario this area has changed from a shipping port to a resort community and features some of the best fishing, swimming, boating and camping in New York State.

Pedestrian and Bicycle Facilities

Pedestrian and bicycle facilities include bicycle lanes, paths and trails, cross walks, sidewalks, pedestrian bridges and medians. Pedestrian and bicycle facilities provide efficient means of transportation and represent a viable commuting alternative. These types of facilities are typically owned by the National Parks Service, DEC, OPRHP, municipalities and private companies.

The following hiking and biking/riding trails are located in the Study Area: Auburn-Fleming Trail; Cato Fair Haven Trail; Cayuga County Erie Canal Recreational Trail; Cayuga Lake Scenic Byway; Hojack Trail, Erie Canalway Trail, Great Lakes Seaway Trail, Finger Lakes Trail (Interloken segment), and NY Route 5.

3.3.1.2 Transportation Wireless Communication

Wireless communications systems are utilized throughout the various transportation systems. They are used by maintenance, system management and emergency service providers. State, local and federal transportation agencies typically have wireless communications systems which provide for instantaneous communication. Their use ensures the efficient and effective response for transportation, maintenance, traffic control systems and emergency response.

Bus lines and taxis use wireless communications for scheduled maintenance, repairs, routing and emergencies. Light rail and rail rapid transit also depend on wireless for similar communication as well as varying degrees of contained system operation. Marine transportation is exclusively wireless for information on water conditions, weather, direction, etc. Fleet management and coordination for truck lines and commercial aircraft is often accomplished through wireless communications. Public safety and public service vehicles require wireless communications to facilitate adequate response times and to coordinate efforts with their units. Privately-owned vehicles use wireless phones to communicate with other phones where service infrastructure exists.

3.3.1.3 Transportation Patterns

Transportation patterns vary by area as follows:

Metropolitan Areas – These have the greatest number and diversity of transportation resources of all the land uses. Along with roads and highways, there can be bus lines, taxi service, intercity rail, marine service, airports and pedestrian/bicycle facilities. The greater diversity and number

of resources enables the city and surrounding urban area to function more efficiently and reduce travel delay.

Towns and Villages – These areas have a smaller population, and proportionally, have somewhat reduced available transportation systems. There are roads and highways present, but generally fewer options for public transportation. In most areas there will be limited bus systems that may complete only daily and weekly routes. Taxis are reduced in number to that which can be profitable for a limited number of companies servicing the smaller population. Airports located in these areas are usually municipal or private, and accommodate smaller aircraft, in contrast to metropolitan airports.

Rural Areas – In most rural areas, the only types of transportation resources generally available are roadways. In these areas, personal vehicles are the primary transportation resource. There are occasional specialty bus services operating on a weekly or on- demand basis and taxi service is typically limited if not non-existent.

Recreation, Open Space and Park Land Areas – These areas generally do not have any transportation infrastructure that is not otherwise accounted for in the surrounding city, town or village. Accordingly, no extensive discussion of the transportation infrastructure is necessary for this land use type.

Coastal Areas – Coastal areas generally have highways and local roads that provide access to the coastline. Coastal areas are responsible for all of New York State's commercial shipping: this includes the Great Lakes and St. Lawrence Seaway. Marina services may include commercial (barges), recreational travel (tour services) and commuting ferries (water taxis).

3.3.2 Land Use and Zoning

Existing Land Use

Existing land use is reflected in the National Land Cover Data 1992, provided by the DOI and the USGS. It is based on satellite information as well as topographical data, census, agricultural statistics, soil characteristics, other land cover maps and wetlands data to determine and label the land cover types at a 30-meter resolution. Twenty-one classes of land cover have been reduced to eight generalized land use types for this DGEIS. These classes consist of water, residential development, commercial/industrial development, barren (e.g., bare rock, sand, clay, quarries, mines, pits), natural forested upland, shrubland/herbaceous upland, agriculture (e.g., crops, grains, pasture, vineyards, orchards, fallow) and wetland.

A Study Area generalized land use map is provided as Appendix G, Figure 2- Study Area Generalized Land Use. Concentrated areas of residential development within the Study Area

include the City of Auburn which is surrounded by the towns of Sennet, Throop, Owasco, Fleming and Aurelius. The Study Area has significant acreage dedicated to agricultural uses. Natural forested upland covers a large portion of the land in the southeast and northern portion of the Study Area. No barren land has been identified in the Study Area.

Land Use Planning

Land use planning in the Study Area can take place at the municipal, regional and/or State level. Zoning codes have been enacted by many of the municipalities in the Study Area. In some instances, municipalities create inter-municipal agreements to address regional planning issues. Such inter-municipal agreements address resources that cross municipal boundaries. Other regional planning initiatives are promoted by the State, with voluntary local participation.

Some planning is initiated at the federal level and implemented at the State and local level. State agencies are required to comply with the New York State Coastal Management Program, which is the State's implementation of the Federal Coastal Zone Management Plan. Established program areas extend over Lake Ontario in the Study Area and major inland waterways, including the Canal System. Furthermore, the Coastal Management Program is implemented through locally adopted and State approved LWRPs. According to NYSDOS Coastal Resources online (http:/ www.nyswaterfronts.com), there are no LWRPs developed for communities in the Study Area. The DOS Division of Coastal Resources provides resources supporting the creation of various regional initiatives such as the Great Lakes Coastal Watershed Restoration Program. Land that is in the public domain, such as State-owned and federally-owned lands, are not subject to municipal planning.

Cayuga County has a watershed committee that provides guidance and monitoring of issues related to the Cayuga Lake Watershed.

Coastal Area (General Category)

The DOS has developed a series of 44 policies as part of its Coastal Management Program. State agencies must comply with these policies when approving, funding, or undertaking an action. Such policies apply to subject areas including Development Policies, Environmental Protection Policies, Recreation Policies, Public Access Policies and Natural Resource Policies. “The Explanation of Policy” for each of the 44 policies expands on the applicability and application of each policy.

The Study Area falls within the Central Great Lakes Region for DOS Division of Coastal Resources. This coastal area follows the coast of Lake Ontario and has a landward costal

boundary. The coastal area is delineated on Appendix J, Figure 1 – Study Area Scenic and Recreation Areas.

The DOS has identified the following Significant Coastal Fish and Wildlife Habitats in the Study Area:

- Lake Shore Marshes
- Sterling Creek and Wetlands

3.3.3 Community Services & Public Utilities

Community services are provided by the State and local municipal governments. They are provided for the entire community or parts thereof. Services may be broken down into two specific categories: those solely population dependent and those that are population and communication dependent. There may be some overlap between these two categories. Locations of community services such as colleges, EMS, fire stations and hospitals are depicted on Appendix H, Figure 1, Study Area Community Resources.

<u>Population Dependent Services</u>

Population dependent services are those services which are dependent on the size of the population being served. These include:

- Highway Maintenance - The common practice in New York State is for a municipality to operate a public works or highway department to manage resources for transportation, construction and maintenance. Construction activities may include road building, bridge construction and supporting construction (e.g., signage, comfort areas, signaling). Maintenance activities include repair, weather-related activities (e.g., snow removal, salting/sanding, vegetation controls) and repairs required due to accidents. The resources required by the municipalities are proportionate to the miles of road under their jurisdiction. As an example, the amount and degree of annual road repair is dependant upon daily use and available funding, including state aid. A road in a higher traffic area will require more frequent maintenance.
- Utilities - Various utilities, including electricity, natural gas, telecommunications services(wireless, land-line and fiber optic (for phone, fax and dial-up internet), a high-speed digital modem technology (digital subscriber line ("DSL"), and cable internet access), water and sewer authorities, and others are provided by various companies and organizations in the Study Area. Examples include: New York State Electric and Gas (natural gas, electric and/or steam);Road Runner, Verizon and Finger Lakes Technologies Group (telecommunications); Cayuga County Water and Sewer Authority, Onondaga

County Water Authority, Seneca County Sewer District No. 1 and No. 2, (water and/or sewer services).

- Solid Waste - Solid waste services are provided by municipalities (e.g., through public works funded by municipal taxes), private hauling and disposal companies (e.g., refuse haulers, transfer stations and landfills) or some combination of the two. Refuse disposal includes source separation activities at the point of generation, separation at transfer stations and refuse sorting and segregation at resource recovery facilities. Special facilities exist for industrial solid and hazardous waste, land clearing waste, demolition debris, household hazardous waste, asbestos and sewage. Examples of landfills and transfer stations in the Study Area include: Auburn Landfill No. 2, Owasco Recycling Center, Fleming Transfer Station, Ira Transfer Station, and Auburn Transfer Station.

- Education - The University of the State of New York is the most complete, interconnected system of educational services in the United States and includes more than 7,000 public and private elementary and secondary schools, 251 proprietary (for-profit) schools and 248 public and private colleges and universities (New York State Education Department). Colleges and universities in the Study Area include Cayuga Community College and Wells College.

  Public and private schools providing education for students in grades K through 12 are dependent on the local population to sustain the student body as well as to assist in providing faculty and staff. There are numerous public and private schools located within the Study Area, including: Auburn City School District (Casey Park Elementary, Genesee Elementary, Herman Avenue Elementary, Owasco Elementary, William h. Seward Elementary, East Middle School, West Middle School, Auburn High School), Cato-Meridian Central School District, Moravia Central School District, Peach Town Elementary School, Romulus Central School, South Seneca Central School District, and Southern Cayuga Central School. Additionally, there are technical/vocational school(s) (BOCES) and a number of parochial/nondenominational schools located in the Study Area.

- Recreation Facilities - Recreation facilities include parks, playgrounds, beaches, private gyms, publicly accessible stadiums, track and field facilities, downhill ski slopes and resorts and cross-country ski trails.

  Examples of recreational properties located in the Study Area include: Bahar Nature Preserve, Bear Swamp State Forest, Casey Park Sports Complex/Recreation Center, Cato-Fair Haven Trail, Cato-Meridian Recreation Center, Cayuga County Erie Canal

Recreation Trail, Cayuga Lake Scenic Byway, Cayuga Marina and Campground, Champions for Life Indoor Tennis & Sports, Cranebrook Golf Club, Cross Lake Campground and Marina, Dean's Cove Boat Launch, Disc Golf, Dorothy Mcllroy Bird Sanctuary, Dutch Hollow Country Club, Emerson Park, Fair Haven Bandstand Park, Fair Haven Beach State Park, Fillmore Glen State Park, Finger Lakes Scenic Railway, Frontenac Park, Frozen Ocean State Forest, Hojack Trail, Hoopes Park, Howlands Island Wildlife Management Area, Long Point State Park, Northern Montezuma Wetlands State Wildlife Management Area, Owasco Flats, Phillups Park, Riverforest Park, Marina and Campground, Sampson State Park, Seaway Trail, Sterling Lake Shore Park and Nature Center, and Veteran's Memorial Park. *See* Appendix J, Figure 1, Study Area Scenic and Recreation Areas for park locations.

Population and Communication Dependent Services

Emergency Services (911 dispatch, law enforcement, fire, EMS and state military forces) are population-dependent and communication-dependent, and are expected to respond to emergency calls. Health care services are also population-dependent and communication-dependent.

The following services are provided within the Study Area:

- 911 Dispatch - Emergency services are largely dependent on land-line and wireless 911 capabilities. Wireless 911 capabilities are called “Enhanced 911” or “E911.” E911 capabilities currently exist in three phases Statewide. Phase 0 has wireless calls sent to the PSAP by the wireless provider. Phase I requires wireless carriers to provide the local PSAP the telephone number of the wireless 911 caller and the location of the antenna receiving the call. Phase II requires wireless carriers to provide the location of the wireless 911 caller within 50 to 100 meters. PSAPs that currently do not have E911 capabilities are unable to locate wireless 911 callers unless the caller gives a location to the dispatcher.

  Emergency call response is affected by both population and communication. The larger the population, the more E911 calls a PSAP must answer. PSAPs are under the jurisdiction of municipalities as small as a village and as large as the State Police. Not all of these systems throughout the State are integrated. Certain areas of the Study Area, including Cayuga County have land-line and wireless E911 capabilities.

- Fire - Fire prevention and control within the Study Area is conducted by various firefighting entities including fire houses, fire departments and fire companies. Firefighting entities are grouped together into fire districts with each county having multiple districts (Association of Fire Districts of the State of New York, 1997-2000).

Fire districts are created by local town boards. The number of firefighting entities and the size of the firefighting staff are based upon the number and type of structures that have historically existed within a given area and what is being built. Fire fighters in the Study Area are predominantly volunteers, with the exception of certain communities, such as the Auburn Fire Department, which is staffed 24/7.

Hazardous materials emergency response falls under the jurisdiction of local firefighting entities. The DOS Office of Fire Prevention and Control offers educational classes to fire fighters about hazardous materials. The State Emergency Response Commission is responsible for the implementation of programs for enhanced response to hazardous materials emergencies (Department of State, 2003).

Emergency Medical Service - EMS is the domain of the DOH and regional EMS councils. EMS may be public, private or a combination of the two.

Law enforcement in the Study Area falls under the jurisdiction of State, County, and local agencies and, when authorized by the Governor, the Army National Guard. Local police services are provided by the New York State Police, various County Sheriff's Offices and at the city or village level. The Sheriff is the chief law enforcement officer in the counties included in the Study area. In Cayuga County, the Sheriff is also responsible for the Cayuga County correctional facility, as well as areas not covered by other police. The Study Area is also covered by New York State Police Troops D and E, with stations in a number of locations throughout the Study Area, including Auburn, Moravia, Homer, and Romulus. Various municipalities within the Study Area also have their own local police force.

Federal agencies also provide law enforcement services. These agencies include, but are not limited to, the U.S. Department of Homeland Security which administers the U.S. Border Patrol, the Coast Guard, National Security Association, the Central Intelligence Agency, the Federal Bureau of Investigation ("FBI"), the U.S. Marshals Service, the Drug Enforcement Administration ("DEA") and the Bureau of Alcohol, Tobacco, Firearms and Explosives ("ATF"). The U.S. Marshals Service, DEA and ATF are administered by the Department of Justice. The FBI, DEA and ATF have field divisions located throughout the State.

The U.S. Coast Guard patrols the international waters, ports and coast of the United States. The Study Area is located within the 9th Coast Guard district. Area offices for the FBI, DEA and ATF in the Study Area are located in Syracuse (Department of Justice, 2004, 2004b).

Four separate forces comprise the New York State Military Forces: New York Guard, New York Army National Guard, New York Air National Guard and New York Naval Militia. The 222nd

Military Police Battalion of the New York Army National Guard is headquartered in Auburn, New York.

Health care services are provided through hospitals, private practices and clinics. Health care is population dependent for patients, health care providers (e.g., technicians, nurses, doctors, occupational therapists and physical therapists) and staff (e.g., receptionists, janitors, maintenance, etc.). Health care services are provided on a routine or emergency basis. People who have inadequate health care are sometimes forced to use the emergency room for otherwise routine medical care. Health care services, specifically emergency rooms, are population and communication dependent for situations ranging from everyday emergencies to a terrorist bombing. Emergency rooms must be able to communicate with other hospitals, ambulance crews, police and 911 dispatch. One of the larger health centers in the Study Area is Auburn Memorial Hospital in Auburn. Smaller health care facilities are located throughout the Study Area. See Appendix H, Figure 1, Study Area Community Resources.

3.3.4 Demography & Environmental Justice

3.3.4.1 Demography

Demography is the study of changes in the number of births, marriages, deaths and other population parameters in a particular area. The demographics of an area are the number and characteristics of the people who live in an area. It includes their age, sex, race, marital and socio-economic status. The most recent demographic data compiled for New York State comes from the decennial U.S. Census Bureau, Census 2000 database.

Demographic data is used for statistical studies and analysis to delineate major and minor metropolitan areas, city, urban, suburban and rural areas. It can be used to forecast population trends, distribution and growth. Demographic data is also used to describe socio-economic conditions in a geographic zone. Housing, income, income relative to the poverty level, and other social and economic parameters are all used for such a description.

Population Distribution (Density) - Population distributions, more commonly referred to as population density, is the total population within a geographic entity (e.g., county) divided by the land area of that entity. Density is expressed as "people per square mile." Appendix I, Figure 1 presents Study Area Population Densities.

In the Study Area, the population density of the metropolitan area is significantly higher than surrounding areas. Based on information recorded by the US Census April 2000 data, the 2009 population estimate for the counties contained in the Study Area are as follows:

Cayuga County: 79,526.

Onondaga County: 454,753

Seneca County: 34,049

Table 3.5 - Study Area Population by Race
(based on percentages):

County	White	Black	Hispanic	Native American	Two or More Races	Other
Cayuga	93.6	4.2	2.4	0.4	0	0.5
Onondaga	83.7	9.4	2.4	1.5	2	0.9
Seneca	92.3	5.1	3.1	0.4	1.2	1.0

Additionally, the breakdown of population by race is contained in Table 3.5. These percentages alone do not necessarily indicate the presence of EJ areas.

Appendix I, Table 1, Study Area Population Changes, provides a summary of percent population changes within each town, city and village within the Study Area from 1990 to 2000 (Census Population and Housing). Median household incomes within the Study Area, by county, are: Cayuga County: $47,308; Onondaga County: $50,640; Seneca County: $46,364. The US Census is currently being conducted for 2010; however, the results are not currently available.

The US Census also reports the following geographic data: in 2000, the population per square mile in the various counties that make up the Study Area was: Cayuga County: 118.3; Onondaga County: 583; Seneca County: 102.6.

3.3.4.2 Environmental Justice

Environmental justice ("EJ") is defined as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies."

On March 19, 2003, the DEC established an EJ policy by issuing CP-29 *Environmental Justice and Permitting*. The policy states: "[I]t is the general policy of DEC to promote environmental justice and incorporate measures for achieving environmental justice into its programs, policies,

regulations, legislative proposals and activities. This policy is specifically intended to ensure that DEC's environmental permit process promotes environmental justice. Any application for a permit received after the effective date of this policy will be subject to the provisions of this policy."

The primary objective of the EJ program is to assess whether low-income or minority communities will bear a disproportionate burden from industrial, municipal and commercial operations. The principal procedures of the EJ program are to solicit community input through a comprehensive public participation program, identify the issues of concern and develop, with the affected communities, ways to mitigate negative impacts. Factors relevant to EJ assessments generally fall into four sets of indicators: environmental, health, social and economic. Technically, the EJ policy applies to major projects and major modifications as reflected in environmental quality permits authorized by the ECL.

The DEC EJ program uses the Census 2000 database for the computation of pertinent demographic data. The data includes minority and poverty percentage threshold values, and in certain circumstances requires a public participation program. For example, a low-income community is a census block group or contiguous area with several census block groups, with a low-income population equal to or greater than 23.59% of the total population of that area. Depending on the type of project, the community of concern could be something as small as a neighborhood block or as large as a major metropolitan area. The intent of the EJ program is to respond to community concerns on a project-by-project basis and, given the nature of the project, to identify those communities where EJ concerns may arise.

The State program does not identify EJ communities or areas. Nonetheless, the program defines the locations where the minority population or the income criteria may be met. These areas are considered potential EJ communities and can be used as a guide when considering the applicability of the EJ program. The EJ program provides a methodology for identifying potential COC, evaluating whether they meet the criteria as a minority low-income community and assessing whether their environmental burden is disproportionately high and adverse. Some of the information an EJ analysis considers are:

- Boundaries of the COC, and rationale for its selection.
- Identification of the statistical reference area used.
- Results of the following factors: minority, low-income and environmental burden.
- Any additional factors that were considered and conclusion of the analysis, incorporating all three factors.

Appendix I, Study Area Potential Environmental Justice Areas identifies locations in the Study Area where potential EJ areas may exist. These and other areas would have to be more critically screened before a final determination could be made.

3.3.5 Visual Resources

Land is of a distinctive visual or aesthetic character when it possesses important scenic qualities or materially contributes to scenic values. Such areas exhibit outstanding or unique arrangements of natural or man-made features including water features, land forms or vegetative patterns that provide inspiration, hold interest and command the attention of the viewing public (N.Y. State Open Space Conservation Plan, 2002).

Some aesthetic resources are of Statewide significance. Those that may be present in the Study Area include properties eligible for inclusion in the National or State registers of historic places; State parks; urban cultural parks; state forest preserves; national wildlife refuges; national natural landmarks; national park system recreational areas, seashores and forest; rivers designated as national or State Wild, Scenic or Recreational; a site, area, lake, reservoir or highway designated or eligible for designation as scenic; scenic areas of statewide significance; State or federally designated or proposed trails; State nature and historic preserve areas; and Bond Act properties purchased as properties of exceptional scenic beauty or open space. Selected scenic and recreation resources are presented on Appendix J, Figure 1- Study Area Scenic and Recreation Areas.

Local governments may designate visual characteristics that are important to their areas. These may include local parks and recreational areas, water bodies, agriculture fields, mountain vistas, scenic byways and gateways. Man-made features may similarly be of aesthetic value to communities, may define the community's character or become immediately associated with a particular community. Skyscrapers, buildings of distinctive architecture and skyline views are examples of man-made structures that may possess important aesthetic characteristics.

Two perspectives are relevant to the consideration of visual resources. The first is the view *of* a given location. The second is the view *from* the scenic resource. Either view, and in some cases both views, may represent visually important resources.

The importance of scenic resources may be affected by their accessibility. A resource may be more valuable if it is readily available and viewed by many people. While still of value, viewsheds that are not accessible by conventional means or are accessible to only a few people may be less important than a scenic vista seen by many people. Relevant viewer groups (receptors) may be local residents, travelers or tourists who may view the resource from their homes, their cars or while engaged in recreational activities.

Local Residents – Local residents generally view the landscape from their yards, homes and local roads. Except when involved in local travel, these viewers are likely to be stationary, and some could have frequent or prolonged views of certain landscape features. Local residents may view the landscape from ground level or elevations. Residents' sensitivity to visual quality is variable, and may be tempered by the aesthetic character/setting of their neighborhoods. For example, residents with a view of existing industrial or transportation-related facilities may be less sensitive to landscape changes than those with a view of undisturbed meadowland. Renters are included in the "local residents" group, although they may be less sensitive to visual quality than homeowners or others with a more long-term investment in the neighborhood. It is assumed, however, that local residents are most familiar with the local landscape and may be very sensitive to changes in particular views that are important to them.

Business Employees – Business employees work primarily in commercial, industrial and institutional landscape settings. Except while traveling to and from their places of employment, business employees may experience limited views of the surrounding landscape. During the workday, business employees are typically focused on their job responsibilities, many of which occur inside buildings. Individuals who work outside could have high or low sensitivity to changes in visual quality, depending on their job responsibilities and workplace setting.

Through Travelers/Commuters – Through-travelers and commuters view the landscape from trains or automobiles on their way to work or other destinations. Most views will be from street level, although travelers on bridges and overpasses are afforded elevated views of the surrounding area. Commuters and through travelers are typically moving, have a relatively narrow visual field, and for the most part are preoccupied with traffic and the roadway. Their views of specific features in the landscape will be relatively brief. Being destination-oriented, their sensitivity to visual quality and changes in the visual environment is also likely to be relatively low. Passengers in moving vehicles will have greater opportunities for prolonged off-road views toward landscape features than will drivers, and accordingly, may have higher sensitivity to visual quality and changes in the visual environment than drivers.

Recreational Users – Recreational users include local residents involved in outdoor recreational activities at parks, playgrounds, recreational facilities and in undeveloped natural settings such as forests, fields and water bodies. This group includes those involved in competitive sports, snowmobilers, bicyclists, hikers, joggers, recreational boaters, hunters, fishermen and those involved in more passive recreational activities (e.g., picnicking or walking). Visual quality may or may not be an important part of the recreational experience for these viewers. Certain recreational users will have continuous views of landscape features over relatively long periods of time. Passive recreational activities generally do not require as much concentration as more

active recreational activities. Those engaged in passive activities have the opportunity to concentrate on views and observe the surrounding area for a prolonged period of time. Most recreational viewers will only view the surrounding landscape from ground-level vantage points.

Tourists – Tourists travel to certain areas specifically to enjoy cultural, recreational and scenic resources. Tourists may view landscape features on their way to a destination or from the destination itself. Their sensitivity to visual quality and landscape character will be variable (depending on their reason for visiting an area), although this group is generally considered to have relatively high sensitivity to aesthetic quality. In many areas tourists will expect to see a variety of man-made features in the landscape.

A number of state parks, forests and unique areas are located in the Study Area, including: Dean's Cove Boat Launch, Fillmore Glen State Park, Long Point State Park, Fair Haven Beach State Park, Frozen Ocean State Forest, Bear Swamp State Forest, Hewitt State Forest, Sampson State Park, and Summer Hill State Forest. Cayuga Lake Wildlife Management Area, Cross Lake Islands Wildlife Management Area, Willard Wildlife Management Area, and Montezuma National Wildlife Refuges are also located within the Study Area.

A number of historic districts are located in the Study Area, including: Aurora Village/Wells College Historic District, Seneca River Crossing Canals Historic District, South Street Area Historic District and the North Main Street Historic District.

Scenic Areas

Examples of scenic areas within the Study Area include**:**

Finger Lakes – An area with a rolling landscape formed by the glacial drumlins runs north to south along the northern border of the Finger Lakes Region west of Syracuse. The land is relatively rural, dominated by active and abandoned farmland, wooded and wetland areas. The Montezuma National Wildlife Refuge is a major flat wetland in the area of the Cayuga Seneca Canal crossing between Weedsport and Seneca Falls. This landscape continues west past the City of Rochester. The former Erie Canal is present on and adjacent to the area and historically significant locks and canal sections may be observed from different locations.

The Great Lakes Seaway Trail: the Great Lakes Seaway Trail parallels 518 miles of shoreline along the St. Lawrence River, Lake Ontario, Niagara River and Lake Erie in New York and Pennsylvania, including the Study Area (*See* Figure 3.6, Scenic Trails of the Study Area). The Great Lakes Seaway Trail is a National Recreation Trail which connects historic villages and vibrant cities with scenic landscapes and diverse destinations. It is considered one of "America's

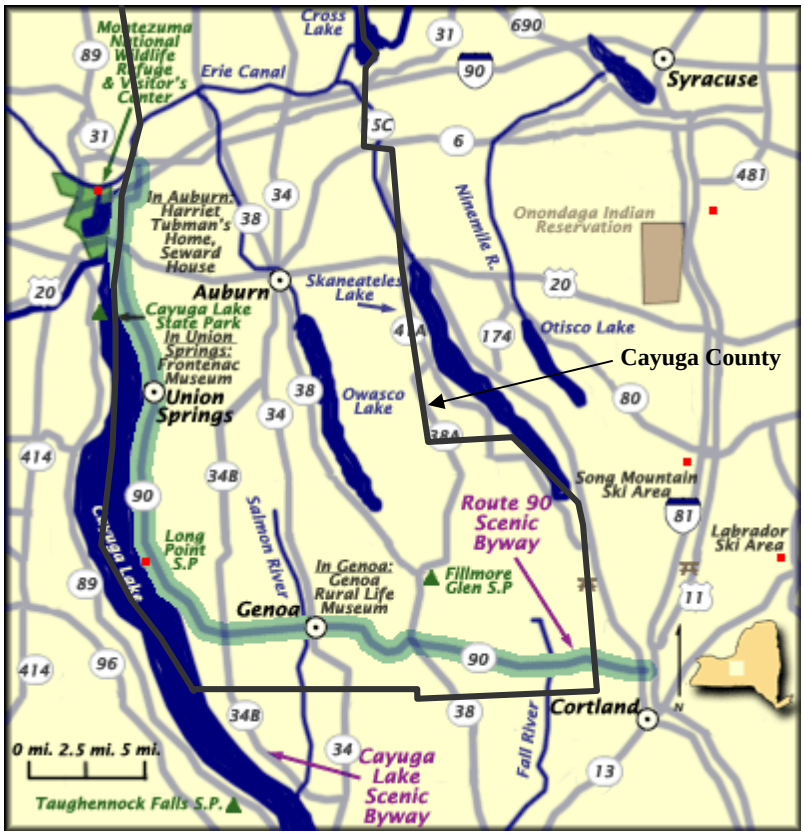
Byways" by the U.S. Department of Transportation, which means that it possesses "outstanding qualities that exemplify the regional characteristics of our nation."

Erie Canalway National Heritage Corridor: The U.S. Congress recognized the Erie Canal's significance by establishing the Erie Canalway National Heritage Corridor in 2000. The Corridor stretches 524 miles across the full expanse of upstate New York. It encompasses the navigable waterways that make up the New York State Canal System, including the Erie, Cayuga-Seneca, Oswego and Champlain Canals, as well as their historic alignments, and the 234 cities, towns, and villages that touch the canal system. The Canalway is maintained through a cooperative effort by New York State and area residents, businesses, organizations, and municipalities.

Route 90 Scenic Byway: This byway travels through the historic farm country of the Finger Lakes region before running through the small towns on the shores of Cayuga Lake. Features along the byway include museum exhibits, shop-lined main streets, restored hotels, and an old railway. Additionally, the byway provides access to a number of historic homes, including the final home of Harriet Tubman. Several state parks provide both camping and recreation opportunities nearby on Cayuga Lake.

Cayuga Lake Scenic Byway: a byway that follows the shores of Cayuga Lake, passing by numerous wineries, local restaurants and businesses. Other recreational facilities near the byway include state parks, gorges and falls, museums, birdwatching opportunities, and others.

Figure 3.6 - Scenic Trails of the Study Area



3.3.6 Noise

Unwanted sounds are often considered and referred to as noise. Human response to noise is affected by several factors including loudness, duration, quality (tonal purity) time of day and year, background or "residual" noise present, distance to the source, familiarity with the noise and other factors such as the location or setting.

The "loudness" of noise is measured based on the energy of the sound wave that produces the noise. The unit of sound measurement is the decibel (dB).

Many activities produce noises we are accustomed to, but our acceptance or perception of the noise changes in different situations. For example, normal conversation is about 55 to 60 dB, and can barely be heard at 100 feet. A loud conversation at 50 feet may be 70 bB, and, at 2:00A.M., when background noise is very low and our sleep is disturbed, it may not be welcome. The average car passing by on a local street typically produces about 55 dB at the sidewalk, and does not intrude on normal conversation. A loud sports car passing by our front yard producing 75 to 80 dB may be intrusive and less acceptable. A lawn mower may produce 85 dB at the source, making it difficult to carry on a conversation over the noise, but when heard from the next yard, may be perceived at as about 70 dB. Nonetheless, most suburban dwellers are

accustomed to lawnmowers and accept the noise that accompanies them. Urban freeway traffic at rush hour may approach 80 dB in an adjacent apartment; however, urban dwellers may accept the necessity of vehicle noise in their circumstances. Jet aircraft takeoff produces about 95 dB. This noise is transient but very loud, and is often considered uncomfortable.

Noise decreases with distance. The decrease in sound levels from any single noise source normally follows the "inverse square law". That is, the sound pressure level ("SPL") changes in inverse proportion to the square of the distance from the sound source. At distances greater than 50 feet from a sound source, every doubling of the distance produces a 6 dB reduction in the sound. A sound level of 70 dB at 50 feet, for example, would have a sound level of approximately 64 dB at 100 feet. At 200 feet the sound from the same source would be perceived at a level of approximately 58 dB, about the same volume as a normal conversation at that location.

Sound levels can also be dissipated by physical obstructions. Trees or berms, and barriers such as the walls and closed windows of a home interfere with the movement of sound waves through the air and absorb some of the sound wave's energy. As a result, we hear a reduced noise level. An open window, more frequent occurrence or longer duration of a noise, or the novelty of an unaccustomed noise, change our perception of the same noise level.

Setting also affects perception. A wilderness area may have a daytime background noise level as low as 20 dB, compared to 40 dB for quiet suburban residential areas and vacation resort areas, or 80 dB in busy urban settings. Snowmobiles and personal watercraft that might be used in otherwise quiet recreational settings can produce noise that varies from 70 dB to nearly 90 dB measured at 50 feet, according to EPA, Coast Guard and industry sources. In many cases, it is the setting and conflicting uses that most affect our perception of noise and our reaction to it. Engine driven generators found in recreational vehicles typically produce up to 60 dB, yet those relying on them accept that noise level.

Construction noise is typically short term but can be loud. Typical sources include engine and operating noise from trucks, cranes, bulldozers, stationary engines and pumps, compressors and engine driven generators and even drilling and blasting. Industrial and commercial land uses are typically accompanied by the noise of installed equipment such as production machinery and building cooling fans, electrical equipment, and stationary and vehicle (backup) alarms. Other typical urban noise sources include trains, buses, heavy and light duty trucks, automobiles and motorcycles.

Sound can be described in terms of four characteristics:

- Sound Pressure Level (SPL) (also designated by the symbol L_p or perceived loudness), is expressed in decibels (dB) or A-weighted decibel scale dB(A) (or dBA) which is weighted towards those portions of the sound frequency spectrum, between 20 and 20,000 Hertz, to which the human ear is most sensitive. Both are measures of sound pressure in the atmosphere.
- Frequency (or "pitch"), is the rate at which a sound source vibrates or makes the air vibrate.
- Duration is the temporal nature of sound (persistent vs. intermittent). Recurring fluctuation in sound pressure or tone at an interval, or sharp or startling noise at recurring interval may be more objectionable than persistent sounds, for example, a dog barking.
- Tone has to do with frequency. Pure tones consist of a single frequency and are relatively rare in nature. Man-made pure tones are not uncommon. When they occur, they can be annoying. An example is the 60-cycle hum often associated with electrical equipment.

Another term, related to the average of sound energy over time, is the Equivalent Sound Level or L_{eq}. The L_{eq} integrates fluctuating sound levels over a period of time to express them as a steady state sound level. As an example, if two sounds are measured and one sound has twice the energy but lasts half as long, the two sounds would be characterized as having the same equivalent sound level. L_{eq} expresses sound as a function of its frequency of occurrence and time. By its derivation, L_{eq} does not express the maximum nor minimum SPLs that may occur in a given time period. It is generally shown as a parenthetic $L_{eq}(8)$ would indicate that the sound had been measured for a period of eight hours. Equivalent Sound Level correlates well and can be combined with other types of noise analyses such as Composite Noise Rating, Community Noise Equivalent Level and day-night noise levels.

Noise occurring at night generally produces greater annoyance then the same sound occurring during the day. People perceive intrusive noise at night as being 10 dBA louder than the same level of intrusive noise during the day. This perception is largely because background environmental sound levels at night in most areas are also about 10 dBA lower than those during the day. This increased sensitivity to sound at night has been incorporated into the day-night average sound level, which is symbolized as the L_{dn}. The day-night average sound is the twenty-four-hour equivalent sound level that includes a 10 dBA "penalty" added to noise occurring between 10:00 p.m. and 7:00 a.m. to account for increased sensitivity to nighttime noise. To help

place day-night average sound level into perspective, Appendix K, Table 1- Land Use Types and Typical Noise Levels contains a scale showing L_{dn} values for various types of outdoor locations. These noise levels are shown in an approximation to common land use types.

Measurement of ambient noise and assessment of potential impacts is related to the environment in which it occurs. As Appendix K, Table 1- Land Use Types and Typical Noise Levels demonstrates, noise levels are expected to be much higher in metropolitan areas than in town, village or rural areas. Construction noises will be transient in all locations and likely of similar loudness, but construction activity is much more common in major metropolitan areas than most other areas.

Mechanical noise, such as that of honking horns and internal combustion engines in vehicles, is common in major and minor metro areas. Such engine noise is also common, but often overlooked, in rural areas, where farm vehicles may employ similar engines and electrical or mechanical power may be produced by similar engines.

Open Space, recreational and park land areas and coastal areas are not specifically identified above, since these can occur in all settings (e.g., from urban parks and coastal areas to the rural and park wilderness areas and coastlines).

3.3.7 Historical and Archeological Resources

Areas of historic, architectural, archeological and cultural importance are considered valuable because of the link they provide to our past. The various historical and archaeological resources present in the Study Area are presented on Appendix L, Figure 1, Study Area Archaeologically Sensitive and Historic Places, and Appendix L, Figure 2, Study Area Historical Places and Districts.

3.3.7.1 Historical Resources

The State and National registers of historic places is the official list of buildings, structures, districts, objects and sites significant in the history, architecture, archaeology and culture of the State and the nation. The same eligibility criteria are used for both the State and National registers. Properties are nominated to the National Register by the SHPO and, by the Federal Historic Preservation Officer for properties under Federal ownership or control, or by the THPO if the property is on tribal lands.

Properties can be nominated based on relevance to American history; architectural history; architecture; prehistoric and historic archeology; and other related disciplines. The National Register is administered at the federal level by the National Park Service which is part of the DOI.

Historical resources that are not listed or eligible for listing may nonetheless be considered historic in the local context. Examples include:

- Historic Places Eligible for Listing – Many resources are eligible to be listed, but have not yet been identified, or may have requests for determinations submitted or pending.
- Historic Buildings – Most historic resources are buildings such as post offices, schools, town or city halls, churches, mills or factories, mansions, hospitals and libraries.
- Building Ruins and Foundations – Some buildings may no longer be intact as a result of fire, demolition, or natural disaster, but nonetheless remain historic sites.
- Natural or Manmade Landscape Features – Some landscape features such as the Adirondack and Catskill Forest Preserves are historic resources, as well as land formations such as Petrified Sea Gardens and Natural Stone Bridge, and historic mines or quarries.
- Cemeteries or Burial Grounds – Many cemeteries and Native American burial grounds have special significance, or represent important periods in the history of a town or settlement.
- Transportation-Related Facilities – Many historic sites were designed for transportation, including canals, railroads, aqueducts, train stations and lighthouses.
- Sites of Historic Events – Locations of important events may not have structures or ruins but the location remains important by virtue of what occurred there, and artifacts may remain. Battlefields are an example.

The Study Area is rich with historic sites, museums and homes, parts of the Underground Railroad and original construction of the Erie Canal. See Appendix L, Table 1 - Study Area National Register of Historic Places Listing, which contains the various listed historical sites in the Study Area. Historic sites within the Study Area include old fortifications, public- and privately-owned buildings and homes of historic figures, transportation facilities including canals, trails and railroads, museums, historic parks, cemeteries, U.S. Post Offices, schoolhouses, town and city halls, churches, mills and factories, mansions, train stations, hospitals, libraries, farms, lighthouses, bridges and parks.

3.3.7.2 Archeological Resources

Archeological resources may include those with historic resources. Archeological resources include, but are not limited to, the following types of sites:

- Burial grounds.
- Sites of buried archeological materials and structures.
- Sites of pre-historic events or activities, such as camps, areas used for mining and shaping stone tools or rock formations used for grain milling.

There are a number of historical and archeological resources in the Study Area, as indicated by the National Register, listing provided in Appendix L, Table 1, Study Area National Register of Historic Places Listing.

The New York State Museum lists a large number of archaeologically sensitive sites with significant concentrations, particularly within the northern portions of Cayuga County and along the Erie Canal (see Appendix L, Figure 1, Study Area Archaeologically Sensitive Areas and Historic Places).

3.3.8 Public Health and Safety

An understanding of electromagnetic waves and their place in the electromagnetic spectrum is important to understanding how a wireless network operates. The entire world is constantly bathed in these waves. They play a crucial role in life. Like air and water, electromagnetic waves are a basic feature of our universe and are essential to our survival.

This Project will employ Trunked Land Mobile Radio technology. TLMR works by sending and receiving signals in the form of radio waves. These radio waves are broadcast through the air in a very specific range. The energy used is a specific portion of the radio frequency spectrum. This radio frequency spectrum is a very specific portion of the overall electromagnetic spectrum.

The term “spectrum” can be interchanged with the term “range.” As an illustration, a person can be a member of their town, but they would also be a resident of New York State and a citizen of the United States. The frequency used for TLMR is a resident of the radio frequency spectrum and, in a sense, a citizen of the electromagnetic spectrum.

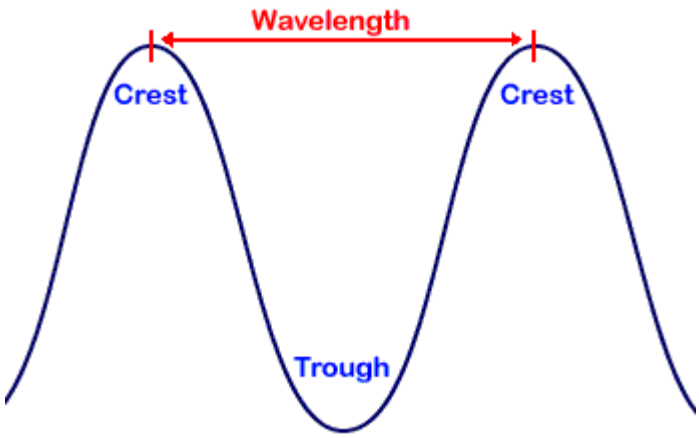
When electricity and magnetism move or change together, they make waves similar to waves in the ocean. Electromagnetic waves are formed when a magnetic field is coupled with an electric field. Unlike ocean waves, electromagnetic waves can travel through empty space, air and solid materials. This ability to travel through space and objects allows the electromagnetic waves to go everywhere. This is why we can use cordless phones, receive wireless TV signals and listen

to the radio. Electromagnetic waves are always all around us, even when we just sit quietly in a room. They are both a natural and a man-made part of our environment.

The difference between types of electromagnetic waves is their wavelength, frequency and energy. These three characteristics together determine what waves will do and how they interact with our world.

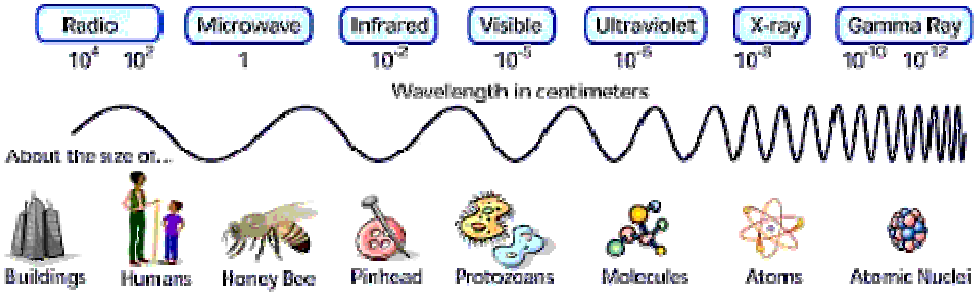
Like an ocean wave, the wavelength in an electromagnetic wave is the distance between the peaks or crests of the waves. As seen in Figure 3.7 below, wavelength is illustrated as the distance between the crests of the waves.

Figure 3.7 - Wavelength



Waves in the electromagnetic spectrum (the full range) vary in size from very long radio waves the size of buildings, to very short gamma rays smaller than an atom. Electromagnetic waves can also differ in their frequency. The frequency is the number of complete cycles (the number of peaks of the wave) that pass a point in a second. The electromagnetic spectrum includes, from longest wavelength to shortest, radio, microwaves, infrared, visible, ultraviolet ("UV"), X-rays and gamma rays. Figure 3.8 below, illustrates the relationship of wavelength to electromagnetic-producing sources.

Figure 3.8 - Electromagnetic Spectrum
(imagers.gsfc.nasa.gov/ems/index.html)

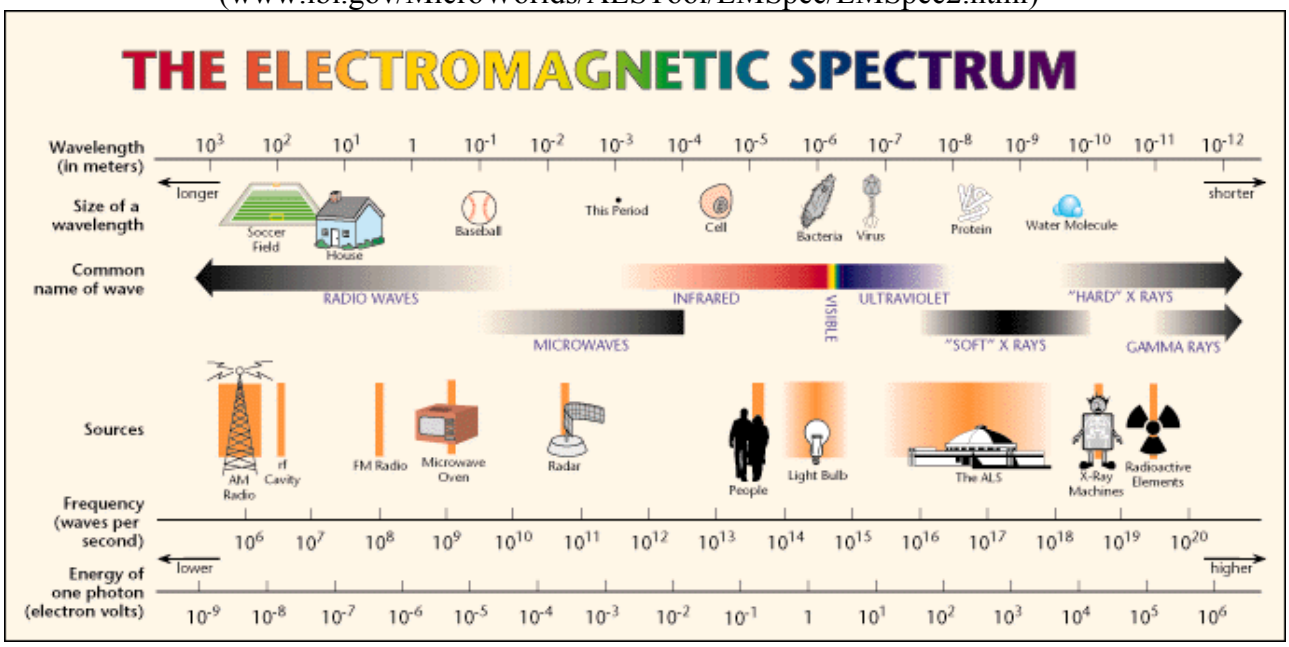


The energy of an electromagnetic wave is the intensity of the wave. The greater the height (amplitude) of the wave, the more intense or powerful the wave is. This is why, on a nice day with no clouds in the sky (e.g., which reduce the energy of the sun's rays (UV electromagnetic waves), there is a higher chance of sunburn.

In our everyday world, there are electromagnetic waves of varying length, frequency and energy that continually shower down on us. Electromagnetic spectrum is the name given to the range of energies that exists in the form of waves (light) or particles (e.g., more commonly known as radiation). These different waves are what make up the full range of frequencies in the electromagnetic spectrum, from radio waves, to visible light, to gamma rays.

Light waves are produced by fluctuations of electric and magnetic fields – the radiation we see - as light is energy that spreads out as it travels. Visible light from a lamp and radio waves from a radio station are two types of electromagnetic radiation. Other examples of electromagnetic radiation are microwaves, infrared and UV light. Figure 3.9 illustrates some of the different types of radiation in the electromagnetic spectrum.

Figure 3.9 - Electromagnetic Spectrum with Frequency and Energy
(www.lbl.gov/MicroWorlds/ALSTool/EMSpec/EMSpec2.html)



Examples of components of the electromagnetic spectrum follow:

- Radio – Radio waves are the longest waves. Radio, television and telephone signals that are around us everyday are electromagnetic waves. Stars and gases in space also create electromagnetic waves. Scientists use these "star" radio waves to develop pictures of our

galaxy. The TLMR system proposed for this Project will fall within the radio wave range or spectrum.

- Microwaves – Microwaves are shorter in length. These waves are used for a variety of specific functions, from cooking food in microwave ovens to point-to-point signal transmissions for communications. These waves are of higher energy, and more closely controlled, than radio waves (e.g., in microwave ovens the microwave energy is shielded by the oven enclosure; for point-to-point signal transmissions the microwave dishes are installed on high structures away from people).
- Infrared – Infrared is most often associated with heat, due in part to the sensation we feel when exposed to it. More than half of the sun's power is in the form of infrared waves. The common television remote control sends its commands using infrared waves. Safety features such as those on automated garage doors, motion sensors in home security systems and more elaborate security systems in banks also use infrared waves.
- Visible – Visible waves are what we see as light from the sun, electric light bulbs and the stars. The visible light wave causes the sensation of sight. The human eye and brain process the light waves that bounce off objects, which is how we see. Like a radio receiver, the person receives a very specific range of electromagnetic waves to see the world around them.
- Ultraviolet –UV waves are the part of the spectrum that we most commonly associate with the sun. UV waves are what cause sunburn. These waves are about as long as a single human cell is wide.
- X-rays – X-rays are some of the shortest waves and are most often associated with medicine. These are the waves that allow the doctor to view our bones and allow security personnel to look into our bags at the airport.
- Gamma – Gamma rays are the smallest waves known. These are most commonly associated with nuclear material used in medicine, industry and atomic power. Stars and other phenomena outside our solar system also produce gamma rays. These very high-energy waves are frequently referred to as ionizing radiation. The lower-energy, non-ionizing radiation resulting from the radio waves associated with TLMR technology are significantly different in potential effects on living things than those of the ionizing radiation of gamma rays.

Electromagnetic radiation can be described in terms of its energy. One difference between the various types of electromagnetic radiation is energy. Radio waves have low energies.

Microwaves have slightly more energy than radio waves. Next are infrared waves, then visible light, UV light, X-rays, and finally the gamma rays that have the most energy.

The term radiation is often misunderstood because of its association with harmful events. The actual definition of radiation simply reflects the everyday event of energy being released in waves from a multitude of different sources. A heat lamp releases energy associated with infrared waves. A microwave oven releases energy associated with microwaves. These energy waves, both natural and man-made, are encountered everyday. We rely on this radiation for our existence and convenience.

The public uses man-made radiation sources everyday. These sources include televisions, wireless phones, radios, garage door openers and other remote control devices, baby monitors, smoke detectors, building materials, lantern mantles and computer equipment, to name a few.

By far, the most significant source of man-made radiation exposure to the public is from medical procedures, such as diagnostic X-rays, nuclear medicine, and radiation therapy. As noted above, this type of high-energy radiation is very different in effect from low- energy radio waves. The radio frequencies that are used for TLMR are an extremely small part of the overall radio frequency, and an even smaller part of the overall electromagnetic spectrum.

The top portion of Figure 3.10, TLMR Radio Frequencies in the Electromagnetic Spectrum below illustrates the entire electromagnetic spectrum. The section labeled radio is the portion of that spectrum in which TLMR operates. The lower portion of the chart shows in greater detail how radio frequency is further divided for different radio needs and shows more clearly where the TLMR frequencies fall relative to the radio frequencies used for other purposes. The radio frequency spectrum in the United States is allocated and controlled by the National Telecommunications Administration and the FCC.

Figure 3.10 - TLMR Radio Frequencies in the Electromagnetic Spectrum
(New York State Technology Enterprise Corporation)

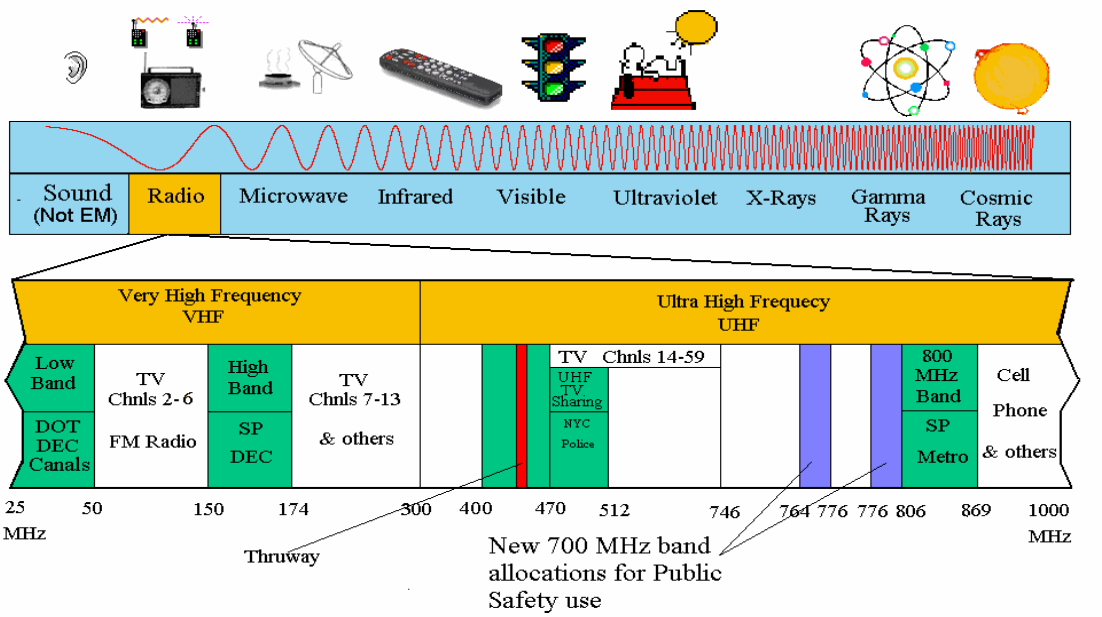
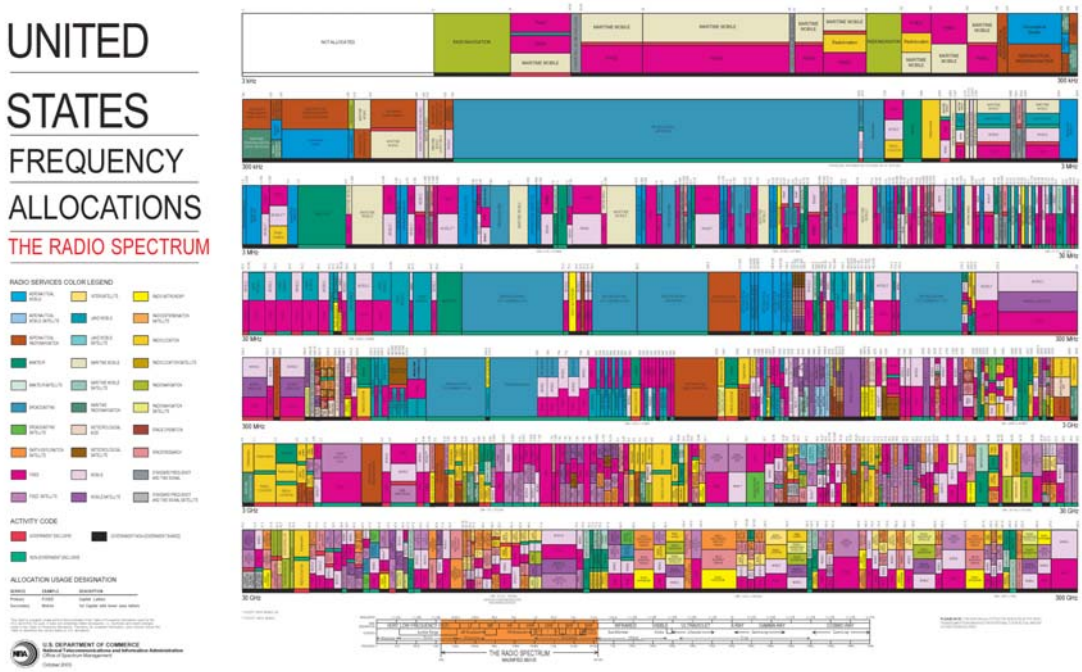


Figure 3.11 shows the large number of different users and uses in the United States. There are over 450 radio frequency bands.

Figure 3.11 - Frequency Allocation
(U.S. Department of Commerce, 2003)



The figure above shows that the radio frequency spectrum is broken down into 450 unique frequency bands to allow for a well-controlled use of the available spectrum. This is further broken down into bands defined by broadcast power output and sharing. Out of the 450 different bands, some are used when you open your garage door or remotely unlock your car. Others are used when you perform a transaction at the ATM or place a call on your cellular phone. A more recent use of portions of the spectrum is for remote meter reading of the gas and electric meters on residential homes.

Below is just a small list of common applications that use part of the radio frequency spectrum.

- Amateur – Ham radio, Citizens Band ("CB") radio.
- Broadcast – Television; AM/FM radio; cable television and internet; satellite radio; wireless phones; and wireless broadband services.
- Fixed – Microwave, telephone lines, ATM communications.
- Automobile – Remote controlled door locks, starters, theft alarms, navigation systems, radar, satellite radio.
- Maritime – Ship to shore communications.
- Radio Astronomy – Viewing of the stars.
- Land Mobile – Public safety and service communications.
- Public – Unlicensed items such as garage door openers and baby monitors, and wireless broadband.

4.0 ENVIRONMENTAL IMPACTS

As discussed in the Executive Summary, this section incorporates portions of the OFT GEIS that are relevant to this DGEIS, in particular, the potential significant environmental impacts expected for the Project that are similar to those analyzed for the SWN.

4.1 LAND USE TYPES

The land use types identified in Section 3.1 of this DGEIS will be referred to as appropriate for the analysis of potential impacts contained in this Section.

4.2 NATURAL RESOURCES OF THE STUDY AREA

Natural resources include: geology; water resources; terrestrial and aquatic ecology; air resources; and agricultural resources. This section describes the impacts to those resources as it applies to the Study Area or each municipality, as appropriate. Land use types are used to further distinguish the impacts.

4.2.1 Geology

Geological resources include subsurface geology; surface or surficial geology; and topography. The geology of the Study Area and the geologic conditions at each Project facility can vary significantly. The geology of a site can consist of consolidated or unconsolidated deposits either or both of which can occur at the ground surface or in the subsurface. Consolidated deposits generally consist of bedrock, extremely dense glacial till, and cemented sand and gravel. Unconsolidated deposits consist of such materials as sand and gravel, silt, clay, till and alluvium. Similarly, the topography of each site can be variable across the Study Area. Such variability can occur in the same land use type, in different land use types and at each specific facility site.

4.2.1.1 Subsurface Geology

Subsurface geology will only be affected when new or substantially redeveloped antenna sites are constructed that may require, excavation, grading or filling activities. These activities will only occur when foundations are excavated or access roads are constructed. In areas of previous development, neither construction nor operation of antenna sites or NMCs is expected to cause a significant impact.

The nature of the subsurface deposits at any given location will be determined by site-specific investigation. Ground disturbance is expected to be relatively localized in both vertical and horizontal dimension. The operational phase of the Project will not have an adverse impact to subsurface geology.

4.2.1.2 Surficial Geology

Surficial geology will be impacted only where previously undeveloped sites are disturbed, excavated, graded or filled for the siting of an antenna facility or NMC. These activities generally occur when foundations are excavated, utilities installed, fill or backfill is placed and sites are regraded or restored. In areas of previous development of any land use type, neither construction nor operation of antenna sites or NMCs is expected to cause any impact to surficial geology.

The construction of antenna sites in previously undeveloped areas may cause minor impacts to surficial geology during installation of buried utilities, foundation and road construction. Although most likely on a small scale, the construction of an antenna facility could change the surficial geology at the site itself or along the route of a new access road to the site.

These potential impacts may involve erosion and sedimentation during excavation, site grading and restoration. Such impacts would not be potentially significant because the foundations and buried utility trenches for a new antenna site require little space, allowing erosion control to be managed effectively, and because disturbance associated with the few new access roads that may be required in these areas is readily controlled and repaired in the process of site stabilization following construction.

However, it is unlikely that new antenna facilities would be proposed within areas with sensitive surficial geology. Pursuant to the siting guidelines these areas would be of very low priority because of their sensitive nature. There will be no adverse impacts to the native surficial geology from the installation of a facility in previously developed areas because most surficial and ground materials will have been previously disturbed by prior construction activities. For NMCs which are expected to be established in existing buildings, the renovation of an existing building generally involves neither excavation nor regrading. No impacts are expected during either the construction or operational phase of the Project.

Facility sites that are collocated on existing antenna sites or on existing elevated structures (e.g., buildings, signs, towers) will involve minimal excavation, trenching and regarding to accommodate the installation of equipment shelters and generators and, accordingly, will cause minimal changes to surficial geology.

No adverse impacts to surficial geology are anticipated during the operational phase of the Project.

4.2.1.3 Topography

Topography may be impacted where previously undeveloped sites are disturbed, excavated, graded or filled for the siting of antenna sites or NMCs. In areas of previous development of any land use type, neither construction nor operation of antenna sites or NMCs is expected to cause a significant adverse impact to topography. This is because these sites most likely were previously graded to accommodate an existing facility and will not likely require extensive regrading to accommodate a Project facility.

No adverse impacts to topography are anticipated during the operational phase of the Project.

4.2.2 Water Resources

Water resources include surface water and groundwater. Construction of new or modified antenna facilities may affect either of these resources. The addition of antenna facilities to existing structures will result in little or no change to water resources since ground disturbance will be minimal. NMCs are expected to be constructed in preexisting buildings. Potential impacts to water resources from these activities would be largely limited to the construction phase.

Antenna facilities are anticipated to require no water resources. NMCs will utilize existing potable water supplies.

In evaluating potential impacts to water resources, an important overall consideration is that Project-related activities involve very small areas. For example, typical antenna facilities will be located on parcels up to approximately one acre in area. It is anticipated that NMCs will be housed in preexisting buildings.

Potential minor impacts to groundwater and surface water may result during construction and operational phases of the Project. Cars, trucks and construction vehicles operated at the sites could experience incidental or accidental leaks of gasoline, motor oil, antifreeze or hydraulic fluid. Such incidental leaks of motor oil and hydraulic fluids would be small in quantity, typically only a few ounces. These products are not very soluble in water and tend to adsorb to soil rather than wash into the groundwater. Incidental leaks or spills of small amounts of oils would likely be contained within shallow soils. Spills and leaks of gasoline could result from the rupture of construction-vehicle fuel hoses or tanks or from field refueling activities. Construction vehicle fuel tanks can have capacities exceeding 50 gallons. Fuel tank rupture could involve a release of tens of gallons. Relatively large volume releases such as these are rare.

Diesel fuel and gasoline contain constituents that are more soluble in water than oils. When spilled onto the soil, these materials may eventually reach the groundwater or surface water unless absorbed by soil. Small amounts of antifreeze could also leak from vehicles or be released into the environment as a result of an accident. It is expected that leaks of less than one gallon would be most common. On rare occasions, a vehicular accident could result in leakage of larger volumes of antifreeze (i.e., five to ten gallons). Antifreeze that is spilled onto the soil may eventually reach groundwater or surface water, but that likelihood is minimized by the readily biodegradable nature of most glycol based antifreeze. The degree and significance of any resulting groundwater or surface water contamination will depend upon site specific conditions such as groundwater depth, soil type, topography and distance to surface water.

A spill in an area having a deep groundwater table will likely have less of an impact than in areas with a shallow groundwater table. The presence of soils such as silt or clay will also tend to reduce spill impacts, since water does not move rapidly through these soil types. Similarly, flat topography and long distance to surface water bodies would tend to limit the movement of pollutants to surface waters.

The quantity of groundwater and surface water could also be affected by Project construction and operational activities. The infiltration capacity of soils may be decreased as a result of compaction by construction equipment and motor vehicles. Placement of concrete, pavement and structures could also reduce surface water infiltration capacity. Changes to topography during construction could also affect runoff patterns. Project sites will typically be one acre or less. In contrast, groundwater aquifers, recharge areas and surface water drainage basins are typically regional in nature and may encompass significant land areas occupying hundreds of square miles. Changes to infiltration capacity and runoff patterns will have negligible impact to the drainage basin or aquifer.

During construction, surface water and groundwater quality may also be affected by concrete wash or waste residues. Concrete may be used during construction for building foundations, structural footings, sidewalks, roadways or parking areas. Small quantities of concrete residues may be generated by washing equipment and hand tools. These wash residuals are typically alkaline in nature and could have pH levels above 8.5. Concrete wash residues could have a volume of 50 gallons. Construction activities may also include the use of foam lubricants and cable-trace lubricants in small quantities. Spills or leaks of these oils would be absorbed into shallow soils and would pose very little risk to groundwater or surface water.

Construction-related activities may include vegetation removal, excavation, grading, trenching and placement of fill. These activities may potentially result in the increase of site erosion and

runoff. Increased turbidity also has the potential to affect surface water quality as increased amounts of sediment and suspended soils are washed from construction areas. Increased turbidity in surface water could affect biota in those streams that have a best usage rating for fish survival and/or propagation. The aesthetic value of surface water drinking supplies may be reduced by increased turbidity.

Electric generators and engines will be present at antenna facilities and NMCs. Regular engine maintenance activities, including periodic oil changes, will be performed. Incidental spills or leaks of lubricating oils from the engines may occur during normal operations or servicing, resulting in small quantities of oil spilling onto concrete foundation slabs or into the soil. Oil generally has low water solubility and small quantities would be absorbed into the near surface soil.

The backup power supply at antenna sites will operate on diesel fuel. The potential impacts that are associated with leaks or discharge from fuel storage or fuel delivery operations are similar to those described above.

Winter road maintenance may include application of salt, chemicals or sand to prevent ice and snow build up. The NMCs will be staffed and routine vehicle access will be necessary. Antenna facilities, although unstaffed, will also require vehicle access for periodic maintenance, inspections and services. Road salt, chemicals or sand may be used to treat paved and unpaved surfaces. The use of deicing agents will be consistent with normal treatment activities already in place for existing roads in the general area but their use could produce some localized and seasonal effect on surface water or groundwater.

The County anticipates staffing NMCs with current staff and using preexisting buildings in urban areas. These facilities are expected to use established potable water and sewer systems. As such, new septic systems and wells will not be required for NMCs. No significant Project-related impacts are anticipated.

4.2.3 Terrestrial and Aquatic Ecology

The following section discusses potential impacts to terrestrial and aquatic ecological resources, including vegetation, fish, wildlife and wetlands.

4.2.3.1 Vegetation

<u>Impact on Endangered, Threatened or Rare Species and Communities</u>

Vegetated sites that could be impacted by Project-related construction activities range from open agricultural fields to successional communities and mature forests. With the exception of active crop fields, almost all of these communities could include endangered, threatened or rare plant

species. Physical disturbance to vegetation by construction vehicles and equipment has the potential to result in the loss of some endangered, threatened or rare plant species.

There is typically sufficient similar habitat surrounding a potential antenna site to accommodate and maintain species populations that may be displaced. Individual plants may be eliminated for various reasons as a result of construction activities, but populations of these species can be maintained within similar habitat in the vicinity of an antenna site.

Damage to Vegetation from Chemicals

Damage to vegetation can occur from accidental spills of materials (e.g., petroleum products and solvents) during construction and intentional application of chemicals (e.g., salt, herbicides and pesticides) during facility maintenance. These chemicals might have toxic effects when absorbed by plants and may result in the loss of, or damage to, vegetation.

4.2.3.2 Fish and Wildlife

As defined in previous sections, fish and wildlife include mollusks, insects, fish, amphibians, reptiles, birds and mammals. Wildlife species composition in any given location will vary based on habitat conditions, land use activity and species range.

Potential impacts to fish and wildlife may exist in all land use areas as a result of construction and operation activities associated with antenna facilities. Potential impacts to fish and wildlife may include: temporary or permanent displacement of common fish and wildlife species or their habitats; potential displacement or loss of endangered, threatened or special concern species or their habitats; and potential disturbance of wildlife due to soil erosion, stream sedimentation and chemical contamination. Potential impacts specific to avian species and bats include all of the above, in addition to navigational and physical disturbances (e.g., flight collisions) resulting from construction of new or enlarged antenna facilities. Impacts to fish and wildlife are not anticipated as a result of construction or operation of NMCs because sensitive species are not generally found in areas of commercial development.

Disturbance/Loss of Common Wildlife Species and their Habitats

The Study Area contains a diverse landscape that includes open agricultural fields, successional communities, mature forests, wetlands, lakes, ponds and streams. These habitats provide nesting and foraging areas for many common resident and transient fish and wildlife species. Construction activity in such areas could result in incidental injury and mortality to fish and wildlife species, as well as physical disturbance to nesting and foraging areas (e.g., tree, shrub, and brush removal and ground disturbance). Potential indirect construction-related impacts include increased human disturbance and degradation of habitats due to soil erosion and

sedimentation. Forest fragmentation on wooded sites can make habitats unsuitable for forest interior songbirds and other species. Conversion of natural habitat to communications facilities may result in a loss of fish and wildlife habitat.

Operational phase activities will have limited potential impact on fish and wildlife, with the possible exception of potential collision impacts involving avian species.

Navigational and Physical Disturbance to Avian Species

For more than 50 years, collision fatalities have been recorded at communications towers in the United States and it is well known that some types of communications towers pose a risk to birds. Various reviews have summarized what is known, the types of potential impacts and risk demonstrated or suspected at communications towers, as well as other tall structures (Avery, et al., 1980; Trapp, 1998; Shire, et al., 2000; and Kerlinger, 2000; and www.towerkill.com). Currently, the FWS estimates that between 2 and 4 million birds are killed each year in the United States, but impacts could be as high as 40 million per annum (Manville, 2000). Whether these fatalities are biologically significant has yet to be determined. With respect to federally endangered and threatened species, very few have been found at such towers, although species listed at the State level have been found in slightly higher numbers. A vast majority of these collisions have been at tall, guyed television towers (Shire, et al., 2000, Kerlinger, unpublished analysis), with few to no birds being reported killed by cellular, state public safety systems, or AM radio system towers. Fewer studies have been conducted at the latter towers.

The level of fatalities at communications towers has recently been scrutinized by the FWS and has become a priority at that agency. As a result of this concern, the FWS issued Service Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers, a document that was written to provide guidance in reducing and minimizing potential impacts of communications tower development. Those guidelines include several best practices or practices that are believed to have the potential to reduce risk.

New antenna towers and modified towers (those that are enlarged or resupported with guy wires) may present a potential collision impact risk to migratory birds. Such fatalities occur predominantly among night-migrating birds such as songbirds and songbird-like species. Also involved are rails and smaller numbers of shorebirds and waterfowl. It is likely that visibility is a factor in night-migrating bird collisions with telecommunication towers. A few bird species have been found to collide with towers during daytime flight, but their numbers are a very small percentage of the overall total (Avery, et al., 1980; Shire, et al., 2000). The types of birds involved are detailed in general migration treatises (Shire, et. al., 2000; Kerlinger, 1995; Able, 1999).

During migration, birds fly along a broad front through the night airspace over much of the United States. These migration patterns are spread rather evenly over the landscape, with some greater concentrations observed along coastal areas. There are also concentrations during daylight hours in areas where there is good stopover habitat in which to rest and feed before undertaking the next leg of the migratory journey. Migrants that fly through New York State include birds that nest in New England and eastern Canada (Quebec and Maritime Provinces, Ontario and portions of the Northwest Territories). These birds pass through the State on their way to the southeastern and Mid-Atlantic United States or the tropics where they winter. As these birds fly over the State, they are spread out from the western tier to Long Island over a broad front. Aside from concentrations at the shores of the Great Lakes and along a few river valleys and along the Atlantic shore areas, there are no particularly significant concentration areas. In other words there are few interior corridors. Therefore, migration corridors for night-migrating birds are very rare or nonexistent at moderate or greater distances from shorelines (Berthold, 2001).

Night migration commences about 30 to 60 minutes after sunset, whereupon the vast majority of warblers, vireos, tanagers, sparrows, flycatchers, orioles, buntings and other night migrants take flight. Waterfowl and shorebirds follow this schedule to a lesser extent, but they are most active in migration one hour after sunset. During the initial few minutes of migration, birds climb, rather rapidly, usually to more than 500 feet above ground level ("AGL"). By 1 to 2 hours after the sun sets, about 75% of all night migrants can be found between 300 and 2,000 feet AGL (Able, 1970; Kerlinger and Moore, 1989). A few birds are scattered below 500 feet, and a slightly larger number are spread above this level. Waterfowl and shorebirds generally tend to migrate at higher altitudes than night-migrating songbirds, and may be found as high as 10,000 feet AGL.

With respect to night-migrating species that have been killed in collisions with communications towers, only one federally-listed species was observed. Two Red-cockaded Woodpeckers collided with tall, guyed communications towers (above 600 feet AGL) in the southeastern United States (Shire, et al., 2000), suggesting that listed species rarely collide with such structures. State-listed species (e.g., Pied-billed Grebe, Least Bittern, Common Tern, Northern Harrier, Upland Sandpiper, Loggerhead Shrike, Sedge Wren and Henslow's Sparrow) have also been killed in small numbers in collisions with tall, guyed communications towers (above 500 feet AGL), although these occurrences were in different regions. In addition, species of special concern in the State are also on the fatality lists with regard to tall, guyed communications towers. Grebes seem to be more at risk for unknown reasons. Their numbers far exceed the small numbers reported for other species.

Migration of most night-migrating birds usually continues all night along relatively level and straight courses with little correction for topography (Berthold, 2001). Birds will alter their altitude depending on wind and other weather factors (Alerstam, 1990). They fly until at least 2:00 to 3:00 in the morning, and ultimately put down at or before dawn, or when suitable habitat is found.

During night flight, collisions with towers have been recorded during both good and poor weather. It is theorized that fewer collisions occur on clear nights because birds cruising at normal migration altitudes are better able to see guy wires and avoid them. These events involve scattered fatalities rather than groups of fatalities, with a single bird colliding with a single guyed tower here and there. On occasion, multiple fatalities involving two to four birds have occurred at some towers on clear evenings. Large-scale fatality events, involving dozens to hundreds or even thousands of birds have occurred, but almost exclusively during fog, low cloud cover and light rain or snow.

Experts theorize that, at these times, birds are attracted to lights on communications towers. There are some who believe that these birds are lured to lower altitudes by lights or fly lower to stay below cloud cover, but conclusive evidence of this theory is elusive. Either way, the birds fly toward FAA-mandated or other lights until they are near a tower and then they circle or mill around until they either tire, fly onward, or collide with guy wires. (Avery, et al., 1980; Cochran and Graber, 1958). Large-scale events triggered by weather at communications towers greater than 500 feet AGL are well-documented in the literature.

Known Risk Factors at Communications Towers

Three collision risk factors regarding tower configuration have emerged from studies of migrating birds and communications towers. These factors in general are not independent, but rather interact as described below. This discussion is based on an exhaustive survey of the literature, involving examination of hundreds of journal articles and newsletters (Avery, et al., 1980; Trapp, 1998; Shire, et al., 2000; Kerlinger, 2000).

Height – A review of the literature demonstrates that birds collide with towers of virtually all heights, but that height is a major factor in overall fatality rates. Large scale fatality events are limited, almost exclusively, to towers in excess of 500 feet in height. For example, a review of the original 47 studies listed by Shire, *et al*. (2000) revealed that only one of the reports they reviewed was on a tower less than 500 feet high, and three towers of the 47 studied were between 500 and 600 feet high (Shire, *et.al*., 2000). The literature suggests a non-linear increase in risk that occurs somewhere between about 400 feet and 700 feet. Although towers less than 500 feet have been involved in large scale fatality events, those events have almost entirely been

documented to involve non-FAA lights as described below. Thus, it is likely that towers in excess of 500 to 600 feet present far greater risk to night-migrating birds, on a per tower basis, than do towers of less than 500 feet.

A critical study evidencing that the height of guyed communications towers is a prime risk factor was published by Crawford and Engstrom (2001). At a site in northern Florida, a team of biologists studied a multiple red lit, 1,000-foot tall guyed communications tower for more than 20 years. This tower was involved in collisions that resulted in the deaths of more than 1,000 birds per year in many years of the study until the height was reduced to 308 feet. It was still guyed and lit, but following the height reduction large-scale fatality events ended and the number of birds killed was reduced by approximately 90% to 98% per year. This tower is one of the most intensely studied towers in the world, and the best comparative study showing that shorter towers, even when located in the same place as a tall tower known to kill large numbers of birds, have much less potential impact on night-migrating birds.

Additional supporting evidence that structures less than 500 feet are not involved in large-scale fatality events comes from the wind power industry. Large-scale fatality events at wind turbines have never been documented (Kerlinger, 2004). Kerlinger concluded that because wind turbines were generally less than 300 feet in height and always shorter than 400 feet, they do not extend into the height of migration to such a degree as to pose a major risk to night-migrating avian species. Similar to communications towers shorter than 500 feet, fatalities do occur but at rates that are likely to be on the order of one to ten birds per turbine per year (Erickson, et al., 2001).

There are several reports of large-scale events occurring at towers or other structures less than 500 feet, but without exception, those towers have either been located adjacent to a source of bright lights, or have had bright lights mounted on them. The best example is reported by Trapp (1998) at a site near Syracuse, Kansas. Trapp reported what was written in newspapers and other popular accounts. Some 10,000 birds had been found dead at three communications towers (200 to 400 feet AGL) after a snowy night. The site was actually a natural gas pumping station with many bright, sodium vapor lamps and other lighting. Birds were found dead on the fences around the facility, on equipment within the facility, impaled on wheat straw, and around three guyed communications towers at the facility. Clearly, this was not a representative communications tower situation. Another case involving a spotlight aimed on the Washington Monument attracted birds to the vicinity which eventually flew into the monument and died. Without such lighting, only one tower less than 500 feet (450 feet with FAA lighting) has been recorded as being involved in a large-scale fatality event.

Guy Wires – Guy wires in and of themselves are the single most important risk factor with respect to bird collisions. It has long been suspected that guy wires are responsible for most of the fatalities at communications towers and that guy wires on meteorology towers at wind power facilities (similar in design and size to short, guyed, communications towers) result in collisions that kill small numbers of birds (un-guyed meteorology towers do not). This conclusion is based on the fact that not a single large-scale fatality event has ever been reported at an un-guyed tower. Because un-guyed towers are generally not in excess of 500 feet in height, these types of towers do not extend, to a great degree, into the main altitude range of night-migrating birds. Only one or two fatalities have been reported from un-guyed communications towers. The only documentation that could be confirmed was of a single bird that flew into a 475-foot un-guyed communications tower operated by the Michigan State Police Communications System. In a study conducted for 20 nights in autumn 2003 under three separate 475-foot unguyed, lattice communications towers, not a single dead bird was found. During the spring of 2004, after six nights of study at six towers of the same structure, only one dead migrant was found. This fatality may or may not have been the result of collision. Not a single reference is available in published literature or unpublished data that documents any fatalities at un-guyed communications towers (Avery, *et al.*, 1980; Trapp, 1998; Shire, *et al.*, 2000; Kerlinger, 2000; Erickson, 2001). Despite the fact that these types of towers are widely distributed throughout the landscape and monitored frequently, they rarely, if ever, are involved in fatal bird collisions. Therefore, it is reasonable to conclude that un-guyed towers pose virtually no risk to birds.

Lighting – The literature clearly indicates that lights attract night-migrating birds during periods of low cloud cover, fog and light precipitation. Bright sodium vapor lamps and spotlights have been shown to be most attractive (Avery, et al., 1980). Lights on communications towers have also been demonstrated to be highly attractive during specific weather conditions. The type of FAA lighting that has mostly been shown to attract night-migrating birds has been the combination of flashing red (L-864) and steady burning red lights (L-810). With very few exceptions, this is the basic type of lighting that has been mounted on almost all towers studied to date. The fact that 1,000 foot tall towers have upwards of nine steady burning lights and five flashing red lights also suggests that towers with more lights are more attractive. This conclusion is based on the fact that the incidence of large scale fatalities occurs most often at towers in the range of 800 to 1,500 feet AGL. Kerlinger presented a paper to the National Wind Coordinating Committee Wildlife Workgroup in November 2003 and at the American Wind Energy Association and the American Bird Conservancy meeting on May 19, 2004, in Washington, D.C. His paper demonstrated that flashing red lights (L-864) mounted on wind turbines (without the L-810s steady burning lights that are on communications towers) do not

appear to attract night-migrating birds. Despite the presence of the 864 lights on wind turbines during nights with migration and fog, no large scale fatality events occurred at these turbines. In fact, few fatalities involving night migrants were found despite studies being conducted at about a dozen wind power facilities in the United States (*see also* Erickson, *et al*., 2001).

These results, combined with the fact that there is no evidence that white strobes attract night-migrating birds, strongly suggest that it is multiple sets of steady burning red (L-810) lights that attract night-migrating birds to communications towers. Towers with these types of lights pose a greater risk than do towers that are unlit or towers that have only flashing lights.

Suspected Risk Factors – Unsubstantiated

There is some speculation (*see*, e.g., the FWS communications tower guidelines document) that risk increases when towers are erected close to wildlife refuges or areas where birds concentrate in large numbers. The guideline document also suggests that communications towers placed in or near migration flyways are riskier. There is no evidence, however, to support these contentions. Towers in the middle of corn fields in Wisconsin and other Midwestern states have been some of the most lethal in terms of night-migrating birds. Those towers were nowhere near refuges or other wildlife areas. They were, however, tall towers with guy wires and combinations of red flashing and steady burning lights.

Type of Communications Towers and Risk

The literature suggests that, of all the different types of communications towers, television towers are the riskiest. Virtually all of the 47 studies listed in Shire, *et al*. (2000) were conducted at television towers in excess of about 500 to 600 feet. To a lesser extent, some of those tall towers were also apparently used for FM transmission. A review of most of the hundreds of references in the literature (Avery, et al., 1980; Trapp, 1998, etc.) reveals that there are few or no known fatalities at towers used for AM radio, public safety systems (800 megahertz) or wireless telephone. The reasons are likely the shorter heights of AM and other towers and the fact that many of these towers are not guyed.

It is likely that some fatalities do occur at these facilities, but that they occur at levels that do not maintain the interest of researchers. After searching under such towers a few times, people seem to give up because they have not been "rewarded" by finding any dead birds. Studies like the one conducted at the Michigan Public Safety Communications System by Dr. Gehring show that un-guyed towers in these systems are virtually free of collisions, whereas the guyed towers in the 475-foot range result in a small number of fatal bird collisions per year. It is likely that the fatalities at these types of towers (with red flashing and red steady burning FAA lights) number perhaps five to twenty birds per tower per year, at least in the Midwest.

Assessment of Risk of the Project

A generic analysis of the type and magnitude of known potential impacts is provided below. Each of the following sections assesses the potential risk to birds associated with the potential types of communications structures expected to be used in the Project.

Including the hub of the communications system, the Project will require 7 to 15 antenna sites of the following types:

Microwave Dishes – Microwave dishes by themselves do not pose a significant risk to migrating birds. The towers on which they are mounted could pose risk, depending on the characteristics of those towers. If microwave dishes are placed on existing towers, risk will not be increased because microwave dishes do not raise the height of towers, nor change tower structure in a material way. If such dishes require new towers, the risks for guyed and un-guyed towers would apply.

Collocation of Antennas on Existing Towers or Structures – Antennas placed on existing structures are not likely to pose a demonstrable risk to birds. The towers on which these antennas are mounted may present some degree of risk, but the antenna itself is unlikely to add to that risk. The literature provides no indication that such antennas present any risk to birds, so they are not likely to provide significant collision risk to migrants. Although the towers or structures on which antennas are collocated may pose risk to birds, the addition of antennas does not significantly add to that risk.

Replacement Towers – In some cases, existing towers will either be reconstructed or renovated for the Project. The degree of additional or new risk at these towers will depend on whether the new tower will be taller than the one being replaced, uses guy wires, or has lighting that will be more attractive to birds. If there is no change in any of these factors, risk is not likely to increase, and there is no likely increase in potential impact. If, however, the tower height is increased, it uses or increases the number of guy wires, or the amount of tower lighting increases, risk is likely to increase.

New Towers – New, un-guyed towers are expected to be included in the Project. The range in height is expected to typically range from 150 feet to 200 feet AGL, although in some cases new structures may consist of un-guyed lattice towers up to 300 feet AGL. Design, exact height, and the lighting specifications have yet to be determined. For the discussion below, it is assumed that towers in excess of 199 feet will have FAA lighting, usually flashing red L-864 lights on the top and possibly at mid-tower level, plus steady burning red L-810 lights at intermediate levels. The use of guy wires is not anticipated.

There is virtually no additional risk associated with collocated antennas and microwave dishes on existing towers, buildings, telephone poles and other structures. Accordingly, such communications facilities are not considered in the discussion below. Similarly, due to the demonstrated absence of risk at un-guyed communications towers, potential impact at un-guyed towers of any height is likely to be de minimus.

Assessment of Potential Risk from the Project

Collision Risk to Endangered and Threatened Species – Because risk to listed species at towers below 500 feet, even assuming the presence of guy wires has not been demonstrated, these towers are not likely to result in a significant potential biological impact to State or federally-listed species. Virtually all documented records of impact to listed species have occurred at guyed communications towers in excess of 500 to 600 feet, which is in the range of 200 to 300 feet taller than the tallest towers likely to be constructed for the Project. Although it is impossible to claim a zero risk level, the expected risk is very small.

Collision Risk to Raptors – Documented risk to raptors at towers, including guyed communications towers, is almost nonexistent. Fewer than five records of raptors colliding with communications towers can be found in the literature from across the continent, and no records in New York State have been identified. Potential avian impacts of this nature, if they do occur at Project facilities, are expected to involve a very small number of birds. These isolated potential impacts are not likely to be biologically significant.

Collision Risk to Waterfowl and Waterbirds – Very few waterfowl or other waterbirds are on the lists of birds that collide with communication towers (Shire, *et al*., 2000). The fact that almost all of the waterfowl and waterbirds listed in that report were found beneath communications towers in excess of 500 to 600 feet AGL, suggests that any new Project towers will not pose a significant risk to these species. The altitude of waterfowl migration is generally in excess of 500 feet (Bellrose, 1976) and usually proceeds at higher altitudes than for night-migrating songbirds (Kerlinger and Moore, 1989). Overall, risk to these birds from new communications towers is likely to be minimal and not biologically significant.

It is possible that very small numbers of non-waterfowl type waterbirds (rails, grebes and bitterns) may collide with towers, although it has not been demonstrated that these birds collide with shorter towers or other short structures (such as those proposed for the Project). Risk to these birds is likely to be the same as for waterfowl, in terms of population scale risk.

Collision Risk to Shorebirds – Comparatively few shorebirds have been demonstrated to collide with communications towers or other tall structures. A list containing the numbers of these birds appears in Shire, *et al.* (2000). As with waterfowl, shorebirds migrate at night and migrate at

very high altitudes. They generally migrate at higher altitudes than night-migrating songbirds, thereby reducing the potential for any collisions with Project towers. It is unlikely that new towers, (with or without guy wires) would pose a biologically significant risk and most, if not all, are likely to present no risk to these birds.

Risk to Night-Migrating Songbirds. – It is unlikely that the new towers will pose a biologically significant risk to night-migrating songbirds, although small numbers of birds would be likely to collide with guy wires if used in the tallest of these towers. This assessment is based on the fact that so few night-migrating birds have been demonstrated to collide with guyed communications towers less than 500 to 600 feet in height, even when they are equipped with FAA lights. The issue of cumulative impact, however, may be relevant, depending on the exact height and number (if any) of guyed towers that are added across the Study Area. The report from which this discussion is based, Potential Avian Risk at the Statewide Wireless Network, Kerlinger, 2004, is located in Appendix C.

Increased Mortality from Traffic and Human Recreation

Installation of access roads for construction, maintenance and operation of antenna sites increases area accessibility, which in turn can increase the likelihood that wildlife will be potentially impacted from additional vehicular traffic volumes and human disturbance as a result of recreational activities or reckless human behavior.

Damage from Chemicals

As discussed for vegetation, damage to fish and wildlife may occur during construction and operational phase activities from accidental spills and intentional application of certain chemicals. These chemicals have the potential to be toxic and cause damaging effects when ingested by fish and wildlife.

Potential Impacts to Endangered, Threatened and Species of Special Concern

All of the direct and indirect potential impacts described above could affect listed endangered, threatened and special concern fish and wildlife species, if such species exist at a proposed antenna site.

4.2.3.3 Wetlands & Floodplains

Impacts to wetlands can be caused by construction projects. Potential impacts to wetlands may include: direct loss of wetland acreage; alteration of wetland functionality; wetland segmentation and changes in flow patterns; changes to resident vegetation and fish and wildlife species; and damage from sedimentation and pollutants. The potential impact of human activity on floodplains consists of reduction in the volume capacity of the floodplain by placing fill below

the 100-year flood elevation, thus raising the flood elevation and increasing the velocity of floodwater flow of future stormwater events.

No impacts to wetlands and floodplains are expected as a result of antenna site operations or operation of NMCs.

If siting any part of a Project facility in a wetland or its adjacent area becomes unavoidable, the following types of potential wetland impact may occur:

Direct Loss of Wetland Acreage

Where wetlands cannot be avoided, construction of antenna facilities and associated access roads may involve direct loss of wetland acreage through filling.

Alteration of Wetland Functions

Pollution filtration and removal within wetlands is a function of the water flow rate and the nature and quantity of chemical constituents in the water. The effectiveness of filtration and renewal may be reduced if the rate of flow through the wetland either increases or decreases. Filling parts of the wetland may alter flow or flow rates through a wetland.

Changes to water chemistry can be caused by alterations to the upslope contributing area (more or less water flows into the wetland from surrounding areas), alterations to flow path, and changes to vegetation composition. Alterations to flow path change the zones of the wetland through which water flows. Water which flows slowly along the surface of the wetland may leave the wetland with reduced turbidity as particles settle out of the water.

Anoxic (no oxygen) flow paths through wetland sediments allow chemical reactions to take place which change the chemical constituent nature of the water. Water chemistry changes may also occur as particles settle out. These wetland functions are beneficial to water quality as high turbidity is seen as a negative characteristic of water. The loss of wetland or portions of wetlands will compromise pollution filtration by altering these two mechanisms.

If the size of a wetland significantly decreases, its storm water surge detention capability may be impacted. A significant decrease in this detention capacity could affect downstream areas.

Loss of wetland vegetation may adversely affect water quality. The ability of a wetland to remove pollutants is directly related to the type of vegetation in the wetland. If a significant amount or assemblage of vegetation was altered as a result of Project construction, the ability for the wetland to remove pollutants would be decreased.

Wetland Segmentation and Changes in Flow Patterns

Installation of access roads and filling in wetland areas can result in wetland segmentation, changes in flow patterns and possible dehydration of wetland areas.

Changes to Resident Vegetation and Fish and Wildlife Species

In disturbed wetlands, native wetland vegetation can be replaced by more competitive, non-native, invasive plant species that do not provide equivalent wetland functions for water quality and wildlife habitat. Construction activities in wetland areas could potentially impact certain wildlife species by fragmenting habitats, changing plant species composition or altering the hydrologic regime.

Damage from Sedimentation and Pollutants

Without adequate protective measures in place, construction activities can increase sedimentation in wetlands. Creation of impervious surfaces allows pollutants to be transported more rapidly into unprotected wetlands and other water bodies.

Adverse impacts to wetlands and floodplains are not potentially significant for the proposed Project because the sitting guidelines for the Project will be used to avoid siting in those areas. Locating an antenna in a wetland, wetland buffer or floodplain would be inconsistent with the premises of the DGEIS and would therefore require further SEQR review on a site specific basis.

4.2.4 Air Resources

Potential impacts to air quality are associated with operation of heavy equipment during construction, and internal combustion exhaust from stationary power equipment during operation. Fugitive dust and by products of fuel combustion are the potential pollutants that may be generated during construction or operation.

Due to the small area of potential impact at antenna sites and the temporary nature of the activity, fugitive dust associated with tower construction is not considered a potential significant impact. Construction work for towers and NMCs will be conducted under a Project environmental protection plan that will have provisions for dust suppression should it be necessary. During operation, antenna sites could be an insignificant source of fugitive dust resulting from trucks running over unpaved roads to access antenna sites for periodic maintenance. Very minimal, if any, earth disturbance will be necessary at NMCs as they will be located in existing facilities. The NMCs will not generate fugitive dust during operation.

Because the construction of antenna sites and NMCs is a temporary activity, fuel combustion emissions from mobile construction vehicles and heavy equipment are not expected to significantly impact local air quality.

Primary power for NMCs and antenna sites is expected to be provided by the public utility electric grid. Emergency power would be provided by stationary generators burning diesel fuel that is generally expected to be rated up to 50 kW/hr (with a potential for one generator rated up to 100 kW/hr). Because air contaminant emission rates for internal combustion engines are approximately linear in relation to power and fuel rate consumption the air impacts expected from these engines are approximately double (2X) those from the backup engines for antenna sites. Hourly and annual emission rates for generators of this size are presented in Appendix D, Table 3, - Study Area - Diesel Engine Emission Factors & Estimated Hourly and Annual Emissions.

Emissions of both Criteria Pollutants and Hazardous Air Pollutants (HAPs) would not produce mass emission rate quantities that would contravene NAAQS limits or the New York State Short Term or Annual Guideline Concentrations (See Appendix D, Table 4, Summary – Maximum Localized Impacts – Criteria Pollutants & Volatile Organic Hazardous Air Pollutants (VOHAPs). As such, air quality impacts associated with the proposed Project are not expected to be potentially significant.

Climate Change

DEC has found that emissions of CO2 may have an adverse impact on global climate. Sources of CO2 emissions include fuel combustion for electric and heat generating equipment, and vehicles. There are also natural emission sources, including solid waste decomposition. Direct emissions would include stack and fugitive emissions from combustion processes or industrial processes conducted on site, and from fleet vehicle use associated with a project. Direct emissions associated with the Project would be produced by power generating equipment (i.e. backup generators). These sources will contribute CO2, however, the emissions will not exceed levels requiring air registration or permitting.

Indirect emissions would include emissions generated by energy plants (off-site) supplying energy used on the site of a proposed facility during its operation, and from vehicle trips to or from the Project site during its operation where vehicles are not owned or operated by the Project sponsor (i.e. freight deliveries, employee commuting, customer visits), as well as generating, transporting, treating and disposing of solid wastes generated at a site. The Project may utilize public utility power for NMCs and antenna sites, however, antenna site demand for power is on the order of a single-family residential home. Given that NMCs are expected to be placed in

existing structures, increased demand for electricity would be negligible. Increased vehicle traffic associated with the Project will be negligible. Emissions associated with management of solid waste derived from the Project will be negligible in the context of regional solid waste management and disposal.

Overall, at a Project-wide level, increases in CO2 emissions will not be significant.

4.2.5 Agricultural Resources

The following agricultural resources were evaluated for potential significant impacts resulting from the Project.

- Agricultural Soils
    - Soil Compaction – construction equipment has the potential to compact agricultural soil in areas of high traffic volume.
    - Soil Burial – during excavation for construction, excavated soils may be placed over or mixed with fertile topsoil resulting in reduced crop production.
    - Soil Erosion – during construction the potential exists for exposed soils to be subject to erosion by the action of wind and precipitation.
- Occupation of Agricultural Land – there is a potential for new tower sites to be located on agricultural land, thus reducing the total acreage available for agricultural use
- Agricultural Land Management Systems
    - Drainage and Irrigation Systems – existing drainage and irrigation systems may be disturbed or destroyed during excavation or other construction processes, possibly reducing use of the area for agricultural purposes.
    - Buffer Zone – disturbance or clearing of buffer zones during construction of the Project may reduce the effectiveness of the buffer and/or adversely effect adjacent protected areas or surface water resources.
    - Erosion Control Measures – grading for access and placement of equipment may alter topography, interfering with methods used to reduce erosion in agricultural areas.
- Associated Agricultural Operations – construction may interfere with access to farm structures or facilities, and free movement of farm equipment.

The deployment of the Project does not require the occupation of a significant amount of land, and the potential impacts would be temporary in nature, primarily limited to the period of

construction and periodic maintenance. Collocation will not result in occupying any new land. New tower sites may require dedicating up to 1 acre of land, although the actual space occupied will be significantly smaller. Impacts to agricultural soils will not be potentially significant.

The instances of tower construction or operation interfering with agricultural operations will be negligible in the context of the overall acreage and farming activity in Cayuga County and its surrounding areas. Accordingly, the Project will not have a potentially significant adverse effect on agricultural operations.

4.3 HUMAN RESOURCES OF THE STUDY AREA

Human resources include: transportation; land use and zoning; community services; demography; visual resources; noise; historical and archeological resources; and, public health and safety. This Section describes the potential impact to the Study Area. Land use types are used to further distinguish potential impacts.

4.3.1 Transportation

Potential traffic impacts may result from both the construction and operation of Project facilities. Delivery of construction materials and large mobile equipment (excavators and cranes), and commuting site workers may temporarily increase the amount of traffic during the period of construction. Periodic maintenance will result in sporadic additional vehicle trips. The overall change in traffic intensity on area roadways will not have a significant adverse impact on existing traffic levels.

Antenna construction may involve crews of up to 15 workers. Adding up to 15 vehicle trips will not create a significant impact on traffic patterns. Therefore, the resulting potential traffic impact would be transient. Operation of NMCs will not increase current levels of permanent staff at this time, so no increase in vehicle trips is expected. Tower sites are unmanned and would need occasional visits by maintenance crews. Accordingly, transportation impacts will not be significant.

4.3.2 Land Use and Zoning

The zoning classification of parcels on which a Project facility will be located will not change as a result of the construction, reconstruction or collocation of a Project facility.

<u>Antenna Sites</u>

The County has established siting guidelines for locating antenna sites, favoring existing County or municipally owned facilities over new construction and siting on already developed land rather than undeveloped sites. Where practicable, preference will be given to adding antenna

equipment onto existing County or municipally-owned towers (collocations), or on the sides or rooftops of existing County or municipally-owned buildings (roof mounts). The siting guidelines place greater priority on sites that have existing development and/or prior disturbance. Antenna facilities may be located on undeveloped sites if the use of higher priority land types cannot fulfill the overall objectives of the Project.

Collocations will have minimal impact on existing land use. The land will already have been dedicated to telecommunications or other use, and the addition of more antennas and associated equipment will not alter or expand that use. Similarly, roof and wall mounts will have no impact on existing land use because the principal land use, whether residential, commercial, institutional or industrial will not be altered or expanded due to the location of an additional antenna. In fact, under most zoning ordinances, rooftop antennas are considered accessory uses to residential, commercial and industrial uses.

According to all objective criteria, antenna sites are, in fact, compatible with any land use. For the most part, the location of an antenna site in a particular area has no impact on surrounding land uses whatsoever. An antenna site does not physically interfere with or impede any existing or future land use. A more detailed discussion of radio frequency interference is provided in the Public Health and Safety Impact section of this DGEIS. An antenna site does not inhibit or preclude any existing or future land use except to the extent that the antenna site physically occupies a given space. Antennas generate no appreciable traffic, involve no movement, create no noise and emit no odor. They involve no hazardous activities. To the extent that there is antenna lighting (typically only on towers of 200 feet in height or more and others requiring lights by the FAA), it will not cause glare or intrusive light at street-level. There is no objective criterion that would support any incompatibility between use of a particular property for an antenna facility and any other adjacent or surrounding land use.

There is, however, a perception among some members of the public that use of property for antenna facilities is inconsistent with other land uses. This perception typically is related to the perceived potential visual impact of the antenna site, concerns over negative health effects from transmitting antennas, and the perception that land values may be compromised due to the presence of the structures. Visual and health-based effects are addressed in the Cultural Resources and Public Health and Safety sections of this DGEIS.

The perception that the adjacent location of an antenna site results in the reduction in value of surrounding properties is related primarily to the perceived aesthetic effects of antenna facilities. Any influence on development decisions for surrounding or adjacent property also results largely from the perceived aesthetic effects of antenna sites. The location of an antenna site in certain

areas may eventually result in a tendency toward the conversion of surrounding land uses from residential to more commercial or industrial uses. Such conversion may or may not be part of existing municipal comprehensive land use plans.

Newly constructed Project sites may potentially impact existing land use only in as much as the land selected will be permanently converted to a telecommunication use, at least for the duration of the Project. In other words, the land will not be available for alternative uses unless Cayuga County adopts an alternative emergency communications network some time in the future.

The coverage requirements for this Project pose the potential for antenna sites to be placed in a variety of land use areas. Newly constructed antenna facilities may be needed on property that is not expressly zoned for such use because system coverage requirements do not necessarily coincide with municipal land use borders. As a result, some antenna site locations may not be expressly authorized by local zoning, anticipated by the local master plan, or considered compatible with surrounding or existing land uses either by adjacent landowners or the community.

Although the antenna site typically has a small footprint, a slightly larger area must be secured for each previously undeveloped site to provide for security and maintenance of surrounding trees. This area is dependent on the type of structure, available land, security and maintenance requirements. In addition, an area with a radius of at least the height of the tower will be maintained around the tower for safety purposes. This may add to the perception that an antenna facility is unsuitable with respect to adjacent property and the "neighborhood." The presence of an antenna facility may have a perceived or real effect on the land value of adjacent properties. The real or perceived potential impact on land use or land value is unavoidable.

Wherever possible, Cayuga County will seek to accommodate municipal zoning and land use requests.

Network Management Center

NMCs are expected to be located in existing buildings. No impact on existing land use is expected because the building where the NMC will be located is already a part of the landscape, and most likely is already dedicated to public, commercial or institutional uses.

4.3.3 Community Services and Public Utilities

This section addresses the potential impact of antenna facility and NMC construction and operation on community services, including road maintenance, utilities, solid waste management and social services. Social services include those services as provided by the Office of Child and Family Services and the Office of Temporary and Disability Assistance, volunteer services,

educational resources, recreational facilities, emergency services (E-911 dispatch, law enforcement, fire, EMS and State military forces) and health care services.

Each community service must have the capacity to provide its product or service to the current population size. The provider may also take into consideration the rate of growth or decline in a population when making projections for budgeting and staffing purposes.

The potentially impacted social and emergency services associated with construction and operation of the Project include:

- Firefighting, police and EMS response
- Emergency Management (i.e. snow, flooding, natural disaster, nuclear plant evacuation)
- Utilities (gas, electric, and telephone)
- Solid waste management
- Public Services (i.e. snow removal, road maintenance and school buses)

Construction of antennas and NMCs will create, at most, a temporary, negligible increase in demand for community services. Population-dependent resources such as health care and social services, education, and recreational facilities will not experience an increase because no new permanent employees are anticipated as part of the Project. Additional resources may be needed for public services such as snow removal and road maintenance for new access roads associated with antenna sites. Overall, the Project will cause a negligible increase in demand on community services and utilities. *See also* Air Resources discussion above.

4.3.4 Demography and Environmental Justice

4.3.4.1 Demography

Due to the transient and short-term nature of construction activities, it is expected there will be no demographic changes as a result of the construction of antenna facilities or NMCs. Since Project operations at antenna facilities will only require periodic maintenance and will not require full time staff, no long-term demographic changes are anticipated.

NMCs are expected to utilize existing employees with no additional staffing at this time. Accordingly, no demographic changes would occur. Therefore, there is no significant impact expected for demography.

4.3.4.2 Environmental Justice

DEC has declared that EJ concerns should be incorporated into the application of SEQRA. DEC *Policy CP-29: Environmental Justice and Permitting* 1 (3/19/2003). The County shares this commitment and intends to upgrade the telecommunication system in a manner which does not impose a disproportionate share of the Project's negative environmental consequences, if any, on any particular racial, ethnic or socioeconomic group. To that end, Cayuga County will identify all "potential environmental justice areas" or "minority or low-income communities that may bear a disproportionate share of the negative environmental consequences" resulting from the deployment of the Project. *Id.*

EJ areas potentially present in the Study Area are illustrated on Appendix I, Figure 2- Study Area Potential Environmental Justice Areas. The location of Project facilities will be selected primarily according to performance or operationally-based standards, meaning that locations will be selected according to optimum coverage and other technical specifications. The location of these facilities will also be established in accordance with the Project siting guidelines; the order of preference focused toward existing structures or buildings and/or previously disturbed sites. Coverage requirements may necessitate siting some Project facilities in potential EJ areas as defined under DEC's current environmental justice policy guidance. Negative environmental consequences to such potential EJ areas may include, but are not necessarily limited to, the construction of new facilities throughout the Study Area, the erection of antennas on existing buildings, noise generation, inconsistency with surrounding neighborhood characteristics, radiofrequency and electromagnetic radiation and other issues. These consequences may be raised during the enhanced public participation and notification process. In all likelihood, no potential EJ area will be disproportionately affected by the deployment of the Project given that the potential impacts of any individual facility are the same as those forecast for areas that are not designated as potential EJ areas; it is likely that fewer Project facilities will be required in potential EJ areas than in other areas to achieve the same coverage; and the locations for Project facilities will be determined on an operational or performance basis and therefore be independent of socio-economic factors.

4.3.5 Visual Resources

The OFT GEIS includes a detailed Generic Visual Impact Assessment ("OFT GVIA") that utilizes DEC's Visual Program Policy on Assessing and Mitigating Visual Impacts to assess expected visual impacts across New York State's diverse landscapes. Because the Project includes components and structures visually similar to those examined in the OFT GVIA, similar potential visual impacts can be expected. Additionally, the seven Landscape Similarity Zones

("LSZs") included in the OFT GVIA fully encompass the landscapes of the Study Area. Therefore, the expected visual impact of Project antennas and structures would be the same as that described in the OFT GVIA and the OFT GEIS.

For the reader's convenience, certain portions of the OFT GVIA and the OFT GEIS (such as certain types of low profile installations) that are not relevant to the Project are not included in this DGEIS. The Project is described and referred to where relevant, instead of the SWN Project. However, because all of the LSZs are relevant to the Study Area and similar components to those of the proposed Project are reviewed in the OFT GVIA, and because of the generic nature of the OFT GVIA, the conclusions of the OFT GVIA remain accurate as applied to the Project. The OFT GVIA is incorporated by reference and is available at the public repository where this DGEIS is housed, the Seymour Public Library, 176 Genesee Street, Auburn, NY 13021.

The degree to which different landscape settings can absorb modifications or changes varies based upon the quality and configuration of elements within the landscape. The effect of a proposed modification to a visual resource is considered the visual impact. Some visual impacts are of little or no significance and some may be significantly adverse and can drastically reduce the quality of the visual resource. The type and magnitude of visual impact is determined through objective assessment of various elements, including, but not limited to, the sensitivity of the specific visual resource, the compatibility or contrast of the proposed project with existing landscape elements and the sensitivity of potential viewers (OFT DGEIS Cultural Resources, Appendix B).

Typically, a visual impact assessment is conducted for a project of known design in a specific location. Consequently, the analysis of potential visual impact generally involves a site/project-specific analysis, including the following:

- Identification of visually sensitive resources/receptors within the project study area (typically a 5 mile radius around the project site).
- Descriptions of specific viewer groups and landscape similarity zones/landscape units within the study area.
- Analysis of potential project visibility, including viewshed mapping, line-of-sight cross sections and field verification (ballooning) to determine where the proposed project may be visible within the study area.
- Computer-assisted visual simulations to show what the project will look like from representative/sensitive viewpoints within the study area.

- A visual impact assessment (utilizing a variety of established methodologies) to evaluate the potential visual impact of the project based on a comparison of existing photos and visual simulations.
- Conclusions and recommendations based on the results of the visual impact assessment, including consideration of visual mitigation techniques, if warranted.

The same general approach to visual impact analysis was undertaken in the OFT GVIA. However, because in both the SWN and the Project, detailed site and design information is not yet available, certain site-specific analyses could not be performed. Consequently, potential impacts to visual resources were assessed based upon generalized descriptions of the landscapes that occur throughout the State and reasonable assumptions regarding proposed facility design and siting. The complete OFT GVIA is found in Cultural Resources, Appendix B of the OFT DGEIS and is available at the public repository where this DGEIS is housed. The OFT GVIA identifies sensitive visual resources per the DEC Program Policy on Assessing and Mitigating Visual Impacts including, *inter alia*:

1. A property on or eligible for inclusion in the National or State Register of Historic Places (16 U.S.C. § 470a *et seq.*; N.Y. PARKS, REC. & HIST. PRESERV. LAW § 14.07 (McKinney 1980));
2. State Parks (N.Y. PARKS, REC. & HIST. PRESERV. LAW §§ 3.09 (McKinney 2003));
3. Urban Cultural Parks (N.Y. PARKS, REC. & HIST. PRESERV. LAW § 35.15 (1982));
4. The State Forest Preserve (New York Constitution, Article XIV);
5. National Wildlife Refuges (16 U.S.C. § 668dd), State Game Refuges and State Wildlife Management Areas (N.Y. ENVTL. CONSERV. LAW § 11-2105 (McKinney 1997));
6. National Natural Landmarks (36 CFR Part 62);
7. The National Park System, Recreation Areas, Seashores, Forests;
8. Rivers designated as National or State Wild, Scenic or Recreational (16 U.S.C. §§ 2701 *et seq.*; N.Y. ENVTL. CONSERV. LAW § 15-2701 *et seq.*(McKinney 1973));
9. A site, area, lake, reservoir or highway designated or eligible for designation as scenic (N.Y. ENVTL. CONSERV. LAW, Article 49 or DOT equivalent and APA Designated State Highway Roadside);

10. Scenic Areas of Statewide Significance (N.Y. EXEC. LAW §§ 42 *et seq.* (McKinney 1951));
11. A State or federally designated trail or one proposed for designation (16 U.S.C. §§ 1241 *et seq.*);
12. State Nature and Historic Preserve Areas; (New York Constitution, Article XIV);
13. Bond Act Properties purchased under Exceptional Scenic Beauty or Open Space category;.

For the Project, on a site-by-site basis, any such sensitive receptors will be identified and appropriate mitigation (including avoidance) will be considered.

The analysis undertaken in the OFT GVIA is consistent with the approach taken by the FCC, the NCSHPO and the ACHP in their development of the Nationwide Agreement for the Collocation of Wireless Antennas. Among other things, this agreement recognizes that the potential visual impact of projects involving multiple installations in a variety of geographic settings can be dealt with in a generic or programmatic manner.

Within the context of the required geographic coverage, Project facilities will be sited according to siting guidelines to minimize, to the maximum extent practicable, any potential environmental impacts from the siting of Project facilities. The guidelines make collocation on existing County or municipally-owned buildings, towers or structures the preferred option, to the extent feasible. If collocation is not feasible, Project antennas will be sited at existing or acquired County-owned sites. Sites will be selected in this order of preference to the extent feasible given Project coverage requirements. In instances where either area or geographic coverage is required and it is not feasible to collocate a Project antenna on one of the existing County facilities described above, will new construction activity be required.

The Project will involve the installation of between 7 and 15 interconnected receiving and transmitting antenna sites located throughout the Study Area. It will also include Network Management Centers.

The OFT GVIA grouped antenna sites into two general categories, referred to as either "high-profile tower sites" or "low-profile tower sites." For the Project, the height, scale and overall antenna combination will vary according to specific site location and final Project design. The following is a general description of the types of antennas and structures assessed in the OFT GVIA that were identified as high-profile tower sites and low-profile tower sites based upon a review of typical tower components and dimensions. It is noted that the high profile and low

profile tower descriptions generated for the OFT GVIA are generally consistent with the proposed Project as described below.

High-Profile Tower Site

The proposed high-profile towers studied in the OFT GVIA were expected to range from approximately 180 to 329 feet in height. Self-supported (i.e., un-guyed) steel lattice and steel monopole towers are the type of towers that are expected to be used. For the purposes of the OFT GVIA, it was assumed that all proposed towers will be galvanized gray in color, with one to four microwave antennas. The diameter of the microwave antenna will generally be 6 feet, but can be up to 10 feet. These antennas include ice shields above the dish and shroud covers over the dish. They will typically be light gray and white in color. The microwave antennas will be spaced vertically and horizontally. The top antenna was assumed to generally be installed 10 feet below the top of the tower with the next antenna 30 to 45 feet lower.

The OFT GVIA assumed that the other type of antenna expected for a high-profile tower is a LMR antenna. The LMR is a whip antenna less than 3 inches in diameter, with a maximum length of 15 to 17 feet. The OFT GVIA assumed that each tower would have up to two LMR antennas, in addition to the microwave antennas described above. The LMRs are typically off-white or light blue in color. A LMR antenna can be directional with the addition of a "wing" placed behind it on the tower. Each wing is a grid of thin metal rods that extend the full length of the LMR and 12 inches on either side.

It is noted that the Project proposes use of microwave antennas that will not be larger or more numerous than those described in the OFT GVIA, as well as use of whip antennas consistent with those described in the OFT GVIA, or antennas that include grid or panels at the top. If grid antennas are used, they are generally expected to range in length from 5 to 10 feet, and 8 to 12 inches wide.

Because the grids do not extend the full length of the antennas like the wings on the LMR antennas studied in the OFT GVIA do, and because they extend horizontally out from the antenna at a comparable width to the wings on the LMR antennas, it is reasonable to expect the visual impact from the grid antennas to be comparable to that of the LMR antennas with wings described in the OFT GVIA. Further, in many cases where grid antennas may be used for the Project, they could be shorter than the whip antennas described in the OFT GVIA.

The OFT GVIA assumes that each LMR antenna will require one coaxial cable, three-quarters to 1 inch in diameter and that each microwave antenna would include a cable known as a "wave guide" with an elliptical cross section of 2.25 inches by 1.33 inches. The OFT GVIA further assumed that the necessary cables for each antenna site would be attached by a cable ladder,

which runs along one vertical side of the tower and accommodates all antenna cables needed for the tower. These ladders were assumed to be unpainted galvanized steel with a gray appearance. In the case of monopoles, all cables were assumed to be installed in the inside cavity of the pole and thus are not visible from the outside.

To protect the cables and wave-guide from ice damage, the OFT GVIA presumed that each tower site would also include an ice bridge. Ice bridges are typically located on the lower quarter of a tower and are generally 10 feet to 15 feet long. An ice bridge is typically installed in the base compound. This base compound typically includes a one-story metal building 16 feet by 12 feet in size that houses a back-up generator and other equipment. Consistent with the Project, the OFT GVIA assumed that typically, a tower site also will include perimeter fencing around the base compound. The fence will be a 6-foot high chain link with three strands of barbed wire along its top.

The OFT GVIA assumed that towers under 200 feet would not require aviation warning lights or color marking. If the FAA requires painting, the scheme (generally, orange and white) is specified per tower. If aviation lighting or marking of any antenna site is required for the Project, it will have to be dealt with on a site-specific basis.

Low-Profile Tower Site

As relevant to the Project, a Low Profile Site will include an antenna mounted to an existing utility pole, building, electrical transmission tower, water tower, bridge, tunnel or silo. The OFT GVIA assumed that the antenna type would vary, but anticipated that 80% of the antennas for the low-profile sites would be "whip antennas." The Project is expected to include either whip or grid antennas described above, which are both expected to be similar for purposes of visual Impact. The OFT GVIA assumed that each low-profile pole could have one whip antenna, typically 10 feet in length and light blue or white in color. Two-thirds of the whip antenna will extend above the pole, with one-third of the antenna anchored to the pole. The OFT GVIA also assumed that in addition to the whip antennas, some of the low-profile sites would include a parabolic grid microwave antenna (*see* OFT DGEIS Appendix B of Cultural Resources, Appendix B). These microwave dishes will generally be 24 to 30 inches in size and gray in color.

For the Project, the use of alternate structures including existing utility poles, buildings, electrical transmission towers, water towers, bridges, tunnels or silos will depend on the ability of these structures to meet various performance and safety requirements.

PHYSIOGRAPHIC SETTING

The following list of landscape settings were included in the OFT GVIA.

Undeveloped Coastline

The dominant feature in this landscape is water that extends to the horizon and meets a large expanse of open sky. The shoreline may include sandy beach, cobbles, cliffs and/or dunes. The vegetation in the immediate environment is usually low and scrubby. Human activity usually is limited to passive recreational use. Examples of undeveloped coastline exist in places along portions of the Lake Ontario shoreline.

Developed Coastline

Open water is the dominant feature but it is frequently interrupted by docks, piers and/or boats. The shoreline may include natural beach or may be bulkheaded or otherwise structurally reinforced. A developed coastline will include ports, marinas and shorefront commercial, residential and recreational facilities. Human activity is varied and plentiful.

Wooded Hills

In this setting the vegetation is primarily mature deciduous forest that occurs in a variety of topographic settings, most typically rolling hills or dissected ridges/plateaus. Water resources are generally limited to small streams meandering through valleys.

Forested Mountains

Forest vegetation in this landscape usually includes a mix of mature deciduous and coniferous species. Rugged mountainous topography creates a dramatic background and typically frames open views. Open/bald mountaintops offer long distance views, whereas forest in other areas generally blocks views. Significant lakes, rivers and streams occur in the valleys and in combination with the mountains, create a dynamic mix of landscape elements. Human activity includes recreational land use, but few man-made structures.

Undeveloped Lakeshore

In this landscape, the dominant visual feature is an open body of water that is enclosed by vegetated shoreline. The shoreline typically is defined by deciduous and/or coniferous trees, but can also include fields and hedgerows. Surrounding topography is typically hilly to mountainous and there is little or no beach or exposed shoreline. The open water and vegetated shoreline define the foreground and allow open long distance views. These foreground elements also frame views of background features. Examples include the undeveloped portions of Cayuga and Owasco Lakes.

Developed Lakeshore

The dominant natural feature is water, with surrounding hills and mountains typically in the background. However, the natural shoreline is interrupted by man-made features, such as seasonal homes/camps, boathouses and docks. Human activity along the shoreline can be fairly intense and includes boating, fishing, swimming, water skiing and other water sports. The foreground that frames the water views includes both man-made and natural features. Examples include the Village of Cayuga on Cayuga Lake.

River Valley

This type of landscape is typically dominated by a linear water feature such as a major river or stream. The water may include rapids, white water or visible current/tidal flow. Trees and hedgerows typically border the river shore, but vegetation is varied and can include riparian forest, wetlands and farm fields. Landform is generally level in the foreground but hills or mountains define the valley limits. Land use tends to be rural (agricultural and/or wooded) and includes scattered rural residences and agricultural buildings/structures.

River Gorge

Landscape features in this setting are similar to those of a river valley setting but are distinguished by a steep gorge or ravine along the river. The scale of the gorge or ravine is the dominant character-defining feature. A river gorge typically provides dynamic open views from the rim, but views from the interior are blocked by steep topography and/or wooded vegetation. Frequently river gorges will include waterfalls or rapids and are often designated as recreational or scenic sites.

Rural Agricultural

The topography in this setting will vary from hilly to flat, with a mix of open fields (crops and pastureland), woodlots and hedgerows. Water features are usually not a major feature, but may include farm ponds and small streams. The dominant land use is agriculture; and farm structures/equipment, such as large barns, silos and tractors, as well as livestock in open fields are significant components of this landscape. Rural residences are scattered along a network of country roads throughout rural agricultural settings. The open character of the landscape and the patchwork of farm fields and woodlots provide abundant and attractive long-distance views.

Rural Hamlet

The dominant feature in this landscape is a cluster of residential structures in a largely rural setting. These areas may have a small commercial center and are usually located at an intersection of two rural roadways or crossroads. Historic structures of varying significance are

often present. Water features are typically absent or insignificant. Open views into the adjacent countryside are framed by the foreground buildings. The components of a hamlet are usually at a pedestrian scale.

Village

This landscape typically consists of a concentration of residential structures with a commercial business core. Historic structures and/or historic districts are often present. The structures may be of a vernacular material or style, but typically include a mix such as Victorian, Greek revival and Italianate. Vegetation consists of large street trees, landscaped yards, and parks. The streets are typically organized in a grid pattern. Views are oriented along the streets, with long distance views generally being limited due to screening provided by foreground buildings and trees. More modern commercial and industrial facilities are typically located on the periphery of villages. Water features are generally small or absent.

Suburban Residential

This type of landscape consists of recent residential development along existing road frontage, as well as residential subdivisions with curvilinear roads and cul-de-sacs. These moderate- to high-density residential developments include larger yards and relatively modern homes of varying architectural styles and materials. The landscaped yards sometimes abut remaining undeveloped woods and fields. The topography is typically level to gently rolling and water features are generally small or nonexistent. Roads and automobiles are a dominant feature and pedestrian activity is restricted to yards and developed recreational facilities. Outward views are highly variable, depending largely on the age and abundance of trees in the yards. This type of setting usually surrounds a village or urban area.

Suburban Commercial

This landscape setting generally consists of strip developments along a highway, including retail stores, automobile dealers, shopping centers and malls. Topography is typically level with no significant water features and vegetation restricted to remnant trees and landscaping around buildings. Views are focused along the axis of the highway and the foreground is dominated by buildings, automobiles and pavement (roads and parking lots). The surrounding landscape can vary from suburban residential, to farmland, to forested hills.

Urban Downtown

This landscape occurs in the center of a city and is characterized by high-rise buildings with the streets in a grid pattern. The landscape is defined by a variety of built features and architectural designs. This setting usually includes wide sidewalks with street lights, benches, trash

receptacles and intense pedestrian activity. The sidewalks are lined with retail stores and office entrances. The streets are congested with automobiles, and vegetation is limited to street trees, planters and pocket parks. Water features are generally lacking. Views are directed along the axis of roads with tall buildings framing (or blocking) most outward views.

Urban Residential

This setting typically is dominated by two- to four-story masonry apartment blocks, single family and multiple family homes. The streets are generally organized in a grid pattern and lined by narrow sidewalks and street trees, which can be fairly large. Vehicles are parked along the streets and there are small landscaped front and/or back yards. Human activity is concentrated on sidewalks, streets, front porches and yards. Water features are typically lacking. Views are along the axis of streets and are often framed/screened by street trees and buildings.

Urban Commercial

This landscape is defined by buildings that are usually two- to four-story masonry structures with retail storefronts along the sidewalks and upper floors that are used as offices and apartments. The streets are arranged in a grid pattern, are busy with traffic, and accommodate on-street parking. Vegetation may include street trees and planters, or there may be none. Neither water features nor landform contribute significantly to the visual character of an urban commercial setting. Views along the streets are framed/screened by adjacent buildings.

Industrial

This setting is dominated by an often haphazard mix of man-made structures associated with manufacturing, warehousing, utility and transportation-related activities. An industrial setting often occurs along the outskirts of urban and village areas. Views are typically dominated by utilitarian, man-made structures, which limit and often reduce the quality of views to the surrounding landscape. If located near waterfronts or ports, some industrial sites may include significant open water views. The topography is generally flat and vegetation is limited or lacking. Pedestrian activity is generally insignificant, as most activity typically occurs within the industrial facilities in such areas.

Highway

This setting is dominated by divided, multilane roads with limited access. Views along road corridors are dominated by automobiles, pavement, guardrails and signs. Views are focused on the roadway and associated traffic. Outward peripheral views are fleeting. The surrounding scenery is highly variable, ranging from urban downtown to forested mountains, but in all settings there is little to no pedestrian activity.

Viewer Groups

The importance of scenic resources may be affected by their accessibility. A resource may be more valuable if it is readily available and viewed by many people. While still of value, views that are not accessible by conventional means or are accessible to only a few people may be considered less important than a scenic vista seen by many people. Similarly, the activity in which viewers are engaged can affect their sensitivity to visual change within the landscape. Viewer groups that may be exposed to the Project (receptors) include local residents, business employees, through travelers/commuters, or tourists who may view the landscape from their homes, their cars, or while engaged in recreational activities. .

OFT GVIA Methodology

The list of landscape zones discussed previously was consolidated for the OFT GVIA. This was accomplished by performing a Geographic Information System ("GIS") analysis of landform (slope), vegetation and areas of development over the entire State. *See* OFT DGEIS Cultural Resources, Appendix B, Figure 3). The GIS analysis illustrates that broad areas of the State can be defined based on this combination of landscape features. Interpretation of this data lead to a further simplification of landscape definition based primarily on land use and level of development, because these were usually associated with fairly typical landform, vegetation and water characteristics. The result of this review was the definition of seven discrete LSZs that would serve as the basis for the OFT GVIA. These LSZs include the following:

1. Village – Characterized by high-density development. Vegetation and landform may contribute to visual character (e.g., street trees), but dominant features are moderate sized buildings (often older/historic) generally two- to four-stories in height.

2. Suburban Residential – Characterized by moderate density residential development, with buildings typically one- to two-stories in height. Buildings are more spread out than in a city or village setting. Landform and vegetation are highly variable, but these areas are generally characterized by mixed vegetation and level to gently rolling topography.

3. Suburban Commercial – Characterized by moderate to high-density commercial development, generally along a major highway. Vehicles, signs and one- to two-story commercial structures are the dominant features. Landform and vegetation may be perceived in the background, but do not define the character of the zone.

4. City – Characterized by high-density development. Vegetation and landform do not typically define visual character. Dominant features are large buildings over four stories tall.
5. Rural Agricultural – Characterized by open or mixed vegetation and landform that ranges from level to hilly. Development is characterized by low density/scattered rural residences and farms. Major water features (rivers and lakes) may be present but are not typical.
6. Rural Wooded – Characterized by closed vegetation and generally rolling to mountainous landform. Low density/scattered residential development may be present, but is often screened from view by trees. Open long distance views are generally restricted to views from mountain tops, highway corridors and across lakes. Lakes, reservoirs, rivers and streams are often present in this LSZ.
7. Coastline – Characterized by the presence of a large body of open water (e.g., Cayuga Lake or Lake Ontario). Vegetation at the coastline is open to mixed, and topography is generally level to gently rolling. Shoreline development, other than cities and villages, is typically low density residential and recreational.

Field review of these LSZs involved photo documentation of typical views within each of the seven LSZs described above. Photos were obtained in clear weather conditions from locations ranging from the Adirondacks to Long Island and from the Hudson Valley to Western New York. Representative photos were obtained from cities, villages, suburbs, rural agricultural areas, rural wooded areas, lakeshores and seashores. Samples of these photos are presented in the OFT DGEIS Cultural Resources, Appendix B, Figure 4. Each of the seven LSZs are present in the Study Area.

Because the exact facilities that will be installed at any given location as part of the SWN were unknown for purposes of the OFT GVIA, some assumptions were made regarding the most likely facilities that would be installed. As discussed above, antenna installations were assumed to fall into one of two broad categories. High-profile sites will generally be installations on new or existing towers which are assumed to be under 200 feet for purposes of the OFT GVIA. (A few towers may exceed 300 feet in height.) However, for towers exceeding 300', given that their potential visual impact will be significantly greater due to their height and FAA lighting and/or color marking, it is assumed that such towers will require additional assessment and are not being evaluated as part of this DGEIS.

The OFT GVIA assumes that the most common high-profile sites are likely to include two LMR antennas and one to four 6-foot diameter microwave dish antennas mounted on existing or new

structures in the range of 180 to 189 feet. For the OFT GVIA, "worst-case" high-profile scenarios were developed assuming the installations would be one of the following:

- New 199 foot steel lattice tower with four 10-foot diameter microwave dish antennas and two 14.5-foot long LMR whip antennas.
- New 199 foot steel monopole tower with four 10-foot diameter dish antennas and two 14.5-foot long LMR antennas.
- Addition of four 10-foot diameter dish antennas and two 14.5-foot long LMR antennas to an existing steel lattice antenna.
- Addition of four 10-foot diameter dish antennas and two 14.5-foot long LMR antennas to an existing steel monopole tower.
- All of these installations would include associated equipment such as cable runs, ice shields and generator buildings.

For purposes of this DGEIS, the types of towers and antennas reviewed in the OFT GVIA are visually consistent with the proposed features of the Project. The second broad category of facility type is referred to in the OFT GVIA as "low-profile." These facilities would include the addition of a single 10-foot long LMR antenna and a single 18- by 36-inch parabolic grid microwave antenna to either: (1) an existing wood utility pole; (2) a suitable existing support structure such as a water tank or transmission line tower; or (3) a new 60-foot wood pole. For purposes of this DGEIS, those low profile simulations on suitable existing support structures are consistent with the Project.

Computer models of each of the high-profile and low-profile antenna scenarios described above were prepared as part of the OFT GVIA. The OFT GVIA assumed that all new towers would be unpainted galvanized steel. LMR antennas were assumed to be light blue in color, while microwave dishes were assumed to be gray and white. To allow for consistent evaluation of the addition of antennas on already built towers in all selected LSZ photos "existing" towers with cellular antennas also were created for the OFT GVIA. The computer models are shown in detail in the OFT DGEIS Cultural Resources, Appendix B, which is incorporated by reference and available at the address indicated at the beginning of this subsection.

A single representative photo was selected for each of the LSZs being evaluated in the OFT GVIA. Photo selection was generally based on the following criteria:

- The photo was representative of the LSZ in terms of vegetation, landform and development density.

- The photo was of relatively high scenic quality and/or good aesthetic composition. Consequently, water, dynamic landform and/or vegetative diversity were considered desirable features.
- The photo allowed placement of visible towers/antennas in the foreground (0-0.5 mile), midground (0.5-2 miles) and background (greater than 2 miles).
- The photos provided representative viewer orientation relative to the proposed facilities. In most cases this would be an inferior viewer position (i.e., looking up at the tower/antennas against the sky). However, photos offering elevated or superior viewer position were also included to illustrate those perspectives as well.
- Photos for the low-profile sites were from typical roadside vantage points where such installations might be necessary to provide additional signal coverage.

Selection of a particular photo in no way indicates that Project antenna sites will be installed in that particular location. The photos of specific sites are simply representative of a type of landscape into which antenna sites could be placed.

For each of the representative LSZ photos, simulations were created in the OFT GVIA illustrating the four high-profile antenna scenarios described previously at three different distances. The typical low-profile scenario was illustrated at foreground distances in each of four representative photos and at midground distances in two of these photos. Because these facilities would not be perceivable at background distances, no simulations of background distance low-profile installations were prepared as part of the OFT GVIA.

To evaluate the possible high-profile antenna scenarios, simulations of new antennas on "existing" lattice and monopole towers were compared to photos showing only the simulated existing towers in each LSZ photo in the OFT GVIA. This comparison was made for foreground, midground and background installations. Similarly, simulations of new antennas on new lattice and monopole towers at foreground, midground and background distances were compared to a photo of the existing view without any towers in place in the OFT GVIA. To evaluate possible low-profile antenna scenarios, photos from typical highway vantage points were evaluated with and without the proposed Project facilities in place.

OFT GVIA Results

High-Profile Installation

Village LSZ

As is typical in most downtown village settings, existing trees and structures, older (perhaps historic) masonry and clapboard sided structures, flags and street trees present an attractive pedestrian-scale streetscape. These elements also significantly screen longer distance views. Automobiles and overhead utility lines are also prominent features of this view. The latter add significant clutter to the view and detract from the otherwise attractive scene.

To illustrate visibility of midground and background antenna facilities, the base elevation of these facilities had to be raised significantly, as if a hill were present, to allow them to be seen above the treetops. Without raising the base elevation, these facilities would have been completely screened from view.

Worst-case scenario near foreground views or approximately 650 feet from the viewer, of new antenna sites in the Village LSZ may be potentially impacted by the scale, color and land use contrast presented by the facility. Although the lattice structure is less solid/massive, its scale and land use contrast may still be very strong. At midground distances, this impact decreases dramatically, even with the towers clearly visible above the tree line, which would not normally occur in this or most other village settings. At this distance there is some change in the character of the view, but for both the monopole and lattice towers, the impact was limited. This results largely from the presence of existing overhead utility lines that appear similar in line, scale and use with the midground antenna facilities. It should be noted that in those relatively few villages where utilities have been placed underground, the impact of such midground facilities is likely to be greater. At background distances, even when extending well above the treetops, the new towers are essentially lost among the overhead wires and poles and do not alter the character of the view. Due to the slender profile and light color of the towers, this would likely be the case even if the overhead utilities were absent. Notwithstanding, without elevating midground and background views there is essentially no impact due to screening.

For those scenarios that involved adding new antennas to existing towers, the potential impacts were largely the same. At the near foreground distance illustrated in the worst-case simulations, the new dish antennas appear large, modern and industrial. As such they are out of character with this traditional village setting. Due to the proximity of the tower to the viewer, the LMR antennas are actually visible, but will not likely be perceived as new elements. In contrast to the foreground view, when the antennas are placed on towers in the midground and background, the visual change/impact will generally be minor or imperceptible, even when unobstructed views of

the new antennas are available. This is due to the relatively small size of the antennas at this distance, and the presence of the existing overhead lines, poles and trees that already clutter the view.

Suburban Residential LSZ

In the Suburban Residential LSZ, the houses and trees serve to partially screen long distance views, but the open yards and driveways and the wide spacing of the houses allow for views out to the midground and background.

In considering worst-case antenna scenarios that involved the installation of new towers, impacts at both foreground and midground distances in this LSZ may occur. New towers and dish antennas in the foreground contrasted with the existing landscape in their scale and land use connotation. At this distance, the monopole tower and dish antennas appear quite large, while the lattice tower has an industrial feel that is out of place in a residential neighborhood.

If an antenna were to be placed on a midground hilltop in this LSZ, an impact may occur due primarily to the hilltop placement of the antenna, which accentuates its vertical line and creates a focal point for the viewer's eye. Although this effect is less pronounced with the lattice tower, the tower's vertical line contrasts strongly with the horizontal hilltops, rooftops and background horizon. Due to their height, the midground towers will likely appear out of scale with their surroundings. However, no impact is anticipated in a distant background location, even when viewed against the horizon as the towers and antennas will likely be difficult to perceive.

In contrast, where new antennas would be added to existing towers, a potential significant impact may be anticipated to occur only with the foreground installations. The addition of the dish antennas to the relatively clean, simple monopole tower created additional visual clutter and scale contrast. The effect was somewhat less with the lattice tower, because this structure already presented a strong industrial feel. However, the addition of the four dish antennas still increased visual clutter and overall scale and land use contrast. Although the LMR antennas were noted as being visible at this distance, they were generally not identified as contributing to the facility's potential visual impact.

At midground distances, the addition of the four dish antennas to existing towers may make the structures visually "heavier," but the effect is mitigated by distance such that the overall change is relatively minor. At the background distances, any visual change resulting from addition of the four antennas to an existing tower were essentially imperceptible.

Suburban Commercial LSZ

In the Suburban Commercial LSZ, pavement, automobiles, overhead utilities and signs dominate the view. Although some street trees and lawn areas are present, vegetation is generally sparse and topography is relatively flat. The area is visually cluttered and haphazard, with no unifying architecture or streetscape design. Viewers in this area will primarily include local residents involved in shopping, along with business employees and commuters. Most will view the landscape from either automobiles or parking lots. Once inside the commercial structures typically found in these areas, views to the outside are either unavailable or very limited.

In the Suburban Commercial LSZ, high profile installations are not likely to impact the character of the existing view at midground or background distances. The midground and background installations (both new towers and new antennas on existing towers) essentially will be lost in the clutter of poles, towers, signs and overhead lines present in the view. Even new tower installations at foreground distances are not expected to contrast significantly with the existing landscape. However, the new towers and antennas will add a new element to an already cluttered landscape. The presence of numerous vertical poles and towers in the view, along with the variety of man-made colors, textures and forms, will minimize the contrast of any new facility. It should be noted that most areas of commercial strip development are linear and surrounded by other LSZs. Placing a tower in this LSZ may potentially impact adjacent LSZs and viewers if the tower is visible but other components of the commercial area are screened from view.

City LSZ

The landscape character of the City LSZ is defined by buildings of multiple heights, architectural styles and building materials, rather than by vegetation, landform or water resources. Within a City LSZ, antenna sites will often not be visible from midground or background views at street level due to the screening provided by buildings of multiple heights which limit long range views. At street level views are largely limited to the near foreground. For rooftop installations, only small portions of even these foreground facilities will be visible.

Many residents, business employees and some tourists view the cityscape from upper floor windows and balconies and, therefore, an elevated viewpoint was also analyzed. This viewer perspective allows for views of more of the proposed antenna facilities at a greater variety of distances.

Lattice and monopole towers, as well as the dish antennas, may present strong contrast from elevated viewpoints at foreground distances. Although the built structure and its vertical orientation are consistent with other built features in the view, which include existing microwave

antennas, the color, form and character of the high profile installation towers and antennas in the worst-case scenarios discussed previously may seem out of place. At midground distances, similar but less pronounced impacts may occur. At background distances, the new tower scenarios appear compatible with the existing landscape. At this distance, their scale is subservient to the buildings and comparable to other vertical stacks, light stanchions and poles present in the view. As noted previously, from street level viewpoints, midground and background installations (i.e., those over 0.5 miles away) almost always would be fully screened from view in a city setting.

Foreground and midground views potentially are impacted if four 10-foot diameter microwave dish antennas are added to existing towers. Foreground and midground installations presented potential impacts due to the larger bulk, color and arrangement of the dish antennas. The antennas tend to draw the viewer's eye toward the towers, which by themselves are simpler and in scale with their surroundings. Only at background distances do the new antennas on existing towers appear small enough so as to not alter the character of the existing view. At foreground distances, the LMR antennas are visible. However, even when visible, they are considered compatible with the existing character and quality of the view.

Rural Agricultural LSZ

This landscape is characterized by a patchwork of open fields, wood lots and hedgerows. Due to the abundance of open fields (especially in hilltop locations), unobstructed, long distance views are common in this setting. As this is a generic analysis and to ensure that as many potential antenna sites as possible have been evaluated, the analysis of the potential visual impact in the Rural Agricultural LSZ was conducted assuming an elevated viewpoint. Although this viewer perspective may not be typical in many agricultural areas, it was selected to allow evaluation of the various high profile antenna scenarios from all distances. In settings with rolling or hilly topography, inferior (ground level) viewer perspectives often will not allow views to midground or background distances or views of ground facilities associated with the antennas.

In the Rural Agricultural LSZ, antenna sites involving new tower construction are likely to have visual impacts at foreground and midground distances. In situations with elevated viewer position, new towers (even in the foreground) are likely to be viewed against a vegetated background, rather than the sky, which significantly lessens visual contrast, especially when a lattice structure is used. On the other hand, the elevated viewer position also allows a clear view of the ground facilities, which contributes to the potential adverse impact noted for the foreground views. Foreground and midground views have the potential for impact if the new towers are sited on prominent ridges or hills. In a background location, although the vertical line

of the new tower extends above the horizon and contrasts with the strong horizontal lines in the landscape (e.g., horizon line, hilltops, field edges and hedgerows), the effects of distance will significantly reduce the overall potential impact of these high profile installations.

Limited potential adverse impact to the foreground, midground or background view is anticipated when new antennas are collocated on existing towers, as the addition of antennas is not anticipated to significantly alter the character of the view. LMR antennas are not considered perceptible at any distance.

Rural Forested LSZ

In the Rural Forested LSZ, other than from lakeshores, open water or exposed mountain tops and overlooks, most long distance views will be screened by foreground trees. However, the uniqueness of these open views significantly enhances their value. Where such views are available, they are likely to be high quality scenic views that are appreciated/valued by viewers who have sought out these locations.

In the Rural Forested LSZ, visual impact associated with construction of new towers will occur at all distances. Potential impact is likely to be greatest at foreground distances and primarily the result of the tower itself and the light colored microwave dish antennas. This potential impact is lessened with use of a lattice tower and with increasing distance from the viewer. It should be noted that the lattice towers will likely blend better with background vegetation and might be imperceivable if they are darker in color. However, even a lattice tower at background distances is likely to contrast with the rolling hills and horizon line.

In contrast, the collocation of antennas on existing towers in the Rural Forested LSZ would significantly reduce potential adverse impact. Potential impacts will likely be limited to installations in the foreground distance zone. At this distance, the form and color of the dish antennas may be in contrast with the existing landscape. However, at midground distances, this contrast will be greatly reduced and at background distances essentially will be imperceptible. LMR antennas will not be perceptible at any distance.

Coastline LSZ

In the Coastline LSZ, open water, beach and flat topography allow for unobstructed long distance views along the shore. Inland views are screened partially by foreground trees and houses.

In the Coastline LSZ, absent mitigation as described in later sections of this DGEIS, construction of new towers may have a potential adverse impact at foreground and midground distances. This potential impact relates primarily to the scale and land use contrast presented by the towers and

dish antennas in the foreground and midground views and the vertical line of the towers, which breaks the horizon line at all distances. In a coastline setting, where vegetation, hills, and structures are all relatively low, the towers will present a contrast in height and scale. This potential impact may be reduced with use of the more open lattice towers.

For installations that involve the addition of new antennas to existing towers, any potential adverse visual impact will be limited to foreground and perhaps some midground views. At these distances, the dish antennas likely will still complicate the simple form of the existing monopole tower. This effect is less pronounced with the lattice tower, which already presents a more complex form. At background distances, addition of antennas to the existing towers is not anticipated to change significantly the character of the views. The LMR antennas will not have an adverse impact at any distance.

For high profile installations in all of the seven LSZs, it is critical to note that the OFT GVIA assumes a worst-case scenario involving four 10-foot diameter microwave dish antennas on high-profile installations. This conservative analysis was necessitated by the generic nature of the visual impact assessment to ensure that as many potential facility configurations as possible were fully analyzed. However, it is anticipated that the typical high-profile installation for the Project will use smaller 3- to 8-foot diameter microwave dish antennas. Also, many high-profile installations may need fewer than four dish antennas. As found in the OFT GVIA, reducing the number and size of dish antennas on high-profile installations has the potential to reduce visibility and significantly lessen any potential visual impact of the facility.

As described above and more fully discussed in the mitigation of impacts section of this DGEIS, use of the siting guidelines on a Project-wide basis and selective siting of facilities on a site-specific basis are anticipated to reduce greatly the potential impact of the high profile installations in any of the seven LSZs both overall and on a site-specific basis.

Low-Profile Installations

Low-profile antenna sites generally will involve the installation of a LMR antenna and a parabolic metal microwave antenna, along with associated cables and ground equipment.

An analysis of the potential impacts of proposed low-profile facilities attached to an existing silo, water tank and high voltage transmission line tower was conducted in the OFT GVIA. The addition of these facilities is not anticipated to change significantly the character of the view. The built silo, water tank and high voltage transmission line tower will remain the dominant features in these views, and the addition of a minor new component to this structure is not considered a substantial change. It will be similar to other antennas that may already be placed on top of these structures.

As the low-profile installations had no significant visual impact at foreground and midground distances, evaluation of potential impact at greater distances (i.e., background) was not considered necessary in the OFT GVIA.

In sum, the visual impact analysis contained in the OFT GVIA finds:

1. Low-profile installations, including those constructed on existing built structures, generally will not result in adverse visual impact, even at foreground distances. The only exception to this may be in situations where a facility is placed directly in front of a significant historic site, scenic overlook or other recognized sensitive visual resource.
2. In any landscape setting and at any distance where potential adverse visual impact was noted, collocation of the high-profile antennas on existing towers or other structures always will reduce potential impact when compared to new tower construction.
3. For high-profile installations, siting is the critical determinant of visibility and potential visual impact. In almost any landscape setting, the degree of potential visual impact will be primarily associated with tower location relative to the viewer and other aesthetic features in the landscape.
4. Opportunities to reduce tower height and number and size of dish antennas on the high-profile installations have the potential to reduce visibility and potential visual impact in any setting.
5. Exclusive of the support structure, the LMR whip antennas do not contribute to the visual impact of any of the high-profile antenna scenarios in any setting or at any distance.
6. Only from near foreground or elevated/superior vantage points are ground facilities likely to contribute to a project's potential visual impact.
7. In most settings, background installations (i.e., over 2.0 miles from the viewer), even these involving new tower construction will have limited potential visual impact. This is especially true for the addition of new antennas to existing towers. This change is essentially imperceptible at background distances.
8. Placement of high-profile facilities in certain landscapes with diminished aesthetic quality and/or low viewer sensitivity, such as a suburban commercial area, will have minimal visual impact, almost regardless of distance. It can safely be assumed that the same is true for industrial areas. However, it must be

recognized that facilities in such locations may also be visible from adjacent landscape settings of significantly different character/quality, and could have an adverse affect on these adjacent settings.

9. Lower elevation viewer position will generally increase the potential visual impact of high-profile facilities, because they will be viewed against the sky rather than background vegetation or structures. One exception to this may be in a city or village setting, where street level views are typically screened by foreground buildings and trees and elevated viewpoints may provide unobstructed views of the facilities.

10. High-profile facilities, whether on new or existing towers, and regardless of distance, are likely to have a potential adverse visual impact on pristine natural sites (e.g., undeveloped coastline) where other man-made features are absent from the landscape and an individual siting analysis will need to be undertaken.

Because of the similarity of the proposed Project to the high profile and low profile installations examined in the OFT GVIA, these conclusions accurately describe the potential visual impact from the Project. Additionally, the recommendations regarding further study for towers meeting certain conditions as described in the OFT GVIA is appropriate for the Project.

4.3.6 Noise

In general, noise is a type or form of sound that is unpleasant or otherwise objectionable to the receptor. The amplitude (loudness), frequency (pitch), impulse patterns and duration (persistent or intermittent nature) of sound all affect the potential for a sound to be judged as noise. The combination of the nature and type of sound, its other characteristics (i.e., pleasant, annoying or the highly objectionable), environmental factors and the physical and mental sensitivity of the receptor to a particular sound determine whether or not a sound may be perceived as a noise.

Numerous environmental factors determine the actual level or even the perceptibility of sound at a given point of reception. These factors include:

- Distance from the source of sound to the people hearing it (i.e., receptors).
- Surrounding terrain.
- Ambient or background sound levels.
- Time of day.
- Background setting.
- Wind direction and speed.

- Temperature gradient.
- Relative humidity.

Potential noise impacts are assessed taking into account these factors, as well as, qualitative and generally accepted quantitative sound evaluation techniques such as SPL impact modeling. Often, what is soothing at low amplitude may become objectionable at higher amplitude and classified as noise. These general considerations have been applied in assessing the presence of noise and the significance of its potential impacts in relation to Project sites.

Most of the sources of sound identified for this Project are typical of daily life. These sources include the sound of construction and maintenance vehicles, vehicle and stationary engines, compressors, pumps and fans. In rural, open space, recreational or parkland settings, these may constitute a potential noise impact. In major or minor metropolitan areas, service vehicle noise or generator engine noise during power outages may occur.

Increases in SPL ranging from 0 to 3 dB typically have no appreciable effect on receptors regardless of setting or land use types. Most people cannot perceive an increase in noise in this range and at these levels, no adverse impacts are expected. SPL increases from 3 to 6 dB may be heard in circumstances where only the most sensitive receptors are present at locations such as historic sites, cemeteries and parks. Increases of 6 to 9 dB would likely be heard as faint sound depending on existing SPLs, surrounding land use type, landscape and the sensitivity of receptors. At less than these values, no adverse impacts are anticipated.

SPLs are measured on a logarithmic scale; this means that an SPL increase of 10 dB results in a perceived doubling of loudness. The perception of sound also depends on the background sound level. For example, an undeveloped rural area may have a daytime background sound level as low as 20 dB, compared to 40 dB for quiet suburban residential areas and vacation resort areas, or 80 dB in busy urban settings. At about 70 dB, sounds begin to significantly interfere with normal conversation, according to the World Health Organization. Engines and motorized recreation vehicles can produce sound that varies from as low as 60 dB to over 90 dB if inadequately muffled. In a quiet setting with a 40 dB background, even 60 dB may be objectionable, whereas in a metropolitan area with an 80 dB background, even the 90 dB sound might not be perceptibly louder. Loud sounds or noise can potentially have adverse impacts on human beings with respect to mood and general feelings of health and well-being. SPLs in excess of 85 dB may contribute to short, and in some cases, long term hearing impairment.

Intermittent sounds may occur at antenna facilities or NMC sites during construction. The potential and typical sources include:

- Heavy equipment such as bulldozers or cranes (85 dB).
- Construction vehicle traffic (80 dB).
- Engine-powered equipment such as compressors, pumps, generators and compactors (70-75 dB).
- Geotechnical drilling rigs and seismic testing or blasting (80 dB).
- Manual or automated equipment such as hammers, saws and drills, and similar noise-producing equipment and devices (65-75 dB).

These sound levels would be expected at a distance of about 50 feet, with a 60 dB background.

These sounds would be of short duration, from 8 to 12 hours per day during daylight hours, over a 60- to 90-day construction period at most. They will cease when construction is completed.

Some persistent sounds may occur at antenna facilities or NMCs during construction. Examples include dewatering pumps, generator engines and other equipment required to stabilize an excavation at a site. These sounds are persistent or continuous but of short duration during the 60- to 90-day construction period, and will no longer occur once construction is completed.

During the operation of the antenna facilities or NMC sites, intermittent sounds may occur from the following:

- Emergency generators (70-75 dB).
- Service or employee vehicle traffic (55-60 dB).
- Equipment alarms (60-70 dB).
- Cooling fans (60 dB).
- Structural vibration sound (40-50 dB).
- Infrequent manual or automated maintenance equipment noises such as pumps, drills, lawn and garden equipment or compressors (70-75 dB).

In metropolitan areas, town and village, and agricultural areas, these types of sounds may arise from many sources. In some circumstances, directly adjacent to a receptor, a sound is likely to be noticeable if it exceeds the background sound level by 6 to 9 dB and if it were a frequent occurrence. In quiet places such as certain historic sites, cemeteries and parks, intermittent sounds are less common and therefore may be more noticeable.

Sound resulting from a generator engine with a muffler, typically will be in the range of 60 to 70 dB at 50 feet. Such use is likely to be of short duration. This will occur during periodic system testing and when short-term but continuous operation is required such as when a power outage occurs. Operation may be hours to several days depending on the nature of the emergency.

During the operation of the antenna sites or NMCs, persistent sounds may arise from the following:

- Structural vibration sound in an area with persistent wind.
- Electrical and mechanical equipment noise.
- Intermittent operation of emergency generators for maintenance purposes.

In metropolitan areas and most town, village and agricultural areas, the persistent sounds identified above are seldom audible. In rural areas, certain agricultural areas, areas adjacent to certain parks, recreation areas or open spaces, the actual background noise may be quite low, 30 to 40dB. Therefore, persistent noise may be more noticeable and possibly significant at sound levels above the 3 to 6 dB range above background in such areas.

4.3.7 Historical & Archeological Resources

Construction and operation of Project facilities may adversely affect historical and archeological resources if any of the characteristics that make the site historically or archeologically significant are changed. Both federal and State historic preservation legislation define the characteristics which make a place historically significant. These characteristics include location, design, setting, materials, workmanship, feeling and association. Some county, town and village governments have established their own criteria for identifying and assessing effects to historic and archeological resources of local significance that do not otherwise satisfy eligibility criteria for the State or National Registers. Adverse effects may be direct or indirect, and may include:

- Destruction or disturbance of resources.
- Alteration of resources.
- Displacement or relocation of resources.
- Changes that affect the setting or character of resources, if the setting contributes to the resources' significance.
- Introduction of visual, atmospheric or audible elements that diminish the integrity of the resources' significant historic features.

4.3.7.1 Historical Resources

Historical resources include a wide range of property types. To be eligible for listing in either the State or National Register of Historic Places, a historical resource must, in most cases, be at least 50 years-old. Many local historic preservation programs contain no specific age restrictions. Historical resources can include buildings, sites, districts, structures and objects. They can also include historic landscapes and places of special importance to a particular ethnic or religious group. The latter are sometimes termed "traditional cultural properties." Historical resources may derive their significance from their association with an important person or an important event. They may represent the work of a master craftsman, or they may embody distinctive characteristics of a type, period or method of construction.

Destruction or relocation of aboveground historical resources to accommodate construction of Project sites is not anticipated.

It is possible, though unlikely, that some Project sites will be located at, within or near a historical resource in such a manner as to require modification of the resource. The most common potential impacts to historic resources associated with the Project might be the introduction of visual or acoustic elements that affect the character or integrity of the setting associated with the historical resource.

The NMCs are expected to be housed in existing buildings. If any of these buildings are a historic resource, structural modifications necessary to accommodate Project facilities could affect the historic qualities of the structure. Technical requirements may require the modification of existing antennas and antenna support facilities to accommodate Project facilities. Some of these existing facilities, particularly any associated with the early period of broadcast communications technology or the Cold War period, or associated with innovative technologies, may be historic. Modifications to these facilities could adversely affect the characteristics from which they derive their significance.

In the case of historical resources located adjacent to, or in close proximity to, Project construction activities, potential impacts will be of relatively short duration. These potential impacts will include construction noise, fugitive dust and traffic that could temporarily alter the setting associated with a historical resource. Other potential construction-related impacts may include geotechnical drilling, seismic testing and blasting. These activities, in addition to creating short-term potential noise impacts have the potential to damage historical resources in close proximity to construction activities.

Each individual Project facility site will have associated with it a unique Area of Potential Effect within which historical resources located beyond the limits of the Project facility site could be

visually or acoustically affected by operation of the site. Because NMCs are expected to be located within existing structures they are not expected to visually impact historical resources. New antenna facilities, enlarged or heightened existing antenna facilities, and support facilities such as access roads and equipment shelters, may introduce visual elements into settings associated with a historical resource that diminish the integrity of the resource setting.

The size of the visual APE associated with a specific facility is dependent upon the tower's height, mass and color, surrounding topography and vegetation, and with the overall characteristics associated with the site's location. Historical resources within the viewshed of the new facility may be potentially visually impacted if the new facility results in a diminution of integrity of the setting associated with the historic resource. Evaluation of the nature and degree of diminution must take into account factors such as distance to the facility; size and mass of the facility; background against which the facility will be viewed; seasonal or year-round nature of facility visibility; and the extent to which the historical resource's setting has already been compromised. Evaluation of the latter must include consideration of the presence of other structures, aboveground utilities, modern transportation features and signage. In such cases, the relative cumulative impact upon the setting of the historic resource, resulting from the introduction of the new facility into the viewshed, must also be considered. A more detailed treatment of these considerations is provided in the visual impacts portion of the Cultural Resources section of this DGEIS.

Any increase in noise levels in excess of 3 dB (the threshold at which an increase in noise level becomes noticeable) at a historical site that results from operation of a Project facility would also constitute a potential adverse impact. Both intermittent and persistent increases in noise at historical sites in close proximity to Project facilities may occur.

4.3.7.2 Archeological Resources

A wide range of ground-disturbing activities may be associated with the construction of the Project. Any ground disturbance has the potential to disturb or destroy archeological resources.

Two broad categories of archeological resources may be affected. The first category includes Native American sites, which may range up to, or even exceed, 10,000 years in age. These sites range from the remains of large villages covering several acres, to small, short-term or seasonally occupied camps and resource procurement locations. They also include burial grounds and individual Native American graves. Although the exact or approximate locations of some sites in the Study Area are known, the number of undiscovered Native American archeological sites is unknown.

The second broad category of archeological sites includes those associated with the Euro-American occupation of the Study Area. These may include remains dating from colonial times through the relatively recent past. Euro-American archeological sites may include the remains of abandoned residences, farmsteads, transportation and industrial facilities, and even entire villages. In many cases, no obvious surface evidence of these sites is visible, but significant underground remains may be present.

Construction activities that could destroy or disturb archeological resources may include the removal of vegetation and topsoil; soil stabilization; geotechnical borings; site grading; construction of foundations; temporary and permanent access roads; parking facilities; utility lines; subsurface electrical grounding features; and soil compaction resulting from the operation of construction vehicles. Some or all of these activities will be associated with the construction of antenna sites.

Most archeological sites derive their significance from the information they contain. For this reason, most archeological sites are not affected by the introduction of new visual, atmospheric or audible elements into their immediate surroundings. There are exceptions to this generality, and archeological sites that are open to, or suitable for, public visitation and interpretation may be potentially impacted by these elements if the integrity of the site's setting is affected. In addition, certain types of aboveground archeological resources such as rock art and structural ruins may be potentially impacted by geotechnical drilling, seismic testing or blasting associated with facility construction.

Unless prior ground disturbance of a depth and extent sufficient to have eliminated the potential presence of intact archeological resources can be confirmed, there is a possibility that an archeological resource is present at or near a proposed NMC or antenna site. Assessment of the relative likelihood of a previously unknown archeological site being present at a particular facility location can be based upon any of a variety of archeological sensitivity models. Using its GIS system, OPRHP has mapped areas of archeological sensitivity throughout the State based on the proximity of previously known archeological sites. This mapping provides only a rough, first-order estimate of the likelihood of an archeological site being present at a given location.

The existence of a previously known archeological resource at a given site location can be determined by reviewing the consolidated archeological site files of OPRHP and the New York State Museum. Some local universities, museums and archeological organizations maintain supplementary listings of archeological resources not included in OPRHP files, and known site data from these organizations can be acquired, when appropriate. The potential existence of

Euro-American archeological sites can often be identified through an examination of historic maps and other primary documentary source materials.

Confirming whether or not a previously unknown archeological resource exists at a specific proposed site location can only be determined through performance of an archeological field survey. Potential impact to archeological and historical resources will be assessed on a site by site basis in accordance with the Nationwide Programmatic Agreement discussed in Section 2, *supra*, and other applicable law, as appropriate.

4.3.8 Public Health and Safety

Potential health and safety impacts may occur during the construction and operation of the Project facilities regardless of location or facility type. In general, the construction and operation of the NMCs are subject to a host of parameters and variables. Since the NMCs are building-based, potential public health and safety impacts will be similar to those of existing telecommunications sites. They include construction hazards, electrical hazards, mechanical hazards, fires and accidents.

Generally, public health and safety concerns during construction of Project facilities are accidents, or mishaps, trespass, vandalism and terrorism.

Once Project facilities are constructed, public health and safety concerns may include: ice build up, increased risk of electrocution and injury or property damage from structural failure of the tower or antenna components.

Public health and safety concerns during construction activities for Project facilities will be typical of any other construction site. All appropriate safety and preventive measures will be taken, and construction of Project facilities should therefore pose no significant adverse impact to public health and safety. Operation of Project facilities is not anticipated to present any significant adverse impacts to public health and safety.

4.3.8.1 Safety Issues and Guidelines for Radiofrequency Emissions

Due to a high level of public concern, the potential for adverse health effects from exposure to RF radiation has been the subject of scientific discussion for many years. Heightened awareness of the expanding use of technology has conjured up speculation concerning "electromagnetic pollution" (risks to human health) from RF electromagnetic fields. There is already a substantial body of literature that deals with whether radiofrequencies emit radiation at a level that could cause any major or minor health impairment.

Numerous studies have shown that the environmental levels of RF energy typically encountered by the general public are far below the levels to cause significant heating or the damages that

follow from increased body temperature. A few studies, however, suggested that in certain workplace environments near high-powered RF sources, there could be tissue damage in humans if the recommended limits for workplace environments are exceeded. But all the studies undertaken thus far have indicated that the RF energy levels routinely encountered by the general public are considerably below the levels that may cause tissue damage or increased body temperature.

Unfortunately, almost all of these investigative studies deal principally with wireless or mobile phones and minimally with respect to the base site or antennas that serve as both receiver and transmitter. In May 2001, in a report to Congress, the GAO released its findings based on its review of ongoing research and regulatory efforts in connection with wireless telephones that emit radiofrequency energy. This report is also exclusively dedicated to the mobile phone related health issues.

Several investigations have also been conducted at scientific laboratories in North America, Europe and elsewhere to determine the biological effects on animals ("in vivo") and animal tissues ("in vitro") from exposures of low levels of RF radiation. Some of these studies suggest a possible link between microwave exposure and action of certain drugs, thus hypothesizing possibilities of certain changes to the immune system, brain tissue and neurological structures. These results, however, are inherently inconclusive. As a result, further research is needed to determine the biological effects of RF radiation exposure and their true significance, if any, in connection with human health disorders or maladies.

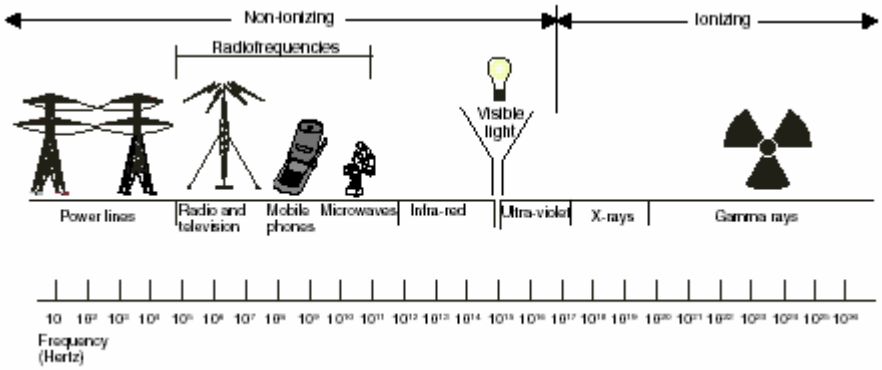
Due to this current uncertainty, in North America and most of Europe, exposure standards and guidelines for RF radiation have been developed carefully by health and safety organizations with special concerns for public safety. In these North American and European countries, the standards and guidelines have been developed based on exposure levels where RF radiation may be harmful to humans. But these standards or guidelines are not universal, and they vary from country to country. All of them incorporate adequate safety margins considered sufficient for human protection.

In the United States, state, local and federal governmental agencies and other organizations have generally relied on RF standards developed by several expert non-government organizations, for example, the American National Standards Institute ("ANSI"), the Institute of Electrical and Electronics Engineers ("IEEE") and the National Council on Radiation Protection and Measurements ("NCRPM"). The ANSI/IEEE standards have been widely used and have served as the basis for governmental standards in the United States and several foreign countries. In addition, several federal health and safety agencies, for example, EPA, the Food and Drug

Administration, NIOSH and the Federal Occupational Safety & Health Administration ("OSHA"), have been actively involved in monitoring and investigating health and safety issues related to RF radiation and devices (for example, cellular telephones) that emit such radiation.

In 1971, a federal RF radiation protection guide was first issued by OSHA for workers based on the 1966 ANSI RF exposure standards. In 1985, the FCC adopted the 1982 ANSI guidelines for evaluating exposure due to RF transmitters licensed and authorized by FCC. In 1986, NCRP issued a two-tier exposure criteria, one for the workplace environment and another, albeit more restrictive, for general exposure. Meanwhile, FCC's guidelines have undergone several revisions as more information came from public and private studies and sources. The current FCC guidelines for safe exposure to RF radiation are based on recommended exposure criteria last issued by the ANSI/IEEE and NCRPM. The ANSI/IEEE and NCRPM exposure criteria identify the threshold level at which biological effects due to heating may occur. They also provide the values for maximum permissible exposure limit ("MPE") recommended for general public and occupational workers that may be exposed to RF radiation.

Figure 4.1 - Electromagnetic Spectrum
(reproduced from the GAO Report, May 2001)



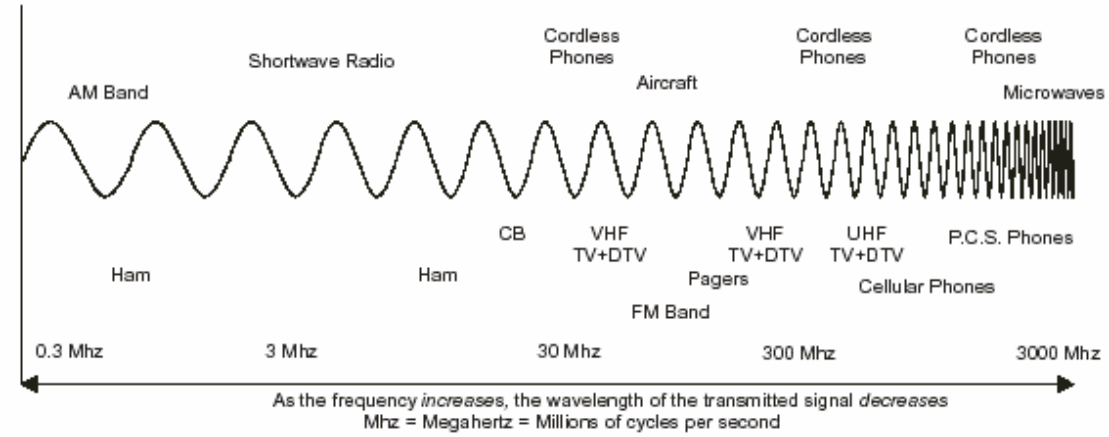
Source: FCC.

Figure 4.1 is a graphical representation of the electromagnetic spectrum that includes ionizing and non-ionizing radiation. Ionizing radiation, for example, X-rays and gamma rays, has energy levels high enough to strip electrons from atoms as well as from molecules. It is generally accepted that exposure to ionizing radiation can cause cancer and other serious biological disorders. The ionization process itself can lead to damages in biological tissue, including affecting DNA, the genetic material. Radiofrequencies fall within the "non-ionizing" portion of the electromagnetic spectrum, which lacks the energy needed to cause ionization. However, at high levels, RF energy can also cause harmful biological effects through tissue damage. Adverse

biological effects that result from the heating of tissue by RF energy are often described as "thermal effects." Exposure to a high level of RF radiation can be harmful because at that stage, RF energy can heat biological tissue rapidly. Therefore, although non-ionizing radiation is a type of radiation, it is not considered extremely harmful or biologically damaging unless the exposure is sustained for a long, continuous period leading to well-defined thermal effects.

In summary, the waves created by the transmission of radio signals are propagated in the form of electromagnetic radiation − more specifically, like a series of waves of electric and magnetic energy that move through space. The spectrum of such electromagnetic radiation comprises a wide range of frequencies from very low-frequency energy (such as electrical power), through visible light, to extremely high-frequency radiation (such as X-rays and gamma rays). Figure 4.2, Relationship Between Transmission Services and Frequencies, shows the relationship between transmission services and radiofrequencies that are typically encountered in the living world. The radiofrequency radiation forms non-ionizing radiation located along an electromagnetic spectrum. Unless there is an exposure to a high level of RF radiation giving rise to thermal effects, RF radiation has not been linked with any harmful biological effect or damage to humans. Compliance with FCC's guidelines provides a good margin of safety against any health or safety impairment.

Figure 4.2. - Relationship between Transmission Services and Frequencies
(reproduced from FCC's Local Official's Guide to RF, June 2, 2000)



4.3.8.2 Potential Radiofrequency and Microwave Impacts

The Project proposes installation of approximately three transmitting and one receiving antenna at each site, as well as between 1-5 microwave dishes. Given that these antennas are proposed to be installed at heights greater than 10 meters, and that the proposed total watts of effective

radiated power ("ERP") is less than 1000 watts, the Project sites typically would be categorically excluded from study by the FCC. FCC has listed certain installations as "categorically excluded" because in previous studies it has been determined through calculations and analysis that, due to their low power or height above ground level, those facilities by their very nature are highly unlikely to cause human exposures in excess of the guideline limits. The antennas installed as part of the Project are expected to fall under such a categorical exclusion. Therefore, specific analysis of impact is not required.

This DGEIS incorporates by reference the OFT GEIS, which includes a detailed study of potential EMF health impacts from radio and microwave antennas proposed for the SWN ("OFT EMF Study"). *See* OFT DGEIS Volume IV, Public Health & Safety, Appendix A. The antennas, configuration and power density proposed for the Project are consistent with those used as parameters in the OFT EMF Study and accordingly, it is reasonable to supplement the FCC categorical exclusion finding with the analysis and results of the OFT EMF Study. Further, it is reasonable to rely upon the reasoning and conclusions contained in the OFT EMF Study as to power densities generated by the Project. Further, additional study of the potential radiofrequency emissions impacts resulting from a network system, including antennas, expected to be included in a comparable county-wide network was recently reviewed pursuant to SEQRA. ("Oswego EMF Study"). The Oswego EMF Study was based on a wireless network, including antennas, configuration and power density, which is consistent with those expected for the Project. Accordingly, the Oswego EMF is also incorporated by reference, and is reasonably relied on for this Project. The OFT EMF Study and the Oswego EMF Study both confirmed, using a highly conservative analysis, that the power densities likely to be generated by a network similar to the Project are well within FCC limits.

For the reader's convenience, certain aspects of the proposed SWN described in the OFT EMF Study and the OFT GEIS (such as pole mounted antennas) that are not relevant to this Project are not included in this DGEIS. The Project is described and referred to where relevant, instead of the SWN Project. Additionally, the Oswego EMF Study is discussed at Section 4.3.8.4, and the Project is described and referred to where relevant, instead of the Oswego wireless network. The OFT EMF Study and the Oswego EMF Study are incorporated by reference and are available at the public repository where this DGEIS is housed, the Seymour Public Library, 176 Genesee Street, Auburn, NY 13021.

Whether health effects are likely to be caused by radiofrequency transmissions is evaluated through a review of medical, epidemiological, toxicological and other scientific literature. Calculated worst-case exposure levels are compared with levels reported to cause health effects in animals or people as reported in the available scientific and medical literature. Health effects

might be associated with a certain radiofrequency or power density, but calculated worst-case exposures to other frequencies or at other power densities may fail to produce conditions under which such effects are observed.

Electromagnetic waves will be emitted by TLMR and microwave transmitters deployed in configuring the Project. The Project proposes using the UHF frequency band. Directional point-to-point microwave transmitters will use a segment of the microwave band. Frequencies below 1,000 megahertz are classified as radio waves. Those from 1,000 to up to 300,000 megahertz are classified as microwaves.

Radio waves and microwaves are electromagnetic radiations in the frequency bands used by radios and microwave ovens. Those frequencies exist within the larger spectrum of electromagnetic radiation. Radiation generated by TLMR and microwave transmitters is non-ionizing. Non-ionizing radiation such as radio waves and microwaves is distinctly different from ionizing radiation such as X-rays. TLMR emergency telecommunications facilities do not produce ionizing radiation.

People and animals encounter electromagnetic radiation whenever they are located within the "effective" range of an electromagnetic field source. The earth and sun are EMF sources, and it is not possible to be free from electromagnetic radiation anywhere or at any time. Humans are, therefore, subjected to whole-body exposure via the atmosphere, even without the addition of man-made EMF sources. People typically are exposed to both natural and various man-made EMFs, emitted by sources such as household appliances, radio stations and power lines. Exposure to EMFs generated by tower, structure or pole-mounted transmitters cause people to come within the range of the EMFs associated with these sources.

Exposure to EMFs may be expressed in terms of electric field strength, magnetic field strength or electromagnetic power density. FCC standards setting exposure limits for electromagnetic radiation are expressed in terms of all three of these parameters. Limits on EMF strength are based upon consideration of both the electric and the magnetic field effects that may be associated with such fields. Power density is the most general parameter. Electromagnetic power density provides a way to express the combination of electric and magnetic field effects.

EMF power density depends upon the following factors:

- mounting height
- radiation type – radio vs. microwave transmission.
- transmitter power – realistic scenario vs. maximum-power scenario.

- collocation – presence vs. absence of other transmitters on the same mounting structure.

Project antenna sites will include transmitters and receivers. Only transmitters were addressed in the OFT EMF Study consistent with the focus of the current public discussion on exposure to EMF generated by such antennas. Transmitters can be of many types and models. The OFT EMF Study, including its mathematical calculations, focuses on a worst-case equipment scenario. A worst-case scenario is one that reasonably may be estimated to overestimate actual impacts. The OFT EMF Study includes consideration of preexisting transmitters that might be present on antenna mounting structures. It excludes risks of physical accidents, such as vehicular accidents, falling antennas, construction mishaps and lightning strikes on poles or towers, since such risks are not associated with the interaction of EMFs with human health or welfare.

If a Project facility contains only one antenna array, the maximum exposure for a receptor located at any point in the horizontal plane can be predicted by using FCC's tables and graphs. However, from a conservative approach, the worst-case scenario will play out when multiple transmitters will beam on a particular receptor. In order to calculate the electromagnetic power density in a worst-case scenarios, all scenarios used in the OFT EMF Study presented here to evaluate RF radiation from antennas similar to those proposed for Project facilities consider multiple transmitters. In the OFT EMF Study scenarios, each transmitter generated EMF power densities that are a small fraction of a milliwatt per square centimeter, measured at the location of a hypothetical "critical receptor" situated below the transmitter. Methods used in this analysis include standard health risk assessment ("HRA") procedures for quantifying worst-case risks to public health and procedures specified by FCC's Office of Engineering and Technology (“OET”) Bulletin 65. The assumptions and general basis of the analysis are provided in the Public Health and Safety Appendices of the OFT DGEIS. The OFT EMF Study found that, in all scenarios, collocation of multiple transmitters operating simultaneously and at maximum power, resulted in power densities of less than 0.1 milliwatt per square centimeter at the location of a hypothetical critical receptor.

Furthermore, calculated power densities at the critical receptor revealed that, under all scenarios, total transmitter power at the critical receptor would be significantly below the FCC-allowable maximum field strength standard of 0.6 milliwatts per square centimeter for LMR and 1.0 milliwatts per square centimeter for microwave, with a comfortable margin of safety between calculated and allowable power densities.

Pursuant to the Telecommunications Act of 1996, the FCC regulates the electromagnetic energy and RF emissions of telecommunications equipment in use throughout the United States to

ensure that they pose no health risk to the public. Based on this worst-case analysis presented in the OFT EMF Study, it appears that the risk to public health, from the adverse effects of exposure to non-ionizing radiation resulting from RF emitted by Project antennas will be well below FCC's guidelines for non-ionizing radiofrequencies. It is also noted that the performance standards set for the Project components will be subject to FCC's maximum permissible exposure limits. As a result, any vendor-provided component that exceeds such limits will not be approved and, therefore, will not be installed.

Lastly, according to the OFT GEIS and OFT EMF Study emerging research on EMFs, including component electric fields and magnetic fields, also reveal no link between ambient EMFs at power densities and causation of any adverse non-cancer effects. This conclusion applies to realistic worst-case scenarios and to more extreme, maximum power scenarios, including collocation scenarios in which many transmitters operate simultaneously from the same mounting structure.

The FCC sets human exposure limits for all radiofrequency emissions. The "power density" of these emissions is a function of the mounting height of the transmitters, the type of radiation, transmitter power and the presence or absence of similar emissions in a proximate area. A thorough evaluation of the electromagnetic radiation exposure that will result from a system like the Project was completed in the OFT EMF Study which determined that calculated power densities at critical receptors were significantly below the FCC-allowable maximum power densities.

Details of the OFT EMF Study as performed are discussed below. As indicated earlier, the OFT EMF Study analysis focuses on electromagnetic waves that are expected to be emitted by LMR and microwave transmitters that are similar to those expected to be deployed in configuring the Project.

4.3.8.3 OFT EMF Study Results

Tower-Mounted LMR Transmitters

In the OFT EMF Study, fifteen tower-mounted LMR transmitters were considered to exemplify equipment that might be deployed in configuring a network similar to the Project. Calculations shown in OFT DGEIS Public Health and Safety, Appendix A based upon these transmitters reveal power densities at the critical receptor ranging from less than 0.00001 to 0.0003 milliwatts per square centimeter under a realistic configuration and power flow with a 180-foot tower-mounting height. The resulting power density range compares favorably with an FCC-allowable power density of 0.6 milliwatts per square centimeter. The power density expected from a

tower-mounted LMR transmitter at the location of the critical receptor is 2,000 to 60,000 times less than the FCC-allowable power density.

The OFT EMF Study found that, under an assumed worst-case equipment configuration, in which each transmitter received the maximum power allowable by law (500 watts) or by engineering specifications, power densities at the critical receptor were found to range 0.00001 to 0.001 milliwatts per square centimeter. Under maximum power to each transmitter, the power density expected at the location of the critical receptor is still 600 to 60,000 times less than the FCC-allowable power density.

In practice, transmitters are often collocated on a common tower. To consider the possible impact of this practice, all 15 transmitters considered above were assumed to be operating from a single tower (notwithstanding that this might be physically impossible) in the OFT EMF Study. Additionally, a second set of 15 similar transmitters was assumed to be collocated on the same tower, but operating under the worst-case, maximum-power scenario. This effectively produced a scenario in which 30 transmitters are operating simultaneously. The OFT EMF Study found that the resulting power density at the critical receptor was 0.009 milliwatts per square centimeter, which is less than 2% of the FCC-allowable power density.

Based on the OFT EMF Study, no adverse impact to the environment will result from tower-mounted LMR transmitters.

Tower-Mounted Microwave Transmitters

In the OFT EMF Study, nine tower-mounted LMR microwave transmitters were considered to exemplify equipment that might be deployed in configuring a network similar to the Project. Calculations shown in OFT DGEIS Public Health and Safety, Appendix A based upon these transmitters revealed power densities at the critical receptor ranging from less than 0.0000001 to 0.00002 milliwatts per square centimeter under a realistic configuration scenario that assumes a 180-foot tower-mounting height and realistic power flow to the transmitters. The OFT EMF Study found that the resulting power density range compares favorably with an FCC-allowable power density of 1.0 milliwatts per square centimeter. The power density expected at the location of the critical receptor is 50,000 to 10,000,000 times less than the FCC-allowable power density.

The OFT EMF Study presented an assumed worst-case equipment configuration, in which each transmitter received the maximum power allowable by law (500 watts) or by engineering specifications, power densities at the critical receptor were found to range from 0.0000006 to 0.001 milliwatts per square centimeter. The OFT EMF Study found that, under maximum power to each transmitter, the power density expected from a Project tower-mounted microwave

transmitter at the location of the critical receptor still ranged from 1,000 to 1,500,000 times less than the FCC-allowable power density.

In practice, microwave transmitters are often collocated on a common structure, such as a tower. To consider the possible impact of this practice, all nine transmitters considered above were assumed to be operating from a single tower in the OFT EMF Study. Additionally, a second set of nine transmitters was assumed to be collocated on the same tower operating under the worst-case, maximum-power scenario. This effectively produced a scenario in which 18 microwave transmitters were operating simultaneously. The OFT EMF Study found that the resulting power density at the critical receptor was 0.003 milliwatts per square centimeter, which is less than 1% of the FCC-allowable power density.

4.3.8.4 Oswego EMF Study

Methodology

The purposes of the Oswego EMF Study were to place quantitative upper-bound limits on the potential uncontrolled exposure of people to microwave frequency electromagnetic fields that were expected to be generated by a network similar in size and configuration to the Project, and to compare those limits with FCC standards for non-occupational exposure of people to electromagnetic energy. The Oswego EMF Study also generated worst-case estimates, i.e. highly conservative upper bounds on expected power densities which would exceed that expected to be generated by a network comparable to the Project when operational. Actual exposure levels can reasonably be expected to be significantly lower than the worst-case, with a high degree of confidence.

The Oswego EMF Study was conducted in a manner consistent with the Federal Telecommunications Act of 1996, including performing calculations to evaluate compliance with RF exposure standards as specified by FCC's OET Bulletin 65, October 1997. Calculations in the Oswego EMF Study were based upon engineering data describing the planned transmitters and mounting configuration, most notably mounting height off the ground. Pre-existing transmitters, if any, present on mounting structures were not included in the Oswego EMF Study. Equations and input parameter values used in the Oswego EMF Study were selected as appropriate to evaluate potential exposure to EMFs at the location of a hypothetical 'critical receptor' (person) who is conservatively assumed to be situated at the base of the mounting structure.

The Oswego EMF Study analyzed a network that would incorporate antennas transmitting at microwave frequencies in the upper portion of the FCC regulated range: 1,500 to 100,000 MHz. The Oswego EMF Study assumed that more than 40 antennas, a number of antennas that could

be included in a network that could be included in the Project, were placed on one tower, operating simultaneously and at full power. Thus, the analysis was highly conservative because it encompasses many more antennas than are expected to be present at any single site within the Project.

Further, the Oswego EMF Study assumes that the equivalent isotropically radiated power ("EIRP") for each antenna and all transmitting antennas, collectively, will be generated. This procedure drastically overestimates the potential power density at a ground based 'reference individual' because it assumes incorrectly that transmissions will go in all directions rather than predominantly in a preferred direction. Generally, antennas do not radiate in all directions (i.e. 'isotropically'), rather, they allocate as much energy as possible to preferred transmission directions such as toward the horizon in a narrowly collimated beam, meaning that radiation in all non-preferred directions, including toward the ground where casual (non-occupational) human exposure might occur, would be far less than the EIRP value assumed in the Oswego EMF Study. Finally, all antennas typically would not transmit simultaneously, even if they occurred together at the same site.

Results

Despite the highly conservative assumptions applied in the Oswego EMF study, the power density at the head of an assumed six-foot-tall reference individual was found to be well within FCC limits. *See* Oswego EMF Study. The power density of a system where it was assumed that all antennas were located on one pole and operating simultaneously at full power was found to be just 0.12 percent of the applicable FCC limit. This value is also well below the five-percent benchmark, which exceedance could trigger a need for further analysis.

Based on the FCC Categorical Exclusion, the OFT EMF Study and the Oswego EMF study, no adverse impact to the environment will result from tower-mounted microwave transmitters.

5.0 MITIGATION MEASURES TO MINIMIZE POTENTIAL ENVIRONMENTAL IMPACTS

As discussed in the Executive Summary, this section incorporates portions of the OFT GEIS that are relevant to this DGEIS, in particular, the applicable mitigation measures that are similar to those analyzed for the SWN.

5.1 SITING GUIDELINES

These siting guidelines were developed to meet the Project goal of providing County-wide access to an integrated emergency services network while limiting, to the extent practicable, the number of new high profile towers to mitigate potential adverse environmental impacts of the project to the maximum extent practicable.

The siting guidelines will be used to achieve these goals by selecting potential Project sites in the following priority. In the first instance, the siting guidelines propose collocation on existing, County or municipally-owned towers, buildings or other Project-suitable structures. These existing buildings, towers and structures are considered part of existing environmental condition. As collocation constitutes avoidance of impact, collocations will not change the existing environmental condition. The preference for collocation on previously developed "County or municipally owned sites" rather than "third party sites" allows the County to make use of existing public infrastructure.

Where due to either area or geographic coverage requirements it is not feasible to collocate a Project antenna on one of the existing facilities described above, new construction activity will be considered. The first priority sites for new builds would involve development on a County or municipally-owned, previously disturbed site. If previously disturbed, County or municipally owned property, meeting the Project's area and geographic coverage requirements is not available, tower construction on County-owned, undeveloped (or "greenfield") property will be considered.

If the County or municipally-owned property does not result in any suitable sites providing the necessary coverage, the County may acquire property to construct a new tower. Purchase of qualifying previously developed properties will be preferred over purchase of greenfields.

Using these guidelines will help the County maximize the use of previously developed, County or municipally-owned sites where feasible and avoid undeveloped, or "greenfield," sites even where new construction is required. The higher priority given to collocation and siting on County owned sites is for both environmental and security purposes. These siting guidelines

further SEQRA's goals of avoidance or mitigation of potential adverse environmental impacts to the greatest extent practicable.

In addition, where new construction is required, a mitigation hierarchy will be observed. As set forth in each of the subsections that follow, in all instances avoidance of impact, to the greatest extent practicable, will guide both site selection and construction techniques. Wetlands, Forest Preserve, coastal zones, historic sites and other sensitive receptors will be avoided wherever possible. Where avoidance is not possible, the additional mitigation techniques outlined in this section will be employed on a site-specific basis as applicable and appropriate.

Prior to purchase, any candidate property will be screened to ensure that it meets certain criteria. Through due diligence as well as preliminary field investigation, property being considered for acquisition will be reviewed to determine if environmental features such as wetlands, floodplains, archeologically-sensitive areas, and/or historic properties, and certain recreation areas and trails are present. Preliminary studies to ascertain the presence or absence of endangered, threatened, and/or species of special concern, as well as a Phase I Environmental Site Assessment, and a Phase IA Archeological Assessment (for sites in archeologically sensitive areas) will also be completed. These analyses will allow the County to determine whether the property to be acquired satisfies the siting preferences included in this DGEIS and thereby avoids or minimizes potential adverse environmental impacts to the maximum extent practicable. Properties will be purchased only if the County can conclude that the siting guidelines and mitigation requirements contained in the DGEIS are satisfied.

Once property has been purchased and/or a site has otherwise been selected as a potential Project site, a site consistency review will be required. The Site Consistency Review process will ensure that all sites selected for the Project minimize potential environmental impacts. The Site Consistency Review is a preliminary screening process that reflects the mitigation and avoidance measures contained in this DGEIS, regardless of where Project facilities are sited. Site Consistency Review of all sites selected for the Project will ensure that Project collocation or construction meet the conditions set forth in this DGEIS, and for those sites that do not do so, further study will be required in accordance with 6 NYCRR 617.10.

5.2 NATURAL RESOURCES

5.2.1 Geology

5.2.1.1 Subsurface Geology

In the unlikely event that construction of a Project facility intersects subsurface geology, potential adverse effects will be avoided or mitigated to the greatest extent practicable.

Mitigation techniques may include, but are not limited to, performing adequate site investigation; planning and design to avoid sensitive sites; state-of-the-art construction practices, such as maintaining ground stability by providing adequate support; flattening sideslopes; not overloading unstable slopes; and providing erosion and sediment control through the use of site grading, silt fences and hay bales. Maintaining sidewalls of the excavation in a stable condition will be accomplished by use of a trench box, engineered trench bracing and shoring. Sloping excavation walls to the natural angle of repose of the surrounding soils and keeping construction equipment at safe distances from the edge of excavations also will be used where necessary. If a facility is located in an area with soils having low bearing capacity, the ground will be stabilized by spreading bearing loads of equipment and materials by using equipment with spread tracks and placing temporary matting in work areas. Unstable soils may be excavated and replaced with materials with greater bearing capacities. Drainage systems can be installed to reduce subsurface soil saturation to prevent settlement or collapse.

5.2.1.2 Surficial Geology

In urban areas, the ground surface and shallow subsurface (up to three feet) is likely to have been disturbed previously. No mitigation will be required where ground surface and shallow subsurface have been previously disturbed.

To the extent practicable, any new structures will be located in level areas to avoid compromising the stability of slopes. Where mitigation is required, it will include standard construction practices, such as appropriate excavation and ground stabilization methods, and erosion and sediment control and protection, including site grading and the use of detention basins, silt fence and hay bales.

These mitigation measures will minimize or avoid impact to geological resources to the maximum extent practicable.

5.2.1.3 Topography

No adverse impacts to topography are anticipated and, therefore, no mitigation is required.

5.2.2 Water Resources

Mitigation measures for all Project construction will include, but not necessarily be limited to, best management practices ("BMPs") and engineering controls to reduce or eliminate potential construction-related impacts associated with inadvertent spills and leaks, changes to runoff and infiltration patterns and site erosion. Dust control will use only water to avoid the introduction of chemicals to a site.

For the operating phase of the Project, generators and engines will be placed on concrete foundation slabs for containment purposes. Any site that has fuel storage will be equipped with a standard spill response kit (absorbent pads or booms, "speedi-dry," shovels, plastic sheeting and an empty drum). To ensure the integrity of fuel storage equipment, storage tank design will meet all State, Uniform Fire Code and Underwrites Laboratory certification requirements for stationary tanks, including leak detection with remote notification, and overfill protection. Fuel deliveries will be monitored continuously by delivery personnel, and the supplier will be required to carry a spill response kit on the delivery vehicle.

Tank and fuel line failure during operation of the Project is unlikely with properly designed, constructed and maintained equipment. Tank and fuel lines will be subject to periodic inspection and will be maintained in good operating condition. Evidence of releases found during periodic inspection and maintenance will be addressed by immediate equipment repair, and cleanup. Placing storage tanks within the secured perimeter at the foot of the antenna provides mitigation in the form or protection from damage.

Loss of tank integrity at unattended Project sites will be detected by the Project system operator by remote notification leak detection devices. This notification will initiate mobilization of system maintenance personnel. If oil is released into the soil, it will be cleaned up immediately with the on-site cleanup equipment, as discussed above.

Potential soil erosion will be mitigated by various project management and engineering controls. Project management controls may include, but will not necessarily be limited to: minimizing the duration of construction activities; reducing the area of disturbance; and planning construction activities in accordance with anticipated weather conditions. Standard engineering controls available to minimize site erosion and runoff include: setting up erosion control measures such as hay bales, silt fences, temporary berms and rip-rap; constructing drainage swales; revegetating disturbed areas; and the constructing temporary or permanent stormwater detention basins.

Compliance with these proposed mitigation measures will result in minimizing or avoiding potential impact to water resources to the maximum extent practicable.

5.2.3 Terrestrial and Aquatic Ecology

Potential impacts to terrestrial and aquatic ecology will be minimized by the proposed siting guidelines. The siting guidelines establish a preference for collocation on existing County or municipally owned towers, and use of existing buildings and previously developed lands. New construction will be considered only when these siting opportunities are not feasible given the Project coverage requirements.

For each individual Project site, a baseline of terrestrial and aquatic ecological resource information will be required to identify whether sensitive resource areas are located in the site vicinity. This information will be used to determine whether additional environmental review will be required. Site Consistency Review will initially involve the review of supplemental data to assess the vulnerability of terrestrial and aquatic ecological resources and determine whether additional environmental permitting or studies are required for an individual site.

To evaluate potentially significant terrestrial and aquatic resource areas near each future site where new tower construction is proposed, the following information will be required as it relates to those sites:

- Vegetation Survey and Report
- Flora and Fauna Study/Habitat Assessment
- Wetland Mitigation Plan (if construction of a new tower in a wetland area is unavoidable)
- Identification of BCAs or IBAs within a 10-mile radius of the proposed site
- Identification of Critical Environmental Areas within a 10-mile radius of the proposed site
- Identification of State Wildlife Management or Refuge Areas and State Forest Areas (Reforestation Areas)
- Identification of State Parks and Parkways and archaeologically sensitive areas
- A topographic survey
- Feedback from federal and State agencies, as applicable regarding Natural Heritage Sites

Mitigation measures that will reduce or eliminate potential impacts from new or substantially reconstructed antenna sites are addressed in the following paragraphs.

5.2.3.1 Vegetation

Mitigation includes:

- Use of preexisting access-ways where available, which include roads, trails, rights-of-way and transmission lines. Heavily wooded areas and forest interiors will be avoided when possible. The cutting of mature trees will be kept to a minimum.
- Buffer areas will be maintained where needed.

- Where possible, access roads and antenna sites will be located on the level portions of the available property. Areas of minimum slope will be selected to the greatest extent practicable. This will minimize disturbance associated with site grading and provide protection from sedimentation of off-site habitats.
- Erosion and sedimentation controls will reduce migration of sediment from soil disturbance that would result in a loss of wildlife habitat or that would alter natural processes. Control measures may include silt fencing, hay bales, sediment traps, channels, sediment basins, turbidity curtains and planting of temporary vegetation.
- Disturbed soils will be stockpiled on-site and covered or otherwise stabilized. These soils will be reused on-site to promote revegetation.
- Revegetation of disturbed areas at the completion of construction activities will be performed to the extent practicable. Dead, dying or otherwise unstable trees at the perimeter of clearings will be removed. This will reduce the potential for blow-down.
- If there will be an effect on an endangered, threatened, rare or species of special concern, the site layout will be modified to the extent practicable so that the species is not disturbed or affected by construction and operational activities. This may include reduction or reorientation of the access road or antenna site, where possible. In the event that the location or layout of a site cannot be altered, a species-specific relocation plan will be developed and implemented. This plan will identify the proper method of relocation. Plans will include selection of the alternative location, relocation timing, removal methods, application of fertilizers and pest control. Additionally, a species-specific protection plan will be developed when necessary. This will include documentation of the actions taken to protect the species, short-term and long-term maintenance requirement and monitoring.
- Any spills of hazardous materials and petroleum products will be cleaned. Spill response and recovery equipment will be kept at each site. Refueling of equipment will be monitored to ensure that accidental spills are properly addressed.
- Road and site maintenance products for ice and weed control will be stored and applied in accordance with manufacturers' instructions. Preference will be given to products having the least potential for environmental damage.

5.2.3.2 Fish and Wildlife

In addition to those mitigation measures identified in section 5.2.3.1 for vegetation, additional measures may be taken to further minimize any potential impacts to fish and wildlife:

- Access road speed limits will be restricted to minimize or prevent increased mortality from traffic.
- Prior to site development, a qualified professional will conduct a wildlife/habitat survey, described further above. This will include an assessment for nesting sites, forage and transient or permanent wildlife pathways. In the event that nest sites are present, consideration will be given to altering the access road so that wildlife nesting sites are not disturbed or affected by construction or operational activities.
- If the nest of an endangered or threatened species or species of special concern is found at an antenna site, it will not be harmed. If a nesting location is in an area that will cause disruption to the antenna site structure or service, the site supervisor will notify the Project Manager to contact a qualified professional to prepare a protection and relocation plan.
- Any potential outdoor chemical application will be scheduled to minimize impact to endangered, threatened or special concern species.

In September 2000, the FWS released interim guidelines, based upon the best information available at the time, regarding the most prudent and effective measures for avoiding bird strikes at towers. The implementation of the guidelines by the communications industry was voluntary and it was recognized that the guidelines must be balanced with FAA requirements and local concerns where necessary. The types of towers anticipated for use in the Project are principally the types of towers that have not been associated with significant avian collision. The types of towers anticipated will often fall within the FWS's first two guidelines for avoiding potential bird impacts: collocation; and, if collocation is not feasible, construction of new towers no more than 199 feet AGL, using construction techniques that do not require guy wires. These towers will be unlighted, if FAA regulations permit.

With respect to new towers in excess of 199 feet, the FWS interim guidelines provide that the cumulative impacts of all the new towers should be considered. To the extent the Project relies upon new towers, the cumulative impact is discussed in section 9.0 of this DGEIS.

The FWS interim guidelines have several other recommendations regarding new tower construction in excess of 199 feet:

1. If at all possible, new towers should be sited within existing "antenna farms" (clusters of towers). Towers should not be sited in or near wetlands, in other known bird concentration areas (e.g., State or federal refuges, staging areas, rookeries), in known migratory or daily movement flyways or in habitat of threatened or endangered species. Towers should not be sited in areas with a high incidence of fog, mist and low ceilings.
2. If taller (i.e., >199 feet AGL) towers requiring lights for aviation safety must be constructed, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA should be used. Unless otherwise required by the FAA, only white or red strobe lights should be used at night, and these should be the minimum number, intensity and number of flashes per minute allowable by the FAA. The use of solid red or pulsating red warning lights at night should be avoided, and the use of white strobe lights is preferable. Current research indicates that solid or pulsating (i.e., beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights. Red strobe lights have not yet been studied.
3. Tower designs using guy wires for support should have daytime visual markers on the wires to prevent collisions when such designs are proposed to be located in known raptor or waterbird concentration areas or daily movement routes or in major diurnal migratory bird movement routes or stopover sites. *See* Avian Power Line Interaction Committee, *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994* 78 (1994); Avian Power Line Interaction Committee, *Suggested Practices for Raptor Protection on Power Lines* 128 (1996) < http://www.eei.org/resources/pubcat/enviro/>.
4. Towers and appendant facilities should be sited, designed and constructed to avoid or minimize habitat loss within, and adjacent to the tower "footprint." However, a large tower footprint is preferable to the use of guy wires in construction. Road access and fencing should be minimized to reduce or prevent habitat fragmentation and disturbance and to reduce aboveground obstacles to birds in flight.
5. If significant numbers of breeding, feeding or roosting birds are known to use the proposed tower construction area habitually, relocation to an alternate site should be considered. If this is not an option, seasonal restrictions on construction may be advisable in order to avoid disturbance during periods of high bird activity.
6. To reduce the number of towers needed in the future, providers should be encouraged to design new towers structurally and electrically to accommodate the applicant/licensee's antennas and comparable antennas for at least two additional users unless this design

would require the addition of lights or guy wires to a tower that is unlighted, un-guyed, or both.

7. Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site.
8. If a tower is constructed or proposed for construction, service personnel or researchers from the Communication Tower Working Group should be allowed access to the site to evaluate bird use, conduct dead-bird searches, place net catchments below the towers but above the ground, and to place radar, a Global Positioning System, infrared, thermal imagery and acoustical monitoring equipment as necessary to assess and verify bird movements, as well as gain information on the impacts of various tower sizes, configurations and lighting systems.
9. Towers no longer in use or determined to be obsolete should be removed within 12 months of cessation of use.

With the implementation of the above mitigation measures, potential significant impact has been minimized or avoided to the maximum extent practicable.

5.2.3.3 Wetlands & Floodplains

There will be no impacts to wetlands as a result of NMC construction or operation. Due to the absence of impacts, no mitigation is required. Further, no mitigation will be required in areas where antenna sites are to be collocated, as such areas have existing access roads and will therefore require no additional disturbance.

On a Project-wide basis, the siting guidelines will minimize impacts to wetlands and floodplains by favoring collocation of antenna facilities and the use of previously disturbed locations as well as requiring a desktop search for wetlands, followed up with field surveys where necessary to determine the presence of wetlands on property being considered for acquisition. On a site-specific basis, sites situated in a wetland or its adjacent buffer area, and floodplains will be avoided.

For new construction sites, the Project will avoid wetland areas. If siting an antenna in a wetland becomes unavoidable, measures will be implemented to minimize potential impacts to wetlands. These measures include, but are not limited to, the following: consulting a qualified professional to ensure that wetland functions are not unnecessarily disturbed by construction activity; use of erosion and sediment controls, including silt fence and hay bale barriers, around delineated wetland areas; on-site stockpiling and stabilizing of disturbed soils; and restoration and replacement of disturbed wetland areas. Any required wetland replacement will be undertaken in

consultation with the appropriate regulatory authorities which may include the DEC and Army Corps of Engineers.

Favoring collocation of facilities and the use of existing or previously developed sites will minimize potential impact to floodplains. On a site-specific basis, new tower construction will avoid floodplains. In the event siting a new tower in a floodplain becomes unavoidable, further review on a site-specific basis would be required.

5.2.4 Air Resources

Construction work for towers and NMCs will be conducted under a Project environmental protection plan that will have provisions for dust suppression should it be necessary. To prevent fugitive dust associated with construction activities, water will be applied to suppress dust on unpaved roads. Paved roads will be watered and swept as necessary. The pile height of excavated soil will be minimized, and soil piles will be covered with tarps or other wind screens. Earth-moving activities will be curtailed during high wind conditions. These methods will be employed if visible emissions are observed during site activity and access road construction or at the access and egress locations onto paved roads. Daily visible dust checks will be made to assure effective mitigation of any observed fugitive dust. More frequent visible emission checks will be made during periods of high site activity or during dry periods or high wind days.

Emissions associated with off-road, diesel-powered construction equipment will be minimized with the use of engines equipped with particulate traps where possible or the use of operational techniques, such as frequent tune-ups, to assure proper and complete fuel combustion. Should smoking diesel exhaust be noted, particularly under light or no-load conditions, fuel adjustments and other engine tune-up activities will be performed to eliminate visible emissions. During operation of the NMCs and antenna sites, minimization of the emissions from operation of diesel fuel engines will be achieved by routine maintenance and use of lean burn or spark retard engines to reduce NO_x emissions.

Employing these mitigation measures will result in minimizing or avoiding potential impact to air resources to the maximum extent practicable.

<u>Climate Change</u>

Measures that may be employed to minimize CO2 emissions include, but are not limited to, use of high-efficiency generators and cooling systems, use of existing and/or previously disturbed sites to minimize vegetation/forest loss, and waste recycling, where appropriate. Additionally, no new employee trips will be generated by the NMCs.

5.2.5 Agricultural Resources

Mitigation of potential impacts to agricultural resources can be achieved by collocating antennas on existing structures. Collocation will not result in occupying any new land.

If new towers are built on agricultural lands, mitigation will be achieved by keeping the occupied area to a minimum, disturbing the least amount of soil possible for the telecommunication equipment and access, implementing BMPs for disturbed soils during construction. Common BMPs for handling excavated soils are typically very effective for erosion control where the area of disturbance is limited. Additional measures include re-vegetating disturbed areas following construction, use of compaction and surface protection measures, avoiding drainage and irrigation systems in the site design and repairing any affected drainage or irrigation systems, and by scheduling construction activities to avoid interfering with agricultural operations.

Proposed sites located in "agricultural lands" in the coastal zone will be evaluated for consistency with New York State Coastal Management Policy 26 as determined necessary. These measures will ensure that impacts to agricultural soils will be minimized or avoided to the maximum extent practicable.

5.3 HUMAN RESOURCES OF THE STUDY AREA

5.3.1 Transportation

No adverse impacts to transportation resources are anticipated and therefore, no mitigation is required. The contractor will comply with all applicable transportation laws and regulations related to the movement of construction equipment and materials (including towers and shelters) to and from construction areas, including obtaining permits where necessary.

5.3.2 Land Use and Zoning

Some municipalities have enacted specific regulations applicable to telecommunications towers. Various components of these documents often include regulations pertaining to minimum setbacks, maximum heights, coloration, lighting, visual impacts and collocation. The manner in which the County will deploy the Project, including the siting guidelines, is largely consistent with these regulations. Likewise, the siting criteria for the Project set forth in the visual analysis of this DGEIS are consistent, to the extent practicable, with these local land use regulations.

The County has established siting guidelines for antenna sites, placing preference on collocation on existing County or municipally owned structures and towers; installation on existing buildings (roof and side wall mounts); and siting on County owned lands. Because these types of facilities will cause no change in existing principal land use, no mitigation is required.

For construction of new towers or modification of existing towers, the following mitigation will occur:

- The County will comply with local zoning requirements to the extent practicable to achieve consistency and harmony with local land use patterns and zoning regulations. If compliance with local zoning is not feasible, the County will necessarily rely upon its immunity from local land use laws.
- Nevertheless, the County will comply, to the extent practicable, with the substantive provisions (setbacks, berming, height limitations, lighting limitations, site security and access road security) of the zoning law or telecommunications ordinance that may be in effect in the municipality in which the facility is proposed to be located.
- The County will make a determination as to any substantive provision of the local zoning law or telecommunications ordinance that may be in effect with which compliance is not practicable.
- The County will review each proposed site and identify whether the site is located within a special resource area, greenway, recreationway, waterway access, corridor or trail. Site selection will avoid these resources to the extent practicable.
- The County will comply to the extent practicable with any State land use program that may be applicable (e.g., Coastal Zone Management plans, aquifer protections plans, open space conservation plan and large resource protection plans)

5.3.2.1 Existing Land Use

There may be specific regional plans or compacts governing tower placement within some areas of the Study Area. Although not required to do so, Cayuga County will comply with these plans or compacts, if they exist in areas where Project facilities are proposed, to the extent practicable.

These mitigation measures will minimize or avoid impact to land use to the maximum extent practicable.

5.3.3 Community Services and Public Utilities

Project specifications will limit, where possible, increased demand on utilities. The NMCs are expected to be sited in existing facilities with existing utility service where possible. Antenna sites will be sited at existing facilities where feasible. These existing facilities will likely have adequate utility service to support the new installations. The siting guidelines will help reduce the number of facilities that will need new electric or gas utilities.

NMCs and antenna sites will use existing communications land-lines wherever adequate capacity exists. This will reduce the need for new communications line construction. If capacity is insufficient, the local telephone company will provide additional communications lines. The additional equipment is common in the industry and is similar to that routinely installed to expand commercial telephone service. No mitigation measures will therefore be necessary.

Electricity and fuel consumption will be minimized through application of uniform building codes which require energy conservation measures including: fully insulated structural components (e.g., walls, windows and doors); energy-efficient appliances and instruments; and programmable thermostats for heating and cooling systems.

Where possible, generation of construction waste will be minimized through reduction, reuse and recycling. Recommended practices include: return of excess materials to the supplier or use at another Project facility; and conservative purchasing to reduce the generation of excess construction materials. Through reuse of materials (such as wood waste) at the construction site or at an off-site location to the extent feasible, generation of waste for disposal will be reduced.

Waste reduction at NMCs will also be achieved through recycling consistent with the availability of commercial recycling programs. Waste paper, cans, bottles and cardboard are candidates for recycling.

These practices will minimize or avoid impact to community services and utilities to the maximum extent practicable.

No mitigation measures are required for social services.

5.3.4 Demography & Environmental Justice

5.3.4.1 Demography

Construction and trade workers constitute only a potential short-term, transient increase in population. With no expected demographic changes as a result of the construction of antenna sites, or NMCS, no mitigation will be necessary. Operational phase activities will not include additional permanent staffing and, therefore, require no mitigation.

5.3.4.2 Environmental Justice

No potential EJ areas will be disproportionately affected by the Project given that the potential impacts of any individual facility are the same as those forecast for areas that are not designated as potential EJ areas. The locations for Project facilities will be determined on an operational or performance basis and, therefore, be independent of socio-economic factors. Environmental Justice analysis will be conducted on a site by site basis regardless of the facility location in

accordance with DEC Policy CP-29, which mitigates any potential EJ impact to the maximum extent practicable.

5.3.5 Visual

Mitigation measures proposed to address potential visual impact are, generally speaking, the same as those proposed in the OFT GVIA. As discussed in Section 4.3.5 (visual impacts), the vast majority of potential visual impacts resulting from the Project would be associated with the construction of new tower facilities. The Project siting guidelines provide mitigation for this potential impact by establishing a preference for antennas to be collocated on existing County or municipally owned structures where possible. As is discussed below, for those antenna sites requiring new tower construction, there are additional site-specific mitigation measures that may be employed either to eliminate or substantially reduce any potential visual impact of individual antenna sites. Thus, on a system wide basis, it is anticipated that potential visual impacts will be mitigated to the maximum extent practicable, resulting in no overall adverse visual impacts.

On a site-specific basis, effective mitigation will be achieved through selective siting of Project antenna sites. Keeping the sites off of prominent hilltops and ridges to the extent practicable, and at greater distances from areas of settlement and other visually sensitive features/receptors (including but not limited to those set forth in the OFT GVIA as derived from DEC's Program Policy, *Assessing and Mitigating Visual Impacts* (July 31, 2000)), will almost always serve to reduce project visibility and potential visual impact substantially. Siting the facilities where existing towers/antennas already exist, or in areas where the visual quality of the landscape is already compromised (e.g., commercial and industrial areas, transportation and utility corridors) will also lessen the facility's visual contrast/impact.

Mitigation is also achieved through appropriate system and facility design. Low-profile installations will not require mitigation due to their limited visibility and minor potential visual impact. Mounting the antennas on existing structures (communications towers and other built components of the landscape) can minimize the facility's vertical line contrast. Minimization of new tower height and reduction in the number and size of the microwave antennas wherever possible will help reduce contrast in scale and form. Where primary views are from more distant locations and superior vantage points, the greater transparency of lattice towers can serve to reduce facility visibility and potential visual impact (again, if not covered with a large number of microwave antennas and multiple cable runs). While the galvanized gray color of the towers and certain antenna components generally works well in a variety of settings, the use of white on the microwave antennas should be avoided if possible.

Additional mitigation will be achieved by requiring the following procedure. For the installation of the low-profile Project facilities, the antenna installation contractor should confirm that the facility is not directly in front of a visually sensitive site/resource. Beyond this, no additional visual impact analysis is required.

Because potential adverse visual impact cannot be precluded for any LSZ into which a new tower may be placed, a site-specific siting process should be followed by the antenna installation contractor prior to construction of any high-profile facility. Site-specific visual analyses will be required for any high-profile Project facilities that (1) require FAA lighting or color marking; (2) are proposed in a landscape setting significantly different from those evaluated in the OFT GVIA; or (3) are in areas of the Study Area that have established, site-specific visual impact assessment requirements in place. In addition, because potential adverse visual impacts could not be precluded for any LSZ into which a high-profile facility might be placed, the OFT GVIA also recommended a site-specific, pre-construction visual analysis/siting procedure. This process should be aimed at identification of visually sensitive resources and siting proposed Project facilities in specific locations that minimize potential adverse impact on these resources/receptors. The process should include the following steps:

1. Identify the general area in which the antenna site is required to achieve necessary signal coverage.
2. Identify specific potential sites within the area where antenna sites could be sited. For each site, specify the required tower height and the number and type of antennas.
3. Map sensitive visual resources (as defined in Cultural Resources, Appendix B) per DEC within a 5-mile radius of each potential site.
4. Conduct a viewshed analysis of the proposed tower sites (*See* Appendix A of OFT GEIS Cultural Resources, OFT GEIS Appendix B, Methodology) based on topography only (i.e., ignoring the screening affect of vegetation). If this analysis determines that the towers are not visible from sensitive resources/receptors within 5 miles, then the installation can proceed.
5. If topographic viewshed analysis suggests visibility of all potential tower sites, redo the viewshed analysis, taking into consideration the screening affects of vegetation, and/or prepare line-of-sight cross sections to determine if the towers could still be visible from sensitive resources within a 5-mile radius. If sites are fully screened from sensitive resources based on this analysis, then installation of the proposed facilities can proceed. If no sites are fully screened, or if visibility through vegetation is a significant concern (e.g., winter views through a thin tree screen), then the preferred/selected site should be

the one with the least potential visibility from sensitive sites as determined by both the topographic and vegetative viewshed analysis. Sites with potential visibility from more distant resources should be preferred over those with visibility from resources/receptors located in foreground and midground instances.

6. If collocation is being proposed and the only sensitive resources with potential visibility are historic resources located over 0.5 miles from the proposed installation, the Project can proceed in accordance with the *Nationwide Programmatic Agreement for the Collocation of Wireless Antennas*.
7. If viewshed mapping suggests visibility from sensitive sites, conduct a field evaluation of actual Project visibility. This exercise would typically involve raising a large helium-filled balloon on the proposed site to the height of the proposed tower. Photo documentation of balloon visibility from sensitive sites is then used to determine Project visibility. If field evaluation determines the proposed facility is fully screened from these sites, the installation can proceed.
8. Where field evaluation indicates Project visibility, site-specific simulations of the proposed facilities from the affected sensitive resources − using the photos obtained during field evaluation − should be prepared to illustrate the visual effect of the proposed Project. If visual impact is negligible −due to distance, screening, and the like – the installation can proceed.
9. If visual impact is likely based on the simulations described above, prepare simulations of possible mitigation options (e.g., alternate support structure, alternate antenna color, etc.) to determine if potential visual impact can be significantly reduced.
10. Based on review of the simulations described in steps 8 and 9 above, select the Project site/facility that has the least visual impact on the fewest number of sensitive resources.

By going through this process, the potential adverse visual impact of proposed facilities can be avoided, minimized and/or mitigated to the maximum extent practicable.

5.3.6 Noise

Noise from construction equipment and construction vehicle engine operation will be reduced through the use of noise mufflers specified by the equipment or vehicle manufacturers. Engine noise will also be mitigated by limiting idling time to the maximum extent practicable.

Stationary construction equipment noise (e.g., that from dewatering pumps, compressors and generator engines) will be enclosed in temporary noise reducing housings in certain circumstances where especially sensitive noise receptors are nearby.

Permanent stationary equipment noise sources (i.e., generator engines) will be equipped with noise mufflers specified by the engine manufacturer. In locations where especially sensitive noise receptors are nearby, noise barriers (walls) will be installed between the source and the receptor or the engine will be housed in a noise reducing housing or structure. If facility structures require cooling fans, the fans will be located in structures designed to dampen fan noise while allowing for adequate ventilation. Noise from the operation of mechanical or electrical equipment will be reduced by its enclosure in the facility structure which protects the equipment from the weather.

Employing these mitigation measures will minimize or avoid potential noise impact to the maximum extent practicable.

5.3.7 Historical and Archaeological Resources

Mitigation as to historical and archaeological resources falls into two categories: primary measures that are incorporated into the initial design and planning, and secondary measures designed to address potential site-specific impacts that cannot be planned for during design or that can only be identified on a site-specific basis.

5.3.7.1 Historical Resources

<u>Avoidance</u>

Avoidance will be the first level employed to mitigate adverse effects of the Project on historical resources. NMCs will not be located in or on historical structures or on the property associated with a historical structure unless technical requirements render alternative locations infeasible. If technical requirements mandate the location of an NMC in or on a historical structure or within a historical district, avoidance of changes to the structure, façade and other visible architectural features will be a design goal for these facilities.

Avoidance of some potential impacts can be accomplished through the collocation of new antenna sites on existing towers and structures, provided that the existing tower or structure is not itself a historic resource. A March 10, 2002 fact sheet issued by the FCC concerning the March 16, 2002 Programmatic Agreement between the FCC, the ACHP and NCSHPO, notes that "the addition of an antenna to a preexisting tower or other structure that is not itself a historic property (i.e., collocation) ordinarily should not have an effect on historical properties." This conclusion is premised on the collocated facility not resulting in a "substantial increase" in the size of the tower. Among other criteria, a "substantial increase" occurs whenever the collocation results in an increase in the height of the existing tower of more than 10%.

Under the terms of the PA, collocation of a Project facility on a building or non-tower structure may require mitigation if the building or structure is more than 45 years old; inside or within 250 feet of the boundary of a historical district and the antenna is visible from ground level anywhere within the historical district listed in or eligible for listing on the National Register of Historic Places; or the FCC is in receipt of a complaint (supported by substantial evidence) that the collocation has an adverse effect on one or more historical properties.

Reduction and Elimination of Impacts

The Nationwide Agreement requires FCC and SHPO notification and consideration of National Register listing for any previously unidentified sites in the APE that are discovered after consultation is complete. All historical resources within the APE associated with each Project facility will be treated as sensitive receptors. Mitigation of potential visual and acoustic impacts will include those measures described in other sections of this DGEIS to reduce these potential impacts.

In the case of potential visual impacts, the planting of screening vegetation at the affected historical resource and at the site of the proposed facility will result in the reduction or elimination of views of the proposed Project facility that are incongruous with the historical resource. Potential visual impacts will also be reduced or eliminated by reducing the size of the proposed facility to the extent possible consistent with system performance objectives so that it is no longer within the viewshed of the historical resource, or is less visible from within that viewshed.

For facilities located within or near historic districts or landscapes or near historic structures, designing the appearance of the new facility in such a manner that it "blends" with the historic character of its surroundings will reduce potential impacts. Design and installation methods include coloration (selection of colors compatible with the natural building colors); positioning (installation to promote shielding of the antennas from the viewing public); and camouflaging (creating a false building feature such as a parapet or chimney to house the antenna).

Potential acoustic impacts to historical resources will be mitigated by enclosing the noise source or erecting noise barriers between the source and the historical resource (most likely near the noise source) when necessary.

5.3.7.2 Archaeological Resources

In all cases of new construction of Project sites, an appropriate archaeological evaluation will be conducted by a qualified professional to ensure all appropriate mitigation measures are undertaken. Types of mitigation are discussed below.

Avoidance

Avoidance is the first level of mitigation that will be used to mitigate adverse effects of the Project on archaeological resources. Archaeological sites and districts with visible, above-grade components that are suitable and available for public interpretation will be avoided whenever feasible, consistent with system performance requirements. Archaeological resources of this type are not common, and avoiding such resources will be a factor in selecting potential sites for Project facilities. All archaeological resources known to contain or suspected of containing human remains will be avoided.

The vast majority of archaeological resources in the Study Area have only a limited surface (visual) manifestation. Previously recorded, newly identified or potentially present archaeological resources of this type may be located within the area of ground disturbance associated with construction of a proposed Project facility. In these cases, if feasible, the construction footprint of the facility will be modified to avoid the archaeological resource. Areas of construction-related ground disturbance (e.g., construction parking, materials storage and laydown areas) can usually be modified to avoid archaeological resources.

If an archaeological resource is known to be in close proximity to proposed construction, a site or facility-specific archaeological resource protection plan will be developed and implemented in consultation with OPRHP for use during the construction period. Depending upon location-specific conditions, protection plans may include designation of buffers or avoidances or limit-of-disturbance zones; use of fencing, signage or flagging to designate the limits of the archaeological site and surrounding buffers; and construction monitoring.

Reduction and Elimination of Impacts

The vast majority of archaeological resources derive their significance from the historical and scientific data they contain. For this reason, the careful and scientifically-controlled excavation (data recovery) of significant archaeological resources that cannot otherwise be avoided will likely constitute the principal form of archaeological resource mitigation. If, after consultation with OPRHP, data recovery is determined to be the most appropriate form of mitigation, a data recovery plan will be prepared and implemented. Data recovery plans will be designed and implemented under the supervision of a Registered Professional Archaeologist ("RPA") and in accordance with the New York Archaeological Council's *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State* (1994) and recommended for use by OPRHP, and the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*, 48 FR 44716 (as amended 1990).

Some forms of construction-related ground disturbance to archaeological resources can be reduced or eliminated by physical protection of the resource. These include controlled burial of an archaeological resource or the use of construction matting to cover an archaeological resource to reduce the effects of compaction and near-surface disturbance that may result from construction equipment traversing and maneuvering over an archaeological site. The decision to employ controlled burial and matting will be made on a resource-specific basis and is dependent upon factors such as soil characteristics, the depth of archaeological deposits, the types of archaeological remains present or anticipated and the kinds of construction equipment that will be maneuvering above the archaeological site.

To further reduce potential impacts to archaeological resources, where necessary an Unanticipated Discovery Plan ("UDP") will be developed in consultation with OPRHP. That plan will specify procedures to be followed in the event that archaeological remains (including human remains) are inadvertently discovered during construction. The UDP will include provisions for protecting the discovery until its significance can be evaluated; an evaluation of the significance of the discovery; will seek input from OPRHP and the appropriate Native American groups when Native American resources or remains are involved; and will implement and report on the results of any subsequent mitigation actions such as data recovery.

5.3.7.3 Other Cultural Resources

Mitigation may include blending tower designs using similar style and materials. Mitigation measures for religious institutions, retreat centers, cemeteries and other cultural resources for both construction and operation activities may include avoidance and compatibility assessments.

Each site will be evaluated pursuant to the Nationwide Agreement and other relevant law to the extent practicable. Compliance with these measures will minimize or avoid impact to historical, archeological, and other cultural resources to the maximum extent practicable.

5.3.8 Public Health and Safety

5.3.8.1 Safety Issues and Guidelines for Radiofrequency Emissions

Mitigation of potential health and safety impacts for Project antenna sites and NMCs begins in the design phase and additional mitigation measures may be introduced during the construction and operational phases. Mitigation of potential public health and safety effects is therefore addressed below from two perspectives. First, radiofrequency and microwave emission exposure is addressed, followed by a summary discussion of what measures may be taken to reduce and/or minimize the adverse effect of such exposure during the construction (assembly and testing) and

operational phases. Second, mitigation of potential health and safety impacts from typical design, construction and maintenance activities is discussed.

5.3.8.2 Radiofrequency and Microwave

The typical rationale for mitigation is inapplicable to the configuration of TLMR and microwave transmitters for Project emergency communications. Based on the analysis contained in Section 4 of this DGEIS, no potential risk of adverse human health effects was identified in association with EMF power densities in the frequency and power ranges of the planned TLMR and microwave transmitters. This was true even at the location of a hypothetical worst-case "critical receptor" situated beneath multiple "collocated" transmitters assumed to operate simultaneously and at maximum power. In the absence of adverse impact, SEQRA does not require mitigation.

From a practical viewpoint, the concept of mitigation can be reduced to limitation of exposure. The best mitigation possible is to avoid any exposure to EMFs arising from Project transmitters, within the constraints imposed by engineering and economic feasibility. If this is not practical or possible, the next best measure is to provide adequate barriers that will reduce the full extent of exposure so that what passes through the barriers is not harmful. The barriers that basically act as a buffer provide a huge margin of safety. However, a margin of safety is not a fail-safe measure nor is it a guarantee against all potential harm. It is acknowledged that science cannot predict all possible outcomes. It only anticipates the possibility or the likely possibility of an adverse outcome by reducing exposures to a level where they are no longer considered harmful.

As policy, such a precautionary principle is controversial, in part because it assumes, albeit incorrectly, that advances in science will reduce acceptable exposure levels. Fortunately, health risk assessments already do this systematically, as a matter of standard procedure. Indeed, in actual experience, new science more often validates the adequacy of risk assessment procedures as conservative predictors of likely effects. Adherence to the precautionary principle is also less controversial when it is tempered by practicality, that is, when it is applied in light of engineering and economic constraints.

<u>Mitigating Exposure</u>

Pursuant to NEPA, the FCC is required to consider whether its actions will "significantly affect the quality of the human environment." Additionally, the Telecommunications Act of 1966 requires the FCC to prescribe and make effective rules concerning the environmental effects of RF emissions.

Pursuant to its statutory authority, the FCC authorizes and licenses devices, transmitters and facilities that generate RF and microwave radiation. In general, all FCC approvals and licenses

of transmitters and facilities, unless specifically exempted, must be evaluated for any potential significant impact on the environment. Permitting for each site in the Project typically would require an RF study specifically tailored to each site, based upon the EMF radiation pattern for each antenna to be installed at the site, along with comparable pattern diagrams for any pre-existing antennas. One aspect of such environmental evaluations is the human exposure to RF radiation by transmitters.

However, low-powered, intermittent or otherwise inaccessible RF transmitters and related facilities are "categorically excluded" from such routine evaluation for RF exposure since the risk is considered minimal or negligible. This exclusion does not mean total exclusion from other applicable compliance requirements, but only from routine evaluation for RF exposure. Under a case-by-case scenario, when evidence of potential non-compliance of such transmitter or facility is brought to the FCC's attention, the FCC may require the so-called "categorically excluded" transmitters or facilities to demonstrate compliance. The FCC's OET Bulletin 65 sets forth the technical guidelines for evaluating compliance with its RF safety requirements. FCC, *Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields* (Edition 97-101, August 1997).

Exposure of people to EMFs arising from Project transmitters will be limited as a result of the Project's compliance with the requirements of the FCC's OET Bulletin 65.

Human exposure will be mitigated through the separation of people from EMF sources. This separation will be accomplished by:

- Transmitter elevation.
- Access control.
- Distance from buildings.
- Microwave beam directionality.

These mitigation strategies are addressed in the paragraphs below.

Separation via transmitter elevation – Transmitters will be mounted at elevations beyond the reach of people at ground level.

Separation via access control – Access to transmitter mounting structures will be limited to authorized personnel. Fences, gates and other positive methods of restricting access will be used. All tower sites will be posted with warning signs and will remain locked at all times. Where necessary, access points also will be monitored by supervised alarms. Access perimeters

will be determined based upon minimizing human exposure to EMF side-lobes, that is, unintended down-transmissions.

Separation via distance from buildings – Locations of transmitter mounting structures will be at reasonable distances from buildings where typically sensitive subpopulations of people might be exposed. Such buildings would include schools, day care centers and hospitals, among other structures. Indeed, a preference for collocating Project transmitters at the safest locations is expressed in the Project siting guidelines by collocating transmitters (where possible) on mounting structures previously found to be situated at low-exposure locations relative to potentially exposed populations.

Separation via microwave beam directionality – Microwave transmitters will have an added exposure-reducing feature. That is, they are designed for narrow beam point-to-point communications. Such directionality uses a collimated (focused) microwave beam which greatly reduces EMF scattering, and thereby diminishing potential human exposure.

Lightning Strike Risks

Tall objects are susceptible to strikes by lightning. There is virtually no fool-proof mitigation or protection device for lightning striking Project facilities, particularly where a Project component is located on a tall structure, for example, a tower or a high-rise building. To the extent that there may be minimal risk of lightning strikes, it will be addressed in accordance with applicable requirements, such as those of the FCC's OET Bulletin 65 (FCC, 1997). The most basic type of lightning protection device is the Franklin lightning rod (Mousa, 1997) named after Benjamin Franklin in recognition of his studies of lightning. Lightning rods achieve protection of the structures on which they are mounted by providing a sacrificial point for the termination of lightning flashes.

Alternate approaches may be preferable under certain circumstances, especially for highly vulnerable structures, such as a multiple point discharge to neutralize cloud charges. These devices now are available commercially and marketed under the name "charge dissipaters." Charge dissipaters vary in shape and dimension. For example, one such unit was used on a 30.5-meter tower at the NASA satellite tracking station on Merritt Island, Florida. Appearing as an umbrella of 6 meters in diameter, it had approximately 300 meters of barbed wire wrapped spirally around the frame of the umbrella. In addition to umbrella dissipaters, other dissipaters have different shapes, for example, balls, cones, doughnuts and cylinders.

Telecommunications facilities specifically have been the subject of guidelines for protection against lightning electromagnetic pulse. Such guidelines are published by the International

Telecommunication Union. They apply to new and existing telecommunications facilities. Basic measures for protecting mounting structures include the following:

- Earthing – grounding via a general ring earth electrode.
- Shielding – isolating telecommunications facilities from electromagnetic interference, including magnetic field effects.
- Bonding – establishing a direct or indirect (via surge protection) contact between metallic parts, thereby reducing electromotive potential (i.e., voltage) differences between metal parts and systems inside the volume to be protected

5.3.8.3 Antenna Sites and NMCs

Mitigation of unsafe or unhealthful practices is addressed, in part, through strict adherence to applicable safety and health laws and regulations. These primarily originate from the following State, federal and safety organizations:

- Federal Occupational Safety and Health Administration – The laws, regulations and enforcement authority of OSHA is applicable to private-sector workplaces. The Project will be designed, constructed and operated by Cayuga County or contractor(s) selected by Cayuga County. OSHA regulations will be applicable both during the construction and operation of the Project and will include contract employees constructing and operating the facilities.
- The New York State Department of Labor ("DOL"), Division of Safety and Health is responsible for protecting public workers in their work environment.

The primary OSHA regulations applicable to the Project are:

- Safety and Health Regulations for Construction (29 CFR Part 1926).
- Occupational Safety and Health Standards (29 CFR Part 1910).

Both the OSHA and the DOL rely on and refer to OSHA's regulations promulgated under the Occupational Safety and Health Act. In addition, the State's Public Employee Safety and Health program inspects and enforces several State-specific program areas. These include asbestos control (the required inspection for asbestos prior to demolition, rehabilitation and renovation of buildings – primarily applicable to Project NMCs); and licensing of crane operators (applicable to construction of the Project rooftop and tower construction operations), among others.

Design and Construction

All the Project facilities will be designed and constructed in conformance with best engineering practices with special attention to safety and health parameters applicable to the type of facility to be built. These procedural steps are, in effect, permanent mitigation measures that would reduce or eliminate potential adverse impacts to the health and safety of employees and the general public. Examples include:

- The design of all Project facilities will be performed by a State licensed professional engineer. This requirement applies to all structural components of tower facilities and NMCs.
- The required compliance by all Project contractors with all State, local and federal laws applicable to the design, construction and operation of the Project facility will ensure necessary safeguards against any undesirable exposure to potential health and safety hazards. Such conformity and vigilance include health and safety regulations, which specifically address the safety of workers at the facilities.
- The preparation, by State licensed professional engineers, of all filings, applications and reports and the performance evaluations of all analyses, as required by State, local or federal law, rule, ordinance or regulation, ensure necessary quality control. Examples include filings to the FCC for frequency allocation (which will mitigate interference) and to the FAA for tower modifications and new construction of towers so hazards to navigable airspace are minimized.
- The design of all Project components will be such as to withstand typical and expected worst-case climate conditions present in the Study Area. Climatic conditions include wind, ice accretion (ice formation), peak rainfall, snow with high water content and seismic activity.
- The requirement that all fuel tanks be installed within enclosures provides additional safety. In addition, leak detectors will be installed and monitored by the facility's remote alarm system.
- The requirement for site security will provide both safety and security features. They will include fencing, barbed wire and locking gates for antenna sites, and building security features for NMCs.

- The requirement for grounding protection systems will further augment safety measures. They will include measures to mitigate, to the extent possible, the areas that may be affected from lightning strikes.

To further assure full compliance with all engineering, health and safety requirements of the Project, certification by a State licensed professional engineer is required for a variety of reports, certificates and all drawings. This requirement provides assurance that a thorough review and inspection of the Project components is provided.

Construction Phase

Antenna sites required for the Project may be installed on existing buildings, existing towers and modified towers, new towers and other structures. NMCs are expected to be constructed in existing buildings that may require renovation.

Construction activities present specific risks. Examples of mitigation measures are described by topic below:

- During the erection of the towers, specialized workers and equipment will be employed. Cranes will be properly maintained and will be used only if they are in good working order. All crane operators will be licensed and trained in accordance with the DOL requirements. Cranes will be operated according to OSHA's standard on overhead and gantry cranes (29 CFR § 1910.179).
- All personnel constructing Project facilities will be required to wear appropriate head protection.
- All climbers accessing the towers or high structures must have appropriate training, certification and the proper equipment according to, but not limited to, all New York State DOL and OSHA PESH Regulations, and applicable safety requirements, applicable to elevated work, such as the OSHA standard on fall protection (29 CFR § 1926.760) and DOL Elevated Work Platforms requirements. In addition, whenever climbing is necessary, two climbers will always be on site, each with full climbing gear to ensure that a rescue can be performed if needed.
- All excavation areas will be reviewed for subsurface utilities consistent with State and local requirements. Temporary barricades will be erected whenever excavations are left unattended.
- To limit exposure to workers during construction and subsequent operation, work will be performed according to the 1992 ANSI/IEEEs guidelines, as required by FCC Order No. 96-326 (as part of FCC ET Docket 93-62), and as further

presented in the FCC OET Bulletin 56. This topic is further addressed in the radiofrequency and microwave portion of this DGEIS.

- Danger to unauthorized persons will be reduced through implementation of good construction management practices such as temporary fencing, barricades and off-hour security of the construction site.
- Unauthorized access to construction equipment will be prevented through locking of equipment, storing of tools in secure areas and provision of security on-site as needed.
- Maintenance of a clean and orderly site will help eliminate trip and fall hazards.
- Control of the risk of fires will occur through minimization of hot work, implementation of fire protection techniques and fire control devices (fire extinguishers, water sources) where necessary.

Operational Phase

Operation of Project facilities will present hazards similar to those during the construction phase. Applicable mitigative measures include:

- Performance of maintenance on antenna sites during favorable weather conditions, where feasible.
- Proper illumination wherever night work is required.
- Maintenance by technicians trained in health and safety procedures including that applicable to low and high voltage energy, high work, confined space entry, hazard communications and other safety programs.
- Provision of emergency first aid kits on all construction and maintenance vehicles.

6.0 ADVERSE ENVIRONMENTAL IMPACTS THAT CANNOT BE AVOIDED IF THE PROJECT IS IMPLEMENTED

As discussed in the Executive Summary, this section incorporates portions of the OFT GEIS that are relevant to this DGEIS, in particular, adverse environmental impacts that cannot be avoided that are similar to those analyzed for the SWN.

6.1 NATURAL RESOURCES

6.1.1 Geology

Based upon the limited potential impacts identified and available mitigation measures, no significant adverse impacts to subsurface geology are anticipated. If it is determined that adverse impacts to surficial geology cannot be avoided by the mitigation measures identified in section 5.1.1, further appropriate review will be conducted.

6.1.2 Water Resources

Based upon the limited potential impacts identified and available mitigation measures, no significant adverse impacts to water resources are anticipated. In the event that new construction of a Project antenna site becomes necessary in a wetland or protected stream, significant adverse impacts will be avoided through appropriate mitigation (to the maximum extent practicable) as described in the previous section. If it is determined that adverse impacts to water cannot be avoided by the mitigation measures identified in section 5, further appropriate review will be conducted.

6.1.3 Air Resources

Based upon the limited potential impacts identified and available mitigation measures, no significant adverse impacts to air resources are anticipated.

6.1.4 Terrestrial and Aquatic Ecology

Construction of Project antenna sites may result in some temporary and/or permanent loss of habitat for terrestrial wildlife as well as a loss of vegetation. There typically is ample similar habitat surrounding a particular antenna site to accommodate and maintain species populations that may be displaced. On a site-specific basis, individual plants or animals may be eliminated for various reasons as a result of construction activity, but populations of these species can be maintained by similar habitat in the vicinity of an antenna site. On a Project-wide basis, however, based upon the limited potential impacts identified and available mitigation measures, no significant adverse impacts to terrestrial and aquatic ecology are anticipated. If it is

determined that adverse impacts cannot be avoided on a particular site, further appropriate review will be conducted.

6.1.5 Agricultural Resources

Based upon the limited potential impacts identified and available mitigation measures, no significant adverse impacts to agricultural resources are anticipated.

6.2 HUMAN RESOURCES

6.2.1 Transportation

Based upon the limited potential impacts identified and available mitigation measures, no significant adverse impacts to transportation resources are anticipated.

6.2.2 Land Use and Zoning

During both the construction and operational phases of the Project, there will be impacts to existing land uses through the permanent conversion of land to telecommunications use. The unavailability of such lands for other uses is limited, although not completely eliminated, through the County's siting guidelines and by restricting the footprint of any new facility. Based upon the limited potential impacts identified and available mitigation measures, no significant adverse impacts to land use or zoning resources are anticipated.

6.2.3 Community Services

No significant adverse impacts to community services are anticipated.

6.2.4 Demography

Project activities will have no appreciable impact on demographics. During construction, there will be a transient increase in population which will be unavoidable, but will have a negligible impact on long-term population density given the size of the work force needed for construction.

It is likely that some Project facilities will be sited in or around potential EJ areas. Given the fact that the locations for Project facilities will be determined on an operational basis, independent of socio-economic factors, it is very unlikely that any potential EJ area will be disproportionately affected by the construction or operation of the Project.

No significant adverse impacts to demographic resources are anticipated.

6.3 CULTURAL RESOURCES

6.3.1 Visual Resources

On a Project-wide basis, construction of Project antenna sites will result in impacts to visual resources. Adherence to both the siting guidelines and individual antenna site criteria should serve to limit any impacts to the greatest extent practicable. In all cases, compliance with the recommended siting criteria set forth in this DGEIS will be required to the extent practicable.

6.3.2 Noise

Based upon the limited potential impacts identified and available mitigation measures, no significant adverse noise impacts are anticipated.

6.3.3 Historical and Archaeological

Based upon the limited potential impacts identified and available mitigation measures, no significant adverse impacts to historical and archaeological resources are anticipated.

6.3.4 Other Cultural Resources

Based upon the limited potential impacts identified and available mitigation measures, no significant adverse impacts to other cultural resources are anticipated.

6.3.5 Public Health and Safety

There are no unavoidable health and safety impacts in the design, construction or operation of the Project.

7.0 ALTERNATIVES

As discussed in the Executive Summary, this section incorporates portions of the OFT GEIS that are relevant to this DGEIS, in particular, the alternatives applicable to the Project that are similar to those analyzed for the SWN.

SEQRA requires "a description and evaluation of the range of reasonable alternatives to the action that are feasible, considering the objectives and the capabilities of the project sponsor." 6 NYCRR § 617.9(b)(5)(v). The County considered and evaluated the following alternative technologies for the Project:

- Land-line communications.
- Cellular.
- Personal communications service.
- Specialized mobile radio.

In addition, the County considered the "no action" alternative.

Before considering any alternative to the Project, minimum functional requirements for any public service or public safety radio system must be identified. Given the Project's objectives and the important public need it hopes to fill, any system that does not provide this minimum functionality is not a viable alternative to the Project.

Coverage – The Project equipment must function in all geographic areas of Cayuga County without restriction. It must provide 87% geographic coverage with a Digital Audio Quality of 3.4.

Capacity – The Project must support a multitude of public safety users during emergencies with orderly and prioritized access with the ability to accommodate expansion.

Reliability – The Project must be designed for mission critical applications with multiple levels of fault tolerance, redundancy, and back up power.

Control - The Project must provide the ability to manage and monitor who is communicating, when they communicate and whom they communicate with.

Digital – The Project must use a digital format allowing for data transfer and encryption.

Frequency – The Project must operate on available frequencies.

7.1 ALTERNATIVE SCALE OR MAGNITUDE

One of the fundamental objectives of the Project is that it be a county-wide system. As discussed in detail elsewhere in this DGEIS, the county-wide nature of this Project is absolutely critical to

the protection of Cayuga County's citizens. Any system that is not county-wide is simply not a viable alternative to the current proposal. Even if the Project were reduced in scale or magnitude, the system uses line-of-sight technology, therefore, reducing the number of users would not necessarily lessen environmental impacts of the Project, as the same number of antenna sites would be required to achieve county-wide coverage regardless of the number of users.

Additionally, the functional capability of the Project does not present a significant opportunity to reduce, to any great extent, the number or physical size of required antenna sites or NMCs. From this perspective, there is no net environmental benefit from reducing or altering the functional features of the system.

7.2 ALTERNATIVE TIMING OR PHASING

The proposed Project could be delayed for a number of years. In this case, environmental impacts would be delayed. During the period of delay, impacts would be the same as those from the no action alternative.

Delay prevents the County from complying with FCC mandated re-banding requirements which necessitate modifications to the existing system and installation of new equipment. This alternative is not feasible solely on the basis that the County would not be in compliance with federal regulation.

Additionally, during the period of delay, municipalities with a critical need for upgrading their communications systems would likely build their own systems in an uncoordinated and perhaps inefficient manner. The resulting systems would provide limited geographic coverage coincident with its municipal jurisdiction. Rather than minimize the proliferation of tower sites across Cayuga County, this approach would likely encourage the proliferation of tower sites. Accordingly, while delay of implementation of a Countywide system could otherwise be a viable alternative, such delay would likely result in greater, rather than less, environmental impacts.

7.3 ALTERNATIVE TECHNOLOGIES

Several communications technologies are available and, in varying degrees, are capable of serving public safety and public service providers. The unique requirements of public safety and public service agencies influence the suitability of these other systems.

In sum, however, none of the available alternatives is able to meet the Project's functional requirements and, accordingly, cannot realistically be considered a viable alternative.

A brief description of features, impacts and capabilities of the technologies is provided below.

7.3.1 Land-line Communications Systems

Land-line communications systems (e.g., traditional telephones) are based upon a physical connection between users of the system. A call cannot be completed without the user being directly connected to the telephone system, referred to as the Public Switched Telephone Network ("PSTN"). Initially, the land-line communications system was based on analog technology. Advances in telecommunications have introduced new features and, at the present time, digital technology is common and more desirable. Recent advances also allow multiple parties to be part of a single call ("conference call"). Public safety and public service providers need wireless communications so they can communicate from vehicles or on foot while on the move.

The environmental impacts associated with land-line communications systems are primarily related to the construction of aboveground and underground utilities (e.g., telephone wires, fiber optic and electric lines), switching equipment and associated rights-of-way or roadways. Impacts may include removal of vegetation and habitat and impacts to water and air quality. Based on the extensive development of the existing land-line communications systems, little new construction would be required to host a County-wide public safety and public service network and its impact would not be significant.

Land-line communications systems do not, however, meet the needs of the Project due to the following:

- Wireless communications are required.
- Lack of portability/mobility.
- Limited multi-party calling.
- Coverage limited to areas where hard-wire exists.
- Calls routed on a first come-first served basis (no priority).
- No call preemption.

7.3.2 Cellular

Cellular is a wireless technology that has been migrating from analog to digital services and is based on division of the service area into small geographic regions, called cells. Each cell has an antenna site that is equipped with transmitters, receivers and other equipment. The cell site communicates by radio signal with cellular phones located within the cell. Cells are connected to the Mobile Telephone Switching Offices and the PSTN to allow calls to be routed to both wireless and land-line systems.

Cellular technology requires a cellular infrastructure. Additional antenna sites and equipment would need to be sited where coverage is not currently provided in Cayuga County. This represents a significant area of Cayuga County for some carriers. This would require the construction of towers, antennas on structures, underground and aboveground utilities, roads and other infrastructure. In this respect, it is much like the proposed action. The environmental impacts, if any, would also be similar.

Cellular communications systems also do not meet the needs of the Project due to the following:

- Very limited multi-party calling.
- Limited coverage.
- Calls routed on a first come-first served basis (no priority).
- No call preemption.
- Limited reliability.

7.3.3 Personal Communications Service ("PCS")

PCS is a wireless digital technology that is similar to cellular. Voice or data is converted into a digital signal prior to being sent via radio. PCS technology requires antennas mounted on towers and structures. The PCS system uses computer technology to scramble and unscramble the digital message, making the digital system more secure.

PCS, similar to cellular, is limited in range. The signal is greatly affected by obstructions such as rolling terrain, buildings and trees. PCS requires that the signal from different sites overlap somewhat to provide uninterrupted service. Each PCS site must be located within its geographic region to provide overlapping, but not duplicative, coverage. PCS operates at higher frequencies than cellular, which results in the need for more sites than cellular requires to achieve the same level of service.

The environmental impacts associated with PCS are primarily related to the antenna sites. These impacts vary depending upon the facility type and its location. Minimal visual impacts typically result when a new antenna is added to an existing building or structure. Construction and visual impacts may result where a new antenna site is required.

PCS systems do not meet the needs of Project due to the following:

- Limited multi-party calling.
- Limited coverage.
- Calls routed on a first come-first served basis (no priority).

- No call preemption.

7.3.4 Specialized Mobile Radio ("SMR")

SMR is a dual function wireless technology. In the mobile telephone mode, the radio communicates to a base station and the PSTN. In the two-way radio mode, users communicate between two or more portable, mobile or fixed base units. SMR has traditionally been analog. Digital service is becoming available as access to bandwidth improves. SMR requires antennas to be mounted on towers and structures with equipment similar to other cellular and PCS systems.

The environmental impacts associated with SMR are primarily related to the antenna sites. These impacts vary depending upon the facility type and its location. Minimal visual impacts typically result when a new antenna site is added to an existing building or structure. Construction and visual impacts result where a new antenna site is required. Clearing of vegetation may be necessary. Construction of access roads and the installation of electric service or telephone service may also be required.

SMR does not meet the needs of Project due to the following:

- Limited digital capabilities.
- Multi-party calling available in only one mode.
- Limited coverage.
- Calls routed on a first come-first served basis (no priority).
- Call preemption available in only one mode.

7.4 NO ACTION ALTERNATIVE

The "no action alternative" would result in the Project not being constructed. This alternative will result in continued use of existing communications systems and whatever ad hoc local improvements become available in the future. The environmental impact of this alternative includes the uncoordinated proliferation of antenna sites in individual municipalities. This would likely result in the redundant proliferation of emergency communications facilities that may not be capable of operation with a County-wide system. This alternative would result in greater environmental impact than that anticipated from construction of the Project. Further, the County would not be able to comply with FCC re-banding requirements if the No-Action alternative is selected.

8.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

As discussed in the Executive Summary, this section incorporates portions of the OFT GEIS that are relevant to this DGEIS, in particular, the irreversible and irretrievable commitment of resources that are similar to those analyzed for the SWN.

Irreversible and irretrievable commitment of resources refers to natural and man-made resources that are consumed, converted or made unavailable for future use.

Building the Project will result in an irreversible and irretrievable commitment of some resources. During construction of antenna sites and NMCs, fossil fuels will be used to power construction vehicles. Construction materials such as concrete and steel for structures and precious metals for communications equipment will be consumed. Operation of the Project will consume fossil fuels for back-up and primary engine operation.

Parcels of land will be committed to long-term use by antenna sites. The presence of these facilities will preclude use of the land for other purposes. Because the antenna site will typically cover up to 1 acre, the quantity of land precluded from other uses will be insignificant.

Portions of the radio frequency spectrum will be allocated for the Project by the FCC. The FCC will grant an exclusive license to Cayuga County for the frequencies required for the Project. Consequently, these frequencies will be unavailable to others as long as Cayuga County holds the license for them. The frequencies allocated to Cayuga County are not consumed or otherwise permanently eliminated. They are simply occupied by Project usage for a time. That usage will preclude use by others for a long time, but not irreversibly.

Implementation of the Project does not result in irreversible and irretrievable commitment of any natural resource other than consumption of fossil fuels and raw materials for construction.

9.0 CUMULATIVE IMPACTS AND GROWTH INDUCING ASPECTS

As discussed in the Executive Summary, this section incorporates portions of the OFT GEIS that are relevant to this DGEIS, in particular, cumulative impacts and growth inducing aspects of the Project that are similar to those analyzed for the SWN.

9.1 CUMULATIVE IMPACTS

Cumulative impacts may result from the totality of otherwise insignificant impacts when considered on a Project-wide basis. Cumulative impacts may also result when the impact of the Project is considered with other approved contemporaneous wireless network projects. SEQRA requires a discussion of cumulative impacts only where "applicable and significant" (6 NYCRR § 617.9(b)(5)(iii)). In the context of the Project, the only potential cumulative impact that may be significant is the potential impact to visual resources. Potential impacts to all other resources, including geology, water, air, terrestrial and aquatic ecology and human resources have been determined either to be insignificant or capable of mitigation to an extent where any potential impact is no longer considered significant and/or adverse.

By way of example, as discussed in Sections 4 and 5, no significant impact to geologic resources at any individual Project site is anticipated. For the purposes of a cumulative impact analysis, however, the totality of the potential impact to subsurface geology from all anticipated Project sites must be considered together. Assuming that the maximum number of antenna sites (15) are required for the Project and that every single site requires new construction (this assumption is completely contrary to the Project siting guidelines) and further assuming that each antenna site will require disturbance of the maximum anticipated one acre of land, a total of 15 acres of land across the Study Area will be disturbed. Thus, on a worst-case cumulative basis, the Project may disturb 0.00004% of the surface geology of the Study Area. More acres are disturbed every year by residential housing construction than will ever be disturbed on a one-time basis by the Project. The actual cumulative disturbance to geologic resources will be far less based upon the preferences included in the Project siting guidelines. Therefore, there will be no significant cumulative impact to geologic resources.

This same analysis is applicable to all other potentially impacted resources and results in the same conclusion: there will not be any significant adverse or cumulative impacts from construction or operation of the Project.

Notwithstanding that as discussed in sections 4 and 5 no significant impacts to avian resources are anticipated as a result of construction of the Project, the 2000 FWS interim guidelines require that the cumulative impact of all new towers in excess of 199 feet be considered. Pursuant to the FWS interim guidelines, any new towers that are less than 199 feet are not anticipated to

have an adverse effect on avian species and therefore no analysis of their cumulative effect is required.

At this time, it is not known how many new antenna towers in excess of 199 feet may be required for the Project. Thus, a useful discussion of any potential cumulative impact from such towers is not yet possible. Any new towers in excess of 199 feet will necessitate a cumulative impact analysis of such towers.

Potential cumulative impacts to visual resources merits a separate discussion. As discussed in the OFT GVIA, new tower construction may potentially impact some visual receptors with near-ground and/or mid-ground views of the towers. The Project siting guidelines and prescribed siting criteria for individual tower sites will mitigate these potential impacts to the maximum extent practicable. Nonetheless, because the Project will be constructed at various locations throughout the Study Area, the potential exists that a visual receptor will have a view of more than one tower, a potential cumulative impact.

The OFT GVIA presumes exposure of near-ground and, in some cases, mid-ground receptors to a 180 to 189-foot tower supporting four 10-foot diameter microwave antenna dishes (high-profile towers). In all cases (except rural forested), no impact to receptors at background distances (in excess of 2 miles) is anticipated. For line-of-sight technology, there is a correlation between tower height, antenna size and signal throw (i.e., the distance the signal is able to travel). Taller towers with a larger antenna result in greater signal throw capability. A 10-foot diameter antenna on a 180-foot tower is able to throw its signal, assuming no intervening barriers, well in excess of five miles. Thus, while a visual receptor may be within a near-ground or mid-ground distance of a single high-profile tower, it is most likely that the next line-of-site, high-profile tower will be in excess of 2 miles distant from the receptor and therefore not adversely impacted by that receptor. In other words, it is unlikely that an individual receptor will be exposed to more than one high-profile tower at any given time. From this perspective, there will be no cumulative impact. In the event that intervening barriers require the siting of two or more high-profile towers within near-ground or mid-ground view of an individual receptor, further analysis of the towers' potential cumulative impact should be undertaken.

Cumulative Impacts of the Project with Other Planned Wireless Network Projects

As noted in Section 2.3.6, it is possible that some public and private project sponsors have plans to build new telecommunications antennas and new tower sites before or contemporaneous with Project deployment. As a consequence of the siting guidelines, which require collocation where feasible, certain of these new antenna sites will represent an opportunity to collocate Project antennas. To the extent that this occurs, the cumulative effect of contemporaneous construction

and deployment will be positive. Fewer new antennas and tower sites will be required than if these complementary systems were not constructed contemporaneously.

Although some collocation can be expected, the contemporaneous construction of the Project and other telecommunication sites may increase the total number of sites disturbed by construction. The impacts associated with other telecommunications site construction may be expected to be similar to that for Project antenna sites. Consequently, the potential for cumulative impacts from contemporaneous construction is not anticipated. Nonetheless, because a number of carriers will have similar coverage goals, they may find a common area advantageous for new tower construction. Consequently, it is possible, but not likely, that in some circumstances the contemporaneous construction of Project antennas and other telecommunications antennas will result in some concentration of antennas not likely for the Project alone and some cumulative impacts slightly greater than those reasonably anticipated from construction of the Project alone. In such an event, further analysis may be required.

9.2 GROWTH INDUCING ASPECTS

Growth inducing aspects describe the potential for the action to stimulate new residential, commercial or industrial activity that would not occur if the Project were not built. Residential growth often follows the creation of new job opportunities. Commercial growth may occur in response to increasing residential population. Operation of the Project will offer a negligible number of new employment opportunities through maintenance of antenna sites. No new employees are expected in relation to operation of the NMCs.

Deployment of the Project may increase the development potential of a local area. Overbuild of Project antenna sites with collocation could provide opportunities for new or improved commercial wireless coverage in rural and remote areas that currently do not have wireless service. The convenience of commercial wireless service could alleviate a significant impediment to industry, commerce and residential development, and could increase the desirability of these rural areas for growth. While possible, such growth is highly speculative and not capable of evaluation.

No other growth inducing aspects are anticipated.

10.0 EFFECTS ON THE USE AND CONSERVATION OF ENERGY

As discussed in the Executive Summary, this section incorporates portions of the OFT GEIS that are relevant to this DGEIS, in particular, the effects on the use and conservation of energy for the Project that are similar to those analyzed for the SWN.

Energy consumption will occur during construction, installation and operation of the proposed structures. During construction, energy will be used for equipment and various construction vehicles. Construction of NMCs is not anticipated to take more than 60 to 90 days. Construction of NMCs will be indistinguishable from other commercial construction. Accordingly, construction activities for Project NMCs will not have a significant impact on fuel resources or energy supplies.

Operational energy will be required for space heating, air conditioning, computers, communications and other electrical equipment. Electricity at NMCs will be provided by electric lines, and natural gas will be provided for heating if available at the location.

Antenna site operation will consume electricity to power telecommunications equipment, space heating, air conditioning, a security system and security lights. Electricity for antenna systems will be supplied by electric lines. Antenna sites will be equipped with backup power sources. Antenna site demand for power is on the order of a single-family residential home.

There are no reliable alternatives to these energy sources.

APPENDIX A

GEOLOGY RESOURCES

APPENDIX B
WATER RESOURCES

APPENDIX C

TERRESTRIAL AND AQUATIC RESOURCES

APPENDIX D

AIR RESOURCES

APPENDIX E

AGRICULTURAL RESOURCES

APPENDIX F

TRANSPORTATION RESOURCES

APPENDIX G

LAND USE AND ZONING

APPENDIX H

COMMUNITY SERVICES AND PUBLIC UTILITIES

APPENDIX I

DEMOGRAPHY AND ENVIRONMENTAL JUSTICE

APPENDIX J

VISUAL RESOURCES

APPENDIX K

NOISE

APPENDIX L

HISTORICAL AND ARCHEOLOGICAL RESOURCES

APPENDIX M

PUBLIC HEALTH AND SAFETY

Reference: **Potential EMF Health Impacts from Radio and Microwave Transmitters in New York's Statewide Network for Emergency Communication, RAM TRAC Corporation, June 2004**

Reference: **Evaluation of Potential Uncontrolled Exposure to Microwave Frequency Electromagnetic Fields Generated by the Planned Cayuga County, New York Emergency Telecommunications Network, RAM TRAC Corporation, April 2010 ("Oswego EMF Study")**