12.1 INTRODUCTION

Chapter 12 addresses the infrastructure requirements for the proposed CLI-II facility. It discusses facility water supply needs; water supply availability; wastewater generation and disposal; groundwater; surface water; stormwater runoff/erosion control; emergency management; solid waste generation; energy usage; and provides an assessment of potential electromagnetic fields. Alternative natural gas transportation options under consideration are described in detail in Chapter 19.

12.2 OVERVIEW

The CLI-II facility would use natural gas as its primary fuel with ultra-low sulfur distillate (ULSD) as a backup fuel. The facility would have a nominal capacity to generate 752 MW of electricity. The project would interconnect to LIPA's 138-kilovolt (kV) transmission system via overhead conductors installed between the project's step up transformers and the proposed expansion of LIPA's 138 kV switchyard, which is located on the CLI-II site. The new conductors would be located entirely within the approximately 81-acre parcel and no new transmission line right-of-way would be required. LIPA's proposed switchyard expansion is located directly east of the CLI-II facility adjacent to LIPA's existing Sills Road Substation as shown in Figure 2-5.

Water would be required for several functions associated with the efficient operation of the proposed facility. Water would be used for steam cycle makeup (i.e., HRSG makeup), air emissions control when using the backup fuel, plant maintenance, inlet air cooling, combustion turbine compressor cleaning, and to satisfy potable water needs. To minimize water supply needs, an air-cooled condenser (ACC) would be used for heat dissipation, rather than relying on once-through or evaporative cooling technologies. In addition, water supply and wastewater discharge needs would be minimized through use of a fin-fan cooler to manage the facility's auxiliary cooling loop, as well as through recycle and reuse of process wastewater, when practicable. As such, the proposed facility would be one of the most water-efficient combined cycle electric generating facilities statewide.

Floor drains from potentially oily areas would be routed to an oil/water separator and collected in one of two 20,000-gallon holding tanks for subsequent off-site transport by a licensed waste hauler. Sanitary wastewater would be directed to an on-lot subsurface disposal system, while stormwater runoff would be routed to an on-site recharge basin.

ULSD would be stored in two new 800,000-gallon above ground storage tanks. The proposed oil storage tanks would be double walled and equipped with interstitial leak monitoring. Each tank would be constructed and operated in accordance with good engineering practice and applicable state and local codes, including NYSDEC regulations contained in 6 NYCRR Part 614 entitled "Standards for New and Substantially Modified Petroleum Storage Facilities."

Solid waste generated at the facility typically would be limited to small quantities of office waste and general plant refuse. All non-hazardous solid waste would be loaded into on-site dumpsters and removed from the site by a local vendor. Recyclable materials, such as newspapers and corrugated cardboard, would be recycled, when practicable. Other wastes typical of power generation activities, such as oil collected in oil/water separators, spent lubricating oils and used filters, would be transported off-site by an appropriately licensed vendor and properly recycled or disposed.

With proper storage, handling and management of fuels, lubricating oils, water conditioning chemicals, aqueous ammonia for emissions control and regulated waste materials coupled with implementation of a site-wide "Best Management Practices (BMP) Plan," significant adverse impacts to groundwaters or surface waters of Suffolk County would be avoided.

12.3 WATER SUPPLY

12.3.1. APPLICABLE REGULATORY REQUIREMENTS

The proposed water supply source for meeting the potable and process makeup needs for the facility would be the Suffolk County Water Authority (SCWA) distribution system. The SCWA is an independent public-benefit corporation operated under the Public Authorities Law of the State of New York. SCWA operates one of the nation's largest distribution systems, which currently serves approximately 1.2 million Suffolk County residents.

In accordance with Article 4 of the Suffolk County Sanitary Code, all interconnections to the SCWA distribution system would be equipped with a suitable backflow prevention device. Backflow prevention devices or "backflow preventers" are used to block inadvertent mixing of process water with potable water in the distribution system. The facility would install backflow preventers in accordance with applicable Suffolk County Department of Health Services (SCDHS) and SCWA requirements.

12.3.2. WATER SUPPLY NEEDS

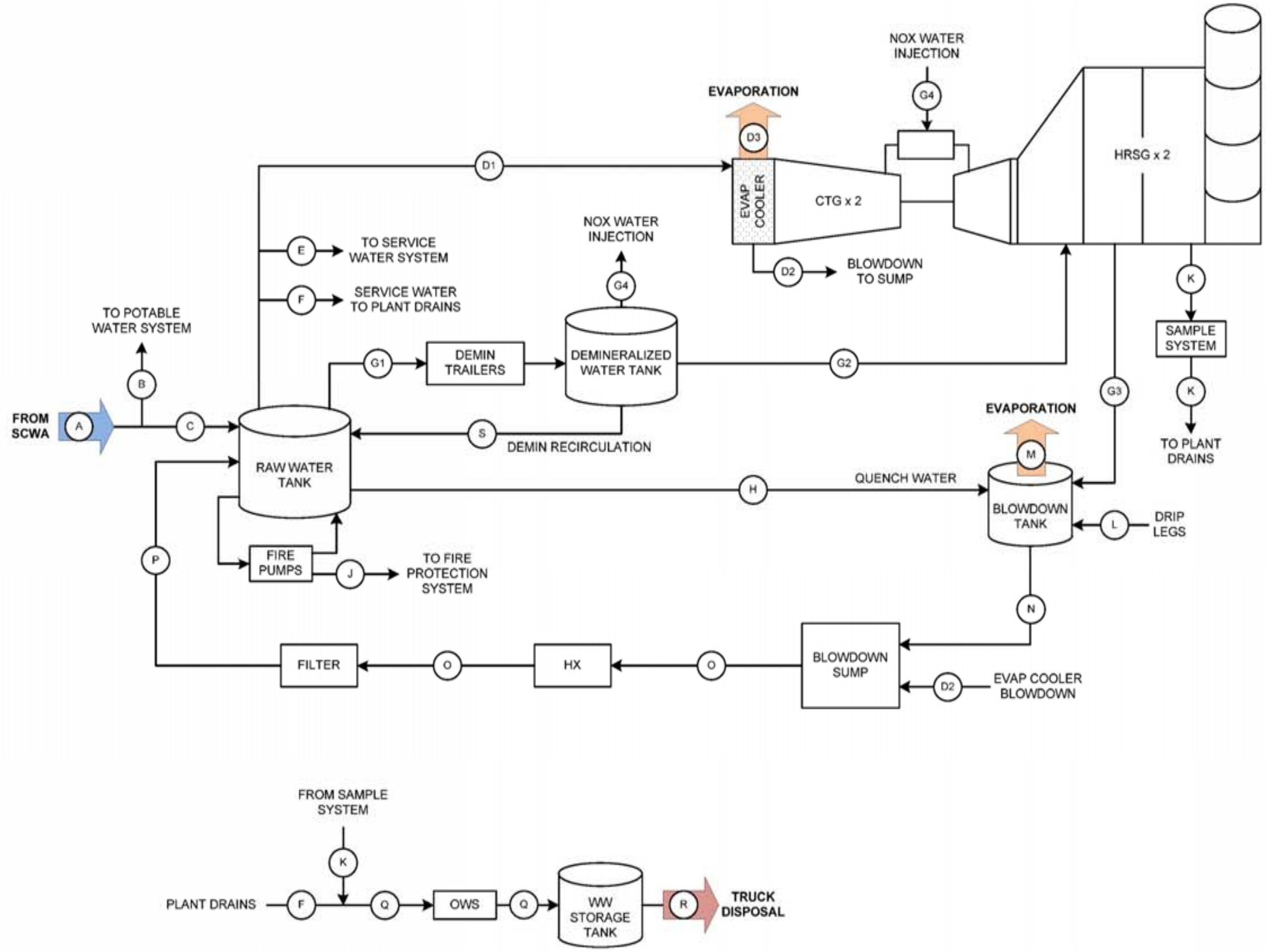
A. PROCESS MAKEUP

Figure 12-1 and Table 12-1 present preliminary water balance information for the proposed facility. Figure 12-1 schematically illustrates the primary water supply, recycle/reuse and wastewater discharge pathways through the facility. Table 12-1 summarizes facility water use, reuse, wastewater generation and consumptive water use (i.e., evaporative water loss) for the anticipated range of operating conditions.

The facility's water supply needs typically would range from approximately 35 gpm or 50,400 gpd to 130 gpm or 190,000 gpd, when operating on the primary fuel, natural gas. When the backup fuel is used, the proposed facility's water supply needs typically would range from 700 gpm (approximately 1.0 million gallons per day [mgd]) to 750 gpm (approximately 1.1 mgd). Potable water needs would typically range between 1 gpm and 3 gpm. Water to support facility operations would be obtained from the SCWA distribution system via a new 12-inch diameter lateral. The new lateral would

NOTES:

1) Diagram is conceptual. Actual line routing and process flow locations are subject to change.



PRELIMINARY - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DWN	CHK	APP	DATE
F	Project Comments	LD			9/30/13
E	Project Comments	LD			9/26/13
D	Updated GE Heat Balances	LD			9/16/13
C	Fuel Oil Case Incorporation	LD			9/11/13
B	Owner Comments	LD			8/7/13
A	Initial Draft	LD			7/26/13

Caithness Energy Center II

GE 7FA.05-series

2 x 1 Combined Cycle - Long Island, NY

Kiewit
9401 RENNER BLVD
LENEXA, KS 66219

WATER BALANCE FLOW DIAGRAM

	BY	DATE	DRAWING NUMBER
DRAWN	LD	7/26/13	2010-042-WB-001
CHECKED			
APPROVED			

TRC
1200 Wall Street West, 5th Fl.
Lyndhurst, NJ 07071
201-933-5541

PRELIMINARY WATER BALANCE FLOW DIAGRAM

CAITHNESS LONG ISLAND ENERGY CENTER II
TOWN OF BROOKHAVEN, NEW YORK

FIGURE 12-1	NOVEMBER 2013

Table 12-1.
Preliminary Water Supply, Recycle/Reuse and Wastewater Flows under Various Modes of Operation

ESTIMATED STREAM FLOWS

		GE HB 1	GE HB 2	GE HB 3	GE HB 4	GE HB 5	GE HB 6	GE HB 7	GE HB 8	GE HB 10	GE HB 11	GE HB 12	GE HB 13	GE HB 14	GE HB 15	GE HB 16	Maximum Instantaneous Flows for Pipe Sizing
	Case Number	GE HB 1	GE HB 2	GE HB 3	GE HB 4	GE HB 5	GE HB 6	GE HB 7	GE HB 8	GE HB 10	GE HB 11	GE HB 12	GE HB 13	GE HB 14	GE HB 15	GE HB 16	
	Ambient Conditions	92°F / 45% RH	92°F / 45% RH	25°F / 60% RH	59°F / 60% RH	59°F / 60% RH	-10°F / 60% RH	25°F / 60% RH	59°F / 60% RH	105°F / 43% RH	59°F / 60% RH	-10°F / 60% RH	25°F / 60% RH	59°F / 60% RH	92°F / 45% RH	105°F / 43% RH	
	Evap Coolers	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	ON	ON	ON	
	Duct Burners	UNFIRED	FIRED	FIRED	FIRED	UNFIRED	UNFIRED	UNFIRED	UNFIRED	FIRED	FIRED	UNFIRED	UNFIRED	UNFIRED	UNFIRED	UNFIRED	
	Fuel Type	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	OIL	OIL	OIL	OIL	OIL	
	Net Output (kW)	624,660	736,040	796,040	762,750	646,770	678,490	673,480	636,980	710,210	771,000	631,100	639,370	642,550	633,250	612,080	5% HRSG BD
	Description / CTG in Service	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
A	Requirement from SCWA	99	116	52	51	62	33	34	33	127	80	697	722	738	742	704	959
B	Potable Water System Feed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
C	Raw Water Tank Feed	96	113	49	48	59	30	31	30	124	77	694	719	735	739	701	956
D1	Evap Cooler Raw Water Feed	86	86	0	0	38	0	0	0	101	38	0	0	35	83	98	111
D2	Evap Cooler Blowdown	22	22	0	0	9	0	0	0	25	9	0	0	9	21	25	28
D3	Evap Cooler Evaporation	65	65	0	0	28	0	0	0	75	28	0	0	26	62	74	83
E	Service Water System Feed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
F	Service Water to Plant Drains	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6
G1	Demineralized System Feed	169	215	154	151	132	101	105	102	228	180	756	782	800	806	768	1226
G2	Steam Cycle Make-up Feed	105	151	154	151	103	101	105	102	152	152	88	91	93	96	96	382
G3	Steam Cycle Blowdown	103	149	152	149	101	99	103	100	150	150	86	89	91	94	94	380
G4	NOx Water Injection	0	0	0	0	0	0	0	0	0	0	667	692	681	647	598	761
H	Blowdown Quench Water Feed	91	124	126	124	90	88	91	89	125	125	77	79	81	83	83	316
J	Fire Protection System Feed	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
K	Sample System Feed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
L	Drip Legs Discharge	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
M	Blowdown Tank Evaporation	23	40	41	40	23	22	23	22	41	40	19	20	20	21	21	103
N	Blowdown Tank Effluent	171	234	238	234	169	166	172	168	236	235	146	149	152	157	157	594
O	Wastewater to HX	193	255	238	234	179	166	172	168	261	244	146	149	161	178	181	622
P	Recycled Raw Water Feed	193	255	238	234	179	166	172	168	261	244	146	149	161	178	181	622
Q	Oil / Water Separator Feed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	8
R	Wastewater to Truck Disposal	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	8
S	Demin Blend to Raw Water Tank	65	65	0	0	28	0	0	0	75	28	0	0	26	62	74	83

NOTES:
1) All flows are in gallons per minute (GPM).
2) Recovery rates and COC are estimated based on historical values and require vendor confirmation.
3) Normal operating average values are shown for a case.
4) Information based on GE heat balance data.
5) Water use assumptions are listed below.
6) Steam cycle blowdown, quench water, and flash evaporation calculated based on heat balances and assumptions.
7) Maximum instantaneous flows safety factor = 1.3
8) Oil / Water Separator should not be sized based off flows in this water balance.
9) Flow rates for the Fire Protection System will be determined at a later date.

INPUTS:

1)	Evap Cooler COC	4.0
2)	Steam Cycle Blowdown, %	2.0%
3)	Potable Water Use Rate, gpm	3
4)	Service Water Use Rate, gpm	2
5)	Service Water to Plant Drains Rate, gpm	5
6)	Fire Protection System Rate, gpm	TBD
7)	Sample System Water Rate, gpm	2
8)	Drip Legs Water Rate, gpm	1

PRELIMINARY - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DWN	CHK	APP	DATE
F	Project Comments	LD			9/30/13
E	Project Comments	LD			9/26/13
D	Updated GE Heat Balances	LD			9/16/13
C	Fuel Oil Case Incorporation	LD			9/11/13
B	Owner Comments	LD			8/7/13
A	Initial Draft	LD			7/26/13

Caithness Energy Center II

GE 7FA.05-series

2 x 1 Combined Cycle - Long Island, NY

Kiewit
9401 RENNER BLVD
LENEXA, KS 66219

WATER BALANCE FLOW DIAGRAM

	BY	DATE	DRAWING NUMBER
DRAWN	LD	7/26/13	2010-042-WB-002
CHECKED			
APPROVED			

extend west of the facility to an existing 12-inch distribution main located along Old Dock Road or south to an existing 12-inch distribution main located along Zorn Boulevard.

Inlet air cooling typically would be used when ambient air temperature exceeded 59 degrees Fahrenheit (^oF). When ULSD is used, additional water is needed for air emissions control purposes. During oil firing, demineralized water would be injected into the combustion turbine to limit the formation of nitrous oxides (NO_x). Oil firing, however, would be limited to a maximum of 720 hours in any one year in accordance with the facility's proposed air pollution control permit.

Peak hourly demand (i.e., the hourly instantaneous demand) is projected to total up to 1,000 gpm during facility commissioning and when firing ULSD. The intermittent peak demand periods, however, are anticipated to be of limited duration (i.e., over a period of one to eight hours) with maximum daily withdrawals less than 0.5 million gallons during facility construction/commissioning and typically less than 1.1 million gallons when operating using the backup fuel. Once fully operational, the maximum hourly withdrawals likely would occur during or immediately following a maintenance outage.

During commissioning, a temporary condition lasting for approximately 4 months preceding commercial operation, the project's average daily water supply needs would be expected to approach 500,000 gpd or approximately 350 gpm. The increased water demand would be used for cleaning HRSG components; hydrostatic testing; flushing of water supply and treatment systems; flushing of steam, ACC and condensate pipelines; and testing of steam cycle components.

The preliminary water balance information presented in Figure 12-1 and Table 12-1 is based on the following assumptions:

- The project would be capable of operating as a baseload facility and, therefore, 100 percent combustion turbine load was assumed for plant operations.
- Water supply requirements for power production and potable water use are assumed to be the daily average usage.
- The project's peak hourly water supply needs are based on a peaking factor of approximately 1.3.
- Inlet air cooling typically would occur when ambient air temperature exceeded 59^o F.
- Actual water use during a maintenance outage would vary based on the maintenance activities being performed.

B. FIREWATER DEMAND

The facility would be equipped with an internal fire protection loop, foam fire suppression systems, deluge systems and emergency fire protection pumping and backup capacity. In accordance with National Fire Protection Association (NFPA) guidelines, the internal fire protection loop would have a design capacity to provide approximately 2,660 gpm of water over a two hour period. The 1,500,000-gallon raw water/fire water storage tank would provide primary capacity for emergency firefighting use, with secondary capacity provided through the SCWA distribution system. To ensure that primary capacity would be available at all times, approximately 350,000 gallons of on-site storage capacity would be dedicated for firefighting purposes. The fire suppression systems would be available for emergency use as well as for periodic testing of emergency systems.

C. WATER CHEMISTRY REQUIREMENTS

High purity demineralized water is required for steam cycle makeup (i.e., HRSG makeup), combustion turbine NO_x injection water and compressor wash water. Demineralized water is used to limit scale formation and minimize corrosion of internal components.

Demineralization would be performed using a leased, truck-mounted cation/anion exchange system. Water from the raw water/fire water storage tank would first pass through cation and anion exchange beds. Then it would be routed to a mixed bed polishing unit. Following processing, demineralized water would be stored in a 1,000,000 gallon demineralized water storage tank. The 1,000,000 gallon on-site storage capacity would serve to damp out fluctuations in on-site demineralized water production capacity.

Ion exchange resins require periodic regeneration to maintain treatment effectiveness (i.e., when the exchange capacity is exhausted). Since this would be a leased system, regeneration would be performed off-site. Using off-site regeneration reduces facility water supply needs, as well as the need for on-site storage/use of regenaertion chemicals, such as sulfuric acid and sodium hydroxide.

12.3.3. PROPOSED WATER SUPPLY INFRASTRUCTURE

The project proposes to obtain water from SCWA's distribution system to satisfy potable and process makeup needs. SCWA has issued a Letter of Availability for the proposed project, which is included in Appendix C. Water would be delivered to the site through a new 12-inch diameter lateral, which would extend west of the facility to an existing 12-inch distribution main located along Old Dock Road or south to an existing 12-inch distribution main located along Zorn Boulevard. At the metering station, a suitable backflow prevention device would be installed.

Withdrawal of more than 130 gpm over a 24-hour period is not expected when operating using the primary fuel, natural gas. However, to accommodate peak hourly water supply needs, Caithness has agreed to fund the SCWA's design and construction of a booster pump station at SCWA's Station Road wellfield. The Station Road wellfield is located in North Bellport, NY, approximately 1.75 miles southwest of the proposed facility. The new booster pump station would be constructed, owned and operated by the SCWA. When necessary, it would be used to supplement the water supply availability in the intermediate pressure zone, where the proposed facility is located, from the adjacent low pressure zone along Station Road.

12.3.4. PROBABLE WATER SUPPLY IMPACTS

A. AGREEMENTS WITH WATER PROVIDER

The facility would be a regular ratepayer of the SCWA and would not operate under any special agreements. As indicated above, the SCWA has issued a Letter of Availability for the proposed water use, confirming that the projected water supply needs for the proposed project would be available from the SCWA distribution system.

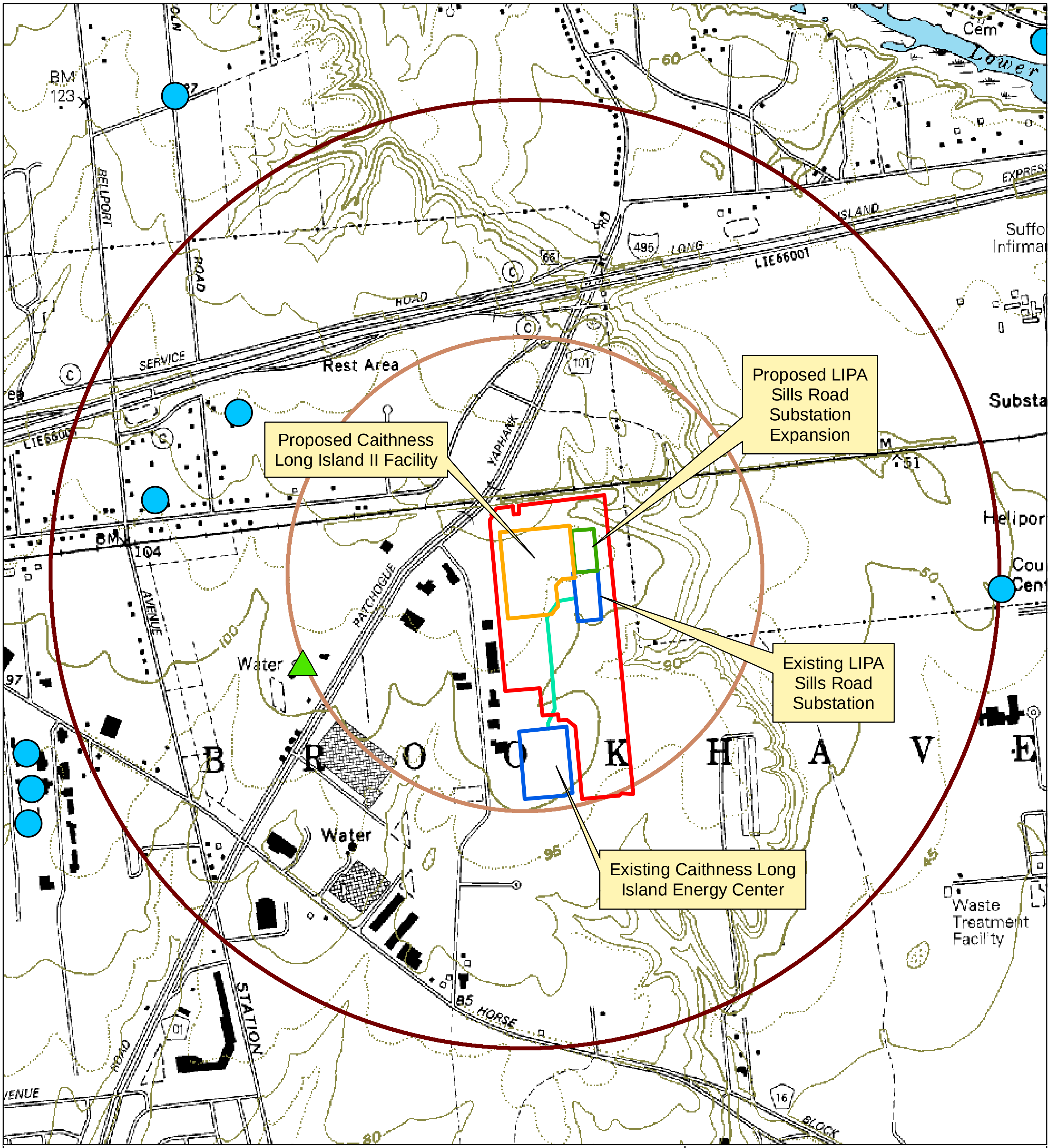
B. POTENTIAL IMPACT ON PUBLIC AND PRIVATE WATER SUPPLIES

Public and private potable water supply wells in the project vicinity are shown in Figure 12-2. Based on available data, there are no private water supply wells located within a 0.5 mile radius of the project site. The nearest public water supply wellfield to the proposed facility is SCWA's Patchogue/Yaphank wellfield. The Patchogue/Yaphank wellfield is located off East Patchogue-Yapank Road (Rt. 101), approximately 0.5 miles west of the project site. Due to the site's proximity to the wellfield, it typically would supply most of the project's water needs.

SCWA is the largest groundwater supplier in the nation. Currently, SCWA supplies over 160 million gallons per day (mgd) to its existing customer base. The SCWA distribution system consists of over 400 active wells, as well as water tanks having a combined storage capacity exceeding 60 million gallons. Water production for the system currently exceeds 60 billion gallons per year, with peak daily production capacity in excess of 450 million gallons and peak monthly production capacity in excess of 11 billion gallons.

By comparison, the project's water needs would represent only a small incremental increase in water withdrawal from the SCWA's system. The project's average annual water needs would constitute less than a 0.1 percent increase over the present demand on the SCWA system. As noted above, in accordance with SCWA's recommendation, Caithness would fund the design and construction of a booster pump station at the Station Road wellfield to ensure that adequate water supply capacity is available to meet the projected peak hourly water supply demand without adversely impacting SCWA's existing customer base. Since the SCWA distribution system is networked, an increase in permitted water withdrawals would not be necessary to support the water supply needs of the project.

Consistent with current distribution system pressures reported at the Patchogue/Yaphank wellfield, water pressure at the project site boundary is expected to generally range between 60 and 75 pounds per square inch (psi).



Approximate Site Boundary
Principal Area of New Development
Proposed LIPA Facility
Existing Transmission Line
Existing Facility
1 Mile Radius
1/2 Mile Radius

Private Well
Public Wellfield

0 0.5 Miles

Source Map: Carmens River Conservatrion and Management Plan, Town of Brookhaven, 2013

Base Map: New York Department of Transportation Digital Raster Quadrangle: Bellport

N

TRC
1200 Wall Street West, 5th Fl.
Lyndhurst, NJ 07071
201-933-5541

PUBLIC AND PRIVATE GROUNDWATER PRODUCTION WELLS IN THE PROJECT VICINITY

CAITHNESS LONG ISLAND ENERGY CENTER II

TOWN OF BROOKHAVEN, NEW YORK

FIGURE 12-2	NOVEMBER 2013

R:\Projects\GIS_2013\206458_CLIEC_II\mxd\Infrastructure\Figure12-2_WellLocations_2013_11_11.mxd

C. POTENTIAL IMPACT ON NEARBY WELLFIELDS

As shown in Figure 12-3, the proposed facility is not located within a "Deep Recharge Zone" designated under Article 7 of the Suffolk County Sanitary Code. In addition, as shown in Figure 12-4, the proposed facility is not located within a groundwater contributing area to any public water supply well, nor is it located within a designated Special Groundwater Protection Area. Figure 12-5 shows water table contours in the Upper Glacial Aquifer, which can be used to determine the direction of groundwater flow in the site vicinity (USGS, 2006). The Upper Glacial aquifer consists of fine to coarse brown sand, gravel and stones. Two wells at SCWA's Patchogue/Yaphank wellfield are screened in the Upper Glacial aquifer and the third is screened in the Magothy Formation. The depth to groundwater at the Patchogue/Yapank wellfield is approximately 65 feet and the saturated thickness of the Upper Glacial aquifer is approximately 135 feet. Eight-hour pump tests performed at the wellfield during the mid-1970's indicated the specific capacity wells screened in the Upper Glacial aquifer ranged from approximately 78 gpm per foot to 88 gpm per foot.

Conservatively assuming the following:

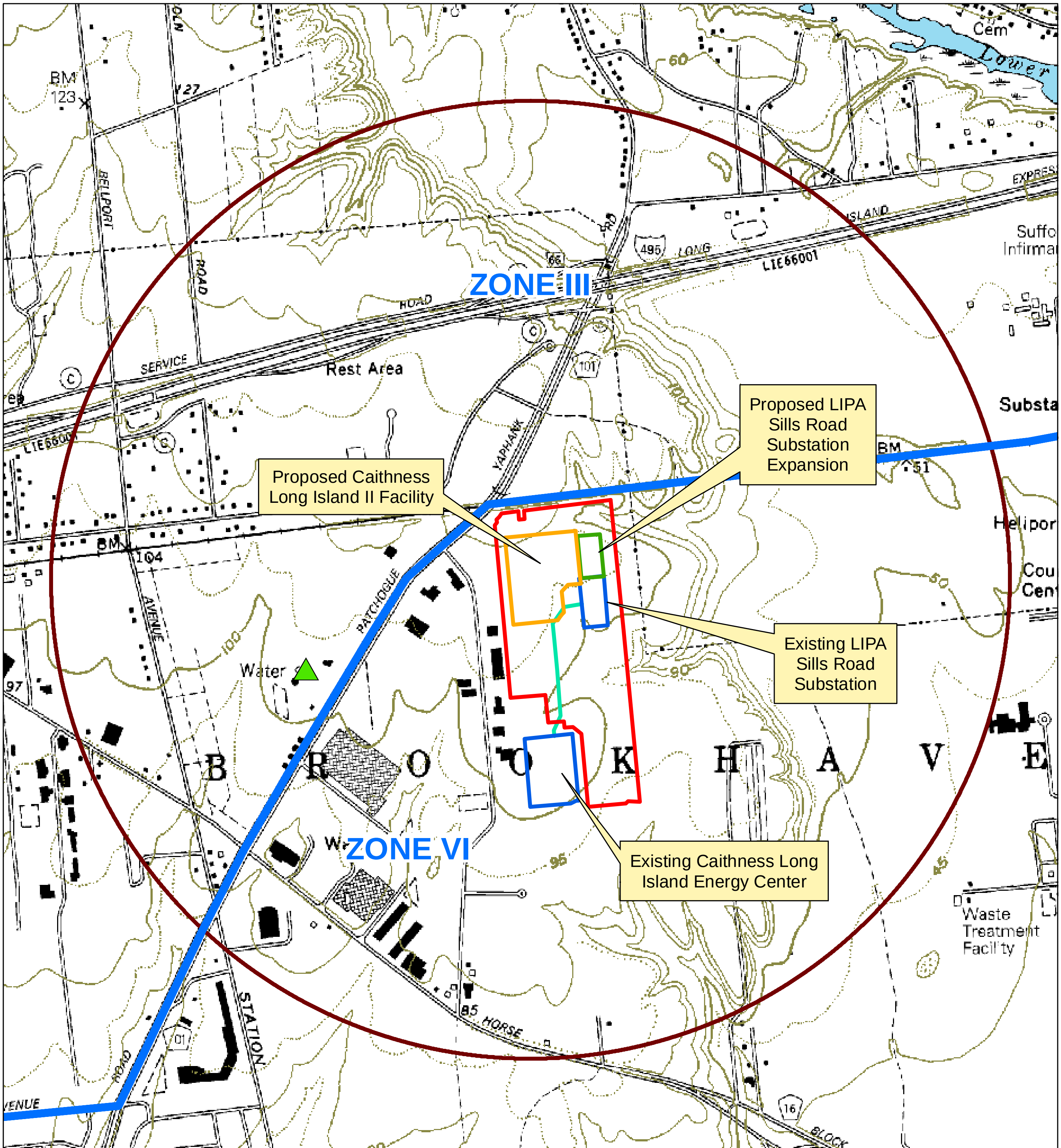
- the project would have an average annual water demand of approximately 100 gpm;
- all water supplied to the project would come from Upper Glacial wells at the Patchogue-Yapank wellfield; and,
- the specific capacity of Upper Glacial wells at the Patchogue-Yapank wellfield was 70 gpm per foot;

the incremental drawdown of the Upper Glacial aquifer at the wellfield would be limited to between 1.25 and 1.5 feet. However, as distance from the wellfield increases, the incremental drawdown created by the project would decrease. Therefore, the comparatively small incremental drawdown at the wellfield associated with an average annual water demand of 100 gpm would have only a minimal impact on groundwater contours in the Upper Glacial aquifer.

D. POTENTIAL IMPACTS ON THE CARMANS RIVER

The most significant surface water resource in the project vicinity is the Carmans River, which is fed by groundwater and surface water runoff. The groundwater tributary area to the Carmans River and estimated groundwater time of travel zones are shown in Figure 12-6 (Carmans River Conservation and Management Plan).

The recently adopted Carmans River Management Plan Area encompasses that area within the 0 to 2 and 2 to 5 year groundwater time of travel to the Carmans River. This includes the groundwater and surface water tributary areas that may affect the environmental health and quality of the Carmans River (water quality, habitats, biodiversity, and species abundance and distribution), and the aquatic, riparian and terrestrial communities comprising the ecosystem of the Carmans River.



Approximate Site Boundary
Principal Area of New Development
Proposed LIPA Facility
Existing Transmission Line
Existing Facility
1 Mile Radius
Hydrogeologic Zone Boundary
Public Wellfield

0 0.5 Miles

Source: Suffolk County GIS, 2013

Base Map: New York Department of Transportation Digital Raster Quadrangle: Bellport

N

TRC
1200 Wall Street West, 5th Fl.
Lyndhurst, NJ 07071
201-933-5541

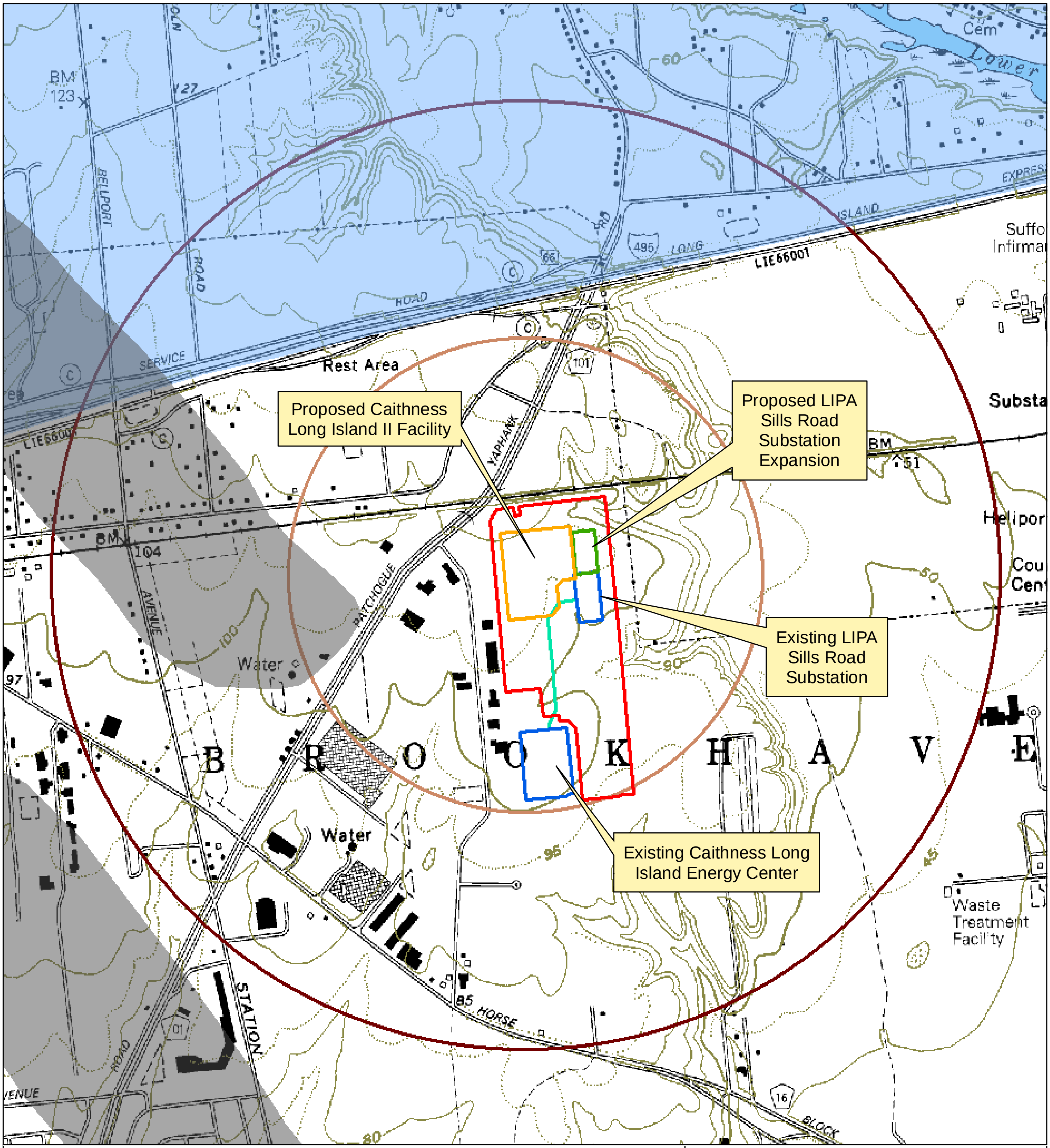
HYDROGEOLOGIC ZONES

CAITHNESS LONG ISLAND ENERGY CENTER II

TOWN OF BROOKHAVEN, NEW YORK

FIGURE 12-3 | **NOVEMBER 2013**

R:\Projects\GIS_2013\206458_CLIEC_II\mxd\Infrastructure\Figure12-3_HydrogeologicZones_2013_11_11.mxd



- Approximate Site Boundary
- Principal Area of New Development
- Proposed LIPA Facility
- Existing Transmission Line
- Existing Facility
- 1 Mile Radius
- 1/2 Mile Radius
- Groundwater Protection Area
- Public Well Contributing Area

0 0.5 Miles

Source: Long Island Comprehensive Special Groundwater Protection Area Plan, 1991

Base Map: New York Department of Transportation Digital Raster Quadrangle: Bellport

N

TRC
1200 Wall Street West, 5th Fl.
Lyndhurst, NJ 07071
201-933-5541

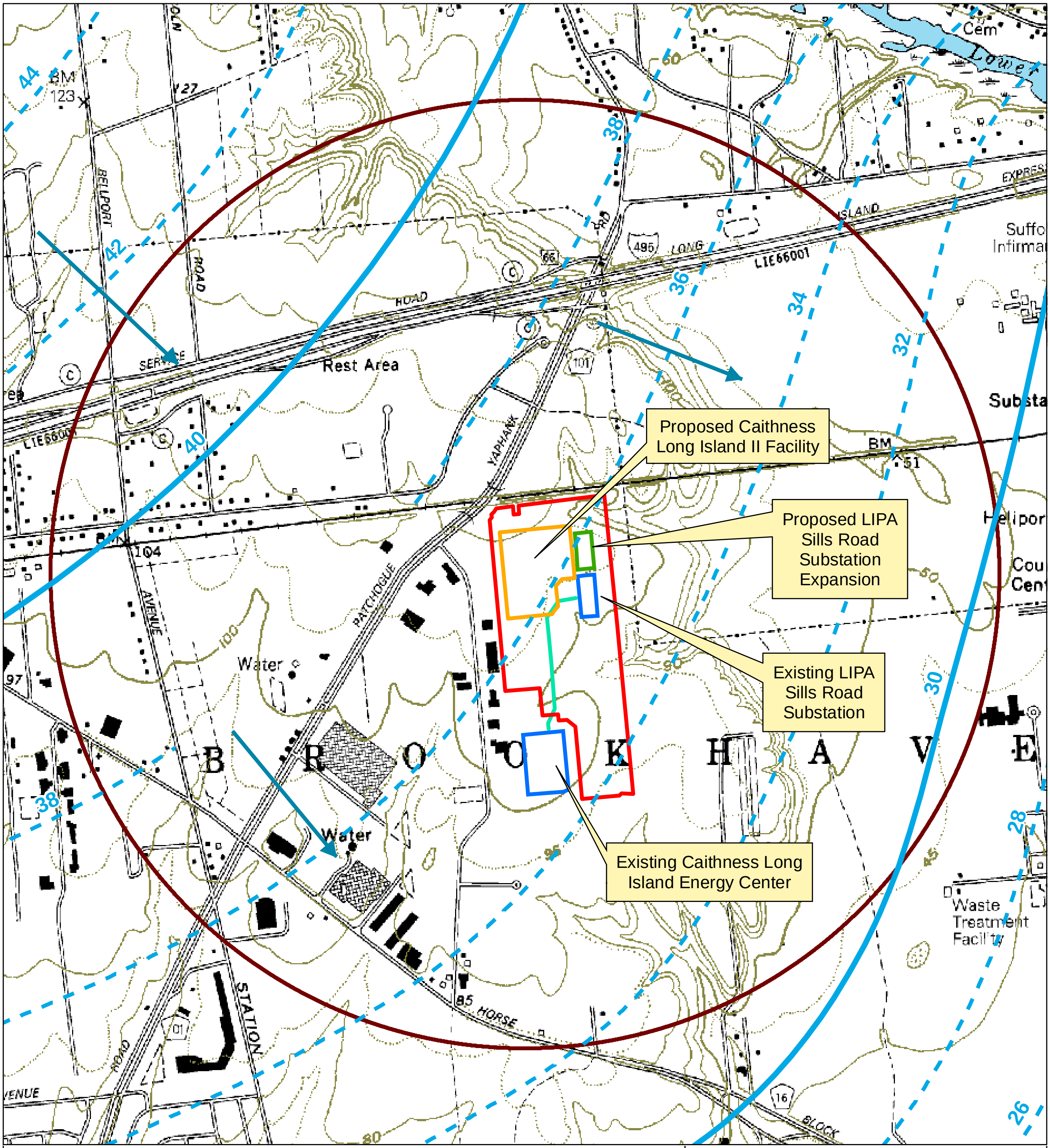
SPECIAL GROUNDWATER PROTECTIONS AREAS

CAITHNESS LONG ISLAND ENERGY CENTER II

TOWN OF BROOKHAVEN, NEW YORK

FIGURE 12-4	NOVEMBER 2013

R:\Projects\GIS_2013\206458_CLIEC_II\mxd\Infrastructure\Figure12-4_GroundwaterProtectionAreas_2013_11_11.mxd



- Approximate Site Boundary
- Principal Area of New Development
- Proposed LIPA Facility
- Existing Transmission Line
- Existing Facility
- 1 Mile Radius
- Upper Glacial 10ft Contour
- Interpolated Groundwater Contour
- Approximate Groundwater Flow Direction

0 0.5 Miles

N

Source: United States Geological Survey, 2006

Base Map: New York Department of Transportation Digital Raster Quadrangle: Bellport

TRC
1200 Wall Street West, 5th Fl.
Lyndhurst, NJ 07071
201-933-5541

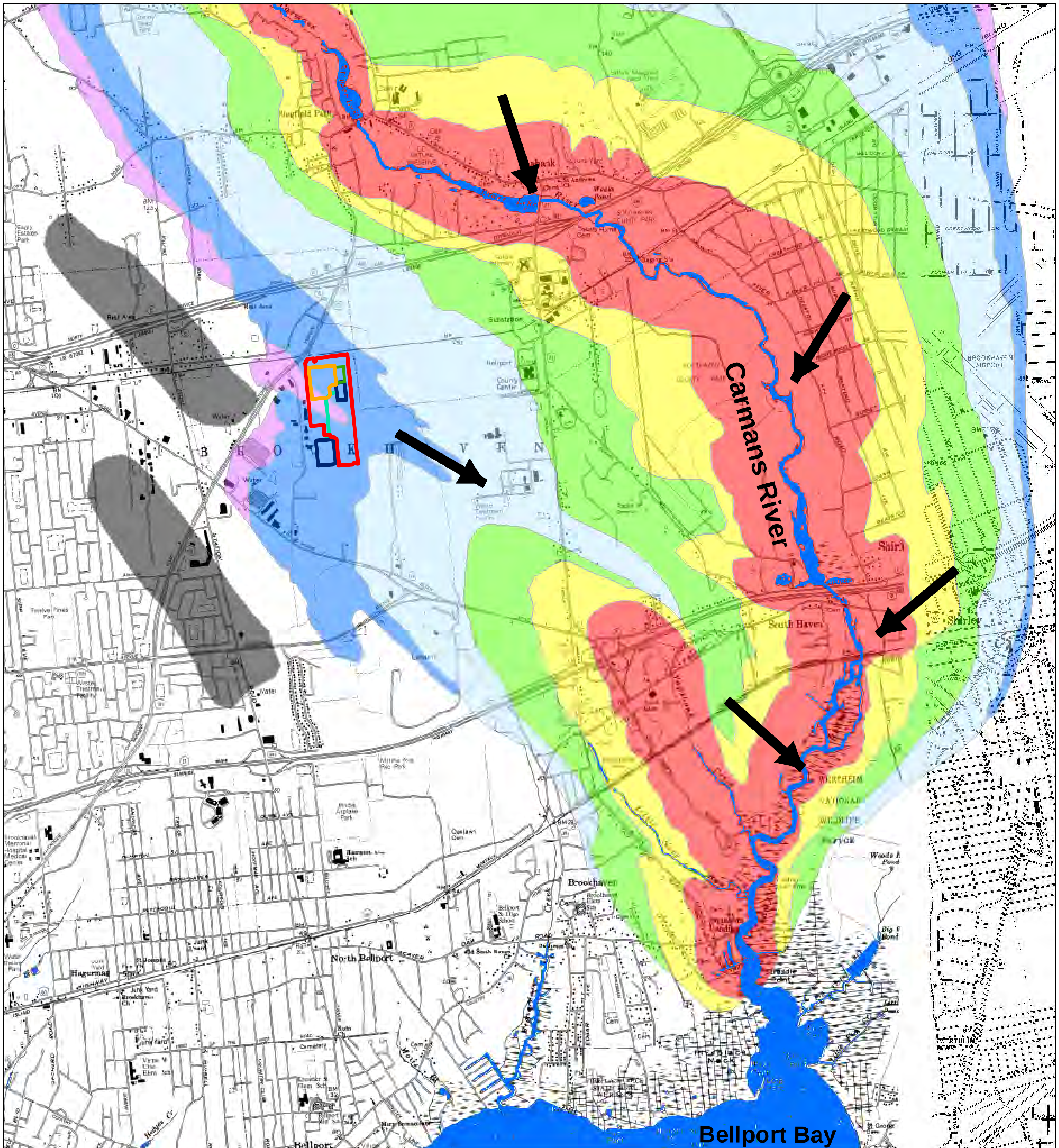
LONG ISLAND GROUNDWATER CONTOURS

CAITHNESS LONG ISLAND ENERGY CENTER II

TOWN OF BROOKHAVEN, NEW YORK

FIGURE 12-5	NOVEMBER 2013

R:\Projects\GIS_2013\206458_CLIEC_II\mxd\Infrastructure\Figure12-5_GroundwaterContours_2013_11_11.mxd



- Approximate Site Boundary
- Principal Area of New Development
- Proposed LIPA Facility
- Existing Transmission Line
- Existing Facility
- Approximate Groundwater Flow Direction

Groundwater Contributing Area Time of Travel

- 0-2 Years
- 2-5 Years
- 5-10 Years
- 10-25 Years
- 25-50 Years
- 50-100 Years
- 0-100 Year Well Contributing Area

Source: Carmans River Conservation and Management Plan, 2013
Base Map: New York Department of Transportation Digital Raster Quadrangle: Bellport

0 0.5 1 Miles

N

TRC
1200 Wall Street West, 5th Fl.
Lyndhurst, NJ 07071
201-933-5541

CARMANS RIVER TIME OF TRAVEL ZONES

CAITHNESS LONG ISLAND ENERGY CENTER II

TOWN OF BROOKHAVEN, NEW YORK

FIGURE 12-6 | **NOVEMBER 2013**

R:\Projects\GIS_2013\206458_CLIEC_II\mxd\Infrastructure\Figure12-6_CarmansRiverTimeZones_2013_11_11.mxd

As shown in Figure 12-6, although the proposed facility is located within the groundwater tributary area to the Carmans River, the time of travel to the Carmans River from the site is estimated to range from 25 to 75 years, which is well outside the 2 to 5 year groundwater time of travel used to develop the Carmans River Management Plan Area.

The Central Pine Barrens are protected by landmark legislation enacted by the New York State Legislature. The Pine Barrens Protection Act of 1993 created a 55,000-acre Core Preservation Area, where development is largely prohibited, and a 47,000-acre Compatible Growth Area, where development is permitted consistent with established standards and guidelines. In May 2013, the New York State Legislature voted to expand the Core Preservation Area and the Compatible Growth Area to encompass areas most critical to the Carmans River. The expansion area includes parcels located within the 0 to 2 year time of travel and the 2 to 5 year time of travel to the Carmans River.

The proposed CLI-II development site is not located in the Central Pine Barrens Core Preservation Area, the Core Expansion Area, the Compatible Growth Area or the Compatible Growth Expansion Area. As such, based on groundwater time of travel, the site is not located on environmentally sensitive lands that are critical to the ecological health and water quality of the Carmans River or lands representing significant habitat within the Carmans River Watershed. In addition, the site is not located within a Primary Acquisition Area or a Secondary Acquisition Area identified in "The Carmans River Conservation and Management Plan."

Finally, the project site and proposed facility would not represent a significant source of pollutant or nutrient loading to the Carmans River for the following reasons:

- The proposed site is located within or beyond the 25 to 50 year estimated groundwater time of travel to the Carmans River;
- Sanitary subsurface disposal systems at the site will be designed, constructed, maintained and operated in accordance with requirements established by the SCDHS;
- Actively managed landscape areas, and associated use of fertilizers for turf management, pesticides, and herbicides, at the project site would be minimized;
- The proposed facility would operate in accordance with the terms and conditions of a State Pollutant Discharge Elimination System (SPDES) permit to manage site stormwater runoff and selected process wastewater discharges, which would include development and implementation of a best management practices plan; and,
- Depth to groundwater at the proposed development site ranges from 60 to 70 feet below land surface, which provides for filtration of site stormwater runoff prior to reaching the water table.

Flow in the Carmans River also would not be adversely affected by the project, since the recharge area for the Patchogue/Yaphank wellfield extends in a northwesterly direction from the wellfield, whereas the Carmans River is located in a northeasterly/easterly direction. Because the wellfield's recharge area is sufficiently removed from and situated cross gradient of the river, the small incremental increase in water withdrawal associated with the project would not measurably decrease river flow.

Based on the above, it is reasonable to conclude that the proposed project would not have a significant adverse impact water quantity or water quality in the Carmans River. In addition, development of the project would not represent a potential conflict to achieving the goals and objectives of the Carmans River Conservation and Management Plan or preclude implementation of the recommendations identified in the plan.

12.3.5. WATER SUPPLY MITIGATION MEASURES

The project avoids significant adverse impacts to public and private water supplies through implementation of the following:

- Minimizing water needs through selection of an air cooled condenser for heat dissipation, rather than relying on once through or evaporative cooling technologies;
- Selection of a closed cycle fin-fan cooler to manage the heat load from the auxiliary cooling loop;
- Installation of a 1,500,000-gallon on-site raw water/fire water storage tank and a 1,000,000-gallon demineralized water storage tank to reduce peak hourly water demands;
- Recycling process waste streams, such as blowdown from the inlet air coolers and HRSGs, back to the raw water/fire water storage tank for reuse as process makeup water; and,
- Funding the design and construction of a new booster pump station at SCWA's Station Road wellfield.

Accordingly, no additional mitigation would be necessary to address potential water supply impacts.

12.4 WASTEWATER GENERATION

Several features of the proposed design are targeted at minimizing water use and, consequently, wastewater requiring on-site or off-site disposal. In addition, many of the process waste streams generated during normal operation, such as inlet air-cooler blowdown, HRSG blowdown, and quench water, would be filtered and returned to the raw water tank for reuse. Nevertheless, the project would generate some process and sanitary wastewater requiring proper handling, management and disposal. These waste streams include:

- Sanitary wastewater;
- Rinse and drain down water from the demineralization system;
- Off-line compressor wash water;
- Plant maintenance water collected in facility floor drains; and,
- Site stormwater runoff.

The following sections describe the proposed methods for managing wastewater generated at the facility. Section 12.6 describes the proposed stormwater management system for the project site. The proposed facility's SPDES permit application is included in Appendix J.

12.4.1. SANITARY WASTEWATER

The project site is not located within a sewerage district and is not currently served by a sanitary wastewater collection system. Therefore, sanitary wastewater would be managed using an on-lot subsurface disposal system. The subsurface disposal system would be designed in accordance with applicable state and local codes, including: the New York State Uniform Fire Prevention and Building Code and Sanitary Code, the Suffolk County Sanitary Code (Articles 6 and 7) and the Town of Brookhaven Building Code.

The average daily sanitary wastewater design flow for the facility is conservatively estimated to total 3 gpm or 4,320 gpd. The facility would have separate wastewater collection systems, one for sanitary wastewater and one for process wastewater. Cross-connections between these systems would not be allowed. In addition, all sanitary fixtures at the facility would be equipped with low volume flush toilets and all sinks, showers and faucets would be fitted with water saving devices.

12.4.2. DEMINERALIZER RINSE AND DRAIN DOWN WATER

When a new demineralization trailer arrives on-site the ion exchange resin beds would be empty. Prior to connecting the new trailer to the demineralized water storage tank, the resin beds would be rinsed using water from the raw water/fire water storage tank. Because the initial rinse water may not meet the stringent demineralized process makeup requirements, it cannot be directed to the demineralized water storage tank. However, this intermittent discharge stream would meet all groundwater discharge standards. As such, initial rinse water would be directed to an on-site recharge basin. The volume of initial rinse water is estimated to range between 100 and 1,000 gallons during each trailer change out.

Also, prior to exiting the project site, any residual water in ion exchange beds would need to be drained (i.e., only empty ion exchange beds are transported over-the-road). Since residual water would not pass through the complete demineralization treatment train, it would not meet the stringent requirements for process makeup use. This intermittent waste stream would, however, meet all groundwater discharge standards. Therefore, residual water from the ion exchange beds also would be drained to an on-site recharge basin. The estimated drain down volume would be approximately 1,000 gallons per trailer.

12.4.3. OFF-LINE COMPRESSOR WASH WATER

The compressors serving the combustion turbines require periodic cleaning to maintain operating efficiency and prevent excessive wear and tear on internal components. Compressor cleaning can be performed when the combustion turbines are on-line or off-line. During an on-line wash, demineralized water is injected into the compressor section of the combustion turbine and lost to the atmosphere through evaporation.

Off-line washes are generally performed on a quarterly basis. An off-line wash consists of injecting a demineralized water/detergent mixture into the compressor when the combustion turbine is off-line to remove accumulated dust, dirt or other contaminants that cannot be removed during an on-line wash. In general, the cleaning solution would consist of 25 percent detergent and 75 percent demineralized water. The resultant wastewater (approximately 500 gallons per wash) would be collected in the false start drain tank(s) for off-site processing at an appropriately licensed facility.

12.4.4. FLOOR DRAINS

Trench, grate or hub type floor drains would be used to collect equipment and floor wash water from the Turbine Building. Since this waste stream may contain oil or grease, it would be directed to an oil water separator. Floor and equipment wash water would be drawn from the raw water/fire water storage tank.

Following processing through the oil/water separator, this wastewater would be sent to one of two 20,000-gallon wastewater holdup tanks. This waste stream may contain low levels of oil and grease (i.e., less than 15 milligrams per liter [mg/l]), detergents or surfactants used for various cleaning/maintenance activities and low levels of suspended solids. The suspended solids concentration of the discharge is expected to range from 10 to 30 mg/l. Remaining constituents in the wastewater are anticipated to be at concentrations approximately equivalent to the quality of the raw water makeup supply from the SCWA distribution system. The wastewater holdup tanks would be emptied on an "as needed basis" and transported to a local sewage treatment plant (STP) for proper treatment and disposal.

Any sludge or oil collected in the oil water separator would be periodically removed and transported for off-site processing at an appropriately licensed facility.

Table 12-2 shows the estimated quantities of process wastewater that would be generated by the project under typical operating conditions.

Table 12-2
Wastewater Generation

Source	Rate*	Daily Volume	Monthly Volume
Continuous Generation			
Sanitary waste	~3 gpm	~4,320 gallons	~130,000 gallons
Miscellaneous Floor Drains	7 gpm	~10,080 gallons	~302,400 gallons
Total	10 gpm	~14,400 gallons	~423,000 gallons
Periodic Generation			
Demineralization Rinse/Drain Down	<1 gpm	~1,500 gallons/change out	3,000 gallons
Off-line Compressor Wash Water	<1 gpm	~500 gallons/wash	Up to 1,000 gallons

Notes: * Average daily flow rate over 24-hour period

Sanitary wastewater would be managed using an on-site subsurface disposal system. Demineralization rinse and drain down water would be directed to an on-site recharge basin in accordance with the terms and conditions of a SPDES permit issued by the NYSDEC. Remaining waste streams, consisting of miscellaneous floor drains and compressor wash water, would be managed using a hold and haul system. Ultimate disposal is projected to be at the Suffolk County Sanitary Sewage District #3 – Southwest Sewage Treatment Plant (STP #3, NY0104809). This STP has a design capacity of 30 mgd and typically treats 20 to 25 mgd. The proposed project's wastewater requiring off-site disposal, totaling about 423,000 gallons per month, would represent less than 1 percent of the typical monthly excess capacity. As such, it would not cause a significant adverse impact to STP #3's ability to properly treat and dispose of wastewater it currently receives.

The facility would require authorization to transport process wastewater to a local STP (i.e., floor drains and compressor wash water) and comply with applicable sewer use limits for pollutants, including limits for specific metals and toxic organics. Applicable sewer use limits and projected wastewater characteristics for the facility are listed in Table 12-3.

Table 12-3
Suffolk County Sewer Use Limits and Projected Wastewater Characteristics

Parameter	Daily Average Limit (mg/l)	30-day Average Limit (mg/l)	Projected Avg. Discharge (mg/l)[1]	Projected Peak Discharge (mg/l)[1]
pH	5.0 to 12.5		6.0 to 9.0	6.0 to 11.0
Acetone	50.0	50.0	BA[2]	BA[2]
Arsenic	0.4	0.2	< 0.01[3]	< 0.01[3]
Available Chlorine	100	50	< 1.0[3]	< 1.0[3]
Barium	8.0	4.0	< 0.2[3]	< 0.2[3]
Cadmium	0.8	0.4	BA	BA
Chromium, Hexavalent	0.4	0.2	BA	BA
Chromium, Total	8.0	4.0	BA	BA
Copper	1.6	0.8	< 0.5	< 0.5
Cyanide, Total	3.2	1.6	BA	BA
Cyanide, Amenable	0.8	0.4	BA	BA
Fluorides (fresh water)	8.0	4.0	< 0.5[3]	< 0.5[3]
Gold	0.4	0.2	BA	BA
Lead	0.4	0.2	< 0.01[3]	< 0.01[3]
Manganese	8.0	4.0	< 0.5[3]	< 0.5[3]
Mercury	0.4	0.2	BA	BA
Nickel	8.0	4.0	< 0.01[3]	< 0.01[3]
Phenols	1.5	1.5	BA	BA
Selenium	0.4	0.2	BA	BA
Silver	0.4	0.2	BA	BA
Sulfide	12.0	6.0	< 0.01	< 0.01
Zinc	5.0	2.5	<0.2	<0.2
Petroleum Hydrocarbons	50	50	< 50	< 50
Total Toxic Organics	10.0	10.0	< 0.1	< 0.1

Table 12-3
Suffolk County Sewer Use Limits and Projected Wastewater Characteristics

Parameter	Daily Average Limit (mg/l)	30-day Average Limit (mg/l)	Projected Avg. Discharge (mg/l)[1]	Projected Peak Discharge (mg/l)[1]
BOD	300	300	< 30	< 100
Chlorine Demand	25	25	1.0	5.0
Total Suspended Solids	300	300	< 30	< 100

Notes:
1. Unless otherwise noted
2. BA – Believed absent
3. Potentially present in raw water supply

As shown in Table 12-3, projected effluent characteristics are well within allowable discharge standards established for Suffolk County STPs. In fact, many of the constituents found in the wastewater result from their presence in the raw water supply, which complies with drinking water standards.

Oil and grease concentrations in the wastewater holdup tank (i.e., petroleum hydrocarbons in Table 12-3) would be maintained at or below acceptable levels for off-site disposal through use of an oil/water separator. The separator would be sized to provide a low through flow velocity and adequate retention time to allow oil and grease to separate from the process wastewater. Oil/water separators consist of several chambers, including: an inlet stilling chamber; a separator chamber; and an outlet chamber. Water enters the stilling chamber, where flows are slowed and admitted to the separation chamber. In the separation chamber the oil and grease are collected at the surface through flotation. Clean water remains at the bottom, where it passes under an inverted weir into the outlet chamber. The inverted weir prevents passage of oil and grease to the holdup tank. Oil trapped in the oil/water separator would be collected for off-site treatment and disposal by an appropriately licensed contractor.

In addition, transport of process wastewater to a local STP also would be regulated under Federal pretreatment standards for new sources (PSNS criteria) for the steam electric generating point source category (40 CFR 423.17). Federal wastewater discharge standards applicable to the proposed facility under 40 CFR 423.17 are listed below.

- No discharge of polychlorinated biphenyl compounds (PCBs); and
- The pollutants discharged in metal cleaning wastes shall not exceed 1 mg/l for total copper.

12.4.5. POLYCHLORINATED BIPHENYL COMPOUNDS

No process wastewater at the facility would contain PCBs. In fact, no equipment containing PCBs would be installed or operated at the proposed facility or in the adjacent LIPA switchyard. As such, the proposed project would comply with PSNS criteria for PCBs.

12.4.6. COPPER

PSNS criteria require that pollutants contained in metal cleaning wastewaters not exceed a copper concentration of 1.0 mg/l. For the proposed facility, metal cleaning wastewaters typically would be generated once or twice per year. Under the proposed plan, periodic metal cleaning activities would be performed by outside vendors and any waste streams generated would be captured for off-site treatment and disposal at an appropriately licensed facility. As a result, there would be no discharge of metal cleaning wastes from the facility to a local STP. Therefore, the facility would comply with PSNS criteria for copper.

12.5 GROUNDWATER

12.5.1. APPLICABLE REGULATORY REQUIREMENTS

The Federal Safe Drinking Water Act of 1974 (42 USC 300h-3.e) established a program to designate sole source aquifers – zones where groundwater serves as the primary source of potable water supply. The project parcel is within the EPA's Nassau-Suffolk Sole Source Aquifer.

New York State has acted in several ways to protect Long Island's groundwater resources. Environmental Conservation Law (ECL) §15-0514 identifies "primary groundwater recharge areas," which are based on the Long Island Comprehensive Waste Treatment Management Plan of 1978 (developed pursuant to Section 208 of the Clean Water Act and commonly referred to as the "208 Plan"). The 208 Plan identified the areas where precipitation is able to recharge the deeper aquifers, known as "Deep Recharge Areas." These zones are within the interior of the island.

Figure 12-3 illustrates the Hydrogeologic Zones developed under the 208 Plan located in the site vicinity. The proposed project parcel is located within Zone VI, which is not classified as a Deep Recharge Area. Zone III, located north of the project parcel, is classified as a Deep Recharge Area. Also, pursuant to ECL Article 55, Special Groundwater Protection Areas (SGPAs) were defined. As illustrated on Figure 12-4, the nearest SGPA is on the north side of the LIE, coterminous with the Central Pine Barrens. As such, the project parcel is not located within a SPGA.

Article 7 of the Suffolk County Sanitary Code protects both Deep Recharge Areas and other areas proximate to water supplies – "Water Supply Sensitive Areas." The latter are protected as though they were deep recharge areas for 1,500 feet up-gradient and 500 feet down-gradient of a well. The proposed project parcel is not located within a Deep Recharge Area and there are no known private water supply wells located within a 0.5 mile radius of the project parcel.

Article 12 of the Suffolk County Sanitary Code is a design-based regulation, the purpose of which is to ensure the safe storage and handling of all toxic and hazardous materials, including oil and chemical transfer procedures. Among Article 12 requirements is registration for bulk chemical and petroleum storage tanks, including any chemical tank holding more than 80 gallons, any petroleum tank holding more than 1,100 gallons. Registration is also required for any storage area holding five or more 55-gallon drums. Caithness intends to meet the design and registration requirements of Article 12, as well as

NYSDEC's major oil storage facility (MOSF) regulations and chemical bulk storage registration requirements.

12.5.2. PROBABLE IMPACTS TO GROUNDWATER

Potential impacts to groundwater would be associated with drawdown, construction dewatering, discharge of wastewater, and infiltration of stormwater.

A. DRAWDOWN

Water withdrawal from a well has the potential to impact water table elevations. Potable and process water needs for the facility would come from the SCWA distribution system. It is reasonable to assume that most of the water used at the facility would be pumped from the Patchogue-Yaphank wellfield. As discussed in Section 12.3.4, the incremental increase in drawdown at the Patchogue-Yaphank wellfield is not anticipated to exceed 1.5 feet at the well head, and decrease with increasing distance from the wellfield. Since there are no other private or public water supply wells within 1500 feet of the Patchogue-Yaphank wellfield, and given the wellfield's 25-year operational history, private water supply wells would not be adversely impacted by water supply withdrawals for the project.

As shown in Figure 12-4, the recharge area to this wellfield does not extend to the Carmans River, the nearest surface water body. For this reason, no reduction in the supply of groundwater available to local wells or measurable reductions in water flow in the Carmans River are anticipated.

B. CONSTRUCTION DEWATERING IMPACTS

No construction dewatering impacts are projected because depth to the water table at the project parcel is approximately 70 feet, which is well below the deepest on-site excavation. Temporary dewatering may be required for the installation of a new natural gas pipeline, as described in Chapter 19, depending on the alternative pipeline route selected. Construction dewatering is not anticipated for the construction of other utility interconnections.

C. WASTEWATER DISCHARGE

As described in Section 12.4, sanitary wastewater would be managed using an on-site subsurface disposal system. Process wastewater would be managed using a hold and haul system for waste streams not meeting groundwater discharge criteria and through on-site infiltration for demineralization rinse and drain down waters, which comply with groundwater discharge standards. Discharge of process wastewater or stormwater runoff from secondary containment structures at the facility into recharge basins would be regulated under a SPDES permit issued by the NYSDEC. Compliance the terms and conditions established in the facility's SPDES permit would ensure the protection of groundwater quality.

D. STORMWATER RECHARGE BASINS

All stormwater generated at the project parcel would be directed to stormwater recharge basins and continue to serve as source of recharge to the local aquifer system. The project would protect groundwater quality through implementation of both structural and non-structural controls developed as part of a comprehensive site-wide Best Management Practices Plan (BMP Plan).

E. SPILL PREVENTION AND CONTROL

This section provides a description of spill prevention and control measures to be in place for oil, ammonia and other chemicals at the project site.

- The project would develop a formal Spill Prevention, Control, and Countermeasures (SPCC) Plan. This plan would be developed and refined during the final design stages of the project, as final equipment selections are made. The final SPCC Plan would be in place prior to commencement of commercial operations. On-going planning efforts are directed at both minimizing the potential for an accidental release as well as ensuring that plant personnel are prepared to respond in the unlikely event of a release.
- Design plans demonstrating compliance with petroleum and chemical bulk storage regulations and requirements would be submitted for review to the NYSDEC (i.e., chemical bulk and major oil storage facility regulations) and to SCDHS (Article 12, as applicable).

12.6 SURFACE WATERS AND AQUATIC ECOLOGY

12.6.1. SURFACE WATERS

There are no surface waters on or adjacent to the project parcel, including any rivers, streams, ponds or wetlands. In addition, there are no designated waters of the State or waters of the U.S. along proposed utility corridors for water supply, communications or electrical interconnections. Potential wetland and/or stream crossings associated with alternative natural gas pipelines, which would be permitted, developed, operated and maintained by others, are described in Chapter 19.

The nearest surface water resource to the project site is the Carmans River. The Carmans River is located over 1 mile northeast of the project parcel. The estimated time of travel for groundwater recharge at the site to discharge to the Carmans River would range between 25 and 75 years. Since there would be no direct discharge of process wastewater or stormwater runoff resulting from the project or any direct water withdrawals from surface water resources, the project would avoid any measurable impacts to surface water resources in the project vicinity.

12.6.2. AQUATIC RESOURCES

Because no aquatic resources are found on or near the project site, no significant adverse impacts to aquatic resources would be anticipated.

12.7 STORMWATER RUNOFF AND EROSION CONTROL

12.7.1. APPLICABLE REGULATORY REQUIREMENTS

NYSDEC has been delegated by the EPA to implement the National Pollutant Discharge Elimination System (NPDES) regulations established under the Federal Clean Water Act.

This program is administered in New York through the SPDES permit program. The SPDES permit program regulates point source and non-point source discharges into Waters of the State of New York, which includes both surface waters and groundwaters. For the project, the discharge of sanitary, process wastewater (i.e., rinse and drain down water from leased demineralizer trailers) and stormwater associated with industrial activities are subject to this program.

During facility construction, best management practices (BMPs) would be used to minimize erosion and sedimentation. The facility, however, is not required to seek coverage under the NYSDEC's General Permit for Stormwater Associated with Construction Activity, since NYSDEC only regulates stormwater discharges from construction activities to surface waters of the State.

Caithness would submit an individual SPDES permit application to address stormwater discharge from secondary containment basins, plant site runoff, sanitary wastewater, and rinse and drain down water from the leased demineralization trailers.

12.7.2. CONSTRUCTION STORMWATER

Although not subject to a SPDES permit, applicable New York State guidelines for erosion and sediment control practices would be followed. Erosion and sediment control measures would be installed prior to beginning land disturbance activities and would not be removed until the disturbed areas are stabilized. Such practices include seeding or mulching, use of silt fences/straw bale barriers, diversion swales, recharge basins and stabilized construction entrances. Maintenance would be performed, as necessary, to ensure continued stabilization. Below are descriptions of measures that would or may be used during project construction:

- Protection of trees/mature vegetation – Natural vegetation would be preserved where possible, as shown on the engineering plans in Appendix B. Preserving natural and mature vegetation provides an aesthetic buffer, preserves habitat, and reduces soil erosion.
- Stabilized Construction Entrance - All construction access points would be protected to prevent the deposition of materials onto public roadways by installing and maintaining a stabilized construction entrance. Accumulated sediment would be removed when 60 percent of the storage capacity of the retention structure was filled. This is a standard construction practice that would be implemented.
- Diversion swales – During construction, surface runoff would be diverted or otherwise prevented from flowing through areas of construction activity via a system of temporary swales. During operation, vegetated drainage swales would be used to collect and convey runoff to on-site recharge basins.
- Strawbale Barriers/Catchbasin Inlet Protection – Strawbale barriers would be used to prevent sediment inflow into newly installed catch basins during the construction process. They may also be used in place of silt fencing, where applicable.
- Permanent Seeding – The permanent planting of vegetation would stabilize the soil by holding soil particles in place. Permanent seeding would be used on

graded and loamed surfaces with a mixture of fast growing and permanent seedings suitable to the project parcel and regional conditions. Seeded surfaces would be maintained until an adequate and permanent vegetative cover is established.

- Mulching – Mulching is the placement of material, including grass, woodchips, straw, or gravel, to cover and hold in place disturbed soils. This practice is complementary to seeding practices, and would be used.
- Geotextiles/Erosion Control Blankets – Geotextiles are porous fabrics used in construction. They are used for filtration, reinforcement, material separation, matting, drainage applications and erosion control. Erosion control blankets are commonly used as matting to stabilize flow in channels, swales or recently planted slopes.

All erosion and sediment control measures and best management practices used during construction would comply with the specifications contained in the New York Standards and Specifications for Erosion and Sediment Controls, August 2005.

12.7.3. STORM DRAINAGE FACILITIES

A. DISPOSAL LOCATIONS

Engineering drawings for the proposed facility are included in Appendix B and listed below:

- 500-foot Radius Map and Parcel Ownership Information
- 2 x 1 Combined Cycle Plant
- Drainage Plan (Hydrologic Calculations)
- Existing Conditions Plan
- Overall Grading and Drainage Plan
- Construction Grading and Drainage Plan
- Sedimentation and Erosion Control Plan
- Site Laydown Plan

They depict existing and proposed contours, drainage areas, and stormwater recharge basins, to illustrate the pattern of stormwater runoff within each drainage area, as well as the locations of catch basins, subsurface stormwater collection systems, vegetated drainage swales, and locations of tanks and/or major process equipment. Given the high infiltration capacity of on-site soils and the low topographic relief of the project parcel and surrounding area, surface run-on is not expected.

The main plant area is subdivided into two principal drainage zones. Zone 1 is located along the eastern side of the site and Zone 2 is located along the western side of the site. Stormwater from Zone 1 would be collected in catch basins and conveyed through a subsurface piping network and vegetated drainage swale to recharge pond 2 and recharge pond 3, which are located south of the development site. Zone 2 is located along the western portion of the developed site area. Like Zone 1, catch basins and a subsurface collection network would be used to collect and convey stormwater to a vegetated drainage swale that discharges to recharge pond 1.

Runoff from the proposed LIPA switchyard would be routed via overland flow to the vegetated drainage swale discharging into recharge pond 1. Runoff from adjoining undeveloped/revegetated areas of the site would discharge to one of five (5) recharge ponds under post development conditions. Drainage from these areas would be routed via a combination of overland flow and vegetated drainage swales (i.e., there would be no subsurface collection system installed). Recharge pond sizing was performed using the rational method, as shown on Figure 002 in Appendix C.

B. FLOODWAYS AND FLOOD HAZARD AREAS

There are no floodways or flood hazard areas that would be affected by stormwater runoff generated during construction or operation of the facility. The nearest flood hazard area is located along the Carmans River, over 1 mile northeast of the project site. Stormwater generated during construction would be diverted into temporary/permanent recharge basins via overland flow or through surface swales, where necessary. Under post-development conditions, the primary development area will have a stormwater collection and conveyance system to divert stormwater runoff into permanent recharge basins. The site's permanent recharge basins would be designed to manage runoff for storms up to and including the 100-year event.

12.7.4. ANALYSIS OF STORMWATER IMPACTS

On-site recharge basins would be used to manage stormwater runoff during construction and operation. Thus post-development runoff rates and volumes would not exceed pre-development (natural) conditions. The stormwater collection system has been designed to provide safe conveyance of the 100-year, 24-hour storm.

12.7.5. PREVENTING STORMWATER CONTAMINATION

An overview of proposed structural and non-structural stormwater pollution control measures is presented below. Where feasible, outdoor secondary containment basins would be covered with a shed roof, to minimize the potential for stormwater contact.

A. STRUCTURAL DESIGN FEATURES

Transformer Containment Areas

Transformers that contain insulating oil would be installed in a secondary containment basins sized to contain 110 percent of the oil volume plus 8 inches of rainwater. Each containment basin would be fitted with manual valve or sump pit. After a rainstorm, accumulated stormwater would be visually checked for the presence of oil. Stormwater that is free of oil would be routed through manually opened valves or pumped for discharge into a recharge basin. If any unusual conditions are encountered (odors or visual evidence of a leak or spill), the valve or pump would not be activated until the problem can be identified and corrected. Discharge of oil contaminated stormwater would not be permitted.

Backup Fuel Oil Unloading and Storage Areas

The project would use ULSD as a backup fuel. The backup fuel would be stored in two 800,000-gallon double walled storage tanks. Use of double walled storage tanks eliminates the potential for stormwater contamination.

Stormwater collected in the fuel oil unloading containment would be directed to a low point sump, from which it would be pumped to an on-site recharge basin. The pump would be manually operated following visual inspection by maintenance staff. If any unusual conditions are observed (odors or visual evidence of a leak or spill) the discharge pump would not be activated until the problem can be corrected. Discharge of oil contaminated stormwater would not be permitted.

The fuel oil storage tanks would be equipped with automated level monitoring gauges, intermediate level warning indicators, and visual and audible high-level alarms. An oil leak detector also would be installed between the tank and containment wall.

All underground fuel oil pipelines would be of double wall construction and equipped with cathodic protection. Oil sensors would be installed at key locations within the interstitial space of all double walled piping systems.

All unloading operations would be performed under the direct supervision of plant personnel in accordance with the facility's tank truck unloading procedures as described below.

Wastewater Holding Tanks

The wastewater holding tanks would be provided with secondary containment encompassing the loading area, the storage tanks, and the transfer pump area and covered by a shed roof. Stormwater collected within the containment area would be directed to a low point sump or valve box for discharge to an on-site recharge basin. The pump or valve would be manually operated following visual inspection by maintenance staff. If any unusual conditions are encountered (odors or visual evidence of a leak or spill) the discharge pump or valve would not be activated until the problem can be corrected.

The tanks would be equipped with automated level monitoring gauges, intermediate level warning indicators, and visual and audible high-level alarms.

Chemical Storage

Chemicals would be stored in designated indoor container storage enclosure(s), as would both new and used oils and other lubricants. The enclosure(s) would be constructed with a chemically resistant pad and containment curb. The pad would be impervious to the materials being stored, and would provide sufficient storage volume to contain at least 110 percent of the contents of individual containers.

The portable containers would not be stacked more than two high without using a properly designed storage rack. In addition, portable containers would not be stacked unless appropriate equipment is used. Drums and containers would be arranged on pallets to allow for easy access by forklifts. Container storage systems would also allow for all sides of individual containers to be available for inspection.

Employees responsible for the handling, storage, and management of oil or chemicals would be thoroughly familiar with proper drum handling methods and procedures and would receive required OSHA training.

Empty containers or drums, which previously contained toxic or hazardous materials that are empty and no longer in use, would be labeled as such. They would not be reused unless they are properly relabeled with their contents. Unless containers are labeled empty, they would be treated as active containers. Empty containers would be stored in a way that would prevent precipitation from entering the containers. Any water or material observed in an "empty container" would be presumed to be contaminated with the previous contents of the container.

The components of the project's ammonia storage system (tank, transfer area, piping and ammonia skid) would be designed in conformance with applicable requirements of the New York State Chemical Bulk Storage Regulations (6 NYCRR Parts 596 through 599) and Article 12 of the Suffolk County Sanitary Code. The ammonia off-loading and secondary containment basin would be covered with a shed roof.

B. NON-STRUCTURAL BEST MANAGEMENT PRACTICES

The following summarizes non-structural BMPs to be employed at the facility to prevent the pollution of stormwater at the project site.

Best Management Practice Plans

Best Management Practice Plans (BMP Plans) to support facility construction and operation would be prepared and implemented. The BMP Plans would be amended whenever there was a change in facility design, construction, operation, or maintenance that materially affected the potential for the discharge of contaminants in stormwater runoff or the potential for the discharge of oil or toxic/hazardous materials.

Spill Control Equipment

Emergency spill control equipment would be provided throughout the facility site. The spill kits would include sorbent materials (Speedi-dry or similar), petroleum sorbent pads, protective clothing and gloves, and safety glasses/goggles. Emergency spill control equipment near off-loading areas also would include portable oil and/or chemical resistant rubber diking and catch basin spill mats to block off and cover the catch basins in the event of a spill.

Tank Truck Loading and Unloading

Tank truck loading and unloading procedures would be conducted under the direct supervision of facility staff to ensure that proper loading and unloading procedures are followed and a trained facility representative is present in the event of a release.

Upon arrival at the facility, a maintenance employee would meet the driver in the designated loading or unloading area and provide access to the appropriate storage tank. Truck loading and unloading operations would occur only in designated transfer areas.

Prior to and during the transfer of fuel or hazardous materials to storage tanks, inspections of the tank truck and the receiving tank would be conducted to ensure that spillage and overfilling do not occur. The inspection checklist includes protocols for hose inspection, securing manifolds and valves, proper grounding and use of chock blocks to prevent premature disconnect during transfer operations. Tank trucks in the process of being unloaded would be attended by facility personnel at all times.

Daily, Monthly, and Annual Inspections

As part of the facility's BMP Plan, the facility would complete daily visual inspections, in-depth monthly inspections, and annual compliance testing, where appropriate. Objectives for each type of inspection are discussed below. The inspections are intended to uncover any conditions that may adversely impact spill potential or the quality of stormwater discharges.

Integrity inspections of the oil and hazardous materials storage tanks, above ground valves and pipelines, and secondary containment areas would be completed by designated plant staff during each operating shift (rounds would be performed a minimum of three times per day). The inspections consist of a visual integrity check directed at identifying evidence of leaks or any malfunctions of oil or hazardous materials storage, transfer, or handling equipment. Any signs of leakage or conditions that could result in a spill would be promptly reported to the Control Room Operator.

Detailed monthly inspections of the above ground storage systems (i.e., tanks, containment dikes, and piping) would be conducted by maintenance personnel familiar with the systems and with the BMP Plan. Detailed monthly inspections are directed at ensuring that all equipment is maintained in a clean, operational, and environmentally safe condition. Monthly inspections would include visual inspections of all loading and unloading areas, bulk storage tanks, station transformers, stormwater recharge basins, and hazardous material storage areas. Inspections would include visual examination of items including piping, flange joints, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking valves, and metal surfaces.

All container storage enclosures and bulk storage systems would be inspected prior to each permit renewal application to operate a storage facility; subsequent to any substantial modification of the storage facility or part thereof; and prior to putting into service a storage facility or part thereof, after repairs had been performed.

In addition to visual inspections, federal regulations (40 CFR 112.7(e)(2)(vi)) require that above ground petroleum storage tanks be subject to periodic integrity testing. The testing method would take into account tank design and use techniques such as hydrostatic testing, visual inspection, or a system of non-destructive shell thickness testing. Comparison records would be kept and periodically reviewed. Tank supports and foundations would be included in these inspections. Periodic integrity tests of the above ground tanks would be conducted at a minimum frequency of 10 years or when material repairs are performed on the tank. Tank testing records would be kept for the life of the tanks.

A set of tracking and follow-up procedures would be used to ensure that appropriate actions are taken in response to the inspections. Equipment integral to, or supporting, the oil spill discharge prevention system (e.g., lighting, instrumentation, and communication systems) would be maintained, monitored and tested, as appropriate, and any operational problems reported. A record of the inspections, signed by the appropriate supervisor or inspector, would be made part of the BMP Plan.

Personnel Training

Effective stormwater pollution prevention includes periodic training of personnel in the proper operation and maintenance of equipment to prevent the discharge of oil or hazardous substances. Training of facility personnel would ensure that personnel involved with the operation and maintenance of the oil and chemical storage systems know the proper actions to take in the event of a spill or release. Facility personnel responsible for observing and directing product deliveries during unloading operations and those responsible for regular inspection and maintenance of the storage systems would be trained in the proper operating procedures for the transfer of product and in the use of spill containment equipment. These personnel also would be familiar with the BMP and SPCC Plans to ensure that, in the event of a spill, they are capable of following the appropriate procedures for spill cleanup and reporting.

A variety of training programs specifically directed at minimizing the potential for the discharge of pollutants in stormwater runoff would be implemented. These programs would cover a broad array of topics and address proper materials handling, good housekeeping, and spill prevention and response procedures. Personnel training would be conducted upon initial assignment to the facility and whenever the BMP Plan is modified. Spill prevention briefings would be conducted on an annual basis for all facility staff.

Training programs would address topics such as:

- Physical and structural characteristics of tanks, valves and piping;
- Transfer operations;
- Product specific handling procedures;
- Preventive maintenance procedures;
- Discharge prevention laws and regulations; and
- Contents of the BMP Plan.

A copy of any training certificates acquired by employees would be recorded and kept in the facility's training database.

Annual BMP Plan Review

A documented audit and evaluation of the BMP Plan, including a facility walk through, would be completed at least once per year. As a result of this review and evaluation, the BMP Plan would be amended to include additional prevention and control technologies, if existing practices are determined to be insufficient, for: 1) controlling contaminants in stormwater runoff; and/or 2) minimizing the risk of a spill or release from occurring.

The annual plan review typically would include:

- Visual inspection of all areas contributing to stormwater discharge to determine if any conditions have changed;

- Review and evaluation of the effectiveness of measures being implemented to prevent pollution;
- Visual inspection of the spill response equipment to ensure that it is available and in good working order; and
- Visual inspection of any containment dikes or berms to ensure their structural integrity.

12.8 SECURITY

During construction and operation, the facility would be staffed 24 hours per day, 7 days per week, 365 days per year. Prior to commencement of operation, the perimeter of the project site would be secured with a chain link fence topped with barbed wire, sliding motorized gates and surveillance equipment to permit only authorized access to the facility’s service drive, structures and operations. The motorized gate(s) would be closed during normal operations with access provided by control room personnel or passcode by employees. Normal plant lighting and emergency temporary lighting would be provided throughout the facility. Live video surveillance of the entrance, perimeter and discrete sensitive areas would be monitored by control room staff. The video surveillance would be digitally recorded and stored for several days.

12.9 EMERGENCY PREPAREDNESS PLANNING AND RESPONSE ACTIONS

To ensure that on-site personnel are prepared to address emergency operating conditions at the facility, written protocols and standard operating procedures (SOPs) would be developed to:

- provide for the safety of on-site staff and visitors should an emergency condition arise;
- provide for the safe shutdown of the Facility, when necessary; and
- guide personnel in implementing emergency response actions, as appropriate.

An emergency operating condition results from an unplanned event, which could adversely impact human health and safety, plant equipment, or the environment. Primary responsibility for proper implementation of emergency preparedness and emergency response SOPs will rest with the Plant Manager. The Plant Manager would also be responsible for administration, review and approval of all emergency response SOPs. The facility’s Operations and Maintenance Supervisor and designated plant staff would assist the Plant Manager with implementation. Specific duties and responsibilities for designated emergency response personnel would be described in the SOPs, as appropriate.

The emergency preparedness and emergency response SOPs would be refined during final facility design to reflect vendor specific information pertaining to plant equipment, operation, monitoring and maintenance requirements. The SOPs would also be reviewed and updated on an annual basis, or more frequently, if necessary. An overview of key elements of the emergency preparedness and emergency response SOPs and how they would be implemented follows:

12.9.1. STAFF TRAINING

An integral component in the successful implementation of emergency preparedness and emergency response actions is having a trained staff. All employees at the facility would receive annual training in emergency preparedness and emergency response, including participation in periodic drills to verify their effectiveness. More frequent in-depth training would be provided to emergency response coordinators and staff directly responsible for the storage, handling and proper management of oil or hazardous substances. Supplemental training sessions would be used to notify staff of any modifications, revisions or changes to the facility's emergency preparedness and emergency response SOPs, as needed. All on-site staff would receive training in the identification and proper reporting of spills or releases of hazardous materials or petroleum.

12.9.2. EMERGENCY CONTACT INFORMATION

The Control Room Operator would maintain an up to date listing of emergency contact information and telephone numbers. They will include, but not be limited to:

- Plant Emergency Coordinator, Plant Manager;
- 1st and 2nd Alternate Emergency Coordinators;
- State/County/Local Police;
- Fire Department;
- Ambulance/Emergency Medical Assistance;
- Local Hospitals;
- Suffolk County Department of Health Services;
- Town of Brookhaven Environmental Protection Division;
- DEC Spill Hotline;
- National Response Center (NRC) for Oil/Chemical Spills;
- Emergency Hazmat Response Contractor(s);
- LIPA;
- Chemical vendors; and,
- Fuel oil and natural gas suppliers.

12.9.3. FIRE OR EXPLOSION

Any staff member that discovers a fire and/or explosion will immediately notify the Control Room and, when necessary, pull the nearest fire alarm. When notified, control room personnel would request the following information:

- location, severity and type of fire or explosion;

- any known or suspected physical injuries to staff, outside contractors or visitors;
- need to initiate plant shutdown procedures; and
- need for additional on-site personnel to stabilize conditions.

The Control Room Operator would verify that local fire, police and emergency medical personnel were mobilized by dialing 911. Follow-up actions may include the following, as appropriate:

- When a fire alarm sounds, non-essential personnel would proceed directly to the plant entrance or alternate evacuation assembly point, as directed by the Control Room Operator;
- The Control Room Operator would alert staff and keep them informed of the situation using the Facility's public address system and plant radios;
- A staff member would be dispatched to the plant entrance to direct emergency response personnel to the proper location;
- The Control Room Operator would initiate a controlled shutdown of the plant, if necessary;
- The Control Room Operator would notify the designated Emergency Coordinator, who would take responsibility for further actions.

The plant's permanent employees would receive practical training on defensive firefighting measures and would work cooperatively with the local fire departments in the event of a fire at the proposed plant. However, on-site staff would only be authorized to fight small, early stage fires. A small, early stage fire is one that can be controlled or extinguished using portable fire extinguishers without the need for special protective clothing or breathing apparatus.

12.9.4. SERIOUS PERSONAL INJURY OR ILLNESS

Should a serious personal injury or illness occur on-site, staff would immediately notify the Control Room Operator. The Control Room Operator would contact emergency medical personnel by dialing 911. Once emergency medical personnel were notified, the following actions would be taken:

- On-site personnel with first aid training would be dispatched to the scene with a first aid kit and portable defibrillator to assess conditions and take immediate actions, as appropriate;
- Ill or injured persons would be kept calm, warm and quiet while awaiting the arrival of outside emergency response personnel;
- The Control Room Operator would maintain contact with on-scene personnel via plant radios to determine if additional actions are required;
- A staff member would be dispatched to the plant entrance to direct outside emergency response personnel to the proper location;

- The Control Room Operator would notify the on-site Emergency Coordinator, who would take responsibility for further actions.

12.9.5. HAZARDOUS MATERIAL SPILL OR RELEASE

If a spill or release of oil or hazardous material is discovered, plant staff would be trained to: 1) take the necessary steps to mitigate the cause or source of the spill or release (e.g., shut off pumps, close valves, discontinue loading/unloading operations, etc.), whenever possible; and 2) immediately notify the Control Room Operator with the following information:

1. location of the spill or release;
2. type and quantity of material spilled;
3. any known or suspected personal injuries to staff, contractors or visitors;
4. actions taken to mitigate the cause or source of the spill; and
5. circumstances that may have caused the spill.

The Control Room Operator would initiate the following spill response measures and immediately notify the Emergency Coordinator.

1. The site SPR/SPCC Plan would be consulted for all emergencies involving hazardous materials, non-hazardous chemicals, fuel, transformer oils, lube oils or hazardous wastes;
2. On-site personnel with spill cleanup training would be dispatched to the scene to assist in spill containment activities, if conditions allow;
3. The Control Room Operator would notify outside emergency response agencies (e.g., police, fire, ambulance, as appropriate) should conditions warrant;
4. The Control Room Operator would maintain contact with on-site personnel via the plant's public address system and radios to initiate plant shutdown procedures and/or plant evacuation procedures, as required;
5. A staff member would be dispatched to the plant entrance to direct emergency response personnel to the spill location; and,
6. The Control Room Operator would immediately notify the on-site Emergency Coordinator, who would take responsibility for further actions and determine if outside cleanup contractors are required to address conditions.

Spill response actions would be initiated according to the following priorities:

A. PRIORITY 1 – CONTAIN THE SPILL

If the containment system is not operating to design specifications, is not containing all released material, or is in danger of releasing spilled material, all steps necessary to supplement/reinforce the containment system would be taken.

B. PRIORITY 2 – PREVENT HAZARDOUS MATERIAL PATHWAYS

In the event that oil or hazardous material has been released from a containment system, all necessary steps would be taken to prevent it from entering the stormwater collection system or escaping the facility property through use of the following:

- absorbents
- sand bags or dikes;
- diversion ditches;
- curbs;
- pumps; or
- any combination of the above.

At any time the Emergency Coordinator determines that additional measures are needed to prevent, contain, control, or clean up a spill, the Emergency Coordinator would contact designated emergency hazmat response contractor(s) to assist on-site staff in implementing spill control, containment and clean-up efforts. A list of licensed contractors that provide these services would be maintained in the Control Room.

C. PRIORITY 3 – CLEAN-UP

After the spill or release has been effectively contained, clean-up activities would commence. All residuals resulting from spill remediation would be placed in appropriate containers for off-site disposal at an appropriately licensed facility. Off-site transport and disposal would be performed in accordance with Federal, State and local regulations.

12.9.6. SPILL REPORTING PROCEDURES

The Emergency Coordinator would be responsible for reporting a spill or release to any local, state or Federal agencies having jurisdiction. This includes compliance with immediate notification requirements, if applicable, and follow-up written notifications, as required. For immediate notifications to NYSDEC (DEC Spill Hotline), the National Response Center or EPA, as appropriate, the plant manager or designee would provide the following information:

- Facility name and location;
- Owner and operator of the facility;
- Nature of the spill;
- Type and volume of material released;
- Time of the spill;
- Anticipated movement of the spill;
- Actions taken and actions anticipated to be taken to mitigate the release; and
- Weather conditions, if applicable.

Follow up written agency notifications would be provided, when appropriate.

12.9.7. EARTHQUAKE

In the event of an earthquake, Plant staff would be instructed to take the following actions:

If you are inside:

- remain calm and protect your head and face;
- take shelter under a sturdy covering in your work area. Areas near exterior walls should be avoided. Each employee should use their best judgment in selecting the closest reasonable shelter;
- wherever possible, avoid window areas and locations near heavy objects that may shift, fall or topple over due to local ground movement.

If you are outside:

- remain calm and protect your head and face;
- move to a clear outdoor area away from electrical wires or equipment, if possible;
- stay away from electrical wires and electrical equipment; and
- stay away from tall structures, lampposts, tanks, chemical containers, vehicles etc.

The Control Room Operator would do the following:

- maintain contact with on-site staff via the plant's public address system or radios to determine if additional actions are required;
- notify local emergency responders, if warranted, and
- dispatch a staff member to the plant entrance to direct emergency response personnel, if required; and
- notify the on-site Emergency Coordinator, who would take responsibility for further actions.

12.9.8. TORNADO OR STRAIGHT LINE WINDS (MICROBURST)

The Control Room would have access to weather information from the National Weather Service (NWS) and would keep plant staff aware of severe weather conditions in the area via the public address system. The NWS Storm Prediction Center issues tornado watch areas and tornado warnings. A tornado watch is declared when conditions are favorable for the development of tornadoes. A watch does not indicate that a tornado is imminent, but is intended to alert the public to be prepared for a tornado warning. The NWS issues tornado warnings when storm spotters observe a tornado or when Doppler radar indicates circulation that can spawn a tornado. Immediate safety precautions should be taken when a tornado warning is issued for the area.

If the NWS issues a tornado watch, the control room operator would do the following:

- Monitor local radar and weather alerts and inform personnel of impending weather related dangers;
- Contact the Emergency Coordinator; and
- Stop all outside work activities.

If the NWS issues a Tornado Warning, the Control Room Operator would:

- Notify staff to take shelter in the Turbine Building;
- Notify the Emergency Coordinator;
- Notify the Dispatcher that they are leaving the control room due to a tornado warning; and
- Ensure that employees remain indoors until the tornado warning is lifted;

If a tornado or straight line winds are observed, the following would occur:

- Once the event has passed, the Control Room Operator would return to the control room and notify the Emergency Coordinator;
- The Control Room Operator would account for all people on site; and
- A site survey would be conducted looking for fuel oil, hazardous material or gas leaks.

12.9.9. BOMB THREAT

In the event of a bomb threat, the individual receiving the threat should remain calm and encourage conversation to obtain as much information as possible. If the call is to the control room, the Control Room Operator should immediately complete the Bomb Threat worksheet. If an individual other than the Control Room Operator receives the threat, they should notify the Control Room Operator, who would do the following:

- Immediately dial 911 and report available information to the Suffolk County Police Department;
- Notify the Emergency Coordinator of the threat;
- Evacuate all non-essential staff and keep them informed of the situation using the plant's public address system and plant radios; and
- The Emergency Coordinator would work closely with law enforcement authorities and take direction from local law enforcement officials to resolve the issue.

12.10 SOLID AND HAZARDOUS WASTE

During the normal course of operation, the facility would generate small volumes of solid waste as well as minimal amounts of wastes that are classified as hazardous and subject to the Resource Conservation and Recovery Act of 1976 (RCRA), the Environmental Conservation Law Article 27 and the New York

Hazardous Waste Regulations (6 NYCRR 370 et seq.). To minimize the quantities of solid and hazardous waste generated at the facility, a pollution prevention and solid waste management program would be prepared and implemented prior to facility operations that incorporates waste minimization strategies such as recycling and the selection of solvents, paints, and other maintenance chemicals to produce non-hazardous wastes at the facility.

The solid waste generated at the facility generally would be limited to small quantities of office waste and general plant refuse. All solid waste would be loaded into on-site dumpsters and removed from the project site under a contract with a local private vendor. By the placement of appropriate containers, newspapers, corrugated cardboard and metals consumed at the facility during operations would be recycled by operational staff to the maximum extent practicable.

Other wastes typical of power generation operations include used oils collected from the oil/water separator, spent lubricating oils, oil filters from the combustion turbines and air filters. These wastes would be transported off-site by an outside contractor and properly recycled or disposed.

The potentially hazardous wastes generated on-site would be separated from normal waste through segregation of storage areas and proper labeling of containers. All hazardous waste would be removed from the project site by licensed contractors in accordance with applicable regulatory requirements and disposed at either local or regional approved facilities. Because the facility is considered a generator of hazardous waste but not a hazardous waste treatment, storage and disposal facility under the meaning of 6 NYCRR 373, the facility would not require a RCRA permit to operate. To fall below the RCRA threshold, the proposed facility would not store hazardous wastes longer than 90 days.

Additional statutory and regulatory requirements that would be adhered to as part of the facility's hazardous waste management protocol are identified below:

- A Hazardous Waste Identification Number from the EPA would be obtained to dispose hazardous waste generated at the facility. The proposed facility would likely be a Conditionally Exempt Small Quantity Generator as defined by the EPA as a generator of hazardous waste less than 100 kilograms (220 pounds) per calendar month. In the event that larger quantities of hazardous waste are generated, the facility would abide by all requirements associated with that quantity (i.e., periodic reporting).
- All hazardous waste transporters servicing the facility would have their own U.S. EPA Identification Number prior to shipping hazardous waste.
- Facility personnel would follow accurate record-keeping requirements as to the quantity and nature of hazardous wastes generated on-site, with Material Safety Data Sheets (MSDS).
- All hazardous waste would be transported under cradle-to-grave system of manifests.

- All hazardous wastes would be easily identifiable through proper labeling, placarding and placement of containers in accordance with ECL §27-0907 and 6 NYCRR 372.2.
- Appropriate containers would be used, along with appropriate secondary containment measures pursuant to Article 12 of the Suffolk County Code.

12.11 ENERGY

The proposed CLI-II facility will consist of two (2) F-Class heavy duty combustion turbines equipped with heat recovery steam generators (HRSGs). The HRSGs would provide steam through a common header to a single steam turbine generator. The facility would have a nominal generating capacity of 752 MW to assist in addressing Long Island's need for additional electricity, increased competition, and improved system reliability. The project would interconnect to LIPA's 138-kilovolt (kV) transmission system via overhead conductors installed between the project's step up transformers and LIPA's proposed 138 kV switchyard. The new conductors would be located entirely within the approximately 81-acre parcel and no new transmission line right-of-way would be required. LIPA's proposed switchyard is located directly east of the CLI-II facility and immediately north of and adjacent to LIPA's existing Sills Road Substation, which connects the existing CLIEC Facility to the Holbrook-to-Brookhaven 138 kV transmission line corridor.

LIPA's electric system serves the counties of Nassau, Suffolk, and a portion of Queens. Because of increasing electrical demands coupled with plans for decommissioning some of the Island's oldest and least efficient power generating facilities, LIPA conducted studies to evaluate Long Island's future electrical needs. As a result, LIPA solicited proposals for additional power generation capacity and selected a new power plant to be built in Brookhaven, -- the proposed CLI-II facility. In building the power plant and effectively using its generated power, some of LIPA's transmission system and associated substations would require replacement, upgrades, or additional equipment to enable energy from the proposed power plant to be safely distributed across LIPA's three operational segments.

Some of the projected LIPA system improvements would require connecting selected substations within the three regions to new or upgraded transmission lines capable of transmitting the power safely. In addition, some substations would be renovated, expanded or newly constructed to provide optimum power transfer capability to all regions. Most of the LIPA system reinforcements to substations and transmission lines are projected in the central and eastern regions of LIPA's service territory.

A System Reliability Impact Study (SRIS), which includes analyses for thermal, voltage, short circuit and stability, would evaluate the impact of the new plant on the LIPA bulk power distribution system and systems in Southeastern New York. The study would be conducted in accordance with the NYISO SRIS Criteria and Procedures provided to the New York State Independent System Operator (NYISO) for review and approval.

The output of the generators would interconnect to the LIPA substation expansion through three new step-up transformers and 138 kV overhead transmission lines. Each circuit would consist of three conductors, connecting hardware, polymer or porcelain insulators, and support structures. The transmission lines would be designed and constructed so that they provide sufficient clearances to protect the general public, utility workers and plant staff. The approximately 2.75-acre LIPA substation expansion is anticipated to contain switching, protection and control equipment. The substation expansion would contain switch gear, busses, and buss supports and also may contain a control building and breakers.

The electrical effects of high-voltage transmission lines fall into two broad categories: corona effects and field effects. Corona is the ionization of the air that occurs at the surface of an energized conductor and suspension hardware due to high electric field strength. Corona may result in radio and television reception interference, audible noise, light, and production of ozone. Corona is a function of the voltage of the line, the diameter of the conductor (or bundle of conductors), and the condition of the conductor and hardware. Field effects are produced by the voltages and currents and may be induced in nearby conducting objects. Computed electric and magnetic fields associated with the 138 kV interconnections are described in Section 12.12.5.

The facility would utilize natural gas as its primary fuel with ULSD (15 ppm sulfur by mass) as a backup fuel. Natural gas would be provided to the project through a new natural gas pipeline/lateral, as described in Chapter 19. Based on full year operation, assuming operation of the facility for 720 hours on ULSD, the proposed facility would consume approximately 36 x 10^6 million British thermal units (mmbtu) per year of natural gas. This natural gas demand would not impact regional energy systems; nor would it impact or preclude service to other users. Moreover, the new natural gas pipeline/lateral would enhance the existing natural gas distribution system in eastern Long Island.

Assuming operation of the auxiliary boiler and combustion turbine on ULSD for 720 hours per year, the proposed facility would consume approximately 3.4 x 10^6 mmbtu per year of ULSD on an annual basis. Providing a backup fuel supply is necessary to ensure the reliable operation of the electricity grid. Without a backup fuel source, any interruption to the natural gas supply would shut down generation capacity, thereby decreasing the reliability of Long Island's electrical distribution system to meet customer needs. Although a temporary interruption of the natural gas supply is unlikely, it is necessary to have the capability to operate on an alternate fuel on a contingency basis. Further, the project's ability to operate on ULSD would allow the natural gas that would otherwise be consumed by the facility to be available for use elsewhere used by others in the region, without impacting the project's ability to meet power demands.

12.12 ELECTRIC AND MAGNETIC FIELDS

This section analyzes the potential electric and magnetic fields associated with the project's 138 kV interconnection to the LIPA distribution system. The 138 kV interconnection would be made through three (3) overhead circuits from the main station step-up transformers to the proposed LIPA switchyard expansion. The new overhead circuits would be 200 to 240 feet long and located entirely within the approximately 81-acre parcel. As such, no new transmission system right-of-way would be required.

12.12.1. ELECTRIC FIELDS

Voltage on any wire, whether an overhead phase conductor or a lamp cord, produces an electric field. Electric fields are invisible lines of force that repel or attract electrical charges. As with a magnet, if the charges are the same (i.e., either positive or negative), they would repel one another. If the charges were opposite, they would attract one another.

Electric fields near transmission lines are proportional to operating voltage, which is typically controlled within a small range (usually ± 5 percent). Since operating voltage remains relatively constant, electric field strength at any given distance also remains relatively constant. The proposed project's overhead electric conductors would operate at 138 kV.

12.12.2. MAGNETIC FIELDS

Any object with an electric charge has a voltage (potential) at its surface and can create an electric field. When electrical charges move together (an electric current) they create a magnetic field, which can exert force on other electric currents. All currents create magnetic fields. Magnetic fields occur throughout nature and are one of the basic forces of nature. The strength of the magnetic field produced by a transmission line depends on the current (higher currents create higher magnetic fields), the diameter and phasing of the conductor, spacing between conductors, and distance (magnetic fields weaken as the distance from the source increases).

Magnetic fields can be static/unchanging in direction (caused by direct current, "DC") or changing/alternating in direction (as in alternating current, "AC"). Some electrical devices operate on a DC system while others operate on an AC system. The magnetic field from AC sources (such as the electrical equipment of substations) differs from background DC fields (like the Earth) because the field is due to alternating current, which changes direction at a rate of 60 cycles per second or 60 Hertz (Hz) in the United States.

The characteristics of magnetic fields can differ depending on the field source. A magnetic field near an appliance decreases rapidly with distance from the device. Magnetic fields also decrease with increasing distance from line power lines, but not as rapidly as with appliances. Electric transmission line magnetic fields attenuate at a rate that is inversely proportional to the distance squared, whereas magnetic fields from appliances attenuate at a rate proportional to the distance cubed. For overhead electric transmission lines, magnetic fields are highest directly beneath the transmission lines (typically near the center of the right-of-way) and decrease as the distance from the transmission corridor increases.

Representative magnetic field strengths for various devices are listed in Table 12-4.

Table 12-4
Representative Magnetic Field Strengths

Source	Magnetic Field Strength (mG)
Magnetic Resonance Imaging - MRI Scan	20,000,000 (DC)
Permanent magnet	100,000 (DC)
Earth's magnetic field (United States)	470 to 590 (DC)
Hair dryers and electric blankets	100 to 500
Typical household appliance	40 to 80
Typical in-home fields away from appliances	0.5 to 2.5
Notes: *(DC) These magnetic fields are steady fields (not time-varying) as opposed to the other fields listed above, which are low-frequency (60 Hz), time-varying fields.*	

12.12.3. ELECTRIC AND MAGNETIC FIELD STANDARDS/GUIDELINES

A. FEDERAL STANDARDS

There are no Federal standards limiting residential or occupational exposure to 60 Hz magnetic or electric fields.

B. NEW YORK STATE PUBLIC SERVICE COMMISSION STANDARDS

The applicable electric field strength standards established by the NYSPSC for transmission lines are set forth in Opinion No. 78-13 (issued June 19, 1978). The magnetic field standards established by the NYSPSC are set forth in the NYSPSC's Interim Policy Statement on Magnetic Fields, issued September 11, 1990, (Interim Policy). They are summarized in Table 12-5.

Table 12-5
NYSPSC Transmission Line Exposure Standards for Electric and Magnetic Fields

Area Where Limit Applies	Electric Field Stress (kV/m)	Magnetic Flux Density (mG)
Edge of Right-of-Way (ROW)	1.6	200[1]
Public Road Crossings	7	-
Private Road Crossings	11	-
Anywhere	11.8	-
1) **Notes:** Interim policy statement.		

The electric field strength interim standard of 1.6 kilovolts per meter (kV/m) for electric transmission lines at the edge of the right-of-way is measured one meter above ground level, with the line at its rated voltage. The Interim Policy established a magnetic field strength interim standard of 200 milligauss (mG), measured at one meter above grade at the edge of the right-of-way, at the point of lowest conductor sag. The measurement is based on the expected circuit phase currents being equal to the winter-normal conductor rating.

C. OTHER RECOMMENDED EXPOSURE GUIDELINES

The International Non-Ionizing Radiation Committee of the International Radiation Protection Association ("IRPA") has published "Interim Guidelines on Limits of Exposure to 50/60 Hz Electric and Magnetic Fields." The Committee approved the guidelines in 2010. The guidelines for 60 Hz fields are presented in Table 12-6.

Table 12-6
IRPA Exposure Guidelines for 60 Hz Electric and Magnetic Fields

Exposure Characteristics	Electric Field Stress (kV/m)	Magnetic Flux Density (mG)
Occupational Exposure		
Basic restriction: head	120	-
Basic restriction: whole body	800	-
Magnetic field reference level	-	10,000
Electric field reference level	8.3	-
General Public		
Basic restriction: head	24	-
Basic restriction: whole body	400	-
Magnetic field reference level	-	2,000
Electric field reference level	4.167	-
Notes: International Radiation Protection Association, 2010		

The American Conference of Governmental Industrial Hygienists has specified that worker exposure to magnetic fields should not exceed 1000 mG for workers with pace-makers, or 10,000 mG for other workers.

12.12.4. ELECTRIC AND MAGNETIC FIELDS AT SUBSTATIONS

In general, the highest electric and magnetic fields in the vicinity of an electrical substation are produced by the transmission lines entering and leaving the substation. The strength of the fields that emanate from electrical equipment in the substation (i.e., switchgear, transformers, reactors, and capacitor banks) decreases rapidly with increasing distance. Beyond the substation fence, the fields produced by substation equipment are generally low compared to the fields directly underneath the overhead power lines entering and leaving the substation. This analysis focuses on fields produced by the three (3) 138 kV circuits, since they produce the highest exposure levels for comparison with established guidelines. However, since the overhead transmission lines to the LIPA distribution system do not require construction of a new transmission line right-of-way 10 miles or greater in length abutting publicly or privately owned lands, neither the NYSPSC electric field strength standards nor the magnetic field strength standards would apply to this interconnection.

12.12.5. POTENTIAL ELECTRIC AND MAGNETIC FIELD IMPACTS

The magnetic field levels and electric field levels produced by the project's proposed 138 kV electric transmission line interconnections were calculated using *ENVIRO*. *ENVIRO* is part of the EMFWorkstation developed by Enertech Consultants of Campbell, California for the Electric Power Research Institute (EPRI). *ENVIRO* calculates lateral profiles for electric and magnetic fields, as well as audible noise.

The electric and magnetic fields produced by the three (3) 138 kV overhead transmission lines were calculated. The northerly most circuit was designated as Circuit 1, the middle circuit was designated Circuit 2, and, the southerly most circuit was designated Circuit 3. Each circuit contained three individual power conductors. It was assumed that no overhead ground wires were part of the interconnection. Calculations were performed along a straight line profile oriented at right angles to the circuits, which were assumed to be parallel. The profile extended through the midpoint of three towers supporting each circuit and was adjacent to and on the east side of the access road in the station.

The center phase conductor for the middle circuit, Circuit 2, represented the center of the profile (i.e., Station ±0). The fields were calculated for two separate phasing configurations at 5 foot intervals. The profile extended 450 feet northerly from Station ±0 to a point 250 feet southerly from ±0. The length of the profile permitted *ENVIRO* to provide electric and magnetic field information in the vicinity of the 138 kV lines, as well as at distances extending beyond the facility fence line.

Input parameters used in the *ENVIRO* program are:

- Physical configuration and geometry of the power conductors and overhead ground wires;
- Physical specifications for the power conductor and overhead ground wire;
- Operating voltages and currents; and
- Phasing orientation of the power conductors.

The prospective locations of the project and LIPA's switchyard including the three 138 kV circuits are shown on the General Arrangement Plan (see Figure 2-6).

The configuration of the three 138 kV circuits is shown on the drawing to be horizontal or flat. The horizontal locations or coordinates of the nine (9) power conductors were scaled from the drawing. The vertical location or coordinate of each of the power conductors was assumed to be 25 feet above grade because this was the required minimum vertical clearance over an access road in substation where access is restricted to utility vehicles and activities and access by the public is prohibited. To be conservative, calculations assumed a generating capacity of 764 MW. Power conductors were assumed to have a diameter of 1.108 inches for the combustion turbine step-up transformers (maximum 213 MW each) and 1.602 inches for the steam turbine step-up transformer (maximum 338 MW).

The calculations were performed for two different phase configurations. The first considered like phases of adjacent circuits positioned next to one another (e.g., A-B-C C-B-A A-B-C). The second considered unlike phases of adjacent circuits positioned next to one another (e.g., A-B-C A-B-C A-B-C).

Results of the analysis are summarized in Table 12-7 and graphically depicted in Figures 12-7 and 12-8. Positioning unlike phases next to one another (configuration 2) yielded approximately 10 % lower levels of electric and magnetic fields than placing like phases next to one another (configuration 1).

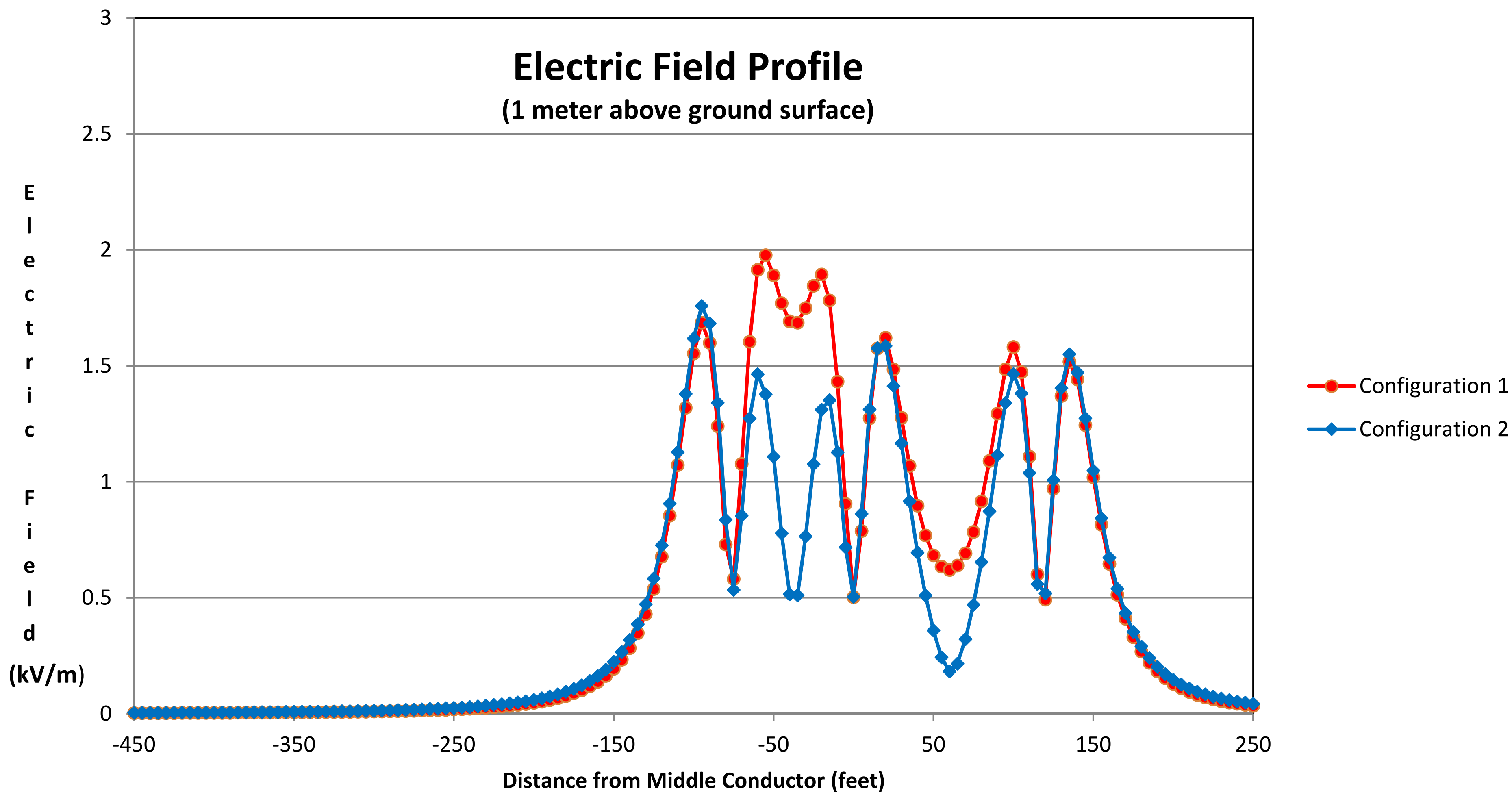
Table 12-7
Calculated Electric and Magnetic Field Levels

Location	Horizontal Coordinate	First Phasing Configuration		Second Phasing Configuration	
		Electric Field	Magnetic Field	Electric Field	Magnetic Field
Northern Fence Line	-384	0.0 kV/m	1.6 mG	0.0 kV/m	3.8 mG
Maximum Value (under the power conductors)		2.0 kV/m	342 mG	1.8 kV/m	310 mG
Southern Fence Line	+197	0.2 kV/m	17.2 mG.	0.2 kV/m	23.2 mG

The maximum predicted magnetic field levels for each configuration (i.e., 342 mG for configuration 1 and 310 mG for configuration 2) occur beneath the conductors and were well below recommended occupational exposure levels. The maximum predicted magnetic field levels at the facility fence lines were 23.2 mG at the southern fence line and 3.8 mG at the northern fence line. These exposure levels are well below the NYSPSC recommended level of 200 mG at the edge of a transmission line right-of-way.

The maximum predicted electric field levels for each configuration (i.e., 2.0 kV/m for the first configuration and 1.8 kV/m for the second configuration) also occur beneath the conductors and were also below recommended occupational exposure levels. The predicted electric field levels decrease to 0.2 kV/m at the southern fence line and 0.0 kV/m at the northern fence line. These exposure levels are also below the NYSPSC recommended level of 1.6 kV/m at the edge of a transmission line right-of-way.

In this analysis the electric and magnetic field levels produced by the three 138 kV circuits were used as a surrogate for what the composite field levels from all sources might be. This is reasonable given that field levels produced by station equipment are expected to be much lower than those produced by the 138 kV overhead electric circuits. Electric and magnetic fields of the magnitude calculated would not exceed recommended occupational exposure levels within the facility fence line or recommended exposure levels for the general public beyond the facility fence line. As such, potential impacts associated with electric and magnetic fields produced at the facility are considered negligible and they would not pose a significant health risk.

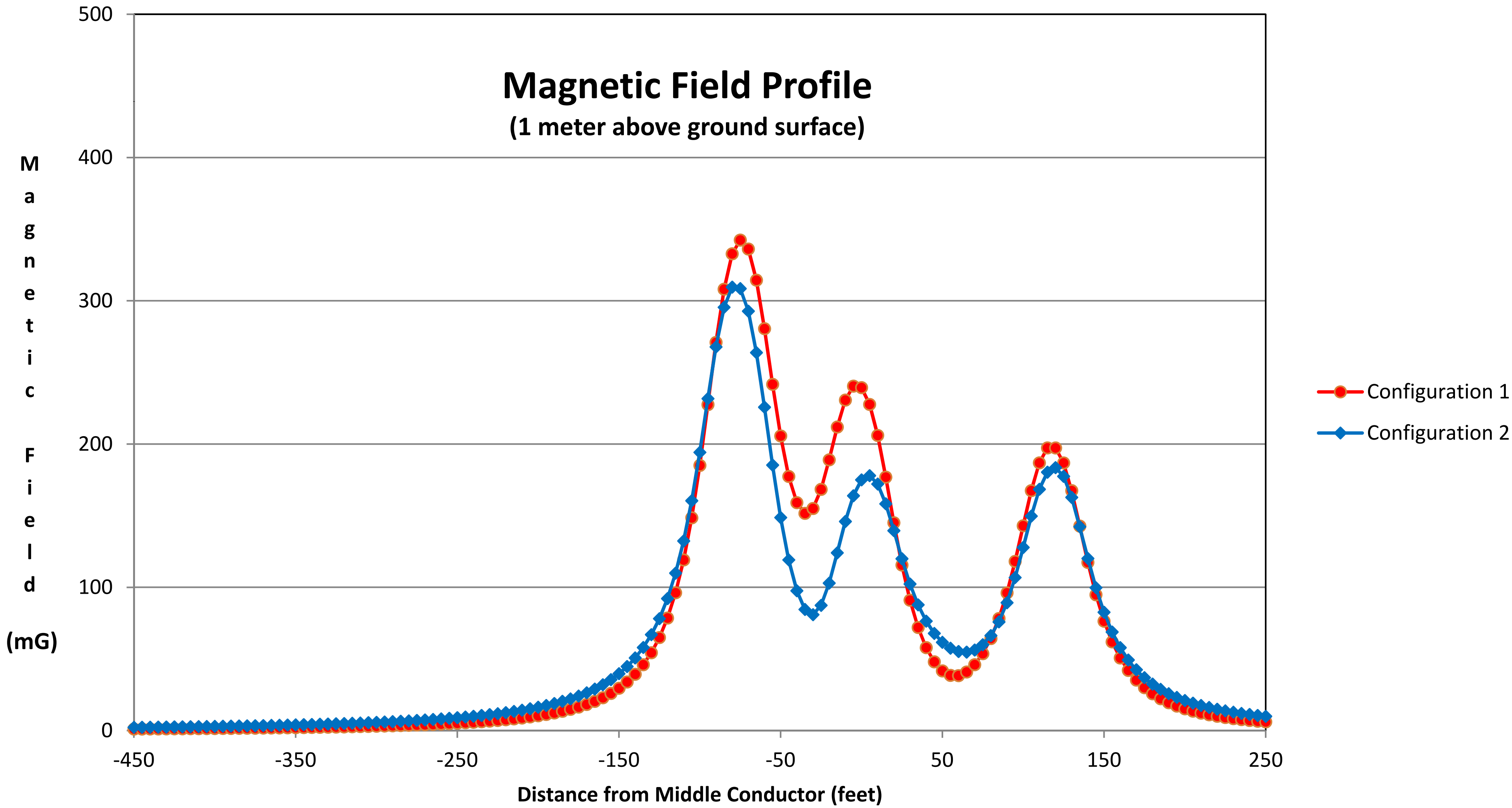


TRC
1200 Wall Street West, 5th Fl.
Lyndhurst, NJ 07071
201-933-5541

ELECTRIC FIELD PROFILE

CAITHNESS LONG ISLAND
ENERGY CENTER II
TOWN OF BROOKHAVEN, NEW YORK

FIGURE 12-7	NOVEMBER 2013



TRC
1200 Wall Street West, 5th Fl.
Lyndhurst, NJ 07071
201-933-5541

MAGNETIC FIELD PROFILE

CAITHNESS LONG ISLAND ENERGY CENTER II
TOWN OF BROOKHAVEN, NEW YORK

FIGURE 12-8	**NOVEMBER 2013**

12.13 DECOMMISSIONING

12.13.1. INTRODUCTION

This section provides a general description of the decommissioning activities anticipated at the end of the facility's useful life. Decommissioning would encompass, where appropriate, removal of structures, equipment, hazardous materials and ancillary facilities. It also encompasses remediation of residual contamination, if found, to acceptable levels for industrial redevelopment. The decision to permanently cease facility operations would be solely at the discretion of Caithness, and would be based on commercial factors. During construction, contractual obligations and remedies would be in place to ensure that the project is completed and commences commercial operations. Once operational, decommissioning is highly unlikely while the facility is economically viable. The CLI-II facility would represent one of the cleanest, most efficient and reliable baseload generating facilities on Long Island.

The CLI-II facility is expected to have a useful life of 30-40 years, a substantial portion of which would be subject to a power purchase agreement with LIPA. Since the CLI-II facility would generate electricity far more efficiently than most other generating stations on Long Island, one would expect that older and less efficient generating stations would be retired well before the CLI-II facility.

Over the useful life of the facility, it is also unlikely that damage to plant components would trigger decommissioning. For example, if a fire destroyed a portion of the facility, insurance coverage would be in place to protect against potential losses. Thus, as long as the plant remains economically viable, it is reasonable to conclude that damaged components would be reconstructed or replaced, as necessary, using insurance proceeds.

There are no known significant environmental conditions at the proposed facility site. Because Caithness would be required to comply with a comprehensive suite of environmental laws, rules and regulations specifically directed at protecting the environment, the risk of future environmental liability is low, particularly when compared with older industrial development sites on Long Island. It is reasonable to conclude, therefore, that industrial redevelopment potential would be high, with minimal impact on surrounding land uses. Decommissioning would allow future developers and decision makers broad flexibility relative to future land development opportunities.

12.13.2. DECOMMISSIONING PLAN

Certain criteria would guide the decommissioning process. First, any facility dismantling or and removal would need to proceed in a safe and environmentally sound manner. It is anticipated that a Phase 1 environmental site assessment would be performed in accordance with current ASTM Standard at the time. Phase I ESAs are used in these instances to identify environmental issues in soil, groundwater or building materials that may need to be investigated further prior to any decommissioning and demolition that is undertaken. Additionally, to ensure that the locations of regulated materials used during facility operation are known prior to decommissioning activities, it is likely that a hazardous materials survey of existing site structures would be conducted to identify areas where regulated materials are used and stored at the facility site. Second, the future owner may determine that certain structures, buildings or utilities would remain to support future redevelopment plans. Third, recycling would be employed to maximize recovery of scrap metal and other marketable materials. Fourth, foundations and underground utilities would be removed to the extent necessary, except for those previously deeded to and operated by public authorities, municipalities, utilities or other agencies, and/or unless commercial agreements allowing for the conservation and reuse of foundations and utilities can be reached. Fifth, to the extent required by applicable law, any environmental contamination would be remediated to applicable standards. Sixth, as needed, the site would be regraded and stabilized.

Actual decommissioning would proceed in four major phases implemented as appropriate: removal of specialized equipment; removal of basic structures; removal of foundations, piping, and utilities (to the extent necessary); and site restoration. For removal of specialized installations, electrical equipment would be de-energized and any hazardous materials associated with that equipment would be removed. Equipment can be a source of scrap metal. For removal of basic structures, where necessary, roofs, wall sidings, beams, above grade structural supports, and tanks would be dismantled. Much of this material would be sold as scrap. When necessary, excavation would be required for the removal of foundations, piping, and utilities. The first part of this phase would be removal of aboveground piping, followed by excavation and removal of foundations (with appropriate disposal of concrete and steel), and followed by excavation and removal of underground piping. Finally, excavated areas would be backfilled. For site restoration, paved surfaces would be removed to the extent necessary. Then, disturbed areas would be stabilized to limit the potential for erosion (i.e., mulched or revegetated, as appropriate).

Decommissioning activities would occur in accordance with the local, state, and Federal regulations in place at the time. The closure of environmental permits and licenses associated with facility operation would be coordinated with the applicable agencies (e.g., NYSDEC). For example, based on the current MOSF tank closure requirements, it can be anticipated that a site assessment would be conducted addressing, at a minimum, the areas adjacent to the oil tanks, manifolds, and transfer areas. The site assessment would include both soil and groundwater samples to identify any areas requiring remediation as noted above. Further, it can be anticipated that local demolition permits would be required based on current Town of Brookhaven requirements (§16-3 of the Brookhaven Town Code).

12.13.3. FUNDING FOR DECOMMISSIONING

It is expected that the aboveground portion of the facility's components would be offered for sale, for salvage or at least scrap value. Even if there were no salvage market for the project's components, the scrap value of the equipment, buildings, and structures would be sufficient to offset site decommissioning costs. ✷